



SAMLEX EUROPE[®] B.V.

Omnicharge²

Model No.

OC² 12-40 (12V/40A)

OC² 12-60 (12V/60A)

OC² 24-20 (24V/20A)

OC² 24-30 (24V/30A)

Owners Manual

Please read this manual before operating your Omnicharge²

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1. INTRODUCTION

Thank you for purchasing a SAMLEX EUROPE (SAMLEX) Omnicharge battery charger. Please read this owner's manual for information about using the product correctly and safely. Keep this owner's manual and all other included documentation close to the product for future reference. For the most recent manual revision, please check the downloads section on our website.

The purpose of this owner's manual is to provide explanations and procedures for installing, configuring and operating the battery charger. The installation instructions are intended for installers that should have knowledge and experience in installing electrical equipment, knowledge of the applicable installation codes, and awareness of the hazards involved in performing electrical work and how to reduce those hazards.

1.1 Important safety information

This section contains important safety information for the Omnicharge battery charger. Each time, before using the Omnicharge battery charger, READ ALL instructions and cautionary markings on or provided with the battery charger, and all appropriate sections of this guide. The Omnicharge battery charger contains no user serviceable parts. Opening up the battery charger will void product warranty.



WARNING

FIRE AND/OR CHEMICAL BURN HAZARD

Do not cover or obstruct any air vent openings and/or install in a zero clearance compartment.



WARNING

SHOCK HAZARD. KEEP AWAY FROM CHILDREN!

Avoid moisture ingress. Never expose the unit to snow, water, etc.



WARNING

FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN DEATH OR SERIOUS INJURY:

1. When working with electrical equipment or lead acid batteries, have someone nearby in case of an emergency.
2. Study and follow all the battery manufacturer's specific precautions when installing, using and servicing the battery connected to the charger.
3. Wear eye protection and gloves.
4. Avoid touching your eyes while using this unit.

5. Keep fresh water and soap on hand in the event battery acid comes in contact with eyes. If this occurs, clean right away with soap and water for a minimum of 15 minutes and seek medical attention.
6. Batteries produce explosive gases. DO NOT smoke or have an open spark or fire near the system.
7. Never attempt to re-charge a damaged, frozen or non-rechargeable battery.
8. Keep unit away from moist or damp areas.
9. Avoid dropping any metal tool or object on the battery. Doing so could create a spark or short circuit which goes through the battery or another electrical tool that may create an explosion.
10. Battery charger must be plugged in to an earthed mains supply. If the unit's power cable is damaged, let it be replaced by a qualified technician immediately.
11. There are no user serviceable parts inside in the charger's enclosure.
12. Always disconnect the AC mains supply to the charger, before connecting or disconnecting a battery.



WARNING

EXPLOSION HAZARD!

Do not use the battery charger in the vicinity of flammable fumes or gases.



CAUTION

LIMITATIONS OF USE

Do not use in connection with life support systems or other medical equipment or devices. This battery charger is not to be used by persons with reduced physical or mental capabilities or lack of knowledge and experience. Not to be operated or used by children.

2. INSTALLATION

2.1 Unpacking

The charger package should contain the following items :

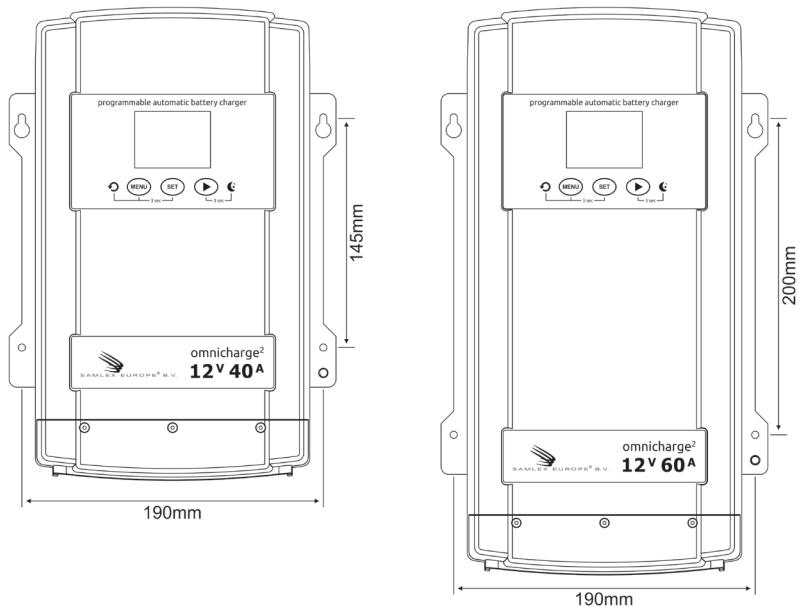
- Battery charger
- Battery temperature sensor (3m)
- Owner's manual
- Charger warning stickers
- 4x M6 crimp terminals
- 4x mounting screws

⚠ CAUTION

After unpacking, check if the product shows any mechanical damage. Never use the product when the enclosure shows any visual damage caused by harsh handling, or when it has been dropped accidentally. Contact your local supplier for further information.

2.2 Mounting

Please see the image below for the preferred mounting method and mounting screw distances.



The Omnicharge² 12-40 and 24-20 have the same size. The same applies to the Omnicharge² 12-60 and 24-30.

Further mounting details:

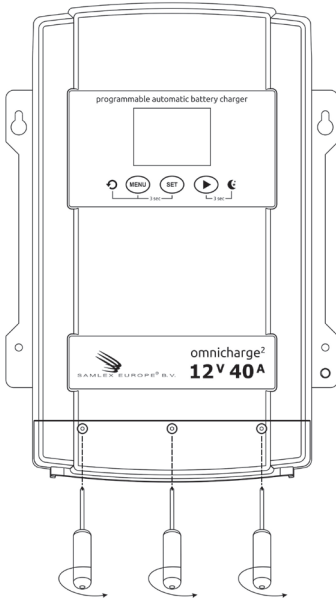
1. Choose an appropriate mounting location.
2. For installing in a dry and clean location, the unit can be mounted in any direction although mounting the charger vertically provides the best thermal performance.
3. For installing in boat or marine environment, the unit can be mounted horizontally and vertically (AC and DC panel facing downwards only to provide adequate drip protection).
4. Use the base of the charger as a mounting template to mark the positions of the fixing screws.



CAUTION

Keep a clear space of at least 10 cm around this product for cooling purposes! Always mount this product in an upright position. Floor mounting is allowed as well, provided that all 4 screws are used to secure the enclosure.

