



BN Products - USA, LLC.

A Division of Benner-Nawman, Inc. - Wickenburg, AZ

MODEL: BNG2800iE INVERTER GENERATOR USER'S MANUAL



3450 Sabin Brown Road • Wickenburg, AZ 85390
(800) 992-3833 • mail@bnproducts.com

thank you

Thank you for choosing our inverter generator.

This manual covers the proper operation and maintenance.

Before operating, please read this manual carefully for important procedures and safety.

All technical data and drawings in this manual are consistent with the information on this product. As a result of revisions and other on going updates, the contents of this manual may be slightly different from the actual product. BN Products reserves the right to make changes at any time, without notice and without incurring any obligation, please understand.

The copyright of this instruction manual belongs to us. No reproduction is allowed without the written consent of BN Products-USA. All rights reserved.

This manual is a permanent part of this generator set and should accompany the generator set if it is resold.

Read the Owner's Manual carefully before using this generator.



Safety Warning

Personal, product, and property safety of you and others is very important.

Please read carefully the extremely important safety warnings contained in this manual and on the labels of this generator set.

Safety warnings can alert you to potential dangers that may harm you and others.

Please note "Danger", "Warning", and "Notice" in front of important safety warnings - details below Please take extra precautions when you read these three notes:



If you do not follow the instructions, your life can be in danger or you can be seriously injured.



If you do not follow the instructions, your life can be in danger or you can be seriously injured.



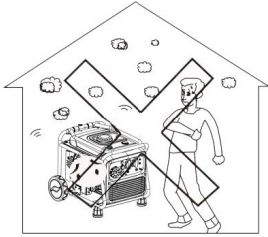
If you do not follow the instructions, you can be injured.

If you do not follow the instructions, your generator set and other property may be damaged.

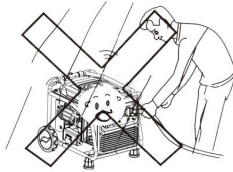
Safety Instruction

Safety Specification:

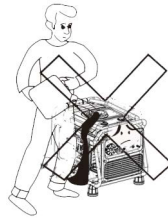
Please read and understand this manual before operating. Familiarity with the safe operating procedures of generators can help you avoid accidents.



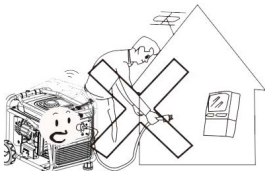
Don't use indoors



Don't use in a damp environment



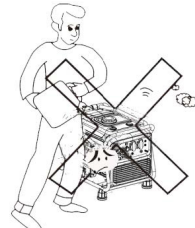
Do not spill gas when fueling



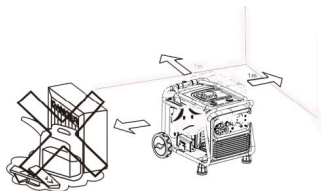
Do not connect directly to household wiring



Don't smoke while adding fuel



Stop generator before fueling



Please remove combustible materials at least 4 feet away from generator

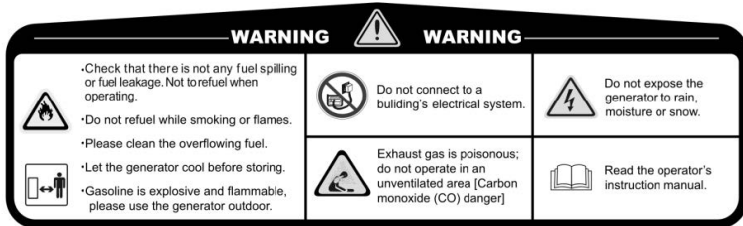
Special Request

- Electrical cords and plugs should be in good condition without exposed wires or connections.
- A ground terminal is on this generator and should be connected to a ground wire.
- Extension cords need to be the proper gauge for the distance they have to run.

Safety Warning Label

Please read the manual carefully before using.

