

# LSU220A : Load Support Unit Operators Manual



## LSU220A LOAD SUPPORT UNIT OPERATORS MANUAL



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## **1 MANUAL REVISION HISTORY**

Rev	Date	Description
1	10-03-2015	First write.
2	21-07-2015	Formatting changes.

## 2 DESCRIPTION

The LSU220A is a general purpose load support unit designed to act as a permanent power supply to maintain backup battery systems whilst alternative sources of power are either impractical or unavailable, such as running diesel engines during maintenance programs.

The LSU220A can support both 12V and 24V systems by simple manual voltage adjustment, with a current capacity of up to 220A amperes.

7 segment display continuously shows both set voltage and current draw.

Voltage output can be trimmed in small steps during operation to offset cable drops and/or variations in demand which can create excessive demand on the backup batteries.

Output is simply enabled or disabled by run and stop buttons.

Internal variable speed fans are employed to ensure the LSU220A operates at a reasonable temperature.

The LSU220A is designed to operate from a standard star connected 415V three phase supply in a L1 + L2 + L3 + N + E configuration.

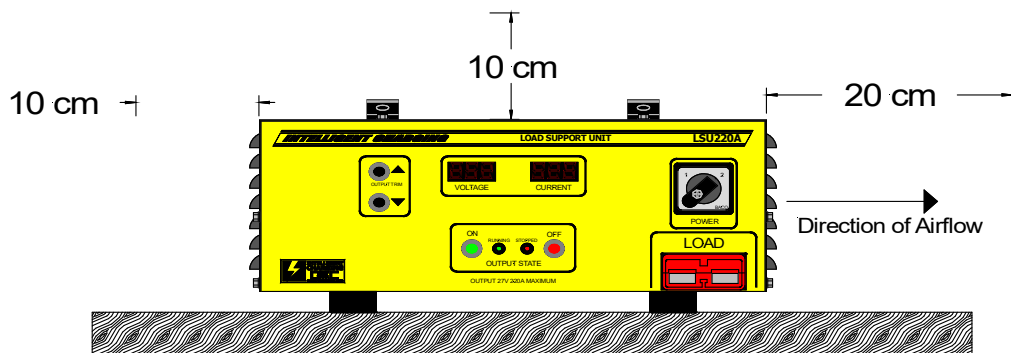
The LSU220A has a simple user calibration procedure to ensure the displays show accurate readings.

## 3 INSTALLATION

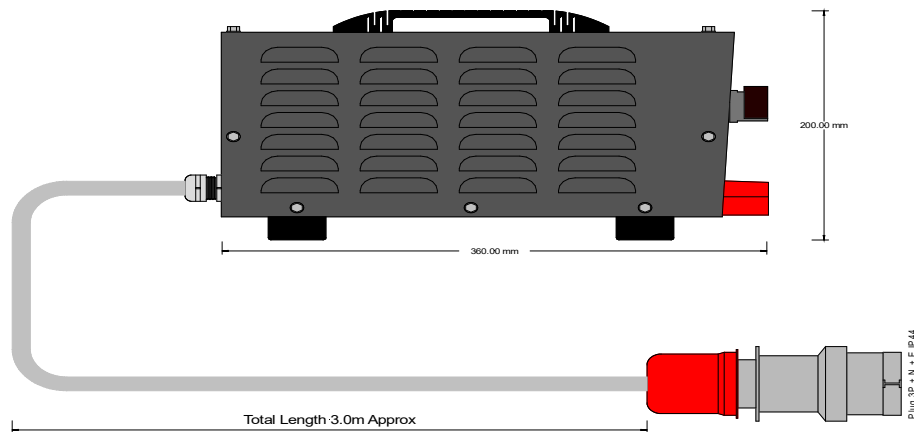
### 3.1 POSITIONING THE EQUIPMENT

The LSU220A should be mounted on a level surface such as a workbench or sturdy shelf which can support a weight of at least 30Kg.

