

Sinewave inverter

ONS SERIES



User's and Installer's Handbook

ONS 24V 2300W
ONS 24V 3300W

ONS 48V 1200W
ONS 48V 2300W
ONS 48V 3500W

Contents

INTRODUCTION.....	3
IMPORTANT NOTES	3
APPLICATIONS AND PERFORMANCES	3
PRODUCT PRESENTATION	4
LOCATION	4
FITTING	4
CONNECTION.....	4
USE.....	4
REMOTE CONTROL.....	5
ADJUSTMENTS.....	5
<i>Standby Level (1).....</i>	<i>5</i>
<i>Adjustment procedure</i>	<i>5</i>
CONTROL	5
INDICATORS.....	5
<i>Green Run - LED (3).....</i>	<i>5</i>
<i>Red Fault - LED (2)</i>	<i>5</i>
SAFETY.....	6
INTERNAL FUSES.....	6
MAINTENANCE.....	6
LEGISLATION.....	6
LIMITATION OF LIABILITY.....	6
CE - DECLARATION OF CONFORMITY	6
DESCRIPTION AND WIRING DIAGRAM.....	7
TECHNICAL DATA	8

Introduction

The ONS sinewave inverters have been designed to meet industrial and domestic needs. They satisfy the highest demands of comfort, safety and reliability.

Any device designed for the public electrical network of 230V / 50 Hz can be connected to them.

The ONS inverters are the perfect solution as sources of voltage in any place where the public network is not available.

Read the connection instructions thoroughly and give them to the technician who is to install the inverter so as to prevent any malfunction. Thus you will have a modern and reliable installation which meets requirements.

Should you have any doubt or question, do not hesitate to contact your specialist salesperson who will give you the best advice.

Important notes

A deficient assembly could damage the device, cause function failures or potential damage to the users.

The working device generates a high voltage which might be fatal in case of contact. So, any manipulation of the inverter must be carried out with utmost care. The following points must be strictly observed:

The installation of the "ONS" can only be performed by a qualified technician.

In case of malfunction, only a technician specially designated and trained by ENAG is allowed to repair the device.

Warning :
Opening the inverters or using them incorrectly will result in the immediate loss of the warranty.

No current or voltage generating devices (public network, generator ...) may be connected to the output of the inverter because this could result in its destruction.

As for the usage of batteries, follow the manufacturer's instructions.

Important:
After disconnecting the battery, the output voltage (230V) may still remain for 30 seconds.

The ventilation of the device should never be obstructed. Should the device be installed in an enclosed structure, make sure that ventilation is possible and adequate.

The installation and assembly of the device must follow the rules stipulated.

This document is an essential part of the inverter and must always be carried with it and be at the disposition of anyone working on the installation.

Applications and Performances

As well as its modern design and its technical characteristics, the ONS inverter is also easy and economical to use in almost all applications.

All devices working within the public electrical network (230V - 50Hz) may be used with the inverter (up to its nominal power).

The inverter generates a perfectly sinusoid output voltage, precisely adjusted by a high technology regulation system.

Thus, the output voltage is totally independent of the charge and the fluctuation of voltage in the battery.

All inverters in the ONS series are protected against overloading and short circuits.

Due to obvious safety reasons, the inverter is not automatically reactivated after a failure (overload, short circuit,...).

Product presentation

The inverters of the ONS series are presented fully equipped, with battery cables, 230V cable and the user's handbook.

Location

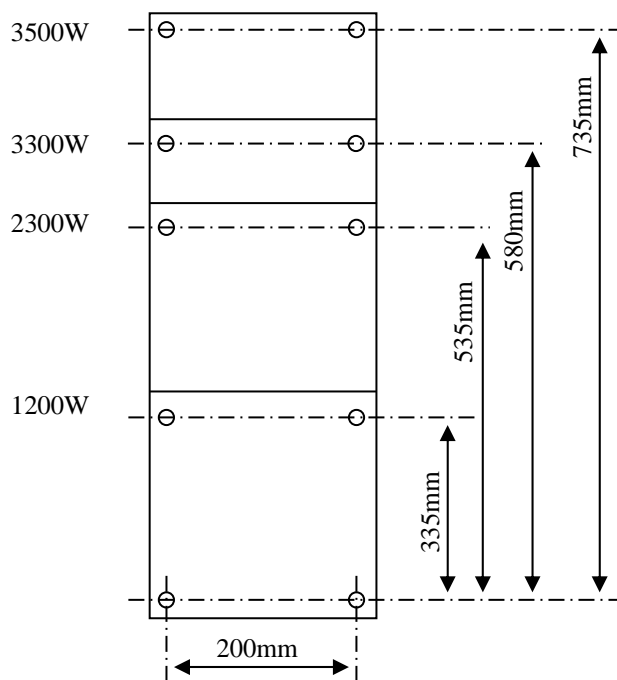
The place where the inverter is to be mounted should meet the following requirements:

- Out of reach of non authorised persons.
- In a dry place with no condensation.
- Not directly on top of the batteries.
- Adequate ventilation. No inflammable material in the same room.
- Do not lay anything on the device.
- An area of 20 cm from the top and the bottom of the device should be kept clear for the ventilation.

