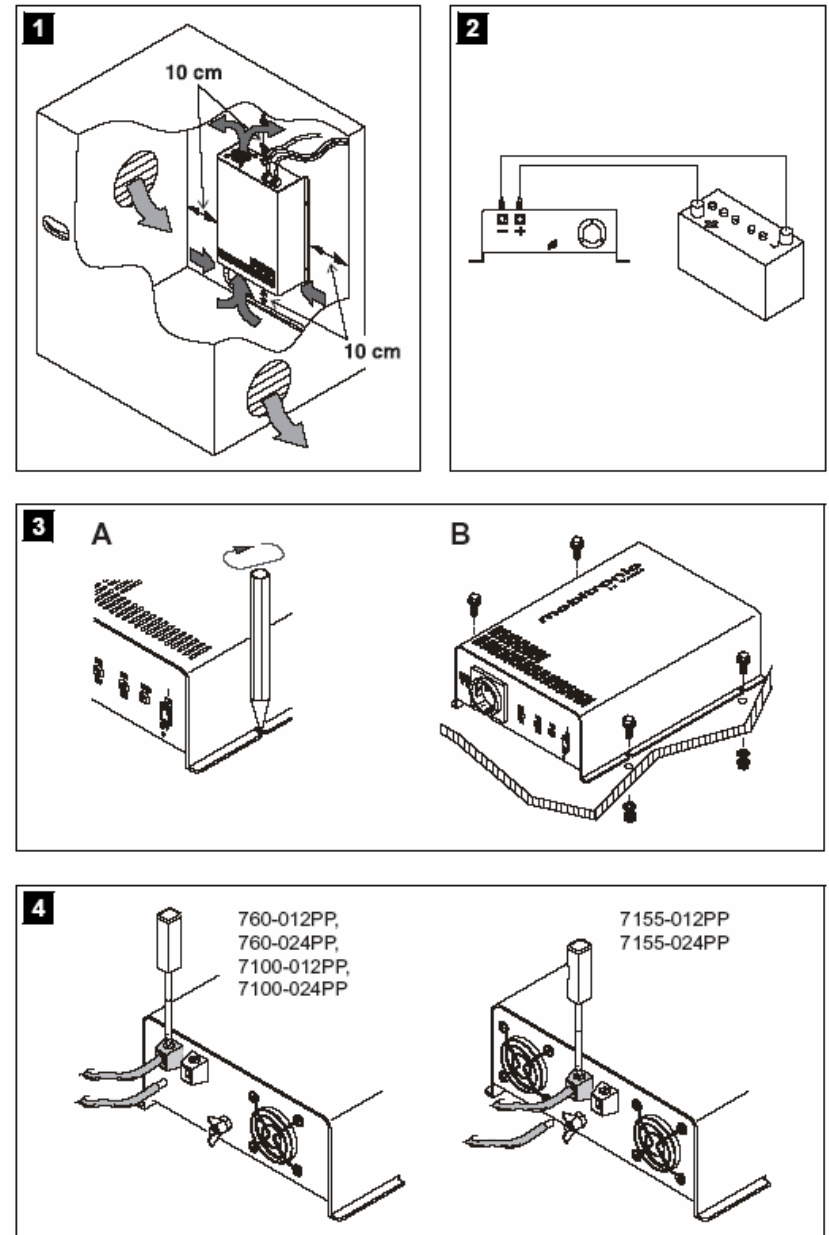
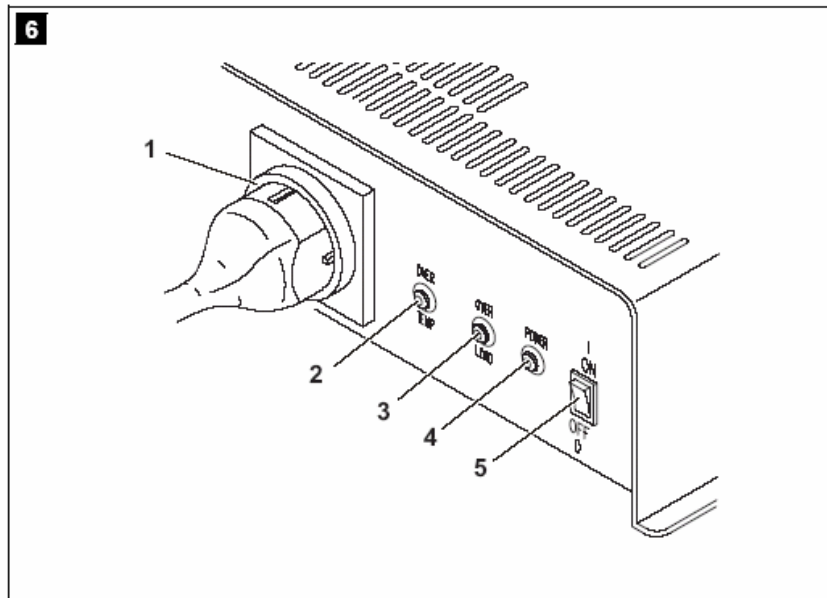
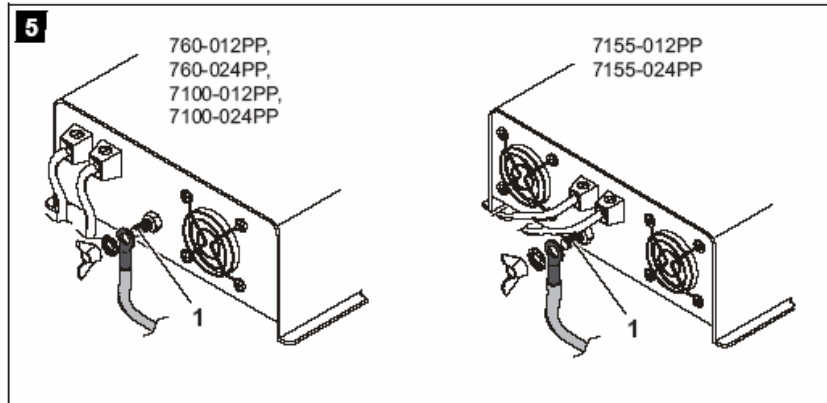


