

HAWKER® MODULAR CHARGERS

KEEP ON GOING!



**EVEN WHEN PART OF
THE TEAM IS MISSING...**



SERVICE MANUAL



Life IQ™ Modular

The modular range is based on the modular concept made of universal power bricks allocated into different cabinet sizes in order to achieve the required output power.

For 1-phase the module is a 1kW power AC DC converter

TC1= 1-phase 230 Vac	
VDC	Ampere DC/ module
12	36A
24	36A
36/48	25/18A

The modules are installed into:

3 bay cabinet up to 3kW

6 bay cabinet up to 6kW (future development)

3 bay cabinet (for chargers up to 3kW)



6LA20650	12V 1kW module	
6LA20629	24V 1kW module	
6LA20635	48V 1kW module	

For 400V 3-phase the module is a 3.5kW power AC DC converter with the following outputs

TC3-3-phase 400 Vac	
VDC	Ampere DC/ module
24/36/48	70/65/60A
72/80	40/36A

6LA20651	24/36/48V 3.5kW module	
6LA20656	72/80V 3.5kW module	

CHARGE PROFILE CODES

The following table describes the codes to be used in new charger part numbers to indicate the charging profile of the charger

Tech	Charging profile	Display on charger	SAP Code
PzS/PzM/PzB	Slow charge	LOWCHG	PROFILESLOW
PzS/PzB	Heavy duty	HDUTY*	22
PzS/PzM/PzB	Normal duty (std flooded)	STDWL	21
PzS/PzM/PzB	Airmix	PNEU	4
GEL	Gel	GEL	2
XFC	XFC Blocs	XFCBLC	5
AGM	AGM	AGM (or RGT)	6
XFC 2V	XFC 2V	2V-XFC	20
PzM	WL20	WL20	9

* The charger displays COLD in case of battery temperature below 15°C

PROFILE DESCRIPTION

HDUTY	Heavy duty profile (IONIC). Auto battery capacity matching with continuous current loops. Default CF 1.15, no need to set CF but available if required.
GEL	IUI profile, 0.17 to 0.22 C, Auto battery capacity by loops, final current 1%, CF = 1.06. Can manually set battery capacity if required.
AGM	IUI profile, 0.2 C, Auto battery capacity by loops final current 2.2%, finish time limitation. Can manually set battery capacity if required.
STDWL	Standard (Water Less®) profile. IUI profile 0.2 C, finish CF = 1.10 final current 5% C, Auto battery capacity matching with phase 1 loop. Can manually set battery capacity if required.
PNEU	Opportunity charge. Must set battery capacity & daily full charge. IU profile 0.25 C, finish current 5% C. Can manually set battery capacity if required.
XFCBLC	For XFC bloc product. Only visible after setting XFCBLC menu item to ON (all other profiles invisible). Do NOT use for XFC2V product, Profile IUI, 0.5 C, finish time limitation, with refresh.
2V XFC	XFC 2V product, IUI profile 0.4 C, finish current 1% C, no T° C compensation, weekly automatic with Wi-IQ®
WL20	Hawker® Water Less® 20 product, IUI profile old WF 200, finish CF= 1.04, needs Airmix
Slow	Slow profile for battery recharge in 9-12 h

IMPORTANT SAFETY INSTRUCTIONS

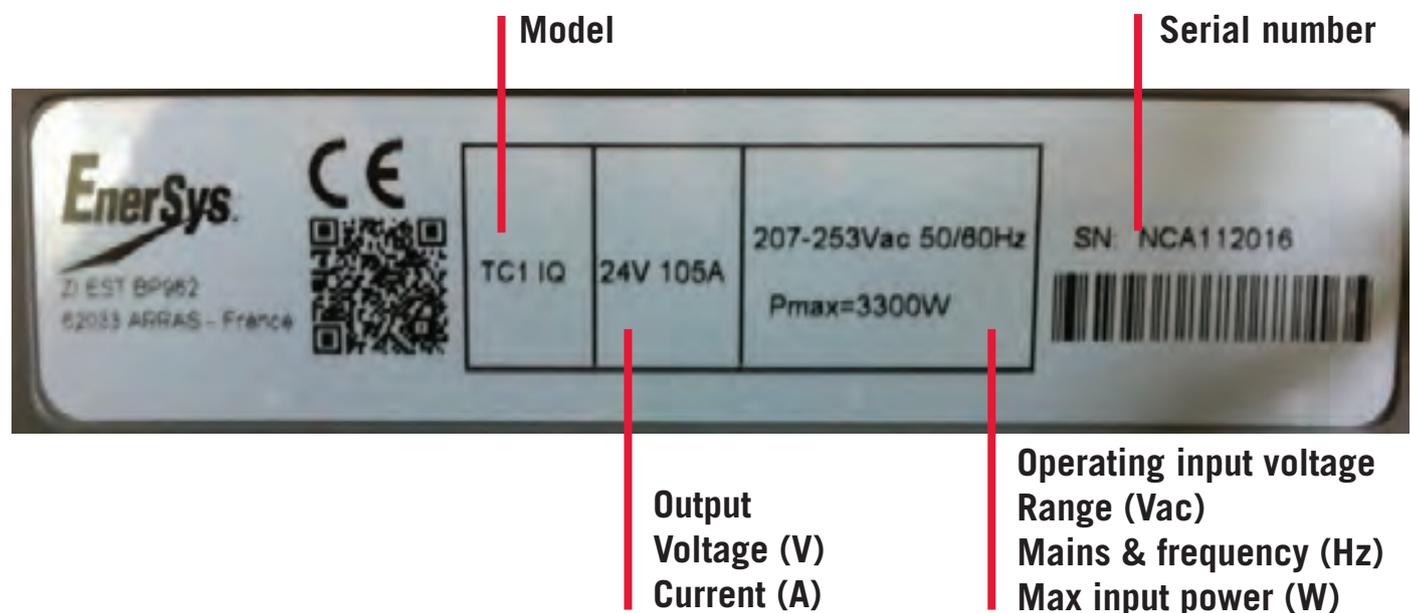
1. This manual contains important safety and operating instructions. Before using the battery charger, read all instructions, cautions, and warnings on the battery charger, the battery, and the product using the battery.
2. This charger has been designed to only charge flooded, lead-acid batteries. Read and understand all setup and operating instructions before using the battery charger to prevent damage to the battery and to the charger.
3. Do not touch non-insulated parts of the output connector or the battery terminals to prevent electrical shock.
4. During charge, batteries produce hydrogen gas which can explode if ignited. Never smoke, use an open flame, or create sparks in the vicinity of the battery. Ventilate well when the battery is in an enclosed space.
5. Do not connect or disconnect the battery plug while the charger is on. Doing so will cause arcing and burning of the connector resulting in charger damage or battery explosion.
6. Lead-acid batteries contain sulfuric acid which causes burns. Do not get in eyes, on skin, or on clothing. In cases of contact with eyes, flush immediately with clean water for 15 minutes. Seek medical attention immediately.

7. Only factory qualified personnel can service this equipment. De-energize all AC and DC power connections before servicing the charger.
8. The charger is not for outdoor use.
9. Do not expose the charger to moisture. Operating conditions should be 0° to 45° C; 0 to 70% relative humidity.
10. Do not operate the charger if it has been dropped, received a sharp hit, or otherwise damaged in any way.
11. For continued protection and to reduce the risk of fire, install chargers on a floor of non-combustible material such as stone, brick, or grounded metal.

WARNING: The shipping pallet must be removed for proper and safe operation.

TECHNICAL INFORMATION

The nameplate, located on the outside of the charger, should be used to check this application before installation.