Fitting

The inverter has been designed to be used only in a vertical position and against the wall. The inverter is fitted using the four external holes (\varnothing 5,5 mm).

The fitting screws are not supplied with the inverter.



Beware:

The casing of the inverter can reach high temperature (80 °C)

Connection

- Check the switch (4) is in “OFF” position.
- First connect the 230V outlet (6) to the user device, so as to prevent any possible accidental contact.

Check the voltage and polarity of the battery!

- The voltage of the battery should coincide with that mentioned in the technical characteristics of the inverter.

- Battery connection :

This connection should done be very carefully observing the polarity in order not to damage the device.

- Check that the connections are fixed correctly.

Use

After connecting the inverter, make sure the user devices are correctly plugged in and that there is no possible contact between the “Line OUT” (6) and a person.

The working device generates high voltages which could be fatal!

The inverter can be activated by moving the switch to the “Auto” position. The “on” indicator -green LED - (3) is illuminated.

If no user device is connected, the LED blinks after some seconds, which indicates that the “standby” mode has started. If a user device is plugged in, the green LED remains illuminated, indicating the uninterrupted presence of 230V in the outlet. If you wish to deactivate the standby mode, put the switch in “Lock” position. The inverter will be then working continuously.

Warning :
With the “lock” mode, the no load consumption of the inverter is 15 to 20 times greater !

Remote control

The inverter can be controlled remotely with a switch (bi-stable) connected to the "Faston" (5) connector on the under side of the device. The main switch (4) has priority over the working mode of the device. If the remote switch is close, the inverter is out of use.

Adjustments

Standby Level (1)

The activation of the inverter, when working in automatic mode, is dictated by the detection of a load. With this function, it is possible to adjust the minimum load detected between 0,3 and 20 Watts. **This level is factory adjusted to 2 watts and so no further adjustment will probably be needed.**

Adjustment procedure

- Make sure that no device is connected. Check for the presence of hidden users such as television, fax, video ... which often have a standby mode and remain working even after being turned off!
- Put the switch in "Autom." position.
- Introduce a screw driver N°1 delicately in the hole (1) provided and turn gently until you feel the screw driver insert in the groove of the screw.
- Turn clockwise ↻ until tight without pressing (do not force!).
- Wait until the green LED blinks.
- Activate the minimum charge you wish to detect.
- Turn the screw slowly anti-clockwise ↺ without pressing until the inverter activates. (Green LED illuminated).
- Check that the inverter goes back to standby mode a couple of seconds after deactivation of all charges.

Warning: In maximum anti-clockwise position the inverter continues to work even if there is no load.

Control

The voltage of the batteries is submitted to control. During their use, the voltage must be between the following ranges:

11.4 V and 16 V in the 12 Volt models,
22.8 V and 32 V in the 24 Volt models,
45.6 V and 61 V in the 48 Volt models.

Outside these ranges the inverter is automatically disconnected.

These values correspond to a no load situation and they are automatically adjusted according to the current of the battery.

The internal temperature and the maximum power are also submitted to control.

In the case of prolonged overload or deficient ventilation it is not possible to restart the inverter until it has cooled down.

Indicators

Green Run - LED (3)

Illuminated: the inverter is connected. A 230 V voltage is present in the outlet.

Blinking: The inverter is in "Autom." mode and no voltage is detected by the standby system.

A 230 V voltage is intermittently present!

Red Fault - LED (2)

The inverter is stopped:

- The voltage of the battery is not correct
- After an overload, overheating or short circuit

To restart the inverter after a failure, put the switch (4) in "OFF" position for 15 seconds, then connect again.

Safety

The inverter is internally protected against overloads and short circuits. Should this protection fail, the inverter is equipped with a fuse (fire protection). If the fuse is broken, qualified technicians should control the installation and change the fuse.

Internal fuses

Fuse	Inverter ONS (mod.)
50A	48V-1200W
80A	48V-2300W
100A	48V-3500W
2*100A	24V-2300W
2*125A	24V-3300W

The use of higher fuse value will not improve the performance of the inverter and will degrade safety protection!

Maintenance

The ONS inverters do not need any special maintenance. The casing may be cleaned with a damp cloth (not wet).

In the case of malfunction, the inverter should be sent to the salesperson for control.

Legislation

In all cases the assembly and installation must be done by qualified technicians, observing the national requirements and rules stipulated. You will find complete information about this in the relevant institutions.

Limitation of liability

ENAG cannot control the installation, use and maintenance of the inverter. Thus, we are not responsible for damages, costs or losses resulting from an installation which is not in accordance with the regulations or inappropriate use or maintenance.

The customer is always responsible for the use of the inverters ENAG.