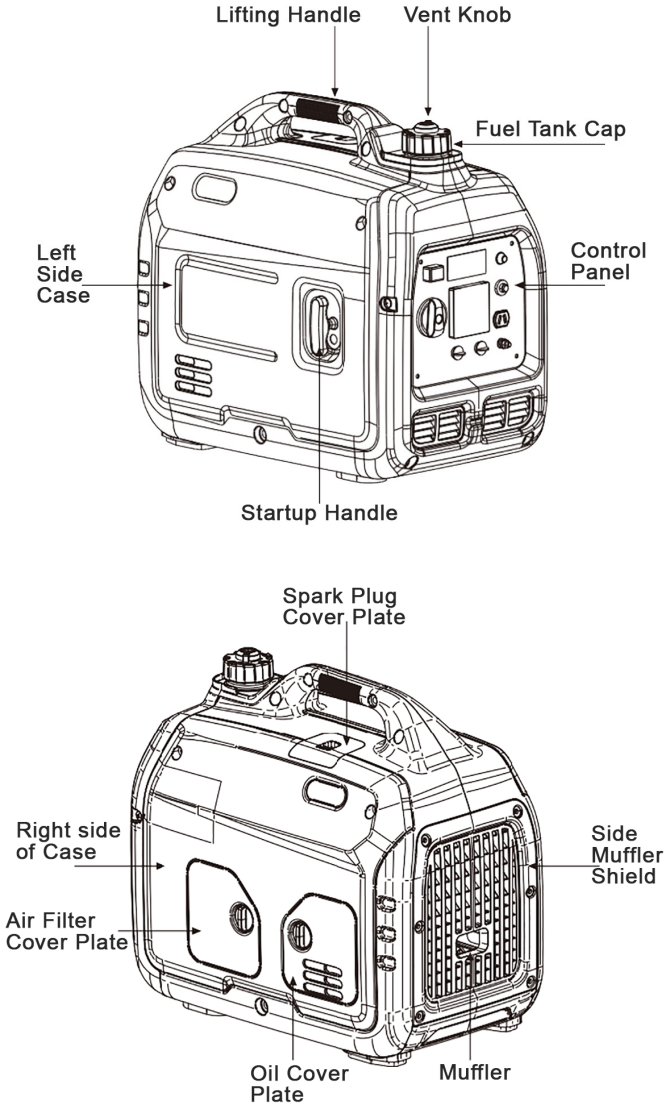
Safety warning labels:



Components Identification

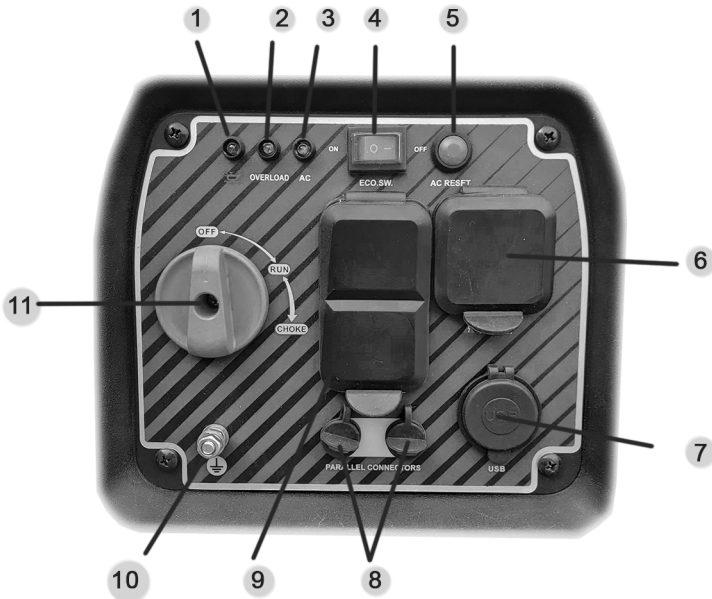
Components Features:

BNG2800iE Gas Inverter



Control Panel

Factory may adjust the panel for different configurations. Please note that the configuration is subject to change without prior notice.