2.3 Accessing the connection compartment

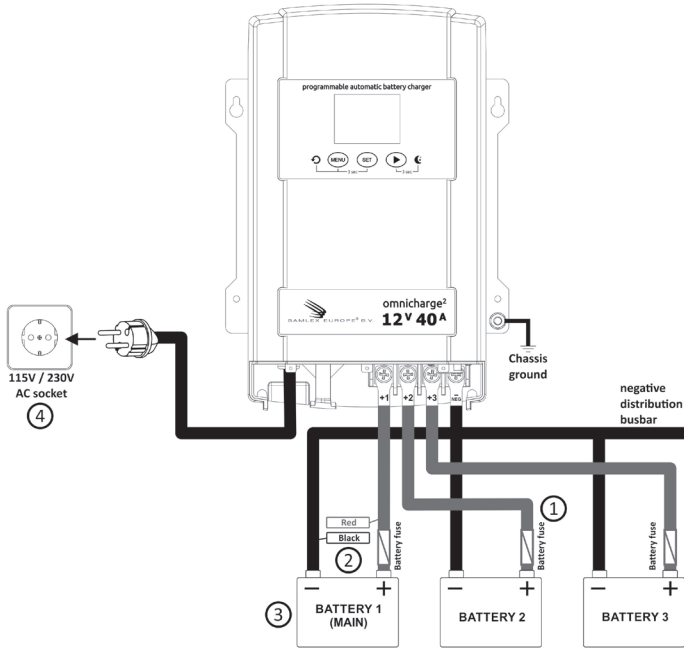


To access the connection compartment, remove the three screws indicated on the left and slide the connection compartment cover upwards.

Never operate this product without having the cover re-installed!

2.4 Wiring details

Please see the image below for the AC and DC wiring details.



☒ Please consult the following table to determine the correct battery cable and fuse size for each model. Using a smaller cable size or a longer cable will cause additional losses and may result in improperly charged batteries. Fire and burning hazards are present if the battery cables are insufficiently sized for the expected current. Battery cable lengths longer than 6 meters, are not recommended.

Model	Cable size (length ≤ 3 m)	Cable size (length = 3 to 6m)	Battery fuse (quick type)
OC ² 12-40	16mm ² (AWG6)	25mm ² (AWG4)	50-70Amp
OC ² 12-60	25mm ² (AWG4)	35mm ² (AWG2)	70-90Amp
OC ² 24-20	10mm ² (AWG8)	16mm ² (AWG6)	30-40Amp
OC ² 24-30	16mm ² (AWG6)	25mm ² (AWG4)	40-50Amp

- ☒ Up to 3 battery banks can be connected to the charger. In single battery bank installations do not use battery bank outputs 2 and 3, always connect the main battery to output 1. Output 1 has charge priority, followed by output 2 and finally output 3. Each output is capable to deliver the full charge current. For more information about the smart charge handling between all outputs, please check chapter 3.1.
- ☒ Since the Omnicharge² battery chargers have a programmable maximum charge current per output, no minimum battery capacity is given. Omnicharge2 allows a mixed use of small and large batteries on each individual output. As rule of thumb, the minimum battery capacity should be at least twice the charge current and the maximum battery capacity ten times the charge current. For example, an OC2 12-40 with the maximum charging current set to the default 40A, has a minimum recommended battery capacity of 80Ah and a maximum capacity of approx. 400Ah. Always consult the battery's datasheet for maximum charge current recommendations!
- ☒ If you wish to use this charger in a fixed installation, it is advisable to connect the charger to a switched AC socket to turn it off completely. In this case, please make sure to avoid having the batteries still connected to the charger for a prolonged time without the AC connected. This can slowly discharge the batteries. Another option is to connect a switch to the remote on/off terminals of the charger. This way the charger only goes to standby/ sleep mode and no current is drawn from the connected batteries.



WARNING

The schematic in this chapter shows a typical standalone installation. No guarantees are given on the compliance of any local electrical regulations. Please make sure that the complete installation is made in accordance to all locally applicable electrical regulations.



WARNING

This Class I product must be earthed! Always connect the PE wire or chassis ground screw at the bottom of the enclosure to your central ground (vehicle chassis, grounding system of your boat etc.)

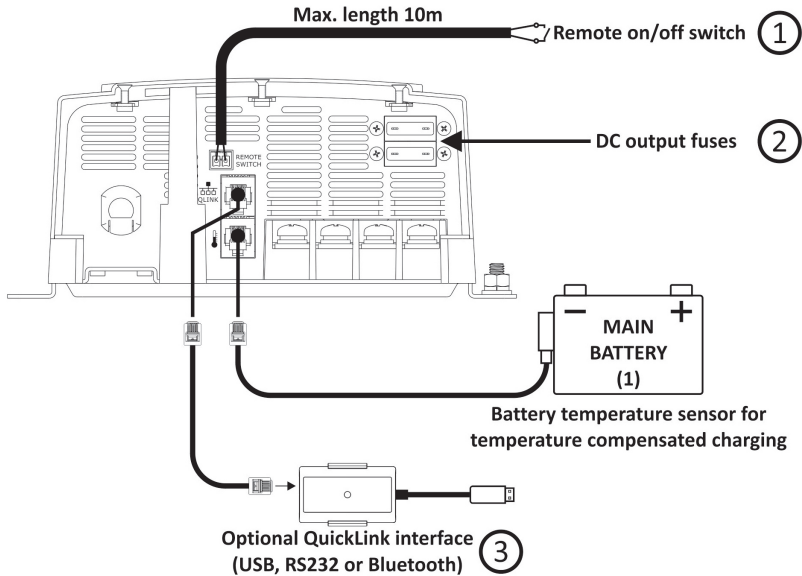


CAUTION

Always connect the negative (-) cable directly to the negative terminal of the battery, or to the "loadside" of a current shunt. Always keep positive and negative cables close to each other to minimize electromagnetic fields. Double check for correct polarity, before connecting the battery cables to the battery! Wrong polarity may damage the charger.

2.4.1 Other connections

The following image shows the remaining connection options of the Omnicharge² battery charger.



- ☒ A remote on/off switch (SPST) can be connected to the 'REMOTE SWITCH' terminals. When the switch is closed the charger is active and when the switch is opened the charger jumps to a standby (sleep-) mode. Before installing the remote wiring, please remove the pre-installed wire link in the removable male connector. The minimum electrical specifications for the remote switch are 5V and 5mA.
- ☒ The DC output fuses are accessible for easy replacement in case these are blown due to an accidental reverse polarity connection of the battery. Always replace the fuses with the correct types. These are:
 - OC² 12-40 / 2x 30Amp ATO blade
 - OC² 12-60 / 3x 30Amp ATO blade
 - OC² 24-20 / 2x 15Amp ATO blade
 - OC² 24-30 / 3x 20Amp ATO blade
- ☒ The optional QuickLink interface kits can be used to configure and readout the charger using 'Dashboard 2' for Windows (USB / RS232) or 'Dashboard Mobile' for iOS and Android (Bluetooth).

3. GENERAL FUNCTIONALITY

3.1 Understanding the smart automatic charge distribution

The Omnicharge² battery chargers are fully automatic multistage chargers with the ability to charge three separate battery banks. Omnicharge² goes one step further by allowing each battery output to be uniquely configured in order to fit the connected battery. This enables the possibility to charge a collection of larger and smaller batteries of mixed chemistry by only one battery charger!