PART NUMBER

UK or standard European input plug can be selected by using different part numbers.

Type	Model	Mains	HAWKER p/n		
			Non UK	UK	
1-phase	TC1 IQM 24V 2kW	3B	1	128PM3MIQ2B24	128PM3MIQ2B24UK
	TC1 IQM 24V 3kW	3B		128PM3MIQ3B24	128PM3MIQ3B24UK
	TC1 IQM 36/48V 1kW	3B	X	128PM3MIQ2B48	128PM3MIQ2B48UK
	TC1 IQM 36/48V 2kW	3B			
	TC1 IQM 36/48V 3kW	3B			
		230V		128PM3MIQ3B48	128PM3MIQ3B48UK

Refer to a latest master data for full list

INSTALLATION

WARNING: The shipping pallet must be removed for proper and safe operation.

Location

For maximum trouble-free service, choose a location which is free of excess moisture, dust, and corrosive fumes. Also, avoid locations where temperatures are high or where liquids will drip on the charger. Do not obstruct the ventilating openings or the space under the charger.

Mounting wall cabinet chargers

The charger must be mounted on a wall or stand in a vertical position. The lower part of the charger must be at least 60 cm from the ground and/or the charger below and the upper part 90 cm from the ceiling. The minimum distance between two chargers must be 30 cm. The charger will be installed with the bracket supplied. See the Wall Mounting Dimensions section at the end of this manual for proper bolt pattern.

NOTE

Ambient temperature at all levels cannot exceed 45°C.

Electrical connections

To prevent failure of the charger, be sure it is connected to the correct line voltage.

Connecting input power

WARNING: Make sure the power to the charger is OFF and the battery is disconnected before connecting the input power to the terminals of the charger.

Connect the input power to the appropriate terminals, including ground. Follow your local electrical or National Electric Code in making these connections.

AC connection

The user must provide suitable branch circuit-protection and a disconnect method from the AC power supply to the charger to allow for safe servicing.

Plug polarity

The charging cable is connected to the DC output of the charger with the positive lead marked RED. The output polarity of the charger must be strictly observed when connecting to the battery (read warning above). Improper connection will open the DC fuse.

Grounding the charger

DANGER: Failure to ground the charger could lead to fatal electric shock. Follow National Electric Code for ground wire sizing.

DESCRIPTION OF OPERATION

General

Life IQ™ Modular chargers can easily be set to charge flooded and sealed lead-acid batteries (including XFC blocs) within the appropriate range of the cell and ampere-hour rating.

Beginning the charge

When a battery is connected to the charger, the control board senses voltage and after a 15 second delay, the charger starts.

Charging

Charging current is determined by the battery voltage and interaction of the charger. As the battery charges, the LCD display will output various charge parameters including the percentage of battery capacity.

AC power fail

If the AC power fails with a battery connected to the charger during a charge cycle, the charger will reset and start a new charge cycle when power is restored. All charger settings as well as the time and date are preserved.

GLOSSARY

Charging profile

The charging profile defines the rate of current charge over time. The charger adapts to the battery's age and level of discharge. Controlling the overcharge coefficient, whatever the battery's discharge level, reduces the amount of electricity consumed.

Equalization charging

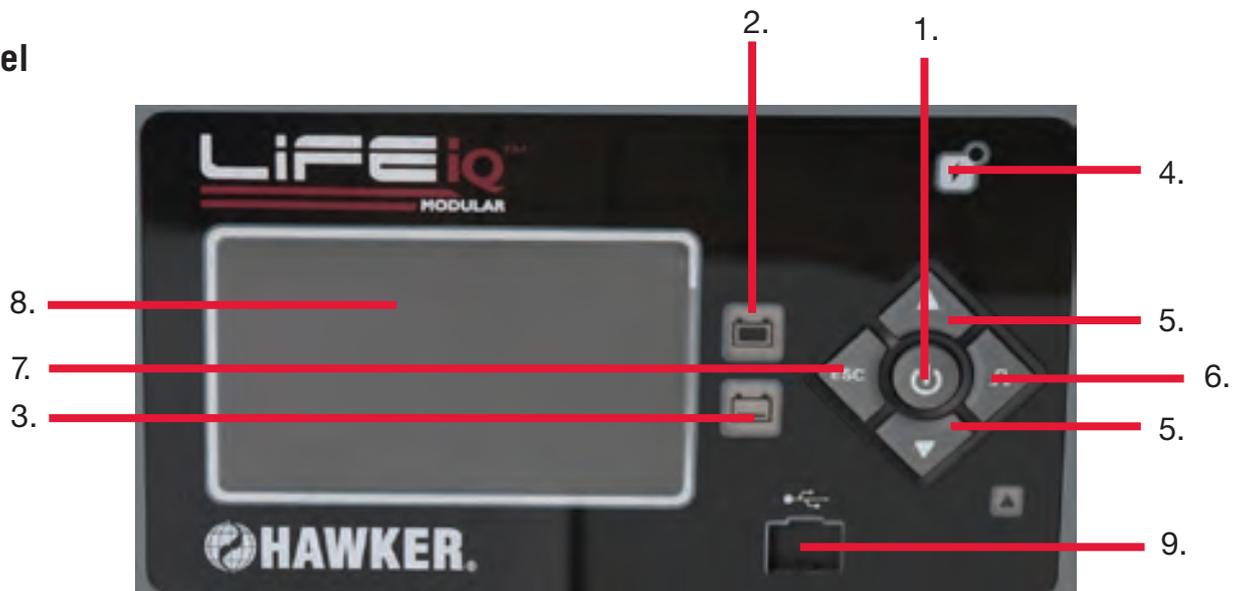
Equalization charging, performed after normal charging, balances the electrolyte densities in the battery's cells.

Refresh charging

Refresh or maintenance charging enables the battery to be maintained at maximum charge all the time that it is connected to the charger.

OPERATING INSTRUCTIONS

Control panel



Display ref	Button / LED	Function	Function
1.	Start Stop button	Start-Stop charge	select of active menu
2.	Charger status indicator	Battery available	–
3.	Charger status indicator	Battery in charge	–
4.	Blue LED	AC supply ON (light)	AC supply OFF
5.	Arrows	Navigation buttons	Return to top of list (press for 2 sec)
6.	Equalization button	Start an equalization	Access a sub menu
7.	Esc	Access a sub menu	Close windows
8.	TFT multicolor screen	Shows details (refer to LCD display par.)	–
9.	USB port	Download memories	Upload firmware

Ref	Function
1	AC input cable
2	DC output cable
3	Option port
4	Ventilation openings
5	TFT screen
6	Navigation buttons
7	Cable holder (only on single phase)



MENU ACCESS

When the charger is idle, press and hold <ESC>, the main menu is then displayed. The main menu is automatically exited after 60 seconds of inactivity or can be exited voluntarily by pressing the <ESC> button.

Main menu display



Main menu

All menus are accessed from main menu; a detailed description of each menu is included in the next sections of this manual. The menus that require a password are not displayed until the correct password has been entered.

The menus provide access to the following functions:

- View status and memorizations (LOGS icon).
- Viewing of faults, alarms, etc. (CHARGER icon).
- USB functions (USB icon).
- Setting of date, language and others (SETTINGS icon).
- Management of password (PASSWORD icon).
- Exit main menu (EXIT icon).

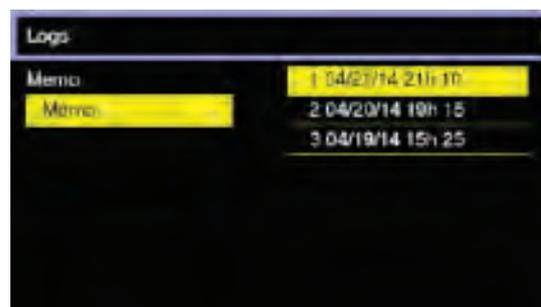
LOGS

Memorizations

The charger can display the details of the last 300 charge cycles.