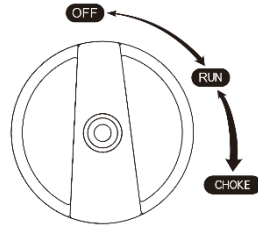


1. Engine Oil Indicator Light
2. Overload Indicator Light
3. AC Indicator Light
4. ECO Switch
5. Reset Button
6. Twist Lock Plug
7. Twin-stage USB Plugs
8. Parallel Sockets
9. Duplex GFCI Plugs
10. Ground Terminal
11. Multi Function 3 in 1 Switch

Control Functions

Three-in-one combination switch (hereinafter referred to as combination switch)

- In the “OFF” position, the engine is off and the fuel valve is closed.
- In the “RUN” position, the ignition circuit is on, the fuel valve is open, and the Choke function is off.
- In the “CHOKE” position, the ignition circuit is on and set to a rich mixture for starting a cold engine. Once running it should be reset to the “Run” position



ATTENTION: If engine is already hot, you don't need to use the “CHOKE” position.

Oil indicator (red)

When the oil in the crankcase drops too low, the oil protection system will automatically shut down the engine, and oil alarm indicator will light up; the engine can be restarted only after the oil is filled to the proper oil level.



Tip: If the engine stops running or will not start, turn the combination switch to the “RUN” position, and then pull startup handle. If oil indicator flashes a few seconds, the oil volume is insufficient, fill oil and restart.

Overload indicator (red)

When the overload indicator lights up, the generator has detected that the output of connected electrical equipment is too much, causing the AC voltage to rise. At this moment, AC protector works and stops producing power, to protect the generator and connected electrical equipment. AC indicator (green) will go off and overload indicator (red) will light up, but the engine will continue running.

When overload indicator is on and the generator has no output, please take following counter measures:

Switch off electrical equipment, and shut down the generator.
Disconnect electrical equipment connected to the sockets.

Check to make sure the air inlet is clean and clear. If there is any blockage, clean it immediately.

After checking, restart the engine.

TIP: When using electrical equipment with high starting current such as compressors, the overload indicator may light or flicker for a few seconds at the beginning, but this is normal.

AC indicator (green)

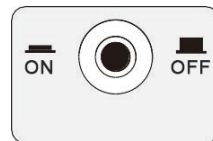
The AC indicator lights up when the engine is started and output is normal.

DC protection

When electronic equipment connected to the DC socket of the generator is too much, the DC switch will automatically trip to the “OFF” position. Before starting the generator again, press the DC switch to reset it in the “ON” position.

“ON” DC power is on.

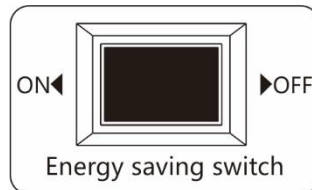
“OFF” DC power is off.



ATTENTION: If DC protection is in the off position, reduce the load to within the rated output range of the generator and reset. If DC protection continues to trip off and consult your dealer.

Energy-Saving Switch

“ON”: When the energy-saving switch is switched to “ON” position, the device controls engine speed based on the load connected, improving fuel consumption and noise reduction.

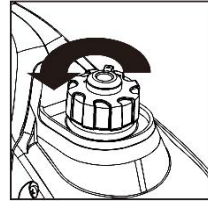


“OFF”: When the energy-saving switch is set to the “OFF” position, the engine will run at the rated speed, regardless of the load load.

Tip: When using devices, such as air compressor pump with high start-up loads, the energy-saving switch must be in “OFF” position.

Fuel tank cap

Remove fuel cap by unscrewing it counter-clockwise.



AC recovery

When the output is overloaded, the generator will automatically trip the reset and stop the output but not the generator. Reduce the load, press the AC recovery switch, and the generator will resume output.

Grounding terminal

The grounding terminal should be connected to a grounding wire to prevent electric shock.

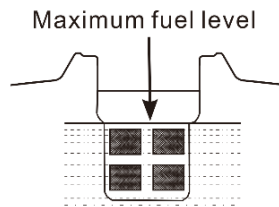


Preparations

Fuel

DANGER: Fuel is flammable and toxic, please read the Safety Instruction carefully before adding fuel.

