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Smart Sinus Inverter 110Vdc/230Vac/3000VA

Model: R30i

MANUAL USER

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1.1 DESCRIPTION

- The inverter generates a pure sinusoidal voltage of 230V~, powered by DC voltage of 110Vdc nominal. Minimum input dc voltage 85V - maximum 145V, the shape and value of the output voltage do not change.
- Two modes of operation: On-Line / OFF-Line, in OFF-Line mode it has output voltage stabilization and a high speed of transfer to Inverter operation (less than 1mS), in this way the Charger-Rectifier that powers the Inverter is relieved.
- The inverter has a transformer-galvanic separation of the electronics from the mains voltage

Turn-on the Inverter

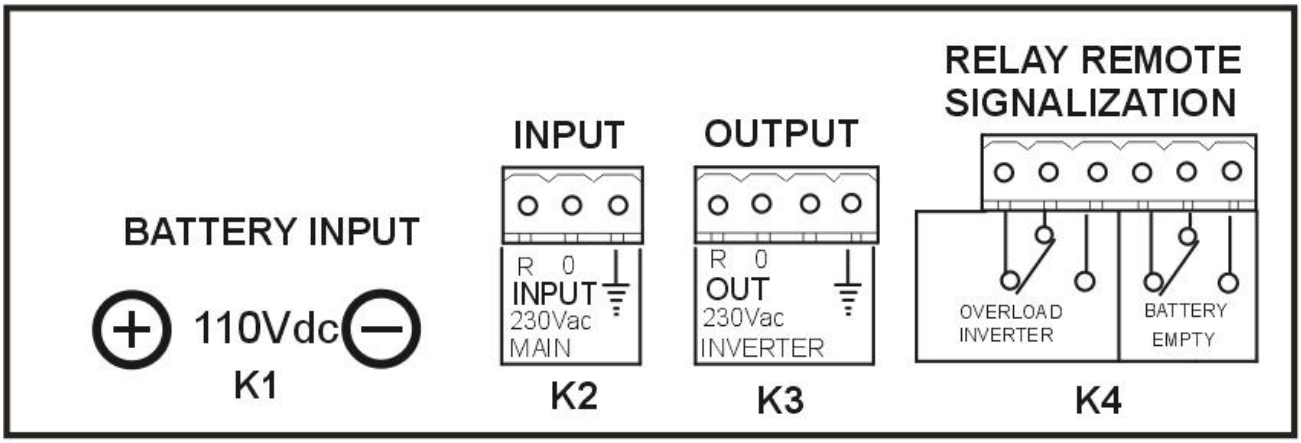
- by pressing the ON button or by connecting the mains voltage or by connecting the DC voltage (or battery) - the inverter starts automatically.

Turn-off the Inverter

- press and hold the OFF button until the inverter turns off (3 sec).

Input/output terminals (under the rear cover):

- Terminal for battery voltage input - protection automatic fuse 40A
- Connector for INPUT 230V~ mains voltage-protection automatic fuse 16A
- Connector OUTPUT 230V~ inverter voltage
- Connector for remote signaling (relay contacts)



- Automatic By-pass that serves to transfer consumers to the mains voltage, in situations: occurrence of short-term shock overload / inverter failure.

- Soft start in the battery circuit, there is no spark when the batteries are connected.

- Protection against reverse polarity of batteries at the input.

- Automatic AC and DC restart, if the inverter was switched off, when the mains voltage is connected or DC voltage (batteries) - the inverter will be activated, for DC restart, the DC voltage threshold at which the inverter will start can be adjusted (see settings above).

- The device has two relay outputs for remote signaling:
    1. Overload (contacts closed - if everything is fine)
    2. Low battery (contacts closed - if everything is fine)
- The inverter can work permanently with 110% load, or 2sec in a short circuit at the output.
- On the front panel, there is a green LED indication that lights up when the inverter voltage is at the output of the device.

The possibility of setting the following parameters via the buttons located on the front panel (permanent memorization):

- Minimum Output AC voltage Below which the alarm occurs
- Maximum Output AC Voltage Above which the alarm occurs
- Minimum Input DC voltage Below which the inverter switches off
- Maximum Input DC Voltage Above which the inverter switches off
- Maximum Input DC voltage of inverter restart
- Minimum Input DC voltage of inverter restart
- Operating mode: Off-line / On-line

Measurements:

On the front panel there is an alpha-numeric display of 4x20 characters for displaying the following parameters:

- input mains voltage **Vi**
- output voltage **Vo**
- output power **P**
- output AC current **I**
- counting of mains voltage drops **N**
- battery voltage **Vb**
- input frequency measurement **fu**

Inverter statuses:

- Inscription in the third line of the display "**ON-LINE**" or "**OFF-LINE**" depending on the selected operating mode.

