

KIPOR[®]

KIPOR POWER OPERATION MANUAL

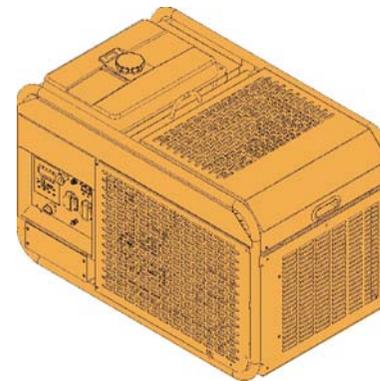
PLEASE READ THIS MANUAL CAREFULLY.
IT CONTAINS IMPORTANT SAFETY INFORMATION.

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KIPOR[®]

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GENERATOR

Single-phase:
KDE12EA
KDE12STA

Three-phase:
KDE12EA3
KDE12STA3

PREFACE

Congratulation and thank you for your purchase of our unit. Our aim is to provide a high-quality generator set to achieve customer satisfaction, and we are confident that your choice will be justified.

This manual provides correct installation, usage and maintenance instruction and gives all basic information to ensure satisfactory and reliable operation of our unit. Please use this manual as a companion to the other manual covering the engine side.

WARNING

1. This generator is movable on the ground.
2. Please read this manual carefully before operation. To operate the generator after fully understanding the contents of working, check and maintenance.
3. The explosive motor is adopted in the generator, so the parts of muffler and water case are very hot. Failure to operate could lead to burn. Please note the warning stickers on the generator.
4. Fuel and lube oil are inflammable which close to the fire, this may touch off fire hazard or explosion. The extinguisher and first-aid kit should be set in the working field.

CAUTION

1. Use SAE 10W-30 lubrication oil, or the same grade of SG (SAE10W) oil. Change the oil after the first 10hrs operation. Afterwards, change it each 50hrs.
2. Don't connect the generator to other power supplies. Such as main-supply of power company. In some special cases, please connect the stand-by power to the electrical system by professional electrician who must know the difference between public supply and generator circuit.
3. For information about the engine operation and maintenance, please see our engine's manual.
4. Laymen especially the children can not realize the danger, they should keep away from the generator.
5. Please wear suitable clothes and safety protective coverall.
6. The key of door lock and electric door accessories for meter door and maintenance door of silent unit should be well kept by operators. Please lock the doors of generator tightly to prevent somebody to operate (the children can not realize the danger).

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EC Declaration of Conformity
According to EU Machinery-Directive 98/37/EC

We, Wuxi Kipor Power Co., Ltd. (Add: Beside Jingyi Rd, Third-stage Development Section of Wangzhuang Industry Area, Wuxi High & New Technology Industry Development Zone.)

declare under our sole responsibility that the product diesel generator set: KDE12EA, KDE12EA3, KDE12STA, KDE12STA3, to which this declaration relates correspond to the relevant basic safety and health requirements of Directive:

- 98/37/EC (Machinery-Directive),
- 2006/95/EC (LVD-Directive),
- 89/336/EC (EMC-Directive), and
- 2000/14/EC (noise directive) incl. modifications.

For the relevant implementation of the safety and health requirements mentioned in the Directives, the following standards and/or technical specification(s) have been respected:

- EN 55012:2002/+A1:2005,
- EN 12601: 2001,
- EN ISO 3744, ISO 11094.

Mode	KDE12EA	KDE12EA3	KDE12STA	KDE12STA3
Item				
Measured sound power level	94.0dB(A)	94.0dB(A)	93.87dB(A)	93.93dB(A)
Guaranteed sound power level	95.0dB(A)	95.0dB(A)	96.0dB(A)	96.0dB(A)

Conformity assessment method to annex VII Directive 2000/14/EC

Maintenance of technical documentation:

Wuxi Kipor Power Co., Ltd.

Signature: Shuoming Huang

Name: Shuoming Huang

Quality Guarentee Manager

1. Main Technical Specifications and Data

ITEM	MODEL	KDE12EA KDE12STA		KDE12EA3 KDE12STA3	
	Generator	Rated Frequency(Hz)	50	60	50
Rated Power (KVA)		8.5	9.0	9.5	10.5
Max Power (KVA)		9.5	10.0	10.5	11.5
Rated Voltage (V)		115/230	240/120	400/230	416/240
Rated Current (A)		73.8/36.9	37.5/75	13.7	14.6
Rated Rotation Speed (r/min)		3000	3600	3000	3600
Phase		Single-phase		Three-phase	
Power Factor (cos Φ)		1.0		0.8 (lag)	
Excitation Mode		Transistorized self-excitation and constant voltage(AVR)			
Working Mode		12 hours continuous running			
Structure Mode		E: Open -frame type;		ST: Super silence	
Connecting Mode		Rotation Shaft Steel Connection			
Dry Weight (kg)		E: 200		ST: 310	
Overall Dimension (L x W x H) (mm)		EA/EA3:1030x600x650(Without wheel & handle)		STA/STA3:1200X650X760	
Fuel Consumption (g/kw.h)	≤340				