Once the charger is activated, it will check all connected batteries starting at output 1, followed by 2 and 3. Output 1 has charge priority. But if any battery connected to output 1, 2 or 3 has a voltage below 11.9V (23.8V @ 24V models), Omnicharge² will charge these batteries first until 12.5V (25.0V @ 24V models) is reached. After this all batteries are fully charged to float (or end of absorption in Mode 2) successively, starting at battery bank 1 and followed by bank 2 and 3. On completion, all three battery banks are moving to a float stage with a shared voltage level. This voltage level is equal to the lowest float voltage value that is stored in the setup menu of any of the three battery banks. In this float stage, all battery banks are still isolated from each other by diode separation.



CAUTION

Battery bank 1 should be connected to the main battery bank that requires charge priority. On single battery bank installations, do not use outputs 2 and 3.

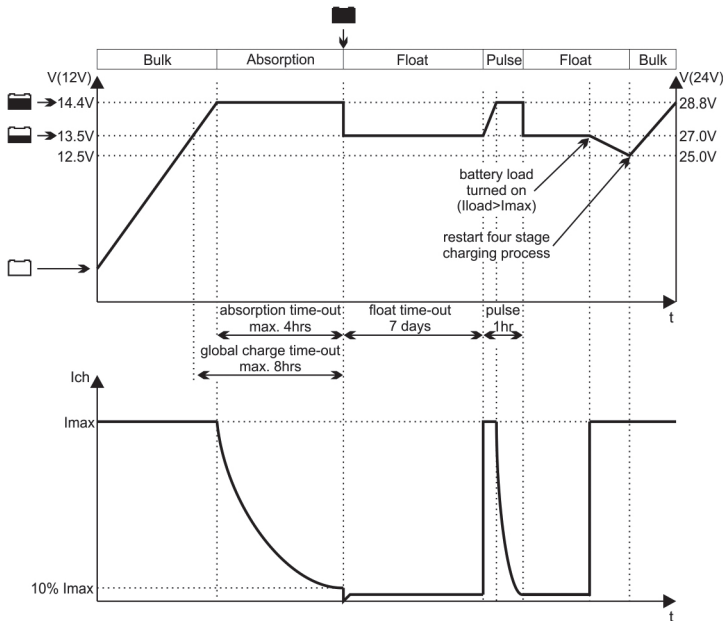
3.2 Night Mode



A unique feature of the Omnicharge² Battery Charger is the ability to disable the cooling fan for total silent operation at night or whenever required. This setting is manually activated by pressing the NEXT (>) button for 3 seconds and remains active for a period of 12 hours, or until manually deactivated (pressing NEXT for 3 sec. again). Once active, Night Mode is indicated by the moon and stars icon on the display. Please note that the charger's output current will be reduced while in silent mode, leading to longer recharge times.

3.3 Charge programs explained

Most standard selectable charge programs, perform a four stage IUoUoP charging process comprising of a "Bulk", an "Absorption", a "Float" and a "Pulse" stage. The image below visualizes the four stage charging process (indicated voltages are typical for a flooded lead acid battery):



In the Bulk stage, the charger delivers full output current and typically returns approximately 80% of charge back into the battery once the absorption voltage is reached. During this stage, indicators 1 and 2 (see battery icon images on the next page) will be lit depending on the Bulk charge progress. When set to lithium, indicators 1, 2 and 3 are lit depending on the Bulk charge progress.

When the absorption voltage has been reached, the Absorption stage will be entered and indicator 3 will be lit. This stage will return the final 20% of charge to the battery. The output voltage is kept at a constant level and the charge current decreases as a function of the battery's state of charge. When the charge current has dropped below a certain value or when the maximum Absorption timer has been expired, the Float stage will be entered or the charge process is stopped depending on the Mode setting (3 or 2). For lithium batteries, more than 80% of charge has been returned to the battery already. So for this chemistry the Absorption stage will be relatively short.

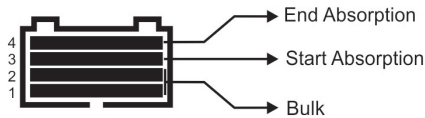
Now indicator 4 will be lit, indicating that the battery is full. When the Mode is set to 3, the Float stage starts and the battery voltage will be held constant at a safe level for the battery. It will maintain the battery in optimal condition for as long as the battery remains connected to the activated charger. Connected battery loads will be directly powered by

the charger up to the charger’s maximum output current level. When even more current is drawn, the battery must supply this which results in a declining battery voltage. At a certain battery voltage level (Charge restart voltage), the charger jumps back to the Bulk stage and will execute a complete four stage charging process again, once the battery load consumption has dropped below the charger’s maximum output current level.

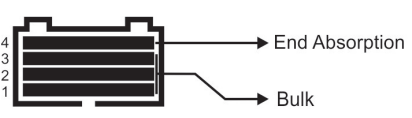
When the Mode is set to 2, no Float stage is entered so the battery is not being maintained. However, also in this Mode the charger will automatically restart the charging process when the voltage of the connected battery has dropped below the restart voltage.

Summary of charge progress indicator steps:

Gel, AGM, Flooded:



Lithium:



The fourth stage called “Pulse”, will perform a short refresh charge of approximately 1 hour each 7 days while the charger operates in the Float or Stop stage. This will keep the battery in optimal condition while prolonging it’s lifetime. The battery can remain connected to the activated charger continuously, without risk of overcharging.

When the battery temperature sensor (BTS) is installed, the charger automatically compensates the charge voltage against battery temperature. This means that the charge voltages are slightly increased at lower temperatures and decreased at higher temperatures. Please see the table below for the compensation amounts:

Battery temperature	Charge voltage compensation amount			
	Gel and Flooded		AGM	
	12V	24V	12V	24V
< 25°C	+ 0.027 V/°C	+0.054 V/°C	+ 0.021 V/°C	+0.042 V/°C
25°C	0 V		0 V	
> 25°C	- 0.027 V/°C	-0.054 V/°C	- 0.021 V/°C	-0.042 V/°C


There is no charge voltage compensation for lithium battery types.

A connected BTS also enables battery temperature protection, which stops the charging process when the battery’s temperature is below -20°C (0°C for Lithium) or above +55°C.

When the BTS is not in use, you can also manually set the battery temperature. There are three settings available (T.NO, T.HI and T.LO). Please see the next table below for the voltage adjustment values compensated from the normal 25°C setting:

Temperature setting	Recommended for battery temperature	Battery type	Voltage adjustment from 25°C setting	
			12V	24V
T.LO (Low)	< 5°C	Gel, Flooded	+0.675V	+1.350V
		AGM	+0.525V	+1.050V
T.NO (Normal)	> 5°C and < 30°C	Gel, Flooded	0V	0V
		AGM	0V	0V
T.HI (High)	> 30°C	Gel, Flooded	-0.27V	-0.54V
		AGM	-0.21V	-0.42V

There is no charge voltage adjustment for Lithium battery types.