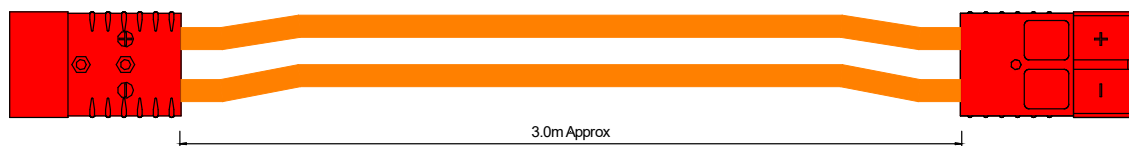
The unit should be sited so that at least 10cm of airspace is available all round the left and top of the unit and at least 20cm on the right hand side to allow free movement of air required for cooling.



The LSU220A is supplied fitted with a three phase L1 + L2 + L3 + N + E plug on 3m of lead.

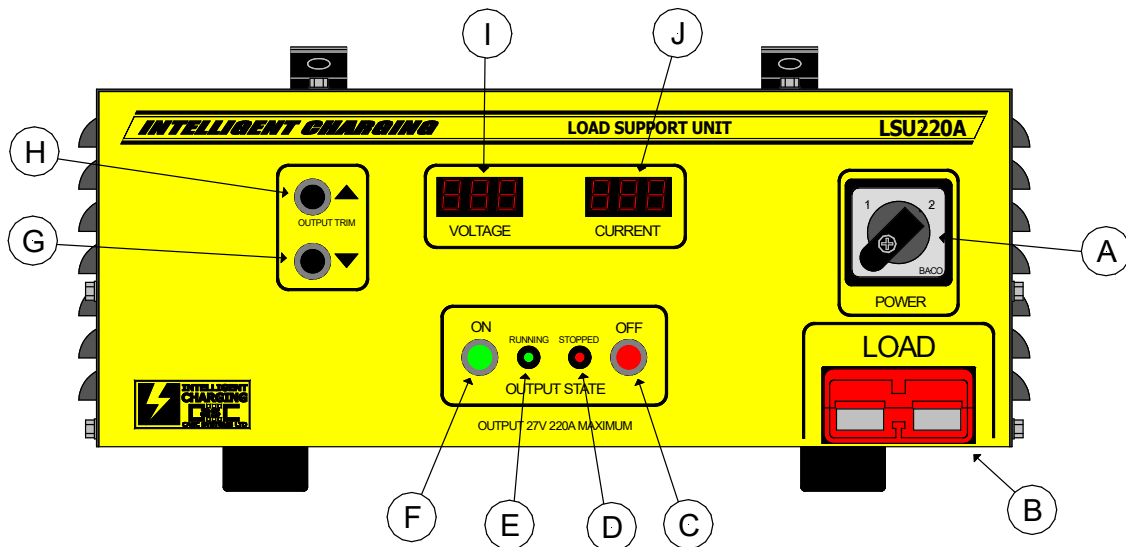


The load is connected via an Anderson 350A connector fitted to the chassis. A 3m lead is supplied fitted at each end with mating Anderson 350A plugs. The cable has a cross section of 50mm<sup>2</sup> per conductor. While operating the unit at very high currents the leads should be laid out in such a manner as to aid cooling.



