DRAKE SVO

SPECIAL VEHICLE OPERATIONS

INSTALLATION & OPERATION MANUAL

Kisae 400W Pure Sine Wave Inverter - SW1204i

Model SW1204i-EU

SUPPLIED AND SUPPORTED BY

Drake SVO

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True Sinewave Power Inverter
SW 1204 series

Modified Sinewave Power Inverter
MW 1204 series

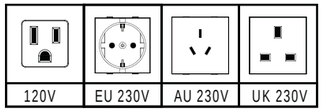
Owner's Manual



SW1204 Series



MW1204 Series



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

True Sinewave series
SW 1204 120V 400W true Sinewave power inverter with USB port
SW 1204i 230V 400W true Sinewave power inverter with USB port
Modified Sinewave series
MW 1204 120V 400W modified Sinewave power inverter

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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 series 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 120 VAC, 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 accessories

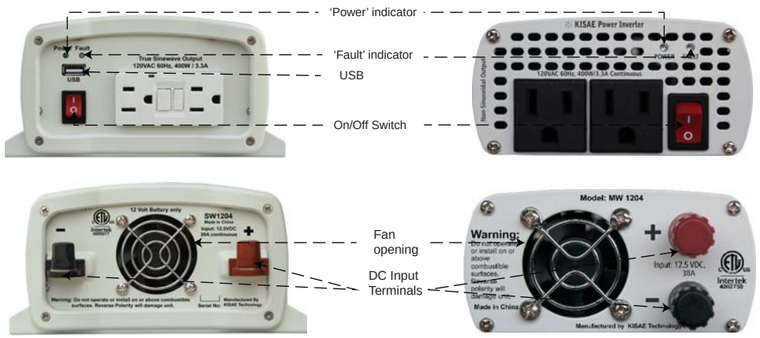
3. INSTALLATION

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 KISAE 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

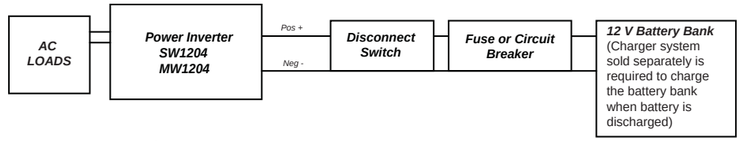
SW1204 series:



MW1204 series:

Material Prepare for Installation

Typical Wiring block diagram of the Power Inverter:



12V Battery Bank:
- The use of deep cycle battery is highly recommended for power inverter application
- For battery size, you need to identify how much you will be using them between charges. KISAE do recommends you purchase as much battery capacity as possible. See more on Battery Run time and Load in Section 4.

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 a minimum of 60 ADC.
- Based on the size of the battery bank chosen on the 12V Battery Bank 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.

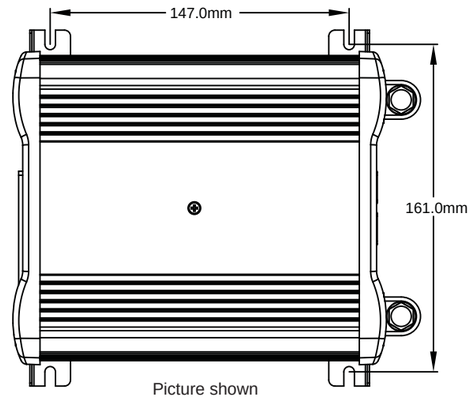
Disconnect Switch:
- Select a Disconnect Switch with the same or higher the rating of the selected fuse or circuit breaker from the above.
- The Disconnect Switch is used to disconnect the DC power between the power inverter and the battery bank during service, maintenance or trouble shooting.

DC Input Cable:
- Use of low resistance wire is required for all the DC connections between the inverter and the battery bank.
- Uses minimum #10 AWG wire with maximum cable length of 5 feet.

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: Reverse the DC Input terminal will damage the unit and cannot be repaired. Damage caused by reverse polarity connection is not covered by the warranty.

Power Inverter Installation (SW1204 series only):
- 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 downwards.
- For RV installation, the unit has to be mounted flat on horizontal surface.
- 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.



Picture shown
SW1204 series

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 Power Inverter DC positive terminal (red). Connect the other end of the positive DC input cable to one of the terminal 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 optional accessories using the Lighter plug cable:

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 optional DC 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.

Connect unit with optional accessories 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' .
- Unit is ready for use.

