

KIPOR[®]

KIPOR POWER

OPERATION MANUAL

PLEASE READ THIS MANUAL CAREFULLY.
IT CONTAINS IMPORTANT SAFETY INFORMATION.

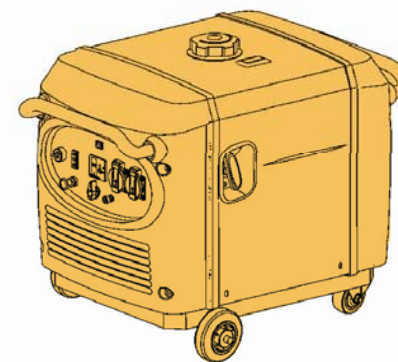
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KIPOR[®]

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SINEMASTER
DIGITAL GENERATOR

IG3000
IG4000

Preface

Thank you for purchasing KIPOR diesel generator set.

This instruction includes the operations and maintenance of IG3000 and IG4000.

This instruction is written according to the newly developed products.

KIPOR has the right to modify this instruction without further notice.

No duplicating without written approval.

As a part of the generator, this instruction should be transferred accompanying the generator.

Please pay particular attention to the following signs:



Failure to properly follow these precautions may result in property damage, serious injury or DEATH!

Read all labels and the owner's manual before operating this generator.

Operate only in well ventilated areas. Exhaust gas contains poisonous carbon monoxide, and can be deadly. Always stop engine before refueling. Wait 5 minutes before restarting.

Check for spilled fuel or leaks. Clean and/or repair before use.



Keep any sources of ignition away from fuel tank, at all times.



Indicates a strong possibility of severe personal injury or death if instructions are not followed

Indicates a possibility of personal injury or equipment damage if instructions are not followed

NOTE: Gives helpful information.



If a problem should arise, or if you have any questions about the generator, consult an authorized dealer.

Our generators are designed to give safe and dependable service if operated according to instructions. Read and understand the Owner's Manual before operating the generator. Failure to do so could result in personal injury or equipment damage.

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1. Safe use instruction

Operate carefully and make sure users and others safety.

WARNING



■ Our generators are designed to give safe and dependable service if operated according to instructions. Read and understand the Owner's Manual before operating the generator. Failure to do so could result in personal injury or equipment damage.

WARNING



■ Never run the generator in an enclosed area for exhaust gas contains poisonous carbon monoxide. Be sure to provide adequate ventilation.

WARNING



■ The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot.

■ To prevent scalding, please pay attention to the warning marks attached to the generator.

WARNING

- Gasoline is extremely flammable and explosive under certain conditions. Refuel in a well ventilated area with the engine stopped.
- Keep away from cigarette, smoke and sparks when refueling the generator. Always refuel in a well-ventilated location.
- Wipe up spilled gasoline at once.
- Restrict application of generator in high-hazard risk to causing fire area.

WARNING

- Connections of communication base station standby power and its electrical system must be made by a qualified electrician and must comply with all applicable laws and electrical codes.

WARNING

- Always make a pre-operation inspection before you start the engine. You may prevent an accident or equipment damage.
- Please operate the generator at outdoor or under good ventilation condition.
- Operate the generator on a level surface. If the generator is tilted, fuel spillage may result.
- Know how to stop the generator quickly and understand operation of all the controls. Never permit anyone to operate the generator without proper instructions.
- Keep children and pets away from the generator when it is in operation.
- Keep away from the exhaust outlet while the generator is running.
- The generator is a potential source of electrical shocks when misused; do not operate with wet hands.
- Do not operate the generator in rain or snow and do not let it get wet.

2. Parts identification

2.1 Outside overview

See Fig.1.

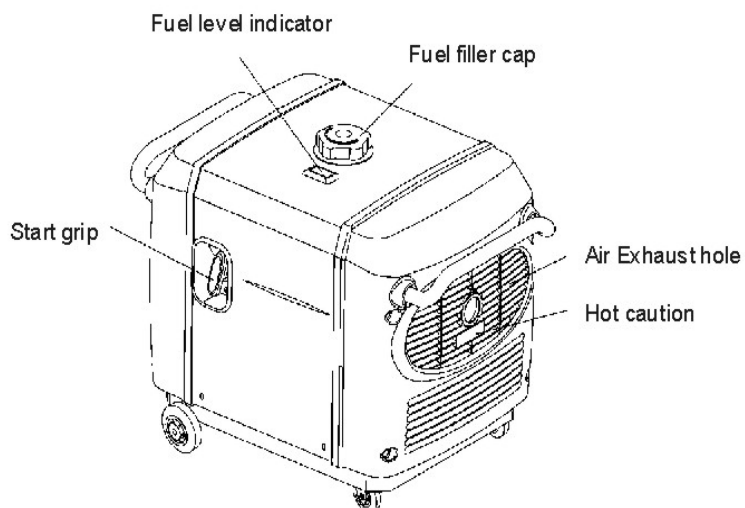
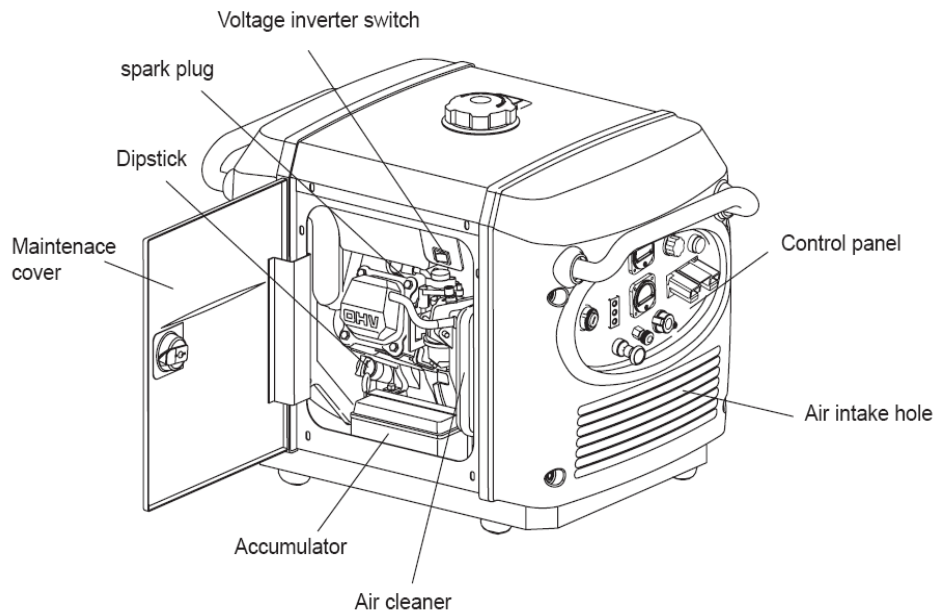
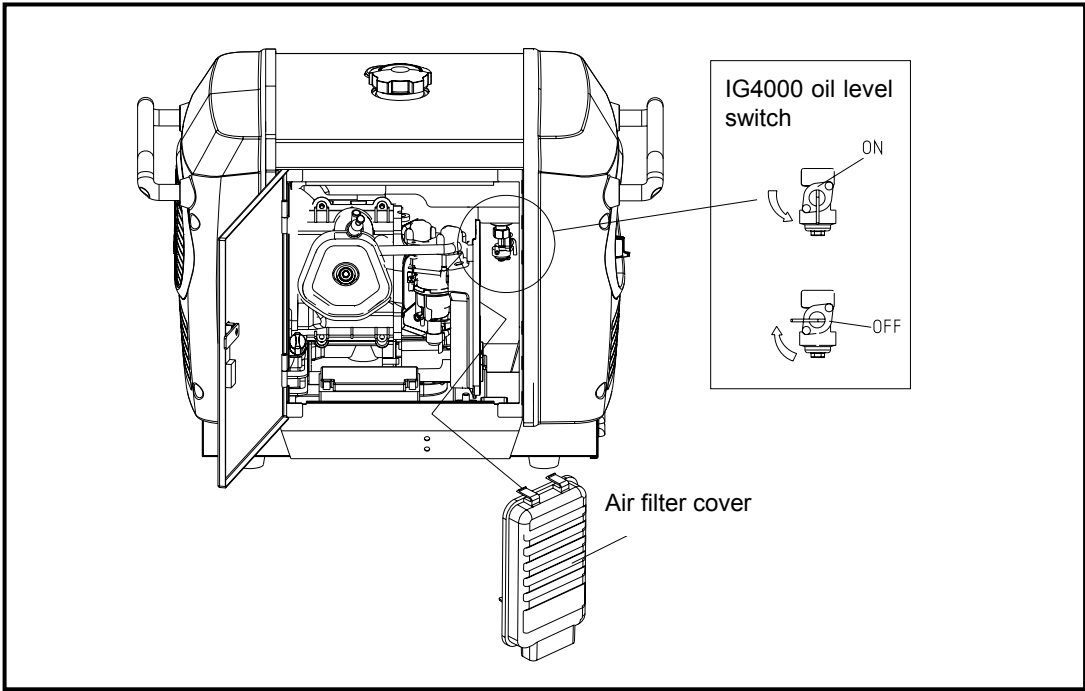


