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KIPOR POWER OPERATION MANUAL

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

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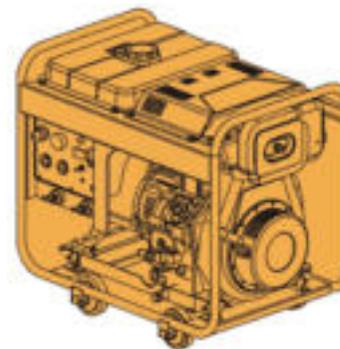
WUXI KIPOR POWER CO., LTD.

Address: Beside Jingyi Rd, Third-stage Development Section
of Wangzhuang Industry Area, Wuxi High &
New Technology Industry Development Zone.

TEL: 86-0510-85205041

FAX: 86-0510-85203796

E-MAIL: kipor@kipor.com



AIR-COOLED DIESEL WELDER AND GENERATOR SET

KDE180XW

KDE180EW

KDE180TW

PREFACE

Thank you very much for that you have purchased the products made by our company.

Our diesel welder and generator set owns the following characteristics:

Its power uses the extremely light type, air-cooled, four-stroke and directly injecting type diesel engine. The set owns two forms of the recoil hand drawing start and of the electric start, the extremely big content combustion oil tank, the automatic voltage stabilization AVR device, NFB circuit protector, AC generating and DC welding double output device, low oil pressure alarm and automatic stop devices. All these make that it is easier for you to use the set and that you feel relieved.

Our series welder and generator set is widely used for the field, outdoor operations, engineering construction, piping construction, the movable power supply for the field army, and the power supply for the electric welding construction. It is also the essential power supply for emergency, spare uses and electric welding construction in the commercial ships, naval ships, animal, husbandry and fish industries, forestry and garden guesthouse and shops, commercial decoration, small type processing workshops.

This operation manual will tell you how to correctly operate and maintain your welder and generator set. Before using the set, please read the operation manual thoroughly to guarantee the correct operation. Following the operation requirements in the operation manual will make that your set is in the best operating state so as to extend the life of the set.



Failure to properly follow these precautions can 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.

If you have any suggestion or problem related to the operation manual, please contact the company or the agency.

With the increasing improvement and enhance of the products made by the company, there may be some differences between the contents described in the operation manual and the practical products, it is our desire that the users will pay attention to the differences.

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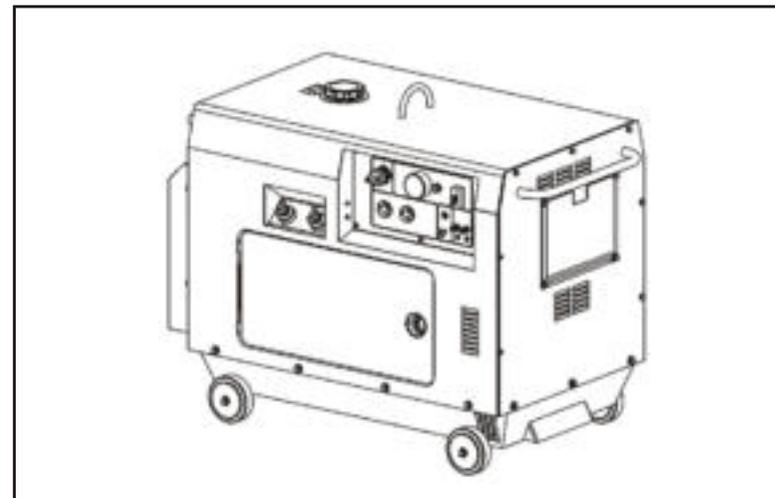
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1. Generator Appearance Diagram

1.1 EW/XW Series External Appearance Diagram



1.2 TW Series External Appearance Diagram



2. Main Technical Specifications and Data

2.1 Main Technical Specifications and Data

| Item | | Set Type | | KDE180XW/EW | | KDE180TW | | |
|--------------------------------|---|---|--------------|---------------------------|------|-----------|--|--|
| | | | | | | | | |
| Welder and Generator Set | Generating Working State (AC) | Rated frequency (Hz) | 50 | 60 | 50 | 60 | | |
| | | Rated power (kW) | 2.8 | 2.8 | 2.8 | 2.8 | | |
| | | Rated voltage (AC)(V) | 230 | 240/120 | 230 | 240/120 | | |
| | | Rated current (AC)(A) | 12.2 | 11.7/23.3 | 12.2 | 11.7/23.3 | | |
| | | Phase No. | Single phase | | | | | |
| | | Power factor (Cos Φ) | 1.0 | | | | | |
| | Working State (DC) | Welding No load welding voltage (DC)(V) | 65-70 | | | | | |
| | | Rated welding current (DC)(V) | 160 | | | | | |
| | | Welding operating voltage (DC)(V) | 25 ~ 30 | | | | | |
| | | Welding load persistence rate | 60% | | | | | |
| | | Welding current adjustment scope (A) | 50 ~ 180 | | | | | |
| | Rated revolution speed (r/min) | 3000 | 3600 | 3000 | 3600 | | | |
| | Excitation mode | Self-excitation (AVR) voltage regulation | | | | | | |
| | Working mode | Continuous operation for 10 hours | | | | | | |
| | Structure mode | Three phase+IGBT(PWM) | | | | | | |
| | Connection mode | Transmission shaft rigid connection | | | | | | |
| Total mass (kg) | XW:130 EW:147 | | 191 | | | | | |
| Overall dimensions (L×W×H)(mm) | XW/EW:720×480×645 | | | 910×520×740 | | | | |
| Diesel Engine | Engine power type | KM186FAG | | | | | | |
| | Persistence power (kW/rpm) | 5.9 | | 6.6 | | | | |
| | Max. Power (kW/rpm) | 6.6 | | 7.35 | | | | |
| | Cylinder diameter×Stroke (mm) | 86×72 | | | | | | |
| | Type | Four-stroke, single cylinder, air-cooled, directly injecting type | | | | | | |
| | Cylinder discharge capacity (ml) | 418 | | | | | | |
| | Cooling system | Forced air-cooled system | | | | | | |
| | Lubrication system | Pressure splash, duplex type lubrication | | | | | | |
| | Lubrication oil quantity (L) | 1.65 | | | | | | |
| | Start system | XW: Recoil hand start | | EW/TW: 12V electric start | | | | |
| | Combustion oil | Diesel oil | | | | | | |
| | Combustion oil tank volume (L) | 16 | | | | | | |
| | Low oil pressure stop protection system | With | | | | | | |
| Start battery | 12V | | 36Ah | | | | | |

2.2 Basic Parameters

2.2.1 Under the following conditions, the set should output the rated power:

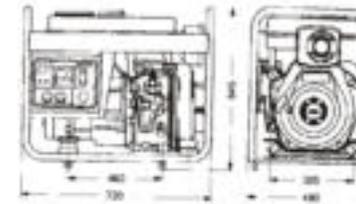
| Altitude height(m) | Environment temperature(°C) | Relative humidity |
|--------------------|-----------------------------|-------------------|
| 0 | +20 | 60% |

