

LIFAN

20000E

GENERATOR SET Owner's Manual



Read this manual carefully before operating this generator.

PREFACE

Thank you for choosing a gasoline generator set by our Co.

Based on the latest technology at home and abroad, our Co. has successfully developed the gasoline generator set. The unit is characterized by advanced design, compact structure, reliable performance, convenient service, low fuel consumption and noise as well as fashion shape. With general gasoline engine as power, it is widely used in many fields such as living, open working, shop, bank, fishing, etc.

The manual gives information with respect to operation and maintenance of the gasoline generator, and be sure to read it carefully first before operating. If any trouble occurs, call your dealer who will provide you with the best after service.

All the materials and diagrams of this manual are in accordance in this manual may be a little different from the actual states. The copyright of this manual belongs to our Co., any group or individual is forbidden to reprint or copy any of it. The manual is subject to change without notice.

Safety Warnings

Please read this manual carefully before using this gasoline generator set .

Special important contents in this manual will be indicated in the following ways, please note.

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

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

CAUTION: Failure to follow instructions may result in minimal harm.

NOTICE: Failure to follow instructions may result in damage to your engine set and other property.

This specification is a permanent part of the gasoline generator set and should be attached when the gasoline generator set is transferred to others.

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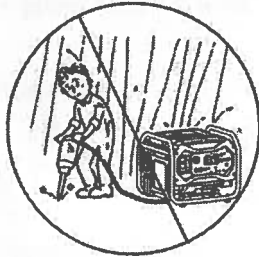
1. Safety notice for gasoline generator set



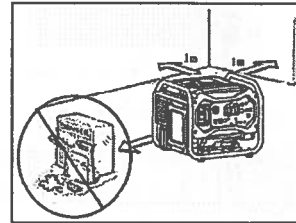
1. Never operate it in an enclosed room.



2. Never connect to home circuit.



3. Do not operate it under wet circumstances.



4. Keep the inflammables away from the unit at least one meter.



5. No smoking when filling fuel.



6. Always fill fuel after stopping it.

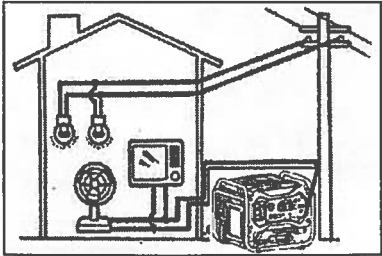


7. Do not spill out when refueling.

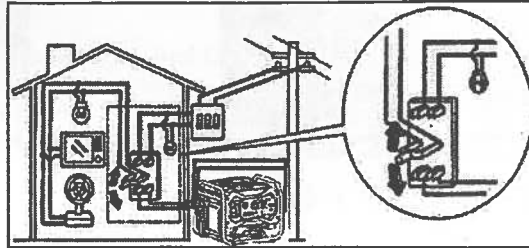
DANGER:

When connecting the generator as home power supply, make sure it's done by a skilled electrician.

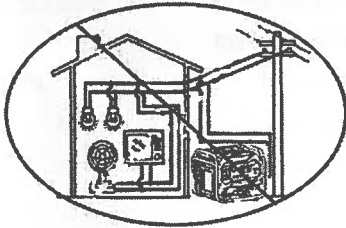
Improper connecting between the generator and loads may cause damage, burn or fire to the generator.