 WARNING
<p>When the BTS is not being used, never set the battery temperature lower than the actual temperature. This may overcharge and damage the battery.</p>

3.4 Forced restart of the charging process



When it is desired to restart the charging process manually, without having to recycle AC power by disconnecting the AC plug, please press the MENU and SET buttons simultaneously for 3 seconds. After this, the charger will automatically restart the charging process by entering the Bulk charge stage.

4. CONFIGURING THE BATTERY CHARGER

The factory default settings inside the Omnicarge² battery chargers were carefully adjusted to fit most standard situations. Please see the next table showing these default values:

Model	Parameter	Value (valid for all 3 outputs)
OC ² 12-40	Battery type	Flooded
	Absorption voltage	14.4V
	Maximum charge current	40A
	End of charge current	4A
	Mode (float=3, no float=2)	3
	Float voltage (if Mode=3)	13.5V
	Battery temperature	Normal
	Charge restart voltage	12.5V
OC ² 12-60	Battery type	Flooded
	Absorption voltage	14.4V
	Maximum charge current	60A
	End of charge current	6A
	Mode (float=3, no float=2)	3
	Float voltage (if Mode=3)	13.5V
	Battery temperature	Normal
	Charge restart voltage	12.5V
OC ² 24-20	Battery type	Flooded
	Absorption voltage	28.8V
	Maximum charge current	20A
	End of charge current	2A
	Mode (float=3, no float=2)	3
	Float voltage (if Mode=3)	27.0V
	Battery temperature	Normal
	Charge restart voltage	25.0V


Model	Parameter	Value (valid for all 3 outputs)
OC ² 24-30	Battery type	Flooded
	Absorption voltage	28.8V
	Maximum charge current	30A
	End of charge current	3A
	Mode (float=3, no float=2)	3
	Float voltage (if Mode=3)	27.0V
	Battery temperature	Normal
	Charge restart voltage	25.0V

As you can see the factory default battery type is set to Flooded, as it's absorption and float voltage values are quite standard and may even fit other lead based battery types. However, when you wish to optimally adapt the charger to your batteries, there are also standard charge programs available for GEL, AGM and Lithium batteries. See the table below with the standard voltage parameter settings for the battery types:

Battery type	Absorption		Float		Restart	
	12V	24V	12V	24V	12V	24V
GEL	14.2V	28.4V	13.5V	27.0V	12.5V	25.0V
AGM	14.7V	29.4V	13.6V	27.2V	12.5V	25.0V
Lithium	14.4V	28.8V	13.3V*	26.6V*	12.6V	25.2V

* Default setting for Lithium is No-Float (Mode=2)

When you wish to change the battery type, one or more default settings, or just review all parameter values, please check the next chapter for the correct procedure.

 CAUTION
Invalid battery type settings can cause serious damage to your batteries and/or connected battery loads. Always consult your battery's documentation for the correct charge voltage settings.

4.1 Setting up battery outputs 1, 2 and 3

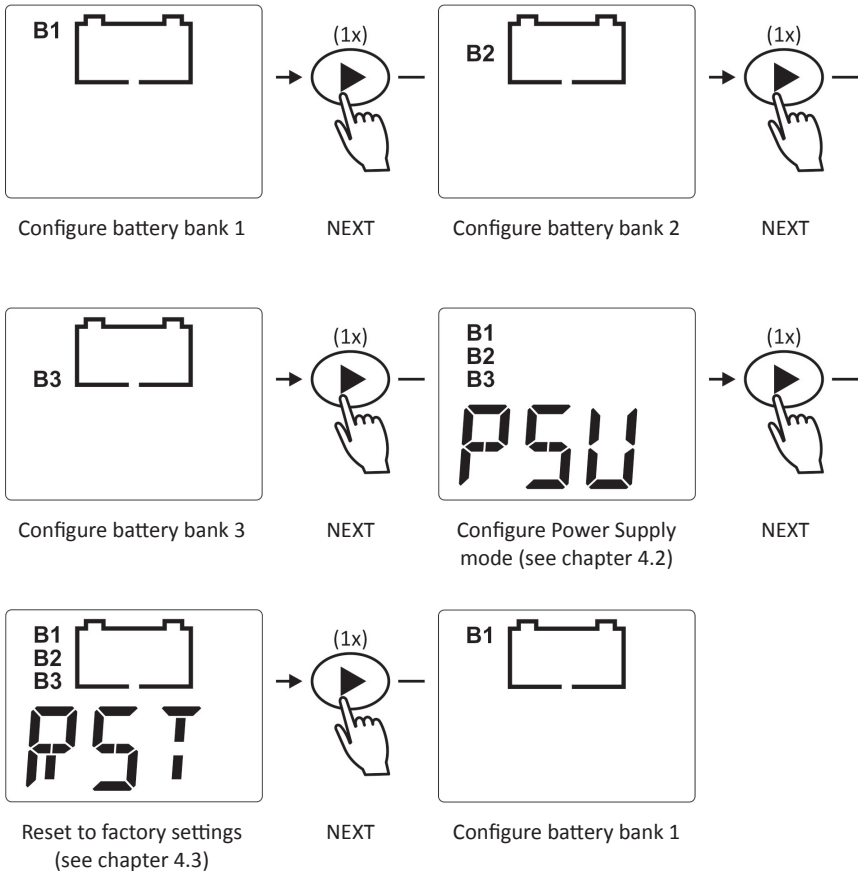
All settings can be changed on the battery charger's frontpanel via an easy to use interface. Settings can also be changed via the Samlex Dashboard application. Depending on the device running Dashboard, you either need a QuickLink to USB Communication kit or a QuickLink

to Bluetooth Communication Kit. In this manual however, we will limit the setup procedure explanation using the frontpanel controls only.

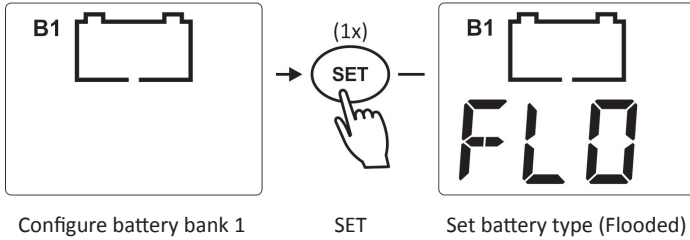


To enter the setup screens of the Omnicharge² from the normal operating mode, the MENU button needs to be pressed for approximately 3 seconds. This button also needs to be pressed for 3 seconds again to save any changed settings and jump back to the normal operating mode. Please note that when no buttons are touched for approximately 20 seconds while running in the setup mode, the Omnicharge² will automatically return to the normal operating mode again without saving any changed setup parameters.

