



# USER GUIDE

## FOR 700W HANDY MAINS INVERTERS

### OUTPUT 230VAC RMS NOMINAL

MODEL: SM3185 12V INPUT (RS **243-1951**)

MODEL: SM3215 24V INPUT (RS **243-1743**)

#### **HIGH VOLTAGES EXIST IN THIS EQUIPMENT. TREAT AS HOUSE MAINS.**

See product safety leaflet 3180R998 before installing.

**GENERAL DESCRIPTION:** This range of "Handy Mains" adaptors converts battery power into a nominal 230Vac RMS 50 hertz supply suitable for operating small power tools, domestic appliances, etc. Note that only heavy duty (high discharge rate) batteries are suitable (so called "leisure batteries" are unlikely to be able to supply sufficient current without excessive voltage drop).

The available output power is determined by a number of inter-related factors, such as mounting attitude/position, ventilation, and ambient temperature. Should the adaptor become too hot, the current limit operates and switches off the output. The output is re-instated by removing and restoring the input power when the unit has cooled and the output loading has been reduced. The nominal continuous power rating into a resistive load is 700 Watts, although intermittent operation at 800 Watts is permitted. The output power, indicated by a neon, is available from an integral BS1363 UK socket.

Because the output waveform contains high order harmonics, any Line to Neutral capacitance, such as is found in equipment mains filters, causes a reduction in conversion efficiency. Use of the Handy Mains is therefore limited to equipment having less than 0.5uF direct Line to Neutral capacitance. Power factor correction capacitors must be removed from fluorescent light fittings before switch-on as instant damage to the inverter will result from excess capacitance.

On 12 Volt systems, (SM3185) the input current drawn is 1 Amp per 10 Watts of output required (45 Amps for full continuous output). Required current rating is halved on 24 Volt systems (SM3215).

An audible warning indicates when the battery is becoming discharged. The tone becomes louder as the battery is progressively discharged, prompting the user to recharge the battery. The unit latches off if the input voltage falls too low. The unit also incorporates an electronic 'relay' to turn it on/off remotely. The control wire (low current) must be switched to battery positive to turn the unit on.

The power input is via short flying lead pairs. Both the RED wires connect to battery positive and both the BLACK wires to battery negative. The on/off input is a YELLOW lead. The case and outlet socket earth pin connect to the GREEN/YELLOW lead, so that the unit and equipment may be connected to chassis or ground. Note that the negative input is also connected to case (negative earth). See, connection section.

The unit is packaged in a powder coated folded metal box. Input wires enter on one side face, and the outlet socket is mounted on the top face. Flanges are available for mounting at each end.

**CAUTION:** This adaptor is supplied on the basis of the user determining the suitability for the purpose for which it is to be used. It is not for life dependent use. The unit is sensitive to capacitive loads. Load capacitance live to neutral must not exceed 0.5 microfarads else instant damage may result. If in doubt consult technical enquiries

**WARNING:** High voltages exist in this equipment, treat as house mains. When using appliances outside a vehicle, an RCD SAFETY ADAPTOR (RS 184-3842 or similar) must be used in or close to the HANDYMAINS outlet socket. The case is connected to the negative input (negative earth).

**INSTALLATION:** Fixing: Four 3.5mm fixing holes are available on the mounting flanges. They are positioned at each corner of a rectangle measuring 70mm by 233mm placed centrally.

**CONNECTION:** These 700 Watt HANDY MAINS units have flying input leads for battery connection. The main input power is supplied to the inverter by two leads for each terminal of the battery. In order to ensure the equal sharing of current between each pair of leads, they must not be shortened. They may be extended by equal length wires having a greater cross section depending on distance from the battery, or they may both be joined to a single wire of at least double the existing wires cross section, via a terminal block.

Note that the current carrying rating for any wire is not a good indication of its suitability. The important parameter is the voltage drop between the battery and the inverter, which can be calculated from wire tables and input current. Voltage drop should be limited to a total of 0.5 volts. If in doubt wire of at least 6 square millimetres cross section should be used. The inverter should always be mounted near to the battery.

Connection is as follows (figure 1 refers):- The two thick BLACK leads are taken to the battery negative, the two RED leads are taken to battery positive and the yellow lead is taken to a light duty switch for on/off control. The green/yellow is taken to local earth / chassis.

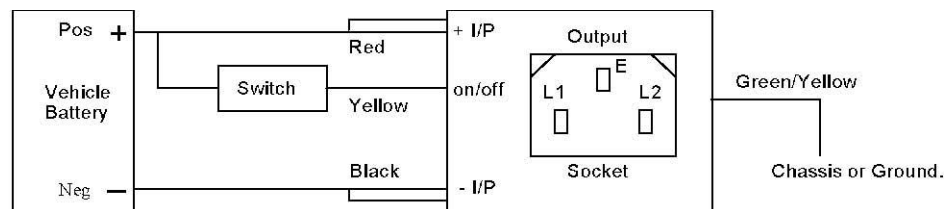


Figure 1

**WARNING:** Do not connect to house mains supply. Stand alone use only. Negative earth only.

**For protection of the input cabling of the SM3185, an 80A fuse should be fitted in the battery positive lead at a suitable point. A 30A fuse should be used with the SM3215. Fuse the switch wire at 1A.**

**FUSE REPLACEMENT:** These units are fitted with two standard blade type car fuses, one in each RED input wire (30A GREEN for 12V input, units, 15A BLUE for 24V input, units). If the unit is connected with reverse polarity, or overloaded, these fuses may blow. The following replacement instructions MUST be followed exactly to avoid hazard.

1. Disconnect unit from battery
2. WAIT 2 HOURS, then remove the four cover screws
3. Lift off the lid and replace the fuses located next to the ferrite transformer.
4. Replace the lid and retaining screws before trying the unit

<b>SPECIFICATION:</b>	SM3185	SM3215
DC Input Supply Range, continuous:	11V - 15V	21.6V - 30V
DC Input Supply Range, 10 seconds:	10V - 19V	20V - 38V
Input Current per 10W loading:	1A	0.5A
Input Current, No Load (typical):	0.8A	0.4A
Battery Low Audible Warning (typical):	10.5V	20.7V
Battery Low Latch Off (typical):	9.6V	19V
RMS AC Output Voltage:	230V nominal, 207V to 253V depending on load and input voltage	
Frequency:	50Hz nominal, 48Hz to 53Hz over load and temperature range	

Output Wave Form:	Stepped quasi sine wave with crest Voltage varying as input varies
Maximum Capacitance:	0.5 microfarads Line to Neutral
Output Power, Nominal:	450 Watts into a resistive load. Capacitance will reduce available power
Output Power, Short term:	600 Watts (resistive load), for 5 minutes from cold, 700 Watts, for 500 mS
Protection:	Over-current and short circuit protection is provided, so that if unsuitable equipment is connected for a short time, no damage should result
Size and Weight:	Length 247mm by Width 103mm by Height 63mm. Weight 1200 grams
Ambient Temp Range:	-10°C to +30°C operating, -20°C to +50°C storage
Manufacturer:	Made in the United Kingdom by Switched Mode Ltd. Reading, Berkshire.