## 3.2 CONTROLS AND INDICATORS

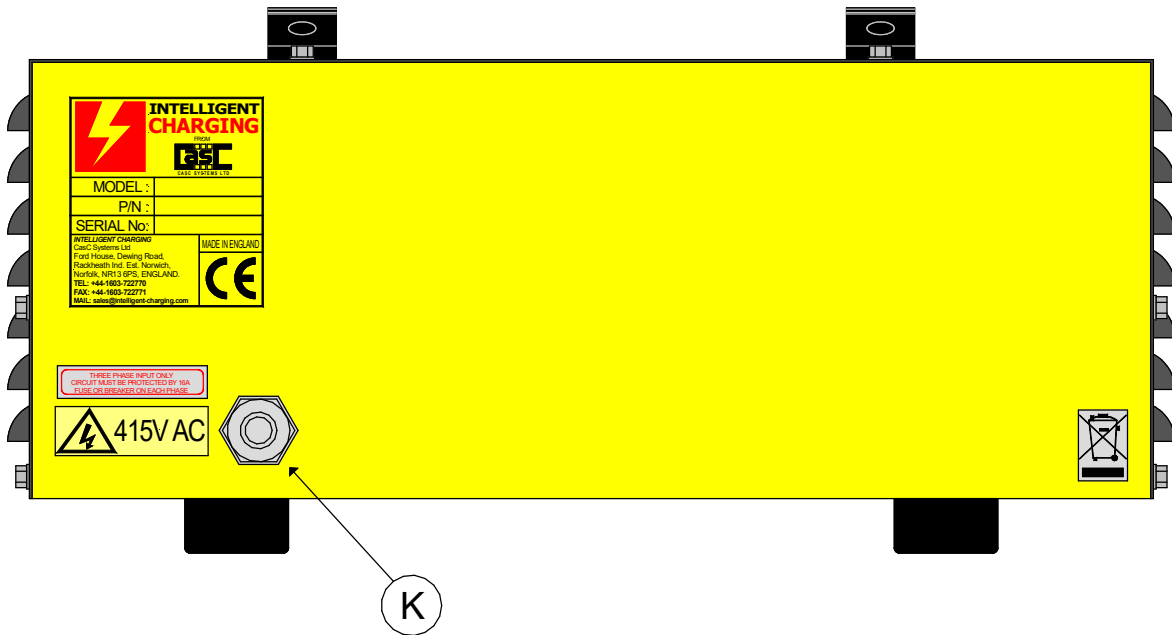
### 3.2.1 Front panel



- A) Main input supply switch turn to position "2" to operate the unit.
- B) Output connector Anderson 350A.
- C) Off push button. Pressing this while the unit is running and providing output power will stop the output power.
- D) This indicator will be illuminated when the unit is stopped and not outputting power.
- E) This indicator will be illuminated when the unit is running and outputting power.
- F) ON push button. Pressing this when the unit is stopped will cause the unit to provide the output power.
- G) Down push button. Pressing this while the unit is running and providing output power will cause the output voltage to be reduced. Pressing this while the unit is stopped will cause the display brightness to be reduced.
- H) Up push button. Pressing this while the unit is running and providing output power will cause the output voltage to be reduced. Pressing this while the unit is stopped will cause the display brightness to be increased.
- I) Voltage indication. While the unit is switched on it will show the voltage present at the output terminals in 0.1V steps.
- J) When the unit is running and providing output power it will show the number of amps being provided in 1A steps.

### 3.2.2 Rear panel

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K) Power cord inlet.

## 4 OPERATION

Before connecting to the load for the first time the LSU220A has to be set to the nominal voltage of the load system it is going to supply. The following steps must be followed prior to connecting to the load.

- Apply power to the LSU220A with load unconnected. Power switch rotated clockwise to position 2.
- Press the RUN button and check the output state RUN LED is lit GREEN and the STOPPED LED is not lit.
- The VOLTAGE display will show the value of output voltage that is currently set.
- Use the OUTPUT TRIM  $\square$  push buttons to set the output voltage display to the load voltage required. This setting will be remembered when power is removed. Note if you press and hold either the  $\square$  push buttons the adjustment will be continuous.
- Press the stop button and check the RUN LED is not lit and the STOPPED LED is lit.
- The voltage display will slowly reduce to zero, or will fall to zero very rapidly if the load is connected.

At this point the load can be connected.

If any residual voltage is shown on the VOLTAGE display this will reduce very rapidly to zero. If the load already has a voltage present, such as a battery maintained system then the VOLTAGE display will show this value.

