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Technical Manual

GB

## **Hawker® Life IQ™**

Single phase and 3-phase  
chargers

## Technical manual Life IQ™ - Single phase and 3-phase chargers

### CONTENTS

AIMS OF THIS MANUAL.....	2
INFORMATION.....	2
WARRANTY.....	2
RECOMMENDATIONS.....	2
ELECTRICAL SAFETY.....	2
LIMITATIONS OF USE.....	3
PRODUCT RECYCLING – DESTRUCTION.....	3
MODIFICATIONS AND IMPROVEMENTS.....	3
RECEIVING – STORAGE.....	3
SPARE PARTS.....	3
INFORMATION PLATE.....	3
GLOSSARY.....	3
EEC DECLARATION OF CONFORMITY.....	3
DESCRIPTION.....	4
INTRODUCTION.....	4
FEATURES.....	4
EXTERNAL COMPONENTS.....	4
CONTROL PANEL.....	4
THE MENUS.....	5
ACCESS TO THE MENUS.....	5
MEMORISED DATA.....	5
STATUS.....	5
USB.....	5
CONFIGURATION.....	5
PARAMETERS.....	6
PASSWORD.....	6
INFORMATION.....	6
USING THE CHARGER.....	6
UNPACKING.....	6
MECHANICAL INSTALLATION.....	6
ELECTRICAL CONNECTIONS.....	7
FACTORY SETUP.....	8
CHARGING THE BATTERY.....	8
HISTORICAL DATA PER CHARGE.....	9
CHARGER HISTORICAL DATA.....	9
MESSAGES AND FAULT CODES.....	9

### INFORMATION

#### GOALS OF THIS MANUAL

This manual is aimed at any authorized personnel wanting to use a single phase and 3-phase Life IQ™ charger to recharge lead acid motive power batteries (vented, Hawker XFC™, Gel or Water Less®/ Water Less® 20 ranges)

This manual contains information on:

- Charger functionality.
- Use and setting of charger parameters.
- Technical specifications of the Life IQ chargers.

EnerSys® intends to provide clear and simple information in this manual, and assumes no responsibility for misunderstanding or improper interpretation of the information.

The owner of the equipment is required to preserve this manual during the life of the equipment and to transfer said manual to any subsequent purchaser.

#### WARRANTY

Warranty is offered by the manufacturer based on local regulations. Please contact your local distributor for further information.

#### RECOMMENDATIONS

##### Recommendations for safe operation

This manual should be carefully read, prior to using the equipment, by anyone intending to use the charger. The Life IQ:

- Must not have its air circulation impaired in any way, primarily around the air inlet areas.
- Dust accumulation must be removed every 12 months.
- Must be used within its protection norms, and never be directly in contact with water.
- Must be used only within the temperature range specified in the technical specifications.
- Internal connection torques must be checked once a year.
- Must not be installed on a surface subject to high vibration levels (proximity of motors, compressors, etc.).
- Must not be installed close to the batteries in order to avoid any gassing that could damage it prematurely.
- Must not be installed in arduous environments such as:
  - Harbour applications (saline air)
  - Close to cold stores
  - External locations with exposure to wind and rain.

##### Operator safety

All proper precautions must be observed when the equipment is used in areas where accidents are possible. Ensure proper ventilation when the charger is used with lead-acid batteries, due to gassing. Never disconnect the battery during the charging process.

##### General warnings

Requirements for use:

- The equipment must be properly grounded (earthed).
- The input voltage must match the charger requirements.
- The battery voltage must match the charger's capabilities.
- The battery capacity is within the charger's range.

#### ELECTRICAL SAFETY

Safety regulations and requirements must be observed.

Safety devices installed on the electrical supply to the chargers must be of the proper type and rating. It is important to ensure that only fuses of the proper capacity be used, should they need to be replaced.

This charger meets the Class 1 Electrical Safety requirements, and therefore needs to be properly grounded during installation. It must be connected to a power supply equipped with a ground cable, and the ground connection should be as short as possible.

The equipment must be totally disconnected from all power sources (main supply and battery) before it can be opened for inspection or servicing. The battery can only be disconnected **after** the STOP/START button has been pushed. Access to the inside of the charger should be restricted to authorized maintenance personnel.

**Please consult a qualified factory representative about any problems or questions related to the installation of this unit.**

## LIMITS OF USE

This charger is designed to be used in a sheltered area. It is designed exclusively to recharge lead batteries in an industrial environment.

## PRODUCT RECYCLING - DESTRUCTION

When this charger becomes obsolete, it can be recycled or destroyed by authorized facilities. Local regulations will prevail and must be followed.