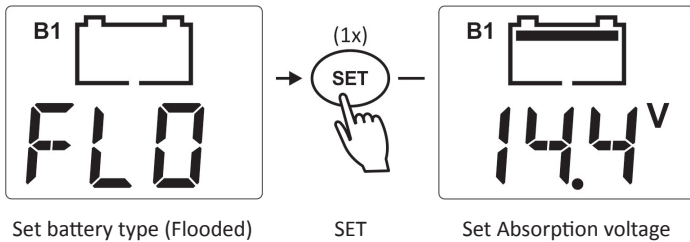
When the setup mode has been entered, the display shows the image indicated on the left below. Pressing the NEXT (>) button allows you to browse through all five main setup sections.



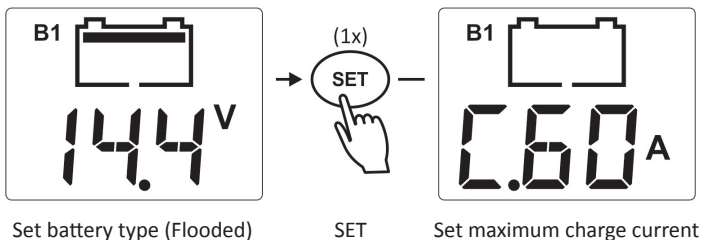
In this chapter we are focusing on setting up battery bank 1 using the OC² 12-60 model. Once the desired setup section is selected, press the SET button to jump to the first setup parameter in this section. This gives us the following screens:



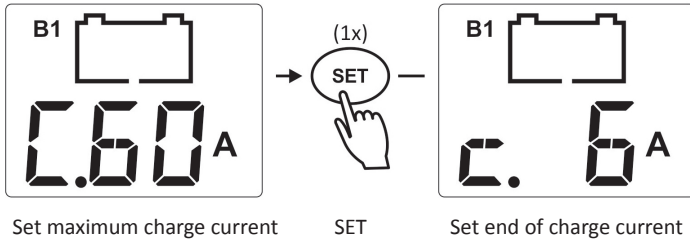
The first setup parameter is the battery type. It will show the current battery type (Flooded in this example), but by pressing the NEXT (>) button, each time a different battery type will be shown. There are four options: GEL, AGM, FLO (flooded) and LIT (Lithium). Once you have selected the desired value, press the SET button to jump to the next setup parameter. Please see the next images:



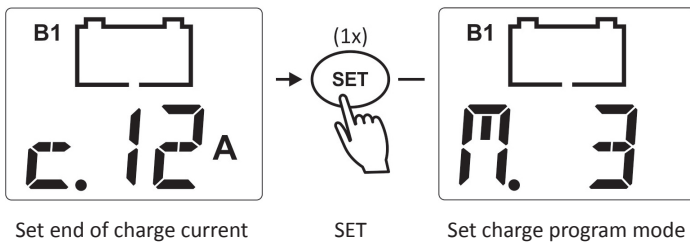
This setup parameter represents the Absorption voltage and is indicated by the upper segment inside the battery icon. For GEL, AGM and Flooded battery types, this value can be changed between 13.9V and 15.0V with a 0.1V step size. For the Lithium battery type, this value range ranges from 13.9V till 14.6V. Once you have selected the desired value, press the SET button to jump to the next setup parameter as indicated below:



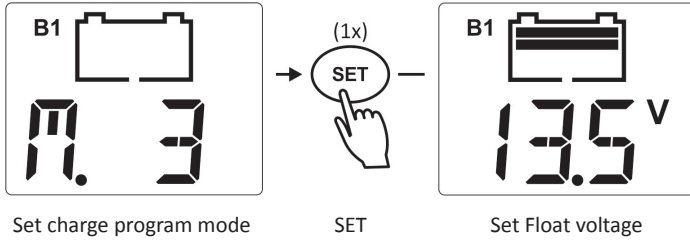
This setup parameter represents the maximum charge current and is indicated by a capital 'C' in front of the charge current value. You can choose between four values. The OC² 12-60 in this example offers the following settings: 60A, 40A, 20A and 5A. Once you have selected the desired value, press the SET button to jump to the next setup parameter as indicated below:



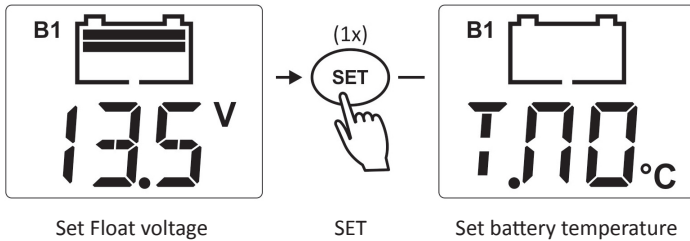
This setup parameter represents the end of charge current value and is indicated by a lower case 'c' in front of the current value. The end of charge current is the current level at which the absorption stage ends and the charger finishes the charging process. You can choose between three values and the level of these values is depending on the maximum charge current setting. In this example where an OC² 12-60 is set to a maximum charge current of 60A, the end of charge current values are: 12A, 6A or 3A. When choosing a lower maximum charge current, the end of charge current values are also automatically lowered. Once you have selected the desired value, press the SET button to jump to the next setup parameter as indicated below:



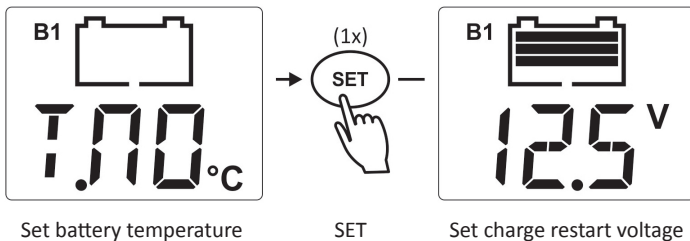
This setup parameter represents the charge program mode and is indicated by the letter 'M' in front of the mode value. The charge program mode can be set to values 3 or 2. When the value is set to 3, the charge program contains a Float stage (3-stage charge program). When the value is set to 2, the charge program only contains 2 stages (bulk and absorption). In this case, the charger stops charging after the absorption stage has ended. Once you have selected the desired value, press the SET button to jump to the next setup parameter as indicated below. This next setup parameter will only appear when the charge program mode has been set to 3. Otherwise the next step will be skipped.



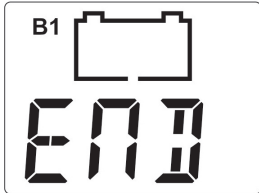
This setup parameter represents the Float voltage and is indicated by the upper two segments inside the battery icon. This value can be changed between 13.0V and 14.0V with a 0.1V step size. Once you have selected the desired value, press the SET button to jump to the next setup parameter as indicated below. This next setup parameter will not appear when the earlier selected battery type is set to Lithium.



