KIPOR

KIPOR POWER

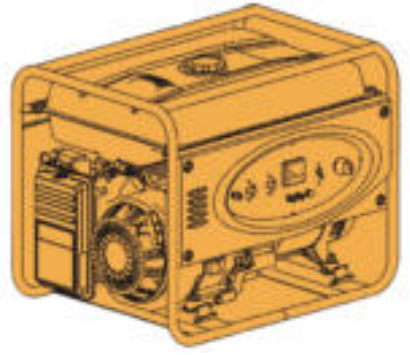
OPERATION MANUAL

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

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KIPOR

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OPEN-FRAME GASOLINE GENERATING SET

SINGLE-PHASE: KGE2500X
KGE4000X
KGE6500X/E
THREE-PHASE: KGE6500X3/E3
WELDING & GENERATING SET:
KGE6500XW/EW

Version 1, Printing date 25/06/2004

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1. SAFETY INFORMATION

In order to operate this generating set safely and reliably, please follow the below requirements.

1-1 Do operate it at well ventilated place, for the exhaust contains poisonous carbon monoxide. Do not operate it at unventilated place! (see fig.1)

1-2 Do not operate it under wet condition.(see fig.2)

1-3 Do not connect it to household circuit without guidance.(see fig.3)

1-4 The set must be kept away from the flammable materials at least one meter. (see fig.4)

1-5 Smoking and igniting and sparking are not allowed while refilling. (see fig.5)

1-6 Stop the generating set while refilling. (see fig.6)



Fig.1



Fig.2

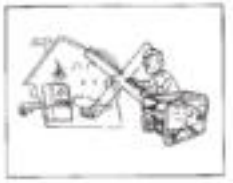


Fig.3

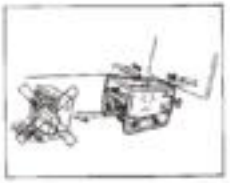


Fig.4



Fig.5



Fig.6



Fig.7

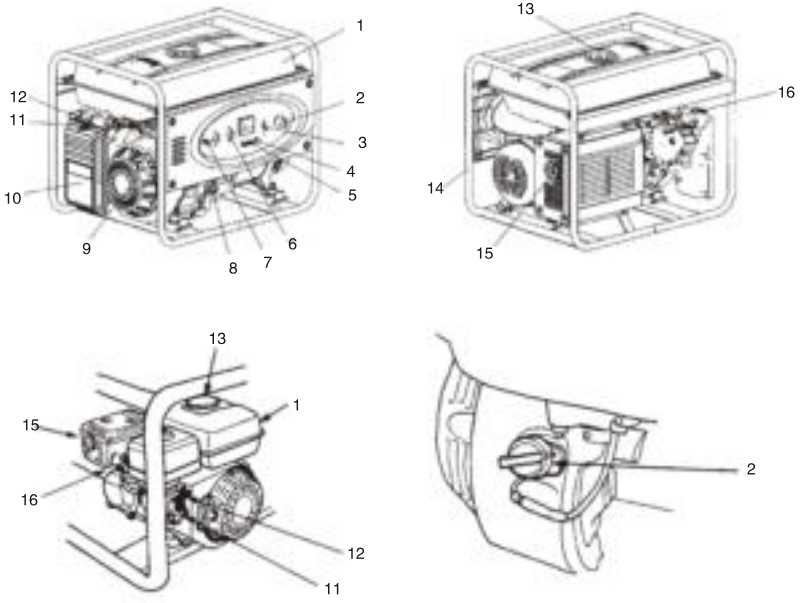
1-7 Do not overflow the fuel oil while refilling. Otherwise, wipe off the overflowed fuel oil if happened. (see fig.7)

1-8 Keep the set in level position while running.

1-9 Keep the children and pets away from the set while running.

1-10 Do not touch the muffler or any over-hot parts to prevent injuring when the set is running or just stopped.

