



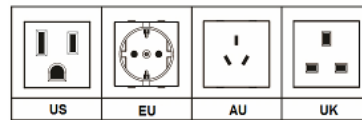
True Sinewave Power Inverter

SW1204 SW2405 SW1204i SW2405i
MW1204 MW1204i

Owner's Manual



Picture shown SW1204i-EU



For safe and optimum performance, the Power Inverter must be used properly. Carefully read and follow all instructions and guidelines in this manual and give special attention to the **CAUTION** and **WARNING** statements.

PLEASE KEEP THIS MANUAL FOR FUTURE REFERENCE

Disclaimer

While every precaution has been taken to ensure the accuracy of the contents of this guide, **KISAE Technology** assumes no responsibility for errors or omissions. Note as well that specifications and product functionality may change without notice.

Important

Please be sure to read and save the entire manual before using your **KISAE Power Inverter**. Misuse may result in damage to the unit and/or cause harm or serious injury. Read manual in its entirety before using the unit and save manual for future reference.

Product Numbers

Modified Sinewave MW Series:

120V mode!

MW1204 12V 400W 120VAC Modified Sinewave Inverter (US - NEMA 5-15)

230V mode!

MW1204i-EU 12V 400W 230VAC Modified Sinewave Inverter (Schuko - CEE 7/4)

MW1204i-UK 12V 400W 230VAC Modified Sinewave Inverter (British - BS1363)

MW1204i-AU 12V 400W 230VAC Modified Sinewave Inverter (Australia - NS/NZS 3112)

True Sinewave SW Series:

120V mode!

SW1204 12V 400W 120VAC True Sinewave Inverter (US - NEMA 5-15)

SW2405 24V 500W 120VAC True Sinewave Inverter (US - NEMA 5-15)

230V mode!

SW1204i-EU 12V 400W 230VAC True Sinewave Inverter (Schuko - CEE 7/4)

SW1204i-UK 12V 400W 230VAC True Sinewave Inverter (British - BS1363)

SW1204i-AU 12V 400W 230VAC True Sinewave Inverter (Australia - NS/NZS 3112)

SW2405i-EU 24V 500W 230VAC True Sinewave Inverter (Schuko - CEE 7/4)

SW2405i-UK 24V 500W 230VAC True Sinewave Inverter (British - BS1363)

SW2405i-AU 24V 500W 230VAC True Sinewave Inverter (Australia - NS/NZS 3112)

Service Contact Information

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1. INTRODUCTION

Thank you for purchasing the KISAE Power Inverter. With our state of the art, easy to use design, this product will offer you reliable service for providing AC power for your home, cabin, RV or Trailer. The KISAE Power Inverter can run many AC-powered appliances when you need AC power anywhere. This manual will explain how to use this unit safely and effectively. Please read and follow these instructions and precautions carefully.

IMPORTANT SAFETY INFORMATION

This section contains important safety information for the KISAE Power Inverter. Each time, before using the KISAE Power Inverter, READ ALL instructions and cautionary markings on or provided with the inverter, and all appropriate sections of this guide. The KISAE Power Inverter contains no user-serviceable parts. See Warranty section for how to handle product issues.

WARNING: Fire and/or chemical burn hazard

- Do not cover or obstruct any air vent openings and/or install in a zero-clearance compartment.
- WARNING: Failure to follow these instructions can result in death or serious injury**
- When working with electrical equipment or lead acid batteries, have someone nearby in case of an emergency.
- Study and follow all the battery manufacturer's specific precautions when installing, using and servicing the battery connected to the inverter.
- Wear eye protection and gloves.
- Avoid touching your eyes while using this unit.
- Keep fresh water and soap on hand in the event battery acid comes in contact with eyes. If this occurs, cleanse right away with soap and water for a minimum of 15 minutes and seek medical attention.
- Batteries produce explosive gases. **DO NOT** smoke or have an open spark or fire near the system.
- Keep unit away from moist or damp areas.
- Avoid dropping any metal tool or object on the battery. Doing so could create a spark or short circuit which goes through the battery or another electrical tool that may create an explosion.

WARNING: Shock Hazard. Keep away from children!

- Avoid moisture. Never expose unit to snow, water etc.
- Unit provides household AC, treat AC output sockets the same as regular wall AC sockets at home.