Do not over fill, otherwise fuel will spill when fuel tank is warm. After refueling, confirm that the fuel tank cap has been tightened.

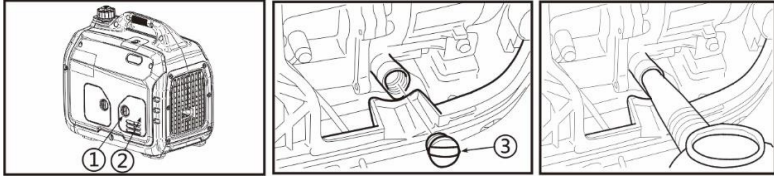


ATTENTION: clean spilled gasoline with a clean and soft cloth to avoid damaging plastic enclosure;

Unleaded gasoline must be used, as leaded gasoline can seriously damage internal parts of the generator

Remove fuel tank cap, and add gasoline to red horizontal line. Fuel tank capacity: One Gallon

Oil



This generator is shipped without oil. Do not start up the generator without filling it with sufficient oil.

- Please place the generator on a flat surface;
- Unscrew the knob to remove oil cover plate;
- Unscrew oil dipstick;
- Fill with oil (SAE 10W/30 oil is recommended, of which the grade is API standard Type SE or higher). It should take about .45 qt.
- Replace the oil dipstick
- Reassemble oil cover plate and latch the knob.

Pre-Use Inspection

WARNING: Before the generator is started visually check for loose bolts or leakage and repair if necessary.

Tip: The condition of the generator shall be inspected before using every time.

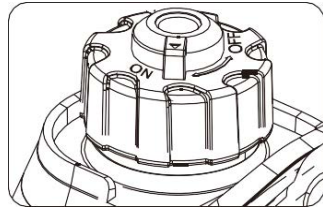
Pre-operation inspection

Fuel: Check the fuel level in the fuel tank of the generator, and add fuel if it is necessary.

Oil: Check oil level of the generator, and fill oil if needed. Check for any oil leaks.

Starting up the Generator

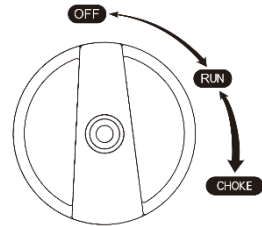
- Remove any connected loads.
- Switch energy-saving switch to “OFF”;
- Turn ventilation knob of fuel tank cap to “ON”
- Turn combination switch control to “CHOKE” position; Switch to the “RUN” position once the generator gets going.



In the “RUN” position the fuel is on • Ignition system is on • The choke valve is closed,

Tip: When a hot engine is started up, it is not necessary to use the “CHOKE” position, just turn the combination switch to “RUN”.

At this point, lightly pull the startup handle, until you feel some resistance, and then pull it with effort.



Tip: When pulling the starter rope, hold the generator carrying handle with your other hand to prevent the generator from overturning.

Shutting Down the Generator

Turn the combination switch to the “OFF” position; After the generator has completely cooled down, turn ventilation knob on fuel tank cap to “OFF”.

Using the Generator

Operation Information:

Applicable temperature: 23° - 104° F (-5 - 40°C);

Applicable humidity: below 95%;

Applicable altitude: regions below 5,000 ft (power will decrease when operating above 3,300 ft.).

Generator Wiring:

- This generator should not be directly connected to house wiring. It is designed to only operate outdoors and to connect directly to appliances by way of extension cords.
- After connecting a load to the generator, check that the electrical connections are safe and proper. Extension cords should be properly sized and rated for the load. Each extension cord should be in good condition without cracks or nicks and they should be equipped with protective plug ends.
- Do not connect this generator to any commercial power outlet.
- Connection of AC power

Connection of AC power

WARNING All electrical equipment should be turned off before plugging into the generator.