2. IDENTIFICATION OF COMPONENTS



(1). Fuel tank
(2). Engine swith
(3). AC breaker
(4). Fusible cut-out
(5). DC terminal
(6). AC receptacle
(7). Grounding terminal
(8). Oil filler cap
(9). Starter handle
(10). Air cleaner
(11). Fuel valve
(12). Carburetor valve
(13). Fuel tank cap
(14). Framework
(15). Exhaust muffler
(16). Spark plug

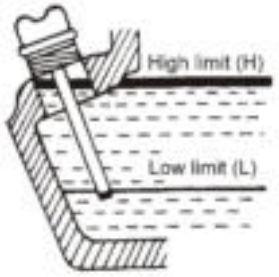
3. PRE-OPERATION CHECKS

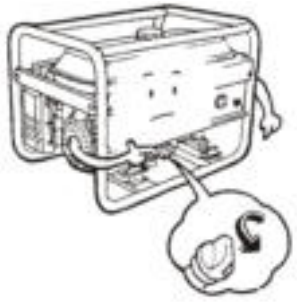
Be sure to perform the following checks before starting the generating set.

3-1 Check whether the generating set is on a level surface.

3-2 Check the level of engine oil

(1) Take out the oil filler cap and clean the measure mark with a clean rag. (see fig.8)
(2) Insert the oil filler cap without rotating it.
(3) If the oil level is below the lower level, refill the oil till the upper level.
(4) Tighten the oil filler cap.





3-3 Check fuel level

(1) Open the fuel tank.(see fig.9)
(2) Check fuel level, refuel if the level is too low.
(3) Refuel till the shoulder of the fuel filter.
(4) Tighten the fuel tank cap.

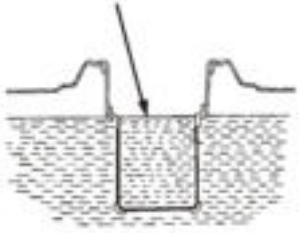


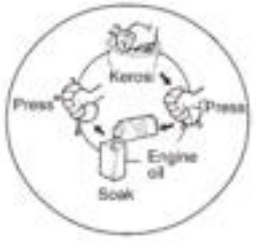


Fig.9

3-4 Check the air cleaner

(1) Remove the clip and dismount the case of air cleaner. Loose the nut and remove the cover of air cleaner.





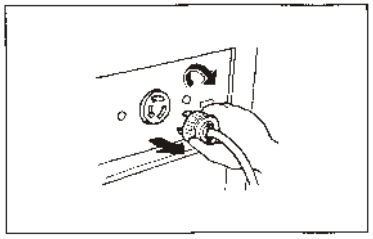
(2) Clean the air cleaner.



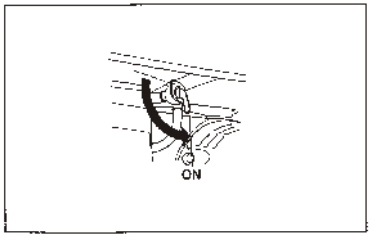
(3) Refix the air cleaner.

4. STARTING THE GENERATING SET

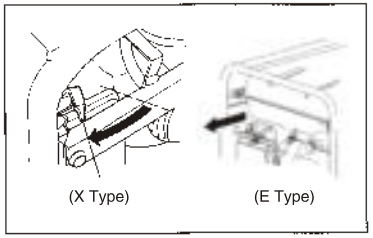
(1) Disconnect any load from AC receptacleand switch off AC breaker.



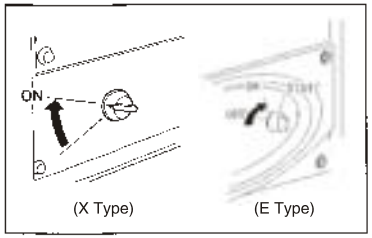
(2) Set the fuel oil valve to “ON” position.



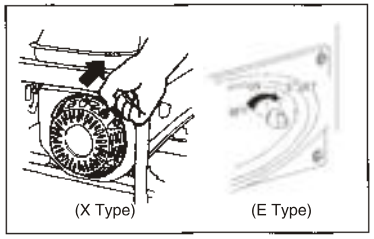
(3). Set the choke lever to “CHOKE” position.