2.2.2 Under the following conditions, the set should output the stipulated power and work reliably.

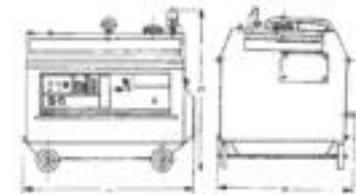
| Altitude height(m) | Environment temperature(°C) | Relative humidity |
|--------------------|-----------------------------|-------------------|
| <1000 | 5-40 | 90% |

2.3 Overall and Installation Dimensions for the Set

2.3.1 XW/EW series set overall and installation dimensions

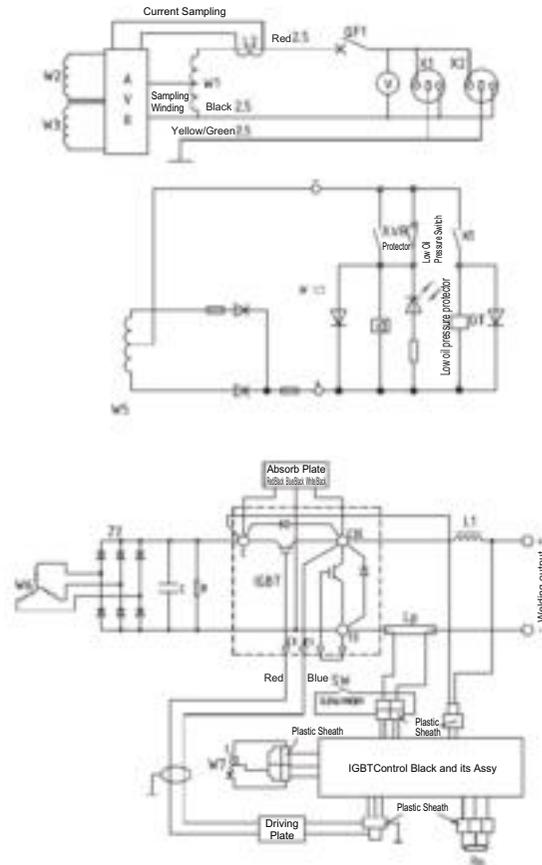


2.3.2 TW series set external appearance



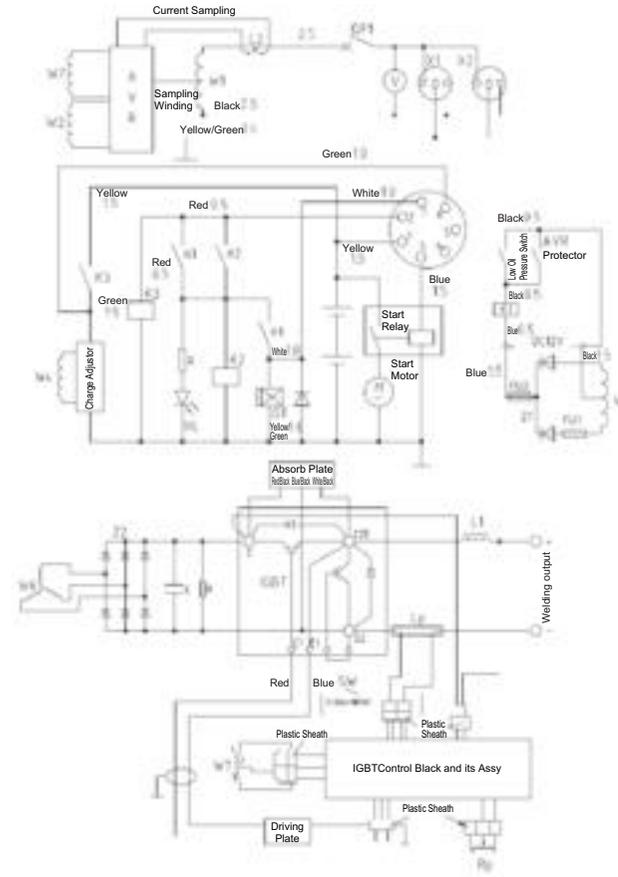
2.4 Electric Wiring Diagram for All Types of the Set

2.4.1 KDE180XW type electric wiring diagram



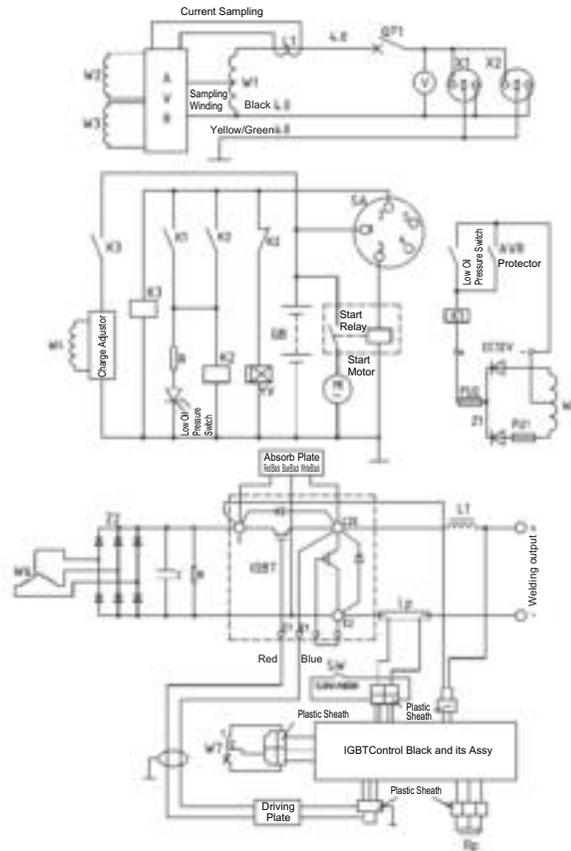
| No. | Parts No. | Description | Qty. |
|-----|-----------|---------------------------------------|------|
| 1 | QF1 | Breaker | 1 |
| 2 | V | Voltmeter (0-300V) | 1 |
| 3 | HL | Operating indicator light (green) | 1 |
| 4 | X1 X2 | Receptacle | 2 |
| 5 | | | 1 |
| 6 | | Print circuit board assembly | 1 |
| 7 | DT | Stop electromagnet | 1 |
| 8 | FU1 | Fuse(0.6×30) | 1 |
| 9 | Z1 | Rectifier bridge | 1 |
| 10 | Z2 | Rectifier bridge | 1 |
| 11 | W1 | Generating and sampling winding | |
| 12 | W2 | Excitation winding | |
| 13 | W3 | Vcc winding | |
| 14 | W4 | Flywheel generator winding | |
| 15 | W5 | I2V winding | |
| 16 | W6 | Welding winding | |
| 17 | W7 | Control winding | |
| 18 | AVR | Automatic voltage regulator | 1 |
| 19 | Rp | Potentiometer (parenthesis knob) | 1 |
| 20 | SW | Welding current select switch | 1 |
| 21 | Lp | Shunt | 1 |
| 22 | L1 | Plain wave reactor | 1 |
| 23 | | IGBT | 1 |
| 24 | | IGBT control black and its assy | 1 |
| 25 | C | Capacitor | 2 |
| 26 | | Welding output terminal post assembly | 2 |
| 27 | | | |
| 28 | | | |