The following steps are followed upon equipment connection.

- Press the START push button and verify the RUN LED is lit and the STOPPED LED is not lit.
- The VOLTAGE display will show the output voltage.
- The CURRENT display will show the output amps being drawn from the unit.
- When the output voltage is no longer required press the STOP push button.

At very high currents the voltage drop in the leads may not provide enough voltage at the equipment.

To overcome this high voltage drop the output voltage can be trimmed by pressing the OUTPUT TRIM  $\square$  push buttons to set the desired output. This setting will be remembered when power is removed. Note if you press and hold either the  $\square$  push buttons the adjustment will be continuous.

On battery maintained systems caution must be observed when using the trim



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feature as not to overcharge the battery as high voltages will cause some of the current to be passed to the battery.

After long term use a very high current it is wise to follow this procedure to enable the unit to safely cool down prior to moving.

- After pressing STOP to remove the output disconnect the load.
- It will be noted that the fans will reduce to a low setting and then stop.
- Press the START push button, the display will show the voltage that was set.
- It will be noted that the fans will then start up again and run slowly while the PSU units are cooled.
- Once the fans have stopped it is safe to remove power from the unit by moving the switch counter clockwise to position 1.

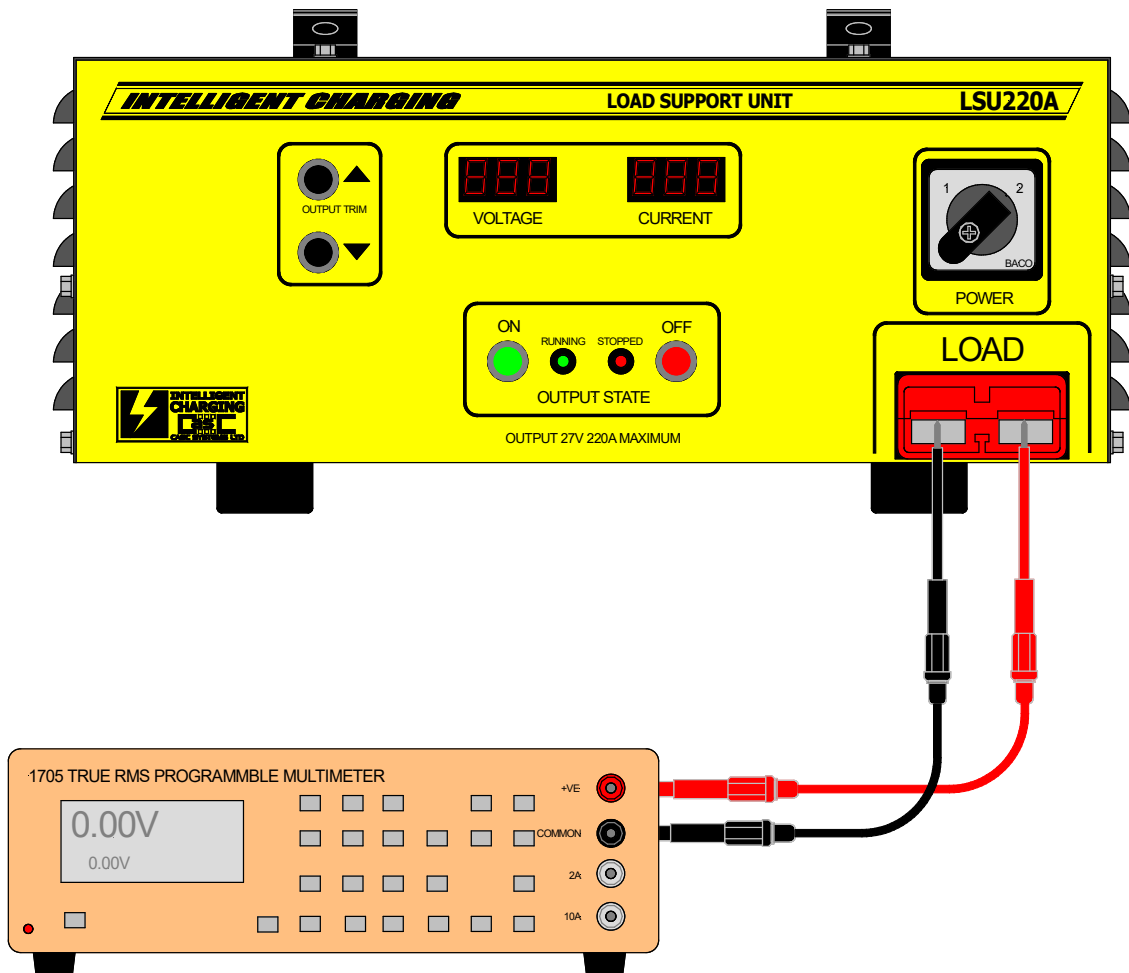
## 5 CALIBRATION

The LSU220A has two displays which show Voltage and Current. These are electronic displays which will require regular checking for their accuracy. Intelligent Charging recommends that the calibration check procedure is followed annually.

To calibrate the unit the following equipment will be required.

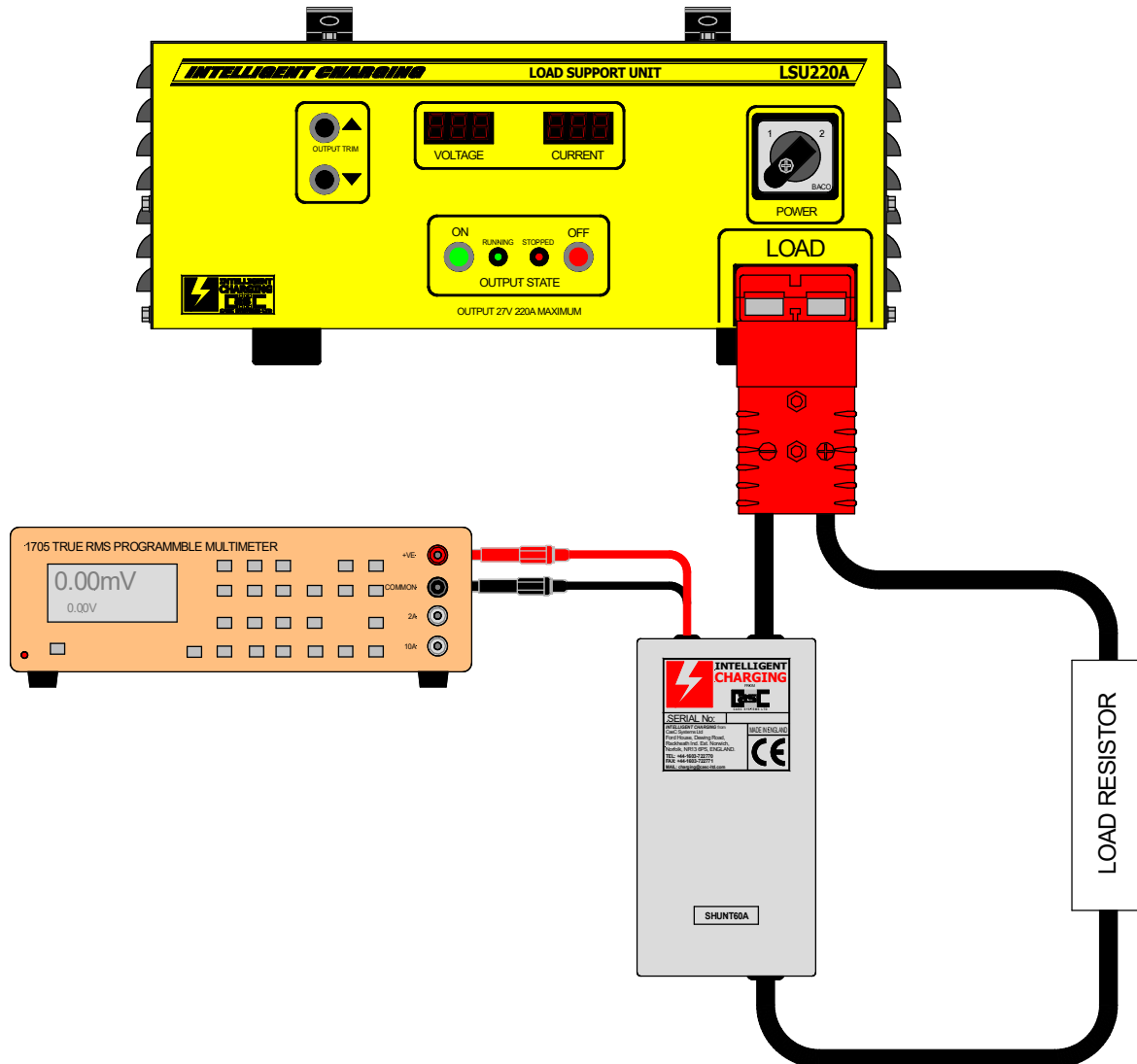
1. Calibrated voltmeter capable of reading 24V to one decimal place.
2. Calibrated ammeter capable of reading up to 200A to one significant digit, or a calibrated ammeter shunt and millivoltmeter combination.