# ***PURE SINE WAVE*** ***DC TO AC POWER INVERTER***

**60S-12A / 60S-24A**  
**60S-12E / 60S-24E**  
**100S-12A / 100S-24A**  
**100S-12E / 100S-24E**  
**150S-12A / 150S-24A**  
**150S-12E / 150S-24E**

**Instruction manual**





SINE WAVE INVERTER

**Please read this manual carefully before installing and starting up and store it in a safe place. If the device is resold, this instruction manual must be handed over to the purchaser along with the device.**

**Contents**

- 1 Notes on using the instruction manual . . . . . 6
- 2 General safety instructions . . . . . 6
- 3 Scope of delivery . . . . . 8
- 4 Proper use . . . . . 8
- 5 Technical description . . . . . 9
- 6 Installing the inverter . . . . . 9
- 7 Connecting the inverter . . . . . 11
- 8 Using the inverter. . . . . 12
- 9 Cleaning and caring for the inverter. . . . . 13
- 10 Rectifying faults . . . . . 14
- 11 Guarantee . . . . . 15
- 12 Disposal . . . . . 15
- 13 Technical data . . . . . 16

## 1 Notes on using the instruction manual



### Caution!

**Safety instruction**, failure to observe this instruction can cause material damage and impair the function of the device.



### Caution!

**Safety instruction** relating to a danger from electrical current or voltage. Failure to observe this instruction can cause material damage and personal injury and impair the function of the device.



### Note

Supplementary information for operating the device.

- **Action:** this symbol indicates that you need to do something. The required action is described step-by-step.
- ✓ This symbol indicates the result of an action.

Please observe the following safety instructions.

## 2 General safety instructions

### 2.1 General safety



### Caution!

We will not be held liable for claims for damage resulting from the following:

- Faulty assembly or connection
- Damage to the device resulting from mechanical influences and overvoltage
- Alterations to the device made without the explicit permission from us
- Usage for purposes other than those described in the installation manual.