2.4.2 KDE180EW type electric wiring diagram



| No. | Parts No. | Description | Qty. |
|-----|-----------|---------------------------------------|------|
| 1 | QF1 | Breaker | 1 |
| 2 | V | Voltmeter (0-300V) | 1 |
| 3 | HL | Operating indicator light (green) | 1 |
| 4 | X1 X2 | Receptacle | 2 |
| 5 | SA | Ignition switch | 1 |
| 6 | | Print circuit board assembly | 1 |
| 7 | DT | Stop electromagnet | 1 |
| 8 | FU1 | Fuse(0.6×30) | 1 |
| 9 | Z1 | Rectifier bridge | 1 |
| 10 | Z2 | Rectifier bridge | 1 |
| 11 | W1 | Generating and sampling winding | |
| 12 | W2 | Excitation winding | |
| 13 | W3 | Vcc winding | |
| 14 | W4 | Flywheel generator winding | |
| 15 | W5 | I2V winding | |
| 16 | W6 | Welding winding | |
| 17 | W7 | Control winding | |
| 18 | AVR | Automatic voltage regulator | 1 |
| 19 | Rp | Potentiometer (parenthesis knob) | 1 |
| 20 | SW | Welding current select switch | 1 |
| 21 | Lp | Shunt | 1 |
| 22 | L1 | Plain wave reactor | 1 |
| 23 | | IGBT | 1 |
| 24 | | IGBT control black and its assy | 1 |
| 25 | C | Capacitor | 2 |
| 26 | | Welding output terminal post assembly | 2 |
| 27 | GB | Battery | 1 |
| 28 | | Charge adjuster | 1 |

2.4.3 KDE180TW type electric wiring diagram



| No. | Parts No. | Description | Qty. |
|-----|-----------|---------------------------------------|------|
| 1 | QF1 | Beaker | 1 |
| 2 | V | Volmeter (0-300V) | 1 |
| 3 | HL | Operating indicator light (green) | 1 |
| 4 | X1 X2 | Receptacle | 2 |
| 5 | SA | Ignition switch | 1 |
| 6 | | Print circuit board assembly | 1 |
| 7 | YV | Stop electromagnet valve | 1 |
| 8 | FU1 | Fuse (16 x 30) | 1 |
| 9 | Z1 | Rectifier bridge | 1 |
| 10 | Z2 | Rectifier bridge | 1 |
| 11 | W1 | Generating and sampling winding | |
| 12 | W2 | Excitation winding | |
| 13 | W3 | Vice winding | |
| 14 | W4 | Flywheel generator winding | |
| 15 | W5 | 12V winding | |
| 16 | W6 | Welding winding | |
| 17 | W7 | Control winding | |
| 18 | AVR | Automatic voltage regulator | 1 |
| 19 | Rp | Potentiometer (parentness knob) | 1 |
| 20 | SW | Welding current select switch | 1 |
| 21 | Lp | Shunt | 1 |
| 22 | L1 | Plain wave reactor | 1 |
| 23 | | IGBT | 1 |
| 24 | | IGBT control black and its assy | 1 |
| 25 | C | Capacitor | 2 |
| 26 | | Welding output terminal post assembly | 2 |
| 27 | GB | Battery | 1 |
| 28 | | Charge adjuster | 1 |

3. Use for Welder and Generator Set

3.1 Use Essentials and Cautions

In order to ensure that you safely operate the welder and generator set, be sure that you read and understand the operation manual. Especially the attention should be paid to the use main points listed below. Otherwise the personal accidents and the equipment damages may be caused.

3.1.1 Fire prevention. The combustion oil used in the diesel engine is light diesel oil. The gasoline, kerosene and other oils should not be used.

Use a clean cloth to wipe off the overflowed oil. The gasoline, kerosene, match and other inflammable and explosive matters should not be put near the set because the temperature for the place around the exhaust noise suppressor is very high while the diesel engine is running.

For the purpose to prevent the fire and to supply the sufficient ventilation condition, during the operation, at least 1.5m distance between the set and the building and other equipment should be kept.

Operating the welder and generator set should be carried out on a smooth floor. If the set is oblique, the oil will overflow.

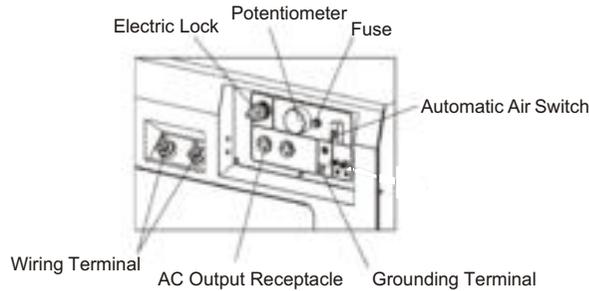
3.1.2 Prevent the suction of the exhausted gas

The exhausted gas includes the poison carbon monoxide. At the places with poor ventilation, the welder and generator set should not be used. If it is necessary to operate the set indoors, the suitable ventilation condition should be supplied to prevent the personnel and livestock from the affection.

3.1.3 Prevent the burn. When the diesel engine is running and is hot, it is not allowed to touch the noise suppressor and its housing.

3.1.4 Electric shock and short-circuit. In order to avoid the electric shock or the short-circuit, when the welder and generator set is wet or when your hand is wet, contacting the welder and generator set is not allowed. This welder and generator set is not waterproof so that it should not be used at places in rain, snow and water mist.

In order to prevent the electric shock, the welder and generator set should be grounded. Connect the grounding terminal of the generator with the external grounding device by using a conductor. Please see Fig.2-1 and Fig.2-2. Before the start, don't connect the other equipment with the welder and generator set.



NOTE

At the time of the start, most motors will exceed their rated power. On any sockets, the current should not exceed the stipulated limit.

3.1.5 Other safety main points

In order to know how to quickly brake the set, the operators should be familiar with operating all the switches. Anyone without passing through the correct guidance should not carry out the operation. The operators should wear the safety shoes and the suitable clothes. The children and livestock should be kept far from the welder and generator set.

3.1.6 Charge the battery.

The electrolyte of the battery contains sulphuric acid. In order to protect your eyes, skin and clothes, if you touch it, it is necessary to use water for wash. If your eyes touch it, you should go to a clinic for wash.

The hydrogen produced from the battery is the explosive gas. Don't smoke particularly at the charge time. Any spark should not be splashed to the places near the battery.

Charge the battery at the places with good ventilation.