ITEM	MODEL	KDE12EA KDE12STA		KDE12EA3 KDE12STA3	
	Engine	Mode	KM2V80		
Type		Two-cylinder, V-twins, Air-cooled, 4-stroke, Bow-wave type			
Displacement (ml)		794			
Bore x Stroke (mm)		80 X 79			
Fuel		0 ~ 35 Diesel			
Oil Tank Capacity (L)		2.27			
Decompression		23			
Standard Power (KVA)		12	14.5	12	14.5
Starting Mode /Battery capacity		12V Electric Starter /36AH or 50AH			
Fuel Tank Capacity (L)		26			

2. Model Specifications:

E: Open-frame type ST: Super silence

A: Digital panel 3: Three-phase

3. Noise instruction:

The noise list indicates the noise emission level while not the safe working noise level. Although the noise emission level is related to the sound exposure level, it is not the judging standard for whether applying noise protection.

Factors affect the practical noise level including: the ambient condition and other noise source, such as the quantity of working machine or the working hours in noisy condition. Furthermore, the sound exposure level varies among different countries.

2. 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:

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

12. APPENDIX

1. 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	125m	150m	200m
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	125m	150m	200m
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

2. PREPARATORY STEPS FOR OPERATION

1. Environmental Requirements

1-1 Outdoors use

- 1) Install Generator in a dry and dustless place.
- 2) Avoid the direct sunshine, place Generator in shade.
- 3) Keep Generator on a level ground so that the unit will not move by itself. For safely, fix the unit on the ground by pegging.

1-2 Indoor use

- 1) Use in well-ventilated areas, or vent exhaust outside and away from any building air intakes. A large volume of air is required for the operation.
- 2) Keep the air inlet/outlet and the exhaust gas outlet 1.5m away from any obstacle.
- 3) Use under 40 degrees temperature.
- 4) Install Generator on a level surface.

2. Preparation for the engine

2-1 Initial start check

Check the each part of the generator before starting.

Making sure that anybody near the generator is warned, before starting the generator.

Be care of these parts in the generator, such as rotary parts, hot parts, high-voltage parts. Start the engine after closing the door for safety and noise control.

⚠ CAUTION

Stop the engine at once and check for the fault, if the warning lamps light.

⚠ CAUTION

Check the unit for oil leakage, water leakage, air leakage and abnormal sound.

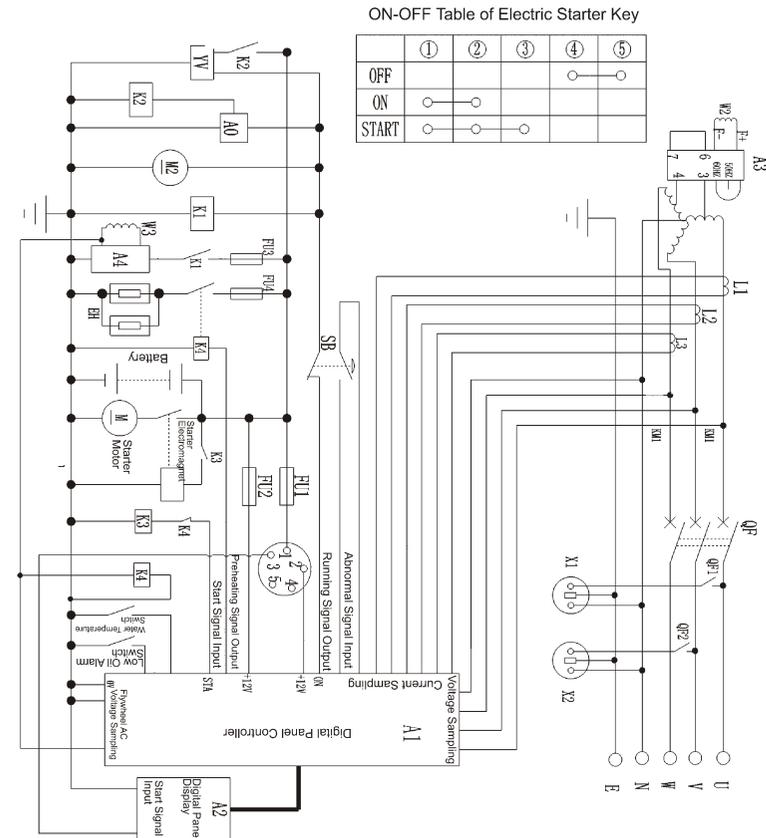
2-2 Initial start check

⚠ DANGER

The rotary parts are dangerous!
The high-speed rotating parts are very dangerous when the generator is running.