WARNING: Explosion hazard!

- DO NOT** use the KISAE Power Inverter in the vicinity of flammable fumes or gases (such as propane tanks or large engines).
- AVOID** covering the ventilation openings. Always operate unit in an open area.

LIMITATIONS ON USE

Do not use in connection with life support systems or other medical equipment or devices.

2. PRODUCT DESCRIPTION

The KISAE Power Inverter package includes the items list below.

- Power Inverter base unit
- Owner's manual
- DC Input cable accessory

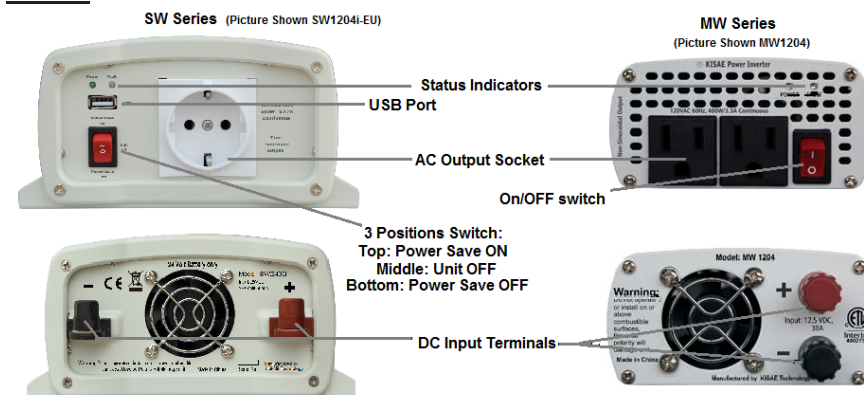
3. INSTALLATION

WARNING: KISAE Technology recommends that all wiring be done by a certified technician or electrician to ensure adherence to the applicable electrical safety wiring regulations and installation codes. Failure to follow these instructions can damage the unit and could also result in personal injury or loss of life.

CAUTION: Before beginning your power inverter installation, please consider the following:

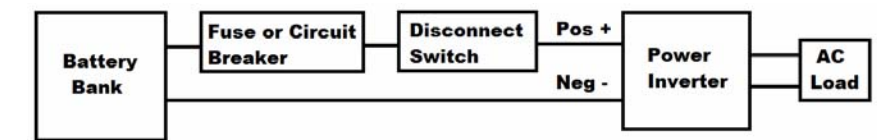
- The Power Inverter base unit should be used or stored in an indoor area away from direct sunlight, heat, moisture or conductive contaminants.
- When placing the unit, allow a minimum of three inches of space around the unit for optimal ventilation.

Understanding the unit features



Material Prepare for Installation

Typical Wiring block diagram of the Power Inverter:



Battery Bank:

- The use of deep cycle battery is highly recommended for power inverter application
- For battery size, you need to identify how long you wish to operate the load(s). KISAE does recommend that you purchase as much battery capacity as possible. See more on "Estimated Run time and Load" in Section 4.
- Please use 12V Battery Bank system for 12V DC Input Inverter (SW1204, MW1204, SW1204i and MW1204i series). Use 24V Battery Bank system for 24V DC Input Inverter (SW2405 and 2405i series). Using 12V DC Input Inverter on 24V Battery System will damage the inverter and may caught fire.

Fuse or Circuit Breaker:

- DC-rated fuse or DC-rated circuit breaker connected along the DC positive line is required.
- Select a fuse or circuit breaker with 60A/16V minimum rating for the 12V DC Input Inverter(s) and 35A/ 30V minimum rating for the 24V DC Input Inverter(s).
- Based on the size of the battery bank chosen on the 12V or 24V Battery Bank system above, determine the overall short circuit current rating of the battery bank from the battery manufacturer. The fuse or circuit breaker chosen has to be able to withstand the short circuit current that may be generated by the battery bank.

Disconnect Switch:

- Select a Disconnect Switch with the same or higher rating of the selected fuse or circuit breaker from the above.
- The Disconnect Switch is used to disconnect the DC power between the power inverter and the battery bank during service, maintenance or trouble shooting.