## MODIFICATIONS AND IMPROVEMENTS

EnerSys® reserves the right, at any time, to modify or improve its products, without any obligation to update this product or this manual accordingly.

## RECEIVING - STORAGE

Upon receipt, please inspect visually the exterior of the charger for any physical damage. If necessary, proceed within 24 hours with the usual claims procedure with the transport company.

If the charger is to be stored before use, it should remain in the original packaging, carefully closed. Store in a clean, dry area at a moderate temperature (0 °C to +40 °C). If the equipment is stored at a temperature below 15°C, it must be gradually (24 hours) restored to operating temperature before use, to prevent the risk of condensation that could cause electrical faults and short-circuits.

## SPARE PARTS

Please supply the unit's serial number, indicated on the information plate when ordering any spare parts.

## INFORMATION PLATE

Located on either side of the charger.

## GLOSSARY

### Charger Features

The EnerSys chargers are managed by a microprocessor. The microprocessor can calculate the battery capacity and automatically sets the appropriate charging profile. This allows the charger to work over a wide range of battery capacities. The control of the charging factor is absolute on all battery types. The Life IQ™ chargers adapt to battery capacity and depth of discharge.

### Charge factor

Charge factor is the quantity of Ampere Hours returned to the battery during the charge cycle versus the amount removed during the last discharge.

### Refresh Charge

A refresh charge maintains the battery at the optimum level as long as it is connected to the charger.

### Desulphation charge

A desulphation charge is done prior to normal charging, and this charge restores the specific gravity of over-discharged or under-utilised batteries.

### Equalisation charge

Done after the normal charge, a balancing charge that 'equalises' the cell voltages and specific gravity of all cells in the battery.

### Wi-IQ®

This device, permanently installed on the battery, wirelessly transmits battery parameters to the charger in order to optimise the charge and to manage the charge and discharge data.

Communicated parameters are:

Temperature, battery capacity, warnings (water level, voltage balance), voltage, charging status ...

The Wi-IQ also transmits data of the battery temperature during the charging process and will possibly stop the charge if the temperature is too high.

### Charging profile

Defines the profile of the current applied to the battery during charging in relation to available time. Diverse charging profiles can be selected. The charger adapts to the battery based on capacity and state of charge and age in order to maximize overall battery life. The control of the overcharge factor, whatever the battery depth of discharge, provides a reduction in water consumption (except on VRLA batteries) and energy consumption .

### Ionic profile

Also called "Ionic Mixing" this profile consists of applying short current pulses to the battery, thus provoking gassing in the active material to diffuse the sulphuric acid from the plates. This introduction of Ionic

Mixing enables faster charging of the battery and eliminates the differences in density by homogenizing the electrolyte throughout the cells. The ionic profile doesn't require weekly equalisation charge.

### Gel battery profile

The procedure for charging sealed, maintenance-free batteries has been optimised to ensure that the particular requirements necessary for recharging are observed. The main advantages of these batteries are that there is no necessity to add water, thus reducing maintenance costs, and no necessity for special charging rooms (subject to local regulations) with ventilation and water demineralisation units.

### Water Less®/Water Less® 20 battery profile

The charging procedure for Water Less batteries has been optimised in order to provide more flexibility and more time due to longer topping up intervals.

### Pneumatic battery profile

**PzM profile (Water Less) - 65 cycles**

**WL20 profile (Water Less 20) - 100 cycles**

This type of battery is fitted with an air injection circuit allowing electrolyte circulation. The electrolyte circulation system reduces the charging time and the water consumption.

## EC DECLARATION OF CONFORMITY



EnerSys hereby declares that the chargers in the Life IQ range covered by this declaration conform to:

**Directive 2006/95/EC** (Low Voltage Directive) :  
EN60950-1

**Directive 2004/108/EC** (ElectroMagnetic Compatibility) :  
EN61000-6-2, EN61000-6-4 :  
Immunity and emissions limits for industrial electronics  
(class A- Industrial Environments)

**Directive 2002/95/EC** (RoHS)

## DESCRIPTION

### INTRODUCTION

The Life IQ™ range of chargers is designed to recharge 24V, 36 V, 48 V or 80 V batteries, depending on the version supplied, from a single-phase or 3-phase main supply. The microprocessor-controlled unit automatically recognises the battery (voltage, capacity, charge level, etc.) and very effectively analyses its condition for optimum handling. Several charging profiles are available (vented lead/acid batteries, VRLA batteries (Hawker XFC™), gel batteries or Water Less® batteries) depending on the configuration selected by the user. The capability for desulphation, equalisation and refresh charging is also included.