Fig.1 Outside view



Oil level switch

2.2 Control panel

2.2.1 IG3000 Control panel

See Fig. 2

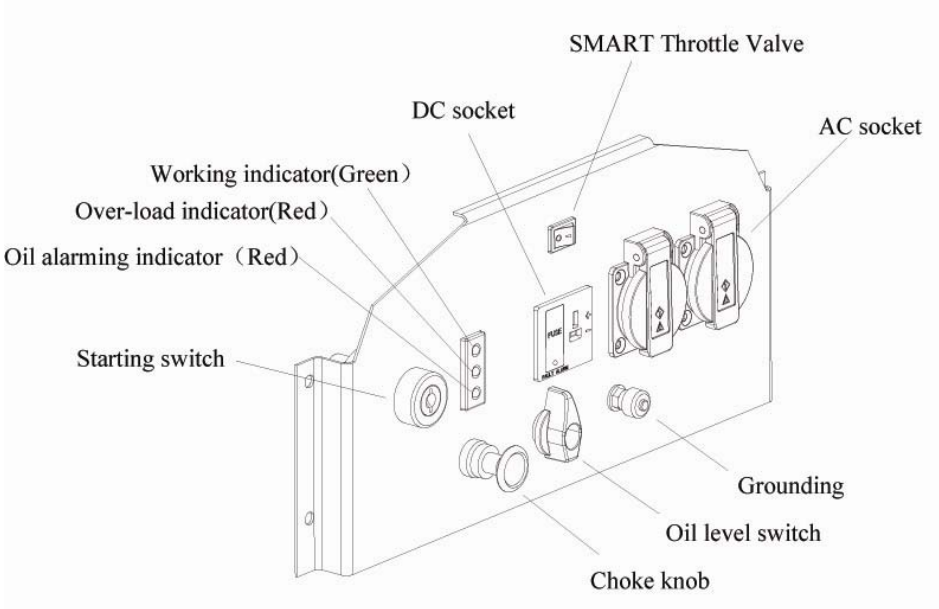


Fig.2 IG3000 Control panel

2.2.2 IG4000 Control panel

See Fig.3 and Fig.4

(1) IG4000 single-voltage control panel

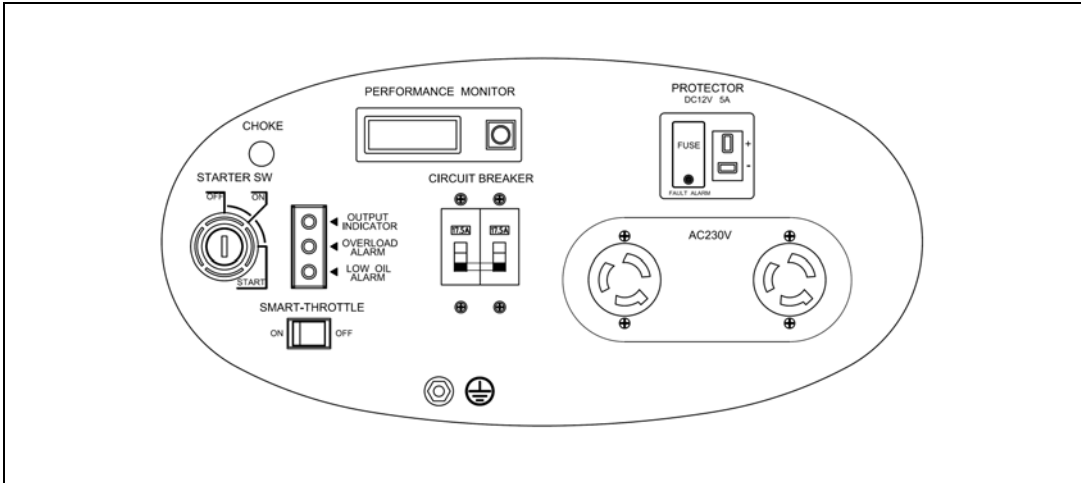


Fig.3 IG4000 single-voltage control panel

(2) IG4000 dual-voltage control panel

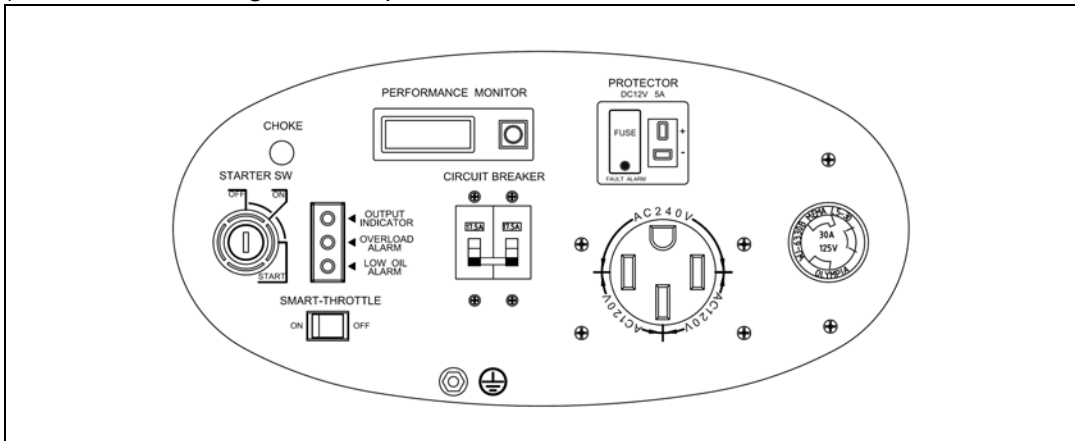


Fig. 4 IG4000 dual-voltage control panel

2.3 SMART Energy-saving switch

ON:

Generator would be at idle state if electrical appliance is disconnected from engine; Engine would return to normal speed once connected with appliance. This equipment is to reduce oil consumption in running.

CAUTION

- (SMART) energy saving switch cannot run effectively when greater instant power is needed.
- Shut down energy saving switch to reduce voltage variation when generator is connected with high electrical load.
- Close energy saving switch during DC operation.

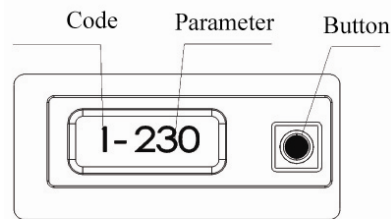
OFF:

Indicates that smart energy saving switch is closed and engine is at high rotation speed.

2.4 LCD parameters display

2.4.1 Single-voltage LCD—230V

LCD will display the following parameters in cycle after powered on:



No.	Parameters	Unit	Note
1	Genset voltage	1 V	V
2	Genset current	1 A	A
		0.1 A	
3	Genset frequency	0.1 Hz	Hz
4	Battery voltage	0.1 V	V
5	Accumulated running time	0.1 Hour	Hr

CAUTION

- LCD back light lights for 10 seconds then goes out automatically once pushed button.
- When the current displayed parameter is not “genset voltage”, displayed parameter will switch to “genset voltage” automatically after 30 seconds.

2.4.2 Dual-voltage LCD—120/240V

After the system is powered on, self-check indicator lights and buttons are pushed continually, the following parameters will be displayed in cycle:

(1) Displayed parameters in series connection: (120/240V simultaneous output)

No.	Parameters	Unit	Note
1	Genset AB-Phase voltage	1 V	V
2	Genset A-Phase voltage	1V	V
3	Genset B-Phase voltage	1V	V
4	Genset A-Phase current	1 A	A
		0.1 A	
5	Genset B-Phase current	1 A	A
		0.1 A	
6	Genset frequency	0.1 Hz	Hz
7	Battery voltage	0.1 V	V
8	Accumulated running time	0.1 Hour	Hr

(2) Displayed parameters in parallel connection: (120V output)

No.	Parameters	Unit	Note
1	Genset voltage	1 V	V
4	Genset current	1 A	A
		0.1 A	
6	Genset frequency	0.1 Hz	Hz
7	Battery voltage	0.1 V	V
8	Accumulated running time	0.1 Hour	Hr

CAUTION

- LCD back light lights for 10 seconds then goes out automatically once pushed button.
- When the current displayed parameter is not “genset voltage”, displayed parameter will switch to No.1 listed parameters after 30 seconds.
- Parameter will be displayed as“—————” when voltage selection switch is at incorrect position.

3. PRE-OPERATION CHECK

Be sure to check the generator on a level surface with the engine stopped.

3.1 Check the engine oil level.

CAUTION

- Using no detergent oil or 2-stroke engine oil could shorten the engine's service life.
- Use high-detergent, premium quality 4-stroke engine oil, certified to meet or exceed U.S. automobile manufacturer's requirements for API Service Classification SG, SF.
- Select the appropriate viscosity for the average temperature in your area

SAE Viscosity Grades

Ambient Temperature	Oil Number
-25°C -30°C	10W-30
-15°C -40°C	15W-40

Open the left side oil maintenance cover. Remove the oil filler cap, and wipe the dipstick with a clean rag. Check the oil level by inserting the dipstick in the filler hole without screwing it in. If the oil level is below the end of the dipstick, refill with recommended oil up to the top of the oil filler neck, see Fig 3.

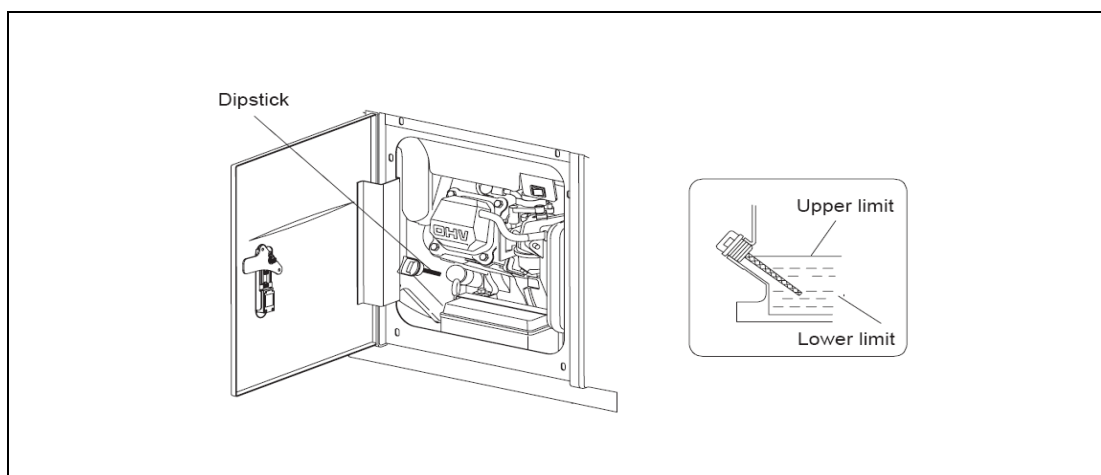


Fig.5 Oil level

CAUTION

- Running the engine with insufficient oil can cause serious engine damage.
- The Low Oil Alarm System will automatically stop the engine before the oil level falls below the safe limit. However, to avoid the inconvenience of an unexpected shutdown, it is still advisable to visually inspect the oil level regularly.

3.2 Check the fuel level

Use automotive gasoline (Unleaded or low-leaded is preferred to minimize combustion chamber deposits).