Memorizations display screen

The display shows here the charges have been stored in memory (title line). MEMO 1 is the latest charge memorized. After memorizing the 300th charge, the oldest record is deleted and replaced by the next oldest.



Displaying a charge cycle

Proceed as follows:

1. Select a record (MEMO x) using the ▲ /▼ buttons.
2. Display the first history screen by pressing Enter.
3. Display the second history screen by pressing ▼.
4. Return to the main menu by pressing Esc.

The charge history is displayed; use the ▲ /▼ to scroll through the parameters.

MEMORIZATION DATA

Memo	Information	Memo	Information
S/N*	Wi-IQ® serial number	I end	Current at end of charge
Capacity	Rated battery capacity (AH)	Temp end**	Battery temperature at end of charge (°C)
U batt	Rated battery voltage (V)	Chg Time	Time of the charge cycle (hh:mm)
Temp	Battery temperature at start of charge (°C)	AH	Amp-hours returned during charge cycle
Techno*	Battery technology	kWh	Watt-hours returned during charge cycle
Profile	Selected profile	Chg end	Full of partial charge cycle
% init	State of charge at start of charge (%)	Default	Fault codes
U start	Battery voltage at start of charge (Vpc)	SoC	Start of charge date and time
U end	Battery voltage at end of charge (Vpc)	DBa	Battery disconnect date and time

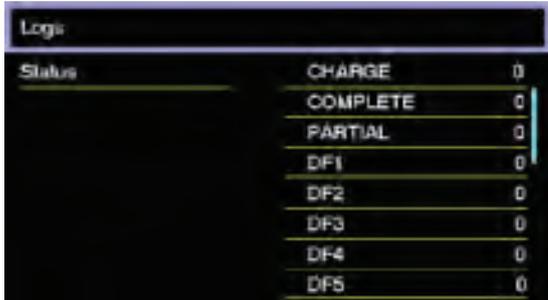
* Only with Wi-IQ

** Not displayed

STATUS

This menu displays the status of the charger's internal counters (number of normal and partial charges, faults by type, etc.).

Status screen



Status	Value
CHARGE	0
COMPLETE	0
PARTIAL	0
DF1	0
DF2	0
DF3	0
DF4	0
DF5	0

Status	Information
Charge	Total number of charges. Corresponds to the total of normally terminated charges and charges terminated with or by faults.
Complete	Number of charges normally terminated.
Partial	Number of charges terminated abnormally.
TH	Number of charger temperature faults.
DF1 etc.	Number of faults recorded by the charger (see Fault codes).

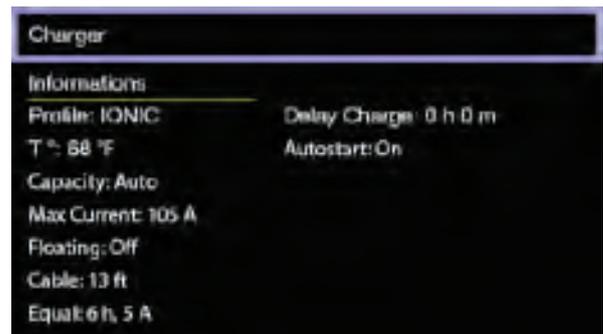
CHARGER

This menu displays information on the chargers configuration and output current of the charger and the power modules.

Information

This screen displays the following information on the charger's configuration.

Charger information display

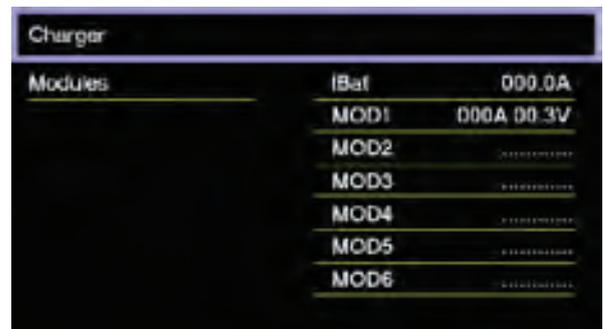


Modules*	Information
Profile	Selected charging profile.
Temperature	Programmed temperature.
Capacity	Automatic (default value) or manual.
Max. Current	Maximum current of charger.
Floating	ON or OFF (default value)
Cable	Length and section of DC cable
Equal	Equalize time and current.
Delay Charge	In hours and minutes
Auto Start	ON (default value) or OFF

Modules (password protected)

This screen displays the total output current charger and the output voltage and current of each power module.

Charger Module Display



Modules*	Information
IBat	Total charger output current.
MOD1	Module one - output current, output voltage.
MOD2	Module two - output current, output voltage.
MOD3	Module three - output current, output voltage.
MOD4	Module four - output current, output voltage.
MOD5	Module five - output current, output voltage.
MOD6	Module six - output current, output voltage.

MOD1 = leftmost module location (numbering from left to right)

USB

This menu provides access to the USB function. The charger can store charging data in a USB memory and update software.

Record memo

This function enables the storage of charge memorizations and the status data. The file, in CSV format (useable with memoreport or excel), will be stored in the USB stick under the name:

MDDDHHMM.CSV with

M: For memorization

DDD: Day of the year

HH: Hour of file creation

MM: Minute of file creation

Update software

Update chargers internal software. The software is provided by EnerSys.

Save setting (password protected)

Record the charger configuration on a USB stick.

Restore setting (password protected)

Upload a configuration from a USB stick to the charger. This function allows to configure easily several chargers with same configuration.

PARAMETERS

Date/time

Sets date and time of the charger. The clock has a battery backup which will preserve the time when power to the charger is off.

Daylight savings

Enable or disable automatic clock adjustment for daylight savings time. When enabled, seasonal time change is adjusted automatically. The charger must be powered up at the time of the change for it to take effect.

Language

Selects the language displayed in the menus.

Region

Select the format for date, metric (EU) or imperial (US) units for temperature, length, and cable gauge.

Display

Set screen saver function.

Screen saver

Enable or disable the screen saver function.

Delay

Set the time the screen stays illuminated. The delay time is adjustable in minutes up to 1 hour and 59 minutes.

Password

This is where the password is entered to gain access to service level menus by authorized EnerSys service personal.

Required setup – The following parameters must be set including date and time:

Parameters \ daylight savings	EUROPE
Parameters \ display \ screen saver	ON
Parameters \ display \ time	00H15
Parameters \ serial number	PER ORDER
Configuration \ charge \ charge delay \ type	OFF
Configuration \ charge \ charge delay \ value hour/delay	00H00
Configuration \ battery \ cap manu auto	AUTO
Configuration \ equalization \ time	06H00
Configuration \ equalization \ delay	00H00
Configuration \ equalization \ frequency	NEVER
Configuration \ equalization \ refresh ON/OFF	OFF

(Default factory ship configurations)

CHARGE**Profile**

To select the right charging profile for the application: LOWCHARGE , HDUTY, STDWL, GEL, AGM, XFC2V, XFCBLC, WL20, PNEU

Without Wi-IQ® :

Profile selected will be used. Values stored in the battery menu, such as capacity and temperature, are used to determine key charging parameters. Make sure these values match the battery to be charged or the battery may be over or under charged which will result in decreased battery life or performance.

With Wi-IQ:

The appropriate profile for the battery technology will be selected at the start of charge. Battery capacity and temperature will also be transmitted to the charger control.