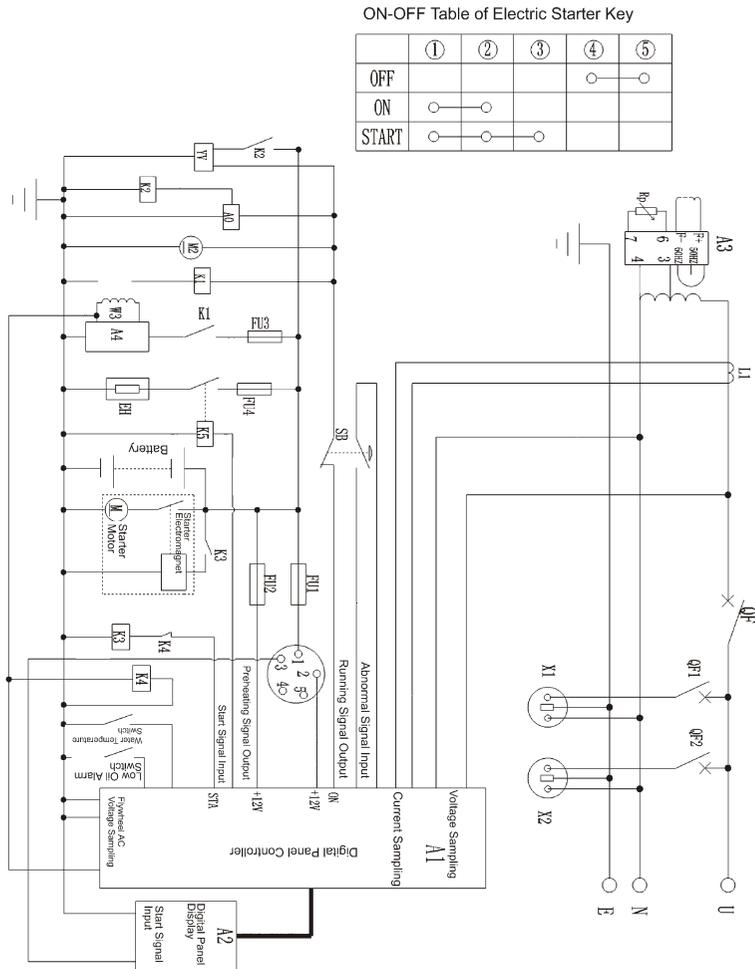
- Close the side doors when running the unit.
- Service the unit after its engine stops completely.

b.KDE12STA3



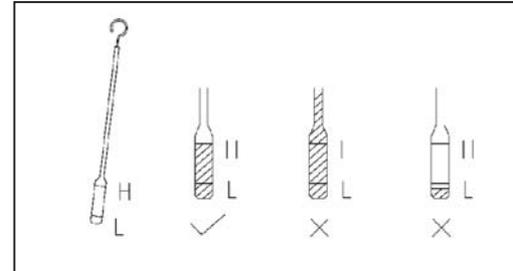
1. Three-phase

a.KDE12STA

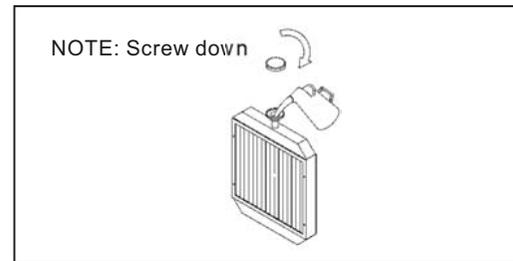


2-3 Check the following items for the initial start:

(1) Check the engine oil



(2) Check the cooling water in radiator.



(3) Check the fuel.

(4) Check the fuel pipe.

(5) Check the battery voltage.

(6) Check the grounding protection.

(7) Check the water leakage and oil leakage.

(8) Check the looseness of the parts.

(9) Clean the dirty and dusty in the unit.

1) Check the engine oil

a) Check the engine oil level with oil dipstick. And the oil level should be between the H (high) and L (low) positions.

b) If the oil level is lower than L position, add the engine oil.

c) Check if the engine is clean or not.

⚠ CAUTION

The engine oil decreases slowly when unit is running continuously. In order to avoid lacking of engine oil to cause fault, inspect the oil level and add engine oil if necessary.