If the fuel level is low, refill to the shoulder of the fuel strainer, see fig. 4.

Never use an oil/gasoline mixture or dirty gasoline.

Avoid getting dirt, dust or water in the fuel tank.

After refueling, tighten the fuel filler cap securely.

WARNING

- Gasoline is extremely flammable and is explosive under certain conditions.
- Refuel in a well-ventilated area with the engine stopped. Do not smoke or allow flame or sparks in the area where the engine is refueled or where gasoline is stored.
- Do not overfill the fuel tank (there should be no fuel in the filler neck). After refueling, make sure the fuel filler cap is closed properly and securely.
- Be careful not to spill fuel when refueling. Spilled fuel or fuel vapor may ignite. If any fuel is spilled, make sure the area is dry before starting the engine.
- Avoid repeated or prolonged contact with skin or breathing of vapor. KEEP OUT OF REACH OF CHILDREN.

Fuel tank capacity: 13L

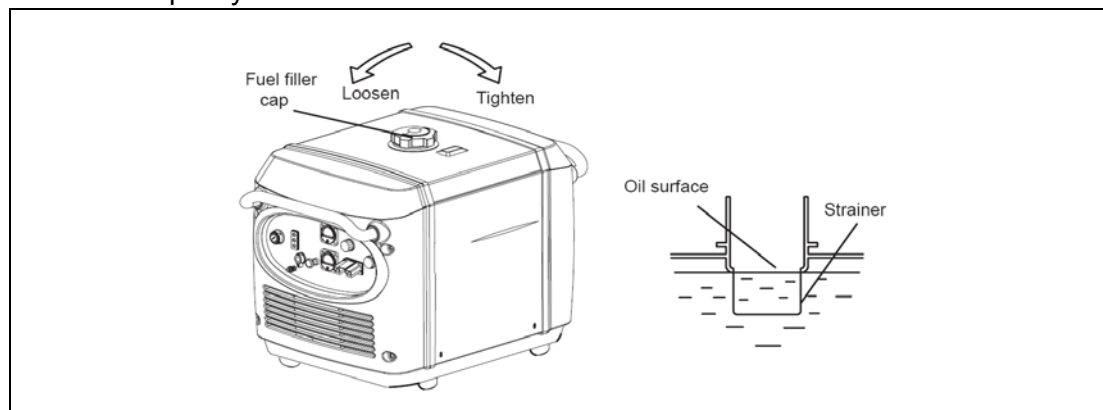


Fig.6The fuel level

Gasoline containing alcohol

If you decide to use a gasoline containing alcohol (gasohol), be sure its octane rating is at least as high as that recommended by us. There are two types of "gasohol": one containing ethanol, and the other containing methanol. Do not use gasohol that contains more than 10% ethanol. Do not use gasoline containing methanol (methyl or wood alcohol) that does not also contain cosolvents and corrosion inhibitors for methanol. Never use gasoline containing more than 5% methanol, even if it has cosolevents and corrosion inhibitors.

NOTE

- Fuel system damage or engine performance problems resulting from the use of fuels that contain alcohol is not covered under the warranty. We cannot endorse the use of fuels containing methanol since evidence of their suitability is as yet incomplete.
- Before buying fuel from an unfamiliar station, try to find out if the fuel contains alcohol, if it does, confirm the type and percentage of alcohol used. If you notice any undesirable operating symptoms while using a gasoline that contains alcohol, switch to gasoline that you know does not contain alcohol.

3.3 Check the air cleaner

Check the air cleaner elements to be sure they are clean and in good condition.

Open the left side maintenance cover. Remove the air cleaner cover, remove the paper element from the air cleaner cover, and check the both elements, clean or replace the element(s) if necessary, see fig.7.

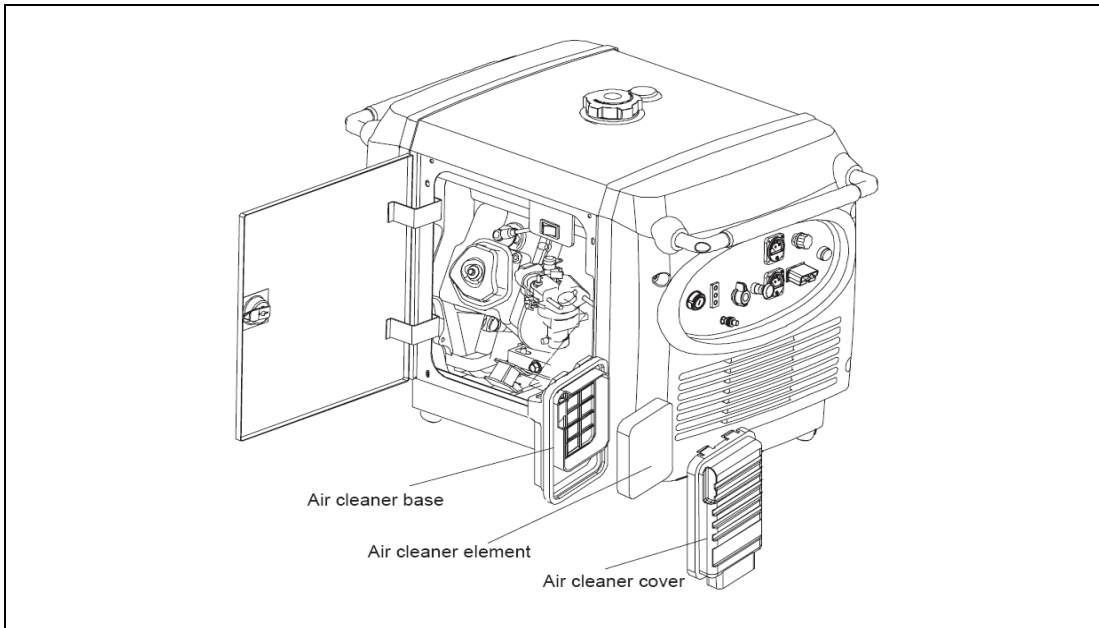


Fig. 7 Structure of air cleaner

CAUTION

■ Never run the engine without the air cleaner. Rapid engine wear will result from contaminants, such as dust and dirt, being drawn through the carburetor, into the engine.

4. Starting engine

CAUTION

- When starting the generator after adding fuel for the first time, after long-term storage, or after running out of fuel, turn the fuel valve lever to the "ON" position, then wait for 10 to 20 seconds before starting the engine.

4.1 IG3000 starting order:

(1) Open the fuel valve first, see fig.8.

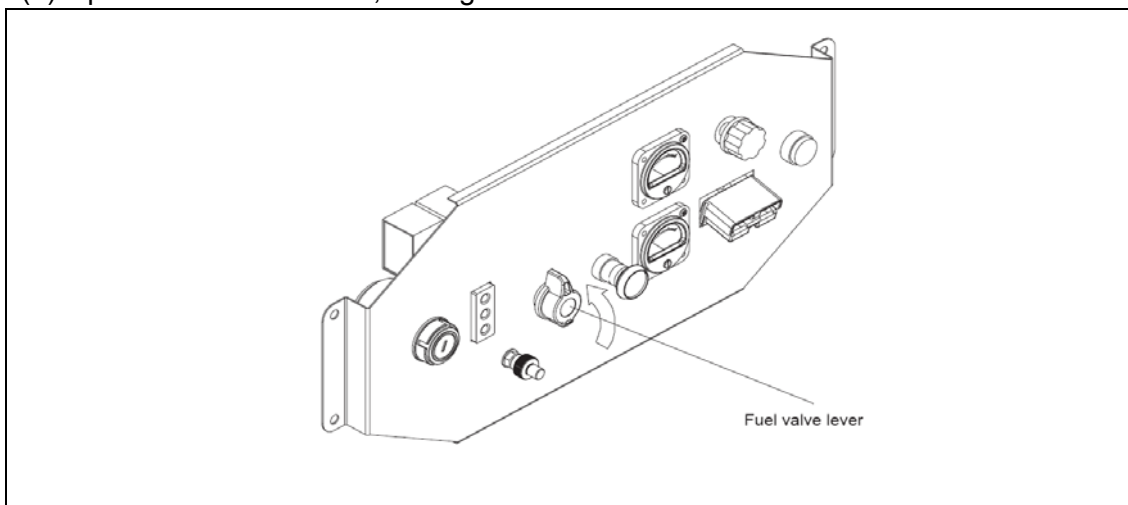


Fig.8 Fuel valve lever to the ON position

(2) Pull the choke knob out to the CLOSED position

Do not use the choke when the engine is warm or the air temperature is high, see fig.9

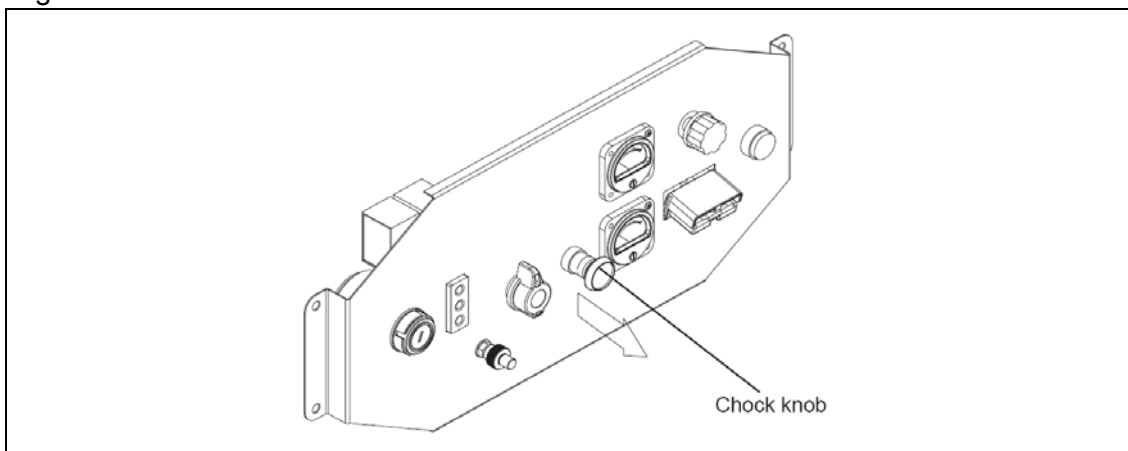


Fig.9 Choke knob to the closed position

(3) Insert the engine key and turn the engine switch to ON position.