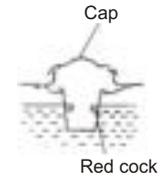
3.2 Preparation before the Start

3.2.1 Select and treat with combustion oil.

Combustion oil tank

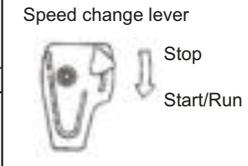
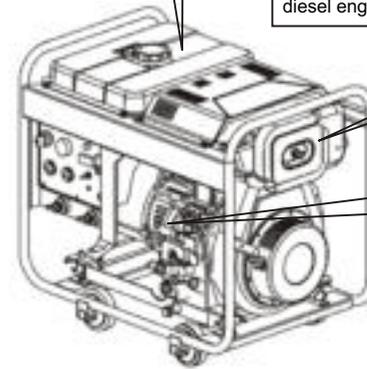
Only use the light diesel oil. The combustion oil should filtered cleanly. The attention should be paid to that don't let any dust and water to be mixed into the combustion oil and the oil tank. Otherwise the high-pressure pump and the oil nozzle may be blocked up.

Attention: Overflowing the oil is very dangerous. Filling the oil into the oil tank should not exceed the top of the red cock inside the filter.



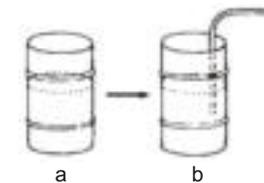
Air filter core

Don't wash the air filter core because the component is the dry type. When the diesel engine output is not good or the color of the exhausted waste gas is abnormal, change the filter core immediately. Never start the diesel engine without using the filter core.



a. After purchasing the fuel, put the fuel in the barrel for 3 to 4 days.

b. After 3 to 4 days, put the suction pipe into the barrel at the place with a half depth of the barrel (water and foreign matter will be sunk onto the lower position in the barrel.)



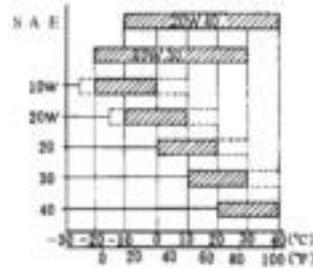
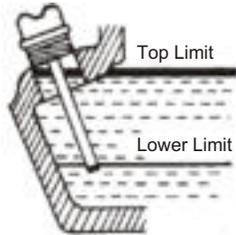
NOTE

At the places of filling the oil into the diesel engine or of storing the diesel oil, don't smoke. Don't let any spark go into this area. At the time of filling the oil, the oil should not be overflowed. After the oil filling, be sure fastening the cover nut on the oil inlet.

3.2.2 Filling the Machinery Oil

Lubrication Oil Filling Inlet

Put the generator set in a level state. Fill the oil into the oil-filling inlet. At the time of checking the oil level, it is necessary only to lightly insert the oil ruler. Please pay attention to that you should not rotate the oil ruler.



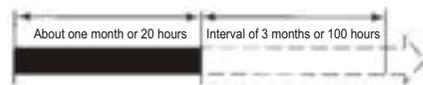
Operating temperature

▨ Recommended value
 ▤ Applicable limit

A.P.I. Diesel engine maintenance classification. The lubrication oil should be CC or CD grade.

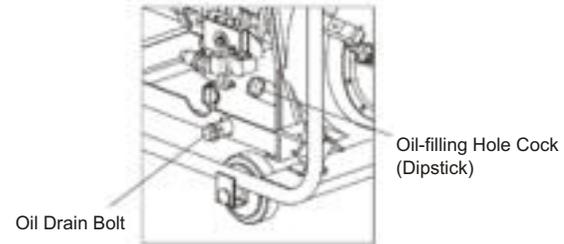
| Volume | Type | KM186FG |
|---------------------------|------|-------------|
| Volume (L) English gallon | | 1.65 (0.36) |

The factor of the affection, to the performance and reliability of the diesel engine, caused by your lubrication oil, is bigger than other factors. If you use any poor quality machinery oil or if you do not change the oil for your diesel engine according to stipulation, it is easy to block up the piston. It is also to quicken the wearing of the cylinder, bearings, and other moving components so that the life of your diesel engine is reduced.



Time for changing the oil

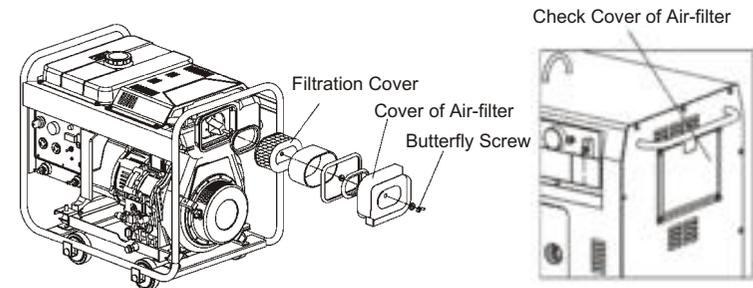
Although there are the low oil pressure alarm system---the stop device. At the time of starting the set, it is necessary to check the oil quantity. If the oil quantity is not sufficient, please add some oil. Discharging the machinery oil should be carried out while the diesel engine is hot. After the cooling, it is very difficult to discharge the oil cleanly.



Don't fill the machinery oil into the diesel engine when the diesel engine is running.

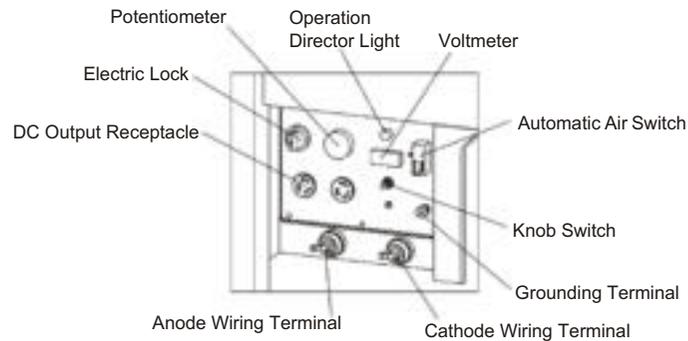
3.2.3 Check the air filter.

(1) Unfasten the butterfly nut, open the filter cover, and take out the filter core. Never wash the filter core by using any detergents. When the output is reduced or the color of the exhausted gas is not good, change the filter core. Never start the generator set without the air filter core. Otherwise the diesel engine will soon be worn out.



(2) After mounting the filter core, cover the air filter housing and fasten the butterfly nut.

3.2.4. Inspection for the welder and generator set



Before starting the set, be sure that the air switch should be turned to OFF state. If the switch is not turned to OFF state, when starting the diesel engine, suddenly loading is very dangerous.

The generator should be grounded to prevent the electric shock.

Blow the dust out of the generator control box inside and surface by using dry compressed air (air pressure should be less than 1.96×10^5 Pa) or manual. Check the clean condition on the slide rings, check the carbon brush pressure, check whether the position on the slide rings are correctly fitted. Check whether the fixing is reliable and whether the contact is good.

According to the electric wiring diagram, check whether the wiring lines are correct and whether the connection joints are firm.

Use a 500V megameter to measure the insulation resistance of the electric device section and the resistance should be not less than 2 megohms. Otherwise it is necessary to carry out a dry treatment. While measuring, AVR should be disconnected. Otherwise AVR may be burned out. (For the noise quieting type set, it is possible not to carry out this check.)