Charge delay

Type - sets OFF, DELAY (default value), or time of day. Value hour delay - sets the amount or time of day for the delay (00:00 to 24:00).

Delay: start of charge is delayed for the amount of time stored in VALUE (0 to 24 hours) (default value = 0h00mn)

Time of day: charge will not start until the time of day stored in VALUE (24 hour format).

Daily charge (N/A for EMEA)

On/Off – Sets daily charge on or off.

Daily Chg Start – Sets daily charge start time.

Daily Chg End – Sets daily charge end time.

Block out charge

On/Off – Sets block out charge on or off (default value).

Block out Start – Sets daily charge start time.

Block out End – Sets daily charge end time.

Conditional charge

Set conditional charge %.

The charger will only commence the charge if the battery has reached the limit of depth of discharge (DoD) of more than x%. For example if the user wants to charge the battery only if it is discharged more than 30%, the parameter 30 has to be entered in the conditional charge. The 00% value disables the function (default value).

It is recommended to select a value between 0 and 30% DOD.

Floating

On/Off- Sets float mode on or off (default value).

Current – Sets float current.

Voltage – Sets float voltage.

This feature can be turned ON or OFF depending on the application. A float charge at the end of standard charge is intended to compensate for consumption by the truck electronics that are left on when truck is not used (typically AGV). The parameter VOLTAGE is in mVpc (millivolts per cell) determines the maximum float voltage. The parameter CURRENT has to be set to according to the truck electronics consumption. The current will automatically decrease to keep the battery voltage at the maximum defined by the VOLTAGE parameter.

Battery rest

Set battery rest time in hours (default value is 0).

Refresh On/Off (only with HDUTY profile)

Sets refresh mode on or off (default value).

I_{max} (high level password)

Sets charger maximum output current.

BATTERY

NB cells

Sets number of battery cells. Automatic mode is compatible only with multi-voltage products.

Cap Manu/Auto

When in HDUTY mode, the charger can estimate the capacity of the connected battery automatically "Auto" or the charger will use the capacity entered manually "Manu" in the Capacity menu.

Capacity

Without Wi-IQ® :

Battery AH capacity used by the charger (Cap Manu/Auto must be set to "Manu") to determine start and finish rates.

With Wi-IQ:

The battery AH capacity will be automatically transmitted from Wi-IQ.

Battery temperature

This parameter adjusts the regulation voltages on the charging profile (values between -15°C and +45°C, default value is +20°C).

Without Wi-IQ:

Defines the average operating battery temperature before the charge. It is recommended the average electrolyte temperature be entered, especially in cold areas.

With Wi-IQ:

The battery operating temperature will be automatically transmitted from Wi-IQ. The battery temperature will be analyzed during the charge; if it increases too much, the charger will stop to prevent any possible damage.

High temperature

Defines a battery temperature safety limit (default value is +65°C).

Without Wi-IQ:

not used.

With Wi-IQ:

If the battery temperature, during the charge, reaches the programmed limit, the charger will stop the charge and wait until the temperature decreases.

CABLE

Length

Select the length of DC cables from the charger to the battery terminals in 1m to 15m.

Section

Sets the DC cable gauge: From 6 to 95 mm².

EQUALIZATION

Current

This defines the equalization or desulphation current for a manual start.

Time

Sets the equalization time from 1 to 48 hrs.

Delayed start (delay)

Sets the delay between the normal charge and the equalization charge from 0 hr to 23 hrs.

Frequency

Selects one or several periods for carrying out the equalization charge. The user can select one or several days per week.

Idle mode

ON/OFF: sets idle mode ON or OFF (default value).

Option

Options Test

Turns on Battery Status (Red/Green), Electrovalve and Airmix output briefly to test operation.

Electroval. Time

Sets the electrovalve time on in seconds (default value is 60s).

Com IQ On/Off

ON/OFF : set the communication with Wi-IQ®s ON (default value) or OFF.

Network

Protocol

Set a protocol to Jbus, LAN, or BFM

Baud Rate

Sets baud rate

Address JBUS

Sets address

EasyKit Param

Allow to communicate with an easycontrol device (with external easykit option).

Address

Set a the easykit address

EasyKit On/Off

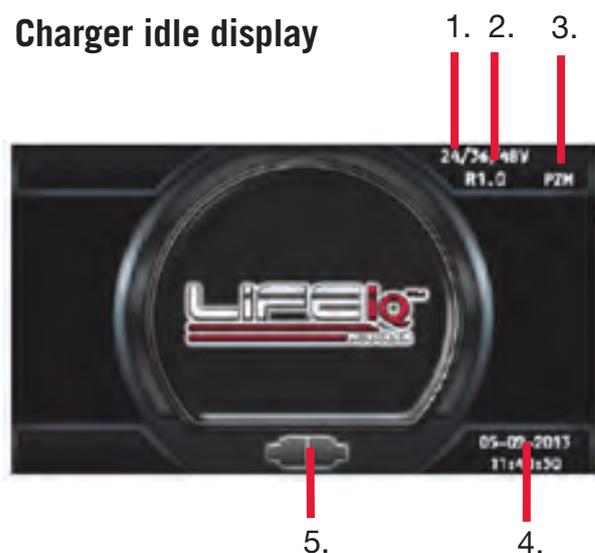
Set ON or OFF (default value) the option.

CHARGING THE BATTERY

At this point, the charger should have been set up by a qualified service person. Charging can only begin with a battery of the proper type, capacity and voltage connected to the charger.

With the charger in wait mode (no battery connected) and without pressing the Stop/Start button, the display will show the following information:

Charger idle display



Ref	Description
1	Charger type
2	Firmware version
3	Selected charge profile
4	System time and date
5	Connect the battery

Starting charge cycle

The charger will start automatically when a battery is connected or push the Stop/Start button if the battery is already connected.

Delayed start

If the charger was programmed for delayed start, charging will begin following that delay. When the battery is plugged in to the charger, the display shows the time remaining before the programmed charging starts.

Count down display



Without Wi-IQ®

If the Wi-IQ adapter is not enabled or no Wi-IQ are in range, effective charging starts after a 15 seconds countdown. The charger uses Profile, Capacity, and Temperature settings programmed in the Configuration menu.

With Wi-IQ

If a Wi-IQ adapter is present and one or more Wi-IQ is in range, the charger will turn on and apply current to the battery. The display will show “SCAN” followed by “LINK”. This routine determines which Wi-IQ in range is one the battery the charger is connected to. Once the charger makes the determination it downloads data from Wi-IQ, displays the battery S/N, updates the profile, capacity, and temperature for charging, and starts the main charge.

Charge display

A few moments into the effective charge, the display will begin alternating between the following charging information:

Charge screens



End of charge display



End of charge without equalization

The green complete LED comes on after proper end of charge. The green complete LED is on and the display shows AVAIL. The display alternates between:

- Total charging time.
- Amp/hrs restored to the battery.

Any other lit LED indicates a problem during charging. Please refer to paragraph Control panel for more information. If the battery remains plugged in and refresh charge has been enabled, refreshes will occur to maintain an optimal charge. The battery is now ready for use. Push the Start/ Stop button before unplugging the battery.

End of charge with equalization

An equalizing charge can be started manually or automatically.

Ref	Function
1	Charge info
2	Charge voltage (total V and V/c)
3	Charge time
4	Battery temperature
5	Battery ID
6	Wi-IQ warnings
7	USB connection
8	Charge Ah
9	Charger type and charging profile
10	% of charge
11	Charge current
12	Equal mode
13	Date / time
14	Wi-IQ Link

Manual start

1. At the end of charge (green LED on or flashing), press on the <EQUALIZE> button. The equalize button can also be pressed any time during the charge and an equalize charge will be started after charging is complete.