See fig.10

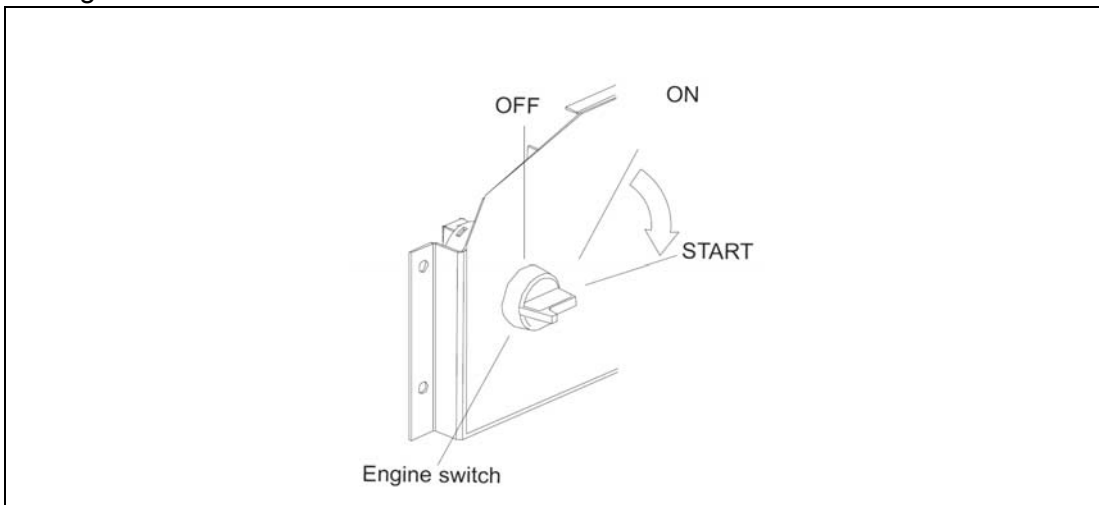


Fig.10 Starting button to the ON position

(4) Starting

Electric start: Pull the engine switch to the START until the engine is started. See fig.11 (a)

Manual start: Pull the starting handle until resistance is felt. Pull quickly in the direction showed in the following diagram. See fig.11 (b).

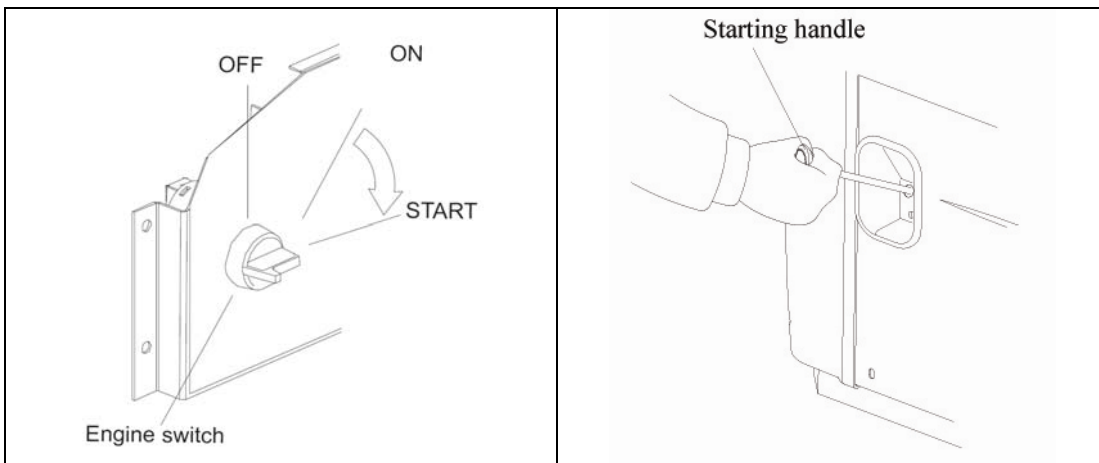


Fig.11 (a) Engine

Fig.11 (b) Starting handle

CAUTION

- Keep the starting handle from rebounding and slowly put the handle in order.
- Keep the starting handle away from rubbing generator or handle would be damaged.

(5) Push the choke knob to the OPEN position as the engine warms up, see Fig. 12.

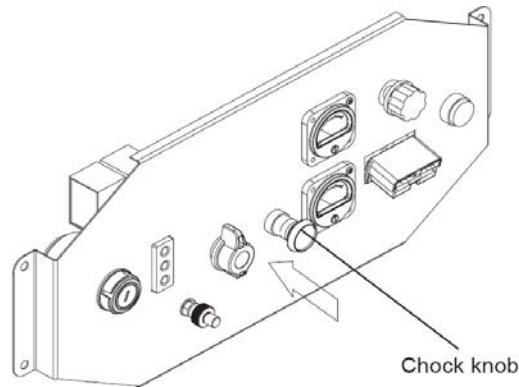


Fig.12 The open position of Choke knob

(6) After normal starting, the genset can be loaded.

4.2 IG4000 starting order:

- (1) Break the load and turn the breaker to "OFF" position.
- (2) Start genset according to the step 2, 3, 4 and 5 of IG3000 starting order.
- (3) After normal running of genset, connect load and turn the breaker to "ON" position.

High altitude operation

At high altitude, the standard carburetor air-fuel mixture will be excessively rich, engine performance will decrease and fuel consumption will increase.

High altitude performance can be improved by installing a smaller diameter main fuel jet in the carburetor and readjusting the pilot screws. If you always operate the generator at altitude higher than 1,500 m (5,000 feet) above sea level, have your authorized dealer perform these carburetor modifications.

Even with suitable carburetor jetting, engine horsepower will decrease approximately 3.5% for each 305 m (1,000 feet) increase in altitude. The effect of altitude on the horsepower will be greater than this if no carburetor modification is made.

CAUTION

- Operation of the generator at an altitude lower than the carburetor is jetted for may result in reduced performance, overheating, and serious engine damage caused by an excessively lean air/fuel mixture.

5. Generator use

WARNING

■ Generator should be earthed in order to prevent electric shock caused by incorrect operation. Coaxial cable should be used to connect the grounding terminal of generator and outside grounding terminal.

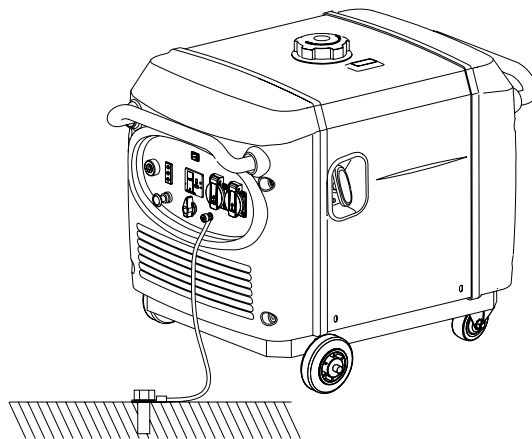


Fig.13 Generator grounding diagram

CAUTION

- Maximum power would be available for the first 30 minutes. Do not exceed the rated power during continuous operations.
 - Socket current limit cannot be exceeded.
 - Do not connect generator to domestic circuit, or generator or appliances may be damaged.
 - Don't modify or use the generator for other purposes other than it is intended for.
- Also observe the following when using the generator.
- A. Do not connect generators in parallel under different voltage selections.
 - B. Do not connect an extension to the exhaust pipe.
- When an extension cable is required, be sure to use rubber sheathed flexible cable.(IEC245DV or relevant rules)
 - Length limit of extension cable: 60m of 2.5 mm² while 100m of 4 mm².
 - Keep generator away from other circuits or cable such as: distribution net.

CAUTION

- DC socket can be used in AC power system.
- Total power of AC and DC power could not be exceeded if both AC and DC socket are used.
- Make sure that electric circuit and plug connection is in order.

5.1 AC use

1. Start engine and make sure the output indicator light (green) remains on.
2. Make sure that appliance is shut down then connect plug into generator socket.

See fig.14.

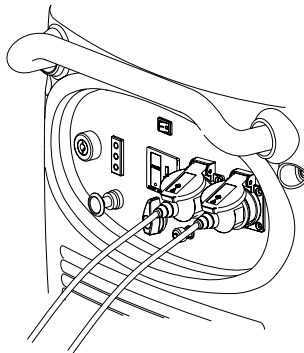


Fig.14 Connection between appliance and generator

NOTE

- Before connecting an appliance to the generator, check that it is in good order. Please shut down the engine immediately and disconnect the connection to appliance, if any abnormality, slow-down speed or unexpected stop is found.

5.2 Output and Overload Indicators, engine oil level indicator

The green output indicator light will remain ON during normal operating conditions. If the generator is overloaded or if there is a short in the connected appliance the green output indicator will go OFF and the overload indicator (red) will go ON and current to the connected appliance will be shut off.

Stop the engine if the overload indicator light (red) comes ON and investigate the overload source. Check the engine oil level if the red oil alarming indicator comes ON.

NOTE

■ Before connecting an appliance to the generator, check that it is in good order, and that its electrical rating does not exceed that of the generator.
Then connect the power cord of the appliance, and start the engine.

NOTE

■ When generator is started, both the red light and green light may go on simultaneously. It is normal that red light is out after 4 seconds. If the red light stays on, consult your dealer.

5.3 DC use

DC sockets output voltage of DC 15-30V at zero load. The DC socket can only be used to charge automatic battery of 12V.

DC output varies as the SMART energy saving switch positions differs.

DC current:

Model	SMART Energy- saving switch	Off	On (No AC output)
	IG3000		5.0A

1. Connect the DC socket of generator to battery terminal with charging cable.

WARNING

■ In order to prevent spark, please connect charging cable to generator first, then to battery, and dismantle first from battery.
■ Disconnect the grounding line of battery first, before charging cable is connected to battery. Connect the grounding line of battery after dismantle charging cable. Short circuit or spark may be prevented if you carelessly make the battery terminal contact with auto frame.