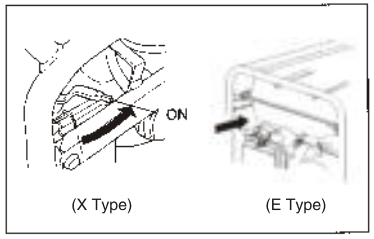
(4) Turn the engine switch to “ON” position.



(5). Pull the starter handle slowly until you feel the resistance, then pull it by force.

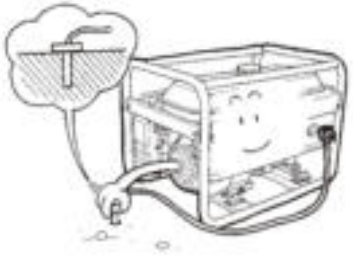


(6).When the engine is warm, set the choke lever to “OFF” position.



5. USAGE OF THE GENERATING SET

5-1 In order to keep the generating set in best mechanical and electrical condition, please follow the blow items.

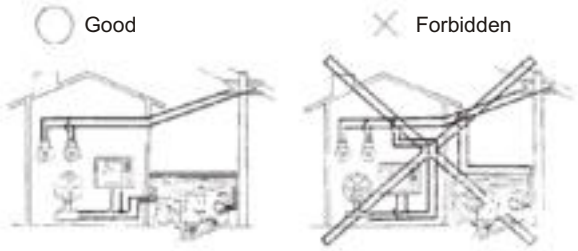


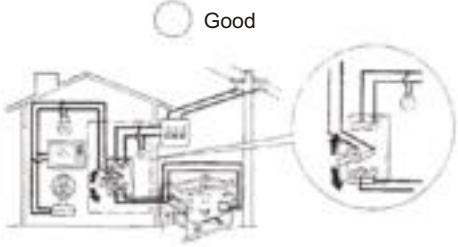
(1) Please ground the grounding terminal of the set to prevent any false operating. Regarding C type set, grounding can be performed from the grounding tap hole which on the front(back) cover of the engine.

(2) Check whether AC output voltage and frequency meet the technical specifications.

(3) If the generating set will be connected with more than two loads, please connect them from that required higher starting current.

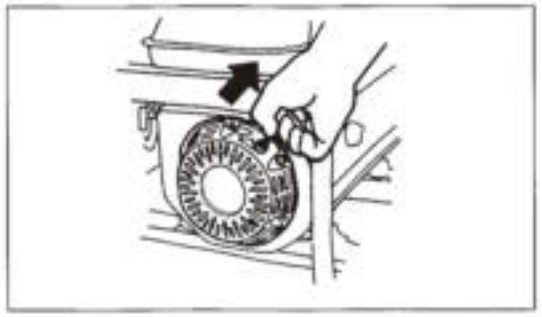
(4) Concerning connecting the set to the household circuit, which must be performed by the professional. Check whether the connection is right after the load is connected to prevent the generating set from damage or fire.





5-2 Application of AC

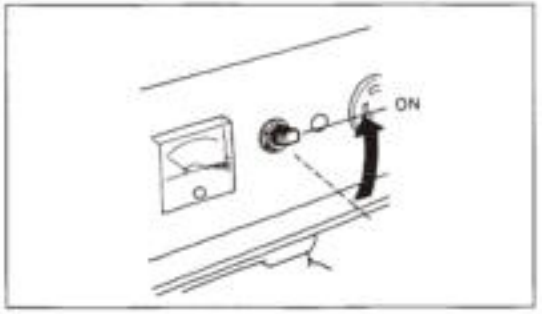
1. Starting the generating set



2. Connecting the load



3. Switch on the AC breaker

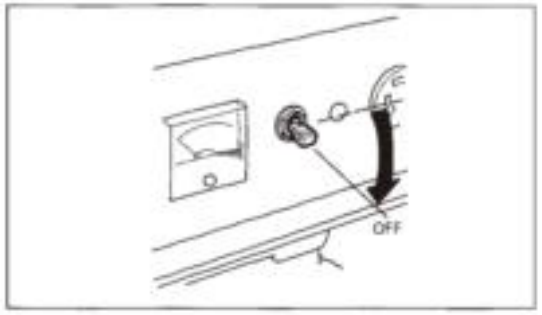


5-3 Electrical apparatus particularly motor-driven equipment will produce very high current while starting, the below table provides the reference for connecting these apparatus to the set.