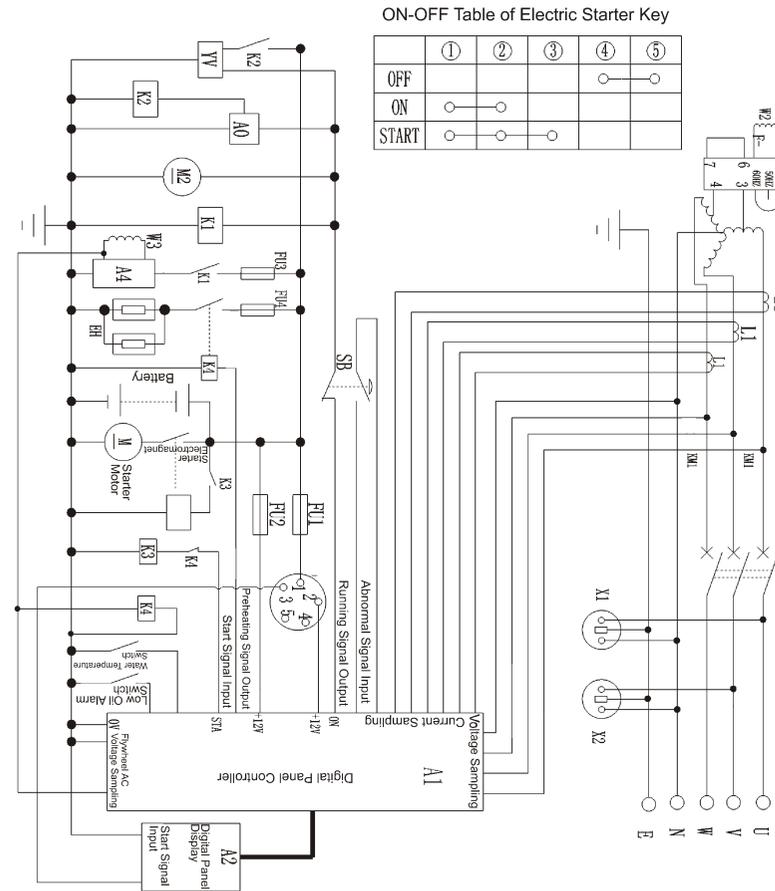
2) Check the cooling water in radiator.

⚠ CAUTION

Radiator
Be careful of the hot radiator. It's very dangerous to open the radiator cover when the cooling water is very hot. The vapor and splashed water may scald you seriously.

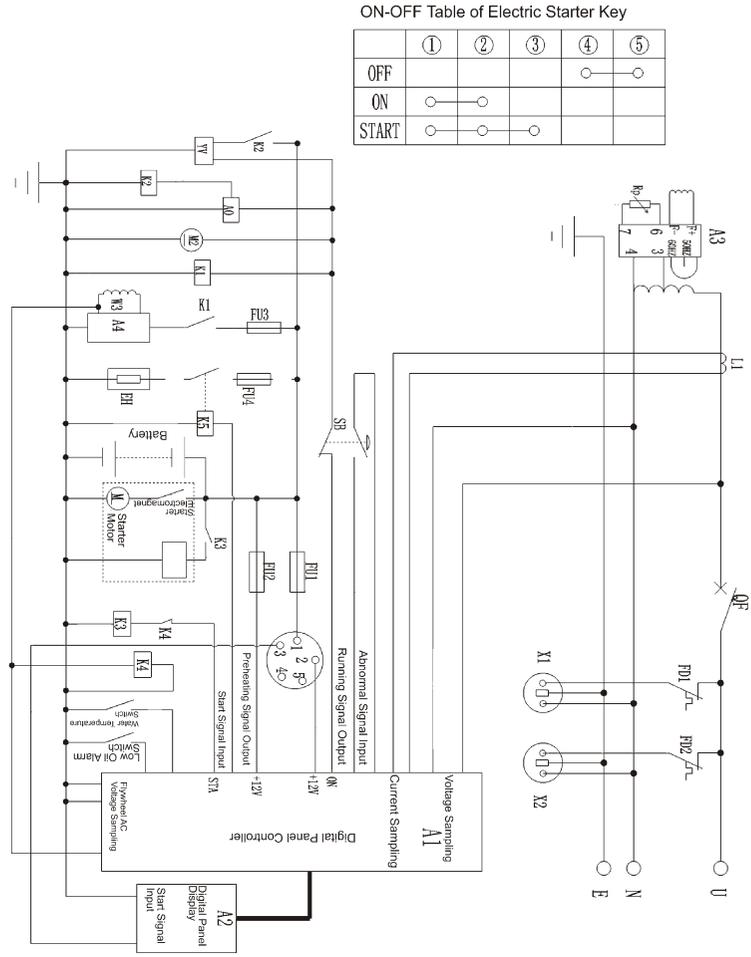
- Don't open the radiator cover when the engine is running or after the engine is stopped just for a while. Because the cooling water temperature is very high in this time.
- Check the cooling water after the engine stops.
- Open the radiator cover when check it, check the radiator if full of the cooling water or not.

b.KDE12EA3



11. ELECTRICAL WIRING DIAGRAM

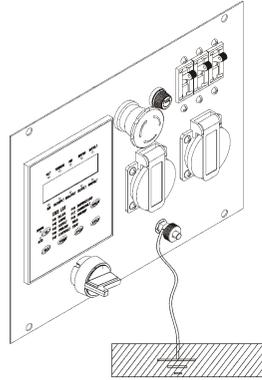
- 1. Single phase
- a. KDE12EA



⚠ CAUTION

Tighten the radiator cover by turn it in right after checking. Otherwise, the cooling water may be vaporized, causing a fatal fault.