CAUTION

- Don't start the engine when generator is connected to battery or the generator may be damaged.
- The (+) pole of charging cable is connected to the (+) pole of battery, or else generator and battery may be damaged.

WARNING

- The battery gives off explosive gases; keep sparks, flames and cigarettes away. Provide adequate ventilation when charging.
- The battery contains sulfuric acid (electrolyte). Contact with skin or eyes may cause severe burns. Wear protective clothing and a face shield.
 - A. If electrolyte gets on your skin, flush with water.
 - B. If electrolyte gets in your eyes, flush with water for at least 15 minutes and call a physician.
- Electrolyte is poisonous.
 - A. If swallowed, drink large quantities of water or milk and follow with milk of magnesia or vegetable oil and call a physician.
- Keep out of reach of children.

2. Starting engine

- DC socket can be used in AC system.
- Over load of DC circuit may cause fuse blown. If this happens, discharge the load and replace with the equivalent after stop.

5.4 Low oil alarm system

The low oil alarm system is designed to prevent engine damage caused by an insufficient amount of oil in the crankcase. Before the oil level in the crankcase falls below a safe limit, the low oil alarm system will automatically shut down the engine. (The engine switch will remain in the ON position) If the low oil alarm system shuts down the engine, the low oil alarm indicator light (red) will come on when you operate the starter, and the engine will not run. If this occurs, add engine oil.

6. Stop the Engine

Normal stopping:

1. Shut down all the equipments connected, and pull out plug.
2. Turn the starting switch to “stop” position.
3. Turn the fuel valve lever to the OFF position.

Emergency stopping:

To stop the engine in an emergency, turn the engine switch to “OFF”.

7. Maintenance

The purpose of the maintenance and adjustment schedule is to keep the generator in the best operating condition.

WARNING

■ Shut off the engine before performing any maintenance. If the engine must be run, make sure the area is well ventilated. The exhaust contains poisonous carbon monoxide gas.

CAUTION

■ Use our original parts or the equivalent. The use of replacement parts which are not of equivalent quality may damage the generator.

7.1 Maintenance Schedule

REGULAR SERVICE PERIOD (1) Perform at every indicated month or operating hour interval, whichever occurs first		EACH USE	FIRST MONTH OR 20 HRS	EVERY 3 MONTHS OR 50 HRS	EVERY 6 MONTHS OR 100 HRS	EVERY YEAR OR 300 HRS
ITEM						
Engine oil	Check	<input type="radio"/>				
	Change		<input type="radio"/>		<input type="radio"/>	
Air cleaner	Check	<input type="radio"/>				
	Clean			<input type="radio"/> (2)		
Spark plug	Clean-adjust				<input type="radio"/>	
Spark arrester	Clean				<input type="radio"/>	
Fuel sediment cup	Clean				<input type="radio"/>	
Valve clearance	Check-adjust					<input type="radio"/> (3)
Fuel tank and strainer	Clean					<input type="radio"/> (3)
Fuel line	Check	Every 2 years [Replace if necessary (3)]				

NOTE:

- (1) Intervals of proper maintenances.
- (2) Service more frequently when used in dusty areas.
- (3) These items should be serviced by an authorized dealer, unless the owner has the proper tools and is mechanically proficient. See the KIPOR Manual.

7.2 Changing oil

Drain the oil while the engine is still warm to assure rapid and complete draining.

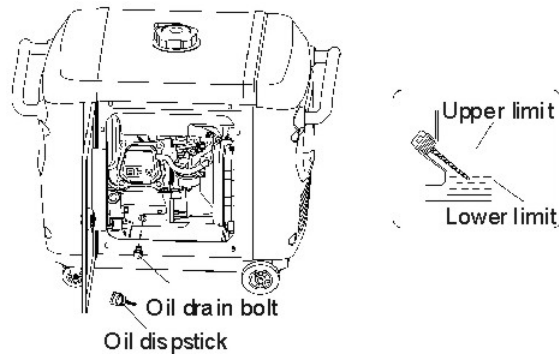


Fig.15 Changing oil

1. Open the left side maintenance cover.
2. Take out the oil dipstick.
3. Remove the drain bolt, and drain the oil. Retighten the bolt securely.
4. Refill with the recommended oil and check the level.
5. Close the left side maintenance cover.

Engine oil capacity: IG3000: 0.6 L IG4000: 1.1 L

NOTE

■ Please dispose of used motor oil in a manner that is compatible with the environment. We suggest you take it in a sealed container to your local service station for reclamation. Do not throw it in the trash or pour it on the ground.

7.3 Air cleaner service

A dirty air cleaner will restrict air flow to the carburetor to prevent carburetor malfunction, service the air cleaner regularly. Service more frequently when operating the generator in extremely dusty areas.

WARNING

■ Do not use gasoline or low flash point solvents for cleaning. They are flammable and explosive under certain conditions.

CAUTION

- Never run the generator without the air cleaner. Rapid engine wear may result.

1. Open the left side maintenance cover.
2. Unsnap the clips, remove the air cleaner cover.
3. Take out the element; blow the inner side of the element with compressed air to remove the dust. If the element is very dirt, please replace it.
4. Reinstall the air cleaner cover; close the left side maintenance cover.

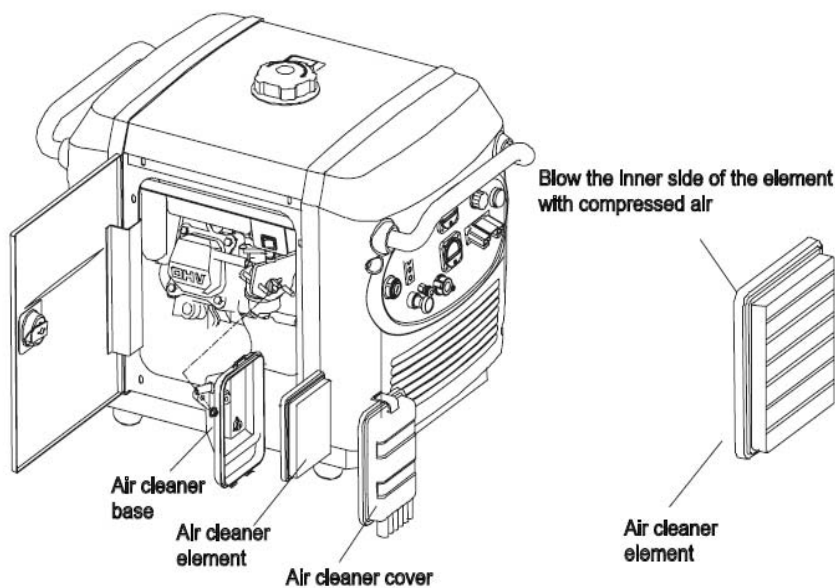


Fig. 16 Air cleaner cleaning

7.4 Spark plug service

Recommended spark plug: WR7DC

To ensure proper engine operation, the spark plug must be properly gapped and free of deposits.

1. Open the left side maintenance cover.
2. Remove the spark plug cap.

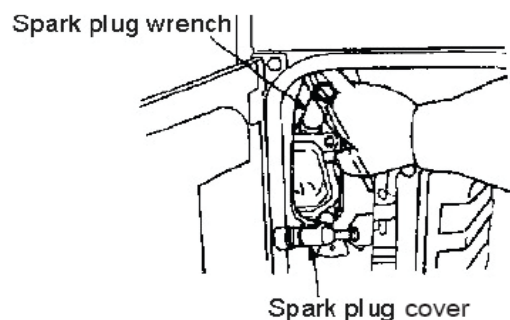


Fig.17 Disconnection of spark plug

3. Use the wrench to remove the spark plug.
 4. Clean any dirt from around the spark plug base.
 5. Visually inspect the spark plug. Discard it if the insulator is cracked or chipped. Clean the spark plug with a wire brush if it is to be reused.
 6. Measure the plug gap with a feeler gauge.
- The gap should be 0.5-0.75mm (0.02-0.03in). Correct as necessary by carefully bending the side electrode.

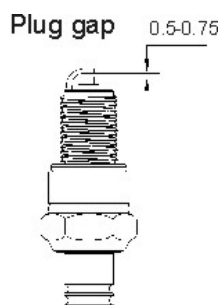


Fig. 18 Gap measurement of plug gap

CAUTION

- The spark plug must be securely tightened. An improperly tightened plug can become very hot and possibly damage the generator.
- Never use a spark plug with an improper heat range.

7. Install the spark plug carefully, by hand, to avoid cross-threading.
8. After a new spark plug has been seated by hand, it should be tightened 1/2 turn with a wrench to compress its washer.

If a used plug has been installed, 1/8 to 1/4 turn is required after being seated.

9. Reinstall the spark plug.

10. Close the left side maintenance cover.

7.5 Spark arrester maintenance, See Fig.19

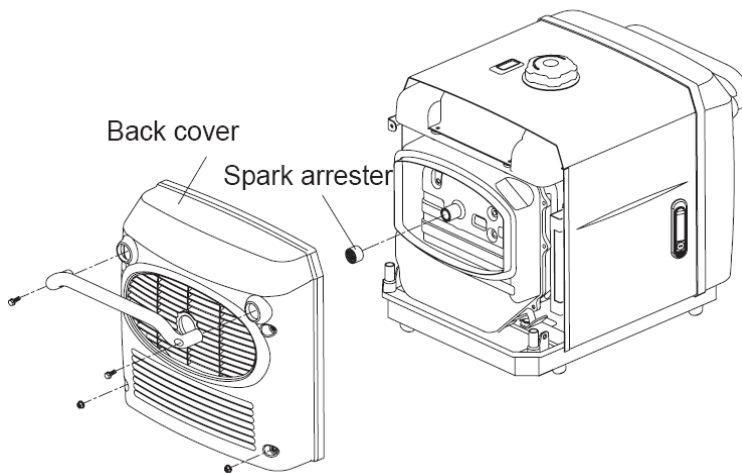


Fig. 19 Disconnection of spark arrester

WARNING

■ If the generator has been running, the muffler may be very hot. Allow it to cool down before proceeding.