The equipment will need to be connected as shown in the following figures.



**VOLTAGE MEASUREMENT**

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## CURRENT MEASUREMENT

### 5.1 CHECKING PROCEDURE

#### 5.1.1 Voltage validation

- With no load connected to the LU220A switch on and press the START push button.
- Using the OUTPUT TRIM  $\square$  push buttons set the output voltage to 24.0V. Note if you press and hold either the  $\square$  push buttons the adjustment will be continuous.
- With the calibrated voltmeter connected to the output terminals verify that the voltage reading is 24.0V +/- 0.2V
- If the voltage is outside of tolerance follow the ADJUSTMENT PROCEDURE

for voltage.

## 5.1.2 Current validation

- With a load which will give a steady 100A connected to the LU220A switch on and press the START push button.
- Using the OUTPUT TRIM  $\square$  push buttons set the output voltage to 24.0V. Note if you press and hold either the  $\square$  push buttons the adjustment will be continuous.
- With the calibrated ammeter or shunt and millivoltmeter combination connected in-line with the load current reading is +/- 2.0A of the displayed value.
- If the current is outside of tolerance follow the ADJUSTMENT PROCEDURE for current..

## 5.2 ADJUSTMENT PROCEDURE

### 5.2.1 Voltage adjustment

- With no load connected to the LSU220A switch on and press the START push button.
- To get the unit into calibration adjustment mode press the START push button and the OUTPUT TRIM  $\square$  push button both at the same time.
- Then release the push buttons.
- The GREEN RUN LED should then flash at a steady rate.
- By using the OUTPUT TRIM  $\square$  push buttons adjust the displayed voltage so that it matches as near as possible the voltage measured on the calibrated voltmeter connected to the output terminals. Note if you press and hold either the  $\square$  push buttons the adjustment will be continuous.
- Once complete press the START push button once and verify that it stops flashing and remains steady.
- Press the STOP push button.
- Calibration voltage adjustment is complete.

### 5.2.2 Current adjustment

- With a load which will give a steady 100A connected to the LU220A switch on and press the START push button.

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- To get the unit into calibration adjustment mode press the START push button and the OUTPUT TRIM  $\square$  push button both at the same time.
- Then release the push buttons.
- The GREEN RUN LED should then flash at a steady rate.
- By using the OUTPUT TRIM  $\square$  push buttons adjust the displayed current so that it matches as near as possible the current measured on the calibrated ammeter connected to the output terminals. Note if you press and hold either the  $\square$  push buttons the adjustment will be continuous.
- Once complete press the START push button once and verify that it stops flashing and remains steady.
- Press the STOP push button.
- Calibration current adjustment is complete.