This device has not been designed and is not warranted for use in life support apparatus or any other critical apparatus with potential risks of serious harm to people or to the environment.

We do not accept any responsibility for any violation of patent rights or other third person rights resulting from the use of the inverter.

ENAG reserves the right to modify their products without previous notice

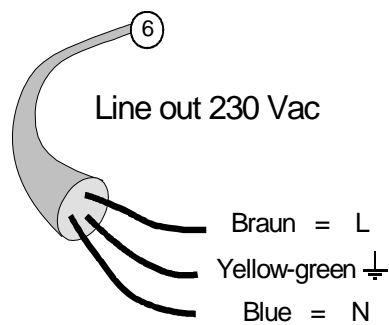
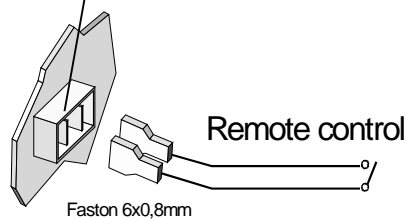
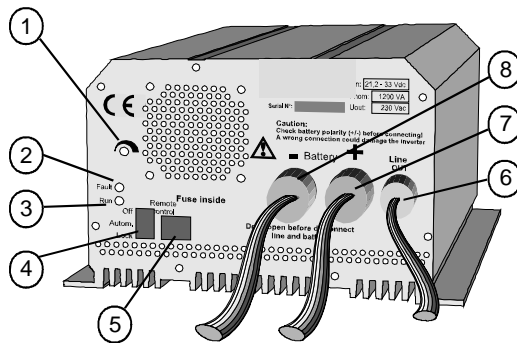
CE - declaration of conformity

ENAG declares under that products mentioned on this manual are in conformity with the following standards or standardisation documents:
EN 50081 I/II, EN 50014 - 50022, IEC 801 II / III / IV, CEI 555



Quimper: June 19th, 1999

Description and wiring diagram



- ① Standby level adjustment
(Not available with *Twinpower* option)
- ② Fault indicator (red LED)
- ③ Run indicator (Green LED)
- ④ Main switch
- ⑤ Remote control connector
- ⑥ Output 230 Vac (Caution! High voltage!)
- ⑦ Plus battery
- ⑧ Minus battery

Battery connection:

!!!! Check battery polarity !!!!

Max. cables length 2 m.! Battery size could be adjusted to the inverter's power:

$$Cbatt [Ah] = 5 \times P_{nom} / U_{nom}$$

(This value could be divided by three for short time applications).

Technical data

Model ONS	48V 1200W	24V 2300W 48V 2300W	24V 3300W	48V 3500W
Input voltage (Unom) [V]	48	24V/48	24	48
Nominal power [W]	1200	2300	3300	3500
« Standby » current [mA] Power « ON » no load [W]	12 4.8	25/17 9	25 13	30 17
Maximum efficiency [%]	95	95	95	95
Length L x 124 (H) x 215 (W) [mm]	391	591	636	791
Weight [kg] Weight [kg]	13.2	26	30	31

Input voltage	Min. - Max.: < Unom x 0.95 to Unom x 1.33
Dynamic correction of Umin.	- 10% at Pnom
Output voltage	True sine 230 Vac ±3%
Distortion	< 2% (at Pnom)
Dynamic behaviour	From 0% to 100% load change. Normalisation: 0.5 ms
Frequency	50 Hz ±0.01% (Crystal control)
Charge detection (standby)	Adjustable: 0.3 → 20 W
Maximum power 15 min	1.3 – 1.6 x Pnom / 25°C
Maximum power 3 min	1.6 – 2 x Pnom / 25°C
Peak power 5s	3.5 x Pnom
Asymmetric load	Up to 2 x Pnom
Cos φ	0.1 – 1
Protections	Overload/Overheat/Short-circuit/Reverse polarity by internal fuse
IP protection index	IP 20 complies with DIN 40050/IP 23 with top cover
Forced ventilation	From 45°C ± 3°C
Overheating protection	75°C ± 3°C
Required battery capacity	> 5x Pnom/Unom (recommended value)
Acoustic level	Without ventilation: < 10 dB With ventilation: < 35 dB
EEC conformity	EN50081 I/II, EN 55014 - EN 55022, EN 61000-3-2 IEC 801 I/II/III/IV, CEI 555, IEC 1000-3-2, LVD 73/23/EEC

Other specifications on request (Ex: 115V/60Hz).

These data are for information only and may change without notice.

Note

An Inverter constitutes an independent power supply from net and could be considered in the same way as a generator set. The phase and the neutral are not differentiate. The tension in between the phase and the neutral is 230V. An appropriate divisor establishes a 115V tension in between neutral and earth, and the phase and earth. According to the local prescriptions or particular requirement, (example: use of a ground fault detector) a true neutral may be established by connecting the neutral and the earth wire together. The so connected point, may be connected with an existing earth: earth of building; the chassis of vehicle or the hull of ship.