### FEATURES

The Life IQ chargers are:

fitted as standard with:

- A wide LCD display with a five colour backlight indicating the status of the charger (Waiting, On charge, Fault, Battery charged)
- Wireless communication with the battery controller, Wi-IQ®. This communication allows optimisation of the charge and automatic adjustment of the charger to the battery according to temperature, capacity and technology (vented, VRLA ...). Communication occurs during the charge to analyse the battery temperature and compensate for any loss in the output cables.
- A real time clock allows the management of charging at a precise time of day (for example, to use off-peak electricity tariffs), for equalising periods (for example: the user can configure an equalisation charge once or several times a week as required).
- Anti arcing system for safe disconnection during the charge.
- A USB interface enables the connection of a USB stick to download all data stored in the charger.

optionally fitted with:

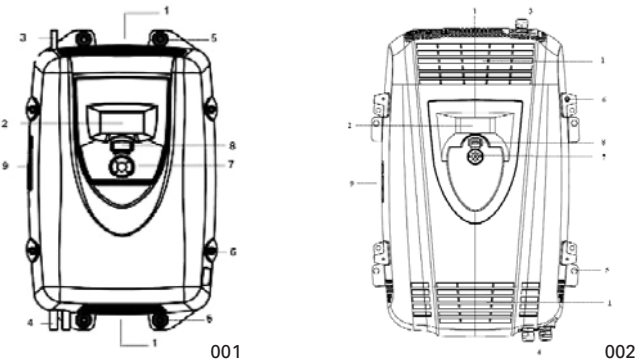
- Ethernet interface for remote management of the charger.

### EXTERNAL COMPONENTS

Presented below:

Single phase model

3 phases model



Ref.	Function
1.	Ventilation louvres.
2.	Display and control panel
3.	AC input cable.
4.	Battery cable.
5.	Wall mounting frame.
6.	Case retaining screw.
7.	Navigation button – Stop/Start button of the charger
8.	USB
9.	Option connector (Electro-valve, BSI, Ethernet...).

Figure 1: Principal components of the charger.

### CONTROL PANEL

Incorporates the Display and the Control Panel. See Chapters “The Menus” and “Using the charger” to get more detailed information.

#### LCD Display

The display is fitted with 5 different colours indicating the status of the charger:

COLOUR	FUNCTION
Dark blue	Waiting status until battery connected
Light blue	Battery on charge
Light blue / Orange	Alternating, on charge indicating a defect pump or overdischarge or thermal fault
Green	Battery charged
Red	Charger faults DF1, DF2, DF3, TH
Green / Orange	Alternating, battery charged with defect pump or overdischarge

#### Functions of keys

The keys offer the following general functions:

Key	Function
	Navigation in the menu. Start/End of list (Press 2 seconds)
	The central button is equipped with a two-coloured LED Green/Red (Green: charger is waiting, Red charger operating)  Stop or Start of charge  Selection of active menu or validation of value stored  Cancel the value stored (Press 2 seconds)
	Start an equalisation charge. Access to a sub-menu.
	Access to the menus (press 3 seconds) Close the window.


## THE MENUS

The menu provide access to the following functions:

- Last 200 charging cycles (*Memorisations* menu).
- Viewing of faults, alarms, etc. (*Status* menu).
- Download of data stored in the charger via the USB storage memory.
- Charger configuration (*Configuration* menu).
- Setting of date, language and others (*Parameters* menu).
- Management of password (*Password* menu)
- Viewing basic information, type of charger (*Information* menu)

### ACCESS TO THE MENUS

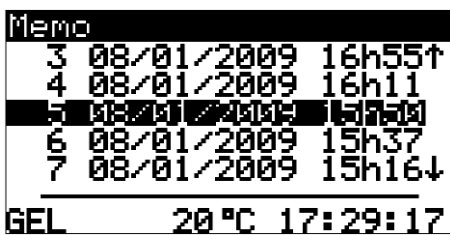
#### Functions of the keys

To access the menu, press the key  for 3 seconds.

### MEMORISED DATA

Displays historical data from the last 200 charging cycles. The MEMO 1 refers to the latest record.






#### Display an history



Memo	Date	Time
3	08/01/2009	16h55↑
4	08/01/2009	16h11
5	08/01/2009	15h54
6	08/01/2009	15h37
7	08/01/2009	15h16↓

GEL 20 °C 17:29:17 006

Proceed as follows:



1. Select a record with  or .
2. View the first screen by pressing .
3. View the successive lines by pressing .
4. Return to previous screen by pressing .