- Use the device only as intended.
- Do **not** operate the device in a damp or wet environment.
- Do **not** operate the device in areas that are potentially explosive.
- Maintenance and repair work must only be carried out by qualified personnel who are familiar with the risks involved and the relevant regulations.

### 2.2 Safety when installing the device

- Ensure that the device has a firm foundation. The device must be set up and fastened in such a way that it cannot tip over or fall down.
- Take the precautions necessary to ensure that children cannot interfere with operation. Dangerous situations may occur which cannot be recognised by children!
- Do not expose the device to a heat source (such as direct sunlight or heating). Avoid additional heating of the device in this way.

### For installation on boats

- If electrical devices are incorrectly installed on boats, corrosion damage might occur. Have the inverter installed by a specialist (marine) electrician.

### Electrical cables

- If cables have to be fed through metal walls or other walls with sharp edges, use ducts or wire bushings to prevent damage.
- Do not lay cables which are loose or bent next to electrically conductive material (metal).
- Do not pull on the cables.
- Do not lay the 115V/230 V mains cable and the 12/24 V DC cable in the same duct.
- Fasten the cables well.
- Lay the cables so that they cannot be tripped over or damaged.

**Caution!**

Note the following basic safety information when using electrical devices:

- Electric shock
- Fire hazard
- Injury
- Operate the device only if you are certain that the housing and the cables are undamaged.
- Make sure the air inlets and outlets of the device are not covered.
- Ensure good ventilation.
- Do not connect the 115V/230 V output of the inverter (fig. 6.1, page 4) to a different 115V/230 V source.
- Even after the fuse triggers, parts of the inverter remain live.
- Always disconnect the power supply when working on the device.

### 3 Scope of delivery

Quantity	Description
1	Sine wave inverter
1	Operating Instructions

### 4 Proper use

The Pure Sine Wave Inverters convert 12 V (60S-12A/E, 100S-12A/E, 150S-12A/E) or 24 V (60S-24A/E, 100S-24A/E, 150S-24A/E) direct current to a 115V or 230V alternating current at a frequency of 50 Hz or 60Hz.

**Warning!**

Reverse polarity connection of the battery wires can damage the inverter. Do not use the inverter with electrical systems using positive ground.

## 5 Technical description

The inverters can be operated wherever there is a 12 V DC supply (60S-12A/E, 100S-12A/E, 150S-12A/E) or a 24 V DC supply (60S-24A/E, 100S-24A/E, 150S-24A/E). With its low weight and the compact design the inverter can be easily installed into Camping mobiles, commercial vehicles or motor and sailing yachts.

The output voltage corresponds to the socket standard (pure sinus-voltage)

Please observe the values for constant output power and peak output power (for a max. of 10 min.) as indicated in section „Technical data“ on page 16. Never connect devices that have a higher power requirement.

**Note**

Note when connecting devices with an electrical drive (such as power drills and refrigerators), that they often need more power than is stated on the type plate.

The 150S-12A/E and 150S-24A/E inverters have two 115VAC or 230VAC sockets and an integrated residual current-operated protective device.

## 6 Installing the inverter

### 6.1 Tools required

For **installation and assembly** you require the following tools:

- Pencil
- Drill bit set
- Drill
- Screwdriver

For making and testing the **electrical connection** the following tools are required:

- Crimping tool
- 3 different flexible cable connections. The required cable diameter can be taken from the table in the section „Connecting the inverter“ on page 11.
- Various terminals, multicore cable ends

For fixing the inverter you need the following mounting devices:

- Screws (M4) with spacers and self-locking nuts or
- sheet metal screws resp. wood screws.

## 6.2 Installation instructions

When selecting the installation location, observe the following instructions:

- Installing the inverter can be set horizontal or vertical.
- The Inverter has to be installed in a dry and clean place not exposed to humidity.
- Make sure that the place is well ventilated. If installed into housing, ensure proper ventilation. At least, keep a free space of 10 cm around the inverter (fig. 1, page 3).
- The air intake at the bottom of the inverter and the air outlet on the back may not be blocked.
- In case of ambient temperatures of more than 35°C (e.g. engine or heating rooms, direct sunlight), the inverter will switch off automatically, because of the activated self heating feature.
- The installation surface must be level and of sufficient strength.