1. Correct

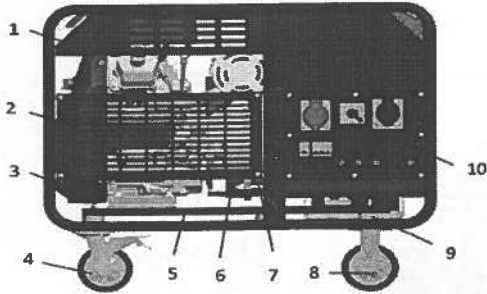


2. Correct

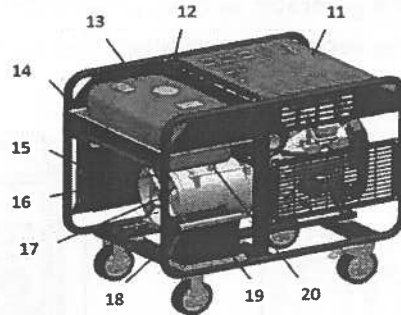


3. Forbidden

2. Introduction to Parts and Components



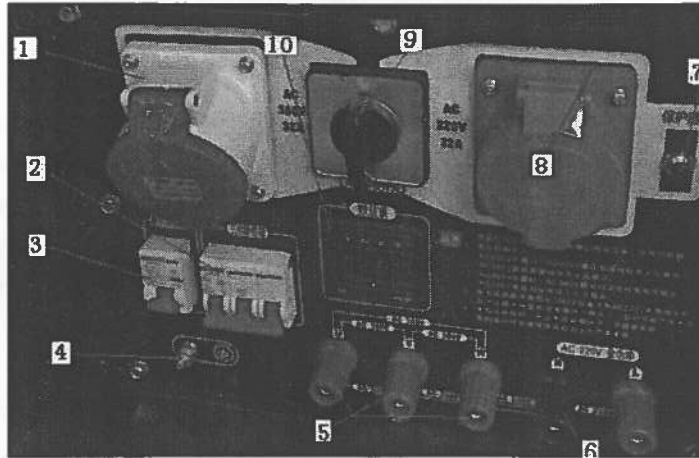
- ① Frame
- ② Side guide plate
- ③ Power section
- ④ Castor
- ⑤ Bottom plate
- ⑥ End cap
- ⑦ Stator and rotor Assy.
- ⑧ Fixed caster
- ⑨ Damper set
- ⑩ Front cover set



- ⑪ Top cover
- ⑫ Baffle
- ⑬ Fuel tank
- ⑭ Fuel tank mounting bracket
- ⑮ Voltage regulator cover
- ⑯ Electric brush
- ⑰ Power strip
- ⑱ Battery bolt
- ⑲ Battery set
- ⑳ Fuel switch

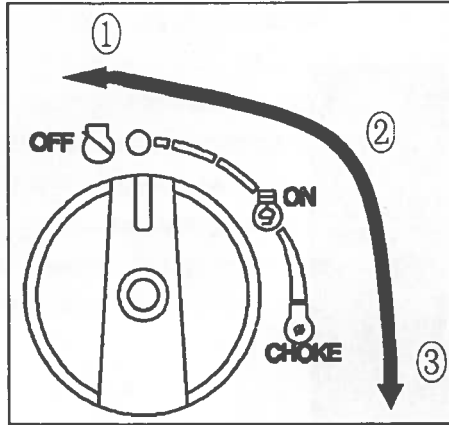
3. Control function

3.1 Control panel



- ① 380V power socket
- ② 380V circuit breaker
- ③ Single phase circuit breaker
- ④ Grounding terminal
- ⑤ 380V power output terminal
- ⑥ 220V power output terminal
- ⑦ Overload protector
- ⑧ 220V power socket
- ⑨ Single/three phase switch
- ⑩ Digital display

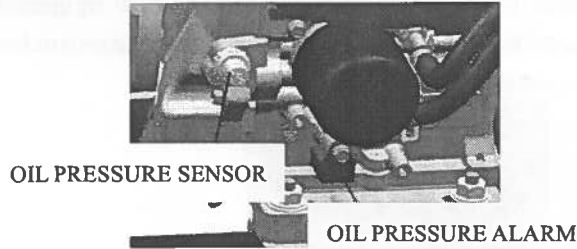
3.2 Ignition switch



- ① Ignition switch in "OFF" position: The power of ignition circuit is off, the oil circuit is closed and the engine cannot be ignited;
- ② Ignition switch in "ON" position: The power is turned on, the oil circuit of the carburetor solenoid valve is connected, and the choke and throttle arm of the carburetor will rotate. Ignition is on preparation stage;
- ③ Ignition switch in "CHOKE" position: The starting motor starts to work, the crankshaft starts to rotate, the spark plug produces sparks, the gasoline enters the combustion chamber, and the power section is ignited.

NOTICE: Don't turn the knob to "CHOKE" position for more than 5S. When the engine is started, the knob must be released immediately. The knob will automatically return to "ON" position under the action of elastic force, and the starting motor will be cut off. If you keep turning the knob and holding it down, it may cause the starter motor to be damaged, thus putting the unit in danger. The knob should be turned to "OFF" position when the unit is not in use.

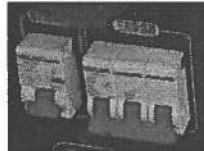
3.3 Engine oil pressure system



When the working oil pressure is insufficient and it drops to about 50KPa, an automatic flameout will be triggered. The insufficient engine oil may cause damage to internal parts.