- 3) Check the fan belt
Check the tension and the extend length of the belt. Check the belt if good or not. Replace it if necessary. Refer to its engine manual for the regulation or replacement of the belt.
- 4) Check the fuel
Check the fuel level if normal before running the generator. Often open the drain plug in the fuel tank to drain the sediment and impurity.



5) Check the grounding protection

The generator frame and load generator frame must be installed grounding protection, and make sure the grounding protection is ok.

6) Check the water leakage and oil leakage.

Inspect the wholly unit and open the door to check if there is water leakage and oil leakage. If there is, please contact with your dealer for service.

7) Check the looseness of the parts

Check the nuts and screws if loosened. If loosened, tighten them. Specially inspect the air cleaner, muffler, and charging alternator.

Pay attention to the broken cables and loosened terminals.

Digital panel electric system

Fault	Reason	Troubleshooting
No display	1. The fuse on the panel breaks	Replace the fuse
	2. The electric starting switch fails or poor connection	Check or replace the electric starting switch
	3. Poor connection of inserter	Check module No.9, PIN inserter and data wire
P-01	1. Insufficient oil quantity	Refill in oil
	2. The lubrication system is faulty	Check the lubrication system
	3. The low oil pressure switch fails	Replace the low oil pressure switch of the same model
	4. Short circuit of low oil pressure switch	Check the circuit
P-02	1. Sampling wire disconnects	Check the sampling wiring harness, there should be no voltage or frequency display on the panel
	2. Abnormal frequency (Too high or too low)	Check the output frequency with multi-meter, the displaying value should be the same with the real value. Adjust the engine rotating speed, set the output frequency the same with the factory setting
	3. Abnormal fuel system, the engine rotating speed is unstable	Check the fuel system
P-03	1. The sampling wire disconnects	Check the voltage sampling wiring harness, there should be no voltage or frequency display
	2. Abnormal voltage (too high or too low)	Check the output voltage with multi-meter, the displaying value should be the same with the real value. Adjust AVR, set the output voltage the same with the related value
	3. Open circuit of excitation circuit	Check the excitation wire and carbon brush
	4. AVR or motor fails	Replace AVR or motor of the same type
P-04	1. Overload	Decrease load less than the related load, turn on the breaker
P-05	1. Fuse of starting circuit disconnects	Replace the fuse of the same type
	2. Starting circuit disconnects or poor connection of inserter	Check the circuit and inserter
	3. The starting motor fails	Replace the starting motor
	4. The charging motor fails	No input of starting signal
P-06	1. The emergent stopping button fails	Replace the emergent stopping button
P-07	1. Open circuit of charging circuit	Check the charging generator AC signal wire and inserter
	2. Charging motor fault	Replace the charging generator of the same model
P-08	1. The temperature of cooling water is too high	Disconnect the breaker, stop the generator set after running with zero load for a while. Restart the generator when the water temperature decreases
	2. Insufficient water in the water tank	Refill in cooling water
	3. Short circuit of water temperature switch	Check the circuit
	4. The water temperature switch fails	Replace the water temperature switch of the same type

Fault	Reason	Solution
The voltage value is not right or there is no voltage.	Bad voltmeter	Replace voltmeter
	Bad AVR	Consult with dealer
	Loading short circuit	Eliminate it
	Generator rotate speed is too low	Adjust the speed
	Rotor circuitry break	Maintain
	Engine circuitry is burnt.	Replace
The generator can't reach rated voltage	Bad voltmeter	Replace
	Bad AVR	Consult with dealer
	Loading is over	Reduce the overload
	Generator rotate speed is too low	Adjust the speed
	Generator cable is burnt.	Maintain
	Rotation speed is too low.	Increase the speed
Over voltage	Bad voltmeter	Replace
	Bad AVR	Consult with dealer
	AVR connection is loose	Reinstalled the receptacle
Voltage decreases too much when connected with load	Wiring is too long between generator and overload.	Adjust the distance and widen the wiring.
	Bad AVR	Consult with dealer
	Main winding is burnt.	Change motor
	Load is not equal.	Make them equal.

8) Clean the dirty and dusty in the unit.

Check the unit inner for dusty and dirty and clean it.

Check the muffler and the places near the engine for trash or flammable materials and clean them.

Check the intake and exhaust port if clogged by the dirty. Clean it, if necessary.