NOTE: When an equalize is manually started, the output current will be set to the value saved in the charger configuration. The factory default depends on the product configuration.

2. The start of the equalization charge is indicated by the message EQUAL. During the equalization charge, the charger displays the output current and alternating, the battery voltage, voltage per cell, remaining time.
3. The battery will be available when the green LED comes back on and the display shows AVAIL.
4. The battery is now ready for use. If the battery remains plugged in and refresh charge has been enabled, refreshes will occur to maintain an optimal charge. Push the ON/OFF button before unplugging the battery.

Automatic start

If an equalization day has been programmed in Charger configurations the equalization charge will start automatically on the programmed day of the week after charging is complete.

Note: The factory default equalization is 6 hours and the day occurrence has to be set up.

The battery will be available when the green LED comes back on and the display shows AVAIL. The battery is now ready for use. If the battery remains plugged in and refresh charge has been enabled, refreshes will occur to maintain an optimal charge.

Push the Start/Stop button before unplugging the battery.

OPTIONS

Ensure when using an optional equipment (airmix, BSI, PLC ...) that the second ribbon cable is connected between the display and backplane boards.

The correct operation of the option can be tested through the menu (option test).

LCD FAULT MESSAGES

Fault	Cause	Remedial action
No display and Blue LED off	No mains supply.	Check the power supply and the input fuse(s).
DF CUR-RENT	Battery available.	–
DF1*	Charger fault.	Check the power supply voltage.
DF2*	Charger fault.	Check that the battery is correctly connected (that the cables are not reversed) and check the output fuse
DF3*	Unsuitable battery.	Battery voltage too high or too low. Connect the correct battery to the charger
DF4	The battery has been discharged more than 80% of its capacity.	Charging continues
DF5	Battery requires inspection.	Check the charging cables (cross-section too small), the terminals (oxidization, not tight) and the battery (defective cells).
DF7	Pneumatic mixing air circuit fault (the red light flashes).	Check the air circuit (pump, tubing).
TH*	Thermal fault resulting in interruption of charging.	Check that the fan(s) is (are) working correctly and/or that the ambient temperature is not too high or whether there is poor natural ventilation to the charger.
MOD TH	Alternating with charge parameters - one or more module in thermal fault - the charge process continues - the faulty module(s) is (are) displayed + red led flashing.	Check that the fan(s) is (are) working correctly and/or that the ambient temperature is not too high or whether there is poor natural ventilation to the charger. If all modules are in thermal fault, a TH* fault will follow.
MOD DFC	Alternating with charge parameters - one or more module in DF1 fault - the charge process continues - the faulty module(s) is (are) displayed + red led flashing.	Check power supplies. If all modules in DF1 fault a DF1* error will follow (blocking fault).
DEF ID	Blocking fault - one or more module are not compatible with the charger configuration (for example 24V charger with one 48V module). This can happen if the user replaces one module with another one with a different voltage setting.	Use correct module.

* A blocking fault preventing charging from continuing.
Refer to the Technical Characteristics sheet joined to the charger.

MAINTENANCE & SERVICE

CAUTION:

There are dangerous voltages within the battery charger cabinet. Only qualified personnel should service this battery charger.

The charger requires a minimum of maintenance. Connections and terminals should be kept clean and tight. The unit (especially the module heatsink and fan) should be periodically cleaned with low pressure air to prevent any excessive dirt build up on components. Care should be taken not to bump or move any adjustments during cleaning. Make sure that both the AC lines and the battery are disconnected before cleaning. The frequency of this type of maintenance depends on the environment in which this unit is installed.

TESTING OF COMPONENTS SINGLE PHASE

Only qualified personnel should service this battery charger.

IMPORTANT: Disconnect battery and turn AC power OFF before servicing.

1. DC output fuse

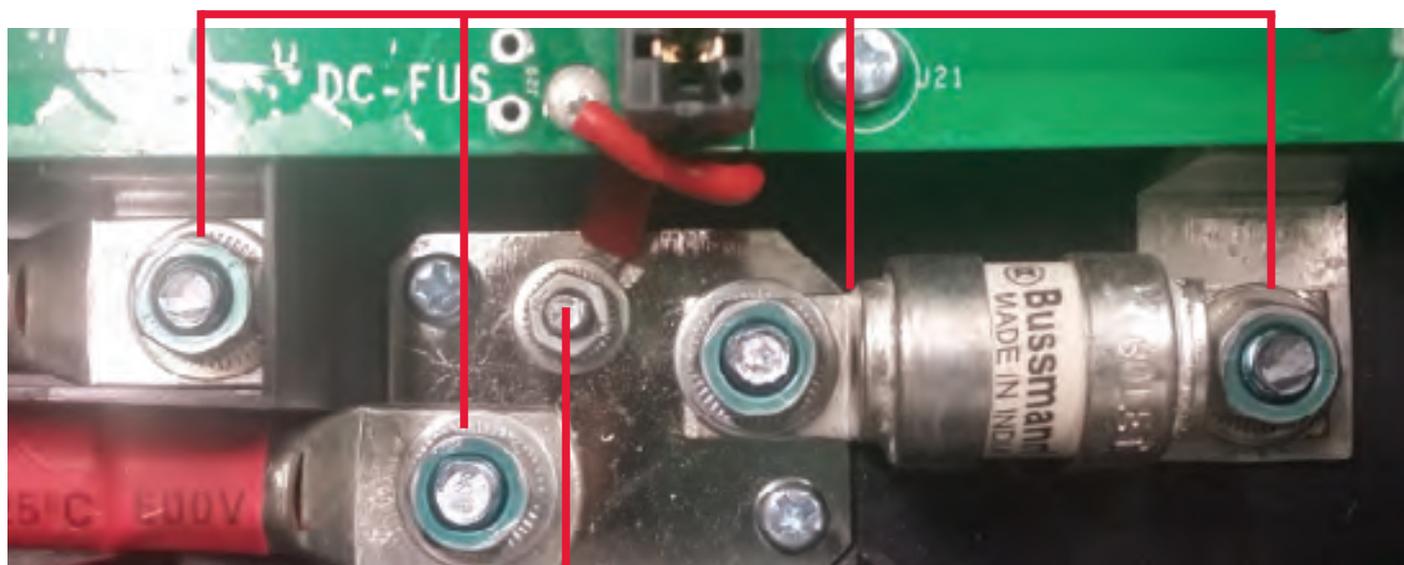
Disconnect the AC power and the battery before opening the door. Check of output fuse is carried out with the multimeter in Ω position.

0 Ω = fuse Ok
Infinity = replace the fuse

Part number : 6LA10465 = DC fuse (fusible DC)

DC output fuse & DC cables - torque M6 to 7Nm and M4 to 1.5 Nm

7 Nm



1.5 Nm

2. Display board and door



CAUTION: Use an anti-static wrist strap when removing and replacing circuit board assemblies.

Part	Description	Energys Part no.
Kit porte	Door kit 3x1kW IQ	3543031

If a fault on the display, control board or external door occurred, replace the full door with Kit 3543031.

REMOVAL

Please follow these steps to remove a display board.

1. Touch your finger to a ground to remove any static charge.
2. Unplug all connectors from the display board. Some connectors maybe secured by screws.
3. Unscrew the hinges on the side.
4. Remove the door.

REPLACEMENT

1. Align the door kit to the in proper position.
2. Reallocate screws in on the side hinge (torque to 1Nm).
3. Reconnect the ribbon cable(s).