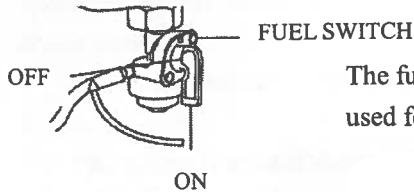
NOTE: If the power section is automatically turned off or cannot be started, first check if there is engine oil and fire and remove the spark plug to check if it is flooded. Then check the engine oil level by dipstick, refuel if necessary. Check and refuel every 30h operation as it will consume a certain amount of engine oil. If the engine oil level is sufficient and the engine cannot be started, try to disconnect the coupler of engine oil pressure switch and engine oil pressure alarm to start it again.

3.4 Voltage switch and circuit breaker



WARNING: When operating the voltage switch (as shown in the above left picture), the electrical equipment should be disconnected first. Then check if the load of the connected electrical equipments are within the rated output power and rated voltage range of the unit. Or put the single/three-phase circuit breaker in the "OFF" position (as shown in the above right picture).

3.5 Fuel switch



The fuel switch is located under the fuel tank. Turn off the fuel switch if it's not used for a long time.

3.6 Grounding (Earth) terminal



Be cautious of the electric shock when connecting the grounding terminal to the grounding wire. If the electrical equipment is grounded, the generator set must be grounded.

4. Pre-use inspection

NOTICE: Make sure to check the unit before each use.

Check if there are unsafe factors around before the engine starts running and do not cover anything on the top which may cause a fire.

The unit should be placed in a place with good ventilation and heat dissipation as it will generate a lot of heat. A large amount of carbon monoxide will be made after a long time operation, which may cause danger.

4.1 Fuel

DANGER: The fuel is a kind of flammable poison. Read the safety requirements carefully before refueling (see page 2 for details).

NOTICE: After refueling, wipe the residual gasoline with a clean and soft cloth in time to avoid fire. Unleaded gasoline must be used. Leaded gasoline can damage engine internal parts severely. Remove the fuel tank cap and add fuel to the fuel level indicator. Tighten up the fuel tank cap after refueling.

Recommended fuel: 92# unleaded gasoline and above
Fuel tank capacity: 40L

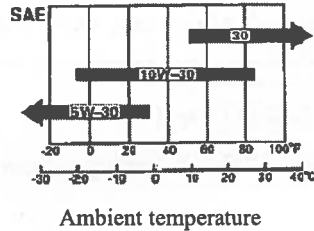
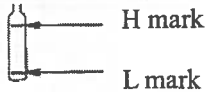
4.2 Engine oil

This generator set is delivered without oil injection. Do not start the engine until sufficient oil has been injected.

NOTICE:

Make sure to check the generator set on a flat ground when it's turned off.

1. Open the dipstick and wipe the dipstick marks clean with a cloth.
2. Insert the dipstick into the oil filler port with it unfastened.
3. Check the oil level. If it's below the L mark, please add oil to H mark (please refer to the picture below).
4. Fasten the dipstick.



Recommended oil for normal temperature areas: SAE 10W-30 SJ

Recommended oil for cold areas: 5W-30 or 10W-30. Please refuel according to the regulations as the above right picture.

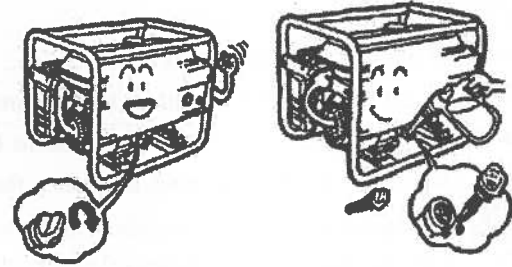
4.3 Preparation

NOTICE: If any of the following parts cannot work properly, please check and repair the engine carefully before starting.

NOTE: A pre-operation check should be done before each use.

Check before use:

- Check the fuel level in the fuel tank. Refuel if necessary.
- Check the engine oil level. Add the recommended oil to the designated oil level if necessary.
- Check for oil leaks
- Check if the battery voltage can reach 12.5V and above.
- Check if the circuit is closed loop. Never connect to the external circuits.
- Check if all the electrical equipments is disconnected.



Abnormal conditions during operation

- Check the running conditions and sound
- Consult your dealer if necessary

5. The operating

WARNING:

- Do not use the generator set in a confined space. The gas discharged from the generator may cause loss of consciousness or even death in a short time. Please use it in a well-ventilated place.
- Do not connect any electrical equipments before starting the engine.
- To prevent electrical misuse, make sure the gasoline generator set is grounded.