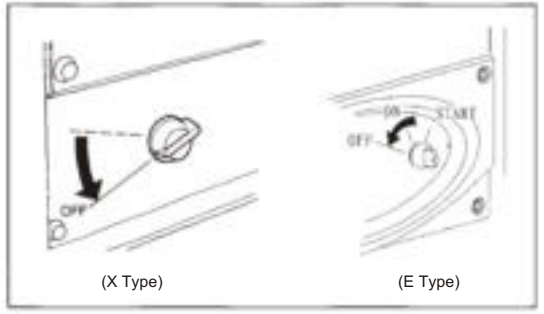
TYPE	WATTAGE		TYPICAL APPLIANCE	EXAMPLE		
	STARTING	RATED		APPLIANCE	STARTING	RATED
· Incandescent lamp · Heating appliance	X1	X1	 Incandescent lamp TV 	 Incandescent lamp 100W	100VA (W)	100VA (W)
· Fluorescent lamp	X2	X1.5	 Fluorescent lamp	 Fluorescent lamp	80VA (W)	60VA (W)
· Motor-driven equipment	X3~5	X2	 Refrigerator  Electric fan	 Refrigerator 150W	450-750VA (W)	300VA

6. STOPPING THE GENERATING SET

6-1 Switch off the AC breaker

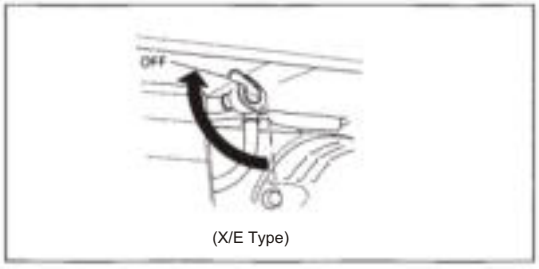


6-2 Switch off the engine switch



(X Type) (E Type)

6-3 Close the fuel valve



(X/E Type)

Note: If you want to stop the engine in emergency, please set the engine switch on "OFF" position.

7. MAINTENANCE

Periodical inspection and maintenance are very important for keeping your generating set in best working condition.

Be sure to shut down the set before performing maintenance, however, if It is necessary to run the set, good ventilation must be provided, for the exhaust contains poisonous carbon monoxide.

Item \ Maintenance Time		Each use	First month or 20 Hrs.	Every 3 months or 50 Hrs.	Every 6 months or 100 Hrs.	Each year or 300 Hrs.
Engine oil	Check	○				
	Replace		○			
Air cleaner	Check	○			○	
	Clean			○		
Fuel strainer cup	Clean				○	
Spark plug	Clean Adjust				○	
Air valve clearance	Clean Adjust					○(2)
Cylinder head cover	Clean					○(2)
Fuel tank Oil pipes	Check Clean					

Note:

(1) Shorten maintenance intervals if the generating set operated in dirty area.

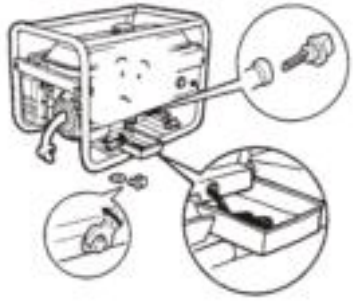
(2) The above-mentioned items must be performed with the assistance of KIPOR dealer.

7-1 Replace engine oil

1. Open oil filler cap.



2. Loose drain screw plug to drain off engine oil.



3. Reassemble the drain screw plug.



4. Refill engine oil until the upper limit level of the oil filler cap.



5. Reassemble the oil filler cap.



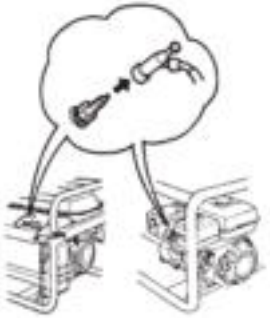
Recommend engine oil: Engine oil for 4-stroke gasoline engine SE, SF engine oil classified by API or SAE10W-30 engine oil which same as SG grade.