- If the mains voltage has disappeared or is out of range, the inscription "**POWER ON BATTERIES**" appears in the third line, while the time measurement (seconds, minutes and hours) appears in the fourth line and a sound signal is heard every 10 seconds.

- When the battery is nearing the end of its operation, the inscription in the third line of the display, "**BATTERY 10%",** sounds a signal every 3 seconds.

- When the battery is completely empty, the inscription "**BATTERY EMPTY**" appears in the third line of the display, a countdown of 1 minute starts, after this

time the inverter switches off. This situation is saved and when the inverter is turned on again, the inscription "BATTERY DISCHARGE 01:02:03" appears (example).

- **"OVERLOAD"** the inscription appears when the power exceeds 100%, if the power exceeds 130%, the inverter turns off. This situation is saved and when you turn it on again, the message **"OVERLOAD HAS OCCURRED"** will appear.

- „**OVERCHARGING**„ if the voltage of the batteries is increased, an inscription will appear, counting down in seconds, if this situation persists for more than three seconds, the inverter turns off. This situation is saved and when you turn it on again, the inscription "**OVERCHARGING HAPPENED**" appears.

- **"OVERHEATING"** if overheating occurs, an inscription appears on the display and a countdown begins in seconds up to 60 seconds, and after this time the inverter is turned off (an alarm is saved).

- By pressing the **OFF** button (keep it pressed), the inscription "OFF" appears in the third line, with a countdown in seconds - after 3 seconds, the inverter turns off. **Switching on again is possible only 10 seconds after switching off.**

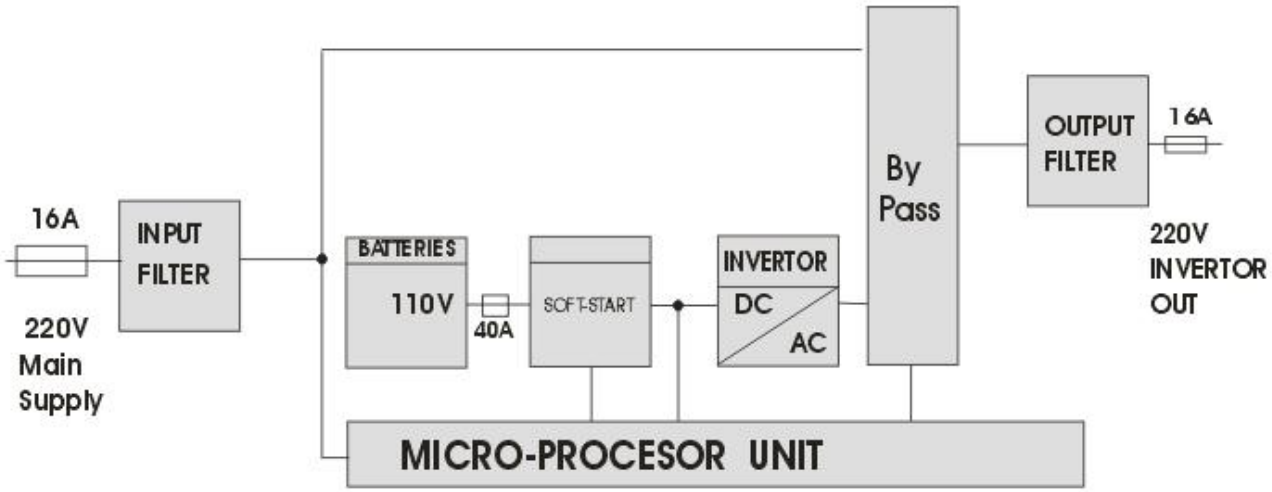
- By connecting the DC voltage (battery) to the inverter, it is automatically activated, if the voltage is outside the limits set by the button (DC restart input voltage: minimum / maximum), the following inscriptions will appear on the display (EXAMPLE):
  DC VOLATAGE OUT OF RANGE
  Vb=70V OFF for=10
  CONTINUATION? PRESS
  BUTTON MENU

If the DC voltage is outside the set values, after the expiration of 20 seconds, the inverter is turned off, leaving the possibility to enter the main program-Restart of the inverter by pressing the "Select" button and correct the voltage level.