This setup parameter represents the average battery temperature and is indicated by the letter 'T'. This parameter can be set to T.NO (normal), T.LO (low) and T.HI (high) and decides the level of charge voltage compensation for GEL, AGM and Flooded battery types. For more information, please check chapter 3.3. When a battery temperature sensor (BTS) is connected to the charger, this setup parameter will be disabled automatically and the actual battery temperature will be used to calculate the charge voltage compensation level. Once you have selected the desired value, press the SET button to jump to the next and final setup parameter as indicated below:



This setup parameter represents the charge restart voltage and is indicated by the upper three segments inside the battery icon. This is the voltage level at which the charger will automatically restart the charging process (see chapter 3.3 for more info). This value can be changed between 12.5V and 14.0V with a 0.1V step size. Once you have selected the desired value, press the SET button to jump to the last step of setting up battery bank 1:



End of battery bank 1
setup section

Now there are two options:




Press the MENU button for
3 seconds to save all
battery bank 1 setting and
jump back to the normal
operating mode

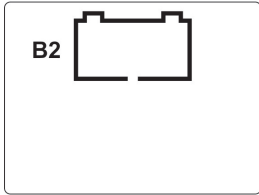


Press the NEXT button once
to jump to the top level of
the setup menu and
proceed with setting up
battery bank 2 and/or 3 as well.

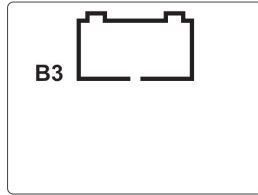
OR

 Changed battery parameters can be saved at any time in the setup mode by pressing the MENU button for 3 seconds. So when you wish to only change one specific parameter for example, there is no need to jump through all parameters and reach an END screen for saving the changes.

Setting up battery banks 2 and 3 works exactly the same as in the described example in this chapter. Just make sure that battery bank 2 or 3 is selected in the top (start-) level of the setup menu, which is indicated by respectively B2 or B3 on the left of the battery icon in the display (see next image).



Configure battery bank 2



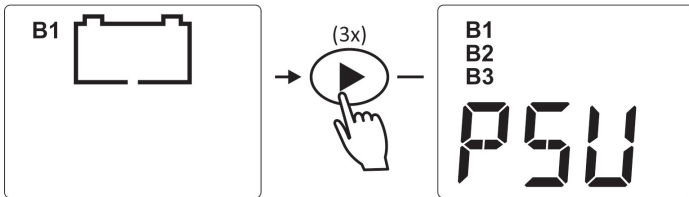
Configure battery bank 3

4.2 Setting up and activating Power Supply mode

In Power Supply mode, the charger only delivers a constant voltage and all charge steps are disabled. The voltage and maximum output current levels are selectable. Please see the next table for the available voltage and current options:

Model	Voltage options	Max. current options	Defaults
OC ² 12-40	10.5V/11.5V/12.5V/13.5V/14.5V	40A/20A/10A/5A	13.5V/40A
OC ² 12-60	10.5V/11.5V/12.5V/13.5V/14.5V	60A/40A/20A/5A	13.5V/60A
OC ² 24-20	21.0V/23.0V/25.0V/27.0V/29.0V	20A/15A/10A/5A	27.0V/20A
OC ² 24-30	21.0V/23.0V/25.0V/27.0V/29.0V	30A/20A/10A/5A	27.0V/30A

To activate the Power supply mode we need to enter the setup mode by pressing the MENU button for 3 seconds. In the setup mode, press the NEXT (>) button 3 times to reach the Power Supply (PSU) section as indicated below:

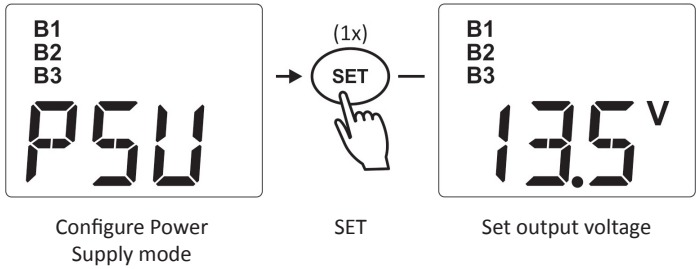


Configure battery bank 1

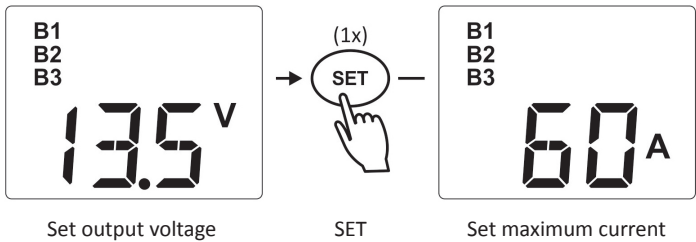
NEXT x3

Configure Power Supply mode

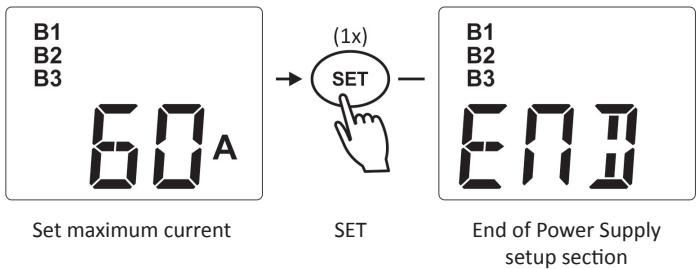
From this screen press SET to enter the voltage setup screen as indicated below:




Using the NEXT (>) button, this value can be changed between 10.5V and 14.5V (or between 21.0V and 29.0V on a 24V charger) with a step size of 1V. Once you have selected the desired value, press the SET button to jump to the maximum output current setting:





Using the NEXT (>) button, this value can be changed between 60A and 5A (depending on charger model) with a variable step size. Once you have selected the desired value, press the SET button to jump to the END screen:



In order to actually activate the Power Supply mode, the MENU button must be pressed for 3 seconds while operating in any of the four above displayed Power Supply setup screens.

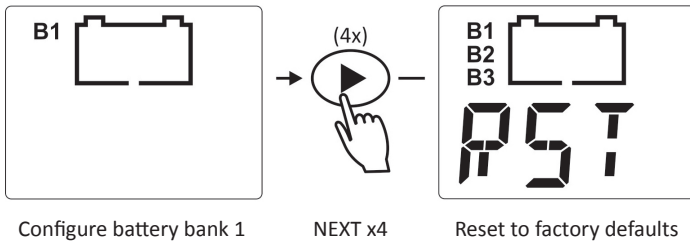
 Please note that it can take up to 10 seconds before the charger is actually producing the desired voltage at the output terminals.

 In Power Supply mode all three outputs (B1, B2 and B3) are active. The maximum output current will be shared between these three outputs, based on the consumption of the connected loads.

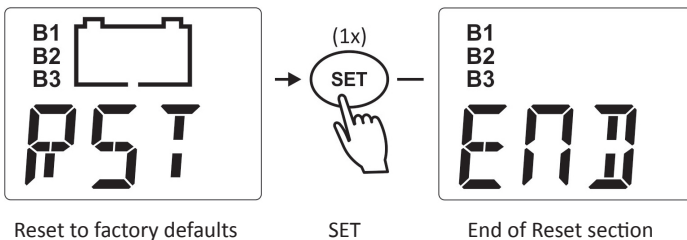
 In order to de-activate the Power Supply mode again, jump to the setup mode by pressing the MENU button for 3 seconds. Then exit the setup mode by pressing MENU for 3 seconds again, while operating in the B1, B2 or B3 screens.