9) Electrical connection with load

a) Make sure that load does not exceed the unit power capacity, then connect electrical connections properly.

b) connect output cable as per regulated wire diameter, the wire diameter should take the load flow of MM² as 3-5A .

c) The output cable is shorter is better, the overlong output wire will effected the voltage decline so generator should be closed to the loading center when install..

3. SAFETY PRECATIONS FOR SERVICING

1. The installation and maintenance work should be operated by professional maintainer.
2. Always wear a face shield, rubber gloves and protective clothing when working on the unit.
3. Do not touch the generator unit or any part of load with your bare hands or wet hands.
4. Keep hands, hair, loose clothing, and tools away from moving parts, such as fans, belts and rotors.
5. The exhaust gas and fuel of generator are poisonous. Please operate carefully.
6. Stop engine and let it cool off before checking or adding fuel.
7. Never smoking and be far away from any flame when filling the fuel.
8. Observe correct polarity (+& -) on batteries.
9. Fix the battery with pressure plate when the generator running.
10. Use equipment of adequate capacity to lift and support unit and components.
11. Don't pour waste oil into the sewer or the river to prevent environment pollution. The exhaust oil from generator must be stored in container. To deal with bad matter, such as fuel, oil cooling water, solvent, filter and battery, according to the law.
12. Shut down the power after removing the battery cathodal wire when checking and maintaining generator. Connect battery anode then cathode.
13. It is limited to use the generator in the high-hazard risk area.

Fault		Reason	Solution
Engine stops because of low oil pressure.		engine oil is not enough.	Fill engine oil
		Badness oil switch	Replace switch
		Engine air cleaner wall up	Replace filter
Engine can't reach the highest speed		Badness regulator	Adjust to short
		Air in the oil pipe	Eliminate air
Idle speed is too high		Regulator lever regulator position is wrong	Adjust regulator lever
Vibration is too big		Regulator position is wrong	Adjust regulator lever
		Air in the oil pipe	Eliminate air
Slow no load speed		Not fix tightly	Fix tightly
Abnormal noise	Engine	Abnormal voice	Mend
	Generator	Bad axletree	Replace
		fasten bolt loose	Tight
Engine shell	Abnormal voice	Mend	
Overheat		Check around	Move thing from
		If lack cooling-water	Check if lack cooling water
		Fan strap loose	Maintain fan strap loose
		Radiator cooling orifice wall up	Clean radiator cooled part

⚠ CAUTION

The usage of the battery
It will explode to cause a severe accident if the battery used in a wrong way.
Remove the negative terminal when servicing the generator.

⚠ NOTE

Breaker can prevent the electric shock. If need to replace, please replace one that has equal degree and performance.

2. Judge and eliminate troubles

Engine doesn't run	Start motor doesn't run or it's speed is so slow	Battery leakage	Liquid measure
		Battery unclamped or rut	Install after cleaning
		The earth terminal is imperfect	Repair
		Start switch badness	Replace
		Starter badness	Replace
		The wire breaks	Repair
	Start motor run but doesn't start	No fuel oil	Fill oil
		Fuel oil cleaner walled up	Clean , and replace fuel oil cleaner
		Air in the oil pipe	Empty air
		Fuel winding does not work	Check the fuse, if disconnection, replace it ,check and replace winding if necessary
Ambient temperature is very low	Fuel is frozen	Use winter oil, or choose the applicable viscosity oil according to the freeze area	
	Some water accumulated in the fuel system is frozen.	Heat, empty fuel oil tank ,fuel oil cleaner and water in oil pipe	
	Bad Air around pipe	Empty air	
Stop automatic, rotate speed doesn't rise	Fuel oil cleaner walled up	Replace fuel oil cleaner element, clean or replace filter	
	Badness water of pipe oil	Mend the engine	
	Air cleaner is clogged.	Replace air cleaner element	

4. WARM-UP PROCEDURE

1. Check the fuel before every start.
2. Check if the engine oil reaches the scale of stipulating.
3. Check the water lever, and fill the cooled-water full.
4. Check the fan strap's degree of tightness
5. Set the main switch to OFF.
6. Turn the engine start key to START position.
7. Warm-up time is about 3-5 minutes.
8. Speed controller has adjusted well before transporting. So don't adjust it at random, or it will cause the engine rotation speed too high or too low.
9. The battery is optional for generator, to install right battery according with the generator before start.

5. STARTING-UP&RUNNING PROCEDURE

1. According to the step of 1-10, finish the starting-up procedure.
2. Ensure voltmeter indicates normal, (single phase: 230V, three phase: 400V)
3. Set the main switch to ON.
4. Observe the voltage is in the normal loaded range.
5. Preheat generator three minute without load after the set starting, then running with load
6. The new generator set have a running-in period, the period is the initial 20 hours, only with 50% load during the running-in period, or it will shorten the set life.
7. Checks during the running
 - 1) Whether there is abnormal sound or vibration;
 - 2) Whether the engine misfires or runs rough;
 - 3) Check the color of the exhaust. (Is it black or too white?)If you notice any of the above-mentioned phenomenon happened, stop the engine and find out the fault cause or contact with our agents.