Use SAE10W-30 engine oil when the temperature is below 10℃.

Use SE, SF engine oil classified by API or SAE5W-30 engine oil which same as SG grade when the temperature is below -15℃.

7-2 Air cleaner (see 3-4)

7-3 Spark plug



(X/E Type) (C Type)

1. Dismount spark plug cap

2. Dismount spark plug

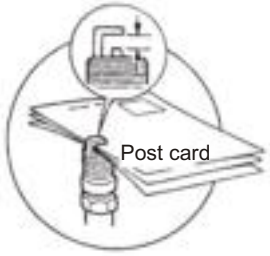




0.7 ~ 0.8mm

3. Clean the carbon





Post card

4. Test the clearance of the spark plug

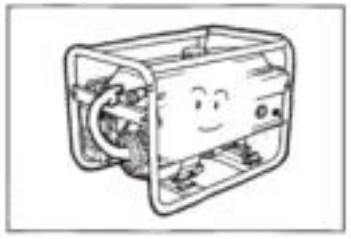
5. Reassembly the cover of spark plug



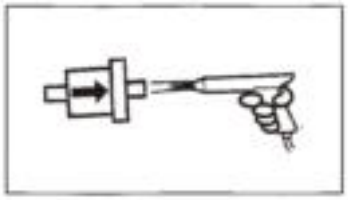
7-4 Maintenance of the fuel filter

(1).Set the fuel valve on “OFF” position and dismount the fuel strainer cup.

Dismount the fuel filter



Blow it from the opposite direction of the arrow



(2) Clean the strainer cup thoroughly.



(3) Reassembly new rubber washer and strainer cup tightly.



8. STORAGE

1. Remove the drain screw plug and drain out gasoline from the carburetor.



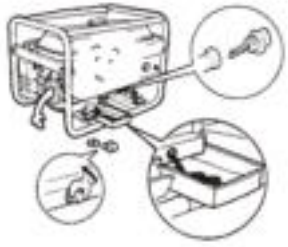
2. Remove the filler cap and drain screw plug, then drain off the engine oil.



3. Reassembly the drain screw plug.



4. Untill the high limit of the filler cap.

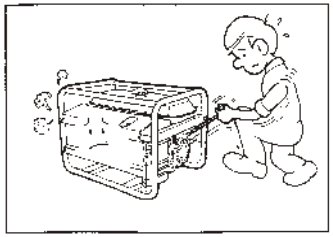


5. Pull out the starting handle slowly untill you feel resistance.

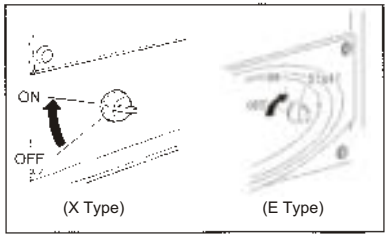


9. TROUBLESHOOTING

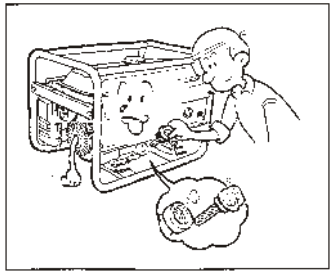
1. The generating set cannot start.



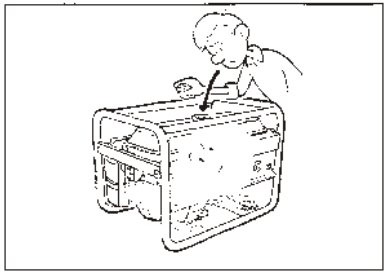
2. Whether the engine switch is in "OFF" position?