4.3 Restoring the factory default settings

When you wish to return to all default settings as shipped from the factory, you can use the Reset command. To perform a factory reset action, press the MENU button for 3 seconds to enter the setup mode. After this, please press the NEXT (>) button 4 times to reach the Reset section as indicated below:



When the Reset section has been reached press the SET button once to jump to the End screen of this section as indicated below:



After this, press the MENU button for 3 seconds to exit the setup mode. This will reset all settings to the factory default values and jump back to the normal operating mode.

5. GENERAL OPERATION

5.1 Understanding the display

The Omnicarge² battery chargers are equipped with a clear backlit display. During normal operating mode, the display is automatically cycling through the battery voltage and current values of each individual battery bank output (B1, B2 and B3).

When all battery banks have reached the Float stage, B1, B2 and B3 are lit simultaneously and only the common float voltage and the total output current values are shown on the display.

5.2 Charging batteries



CAUTION

Before you start to charge batteries, read all enclosed safety instructions and warnings while following all safety precautions about working with batteries.

The list below globally describes the steps to follow for charging batteries:

1. Disconnect the charger from the AC supply
2. If possible disconnect or switch off all loads from the battery
3. Connect the battery to the charger
4. Reconnect the AC supply to the charger, the charge process will automatically start
5. After charging is completed, disconnect the AC supply again before disconnecting the battery

When the charger and batteries are part of a fixed installation, there is no need to connect or disconnect the batteries. In this case, please make only sure that battery loads are disconnected or switched off in order to speed up the charging process.

5.3 Equalizing a flooded battery

If you are using a lead acid battery, an occasional equalization charge cycle may be recommended by the manufacturer. This might also be true when the battery has been very deeply discharged or often charged inadequately. During equalization, the battery will be charged up to approx. 15.8V (31.6V for 24V models) at a reduced output current level. Before starting an equalization charge cycle, the following caution statements must be read carefully :



CAUTION

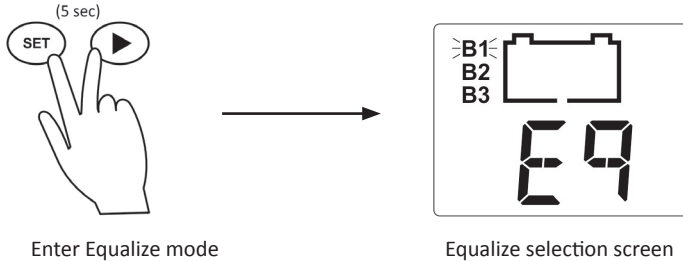
Equalization should only be performed on a lead acid battery type that supports this process. Therefore the Omnicarge2 only allows equalization when the battery type is set to Flooded (FLO). Always follow the battery manufacturer's instructions when equalizing batteries.

During equalization, the battery generates explosive gasses. Follow all the battery safety precautions enclosed with your Omnicharge2. Ventilate the area around the battery sufficiently and ensure that there are no sources of flames or sparks in the vicinity.

Disconnect all loads connected to the battery during equalization. The voltage applied to the battery during this process may be above safe levels for some loads.

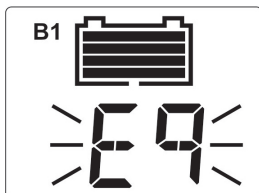
The Omnicharge cannot automatically determine when to stop the equalization of a battery. The user must monitor the battery's specific gravity throughout this process to determine the end of the equalization cycle. The internal 1 hours time-out timer of your charger is only intended as a safety feature, but may not be sufficiently short to prevent battery damage. Therefore, equalizing a battery is always a process that must continuously be supervised by the user.

As explained earlier, the Omnicharge² will only allow equalization when the battery type is set to Flooded. Besides this, the charger also needs to have a full charge cycle completed and must operate in the Float stage. When these two conditions are met, the equalization charge mode can be activated by pressing the SET and NEXT (>) simultaneously for 5 seconds, until the screen on the right below is shown:



The equalize selection screen in this example shows B1, B2 and B3, which means that all three battery banks are configured as Flooded. Battery bank B1 is flashing, indicating that this battery bank is selected to undergo an equalize stage. When you wish to select a different battery bank to equalize, please press the SET button to toggle between all three battery banks.

Once the desired battery bank is selected, press SET and NEXT (>) for 5 seconds again. Now the equalize process is initiated, indicated by a flashing EQ in the display (see below):



If the charger was not operating in a float mode prior to activating the equalize process, it will first perform a full charge cycle before starting the 1 hour equalize stage.

The Omnicharge² will allow a maximum equalization time of 1 hour before it automatically jumps back to the Float stage. If the specific gravity of each cell does not match the battery manufacturer's specifications yet, you can initiate a new 1 hour equalization cycle by pressing the SET and NEXT (>) buttons for 5 seconds again and follow the steps as described above.

Always keep on checking the specific gravity of each cell repeatedly during the equalization process. When these values are correct, you can manually exit the equalization process by pressing the SET and NEXT (>) for 5 seconds. The charger will then return to the Float stage.

6. TROUBLESHOOTING GUIDELINE

Please see the table below if you experience any problems with the Omnicharge² battery charger and/or the installation.

Problem	Possible cause	Remedy
Omnicharge is not working at all.	AC input voltage is out of range or not available. (Error codes E01 or E02 in display?)	Make sure the AC input voltage is available and within the operating range of the charger.
	Remote switch has deactivated the charger, or wire link is missing at the remote on/off input terminals of the charger.	Check if the remote bypass switch is set correctly. Or check if a wire link is placed between the two remote on/off input terminals.
	Poor contact between the charger battery wires and the battery terminals.	Clean battery terminals or charger wire contacts. Tighten battery terminal screws.
	Blown DC fuse. (Error code E08 in display?)	Check battery fuse or charger output fuses.
	Very poor battery condition.	Replace battery.
The battery is not being charged up to it's maximum capacity.	Incorrect absorption charge voltage setting.	Check the battery type selection for correct setting. Or adjust the absorption voltage.