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## 6 SPECIFICATIONS

### INPUTS:

Mains Supply	Three phase star connected
L1 – N	210-240VAC 3.30KW Max.
L2 – N	210-240VAC 1.65KW Max.
L3 – N	210-240VAC 1.65KW Max.
	50-60Hz

### OUTPUTS:

Voltage	10.0V Minimum 27.0V Maximum
Current	220A @ 27.0V Maximum

### OVERLOAD PROTECTION:

105-125% of output power.  
Constant power to 75% of set output voltage  
then output shuts down, recycle AC to reset

### SHORT CIRCUIT PROTECTION:

Output latches off, recycle AC to reset.

### METER ACCURACY:

Voltage accuracy	±0.2V
Current Accuracy	±2.0A

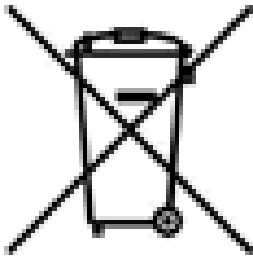
### ENVIRONMENTAL:

Temp Operating	0°C ~ 40°C
Temp Storage	-10°C ~ 60°C
Humidity	20% - 90% Non condensing
Altitude	0 to 3000 Metres.

### IP Rating:

Operating	IP33
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## 7 PRODUCT DISPOSAL INSTRUCTIONS



The symbol shown here and on the product means that the product is classed as Electrical or Electronic Equipment and should not be disposed with other household or commercial waste at the end of its working life.

The Waste of Electrical and Electronic Equipment (WEEE) Directive (2002/96/EC) has been put in place to recycle products using best available recovery and recycling techniques to minimise the impact on the environment, treat any hazardous substances and avoid the increasing landfill.

### Product disposal instructions for residential users.

When you have no further use for it, please remove any batteries and dispose of them and the product as per your local authority's recycling processes. For more information contact your local authority or the retailer where the product was purchased.

### Product disposal instructions for business users.

Business users should contact their suppliers and check the terms and conditions of the purchase contract and ensure that this product is not mixed with other commercial waste for disposal.

## 8 PRODUCT WARRANTY

Your Intelligent Charging Limited product is guaranteed against faulty workmanship materials and malfunction for a period of 12 months from the date of purchase, unless agreed otherwise by Intelligent Charging Limited. Within this warranty period Intelligent Charging Limited will undertake to repair or replace the product proved to be faulty.

We recommend you keep all packaging for the duration of the 12 month warranty, after which you should dispose of all waste packaging in accordance with your local legislation

Products which have become faulty within the 12 month warranty period must be returned to Intelligent Charging Limited, where Intelligent Charging Limited will then investigate the warranty claim.

Intelligent Charging Limited products, when properly used, will render excellent service. Therefore, users must read the User Manual and any other literature supplied with the product carefully, and fully comply with all procedures shown in the literature and product training / familiarisation sessions, as misuse or failure to follow the instructions may render this warranty void.

This warranty is not transferable and excludes routine maintenance, consumables, parts subject to normal wear and tear, service maintenance kits and damage caused by misuse or negligence. Warranty claims attributable to improper, or careless, use or handling, and to normal wear, are excluded from this warranty.

Intelligent Charging Limited only obligation shall be to repair or replace such products that have proved to be faulty. Intelligent Charging Limited shall not be liable for any injury, loss or damage, direct or consequential, arising out of the use, or the inability to use the product. The customer shall determine the suitability of this product for its intended use, and the customer assumes all risks and liability whatsoever in connection herewith.

**Intelligent Charging Limited reserves the right to improve or modify this product without prior notice.**