DC Input Cable:

- Use of low resistance wire is required for all the DC connections between the inverter and the battery bank.
- Uses minimum #8 AWG wire with maximum cable length of 5 feet for 12V DC Inverter system and #10 AWG wire for 24V DC Inverter system.

Installing the Power Inverter System

WARNING: Electrical Shock Hazard

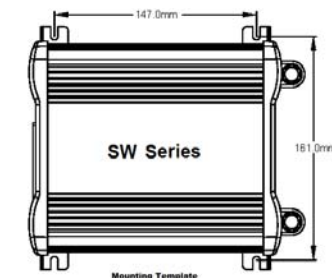
The unit 'On/Off' switch does not disconnect the DC power from the battery. Use the DC Disconnect Switch or disconnect the DC input cables connection to disconnect the DC power from the battery before working on any circuits connected to the unit. Failure to follow these instructions can result in death or serious injury.

CAUTION: Unit Damage

Reversing the battery connection to the DC Input terminals will damage the unit and it cannot be repaired. Damage caused by reverse polarity connection is not covered by the warranty.

Power Inverter Installation (All except MW series)

- Choose an appropriate mounting location.
- For indoor use, the orientation of the unit can be mounted in any direction except with the DC Input panel facing upwards or downwards.
- Use mounting template below to mark the positions of the mounting screws. Drill the 4 mounting holes and place the inverter in position and fasten the inverter to the mounting surface.



Power Inverter DC Input Connection:

- Connect one end of the negative DC input cable to the Power Inverter DC negative terminal (black).
- Connect the other end of the negative DC input cable to the battery negative terminal.
- Make sure the Disconnect Switch is in the OFF position.
- Connect one end of the positive DC input cable to the Inverter DC positive terminal (red).
- Connect the other end of the positive DC input cable to one of the terminals of the Disconnect Switch.
- Connect a DC input cable between the other terminal of the Disconnect Switch and one side of the terminal of the fuse holder.
- Connect a DC input cable between the other terminal of the fuse holder and the battery positive terminal.

- Install the selected fuse to the fuse holder.
- Turn Disconnect Switch to ON position.

**Connect unit with provided accessories (Battery Clips or Lighter Plug Cable)
Using the Lighter Plug Cable: (SW1204 series and MW1204 series only)**

CAUTION: Due to the limitations of the 12V lighter plug socket in vehicles, the unit should be used with the DC cable with lighter plug only to supply AC power to products that require 150W (120VAC/1.3 A or 230V/0.65A) or less. If the appliance requires more than 150W, use the DC Battery Cable Clips for battery connection.

- Attach the red ring-type connector to the positive (+) DC terminal (red) on the power inverter and connect the black ring type connector to the negative (-) DC terminal (black) on the Power inverter.
- Tighten the nut on each DC terminal.
- Insert the light plug of this cable to the fused 12V lighter plug socket.
- Unit is ready for use.

Using the Battery Clips Cable:

CAUTION: Please be sure all the connections are tight before the use of the unit.

- Attach the red ring-type connector to the positive (+) DC terminal (red) on the power inverter and connect the black ring type connector to the negative (-) DC terminal (black) on the Power inverter.
- Attach the negative (black) clip to the negative (-) battery terminal.
- Attach the positive (red) clip to the fuse or circuitry breaker of the 12V battery bank as indicated on 'Typical Wiring block diagram of the Power Inverter' on page 5.
- Unit is ready for use.

Test the Power Inverter:

- Turn unit on by switching the On/Off button to 'ON' or 'Power Save OFF' position on the unit. The 'Power' light turns on indicating the Power Inverter is ON. AC output is now available.
- Plug in a small AC load like a 40W table lamp or small appliance to the AC socket to verify AC is available.
- The unit is successfully installed and functioning properly.

Test the GFCI Monthly (for unit come with GFCI socket only):

- Turn unit on and plug a small AC load (40W light bulb) to the GFCI socket.
- Check the AC Load is ON.
- Press the 'TEST' button on the GFCI socket, the socket will trip and the AC load turns OFF.
- Press the 'RESET' button to reset the GFCI and the AC Load will turns back ON.
- GFCI is functioning properly.

4. UNIT OPERATION

WARNING: RISK OF EQUIPMENT DAMAGE

- Do not connect an AC power source like utility power or generator to the AC outlets of the inverter.
- For MW series, do not plug surge-protected power bars to the AC Output socket of the unit. Some surge protected components on the surge-protected power bar may not like the modified sinewave output generate by the MW series inverter.