CAUTION

■ The spark arrester must be serviced every 100 hours to maintain its efficiency.

1. Remove the back cover.
2. Remove the exhaust tail pipe and spark arrester.
3. Use a brush to remove carbon deposits from the spark arrester screen.

NOTE

■ Inspect the spark arrester screen for holes or tears. Replace if necessary.

4. Reinstall the spark arrester.
5. Reinstall the upper back cover.

8. Transportation/Storage

8.1 When transporting the generator, turn the fuel valve lever OFF and keep the generator level to prevent fuel spillage. Fuel vapor or spilled fuel may ignite.

8.2 Preparation for long-term storage:

1. Be sure the storage area is free of excessive humidity and dust.
2. Drain the fuel completely

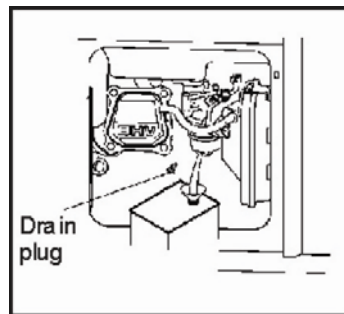
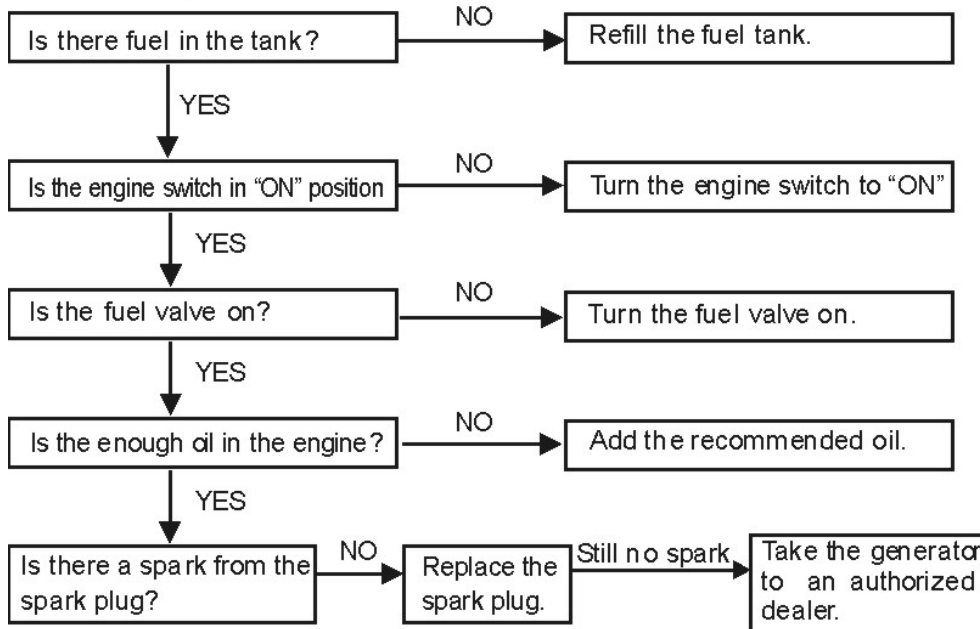


Fig.20

- A. Open the left side maintenance cover.
 - B. Turn fuel valve lever to ON and then loosen the carburetor drain screw. Drain the gasoline from the carburetor and fuel tank into a suitable container.
 - C. Tighten the carburetor screw, close the fuel valve lever and left side maintenance cover.
3. Once a month, recharge the battery.
 4. Change the engine oil.
 5. Remove the spark plug and pour about a tablespoon of clean engine oil into the cylinder. Crank the engine several revolutions to distribute the oil, and then reinstall the spark plug.
 6. Slowly pull the starter grip until resistance is felt. At this point, the piston is coming up on its compression stroke and both the intake and exhaust valves are closed. Storing the engine in this position will help to protect it from internal corrosion.

9. Troubleshooting

When the engine will not start:



⚠ WARNING

- Be sure there is no spilled fuel around the spark plug. Spilled fuel may ignite.

Is the fuel reaching the carburetor?

If the engine still does not start, take the generator to an authorized dealer.

To check:

- 1) Remove the spark plug cap and clean any dirt from around the spark plug.
- 2) Remove the spark plug and install the spark plug in the plug cap.
- 3) Set the plug side electrode on the cylinder head to ground.
- 4) Crank the engine, sparks should jump across the gap.

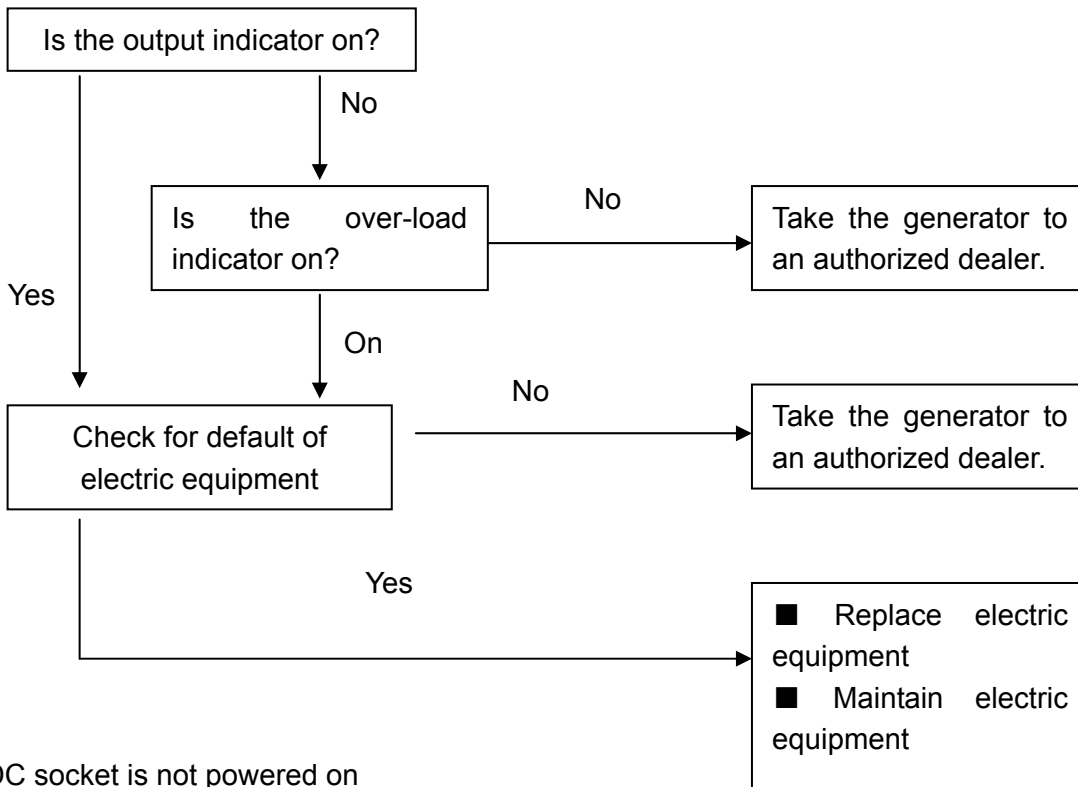
To check:

- 1) Turn off the fuel valve and loosen the drain screw.
- 2) Fuel should flow from the drain when the fuel valve is turned on.

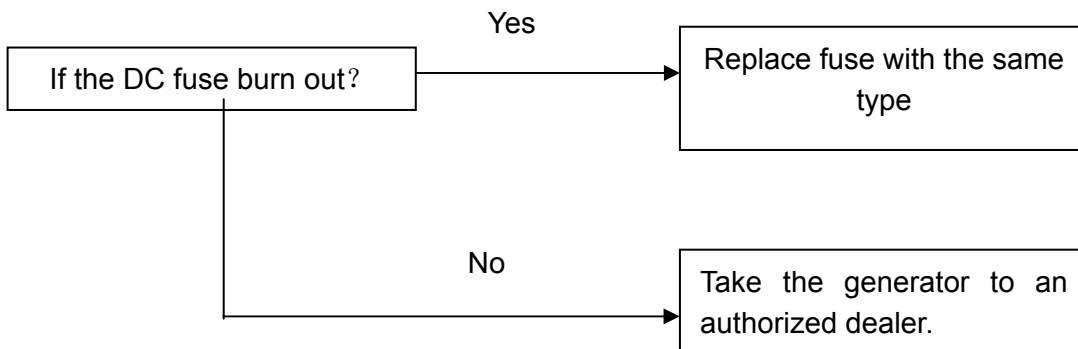
Fuel check:

1. Close the fuel valve, and loosen drain screw.
2. Fuel should drain out from the outlet after opening the valve.

Equipment connected with generator can not start:



DC socket is not powered on



10. Basic parameters

(1) Parameters of IG3000:

Model	IG3000		
Rated frequency (Hz)	50	60	
Rated voltage (V)	230	120	240
Rated current (A)	12.2	23.3	11.7
Rated rotation speed (r/min)	3600		
Rated output power (kVA)	2.8		
Max. output power (kVA)	3.0		

DC output

DC output	12V-5.0A
Fuse	Available
Phase number	Single

Engine

Model	KG205GTi
Type	Single-cylinder, oblique, air-cooled, four-stroke, OHV
Displacement (Bore x stroke)	196ml (68×54 mm)
Compression ratio	8.5:1
Rated frequency [kW/ (r/min)]	4.0/3600
Rated rotation speed (rpm)	3600
Ignition system	T.C.I
Spark plug	WR7DC
Starting system	Recoil starter, electric starter
Fuel type	Automotive unleaded gasoline
Fuel consumption (g/Kw.h)	395
Lube oil brand	SAE 10W30 (Above CC Grade)

Fuel capacity (L)	13.0
Continuous running time(hr) (rated output)	6.7
Noise level(dB(A)/7m(zero load—full load)	63-73 *
Overall dimension (Length×Width×height) [(mm)]	IG3000:686×425×505 (27.01×16.73×19.88)
Dry weight[kg(lbs)]	IG3000:60 (132)

*: The declared values shall consider uncertainties due to production variation and measurement procedures.