### Caution!

Before making any drill holes, ensure that no electrical cables or other parts of the vehicle can be damaged by drilling, sawing and filing.

## 6.3 Installing the inverter

- Adjust the inverter to the chosen installation place and mark the fixing points.
- Fix the inverter by using the self-chosen fixing method.

## 7 Connecting the inverter

### 7.1 General instructions

- In case the inverter is installed into vehicles or boats it has to be connected to the chassis (ground).
- On building up an electricity supply network the safety regulations according to the VDE 0100 standard are to be kept.
- Observe the required cable cross section (see table).

Device	Required cable cross section
60S-12A/E	25 – 50 mm <sup>2</sup>
60S-24A/E	
100S-12A/E	35 – 50 mm <sup>2</sup>
100S-24A/E	
150S-12A/E	50 – 70 mm <sup>2</sup>
150S-24A/E	

### 7.2 Connecting the inverter

- Lay the flexible connecting cable (plus and minus) from the battery to the connecting poles of the inverter (fig. 2, page 3).



### Warning!

Make sure that the poles will not be exchanged! Reverse polarity connection will blow the internal fuses. Exchange of fuses by experts only!

- First connect the positive cable to the red positive terminal (fig. 4, page 3).
- Connect the negative cable to the white negative terminal.

**Warning!**

In order for the integrated residual current-operated protective device of the 150S-12A/E and 150S-24A/E inverters to work properly, the earth connection of the inverter (fig. 5.1, page 4) must be electrically connected to the chassis of the vehicle or boat.

- Lay the flexible earth cable from the earthing point of the vehicle to the earthing point of the inverter.
- Connect the earth cable to the chassis terminal (fig. 5.1, page 4).

**Warning!**

Reverse polarity connection of the battery wires can damage the inverter. Do not use the inverter with electrical systems using positive ground.

## 8 Using the inverter

**60S-12A/E, 60S-24A/E, 100S-12A/E, 100S-24A/E:**

Always connect only one consumer unit to the 115V or 230 V socket on the front of the device.

**150S-12A/E, 150S-24A/E:**

Always connect max two consumer unit to each of the 115V or 230 V sockets on the front of the device.

**Switching on**

Operation is done with the ON/OFF-switch at the front side of the inverter. In switch-mode ON the LED control "Power" illuminates.

**Malfunctions**

Does the battery voltage fall below 10.7 V (60S-12A/E, 100S-12A/E, 150S-12A/E) resp. 21.4 V (60S-24A/E, 100S-24A/E, 150S-24A/E), the LED control „OVER-LOAD“ (fig. 6.3, page 4) illuminates and an audible signal is given. The inverter switches off automatically in case of a battery voltage down to 10 V resp. 20 V.

If the device overheats, the inverter switches off – the "OVER TEMP" LED (fig. 6.2, page 4) lights up.

- If this happens, switch off the inverter using the switch.
- Ensure that the inverter is sufficiently ventilated
- Wait for approx. 5 - 10 minutes and switch on the inverter only.

When operating the inverter at high load for lengthy periods, it is advisable to start the engine in order to recharge the vehicle battery.

**150S-12A/E, 150S-24A/E:**

If a residual current of more than 30 mA flows through the earth wire, e. g. in the case of an accidental short circuit, the integrated residual current-operated protective device automatically switches the inverter off within one second.

- If this happens, switch the inverter off with the switch.
- Rectify the fault.
- Switch the inverter on.
- ✓ The inverter is ready for operation again.

## 9 Cleaning and caring for the inverter

**Caution!**

Do not use sharp or hard objects for cleaning as these may damage the device.

- Occasionally clean the device with a damp cloth.

## 10 Rectifying faults



If you have detailed questions on the **specifications of the inverter** please contact us.