3.2.5. Before delivering the diesel engine from the factory, the fuel oil and the machinery oil had been discharged.

Before filling the fuel oil and starting the diesel engine, it is necessary to check whether there is any air mixed into the oil circuit. If there is any, the air should be discharged. The concrete method is to unfasten the connecting nut between the oil injection pump and the oil transmission pipe so as to discharge the air in the fuel oil until there is no air bubbles to be appeared. Then fasten the connecting nut again.

3.3 Inspection and Operation of the Diesel Engine

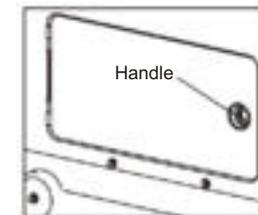
3.3.1 Low oil pressure alarm system/braking device

Our diesel engine possesses the low oil pressure alarm system/braking device. When the oil pressure goes down, the device will automatically brake the diesel engine to avoid the blocking-up of the diesel engine because the oil pressure is too low and the lubrication is insufficient. (2 GF-L can not stop the machine automatically.)

If the diesel engine is running under the condition that the lubrication oil is insufficient, the oil temperature will go up too high. On the other hand, it is also dangerous if there is too much oil. Because the machinery oil may be burned, this will make that the revolution speed of the engine increase suddenly and results in abnormal fast running. For this purpose, it is necessary to check the machinery oil and the oil level should reach the stipulated height.

3.3.2 How to open the machinery casing door and the housing (TW series set)

(1) Open the machinery casing door, rotate the handle counterclockwise. Lift the door and carry out the daily check.



(2) Unfasten the bolts of the air filter housing and take out the oil nozzle housing to check the air filter.

3.3.3 Trial run operation

When your diesel engine is a new set, a large loading will reduce the engine's life. Within the first 20 hours, it is necessary to carry out the trial run.

(1) Avoid the overload.

During the trial run stage, it is necessary to avoid the large load. It uses only 75% of the rated load.

(2) Change the machinery oil of the engine according to the stipulation.

At the beginning of the use, change the oil once each 20-hours or once a month.

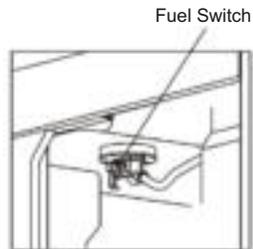
After this, change the oil once each 3-months or once for each 100-hours.

3.4 Starting the Welder and Generator Set

3.4.1. Recoil start (manual start)

Start the engine according to the following procedures:

(1) Switch on the fuel oil switch (in ON position).



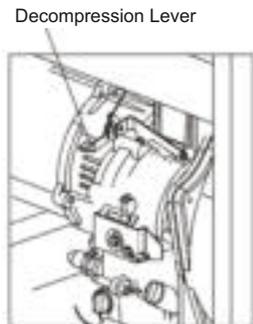
(2) Set the speed handle of the engine at run position.



(3) Draw out the buffer start handle.

a. Draw out the handle till you feel your hand has the resistance force. Then relieve it and let it restore to the initial position.

b. Press down the pressure reduction handle (when the buffer starter is drawn, it will automatically be restored.).



c. Quickly draw out the buffer start handle by two hands.

While operating (or after the start), don't let the handle fly out of your hand to avoid that it smashes onto the diesel engine. Slowly and lightly let the handle return its position to avoid damaging the starter.



When the diesel engine is running, never draw out the start handle otherwise it will damage the diesel engine.

d. In the cold days, when it is difficult to start the diesel engine, unplug the rubber cock on the rocker arm of the diesel engine and fill in 2ml machinery oil.

Plug the rubber cock before the start.

The rubber cock should be plugged except filling in the oil. Otherwise the rain, water, dust and other dirt may enter into the diesel engine to cause the fast wearing of the inside components. This will result in serious problem.

3.4.2 Electric start

3.4.2.1 Start (the preparation for this start is the same as the hand start.)

(1) Insert the electric door key and make it in OFF position.

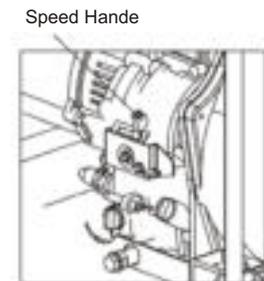
(2) Set the speed handle of the diesel engine in run position.

(3) Turn the start switch to start position clockwise.

(4) After the diesel engine starts, your hand should relieve the switch handle. Let the switch restore to ON position automatically.

(5) If the diesel engine doesn't start after 10 seconds, please wait for another 15 seconds and make the start again. If the start motor rotates for a long time and the voltage of the battery will go down to cause the start motor running hysteresis.

When the diesel engine is in operation always leave the start key in ON position.

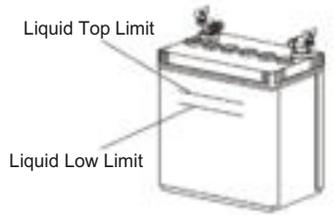




If the start motor rotates for a long time and the voltage of the battery will go down to cause the start motor running hysteresis. When the diesel engine is in operation, always leave the start key in ON position.

3.4.2.2. Battery

Check the electrolyte level height of the battery once a month. When the liquid level goes down to a lower mark, add some distilled water to make that the liquid level goes up to a higher mark.



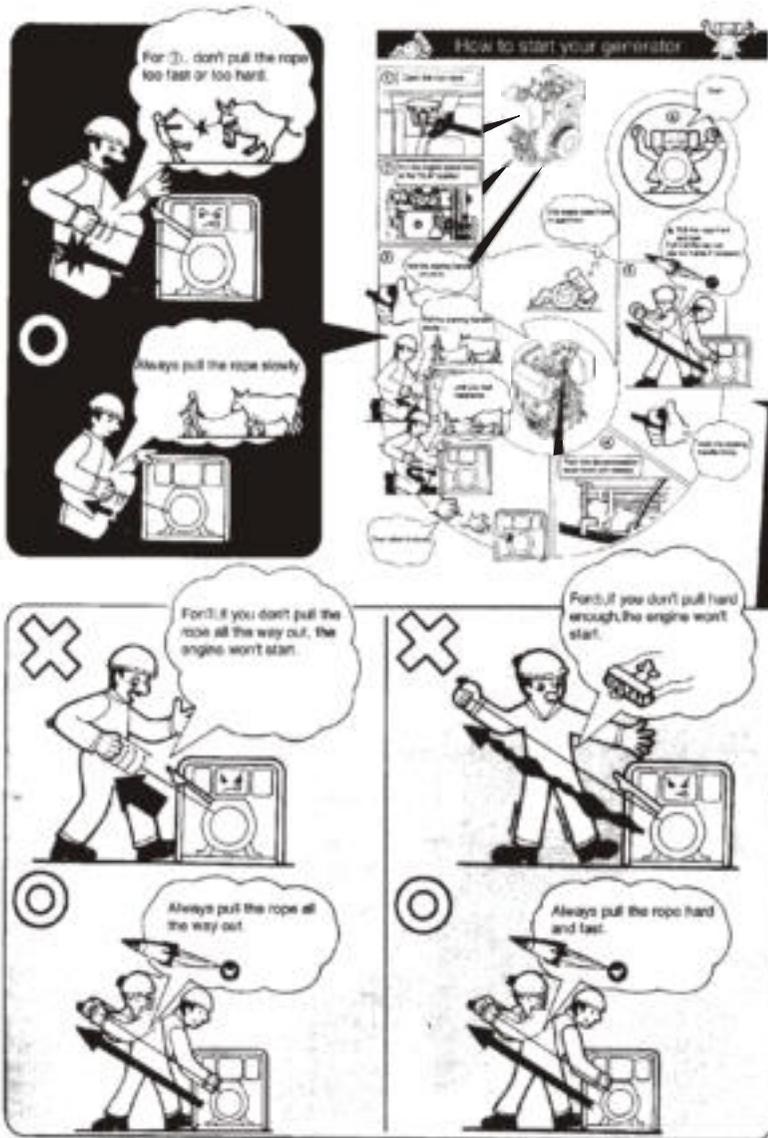
If the electrolyte in the battery is too less, the diesel engine will not start. Because the electric power is insufficient at this time, it is necessary to keep the liquid is at a place between the higher limit and the lower limit.

