



**Zig Electronics Limited**

# **X70 & X80**

**SWITCH MODE POWER SUPPLY  
& BATTERY CHARGERS  
WITH POWER FACTOR CORRECTION**

## **INSTRUCTIONS FOR FITTING & USE**

The X70 - X80 is a fully automatic battery charger. Connected to a six cell lead acid battery with a nominal voltage of 13.8 volts, the unit will charge and recharge the battery by raising the terminal voltage to equal that of the output of the battery charger. As the battery voltage increases, the input current from the battery charger automatically reduces until it ceases to flow. This provides fast and efficient battery charging and eliminates the possibility of overcharging, unless the battery is at fault.

**WARNING: Under no circumstances must non-rechargeable batteries be connected to the X70—X80**

## LOCATION and INSTALLATION

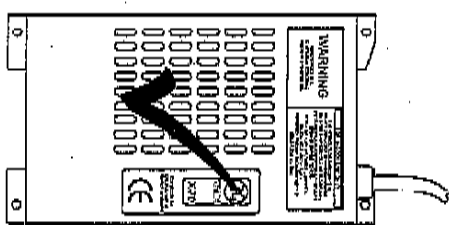
Choose a suitable location for the X70 - X80 bearing in mind the following: -

- Minimum size of a compartment must be 450 x 360 x 250mm. This will allow cool air to circulate around the unit, necessary for correct operation.
- Ventilation preferably to the outside of the van in the form of at least 2 x 25mm diameter vented holes must be provided near to the unit. Ensure that there is no ingress of water or moisture into the unit and that the ventilation holes cannot become blocked.

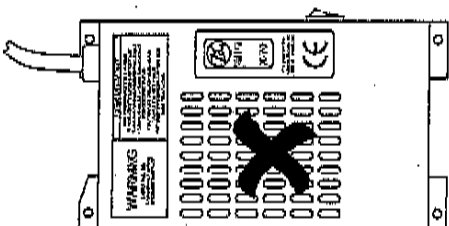
**N.B.** All transformer operated appliances generate heat and therefore run hot when operating at full capacity.

- Access to the battery compartment and mains inlet distribution system will be required.
- The charger must be fitted as indicated in the diagram. Note that failure to mount correctly may cause premature failure. The unit must be mounted securely to a flat surface using 4 x 8 x 1 1/4 wood screws or similar through the 5mm diameter holes in the feet of the charger.

**CORRECT**



**INCORRECT**



UP

FLOOR

FLOOR

## WARNING

The charger is fitted with a safety device which provides a time delay of approximately 2 seconds to reduce the surge of inrush current when switched on. For this device to function correctly there must be an interval of 45 seconds between switching off and on.

The appliance is not intended for use by young children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with the appliance.

## NOTE

The green indicator light will illuminate when the charger is working. If the current rating is exceeded the light will go out. This circuit is self resetting when the load is reduced to the unit's specification.

## NOTE

Check appliance before installation. If the supply cord is damaged it must only be replaced by a repair shop approved by the manufacturer as specialist tools are required.

## INSTALLING THE BATTERY

If a space has not been allocated for the battery during manufacture the following must be observed before installation.

1. The interior of the battery compartment must be protected against corrosive effects of acid-haden gases that may be released from a battery when it is on charge.
2. The compartment must be ventilated at low and high level to the outside of the van. If it is accessible from the outside it must be sealed from the inside structure.
3. The battery must be secured upright where it cannot tip over. It must be free of movement when the vehicle is in motion.

The X70 - X80 is designed to charge 12V lead acid type batteries. The capacity of the battery must not be less than 60-ampere hour. (The bigger the battery the better). Should the battery contain a faulty cell the terminal voltage will not rise sufficiently to switch the charge off and the battery will eventually boil dry. The most common cause for cell failure is discharging the battery below the recommended level, approximately 10v.

## WIRING

Use a cable at least 2.5mm sq. (50/0.25). Each wire when fitted should have identification numbers, letters, or colour codes.  
Connections are made to the X70 - X80 using 1/4" fast-on insulated crimp type connectors. Please refer to suggested wiring diagram on page 6.

## AUXILIARY BATTERY CONNECTIONS

Terminal 1 on the X70 - X80 to positive terminal on the auxiliary battery (Va 25 amp in-line fuse).

Terminal 4 on the X70 - X80 to negative terminal on the auxiliary battery.

## 12S CONNECTIONS

Terminal 2 on the X70 - X80 to pin 2 on the 12S plug.

Terminal 3 on the X70 - X80 to pin 3 on the 12S plug.

## CONTROL PANEL CONNECTIONS

Terminal 1 on the X70 - X80 to auxiliary battery connection on the control/distribution panel.

Terminal 4 on the X70 - X80 to negative on the control panel.

## REMOTE LED CIRCUIT

A Light Emitting Diode (LED) may be connected to the fifth terminal on the X-80 to provide a remote visual indication of mains operation, for instance on the control panel. The anode of the LED should be connected to pin 5 using 0.65mm<sup>2</sup> (14/0.3) cable and the cathode should be connected to a convenient negative.

Note that this circuit is internally current limited for LED operation and hence no further components are necessary.