Sound signaling in the following situations:

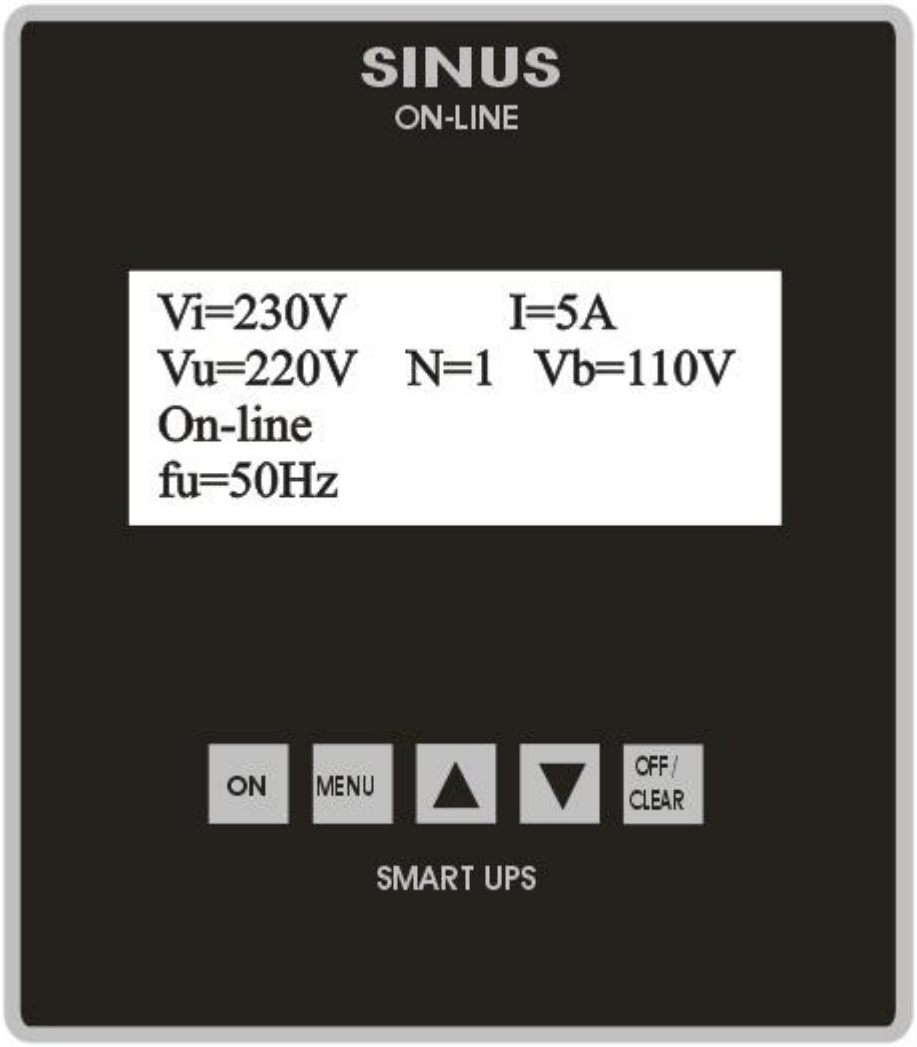
- Overload (continuous sound)
- battery operated (short sound, per every 30sec)
- battery low (continuous sound)
- overcharging (continuous sound)
- overheating (continuous sound)

1.2 BLOCK DIAGRAM



- **Input / output filters** - prevent interference.
- **Soft-start** - when connecting batteries to the input of the inverter, reduces the inrush current (charging of electrolytic capacitors).
- **Inverter**-generates pure sine voltage 230V
- **By-pass**-automatic, transfer of consumers to mains voltage in situations of alarm or overload.
- **The microprocessor unit** serves for command, measurement, management and supervision of the entire system.

1.3 FRONT PANEL LAYOUT



- **ON button** – turn-on the inverter
- **OFF button** – turn-off the inverter (press and hold the button until the device turns off)
- **The Menu** button is used to enter the parameter setting menu
- The **Up** and **Down** arrow keys are used to set the inverter parameters and operating mode.
- **LED indication** (green) if it lights up - the voltage of the inverter is sent to the output (if it does not light up - By-pass is active).