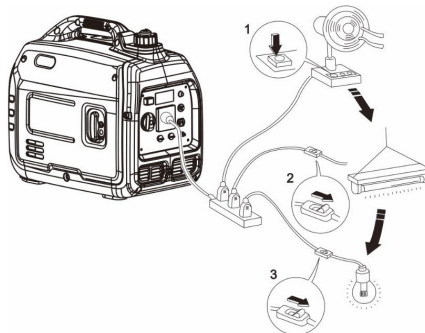
Make sure that all electrical loads are within the rated load range

Tip: Make sure that the generator set is grounded.

Start up the engine

- Turn energy-saving switch to “OFF”
- Make sure that AC indicator is lit up
- Insert the plug into AC outlet
- Turn on electrical equipment.

Tip: The energy-saving switch must be switched to “OFF” if the generator set supplies power to multi loads. When attaching loads to the generator, connect the larger loads first.



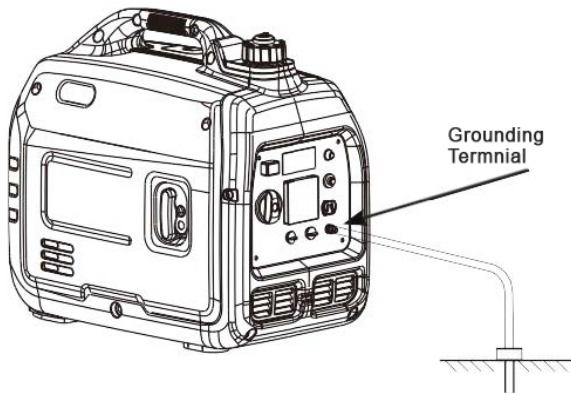
Generator Grounding

In order to prevent any damage to the generator caused by electric shock or improper electrical application, it is recommended that the generator be grounded with insulated ground wire.

Please use grounding wire with sufficient capacity

Connect one end of grounding wire to grounding terminal on control panel of the generator set.

Connect the second end of the wire to a ground rod or other proper grounding devise.



Battery charging

Tip: The rated DC voltage of this generator is 12V. Before charging, make sure that the DC protector has been switched on. Start up the generator.

- Connect red conductor of the battery to positive (+) terminal of the battery.
- Connect black conductor of the battery to negative (-) terminal of the battery.
- Insert charging cord into plug on generator.

ATTENTION: Make sure that red conductor of the charger is connected to positive terminal (+) of the battery, and the black wire is connected to the negative terminal. Do not get these reversed.

The connection between charger cable and battery terminal must be secure, to prevent the cable from moving or loosening. Follow steps in the User's Manual for proper operation. In the process of charging, if the current exceeds the rated current the DC protector will switch off the output. Reset the DC protector to "ON". If the DC protector switches off again, stop charging immediately and contact your dealer.

WARNING: Never smoke, and never connect or disconnect the connection to the battery during charging. The spark generated will ignite gas around the battery. Battery electrolyte contains sulfuric acid, which is toxic and can cause burning. Please avoid exposure to skin, eyes and clothing.




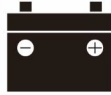
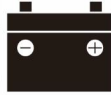
In the case of exposure to sulfuric acid accidentally, treatment method is:

- External exposing: flush with large amount of water.
- Ingestion by mistake: Drink large amount of water or milk, and drink, egg liquid or vegetable oil containing magnesium oxide. Send the victim to hospital immediately
- Spashing into eyes: Flush with water for 15 minutes, and seek medical treatment.

TIP: The battery can generate explosive gas, so please keep it far away from spark, flame or cigarettes. Please provide ventilation when charging or using the battery in a confined space. wear safety glasses when working near the battery.

Keep the batteries out of the reach of children.

Range of application

| AC |  |  |  | DC  |
|--------------|---|---|---|---|
| Power Factor | 1 | 0.8~0.95 | 0.4~0.75 (Efficiency0.85) |  |
| Output | ≤1800W | ≤1350W | ≤600W | Rated Voltage 12V |

Before using the generator, please make sure that the total load is within the rated load range of the generator, otherwise the generator could be damaged.