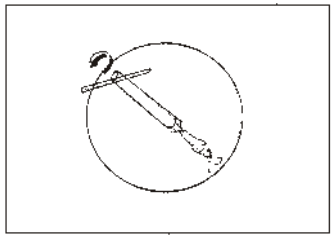
3. Check engine oil level.



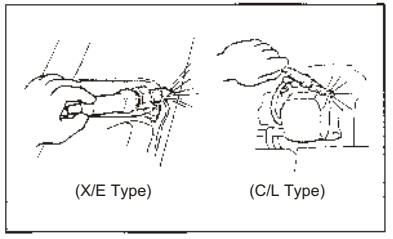
4. Check fuel oil level.



5. Dismount the spark plug.



6. Check the spark plug.



10. MAIN TECHNICAL SPECIFICATIONS AND DATA

10-1 Technical specifications and data of single-phase generating set

		KGE2500X		KGE4000		KGE6500X KGE6500E	
Engine	Model	KG200		KG270		KG390	
	Type	4-stroke, OHV					
	Displacement(cm^3)	196		270		389	
	Bore x stroke (cm)	68×54		77×58		88×64	
	Cooling system	Forced air-cooled					
	Ignition system	T.C.I					
	Spark plug	BP6ES(NGK) W20EPR-U (NIPPON DENSO)					
	Fuel tank (L)	C:3.7 L:9.2 X:15		25		25	
	Engine oil (L)	0.8		1.1		1.1	
	Decompression ratio	8.5:1					
Generator	Rated frequency (Hz)	50	60	50	60	50	60
	Rated voltage (V)	230	240/120	230	240/120	230	240/120
	Rated current (A)	8.7	9.2/18.3	13	14.6/29.2	21.7	22.9/45.8
	Rated output power (kW)	2	2.2	3	3.5	5	5.5
	Max output power (kW)	2.2	2.4	3.3	4	5.5	6.5
	Excitation method	Self-excitation (AVR)					
	Phase	Single-phase					
	Power factor (cos Φ)	1					
	DC output	12V/8.3A (C mode has no DC output)					
	Starting system	E: electric stater/manual stater; others mode: Recoil starter					
	Total weight (kg)	39		68		X:83 E:90	
	Overall dimension (L x W x H)(mm)	600×430×430		680×510×540		X:680×510×540 E:855×510×540	

X mode: Luxury type, manual starter, super tank, large muffler, lower noise.

E mode: Luxury type, electric starter, super tank, large muffle, lower noise.

10-2 Technical specifications and data of three-phase generating set

Item \ Model		KGE6500E3 KGE6500X3		
Engine	Model	KG390		
	Type	4-stroke, OHV		
	Displacement (cm^3)	389		
	Bore x stroke (cm)	88X64		
	Cooling system	Forced air-cooled		
	Ignition system	T.C.I		
	Spark plug	BP6ES		
	Fuel tank (L)	25		
	Engine oil capacity (L)	1.1		
	Compression ratio	8.5:1		
Generator	Rated frequency (Hz)	50	60	
	Rated voltage (V)	400/230	416/240	480/277
	Rated current (A)	8	8.6	7.5
	Rated output (kW)	5.6	6.2	
	Max output (kW)	6	7	
	Excitation method	Self-excitation and constant voltage (AVR)		
	Phase	Three-phase		
	Power factor cos Φ	0.8(lag)		
	Starting system	E3: 12V electric starter; X3: manual starter		
	Net weight (kg)	E3: 90 X3: 83		
	Overall dimension (LxWx H)(mm)	E3: 855X510X540 X3: 680X510X540		

Note:

1. E3 mode:Three-cylinder,luxury type electric starter,super tank,large muffler.
   X3 mode:Three-cylinder,luxury type manual starter,super tank,large muffler.
2. Starting accumulator:12V 36AH.