NOTICE:

Do not tilt the engine when adding oil to prevent excessive oil from damaging the engine.

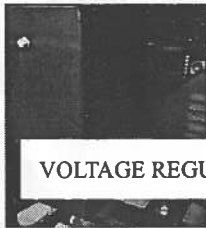
NOTE: The generator set can work with rated output load under standard atmospheric conditions except the plateau areas. Special carburetor must be used in the plateau areas to ensure the power output. Please contact your dealer for special equipment.

- Ambient temperature: $-20^{\circ}\text{C}\sim 45^{\circ}\text{C}$;
Atmospheric pressure: $100\pm 5\text{kPa}$;
Relative humidity: 30%.
- The output power of the generator set will vary according to temperature, height (higher altitude, lower pressure and temperature) and humidity.
- When the temperature, humidity and height exceed the standard atmospheric conditions, the output power of the generator will decrease.

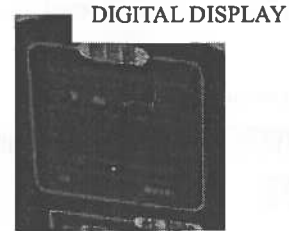
5.1 Start

1. Check if the function buttons on the control panel are in the correct position (see Chapter 3.1 control panel): the power transmission line is closed loop, the load (electrical equipments that needs to be driven) is off, and the voltage value displayed on the digital display is the voltage needed (if the deviation is large, please adjust the voltage according to the following method). Open the single/three phase circuit breaker, check if the wiring terminals are tightly pressed and if they are in the required voltage.

The operation of ignition is seen in Chapter 3.2. When the unit is started, turn on the electrical equipments. The voltage value of the unit has been adjusted before leaving the factory, and the voltage regulator can be adjusted when the voltage is wrong. Unscrew the cover bolts of the voltage regulator, adjust the electronic components on the voltage regulator with the small flat screw insulated on the handle, and observe and adjust the value on the digital display at the same time. (as shown in below pictures)



VOLTAGE REGULATING BUTTON



WARNING: Live working, be careful and safe! If you are unable to adjust by yourself, please contact your dealer for service.

2. Precautions for models with one-key start function

Press the one-key start button more than 5s to start ignition. If it is not ignited, the unit will automatically ignite three times with an interval of 10S. If it has still not been ignited, the red light will be on, and the next ignition can be continued after the red light goes out 150 seconds later.

5.2 Stop

NOTE:

1. Turn off all the connected electrical equipments.
2. Turn the combined ignition switch to the "OFF" position, then
 - A) turn off the fuel switch
 - B) disconnect the battery positive and negative leads.

WARNING:

It's forbidden to cover or touch the frame top when it's just turned off. Or it may cause a fire or burns.

5.3 AC connection

WARNING: All electrical equipments should be disconnected before the plug is inserted.

NOTICE:

- Ensure that all electrical equipments, including wires and plugs, are in good condition before connecting to the generator.
- Make sure the total load of the generator is within the rated load range.
- Make sure the total load current is within the rated current range of the rated socket.

- Start the engine.
- Insert the plug into the AC socket.
- Turn on the electrical equipments.
- If the unit provides power for multiple loads or electrical equipments, please start from high to low according to the load size of the electrical equipments.

5.4 Battery charging

NOTE:

- The start of this generator set must be connected to a 12V battery of DC power supply;
- The connected battery will be automatically charged;
- Connect the red wire (battery "+" lead) to the starting motor positive bolt.
- Connect the battery "-" lead to frame.
- This unit uses a 45Ah large capacity power supply.

NOTICE:

To ensure the normal operation of electrical equipments on the unit, the positive and negative leads of the battery should not be connected reversely.

NOTE:

If the generator set cannot be ignited, it may be because the battery voltage is insufficient. Make sure the battery voltage is $\geq 12.5V$.

A large capacity battery is required for ignition of the unit. If a power supply less than 45AH is used, it may cause a loss of power after being used for many times, therefore the unit cannot be ignited.

WARNING:

- When the unit is not in use, please disconnect the wires to the battery to prevent the electrical discharge and battery loss;
- Battery electrolyte contains sulfuric acid, which is toxic and a burn hazard. Avoid contact with skin, eyes and clothes;
- The battery can produce explosive gas. Please keep it away from sparks, flames, cigarettes, etc.

Treatment:

External contact -- flush with water;




Ingest -- drink plenty of water or milk, milk containing magnesium oxide, eggs or vegetable oil. Call the hospital immediately;

Eye penetrating --- rinse with water for 15 minutes, seek medical advice in time.