(2)Parameters of IG4000:

Model	IG4000		
Rated frequency (Hz)	50	60	
Rated voltage (V)	230	120	240
Rated current (A)	16.5	31.7	15.9
Rated rotation speed (r/min)	3600		
Rated output power (kVA)	3.8		
Max. output power (kVA)	4.2*		

DC output

DC output	12V-5.0A
Fuse	Available
Phase number	Single

Engien

Model	KG280GETi
Type	Single-cylinder, oblique, air-cooled, four-stroke, OHV
Displacement (Bore x stroke)	277ml (78×58 mm)
Compression ratio	8.5:1
Rated frequency [kW/ (r/min)]	5.5/3600
Rated rotation speed (rpm)	3600
Ignition system	T.C.I
Spark plug	WR7DC
Starting system	Recoil starter, electric starter
Fuel type	Automotive unleaded gasoline
Fuel consumption (g/Kw.h)	374
Lube oil brand	SAE 10W30 (Above CC Grade)

Fuel capacity (L)	13.0
Continuous running time(hr) (rated output)	5
Noise level(dB(A)/7m(zero load-full load)	65-73 **
Overall dimension (Length×Width×height) [(mm)]	IG4000:785×470×570 (30.9×18.5×22.44)
Dry weight[kg(lbs)]	IG4000:75 (165)