**ENSURE TO PROGRAM THE CHARGER CORRECTLY FOR THE APPLICATION.
THE CHARGER SERIAL NUMBER HAS TO BE SET UP IN THE MENU.**

3. Module test and replacement

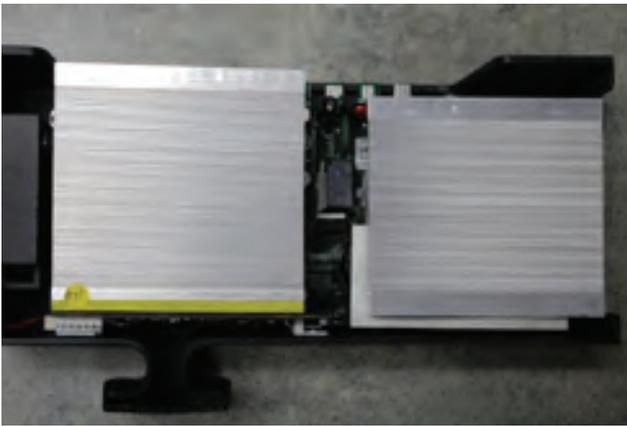
Operation	LED
Init	Rolling green/red alternatively for 6 seconds
Module in stand-by	Short green pulses
Module in operation	Green fixed
Fault	Red ON or flashing – refer to charger display

6LA20650	12V 1kW module	
6LA20629	24V 1kW module	
6LA20635	36/48V 1kW module	

1. Unplug AC plug and DC from battery.
2. Wait till blue light on the screen is off.
3. Touch your finger to a ground to remove any static charge.
4. Remove top and bottom screw.
5. Pull the module out from its guide.
6. Place the new module (ensure to use an appropriate module).
7. Screw the top and bottom screw back.



Module bottom and fan

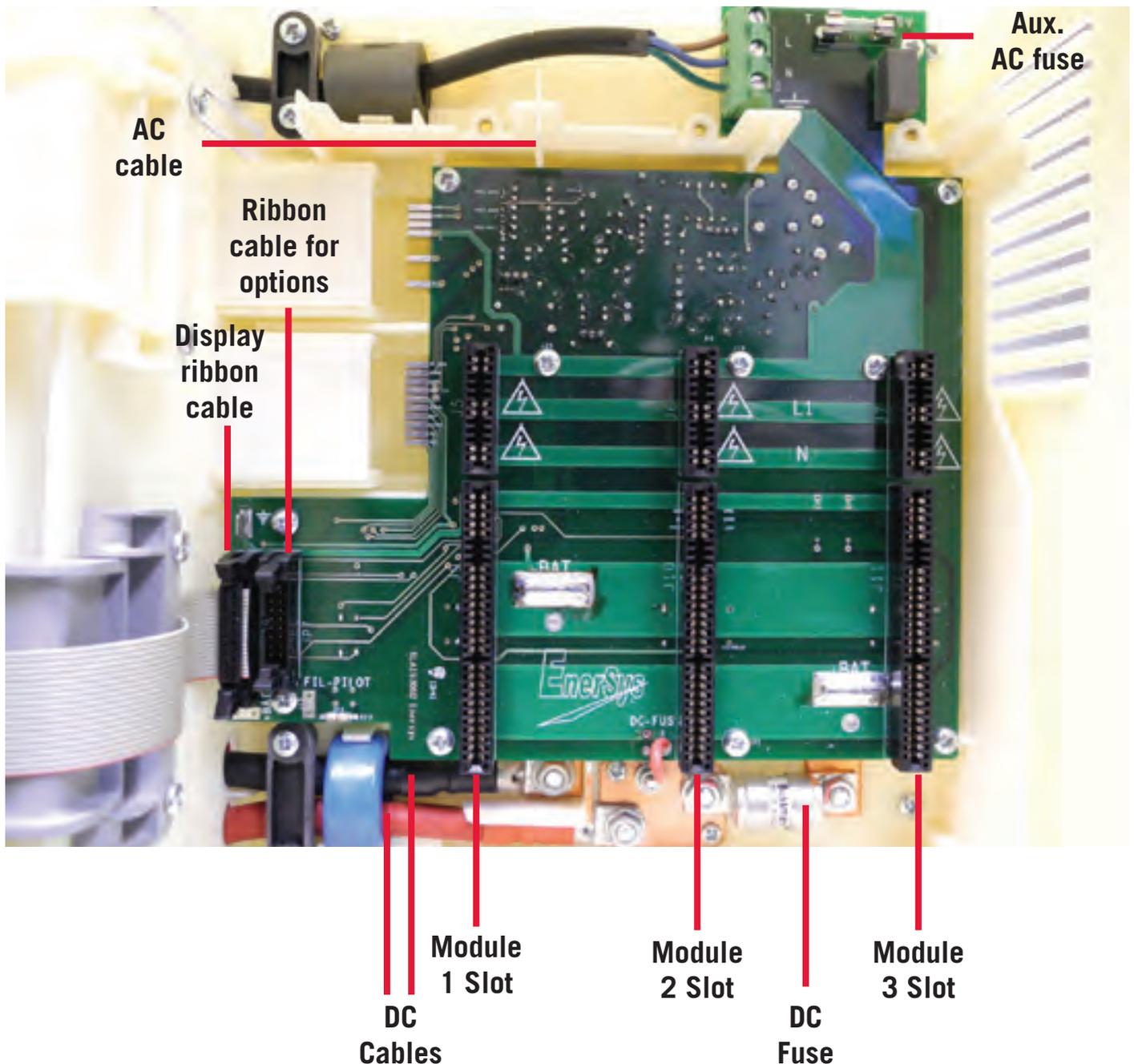


Module heatsinks



Every module has an unique serial number to be used for eventual claims

COMPONENT LOCATIONS 1-phase



TESTING OF COMPONENTS 3-PHASE

Only qualified personnel should service this battery charger.

IMPORTANT: Disconnect battery and turn AC power OFF before servicing.

1. AC input cabinet fuse

1. Disconnect both mains and battery from the charger.
2. Remove the top cover of the charger.
3. Replace the faulty fuses.
4. Replace the top cover.
5. Test the charger.

2 and 4-bay cabinets = 30A time delayed fuses (10x38)
6-bay cabinet = 40A time delayed fuses (14x51)

Refer To Spare part hub for Part numbers

2. AC input module fuse

DC fuse Bussmann FWH-010A6F

3553651

1. Disconnect both mains and battery from the charger.
2. Open the charger door.
3. Unscrew and extract the faulty module.
4. Remove the top lid of the module.
5. Test the voltage across the M7 MOV with a multimeter (diode position).
6. Replace the faulty fuses located as in picture.
7. Replace the top lid.
8. Replace the module.
9. Test the charger.