CAUTION

- If the engine has been running, the muffler will be very hot. Be careful not to touch the muffler.
- The diesel is adopted in the explosive motor. Never fill the diesel which is inflammable when the generator is working. Be careful to fill fuel and prevent fuel overflowing. Wipe up the overflowing fuel immediately. Flame and fire are forbidden near the generator.

10. SIMPLIFIED TROUBLESHOOTING GUIDE

This guide is intended to give brief information for troubleshooting with no testing or measuring instruments to check the unit.

However, testing and measuring instruments are required to diagnose parts and components in many trouble cases.

If you cannot determine the cause by visual inspection, you should consult your dealer whom you purchased this unit from.

1. Troubleshooting

DANGER

Rotating part
It's very dangerous to touch the rotating parts in the generator.
■ Stop the engine to service and maintain the inner parts of the unit.

DANGER

Electric shock
Don't touch the inner parts with high voltage during the running.
■ Stop the engine to service and maintain the inner structure.

CAUTION

Hot part
Attention the high temperature. Some parts of the generator surface and inside are very hot, when operating, please see warning stickers on the generator.
■ To prevent scalding, pay attention to the warning marks attached to the generator.
■ Close and lock the door, when running the super quiet generator. And don't put hand and head into the engine to avoid scalding.

	Check & service item	Daily check	50	250	500	1000
Engine	Clean the inner of the fuel tank.					◇
	Replace the air cleaner element					●
	Check valve clearance.			☆First		◇
	Adjust fuel nozzle.					◇
	Check fuel injection time.					◇
	Check damper rubber.					◇
	Check the nylon tube & rubber tube					◇
	Check if the relay can work					◇
Generator	Check protection for electrical leakage	◇				
	Measure insulated resistance			◇		
	Check circuit terminal and connection				◇	

※ : Consult with dealers.

◇: It is the time for the first check. From then on, check the items according to the normal period.

The check time is different from its engine type. Please read the operation manual carefully.

8. Load

CAUTION

- Do not start 2 or more machines simultaneously. Start them one by one.
- Do not use floodlight together with other machines.

9. AC application

1) Be sure to run the generating set at rated speed, otherwise AVR (Automatic Voltage Regulator) will produce the forced excitation. If the running is for a long time under such condition, AVR will be burned out.

2) After switching on the air switch, observe the voltmeter on the panel of the control cabinet, the voltmeter should point to $230V \pm 5\%$ (50Hz) for single-phase generating set; $400V \pm 5\%$ (50Hz)for three-phase generating set, then the loading can be carried out.

3) When the double voltage generating set changes over the voltage, the air switch should be set at OFF position. Otherwise the generating set and electric devices will be burned out and damaged.

4) Connect the equipment to the generating set in order. For the matter of the motor load, firstly the heavy-duty motor should be connected, and then the light-duty motors. If the operation is false, the generating set will lag or stop suddenly. It is necessary to unload the generating set immediately and turn off the main switch and do checks.

5) Three-phase generating set

■ Balance three phases during the operation. Stop the engine for check if the tolerances exceed 20%. Be sure to keep the tolerance among three phases less than 20%.

■ The load for each phase must be below the rated load as well as the current must be less than rated current.

A, B, C, D (or U, V, W, N) phase arrangement should be from left to right, or clockwise.

■ Concerning starting the three phases asynchronous motors, first start the heavy-duty motors, and then start the light-duty motors.

 CAUTION
■ If overloading of the circuit trips the AC circuit protector, reduce the electrical load on the circuit, and wait a few minutes before resuming operation.

6. STOP PROCEDURE

1. Set the main switch to OFF.
2. Turn the breaker to the OFF.
3. Turn the start switch to the STOP position after running for 1-3 minutes with zero load, then the generator stopped.

 CAUTION
■ First disconnect the unit and load, then stop the generator.

9. MALFUNCTION AND COUNTERMEASURES

1. Maintenance Schedule

◇ Check and clean ● replace

	Check & service item	Daily check	50	250	500	1000
Engine	Check engine oil	◇				
	Check the cooling water	◇				
	Check fan belt	◇				
	Check fuel, drain out sediment and impurity	◇		◇		
	Check battery electrolyte	◇				
	Check for water or oil leakage	◇				
	Check the loosen assembly	◇				
	Check the exhaust color	◇				
	Check meters and warning light	◇				
	Replace engine oil		☆First	●		
	Replace oil filter element		☆First	●		
	Clean air cleaner element			◇		
	Check battery electrolyte density			◇		
	Clean the radiator				◇	
	Replace seal ring of fuel filter element					●

8. ELECTRIC APPLIANCE

Electric appliance particularly motor-driven equipment will produce very high current while starting, the below table provides the reference for connecting these apparatus to the generator set.