If the electrolyte in the battery is too much, the liquid may overflow and this may corrode its surrounding components.

Attention should be paid to avoiding that the electrolyte is too much or is too less. Charge the battery once a month.

3.5 Operation Procedure for Starting the Generator Set





3.6 How to Operate the Welder and Generator Set

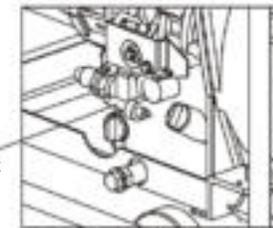
3.6.1 Operating the Diesel Engine

(1) Preheat the diesel engine for three minutes under the condition without any load.

(2) For the diesel engine having the low oil pressure alarm system, it is necessary to check whether the oil pressure signal indicator lights up.

For the diesel engine having the low oil pressure alarm system, the lubrication oil alarm indicator will light up when the oil pressure is low or the lubrication is insufficient, and the diesel engine will stop automatically. If no lubrication oil is added and you do not make a restart, the diesel engine will still stop immediately. It is necessary to check the oil height and add some oil.

(3) Do not unfasten the adjustment bolt used for adjusting the speed limit of the diesel engine or do not unfasten the high-pressure pump limit bolt (they were adjusted well when delivered from the factory.). Otherwise their performance will be affected.



Adjustment Bolt

3.6.2 Inspection during the Operation

(1) Check whether there is any abnormal sound or vibration.

(2) Check whether the diesel engine does not start or the operation is not good.

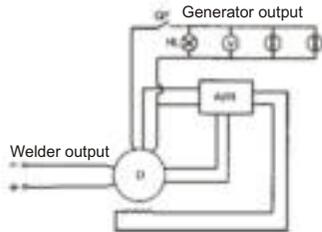
(3) Check the exhausted gas color (is it black or is it too white?)

If you find one of the above mentioned phenomena, it is necessary to brake the set, to find out the trouble cause and shoot the trouble. If the settlement can not be made, please contact agency of our company nearby, or contact our company directly.

3.7 Loading

3.7.1 Load

Load according to the stipulated parameters. For the electric principle diagram of the welder and generator set, please see the following figure.



3.7.2 Welder and Generator Output

(1) Be sure that the revolution speed of the welder and generator set be increased to the rated speed (the speed handle of the diesel engine should be turned to the top.). Otherwise the automatic voltage adjustment device will produce the forced excitation. If the running is for a long time under such condition and AVR will be burned out. For the rated revolution speed of the generator, please see 1.1. Main Technical Specifications and Data in Chapter 1.

(2) After switching on the air switch, observe the voltmeter on the panel of the control cabinet and the voltmeter should point to 230V 5% (50Hz),(for 60Hz set, point to 240 V 5%). At the same time, set the selection switch to GEN (generation) position. At this time, the AC power supply is supplied from the power supply socket.



Do not start more than two machines at the same time. The machines should be started one by one. Do not use the floodlight at the same time of using other machines.

| Type | | Load | | | | |
|-----------------------------------|----------------|---|--|--|---|--------------------------------------|
| | | Incandescence lamp, household electric device | Machines using the rectifier type motors | Machines using the induction type motors (capacity start type) | | |
| | | | | Projector, electric stove | Drilling machines, grinding machines and etc. | Water pumps, air-compressor and etc. |
| | | | Load | | | 60Hz |
| Single phase synchronizing welder | KDE180XW/EW/TW | Not exceeding 2000/2200W | Not exceeding 1000/1200W | 400W or 250W3 | 3 | 3 |
| | | | | | 4 | 3 |

The revolution speed of the generator (50Hz) should be increased up to the rated speed 3000r/min (the speed handle should be turned to the top.).

(3)At the time of connecting with the generator, all kinds of equipment should be connected in order. For the matter of the motor load, firstly the large power motors should be connected. After the operation is normal, then the small power motors can be connected. If the operation is incorrect, the generator will cause the running hysteresis or will brake suddenly. It is necessary to unload the load immediately and to turn off the generator switch. Check where the trouble appears.

If the circuit overload makes that the air switch of AC circuit trips, it is necessary to reduce the circuit load. It is not allowed that the set runs under the overload condition. Maximum output power of the generation for the set should not exceed the stipulation in Table 1-1. It is necessary to wait for several minutes before restoring the operation. If the indication on the voltmeter is too low or too high, the revolution speed can be adjusted. If there is any trouble and any abnormal running condition, it is necessary to stop the generator for check.

(4) When the selection switch is set onto GEN, the switch is used for the generation output.

At this time, there is also the welder voltage output at the welder output terminals. But the output current is smaller, which can be used only for the electric welding rods below 3.2mm. The welding current to be selected can be only below 130A. While welding, the load attached at the generation output side should not exceed 1 kW. In such a way, it is possible to ensure a bigger welding current. The set will supply only the essential illumination at the welding time to avoid the overload.

(5) When the selection switch is set to WELD (welding), the set will supply the welding output (at this time, there is no voltage output from the generation socket.). According to the electric welding rods or the operation demand, the current can be adjusted through the potentiometer knob on the switching board. By adjusting to a suitable position, the welding can be carried out. If a smaller current is needed, it is possible to reduce the not be used for a long time. The position for the rated current is one marks less than maximum position, the rate welding current is 160A.

(6) Before using the set. It is necessary to firmly connect the welding cable joints with the wiring terminals and so as to avoid burning out the terminals because of poor connection.

(7) While the set is in operation, it is necessary to keep good ventilation. The welder and generator set should not be covered with foreign matter to prevent the matter from hindering the heat dissipation.

(8) When the set is used only for the welding separately, the welding cable should be removed or protected. When the set is used only for the welding separately, the air switch should be turned off, or the power supply plug should unplugged to avoid if from short-circuit.

(9) The reference for the current by using the electric welding rods in different diameters

| | | | | | |
|---|-------|-------|--------|---------|---------|
| Diameters of Electric Welding Rods (mm) | 1.6 | 2.0 | 2.5 | 3.2 | 4 |
| Welding Power Supply (A) | 40-50 | 50-80 | 60-100 | 100-140 | 150-180 |

3.7.3 Charge

(1) For the set with the electric start, the set is equipped with a power supply 12V DC. The battery is charged through a regulator. After the battery is connected into the start circuit, and after starting the diesel engine and the set is turned into the running state, at this time, 12V circuit will charge the battery automatically.