### STATUS

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

#### Information displayed

Reset information of this screen is done via the Configuration menu.

Indication	Information
	Number of complete charges.
	Number of incomplete charges.
EGAL	Number of automatic equalisation charges carried out by the charger.
TH	Number of temperature faults*.
DF1, etc.	Number of faults an types 1, 2, 3, 4, 5 or fault pump*.

(\*): see § Fault codes

### USB

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

#### Record Memo

Enables the storage of charge Memorisations and the Status data. The file, in CSV format (useable with Memoreport PC or Excel), will be stored in the USB stick under the name:

MDDDHMM.CSV with  
 M : for Memorization  
 DDD : Day of the year  
 HH : Hour of file creation  
 MM : Minute of file creation

#### Eject

For safe removal of the USB stick without damaging the data file.

### CONFIGURATION

This menu allows to configure the charger.

## Battery

#### Auto/Manu capacity

The charger can estimate the capacity of the connected battery (Auto) or the user can determine the capacity (Manu) via the Capacity menu.

#### Capacity

Determines the battery capacity for an optimised charge (Manu)

#### Temperature

Defines the battery temperature when the charge is started. This parameter adjusts the regulation voltages on the charging profile (values between -15°C and 65°C).

- **Without Wi-IQ<sup>®</sup>:** defines the average operating battery temperature before the charge.
- **With Wi-IQ:** the battery operating temperature will be automatically defined. It is recommended to enter the observed average temperature, especially in cold areas. The battery temperature will be analysed during the charge; if it increases too much, the charger will stop to prevent any possible damage.

#### High temperature

Defines the safety limit in high temperatures.

- **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.

#### Charge

##### Profile

For selecting the right charging profile for the battery: ionic, gel, pneumatic, PzM (Water Less<sup>®</sup>) WL20 (Water Less<sup>®</sup> 20), Hawker XFC<sup>™</sup>

**With Wi-IQ:** the selection of the profile will be automatic and the charger will recharge the battery with the appropriate profile whatever profile has been selected.

#### AutoStart

Default is ON, so the charge will start as soon the battery is connected to the charger. If Autostart is OFF, the charge will start only if the central button is pressed.

#### Delayed start

Defines:

- Either the charging start deadline
- Or the charging start hour.

This delay enables the charger to be used during off-peak when the electricity is at lower tariffs. Note: the charger doesn't manage the summer/winter time changes.

#### Conditional charge

The charger will only commence the charge if the battery has reached the limit of depth of discharge 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 0 value disables the function.

#### Floating voltage

Setting a floating voltage at the end of charge to compensate eventual consumption by the truck (AGV type). The parameter voltage determines the floating voltage at the end of the charge. The parameter Current defines the average current consumed by the truck electronics (crucial for currents at the end of charge).

#### Maximum current

This manually decreases the maximum output current of the charger.

#### Equalisation

These parameters are not valid for GEL and Hawker XFC<sup>™</sup> batteries.

#### Manu Current

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

#### Time

Sets the equalisation time from 1 hr to 48 hrs

#### Delayed start (delay)

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

#### Frequency

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

#### Refresh

Default is ON, (only for the IONIC profile) the refresh charge after the main charge maintains the battery in good condition by adding some pulse after the main charge. If the refresh is OFF, the refresh charge is disabled, but the equalization charge is still operating as defined on the previous menu.

## Cable

### Length

Selects the length of battery-charger DC cable from 1 m to 11 m.

### Section

Defines the battery-charger DC cable cross-section. Select one section over the list of values (10, 16, 25, 35, 50, 70, 95 or 120 mm<sup>2</sup>).

### Network (Option)

Sets the protocol and configuration for the connection of the charger to a network, type Ethernet or series.

### Option

### Options test

Carries out a test of correct functionality of the options - managing the pump, electro-valve and remote display green/red during 30 seconds.

### Electrovalve time

Defines the opening time (between 15 and 300 seconds – ionic profile – pneumatic, PzM (Water Less®) WL20 (Water Less® 20) of the electro-valve for the automatic water refilling of the batteries.

### Reset Memo/status

To reset the memorizations and status recorded by the charger.

## PARAMETERS

### Date/Time

Sets date and time of the charger. The charger doesn't manage summer/winter time changes.

### Language

Selects the language displayed in the menus.

### Region

Selects the format for date, metric/imperial units for temperature and length.

### Contrast

Modifies the display contrast level.

### Change Password

Changes the password.

## PASSWORD

Manages a password to limit access to charger menu..

## INFORMATION

Gives information on the software version, memory and time clock.