Keep the battery away from children.

5.5 Scope of application

Before using the generator, make sure that the total load is within the rated load range of the generator, otherwise it may damage the generator.

AC			
Power factor	1	0.8-0.95	0.4~0.75

Reference value used by this generator set:

Rated output power (50HZ)		
Output voltage	Power factor	Actual load reference value
AC	1.0	≤15kW
	0.8	≤15kW

NOTICE:

Do not overload, the total power of the electrical equipment cannot exceed the output power of the generator, or it will damage the generator set.

When using this generator to supply power to precision instruments, electronic controllers, personal computers, electronic computers, microcomputers, etc., please keep sufficient distance between the equipment and the generator to prevent electromagnetic interference of the engine. It also ensures that the engine is protected from the surrounding electronics.

If this generator is used to power medical equipment, it is recommended to consult the equipment manufacturer, professional or hospital about the amount of current required to start certain electronic equipment or general motors, which may render them unusable. Even if its startup parameters meet the conditions in the above table, please contact the equipment manufacturer.

For long-term use, the temperature of the engine will become extremely high, especially in summer. If the heat dissipation is not good, it will shorten the life of the generator set, so it is recommended that the total load should be 15kw or below.

6. Maintenance

Good maintenance is the best guarantee to achieve safe, economical and zero fault operation. It also contributes to environmental protection.

The user should operate the machine safely. Periodic inspection, adjustment and lubrication can ensure safe and efficient operation of the generator.

WARNING: Please turn off and cool the engine before maintenance.

NOTICE: The original parts should be used in replacement. For more details, please contact your dealer.

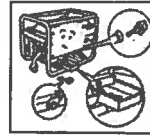
Item	Routine	Every use	Break-in period (30h)	6 months or 100h	12 months or 300h	Every 500h
Engine oil	Check oil level	△	Every 30h △			
	Replace		*	Every 250h *		
Oil filter	Replace		*			
Air filter element	Check			△		
	Clean			△①		
	Replace				△①	
Spark plug	Clean-adjust					△
	Replace					
Combustion chamber	Clean	Every 1000h ②				
Fuel filter	Replace					*
Fuel hose	Check	Every 3 years (replace it if necessary)				

The * stands for replace and the \triangle stands for check.

① The engine oil and air filter should be cleaned or replaced more frequently when used in dusty places to ensure the power and lifespan.

② These items should be maintained by your dealer, unless you have professional tools and repair capabilities. (Note: Damage caused by not following this maintenance schedule is not covered by the warranty.)

- If working under high temperature, overload or dusty conditions, engine oil should be changed every 100 hours.
- If working frequently in dusty or harsh conditions, the air filter element should be cleaned every 30 hours and replaced every 100 hours if necessary.
- Correct maintenance can extend the life.



WARNING:

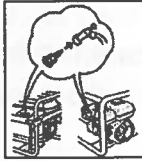
Please stop the engine before any maintenance. The engine should be placed in a horizontal position and the spark plug cap should be separated from the spark plug to prevent engine from starting.

Do not use it indoors or in places with poor ventilation such as tunnels and caves. Make sure that the working area is well ventilated. Exhaust fumes from engines contain toxic gas carbon monoxide, which can cause shock, unconsciousness and even death when inhaled.

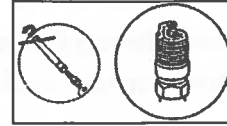
6.1 Spark plug maintenance

Spark plug is an important part of generator and must be checked regularly

1. Remove the spark plug cap.



2. Remove the spark plug.

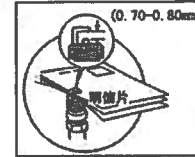


3. Clean off the carbon deposit.



4. Measure and adjust the spark plug gap.

Type: LG K6RTI
Spark plug gap: 0.7-0.8mm



Tip: spark plug gap should be measured with a feeler or thickness gauge, and adjusted if necessary.

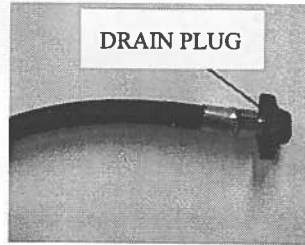
5. Install the spark plug and spark plug cap.

Tightening torque: 18~22 N*m

NOTE: When installing spark plug without a torque wrench, a better estimation method is to twist 1/4 to 1/2 turns by hand. However, the spark plug should be tightened as soon as possible to the specified torque.