Tip: AC and DC can be used at the same time, but total power amount can not exceed rated output power. When total power exceeds rated power the overload indicator will light up and the power output may stop.

Service and Maintenance

Good maintenance and service is the best guarantee for the safe, economical, and reliable operation of this generator. It also contributes to a cleaner environment. In order to keep the generator in good working condition, you must inspect and maintain it regularly. The maintenance schedule is as follows:

| Maintenance cycle | | Each | First maintenance is carried out after 1 month or 20 hours of use | Afterwards, the maintenance is carried out every three months or every 50 hours | Every year or use of 100 hours |
|--|--------------------------|---|---|---|--------------------------------|
| Item | | | | | |
| Engine oil | Check - fill | √ | | | |
| | Replace | | √ | √ | |
| Gearbox gear oil (if any) | Check oil level | √ | | | |
| | Replace | | √ | √ | |
| Air cleaner element | Inspection | √ | | | |
| | clean | | √ | | |
| | Replace | | | √ | |
| Settling bowl (if any) | Clean | | | | √ |
| Spark arrestor | Clean - adjust | | | | √* |
| Spark eliminator | Clean | | | √ | |
| Idle speed (if any) ** | Check - adjust | | | | √ |
| Valve clearance ** | Check - adjust | | | | √ |
| Fuel tank and fuel filter *** | Clean | | | | √ |
| Fuel hose | Inspection | Every two years (Please replace if necessary) | | | |
| Cylinder head, piston | Remove carbon deposit ** | Displacement <225cc, every 125 hours; displacement ≥225cc, every 250 hours. | | | |
| * These items shall be replaced if necessary; ** These items shall be maintained by the dealer authorized by the Company, unless the user has proper tools and maintenance ability. | | | | | |

ATTENTION: If this generator often works under high temperatures or high loads, oil should be changed every 25 hours. If it often operates in dusty or harsh environments, the air cleaner element should be cleaned every 10 hours. If necessary, the air cleaner ele-

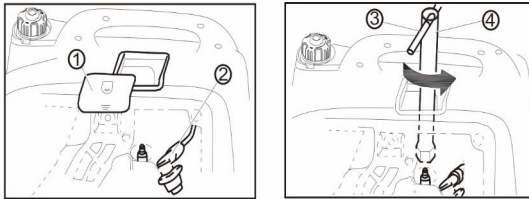
ment should be replaced every 25 hours. It should be maintained by spot-inspection cycle and run time, whichever is earlier. If the service time has passed, perform the maintenance as soon as possible as per the previous table.

WARNING: Shut down the engine before performing any maintenance. The engine needs to be placed on a flat surface. In order to prevent the engine from starting up, disconnect spark plug cap from spark plug.

Do not use the generator indoors or use it in enclosed environment. Make sure that the work area is well ventilated. Exhaust gas from the engine contains toxic gases, breathing them can cause shock, loss of consciousness, and death.

Spark Plug Inspection

The spark plug is an important part of the generator, and should be inspected regularly.



Remove decorative cover and spark plug cap of the generator. Insert the screwdriver into the spark plug wrench, to screw it counterclockwise, and then remove the spark plug. Check for discoloration, and remove any carbon deposits. Check the electrode clearance.

Standard spark plug: A5RTC
Spark plug gap: 0.7-0.8mm

Installation of spark plug



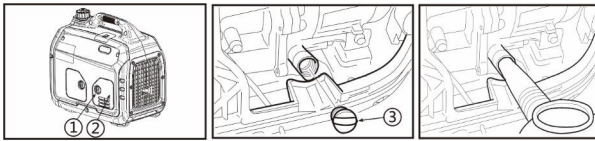
Tip: If there is no torque wrench when installing the spark plug, an estimation method is to screw it 1/4-1/2 turns after seating it in place, but the spark plug needs to be screwed to specified torque as soon as possible. Spark plug cold torque: 9.25 ft lbs.

Adjustment of the Carburetor

The carburetor is an important component of the engine. Adjustment should be carried out by a dealer with professional knowledge, professional data, and equipment, to ensure that the adjustment is proper.