For SW Series with Power Save Mode:

Turn on the unit in 'Power Save OFF' mode

- Toggle the 3 position switch to 'Power Save OFF' position (bottom) to turn unit ON in normal operation.
- Continuous AC Output is available at the AC output socket. Green 'Power' indicator will turn ON and 5V USB is available.
- Toggle the switch to middle position to turn unit off. 'Power' indicator will turn off.

Turn on the unit in 'Power Save ON' mode

- Toggle the 3 position switch to 'Power Save ON' position to turn unit ON with Power Save feature. Green 'Power' indicator will turn ON, 5V USB is available.
- If no load or < 10W load is connected to the AC output of the unit, the RED 'Fault' LED will flash, this indicates 'Power Save' mode is ON. The unit will provide few AC cycle for every 5 seconds.
- If >10W AC load is connected to the unit, the RED 'Fault' indicator will turn OFF indicating that continuous AC output is provided.
Note: This special 'Power Save' mode is designed to let the unit run in standby mode and check for any AC load with more than 10W every 5 seconds. If load connected is >10W, a continuous AC Output is provided. The unit will automatically return to standby mode when AC load connected drops to < 5W.

For MW Series or SW series without Power Save Mode:

Turn ON and OFF the unit

- Toggle the On/Off switch to 'ON' position to turn unit ON.
- 'Power' indicator will turn ON indicates AC Output power is available.
- Toggle the On/Off switch to 'Off' position to turn unit off. 'Power' indicator will turn off.

Understanding the LED indicators

'Power' Indicator: Illuminated indicates unit is ON.

'Fault' indicator:

Illuminated continuously indicates fault was detected. Unit has shutdown. To reset unit, remove the fault condition and reset unit by using the toggle switch and turn unit off and on again.

For SW series with 'Power Save Mode' function, 'Fault' indicator flashing indicates 'Power Save' mode is ON and power consumption on AC load is <10W.

Understanding the Fan Operation

The fan on the unit is load activated. It will automatically turn on when AC output power exceed the pre-set values (~ 200W).

AC Load on Power Inverter

Although the Power Inverter can provide high surge power up to two times the rated output power, some appliances may still trigger on the inverter protection system during start up or surge period. A higher power inverter is required for those appliances.

Important: For Modified Sinewave Inverter MW series, some appliances like speed controllers found in some fans, power tools and some power tools' AC charger may not like the modified sine wave generate by the inverter, those appliances may not work or may be damaged if they are connected to the inverter. If you are unsure about powering any device with the inverter, contact the manufacturer of the device.

Estimated Run time on Load

Following run time is an estimate based on using a 12V-120AH battery bank for 12V system and 24V-60AH battery bank 24V system. Actual runtime may vary.

Load	Consumption	Estimate Run time
Cordless Phone	5W	150 hrs
Clock / Radio	8W	100 hrs
Table Lamp	40W / 60W	27 hrs/ 18 hrs
Small Freezer (8.8 cu. ft.)	80W	15 hrs
20" LCD TV	100W	11.5 hrs
Flooded Light	500W	1 hr
Sump Pump (1/2 hp)	350W	Not applicable (surge too high)

5. TROUBLESHOOTING

Problem	Symptom	Solution
No AC output and 'Power' LED is OFF	The unit is off	Turn unit ON using the toggle switch
	No power to inverter	Check fuse or the Disconnect switch (if installed) is either blown or turned OFF
No AC output. 'Fault' indicator is ON	Unit has detected fault and has shutdown	Verify the fault condition (the load connected may be too high). Make correction and reset unit.
'Fault' indicator is Flashing. AC Load connected is turning ON and OFF (For unit with "Power Save" Feature only	'Power Save' mode is in use and the AC load connected is <10W	Unit is normal. Power consumption on AC load connected is <10W, switch unit to 'Power Save OFF' mode to have a continuous output or increase the AC load to >10W.

6. SPECIFICATIONS

Note: Specifications are subject to change without notices.