Fault	Cause	Remedy
No output voltage, LED not illuminated	Bad connection between battery and inverter. Internal fuses defect.	Check the cables and contact  In this case send the unit back to supplier.
No output voltage OVER-TEMP LED illuminates	The inverter has been overheated.	Switch off the inverter and the power consuming units. Wait for approx. 5 - 10 minutes and switch on the inverter only. Reduce the loading and ensure a better ventilation for the inverter. Then switch back on the consuming unit.
Overload LED illuminates	Current consumption of the consuming unit is too high. Possibly, there is a short circuit in the consuming unit.	Switch off the inverter and disconnect the consuming units. Switch back on the inverter only. If the OVERLOAD LED is off, there is a short circuit at the consuming unit or the total load was higher than the performance specified within the technical data table. Check the connecting cable of the consuming unit for mechanical damages.
Acoustic signal in case of loading	Battery voltage too low. In case of loading battery voltage falls below 10.7 V resp. 21.4 V.	The battery must be recharged.

## 11 Guarantee

Our general guarantee conditions apply. If the product is defective, please send it back to us. For repair and guarantee processing, the following documents must be sent along with the device:

- A copy of the receipt with purchasing date
- A reason for complaint or description of the fault

## 12 Disposal

### 12.1 Disposing of packaging material

Do not simply throw the packaging material away. Please observe the following instructions:

- The cardboard packaging material should be disposed of in a waste-paper bin.
- Ask your local authority for the location of the recycling centre closest to you.

### 12.2 Disposing of the device

If you wish to finally dispose of the device, take it to the nearest recycling centre or return it to your specialist dealer who will be happy to take it back for a small fee.

### 13 Technical data

Item number	60S-12A 60S-12E	60S-24A 60S-24E	100S-12A 100S-12E	100S-24A 100S-24E
Rated input voltage	12 V DC	24 V DC	12 V DC	24 V DC
Constant output power	600 W		1000 W	
Peak output power (a max. of 15 min.)	1000 W (650 W)		2000 W (1200 W)	
Maximum input current	70 A	40 A	100 A	50 A
Output voltage 115VAC 230VAC	115VAC +/- 3% 230VAC +/- 3%			
Output frequency	50 Hz or 60Hz to be specified			
Idle current 115VAC Consumption 230VAC	0.85A 1.4A	0.45A 1A	1.8 A 1A	1.8A 1A
Input voltage range	10.7 V – 15 V	21.4 V – 30 V	10.7 V – 15 V	21.4 V – 30 V
Low voltage alarm	< 10.7 V	< 21.4 V	< 10.7 V	< 21.4V
Low voltage shutdown	< 10 V	< 20 V	< 10 V	< 20 V
Efficiency up to	85 %			
Dimensions (mm)	335 x 236 x 83		395 x 236 x 83	
Weight	3kg		4 kg	

Item number	150S-12A 150S-12E	150S-24A 150S-24E
Rated input voltage	12 V DC	24 V DC
Constant output power	1500 W	
Peak output power (a max. of 10 min.)	3000 W (1800 W)	
Maximum input current	200 A	100 A
Output voltage 115VAC 230VAC	115VAC +/- 3% 230VAC +/- 3%	
Output frequency	50 Hz or 60Hz to be specified	
Idle current 115VAC Consumption 230VAC	1A 2A	0.8A 1.5A
Input voltage range	10.7 V – 15 V	21.4 V – 30 V
Low voltage alarm	< 10.7 V	< 21.4 V
Low voltage shutdown	< 10 V	< 20 V
Efficiency up to	85 %	
Dimensions (mm)	415 x 283 x 100	
Weight	5.75 kg	

### Approval

The device has e13 approval.



Versions, technical modifications and delivery options reserved.

This device conforms to the following EC guidelines:

- “Low Voltage Electrical Equipment Directive” 73/23/EEC issued 19/2/1973 including the modified guideline 93/68/EEC
- “Electromagnetic Compatibility Directive” 89/336/EEC issued 3/5/1989 including the modified guideline 92/31/EEC