1.4 TECHNICAL CHARACTERISTICS

MODEL:	**R30i**
Input:	
Voltage:	230V (165V - 265V)
Frequency:	50Hz +/- 8 %
Output:	
Voltage:	230V +/- 2 %
Wave form:	Pure sine wave
Power:	3000VA/2100W
Output voltage distortion with linear load:	<3%
Frequency:	50Hz +/- 0,02%
Transfer time:	0 msec
Protection from:	Short circuit, overload, low and high DC voltage at the input, high or low AC voltage at the input, overheating, reverse battery polarity at the input.
Front panel:	Alpha-numeric display to show: input/output voltage, input frequency, battery voltage, output power, battery runtime, inverter status, number of mains voltage outages, AC output current. -Keys for activation/deactivation, settings.
Battery voltage:	110V nominal (min 85V – max 145V)
Soft start in battery circuite:	Yes
Settings:	Minimum AC output voltage below which the alarm occurs; Maximum AC output voltage above which an alarm occurs; Minimum input DC voltage below which the inverter switches off; The maximum input DC voltage above which the inverter switches off; Maximum Input DC restart voltage; Minimum Input DC restart voltage; Choice of On-line or Off-line operating mode
Remote signaling: (relay contacts)	Overload / Dc voltage out of limits When everything is ok, the contacts are closed
Efficiency:	>92%
Dielectric strength	5000V DC input / output ; 5000V DC output / ground ; 2500V DC input / ground
Operating temperatures:	-20 C / +50C
Crest factor:	3
Dimensions:	
Height: Width: Depth:	17cm 44cm 67cm
Wight in kg:	36

1.5 SETTINGS

- After pressing the MENU key, the following inscription appears on the display:

STTING ALARM FOR MIN
AC VOLTAGE=170V

- With the "up / down" keys, the voltage level at which the alarm will be activated - if the output voltage is below the set value - is set. Adjustment in 5V resolution in the range from 100V to 210V.

- For further setting - press the MENU button, the following inscription appears on the display:

SET ALARM FOR
Max AC VOLTAGE=260V

- With the "up / down" keys, the voltage level at which the alarm will be activated is set - if the output voltage is above the set value. Adjustment in 5V resolution in the range from 240V to 275V.

- For further setting - press the MENU button, the following inscription appears on the display:

CHOOSE WORKING MODE:
ON-LINE (**or OFF-LINE**)

- With the "up / down" keys, two modes are selected:
  On-line mode-inverter voltage is at the output
  Off-line mode-forwards and stabilizes the mains voltage. When the mains voltage disappears or is outside the permitted limits, the inverter voltage is sent to the output.

- For further setting - press the MENU button, the following inscription appears on the display:

SET SHUTDOWN VOLTAGE
BATTERY MINIMUM=90V

- With the "up / down" keys, we set the Minimum DC voltage level at which the inverter will be turned off. Adjustment in 1V resolution in the range min 90V - maximum 105V

- For further setting - press the MENU button, the following inscription appears on the display:

MAX BATTERY VOLTAGE
TURN-OFF ON=145V

- With the "up / down" keys, we set the level of the maximum DC voltage at which the inverter turns off. Setting in 1V resolution in the range min 130V- max 155V

- For further setting - press the MENU button, the following inscription appears on the display:

Dc min RESTART
TURN ON=95V

- With the "up / down" keys, we set the level of the Minimum DC input voltage at which the inverter turns on. Setting in 5V resolution, in the range min 70V – max 125V

- For further setting - press the MENU button, the following inscription appears on the display:

Dc MAX RESTART
Turn on=135V

- With the "up / down" keys, we set the maximum DC input voltage above which the inverter will not be activated. Adjustment in resolution 5V in the range min 110V-max 160V

- By pressing the MENU key again, we return to the main program, if no one key is pressed for 10 seconds, it automatically returns to the main page.
- **All set parameters are permanently stored.**

1.6 ACCOMMODATION NOTE

- The room where the inverter is located should be free of moisture, dust and aggressive gases, with free air flow.
- The room where the device is located should be secured against access by unauthorized persons.

1.7 IMPORTANT NOTICE

- **It is forbidden to block the ventilation openings.**
- **If the inverter was stored in rooms where the temperature was below zero degrees (or during transport), after it is brought into rooms where the temperature is above 20 degrees Celsius, it is necessary to wait about 2-3 hours for the condensation to dry.**

1.8 WARRANTY TERMS

- The manufacturer guarantees that the product will function properly within the warranty period if it is handled according to the attached instructions, that it will eliminate all malfunctions that occurred during exploitation.
- The warranty lasts 36 months and starts on the day of delivery

Damages caused are not included in the warranty:

- During transport after delivery.
- Improper assembly, maintenance or non-observance of instructions.
- Mechanical damage caused by the fault of the user.

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