## AUTO POWER DIODE CIRCUIT

This terminal is used for connections to alternative charging systems such as a solar cell or wind generator up to 10A. These devices must have a regulated output.

## MAINS ELECTRIC 240V WIRING

The X70 - X80 does not control the mains facilities within your van - it uses mains 240 volts during its operation.

## WARNING

Mains electricity can be dangerous particularly in mobile installations such as caravans and yachts. If you do not have the necessary knowledge you should not attempt the following installation. A qualified electrician should be used for installation. The installation must be in accordance with current IEE wiring regulations or local regulations where applicable.

A Residual Current Circuit Breaker (RCCB) or Earth Leakage Circuit Breaker (ELCB) must be fitted. This is an inexpensive way of protecting against electric shocks. The device fitted must be of current operated type of the following specification: 25 amp 30 milliamps operating in approximately 30 milliseconds.

When all the necessary 12 volt connections have been made the mains wiring can be completed. The mains input plug and socket must be polarised (connection can only be made one way round). Should you find yourself in a situation where the polarity is reversed, for example on the continent, the operation of the Zig unit will continue as normal. However steps must be taken to rectify the situation as soon as possible as other electrical devices may be a source of shock. We recommend you carry a polarity tester when travelling abroad.

The plugs and sockets are widely available from caravan dealers and chandlers and must be to BS4343. Different types may be required abroad. If in doubt your site operator will be able to help.

The socket chosen may be flush or surface mounted, and should be situated as near to the RCCB as possible and should be connected using 2.5 mm sq. cable not exceeding 2 metres in length. The input cable for the X70 - X80 may now be connected via a 5 Amp double pole MCB to BS.EN.60898.

BROWN to LIVE (marked L or red in colour)  
 BLUE to NEUTRAL (marked N or black in colour)  
 GREEN/YELLOW to EARTH (marked E or green in colour)  
 Input 220-240V  $\pm$  10%

**WARNING: This appliance must be earthed.**

We strongly recommend the X70 - X80 is built into the van permanently. If a 13 amp plug is used this must be connected as follows:

GREEN & YELLOW to EARTH  
 BLUE to NEUTRAL  
 BROWN to LIVE

The colours of the wires in the mains lead may not correspond with the coloured markings identifying the terminals in the plug, if so proceed as follows:

The wire that is coloured green and yellow must be connected to the terminal in the plug marked with the letter E or the earth symbol.  
 The wire which is coloured blue must be connected to the terminal marked with the letter N or coloured black.

The wire which is coloured brown must be connected to the terminal marked with the letter L or coloured red.

Secure all mains connections with cable clips and check the installation ensuring no strands of wire are astray which may short to earth.

Do not connect the mains supply at this stage.

Once the complete electrical installation has been satisfactorily checked by a qualified electrician the X70 - X80 can be tested.  
 The mains power to your caravan should be obtained from a normal domestic supply via a fixed connection point. The hook-up cable should have a conductor size of at least 2.5mm sq. and when connected should be uncoiled.

In order to ensure the unit is functioning correctly note the following procedure: -

1. Disconnect auxiliary battery by removing the in-line fuse.
2. Hook the caravan to the mains supply.
3. Switch the X70 - X80 power supply on.
4. If the 12 volt accessories work in the van the unit is functioning correctly.
5. Replace in-line fuse.

The unit is unaffected by low input voltages or reversed polarity in the incoming supply (see specification) ensuring that it works to its full potential particularly when travelling abroad.

## WIRING THE TOWCAR

Pin 4 - (green, vehicle positive)  
 Pin 3 - (white, negative)  
 Pin 2 - (blue, split charging)  
 Pin 6 - (red, refrigerator supply)  
 Pin 7 - (black, fridge negative)

N.B. Under no circumstances must any of the above circuits be interconnected.

The above is provided for your information only. Please note the split charge facility available from the car is automatic and is totally independent from the X70 - X80

N.B. If a battery is not used or is heavily discharged the load drawn by the accessories must not exceed the rated output of the X70 - X80.

Your Zig power supply is designed to give years of trouble free service. It is rigorously tested and complies with the following standards:

BS 6765  
 BS.EN.60335-2-29  
 EN 55014  
 EN 50082-1  
 EN 60555 Part 2  
 EN 60555 Part 3  
 EN 61000-3-2

CCC/SMIT Regulations and their European Norms where applicable.

## PRODUCT SPECIFICATION - X70 - X80 POWER SUPPLY

### Input Specification:

- |                           |                         |
|---------------------------|-------------------------|
| 1. Rated input voltage    | 220 - 240 VAC $\pm$ 10% |
| 2. Rated input current    | 1.3A (RMS) at 230 VAC   |
| 3. Rated input frequency: | 47 Hz-63 Hz.            |
| 4. Max. Wattage           | 300W                    |

### Output Specification:

- |    |                                   |               |
|----|-----------------------------------|---------------|
| 1. | Rated output voltage:             | Nominal 13.8V |
| 2. | Rated output current (continuous) | OA-16.5A      |
| 3. | Ripple and Noise:                 | 100 mV p-p    |
| 4. | Output voltage, stability:        | ± 0.5%        |
| 5. | Current limit                     | 17.5A         |

## Wiring Diagram