6.2 Replacement of engine oil

The oil hose is taken to drain the exhaust oil off. If the engine is cold, run it for 1 minute, then stop it and drain the exhaust oil off. Unscrew the drain plug as shown in the below figure to drain the oil.



WARNING: The temperature of the engine oil could be extremely high, so be careful to avoid burns during operation.

After draining the waste oil, unscrew the oil filler plug on the cylinder head cover and add about 2.3L specified brand engine oil by a funnel.

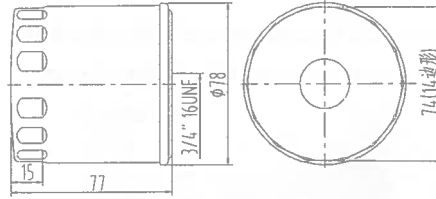
After refueling, check the oil level.

NOTICE: Make sure the engine is placed in a horizontal place when refueling.



6.3 Replacement of oil filter

A larger size oil filter is used for this generator set. It is recommended to replace the oil filter after the new generator set has been used for 30 hours. The oil cleanliness is a prerequisite to ensure the power life.

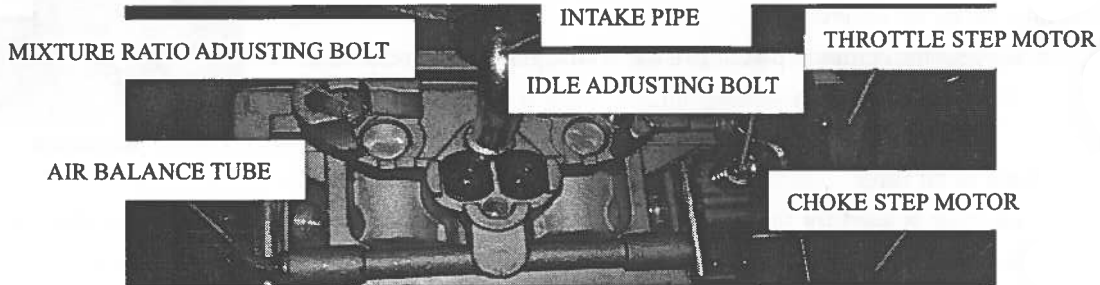


A special wrench should be used to remove the oil filter. Please refer the specifications of the oil filter as the above picture.

6.4 Carburetor

The carburetor is controlled by a dual step motor. The controller automatically adjusts the opening of the throttle and choke according to the input program, combined with the cylinder head temperature and engine speed.

The carburetor structure is as follows:



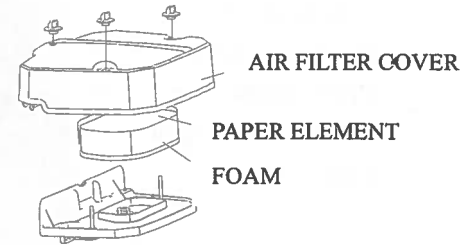
6.5 Air filter

When the air filter is full of dust, it will affect the normal operation of the engine.

1. Remove the nut and air filter cover.
2. Separate the foam and paper element and blow them with a high pressure air gun.

NOTE:

1. Do not start the engine when the filter is not installed, as it will make some loud noise and safety risks.
2. Reinstall the air filter cover to the original position and tighten the screw.
3. Please replace the element if it's too dirty to use, otherwise it will affect the air intake efficiency



6.6 Muffler

WARNING: The engine and muffler may become very hot after the engine is running. Please be careful not to make your skin and clothes directly touch the engine and muffler during inspection and maintenance, otherwise it will cause burns.

6.7 Fuel filter

WARNING: Do not use gasoline where there is smoke or flame.

1. Remove fuel tank cover and filter.
2. Clean the fuel filter gauze with gasoline and put it back in the fuel tank.

3. Reinstall the fuel tank cover.

6.8 Working in plateau areas

At high altitude area, intake air amount of standard carburetor will be decreased due to air pressure, that results in the drop performance and increased fuel consumption. Rich mixture also will contaminate the spark plug to cause difficulty in starting. Exhaust emission may be increased when the engine is operated at a altitude differ from the engine is certified.

If your engine always work at an high altitude ($\geq 1500\text{m}$), please contact your dealer to modify the carburetor to improve the engine performance. In this case, the modified carburetor will meet all emission standard during its service life.

7. Storage

Some storage measures should be taken to prevent aging if you plan to store this generator for a long time.