## USING THE CHARGER

### UNPACKING

The charger is delivered with the following:

- 2m AC mains cable.
- 3m DC battery cable.
- This technical manual.

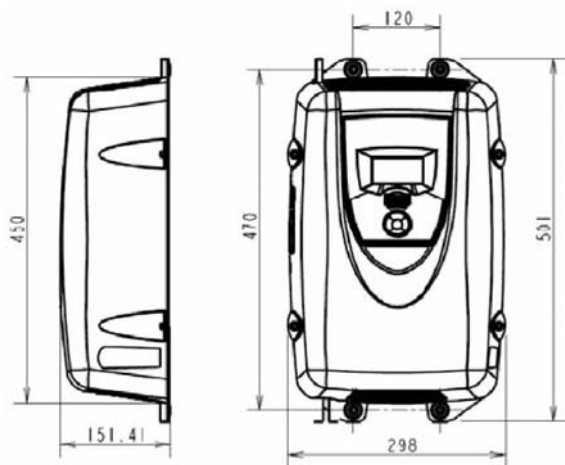
### MECHANICAL INSTALLATION

The charger must be mounted in a vertical position. For wall mounted chargers, the bottom of the charger must be at least 0.60 m from the floor and/or the charger below and the top of the unit at least 1.0 m from the ceiling. The minimum distance between two adjacent chargers must be 0.30 m.

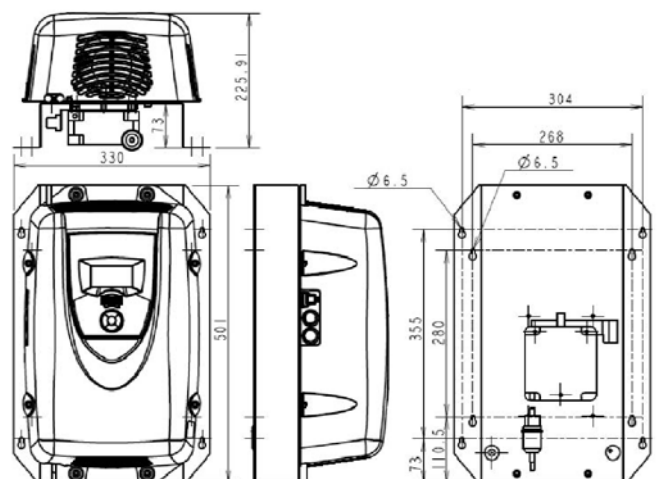
See paragraph *Recommendations* and avoid areas where the chargers may be splashed with water, or saline environments.

The charger is held by 4 x M6 or M10 screws suitable for the type of support. The drilling pattern is depending on the charger model. See illustration below.

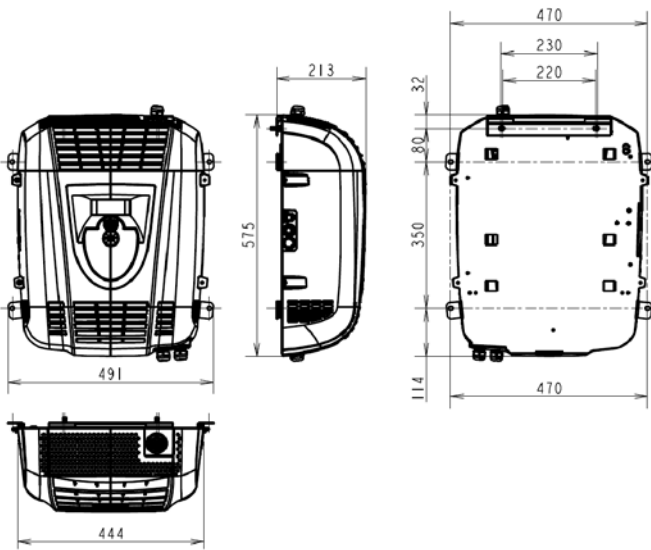
Standard charger model 2 - Fixing L x H: 120 x 470 mm