Problem	Possible cause	Remedy
The battery is not being charged up to its maximum capacity.	Incorrect charge current setting.	Make sure that the maximum output current setting is at maximum level (check if allowed by battery manufacturer).
	Too much voltage loss in battery cables and/or connections.	Make sure that the battery cables have a large enough diameter. Check if all DC connections are solidly made.
	Additional battery loads are consuming too much current during charging.	Turn-off or disconnect all battery loads.
Charge current is too low.	High ambient temperature.	Try to lower the ambient temperature around the charger.
	Charger is operating in the absorption charging stage.	Do nothing. The battery is almost fully charged and consumes less current by itself.
Charge voltage is too low.	The charge voltage is being compensated by the battery temperature sensor to protect the battery.	Do nothing or try to cool down the ambient temperature around the battery.
	Wrong battery type selected, or charge voltage needs to be adjusted.	Select the correct battery type or adjust the charge voltage in the setup menu.
	DC cables too thin.	Install larger DC cables. See the DC cable size table in chapter 2.4.
	Battery load current is higher than the charger's output current.	Reduce or remove the battery load.
Display shows error code E01.	AC input voltage too low.	Check the AC source and connections.
Display shows error code E02.	AC input voltage too high.	Disconnect the charger immediately and check the AC source. Please avoid the use of cheap unregulated generators. Damaged caused by input overvoltage is not covered by warranty.

Problem	Possible cause	Remedy
Display shows error code E03.	Battery connected to charger with incorrect polarity.	Check battery cables for correct polarity.
Display shows error code E04.	Charger runs too hot. Too high ambient temperature.	Move the charger to a cooler environment or provide additional cooling by an external fan.
Display shows error code E06.	BTS measures too hot battery temperature (approx. 55°C).	Move the batteries to a cooler environment, provide additional cooling or check for battery defects.
Display shows error code E07.	BTS measures too low battery temperature (approx. -20°C for Flooded, AGM and GEL settings. 0°C for lithium set).	Move the batteries to a warmer environment or provide battery heating.
Display shows error code E08.	DC output fuse is blown due to an incorrect polarity connection of the battery to the charger.	Fix the connection error and replace the output fuses located inside the connection compartment with correct types.
Display shows error code E09.	Voltage of connected battery is too high (> 16.6V @ 12V models and 33.2V @ 24V models).	Check if the battery voltage is compatible with the used charger, or make sure that other connected charging sources are not pushing the battery voltage up too high.

If none of the above remedies will help solving the problem you encounter, it's best to contact your local Samlex distributor for further help and/or possible repair of your Omnicharge2 unit. Do not disassemble the charger yourselves, there are dangerously high voltages present inside and it will also void your warranty.

7. TECHNICAL SPECIFICATIONS

Parameter	OC ² 12-40	OC ² 12-60	OC ² 24-20	OC ² 24-30
AC input voltage	90-265Vac / 47-63Hz / PF ≥ 0.95			
Full load power consumption	700VA	1050VA	700VA	1050VA
AC input current (115V/230V)	6A / 3A	9A / 4.5A	6A / 3A	9A / 4.5A
Total DC output current ^{1) 4)}	40A	60A	20A	30A
Nominal DC output voltage ¹⁾	12Vdc	12Vdc	24Vdc	24Vdc
Number of full current outputs	3 (internally isolated, individually programmable)			
Charge characteristic	IUoUoP, intelligent 4-stage, temp. compensated			
Bulk/Absorption voltage range ²⁾	13.9 – 15.0Vdc		27.8 – 30.0Vdc	
Float voltage range ²⁾	13.0 – 14.0Vdc		26.0 – 28.0Vdc	
Equalize voltage ²⁾	15.8Vdc		31.6Vdc	
Supported battery types ²⁾	Flooded / Gel / AGM / LiFePO4			
Max. battery capacity ³⁾	400Ah	600Ah	200Ah	300Ah
Operating temp. Range	-20°C...+60°C (humidity max. 90% non condensing)			
Storage temp. Range	-40°C...+70°C (humidity max. 90% non condensing)			
Cooling	Variable speed fan			
Communication port	QuickLink			
Protections	Low AC input voltage, output short circuit, high temperature, battery overcharging and reverse polarity			
Indications	LCD showing charging status, voltage and current			
DC output connections	4x M6 studs			
AC input connections	Fixed AC cord with plug (1.5m length)			
Enclosure body size (HxWxD)	295 x 206 x 86mm (oc ² 12-40) 356 x 206 x 99mm (oc ² 12-60)		295 x 206 x 86mm (oc ² 24-20) 356 x 206 x 99mm (oc ² 24-30)	
Total weight	3.0kg	4.0kg	3.0kg	4.0kg
Protection class	IP32 (mounted in upright position)			
Standards	CE marked. EMC : EN55014-1, EN55014-2, EN 61000-4-2(3/4/5/6). Safety : EN60335-1, EN60335-2-29			

Note: the given specifications are subject to change without notice.

¹⁾ Maximum output current tolerance is +/-10%. Maximum set point voltage deviations are +/-1%. All set point voltages are temperature compensated when the battery temperature sensor is connected.

- 2) Value is programmable.
- 3) Always consult battery manufacturers specifications for minimum and maximum allowable charge current.
- 4) At higher ambient temperatures (>40°C), maximum output current may be reduced automatically.



Please act according to your local rules and do not dispose of your old products with your normal household waste. The correct disposal of your old product will help prevent potential negative consequences for the environment and human health.

8. WARRANTY CONDITIONS

Samlex Europe (Samlex) warrants this product to be free from defects in workmanship or materials for 24 months from the date of purchase. During this period Samlex will repair the defective product free of charge. Samlex is not responsible for any costs of the transport of this product.

This warranty is void if the product has suffered any physical damage or alteration, either internally or externally, and does not cover damage arising from improper use, or from use in an unsuitable environment.

This warranty will not apply where the product has been misused, neglected, improperly installed or repaired by anyone other than Samlex. Samlex is not responsible for any loss, damage or costs arising from improper use, use in an unsuitable environment, improper installing of the product and product malfunctioning.

Since Samlex cannot control the use and installation (according to local regulations) of their products, the customer is always responsible for the actual use of these products. Samlex products are not designed for use as critical components in life support devices or systems, that can potentially harm humans and/or the environment. The customer is always responsible when implementing Samlex products in these kind of applications. Samlex does not accept any responsibility for any violation of patents or other rights of third parties, resulting from the use of the Samlex product. Samlex keeps the right to change product specifications without previous notice.

Examples of improper use are :

- Too high AC input voltage applied
- Reverse connection of battery polarity
- Connecting wrong batteries (too high battery voltages)
- Mechanical stressed enclosure or internals due to harsh handling or incorrect packaging
- Contact with any liquids or oxidation caused by condensation

9. DECLARATION OF CONFORMITY

MANUFACTURER : Samlex Europe BV
ADDRESS : Aris van Broekweg 15
1507 BA Zaandam.
The Netherlands

Declares that the following products:

PRODUCT TYPE : Professional programmable battery charger
MODELS : OC2 12-40, OC2 12-60, OC2 24-20, OC2 24-30

Conforms to the requirements of the following Directives of the European Union:

EMC Directive 2014/30/EU
Low voltage Directive 2014/35/EU
RoHS Directive 2011/65/EU

The above product is in conformity with the following harmonized standards:

EMC : EN55014-1, EN55014-2, EN 61000-4-2(3/4/5/6)
Safety : EN60335-1, EN60335-2-29



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