7.1 Draining off fuel

1. Turn the fuel switch to "ON" position.
2. Open the fuel tank cap and remove the filter. Take all the fuel from the tank into the special tank and reinstall the fuel tank cap.
3. Start the engine and let it run till the fuel is exhausted and the engine stops.
4. Turn the ignition switch to "OFF" position.
5. Remove the battery coupler.

WARNING: The fuel tank is highly volatile and toxic. Please read the safety instructions carefully (see page 1).

NOTICE: Wipe away the spilled oil in time with a soft cloth.

NOTE:

- Do not connect any electrical equipments.
- The running time depends on the fuel remaining in the fuel tank.

7.2 Engine storage

Follow the steps below to protect the box, piston ring and other corrosion-prone parts.

1. Remove the spark plug, pour in a spoonful of SAE10W30 engine oil and rotate the fan and output shaft for

few times to lubricate the cylinder block. Then install the spark plug.

2. Clean the surface, and put the engine in a ventilated and dry place, and cover it with a sheath.

8 Troubleshooting

Engine cannot start

1. Fuel system

There is no gasoline in the combustion chamber.

*No fuel in the tank... Refuel;

*There's oil in the tank... Check if the outlet is blocked;

*Clogged fuel filter... Clean or replace the fuel filter;

*Carburetor is blocked... Clean the carburetor;

*The fuel pump fails to work... Replace the fuel pump;

*Combustion chamber is flooded with oil...Remove the spark plug and ignite. Then drain off the excessive oil, reinstall the spark plug and ignite again;

*Carbon deposit in spark plug...Clean;

*No cylinder pressure...Disassemble and check.

2. Oil system

*Oil level is too low... Refuel;

*Oil pressure sensor malfunction...Replace;

*Insufficient engine oil or no engine oil;

*Oil pressure trigger switch is connected.

3. Electrical system

*Spark plug cannot ignite...Check the wire and parts;

*Spark plug has carbon deposits or moisture... Clean the spark plug carbon deposit and check the spark plug gap;

*Trouble in ignition system... If the problem cannot be found, please contact your dealer;

*Engine oil alarm system fault...Replace.

The generator has no output voltage

*The voltage regulator fault...please contact your dealer;

*The terminals and control panel malfunction...Check if the terminals are loose.