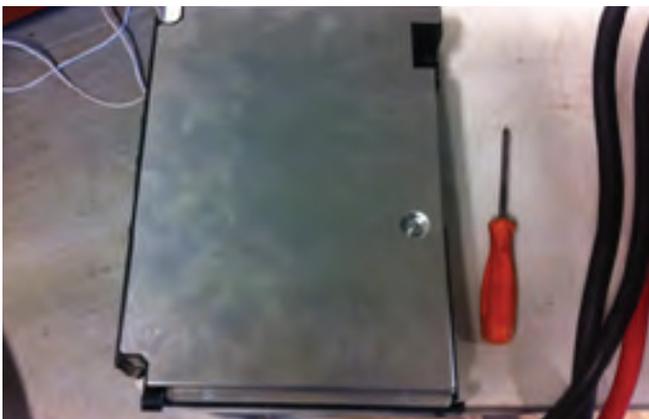
~0.7V => replace the faulty fuse(s)
0.0 to 0.55V => replace the module

3. DC Fuse

DC fuse Bussmann#125LET (24/36/48V module)	3553635
DC fuse Bussmann#80LET (72/80V module)	3553643

Every module has its own output fuse. If one module fails due to a burned fuse (refer to internal LEDs meaning above):

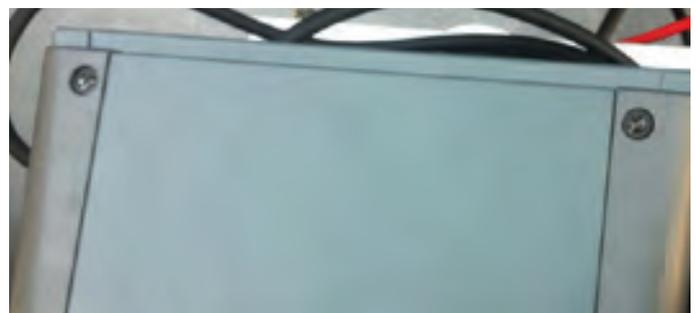
1. Open the front door of the charger.
2. Unscrew the faulty module and extract it.
3. Remove the metal cover on the side.
4. Replace the DC output fuse – torque to 7Nm.
5. Replace the metal cover and screw it back.
6. Replace the module in the charger.
7. Test the charger.



4. Display board and door

Kit display	2/4 bay IQ	3553579
Kit display	6 bay IQ	3554201

1. Remove the top lid of the charger by unscrewing the two main top screws and slide of.



2. Disconnect the ribbon cable.



3. Remove bottom screws of the display panel.
4. Remove the front panel.
5. Reconnect the new panel by screwing back all the screws and reconnecting the ribbon cable.



ENSURE TO PROGRAM THE CHARGER CORRECTLY FOR THE APPLICATION. THE CHARGER SERIAL NUMBER HAS TO BE SET UP IN THE MENU.

5. Module test and replacement

Operation	LED
Init	Rolling yellow/green/red alternatively for 6 seconds
AC power OFF or charger idle mode ON or module in fault	Yellow OFF
In all the following cases, yellow led on	
Module in stand-by	Short green pulses
Module in operation	Green fixed
Fault	Red or flashing – refer to charger display

6LA20651	24/36/48V 3.5kW module	
6LA20656	70/80V 3.5kW module	

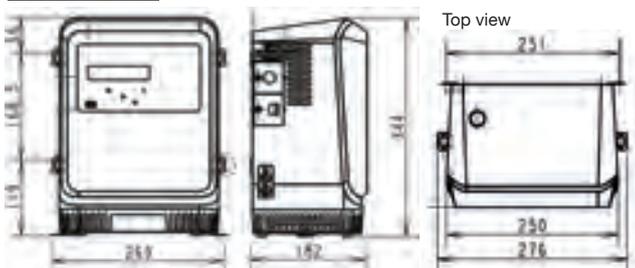
1. Unplug AC and DC plugs from the battery.
2. Wait till blue light on the screen off.
3. Touch your finger to a ground to remove any static charge.
4. Open the charger door.
5. Unscrew the module.
6. Pull the module out from its guide.
7. Place the new module (ensure to use an appropriate module).
8. Screw the top and bottom screw back.

Life IQ™ Modular

TECHNICAL SPECIFICATION - SINGLE PHASE

Specifications	Units	1kW			2kW			3kW	
Battery voltage		12V	24V	36/48V	24V	36/48V	24V	36/48V	
Nominal input voltage	Vac	230V +/- 10% / 1ph							
Frequency	Hz	50/60							
Max current draw @ 230Vac	A	2.4	4.8	5.1	9.6	10.2	14.4	15.3	
AC input cable section	mm ²	3 x 1.5							
AC input cable length	m	1.5							
Max output current @ 230Vac	Adc	36	36	25/18	72	50/36	108	75/54	
Battery cables section	mm ²	25							
Battery cables length	m	3							
IP protection		IP21							
Operating temperature	°C	0°C to +45°C							
Power factor		0.99							
Idle mode	W	≤10							
Display		Multiline TFT							
Weight	kg	6.0			7.0		8.0		
Dimensions (HxWxD)	mm	344 x 250 x 182 (no brackets)							
Weight with airmix	kg	9.0			10.0		11.0		
Dimensions (HxWxD) with airmix	mm	435 x 286 x 185 (no brackets)							
Cabinet		3 bay (1 module)			3 bay (2 modules)		3 bay (3 modules)		