(2) If the set is not in use for a long time, it is necessary to remove the connection lines of the battery to prevent the battery form the electric leakage.

(3) Never connect the positive pole of the battery with the negative pole each other. Otherwise it will damage the battery and the motor.

(4) Do not misconnect the positive pole of the battery with the battery. Otherwise it will damage the battery and the motor.

(5)The flammable gas will be produced while charging the battery. The spark, flame and cigarette should not be approached to the place of charging the battery. In order to avoid that there is any spark produced nearby, firstly connect the battery with the charging conductor and then with the motor. At the time of disconnection, firstly disconnect the motor cable.

3.8 Braking the Welder and Generator Set

3.8.1. Remove the load of the welder and generator set.

3.8.2. Turn off the air switch of the welder and generator set.

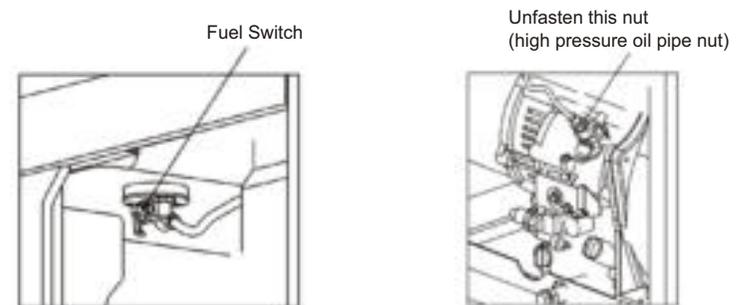
3.8.3. Set the speed handle of the engine to RUN position. Carry out the unload operation of the diesel engine for three minutes. Do not brake the diesel engine suddenly because this may make that the temperature goes up abnormally to cause the blocking-up of the oil nozzle and the damage of the diesel engine.

(1) Press the braking handle downwards.

(2) When using the electric starter, turn the key to OFF .

(3) Set the fuel switch handle to S position.

(4) Slowly draw out the recoil handle till you feel the pressure (i.e., at this point of the compression stroke, the suction and exhaust valves are closed.). Stop the handle at this position. In such a way, when the engine is not in use, the rusting can be prevented.



1. When the speed handle is set at stop position and the diesel engine is still in operation, it is possible to stop the diesel engine either by setting the fuel switch to OFF position or by unfastening the high pressure oil pipe nut. Do not brake the diesel engine by using the pressure reduction handle.

2. It is not allowed that the set stops with the load. It is necessary to firstly remove the load and then to stop the set.

3.9. KDE180 SET

3.9.1 The updated AVR technology and IGBT module control technology are applied in KDE180 generators, which ensures stable welding current and generating voltage. And there won't be any interference between the generating and generating voltage. And there won't be any interference between the generating and welding condition when they are used simultaneously. The unit can be applied for welding and generating simultaneously, however, the total load of the unit cannot surpass the rated load.

The welding current data table:

| | | | | | |
|-----------------------|---------------------|-----|-----|-----|-------|
| Weld current(A) | 160 | 120 | 100 | 50 | 0 |
| Generating power (KW) | Supply little light | 1 | 2 | 2.5 | 2.3/3 |

3.9.2 Choose the welding current with selection button and a regulating knob according to the width of work piece and the diameter of the welding rod. When the small current for thin steel piece is required, first turn the regulating knob to **LOW**, and then choose the appropriate small current by regulating the regulation knob. The regulation range for this work condition is 50-140A. When big current for thick steel pieces is required, turn the regulating knob to **HIGH**. Then you can choose a big current by regulating the regulating knob. Then regulation range for this work condition is 80-180A.

4. Maintenance of the Welder and Generator Set

4.1 Regular Maintenance

In order to keep that the welder and generator set is in a good state, the regular inspection and maintenance is very important. The set is composed of the diesel engine, welder generator, control cabinet, frame and so on. For the details about the inspection and maintenance, please read the operation and maintenance manual for each assembling section.

Before carrying out maintenance to the set, please turn off the diesel engine. If it is necessary to run the diesel engine, its surrounding should be in good ventilation to discharge the gas that contains the poison carbon monoxide.

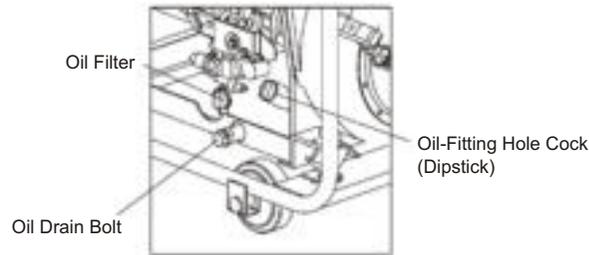
After using the set, it is necessary to wipe off dirt by using a clean cloth to prevent the corrosion and remove the sunk materials.

| Item | Service period regular | Daily check | First month of 20 Hrs | Every 3 months or 100 Hrs | Every 6 month or 500 Hrs | Every year or 1000 Hrs |
|--|--|-------------|-----------------------|---------------------------|--------------------------|------------------------|
| Check and replenish fuel | | ○ | | | | |
| Drain fuel from F.O. tank | | | ○ | | | |
| Check and replenish lube oil | | ○ | | | | |
| Check for oil leakage | | ○ | | | | |
| Check and tighten each parts engine | | ○ | | | ● Tighten head bolts | |
| Change lube oil | | | ○ (1st time) | ○ (2nd and thereafter) | | |
| Clean oil filter | | | | | ○ (Replace if necessary) | |
| Air cleaner element replacement | (Service more frequently when used in dusty areas) | | | | ○ (Replace) | |
| Clean fuel filter | | | | | ○ | ● (Replace) |
| Check fuel injection pump | | | | | ● | |
| Check fuel injection nozzle | | | | | ● | |
| Check fuel pipe | | | | | ● (Replace if necessary) | |
| Adjust valve clearance for intake and exhaust valves | | | ● (1st time) | | ● | |
| Lap intake and exhaust valves | | | | | | ● |
| Replace piston rings | | | | | | ● |
| Check battery fluid | (Monthly) | | | | | |
| Check commutator brush and slip ring | | | | | ● | |

"●" The chart above indicates which checks to make and when to make them, the mark (○) indicates that special tools and skills one required, consult your dealer.

4.1.1 Changing engine oil (Every 100Hrs)

Remove the oil filler cap. Remove the drain plug and drain the old oil while the engine is still warm. The plug is located on the bottom of the cylinder block. Tighten the drain plug and refill with the recommended oil.



4.1.2 Cleaning the oil filter

| | |
|----------------------|-----------------------------|
| Clean | Every 6 months or 500 hours |
| Replace if necessary | |

4.1.3 Changing the air cleaner element

Do not wash the air cleaner element with detergent because this is a wet type element.

| | |
|--------|---|
| Change | Every 6 months of 500 hours (or earlier if dirty) |
|--------|---|



Never start the engine without the element, or with a defective element. Change the element in time.