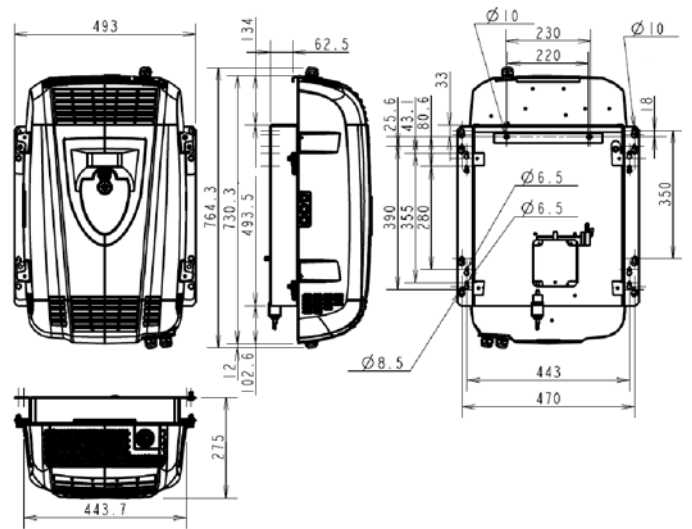
Charger model 2 with optional pump - Fixing L x H: 304 x 355 mm



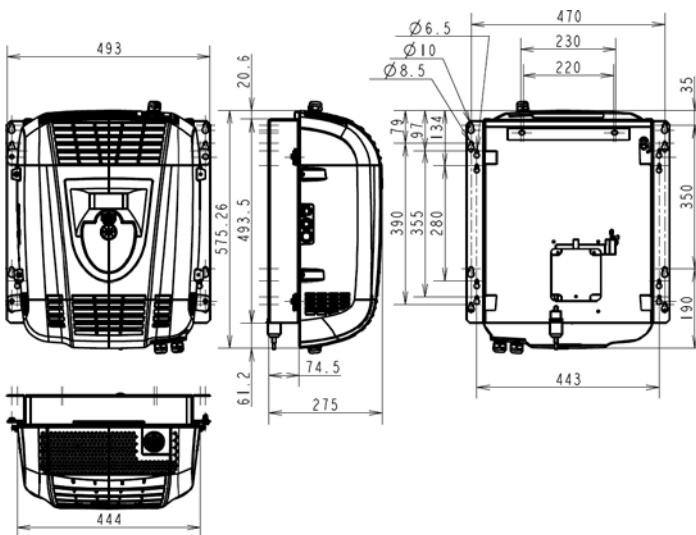
Standard charger model D - Fixing L x H: 470 x 350 mm



Standard charger model E with optional pump - Fixing L x H: 470 x 350 mm



Standard charger model D with optional pump - Fixing L x H: 470 x 350 mm



### ELECTRICAL CONNECTIONS

#### Single phase and 3-phase input

Connection to the mains supply will be 230V AC single phase or 400V AC 3-phase and must be connected using a suitable plug and adequately sized circuit breaker (not included). Current requirements in Amps are indicated on the charger information plate.

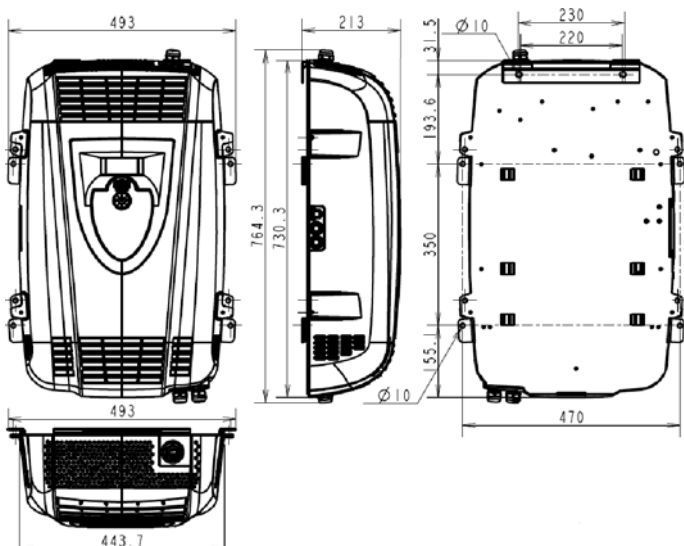
#### Battery output

It is essential to ensure correct polarity. However, reversed polarity will result in blowing the output fuse, inability to charge and the fault code DF2 to be displayed. See *Fault Codes*.

Connection to the battery should be done using the cables supplied:

- RED cable: battery POSITIVE.
- BLACK cable: battery NEGATIVE.

Standard charger model E - Fixing L x H: 470 x 350 mm



## FACTORY SETUP

The charger is delivered with a factory setup as follows:

Profile:	As ordered
Output DC cable length:	3 m
Configuration:	As ordered
Automatic equalisation:	No
Delayed start enabled:	No

- If no modifications are required, go directly to the section: *Charging the battery*.
- If changes are required, go to the *Configuration* section.