Replacement of Oil

WARNING: Do not drain the oil immediately after turning off the generator. Oil temperature is very high when operating. Take care to avoid scalding.



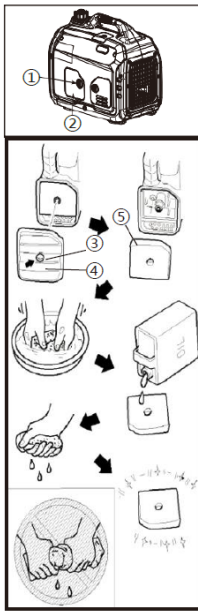
- Place the generator on a flat surface, start up the generator for a few minutes to increase its temperature, and then shut down the engine and turn the three-in-one combination switch knob to "OFF".
- Unscrew the knob (1), to remove oil cover plate (2).
- Unscrew oil dipstick(3).
- Place an oil pan under the engine, tilt the generator to quickly pour out oil.
- Return the generator to a flat surface.

ATTENTION: When filling with oil, do not tilt the generator but keep it flat to prevent adding too much oil.

- Refill oil to the proper level.
- Tighten oil dipstick, replace external cover and tighten the knob.
- Recommended oil: SAE 10W/30
- Oil grade: API standard Model SJ or higher Volume: .45 qt.

Air filter

A dirty air filter may prevent air from flowing into the carburetor. In order to prevent failure of the carburetor, please maintain the air filter regularly. If the generator is used in a dusty environment, it should be maintained more frequently.



Turn the knob (1), to remove the access cover of air cleaner (2). Loosen screw (3), to remove cover of air cleaner (4). Remove foam filter element (5). Clean foam filter element with cleaning solvent and blow it dry. Drip a few drops of oil on the foam filter element and squeeze off excess oil. The foam cleaner element should be saturated, but there should not be dripping oil.

ATTENTION: Be sure not to twist the foam filter element too forcibly to prevent damage.

Replace foam filter element into air cleaner housing.

Tip: Make sure that the surface of the foam filter element is fitted properly in the air cleaner, and there is no gap leaking air. Be sure not to start the engine before the air cleaner properly replaced.

Reassemble air cleaner cover back to original position, and tighten screws.

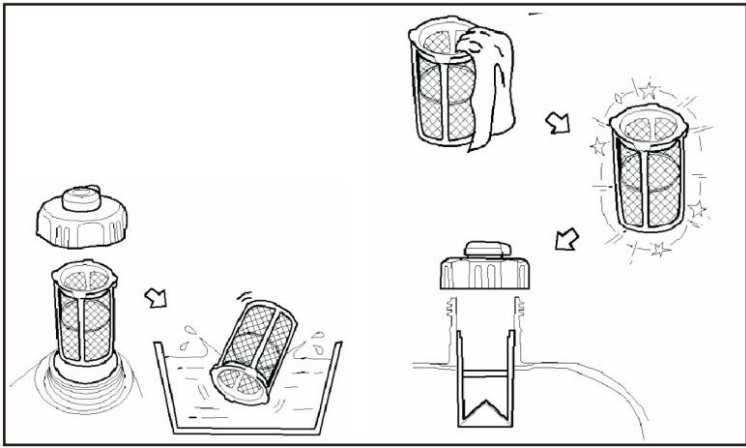
Reinstall air cleaner access and lock into place.

Fuel Filter Screen Service

WARNING: Do not open the fuel tank of the generator while smoking or close to an open flame.

- Remove fuel tank cap and fuel tank filter screen;
- Clean fuel tank filter screen with gasoline;
- Wipe filter screen dry, and put it back into fuel tank;
- Reassemble fuel tank cap.

ATTENTION: Be sure to screw fuel tank cap tight.



Storage and Transport

Generator storage

If it is stored long-term, in order to prevent damage, you should take some storage measures.