4.1.4 Cleaning and replacing the fuel filter

The fuel filter also has to be cleaned regularly to insure maximum engine output.

| | |
|---------|-----------------------------|
| Clean | Every 6 months or 500 hours |
| Replace | Every year or 1000 hours |

- (1) Drain the fuel oil from the fuel tank.
 - (2) Loosen the small screws of the fuel cock and pull out the filter from the F.O. tank. Wash the filter thoroughly with diesel fuel.
- Remove the lock nut, end cap and diffuser discs and clean the carbon deposit.

| | |
|------------|-----------------------------|
| Clean time | Every 3 months or 100 hours |
|------------|-----------------------------|

4.1.5 Tightening cylinder head bolts (Refer to the manual of diesel engine) requires a special tool. Don't try it yourself.

4.1.6 Checking the injection nozzle, injection pump, etc.

- (1) Adjusting the valve head clearance for the intake and exhaust valves.
- (2) Lapping of intake and exhaust valves.
- (3) Replacing piston ring. All these require special tools and skills. Do not perform the injection nozzle test near an open fire or any other kind of fire. The fuel spray may ignite. Do not expose bare skin to the fuel spray. The fuel may penetrate the skin and cause injury to the body. Always keep your body away from the nozzle.

4.1.7 Checking and replenishing battery fluid and charging the battery.

This diesel engine uses a 12V battery. The battery fluid will be lost through continuous charging and discharging. Before starting, check for physical damage to the battery and also the electrolyte level, and replenish with distilled water up to the upper mark if necessary. When actual damage is discovered, replace the battery.

| | |
|---------------------|---------|
| Battery fluid check | monthly |
|---------------------|---------|

4.1.8 Frequent check of the contact between carbon brush and slip ring of alternator, check whether they are in good condition. If spark occurs they have to be adjusted properly.

4.2 Maintenance for a long time storage

If your generator should be storage in a long time, the following preparation should be made:

4.2.1 Operate the diesel engine about 3 minutes, the stop it.

4.2.2 Close the diesel engine when the diesel engine is still hot, drain old lubricate of diesel engine oil out, the refill new one.

4.2.3 Pull out the rubber plug at the cover of diesel engine and ass 2ml of lubricate in cylinder, and finally put the plug on its original place.

4.2.4 Maintenance of starting position

(1) Manual starting

Press the pressure-reduce handle (non-compressin position), pull the recoil handle 2~3 times. (Don't start the diesel engine).

(2) Electric starting

When the starting handle is in the position of non-compressing position, operate the diesel engine 2~3 seconds. When the switch is in the position of istart, don't start the diesel engine.

4.2.5 Pull the pressure-reduce handle out, pull the recoil starter slowly.

When fell it is fasten, then stop. (At this time the intake and drain valve is at the status of close, it is suitable to prevent from rust).

4.2.6 Clean and store it in a dry place.

5. Inspection, Repair and Trouble Shooting for the Welder and Generator Set

5.1 Maintenance and rimedy

| | Cause | Remedy |
|--|---|--|
| The diesel engine can no start | Oil fuel is not enough | Add oil fuel. |
| | The switch is not at ON position | Turn it to ON position. |
| | The pump of high pressure and oil nozzle can not inject oil or the oil amount is not enough | Remove the oil nozzle out and repair it at test table. |
| | The control lever of speed is not at RUN position | Put the control level to RUN position. |
| | Check the level of lubricant | The specified oil level should be between upper level H and lower lever L |
| | The speed and force to pull the recoil starter is not enough | Start the diesel engine according to the requirements of operating procedure of start. |
| | The oil nozzle has dirty | Clean the oil nozzle. |
| | The battery has no electricity | Charge it or replace it with a new one. |
| The generator does not generate the electricity, without welder voltage. | Main switch (NFB) is not closed | Put the main switch to the ON position. |
| | The carbon brush of generator is not good | Change the carbon brush. |
| | The contact of socket is not good | Adjust the feet of socket. |
| | The rated speed of generator ban not be reached | Adjust if according to the requirements. |
| | AVR auto-voltage regulator is damaged | Change the AVR auto-voltage regulator. |
| | The potentiometer for adjusting the welder current is damaged | Change the potentiometer. |

If electricity is still not generated, take the generator to a our Dealer.

5.2 Question and problem

If you have any question or problem when you meet in your operation, please contact with our company or our dealer and tell the following information:

(1) The type of diesel generator sets, the No. and type of diesel engine and the No. and type of generator.

(2) Status

What problem had been taken place when operation and explain how much speed it is operated.

(3) Time of operation

(4) The other detailed conditions, for example, when the problem took and what time, etc.

For details, please fill the sheet of soliciting opinions from the customers and send it to our company.

6. Appendixes

6.1 List for Tools, Accessories and Fittings with the Machine

| No. | Name | Unit | Quantity | Remarks |
|-----|---------------------------------|-------|----------|---------|
| 1 | Diesel welder and generator set | Set | 1 | |
| 2 | Tool bag | Piece | 1 | |
| 3 | Plastics housing Piece | Set | 1 | |
| 4 | Power supply socket | Piece | 1 | |

6.2 Technical documentation

| No. | Name | Unit | Quantity | Remarks |
|-----|--|-------|----------|---------|
| 1 | Operation manual for the diesel welder and generator set | Copy | 1 | |
| 2 | Operation manual for the diesel engine | Copy | 1 | |
| 3 | Component diagram of the diesel engine | Sheet | 1 | |
| 4 | Certificate of quality | Sheet | 1 | |
| 5 | Packing list | Sheet | 1 | |

6.3 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".

$$\text{Potential (v)} = \frac{1}{58} \times \frac{\text{Length}}{\text{Section area}} \times \text{Current (A)} \times \sqrt{3}$$

The relations among of the allowable current, and length, section of the Insulating cable (single core, multi-core) are as follow:

(Presume that the use voltage is 220V and the potential is below 10V.

The application of the single-core insulating cable section mm²

| Length beneath Current | 50m | 75m | 100m | 125 | 150 | 200 |
|---------------------------|-----|-----|------|-----|-----|-----|
| 50A | 8 | 14 | 22 | 22 | 30 | 38 |
| 100A | 22 | 30 | 38 | 50 | 50 | 60 |
| 200A | 60 | 60 | 60 | 80 | 100 | 125 |
| 300A | 100 | 100 | 100 | 125 | 150 | 200 |

The application of the multi-core insulating cable section mm²

| Length beneath Current | 50m | 75m | 100m | 125 | 150 | 200 |
|---------------------------|------|------|------|------|------|-------|
| 50A | 14 | 14 | 22 | 22 | 30 | 38 |
| 100A | 38 | 38 | 38 | 50 | 50 | 60 |
| 200A | 38×2 | 38×2 | 38×2 | 50×2 | 50×2 | 50×2 |
| 300A | 60×2 | 60×2 | 60×2 | 60×2 | 80×2 | 100×2 |

6.4 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:

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