## CHARGING THE BATTERY

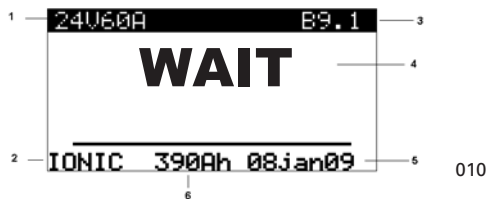
It is now assumed that the charger has been set up as per the Configuration section. Charging can only begin with a battery of the appropriate type, capacity and voltage connected to the charger.

### Off-charge display

With the charger in waiting mode, the display shows information concerning the charger (top and bottom lines):

1. Charger type (Battery voltage + current).
2. Last selected charging profile.
3. Software version.
4. Waiting indication.
5. Date and time of the charge.
6. Set up battery operating temperature.

Alternating battery temperature/capacity if the 'manu' capacity mode is selected.







### Delayed start

If the charger was programmed for a delayed start (*Configuration* menu/Delayed start), charging will begin following that delay, or at the specified time. The display shows the time remaining before the programmed charging starts.

### Starting a desulphation cycle before charging


Desulphation of a vented battery is started manually, in this case the charger will consider the configuration in the menu Equalisation with the current and time set up in the charger menu. To start the desulphation charge, please proceed as follows.

1. **Connect the battery**
2. **Press the central button  to stop the charger.**
3. **Press and hold the button .**
4. **Press the central button  to start the charger.**  
**Release .**



The standard charging cycle will have to be started manually after the desulphation cycle is completed.

### Initiating the equalisation charge after a standard charge

An equalisation charge can be programmed at the end of charge when

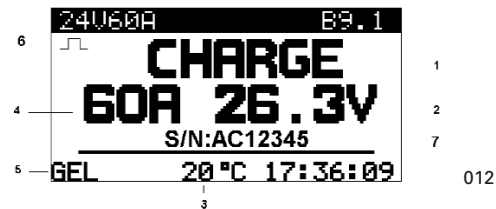
the user presses the button  during the standard charge or when the battery is available. The equalisation symbol appears on the top, left side of the display. The equalisation current is defined by the charger.

### Starting the charge

1. **If Autostart = On (default ON), the charge starts automatically when the battery is connected to the charger. To stop the charge, press the central button .**  
**If Autostart = OFF the charge will start only if the central button is pressed. To stop the charge, press the central button .**

The displays shows information relative to the connected battery and counts down the time remaining until the effective charge begins.



Ref.	Without Wi-IQ®	With Wi-IQ
1.	Charger status (CHARGE, AVAIL, DEFAULT, EQUAL..), possible pump fault or DF4.	
2.	Alternating display of battery voltage, voltage per cell, Ah restored, charging time, remaining charging time, percentage of battery charge.	
3.	Set up operating battery T°C, and battery capacity if manual mode set.	Battery temperature and capacity given by the Wi-IQ (*).
4.	Charging current	
5.	Programmed charging profile.	Detected charging profile (*).
6.	Various information can be displayed: equalisation symbol required at the end of charge, USB connection symbol, Wi-IQ link symbol, possibly battery default DF4.	
7.	Empty line.	Alternating, detected serial number, as information is received and alarms if present. See § <i>Fault codes</i> .



(\*) as information is received.

As soon as the countdown time has elapsed, the display shows the information relative to the charge.

To induce the start of the charge if the delayed charge has been programmed:

1. **Connect the battery**
2. **Press the central button  to stop the charger.**
3. **Press and hold the central button  for 3 seconds. Release.**

Defaults DF1, DF2, DF3 and TH inhibit the charge. Refer to section *Fault codes*.

### End of charge without equalisation

1. **The backlight of the screen becomes green at the end of a correct charge.**  
And the indication AVAIL is displayed. Possible alternating display between DF5 default and pump default and DF4 (ref.1). The displays shows alternately: (ref. 2):
  - charging time achieved.
  - number of Ah restored.

Refer to sections *Memorisations* or *Status* for detailed information relevant to the end of charge.

If the battery remains connected, and in order to maintain it in a fully charged condition, refresh charges followed by equalisation charges will be automatically initiated according to the battery technology.

2. **If an equalisation charge has been programmed (vented battery), it will start automatically.** Alternatively, an equalisation charge can be triggered manually; go to section *End of charge with equalisation*.
3. **Press the central button or disconnect the battery that is now ready for use.**

### End of charge with equalisation

Equalisation only applies to vented batteries. Start can be manual or automatic.

### Manual start

1. **At the end of charge (green lighted display on), press the key .**

The start of the equalisation charge is indicated by the message EQUAL. During the equalisation charge, the charger displays the current (ref 4) and alternating, the battery voltage, voltage per cell, remaining time (ref 2).