Test the Power Inverter:

- Turn unit on by using the On/Off button on the unit. The 'Power' light turns on indicating the KISAE Power Inverter is ON. AC output is now available.
- Plug in a small AC load like a 25W 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 (120V-SW1204 series only, Not Required for 230V-SW1204i series):

- Use the following instruction to perform a monthly test on the GFCI to ensure the GFCI is functioning properly.
- Turn unit on and plug a small AC load (40W light bulbs) to the GFCI.
- Check the AC load is ON.

4. UNIT OPERATION

WARNING: RISK OF EQUIPMENT DAMAGE

- Do not plug surge-protected power bars into the unit's AC outlets. The surge protected Components on the surge-protected power bar may not like the modified sine wave output generate by the inverter.
- Do not connect an AC power source like utility power or generator to the unit AC outlets.

Turn ON and OFF the unit

- Toggle the On/Off switch to 'ON' position to turn unit ON.
- 'Power' indicator will turn green.
- AC O utput is available at the AC output socket. (For SW1204 and SW1204i series, 5V USB is also available.)
- Toggle the On/Off switch to 'Off' position to turn unit off. 'Power' indicator will turn off.

Understanding the LED indicators

'Power' indicator: Indicator turn on indicate unit is ON.

'Fault' indicator: Indicator turns on indicate 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.

Understanding the fan operation

The fan on the unit will automatically turns on when it sense the internal temperature of the unit reach to its preset level.

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. A higher power inverter is required for those appliances.

For MW1204 series, with modified sine wave output, 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..

Estimate Run time on Load

Following run time is an estimate based on using a 12V-120AH battery bank for reference. Actual run time 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
Freezer (8.8 cu. ft.)	80W	15 hrs
20" LCD TV	100W	11.5 hrs
Sump Pump (1/2 hp)	350W	Not applicable (surge too high)

5. TROUBLESHOOTING

To trouble shoot the unit, please note the error code display on the main unit and review the "Understanding the Error Codes" in section 4.

Problem	Symptom	Solution
No AC output and 'Power' indicator 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 turn OFF
No AC output. 'Fault' indicator is ON	Unit detect fault and has shutdown	Verify the error condition and make correction and reset unit
Products connected to unit malfunction or overheat (MW1204 series)	Products connected to unit do not accept modified sine wave output generated by the inverter	Products are not compatible with the modified sine wave output generated by inverter. See "AC Load on Power Inverter" in Section 4. Use KISAE Power Inverter with sine wave output

6. SPECIFICATIONS

Note: Specifications are subject to change without notices.

Specifications	*SW 1204 Series*		*MW 1204 Series*	
	SW1204	SW1204i	MW1204	MW1204i
Inverter				
AC Output Power	400W			
AC Output Current	3.3A	1.74A	3.3A	1.74A
AC Surge Power (Peak)	800W			
AC Output Voltage	120 VAC 60 Hz	230 VAC 50 Hz	120 VAC 60 Hz	230 VAC 50 Hz
AC Output Waveform	True Sinewave (<3% THD)		Modified Sinewave	
Nominal DC Input Voltage	12.5 VDC			
No Load battery draw	< 0.8 ADC		< 0.3 ADC	
DC Input Voltage operating range	10.5 – 15.5 VDC			
Under Voltage Alarm	11.2 VDC			
Under Voltage Shutdown	10.5 VDC			
Under Voltage Recovery	11.8 VDC			
Over Voltage Shutdown	15.5 VDC			
AC Output socket	GFCI Duplex receptacle	EU, AU, UK	NEMA 5-15P	EU, AU, UK
DC Output				
USB Output	5V/ 1 A		Not applicable	

Safety and Environmental				
Conformance	UL 458 CSA C22.2 no. 107.1	CE	UL 458 CSA C22.2 no. 107.1	CE
Agency Markings	cETLus		cETLus	
Operating Temperature	0°C to 40°C (32°F to 104°F)			
Storage Temperature	-20°C to 60°C (-4°F to 140°F)			
Relative Humidity	5-90% noncondensing			
Operating Altitude	Up to 9,843ft (3000 meters) above sea level			
Weights and Dimensions				
Weights	3.8 lbs (1.73 kg)		1.6 lbs (0.73 kg)	
Dimensions	6.9 x 7.9 x 2.3" (175 x 200 x 89 mm)		4 x 6 x 2" (101 x 152 x 51mm)	

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 at info@kisaetechnology.com or Phone 1 604 320-7857 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 at info@kisaetechnology.com or 1 604 320-7857 for general information if applicable.