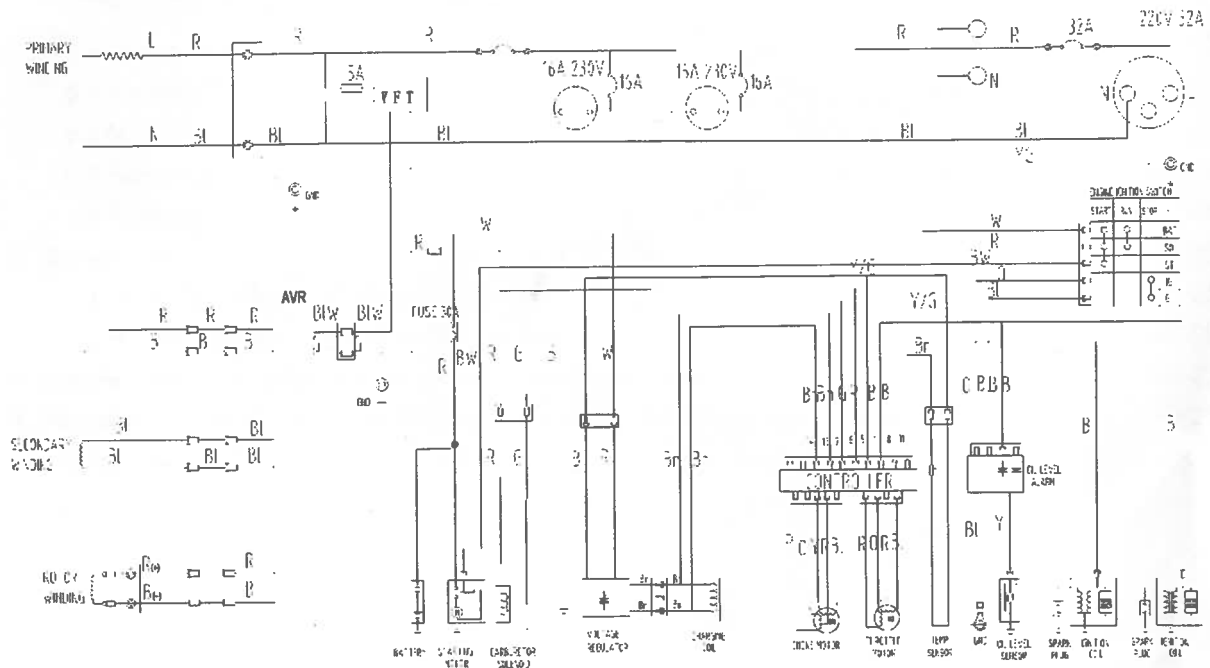
9 Parameters

	Model No.	20000E
Generator	Type	Single/three phase equal power
	Rated frequency/Hz	60
	Rated voltage/V	220/380
	Rated output power/kW	18
	Max. output power /kW	19
	Power factor	1.0
	AC output quality	ISO8528 G1
	THD/%	≤3
	Overload protect	Controlled by overload protect program
Engine	Engine model	LF2V90F
	Engine type	V-twin cylinder, 4-stroke, forced air cooling, OHV
	Displacement/cc	999
	Fuel type	92# unleaded gasoline and above
	Continue running time/h	4.5h (90% load)
	Engine oil capacity/L	2.3
	Spark model No.	LG F6RTI
	Starting mode	Electric

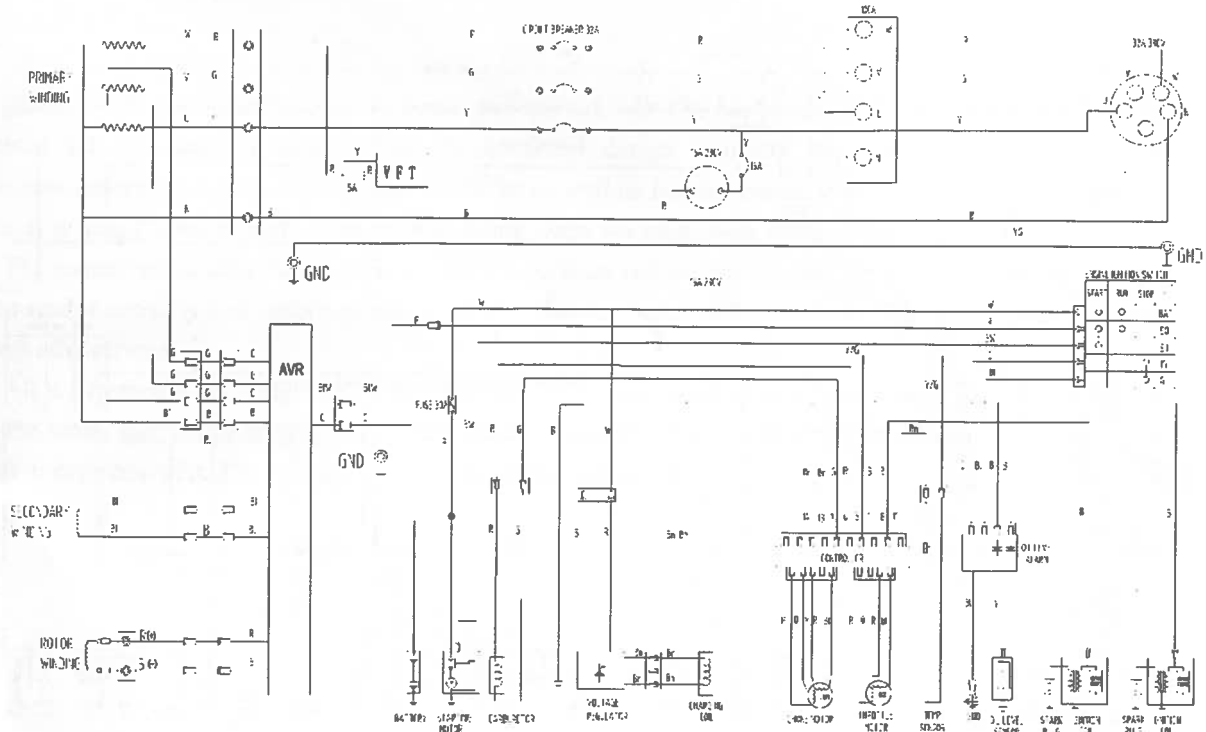
Generator set	L×W×H/mm	1050*715*670
Net weight/Kg		223

10 Wiring diagram

2200E (15GF2-4) Single Phase Generator Set



2200ET (15GF2-4) Three Phase Generator Set



2200ET (15GF2-4) Single/three Phase Generator Set