Specifications	MW1204	SW1204	MW1204i	SW1204i	SW2405	SW2405i
Inverter						
AC Output Power	400 Watt			500 Watt		
AC Output Current	3.33A		1.74A		4.17A	2.17A
AC Surge Power	800 Watt					
AC Output Voltage	120Vac		230Vac		120Vac	230Vac
	60Hz		50Hz		60Hz	50Hz
AC Output Waveform	True Sinewave (<3% THD)					
DC Input Voltage	12.5 VDC			25.0 VDC		
No Load Current	<0.3A	N/A	<0.3A	N/A	N/A	
No Load Current (Power Save OFF)	N/A	< 0.8 A	N/A	< 0.8 A	<0.5 A	
No Load Current (Power Save ON)	N/A	< 0.1 A	N/A	< 0.1A	<0.1 A	
DC Operating Range	10.5 – 15.75VDC			21.0 – 31.0 VDC		
Under Voltage Alarm	11.0 VDC			22.4 VDC		
UV Shutdown	10.5 VDC			21.0 VDC		
UV Recovery	12.0 VDC			23.6 VDC		
OV Shutdown	15.75 VDC			31.0 VDC		
AC Output Socket	NEMA 5-15	NEMA 5-15 (GFCI)	EU, AU, UK		NEMA 5-15 (GFCI)	EU, AU, UK
DC Output						
USB Output (5V)	N/A	2.1A	N/A	2.1A	2.1A	2.1A
Safety and Environmental						
Agency Markings	cETLus *	cETLus *	N/A	CE	cETLus *	CE
Operating Temp.	0°C to 40°C (32°F to 104°F)					
Storage Temp.	-20°C to 60°C (-4°F to 140°F)					
Relative Humidity	5 - 90% noncondensing					

Operating Altitude	Up to 6,560ft (2000 m) above sea level					
Weights and Dimensions						
Weights	0.73 kg	1.73 kg	0.80 kg	1.73 kg	1.73 kg	
Dimensions (LxWxH)	MW1204: 152 x 101 x 51 mm,					
	MW1204i: 158 x 105 x 67 mm					
	SW Series: 312 x 175 x 87mm					

* The product is conforms to UL STD.458 and certified to CSA STD. C22.2 No.107.1

7. WARRANTY

One Year Limited Warranty

The limited warranty program is the only one that applies to this unit, and it sets forth all the responsibilities of KISAE. There is no other warranty, other than those described herein. Any implied warranty of merchantability of fitness for a particular purpose on this unit is limited in duration to the duration of this warranty.

This unit is warranted, to the original purchaser only, to be free of defects in materials and workmanship for one year from the date of purchase without additional charge. The warranty does not extend to subsequent purchasers or users.

Manufacturer will not be responsible for any amount of damage in excess of the retail purchase price of the unit under any circumstances. Incidental and consequential damages are specifically excluded from coverage under this warranty.

This unit is not intended for commercial use. This warranty does not apply to damage to units from misuse or incorrect installation/connection. Misuse includes wiring or connecting to improper polarity power sources.

Return/Repair Policy:

If you are experiencing any problems with your unit, please contact our customer service department atinfo@kisaetechnology.com or Phone 1-877-897-5778 before returning product to retail store. After speaking to a customer service representative, if products are deemed non-working or malfunctioning, the product may be returned to the purchasing store within 30 days of original purchase. Any defective unit that is returned to manufacturer within 30 days of the date of purchase will be replaced free of charge. If such a unit is returned more than 30 days but less than one year from the purchase date, manufacturer will repair the unit or, at its option, replace it, free of charge. If the unit is repaired, new or reconditioned replacement parts may be used, at manufacturer's option. A unit may be replaced with a new or reconditioned unit of the same or comparable design. The repaired or replaced unit will then be warranted under these terms for the remainder of the warranty period. The customer is responsible for the shipping charges on all returned items.

Limitations:

This warranty does not cover accessories, such as adapters and batteries, damage or defects result from normal wear and tear (including chips, scratches, abrasions, discoloration or fading due to usage or exposure to sunlight), accidents, damage during shipping to our service facility, alterations, unauthorized use or repair, neglect, misuse, abuse, failure to follow instructions for care and maintenance, fire and flood.

If your problem is not covered by his warranty, call our Customer Service Department atinfo@kisaetechnology.com or 1-877-897-5778 for general information if applicable.