*: After 20 hours' running-in period

** : The declared values shall consider uncertainties due to production variation and measurement procedures.

11. Electric schematic diagram

(1) IG3000 Schematic diagram

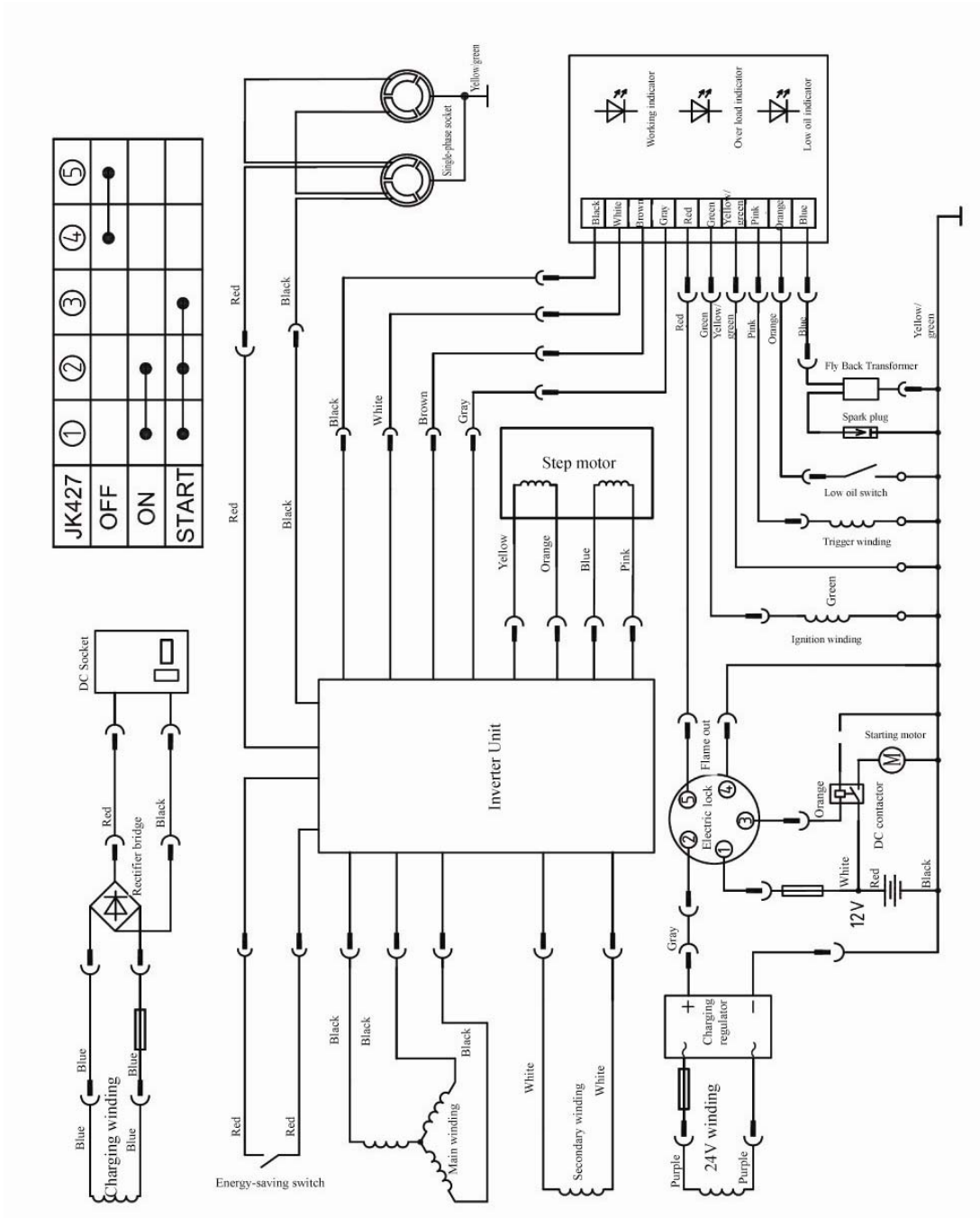


Fig.21 IG3000 Schematic diagram

(1) IG4000 Single voltage genset

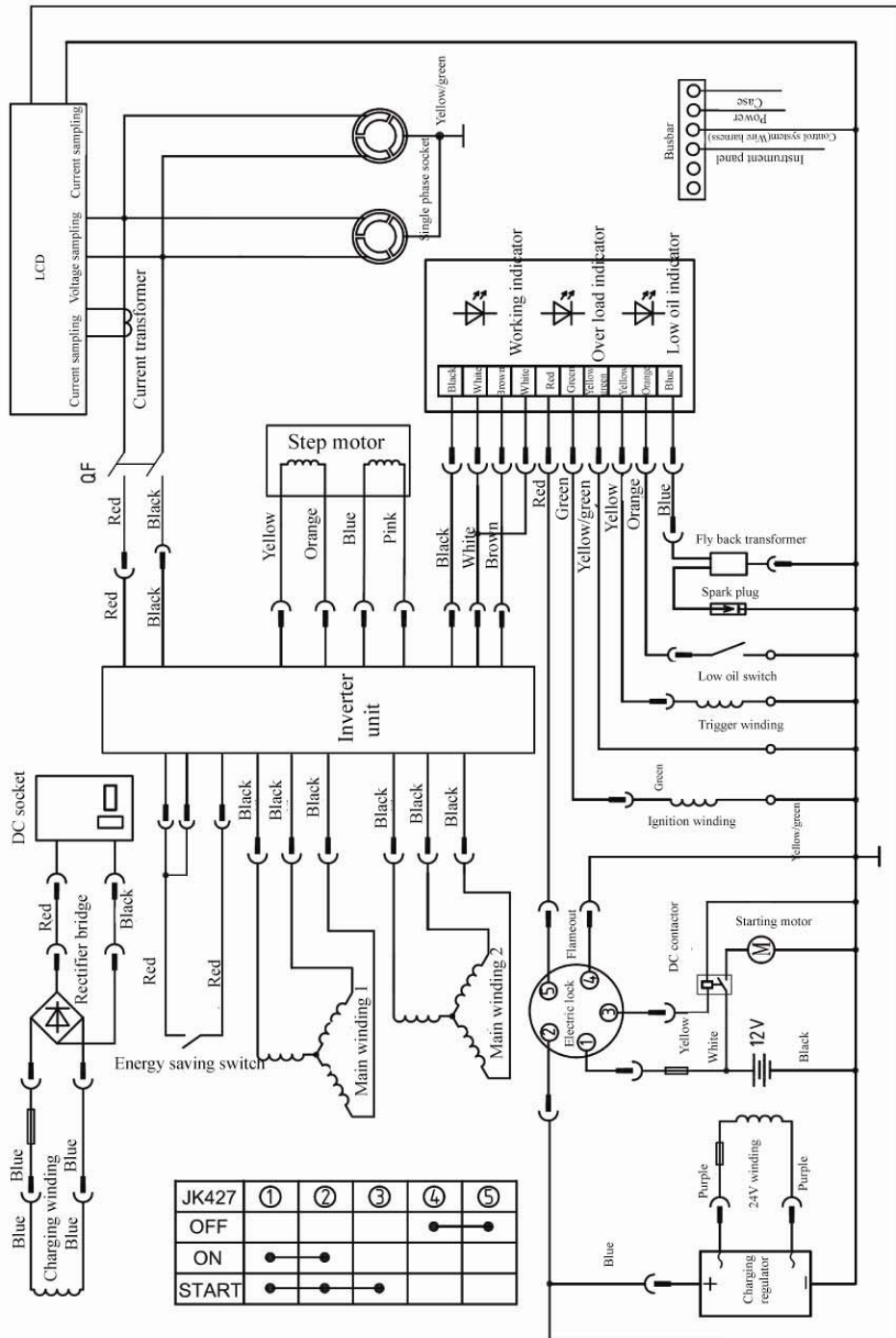


Fig.22 IG4000 (50Hz 230V) Schematic diagram

(3) IG4000 Dual-voltage genset

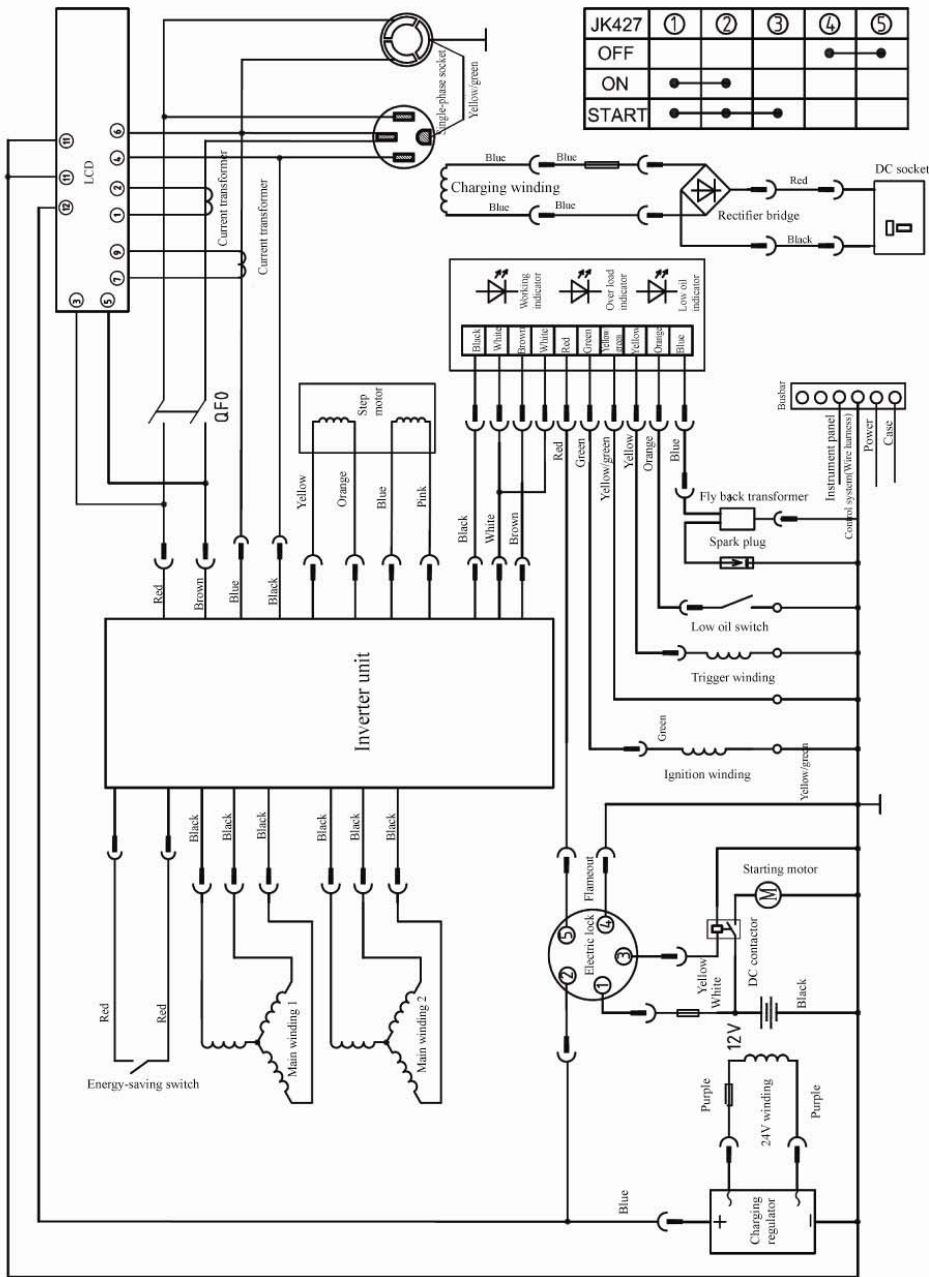
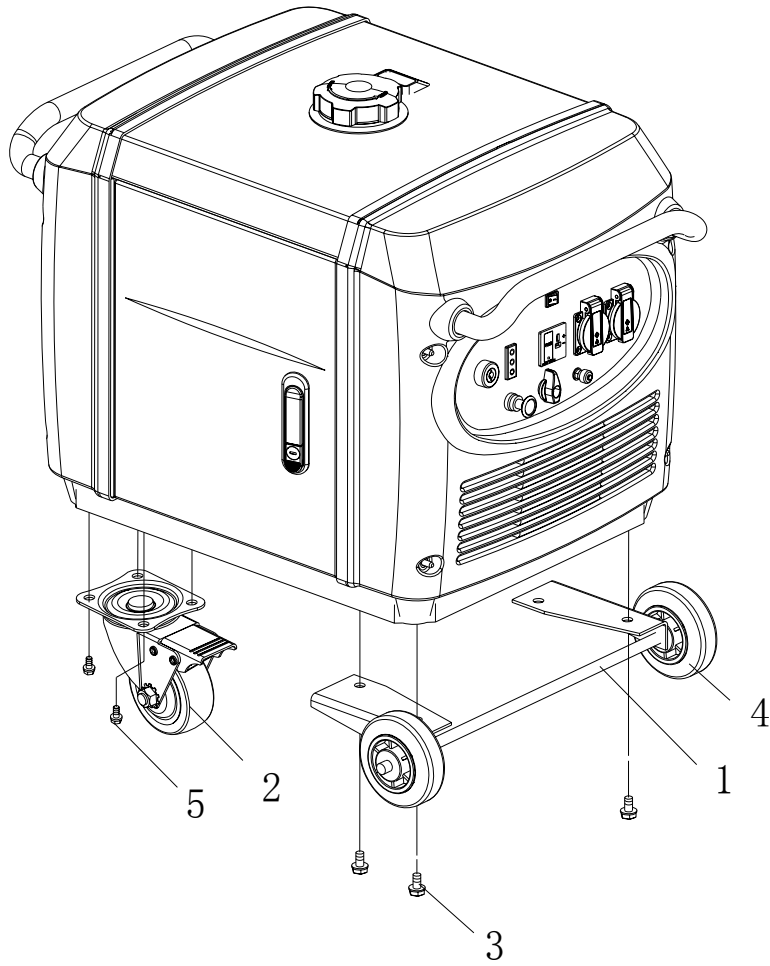


Fig.23 IG4000 Dual-voltage schematic diagram

12. Castor Assembly

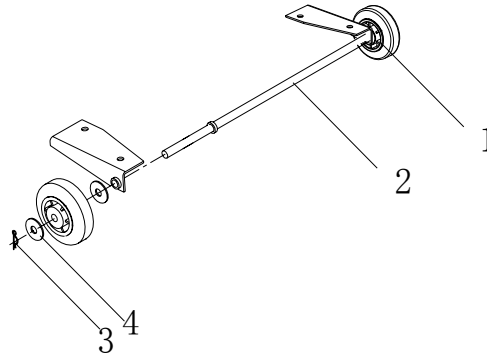


- | | |
|---------------|-----------------------------|
| 1. Axle | 2. 2.5 inch universal wheel |
| 3. Bolt M8×16 | 4. Wheel |
| 5. Bolt M6×16 | |

A. Castor parts assembly

- a. Put washers at both sides of castor and slip them to axle.
- b. Fixed with lock pin.

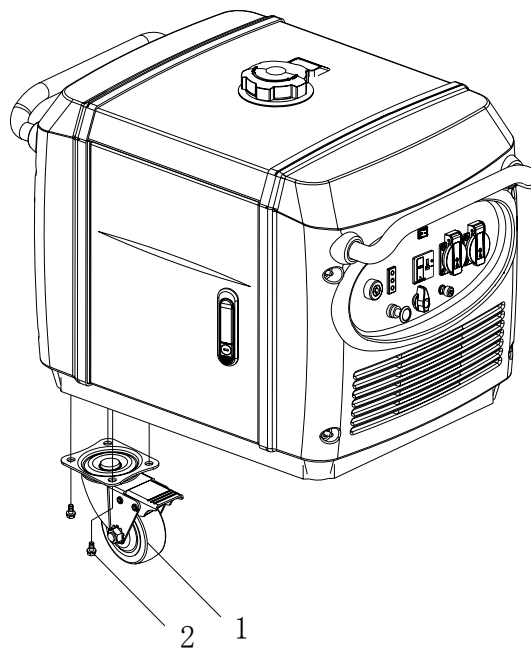
- 1. Ground wheel
- 2. Axle welding
- 3. Lock pin
- 4. Washer



B. Install 2.5 inch universal wheel

- a. Align mounting holes of universal wheel and chassis
- b. Fasten them closely with bolt M6×16

- 1. 2.5 inch universal wheel
- 2. Bolt M6×16



13. Appendix

1. Modified coefficient table of ambient condition power

The conditions of generator rated output:

Altitude: 0 m Ambient temperature: 25°C Relative humidity: 30%

Ambient modified coefficient: C (Relative humidity 30%)

Altitude (m)	Ambient temperature (°C)				
	25	30	35	40	45
0	1	0.98	0.96	0.93	0.90
500	0.93	0.91	0.89	0.87	0.84
1000	0.87	0.85	0.82	0.80	0.78
2000	0.75	0.73	0.71	0.69	0.66
3000	0.64	0.62	0.6	0.58	0.56
4000	0.54	0.52	0.5	0.48	0.46

Note: When the relative humidity is 60%, the modified coefficient is C-0.01

When the relative humidity is 80%, the modified coefficient is C-0.02

When the relative humidity is 90%, the modified coefficient is C-0.03

When the relative humidity is 100%, the modified coefficient is C-0.04

Counting example:

When the rated power of generator is $P_N = 5\text{KW}$, altitude is 1000m, ambient temperature is 35°C, relative humidity is 80%, the rated power of generator is:

$$P = P_N \times (C - 0.02) = 5 \times (0.82 - 0.02) = 4\text{KW}$$

2. The choice of the electric cable

The choice of the electric cable depends on the allowable current of the cable and the distance between the load and the generator. And the cable section should be big enough.

If the current in the cable is bigger than the allowable current, it will become over hot and the cable will be burnt. If the cable is long and thin, the input voltage of the electric appliance will be not enough, causing that the generator doesn't start.

In the following formula, you can calculate the value of the potential "e".

Potential value

Specific resistance of copper ρ [20°C] ($\Omega \cdot \text{mm}^2/\text{m}$) = 0.0175

Voltage drop $e = \rho$ (specific resistance) $\times \frac{L(\text{Length})}{S(\text{Sectional area})} \times I$ (Rated current)

e		5m	10m	20m	30m	40m	50m
230V	2.5mm ²	0.427V	0.854V	1.708V	2.562V	3.416V	4.270V
12.2A	4.0mm ²	0.267V	0.534V	1.068V	1.601V	2.135V	2.669V
IG3000							
230V	4.0mm ²	0.381V	0.761V	1.523V	2.284V	3.045V	3.806V
17.4A	6.0mm ²	0.254V	0.508V	1.015V	1.523V	2.030V	2.538V
IG4000							