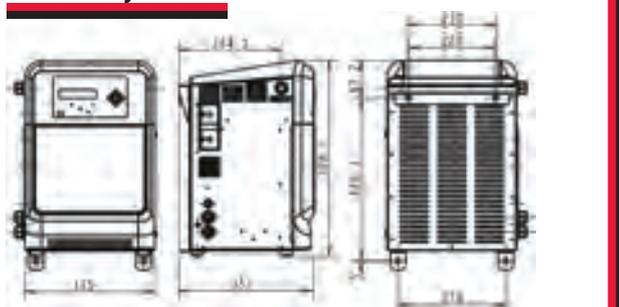
3 bay cabinet



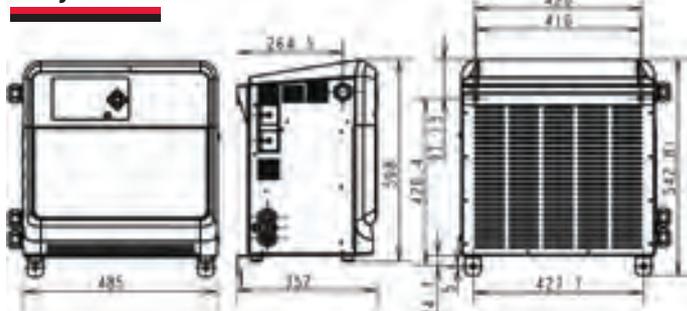
TECHNICAL SPECIFICATION - THREE PHASE

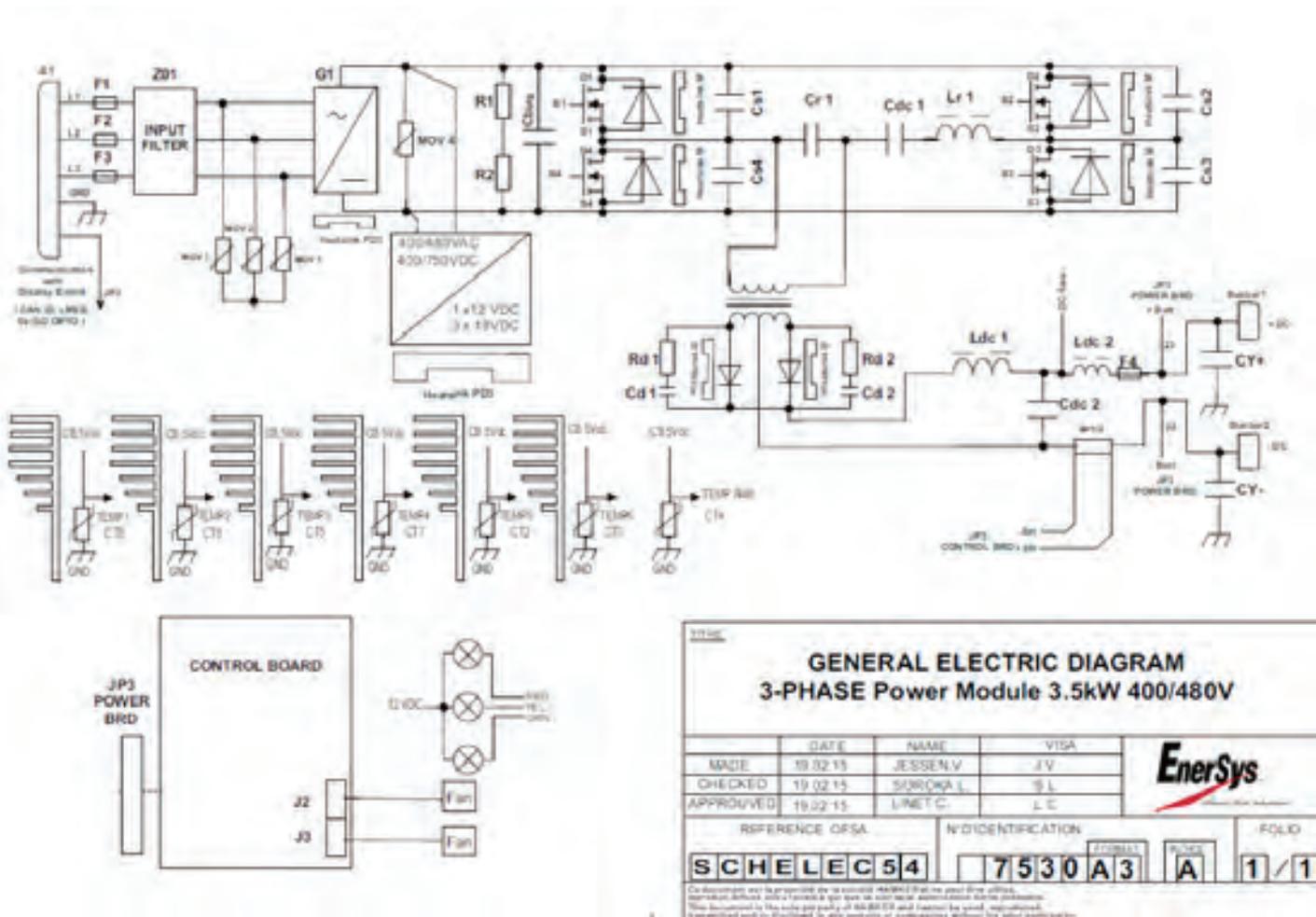
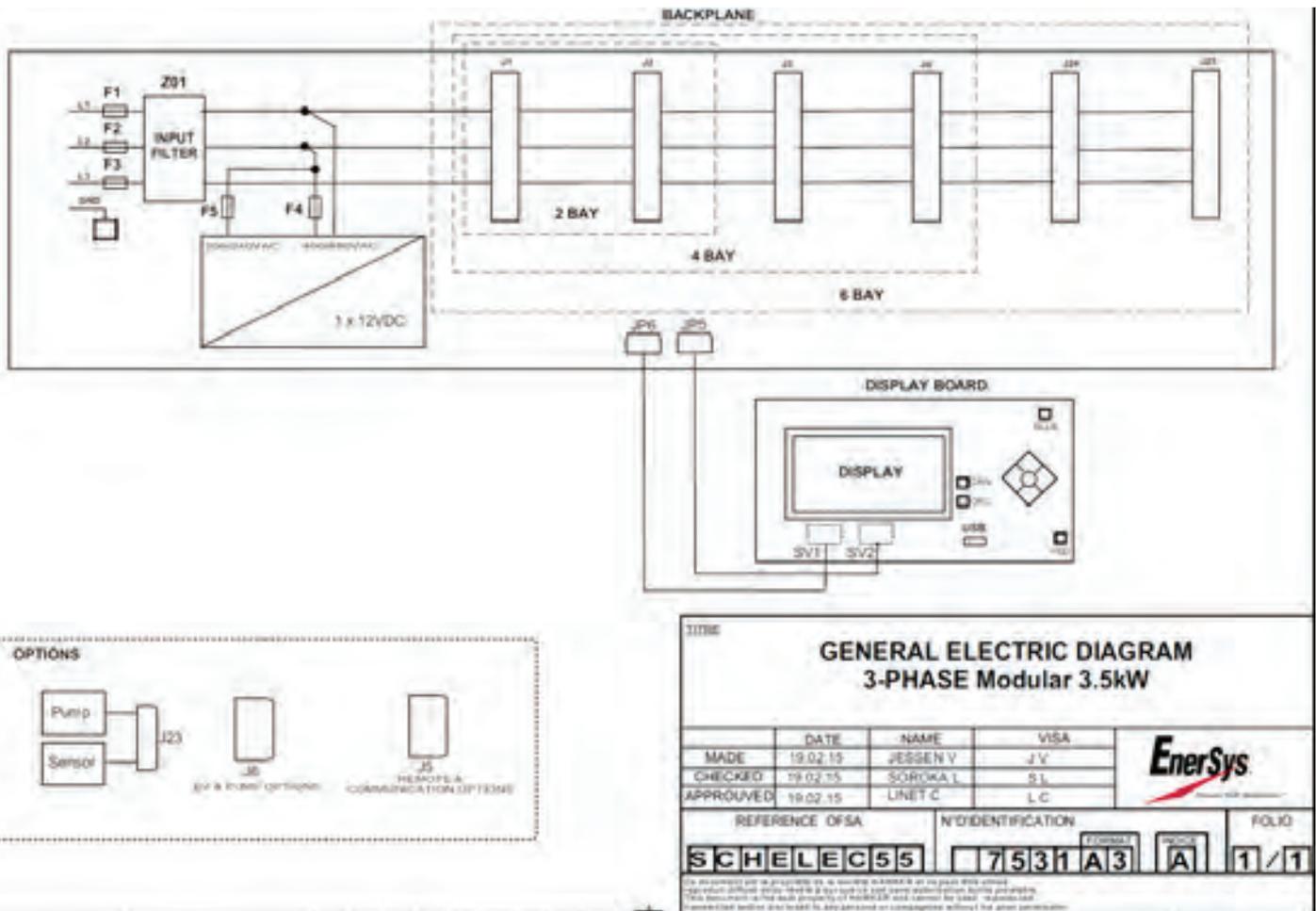
Specifications	Units	3.5kW		7kW		10.5kW		14kW		17.5kW		21kW	
Battery voltage		24/36/48V	72/80V	24/36/48V	72/80V	24/36/48V	72/80V	24/36/48V	72/80V	24/36/48V	72/80V	24/36/48V	72/80V
Nominal input voltage	Vac	400V +/- 10% / 3ph											
Frequency	Hz	50/60											
Max current draw @ 400Vac	A	5.6	5,6	11.2	11,2	16.8	16,8	22.4	22,4	28.0	28,0	29.8	33.6
AC input cable section	mm ²	4 x 2.5				4 x 4.0				4 x 6.0			
AC input cable length	m	2											
Max output current @ 400Vac	Adc	70/65/60	40/36	140/130/120	80/72	210/195/180	120/108	280/260/240	160/144	320/320/300	200/180	320/320/320	240/216
Battery cables section	mm ²	35				70				95			
Battery cables length	m	3											
IP protection		IP21											
Operating temperature	°C	0°C to +45°C											
Power factor		0.95											
Idle mode	W	≤10											
Display		Multiline TFT											
Weight	kg	26.0		29.5		33.5		37.0		44.5		48.0	
Dimensions (HxWxD)	mm	508 x 335 x 352											
Weight with airmix	kg	28.0		31.5		35.5		39.0		46.5		50.0	
Dimensions (HxWxD) with airmix	mm	508 x 335 x 352											
Cabinet		2 bay (1 module)		2 bay (2 modules)		4 bay (3 modules)		4 bay (4 modules)		6 bay (5 modules)		6 bay (6 modules)	

2 and 4 bay cabinet



6 bay cabinet





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