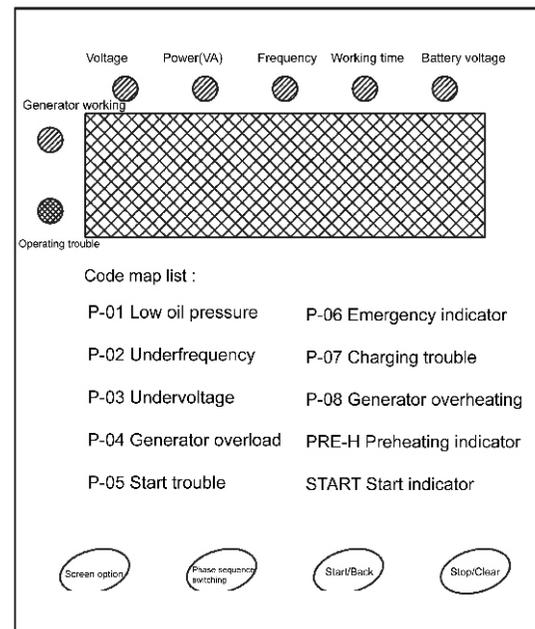
TYPE	WATTAGE		TYPICAL APPLIANCE	EXAMPLE		
	STARTING	RATED		APPLIANCE	STARTING	RATED
<ul style="list-style-type: none"> Incandescent lamp Heating appliance 	X1	X1	 Incandescent lamp  TV	 Incandescent lamp 100W	100VA (W)	100VA (W)
<ul style="list-style-type: none"> Fluorescent lamp 	X2	X1.5	 Fluorescent lamp	 40W Fluorescent lamp	80VA (W)	60VA (W)
<ul style="list-style-type: none"> Motor-driven equipment 	X3~5	X2	 Refrigerator  Electric fan	 Refrigerator 150W	450-750VA (W)	300VA
<ul style="list-style-type: none"> Projection lamp Sodium lamp Halide lamp 	X2	X2	 Halide lamp Projection lamp	 400W	800VA (W)	800VA (W)
<ul style="list-style-type: none"> Switch power Eliminator Power 	X2	X2	 Rectifier cabinet  Converter cabinet	 1kVA	2kVA (kW)	2kVA (kW)

⚠ CAUTION

■ Electrical equipment (including electrical lines and plugs connection) could not be defective. By the effect of mechanical stress, make sure to use the rubber sheathed flexible cable or analog (accord with IEC245-4).
 Limit length of electric line when using the extension line or distributed network is: less than 60m for cables of 1.5mm², and less than 100m for cables of 2.5mm²

7. THE FUNCTIONS OF THE DIGITAL PANEL

PVC Label (Single-phase)



Knob function:

ITEM: switch the content of display, the content include: battery voltage, running time, output frequency, output current, generator voltage

CLEAR: stop alarm and go out kinds of fault indicator.

START: start the generator

STOP: stop the generator

Indicator function:

BATTERY VOLTAGE: indicating battery voltage

RUNNING TIME: indicating generator-running time

OUTPUT FREQUENCY: indicating generator frequency.

OUTPUT CURRENT: indicating generator current
 VOLTAGE: indicating generator voltage
 LONG-RANGE CONTROL: indicating long-range control using if or not
 RUNNING: indicating electric power exist if or not
 OVERLOAD: indicating overload, the generator will self-braking
 LOWER OIL PRESSURE: indicating lower oil pressure, the generator will self-braking
 START FAULT: indicating failure start
 PROTECTION: indicating voltage & frequency higher (lower), the generator will self-braking
 EMERGENCY STOP: indicating stop generator according to emergency Measure

Three-phase current: Indicating generator current.
 Single phase power: Indicating generator power.
 Generator voltage: Indicating generator voltage.
 Generator running: Indicating the existence of electrical power.
 Running trouble: Indicating running trouble, check it according to the code map list.

The indication lamp function of Code map list :
 P-01 Low oil pressure: Indicating low oil pressure, the generator will self-braking.
 P-02 Underfrequency: Indicating frequency higher (lower), the generator will self-braking.
 P-03 Undervoltage: Indicating voltage higher (lower), the generator will self-braking.
 P-04 Generator overload: indicate overload, the generator will self-braking.
 P-05 Start trouble: Indicating failure start
 P-06 Emergency indicator: Indicating stop generator according to emergency measure.
 P-07 Charging trouble: Charging system trouble.
 P-08 Generator overheating: Water temperature of generator is overheated, the engine will self-braking.

PVC Label (Three-phase)