2. **The battery will be available as soon as the screen becomes green.**



### Automatic start

If the equalisation charge has been programmed (*Configuration/Equalisation* menu), the equalisation charge is initiated automatically.

If the battery remains connected, and in order to maintain it in a fully charged condition, refresh charges followed by an equalisation charge will be automatically initiated according to the battery technology. Similar indications to those displayed in manual start (see above) are displayed.

### DISPLAY OF HISTORICAL DATA PER CHARGE




For viewing and resetting stored information, please refer to section *Memorisations*.

### CHARGER HISTORICAL DATA

For viewing and resetting the charger history, please refer to section *Status*.

### MESSAGES AND FAULT CODES

Fault	Cause	Solution
DF1*	Charger problem.	DF1 appears when the charger is not able to supply its output current. Follow the breakdown procedure for the charger with control of the IGBT, diode, mains voltage ...
DF2*	Output default.	Check the correct connection of the battery (reversed polarity cables) and the output fuse.
DF3*	Wrong battery.	Too high or too low battery voltage. Battery voltage must be between 1.6V and 2.4V per cell. Use correct charger for the battery.
DF4	Battery discharged more than 80% of its capacity.	Charge continues.
DF5	Battery requires inspection.	DF5 appears when the charging profile has been achieved with a fault condition, that can be a current increase in regulation phase demonstrating a battery heating or badly programmed regulation voltage, or the charging time is too long and has exceeded the safety limit.  Check charging parameters: profile, temperature, capacity, cables.  Check the battery (defective cells, high temperature, water level..).
DF PUMP	Fault in the air circuit of the electrolyte circulation system.	Check the proper operation of the pump via the menu <i>Option-Option test</i> .  Check the air circuit (pump, tubes).  If this fault occurs, the charger will adapt the battery charging profile for a safe, optimised charge.
TH*	Thermal problem in charger resulting in charge interruption.	Verify the correct operation of the fans, check for too high ambient temperature, or whether there is poor natural ventilation to the charger.
STOP*	Critical battery electrolyte level	Top up battery electrolyte level in accordance with 'battery operating instructions'.

TEMP*	Critical battery temperature.	Wait until the battery temperature cools down, check the battery state (water, profile)  Verify the set up of temperature in the menu <i>Configuration-Battery-High temperature</i> . Control the temperature sensor of the Wi-IQ.
DEF EEP* DEF MENU*	Memory/Charger menu.	Change the main board
DEF CFG*	Error in configuration or 1 phase missing	Check the input fuses and the 3 phases, if OK, enter the password, go into the configuration menu, select charge menu, select charger list and select the right configuration on the list.
IQ SCAN	Look for present Wi-IQ®	
IQ LINK	Set the link Wi-IQ-Charger	
	Low electrolyte level	Battery water topping up or ensure that the Wi-IQ is properly adjusted and installed (see Wi-IQ mounting instructions)
	Default of balance voltage detected by the Wi-IQ	Check each battery cell during discharge.  Check the Wi-IQ is correctly set-up (see Wi-IQ instructions of mounting).
T	Battery temperature too high.	Verify the battery electrolyte level or the correct set up of the charger.  Check the temperature sensor of the Wi-IQ.
	Preventive maintenance indicator.	Consult a qualified factory representative to conduct preventive maintenance operation.

(\*): blocking fault preventing charging from continuing.

Wherever you do business, EnerSys® can support you with motive power energy. The Hawker® branded battery range, matched chargers and systems provide trouble free performance under the most demanding service conditions. Our strategically located manufacturing plants are efficient and responsive with a culture of continuous improvement and added value for our business partners.

EnerSys has an enviable position in technology leadership and with significant investment in research and development we intend to stay at the leading edge in product innovation. The recently developed energy solutions: Water Less® 20 and Hawker XFC™ batteries, Lifetech and Lifespeed IQ™ HF chargers, have defined new benefits for our customers: faster recharge, more machine availability, lower operating and investment costs, reduced carbon footprint. Our team of development engineers is driven by the desire to build the best energy solutions and works closely with our customers and suppliers to identify development opportunities. Our bias for rapid innovation means we get new products to market fast.

EnerSys's integrated sales and service network is dedicated to providing our customers with the best solutions and after-sales support for their business. Whether you require 1 battery or a complete fleet of batteries, chargers, a battery handling system and a state of the art fleet management system, you can count on us. EnerSys is the world's largest industrial battery manufacturer and we are dedicated to being the best.



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