- Turn the three-in-one switch to “OFF”.
- Open fuel tank cap, to take out fuel filter screen. Pump all fuel in fuel tank into a gas can or storage tank, and then reassemble fuel tank cap.
- Start up the engine to burn off fuel in the carburetor.
- Remove bolts of the right side of the enclosure and remove cover.
- Unscrew fuel drain bolt on the carburetor, and drain any fuel in the carburetor into a gas can.
- Turn three-in-one switch to “OFF”;
- Tighten fuel drain bolt;
- Assemble the right side of the enclosure cover, and tighten bolts;
- After the engine is completely cooled, switch off ventilation knob of fuel tank cap;
- Unscrew oil dipstick, and drain oil in the crankcase. Fill with new oil to the proper level, and then replace oil dipstick.
- Remove spark plug, to pour a teaspoon of clean oil into combustion chamber. Rotate the crankshaft a few turns, to distribute oil, and reassemble spark plug;
- Gently pull startup handle until you feel resistance, this allows both inlet valve and exhaust valve to close.
- Store the generator set in a clean and dry area.

Generator transport

- When the generator set is transported, be sure that there is no spilled or leaking fuel.
- Do not fill excessive fuel into fuel tank.

Troubleshooting

When the engine will not start... Check List:

Fuel system

- There is no fuel in combustion chamber.
- There is no fuel in fuel tank. . . . Fuel it.
- Fuel line is blocked... Clean or replace.
- The Fuel valve is blocked. . . . Clean fuel valve.
- Carburetor clogged. . . . Clean the carburetor.

Insufficient oil

- Oil level is too low. . . . Fill oil.

Circuit system

- Turn engine switch to "RUN".
- Check spark.
- The spark plug is dirty or wet. Remove carbon deposit and wipe spark plug dry.
- Bad ignition system. . . . Take it to a service center.

Bad compression

- Abrasion of the piston and cylinder. . . . Take it to a service center.
- Screws on the top of cylinder head are loose. . . . Tighten nuts properly.
- Sealing gasket is damaged. . . . Replace the gasket.

No electrical power is produced

- Water in the genset. . . . Dry the generator.
- Check for loose wire. . . . Tighten any loose connectors.
- Output socket is damaged. . . . Replace the socket.
- The circuit is overloaded. . . . Remove the load and shutdown the generator, then reset the breaker, and restart the engine.

Technical Parameters

| Item | Parameter | |
|--------------------------|--|------------------------------------|
| Engine model | 148F/P-2 | 164F/P |
| Engine type | Single-cylinder, four-stroke, air-cooled, overhead valve, tilted 25° of the center of gasoline engine cylinder | |
| Bore size × Stroke (mm) | 48.6×43 | 64×45 |
| Displacement (cc) | 79.7 | 145 |
| Compression ratio | 8.7± 0.2 | 8.7± 0.2 |
| Gas distribution mode | OHV | OHV |
| Cooling mode | Forced air cooling | Forced air cooling |
| Output power (kW/r/min) | 2.1/4500 | 3.8/4650 |
| Starting method | Recoil start | |
| Fuel tank volume (L) | 1 Gal | 1 Gal |
| Fuel type and grade | Vehicle-use unleaded gasoline | |
| Lubricating oil capacity | 0.35 | 0.45 |
| Lubricating oil type | SAE 10W /30 | SAE 10W /30 |
| Lubrication mode | Splash lubrication | Splash lubrication |
| Noise dB (at 7m) | 62 | 63 |
| Rated power (kW) | 1.8 | 2.8 |
| Rated voltage (V) 1 | 120 | 120 |
| Rated frequency (Hz) | 50/60/50&60 | 50/60/50&60 |
| Rated power factor | 1 | 1 |
| Phase number | Single phase | Single phase |
| DC output | 12V 8.3A | 12V 8.3A |
| Motor | Brushless (permanent magnet) | |
| Voltage regulation | Inverter regulation | |
| Frequency regulation | Inverter regulation | |
| Overall dimension (mm) | 19" x 11.5" x 17" (480x290x430) | 19" x 11.5" x 17" (480x290x430) |
| Net weight (kg) | 40 lbs. (18) | 47 lbs. (21) |

Circuit diagram