Explanation of three-phase generating set:

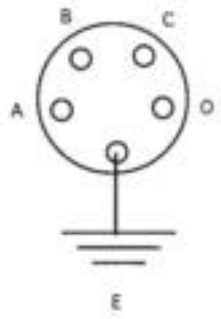
(1) Connect the loads to the generating set in order. As for the motor loads, start the higher power motor first, and then start the lower after the former started. Be sure not start them simultaneously. Any improper operation arouse, the generating set will run sluggishly or halt, at this time, be sue to remove the loads immediately and shut off the motor. Check whether overload happened or any other faults. If overload made AC air breaker tripped, decrease the loads for overload is not allowed. Wait some minutes before restart the generating set, furthermore, do stop the set and make checks if any faults or abnormal phenomenon still existed.

(2) If both of motor loads and inductive loads (e.g. Incandescent) are connected to the generating set, first start motor loads and then inductive loads, otherwise, starting motor loads will be difficult.

(3) Pay more attention to voltage of three phases while running. If the imbalance of voltage of three phases exceeds 10%, do stop the set and make checks, and then readjust three phase loads. Keep three phase loads in balance, the imbalance cannot exceeds 20%. Meanwhile, the total load cannot exceeds rated load, even the load of each phase cannot exceeds rated phase load, that is 1/3 of rated load. Furthermore, the current of each phase cannot over rated current.

The sequence of output terminalsA,B,C,O(or U,V,W,N) of three-phase generating set is from left to right or clockwise direction.

The bellow figure is the phase sequence of three-phase, five-hole-receptacle on the output panel:



10-3 Technical specifications and data of welding&generating set

Item \ Model			KGE6500EW	KGE6500XW
Engine	Model		KG390	
	Type		4-stroke, OHV	
	Displacement (cm^3)		389	
	Bore x stroke (cm)		88x64	
	Cooling system		Forced air-cooled	
	Ignition system		T.C.I	
	Spark plug		BP6ES	
	Fuel tank capacity (L)		25	
	Lube oil capacity (L)		1.1	
	Compression ratio		8.5:1	
Welding&generating set	Welding (DC)	Rated frequency (Hz)	50	60
		Rated output (kW)	2	2.2
		Rated voltage (V)	230	240
		Rated current (A)	8.7	9.2
		Phase	Single-phase	
		Power factor	1.0	
	Generating (AC)	Welding voltage at zero load (V)	60-70	
		Rated welding current (A)	140	
		Working voltage (V)	26	
		Load continuous rate	50%-140A	
		Current adjustment range (A)	50-190	
	Rated speed(r/min)		Generating:3000; welding:3600	3600
	Excitation method		Dual excitation	
	Starting system		EW: 12V electric starter XW: manual starter	
	Structure		Open frame type	
	Net weight (kg)		EW:95 XW:88	
	Overall dimension (L × W × H)(mm)		EW:855×510×540 XW:680×510×540	

Explanation of welding&generating set:

■ Prepare the required welding cable and connect it to the generating set terminals. Determine the diameter of the welding cable on the base of 4-5A/mm^2 current.

■ Provide the generating set good ventilation. Do not put something on the set.

■ Determine the welding current as per the thickness of the would be welded steel plate and the diameter of the welding rod, and then turn the welding current knob to the required position.

■ As for compact electric kits, such as electric drill, cutter and muller, do not weld them simultaneously. Otherwise, the generating voltage will decrease greatly, so the electric kits will shutdown, sluggishly rotate, affect the kit's usage, even damage the kits.

■ The set can power the incandescent and perform welding work simultaneously, however, the generating voltage will decrease sharply which will affect the lighting.

■ Be sure to budget both welding and generating power. The total load power cannot over the rated power.

■ When the set is only under generating working mode, be sure to disconnect the welding cable; whereas the set is welding, switch off air breaker to avoid short circuit at output terminal.

■ Concerning the set which generating frequency is 50Hz, you can turn the select switch to AD50Hz position both for generating mode and generating&welding mode. At this position, the users can get 50Hz voltage with lower welding current. If only the welding current is required, turn the select switch to WELDER to get more welding current. These steps are not necessary for 60Hz welding.

■ Welding current of different diameter welding rods:

Welding rod dia (mm)	1.6	2.0	2.5	3.2	4.0
Welding current (A)	25-40	40-65	50-80	100-130	140-190

■ Parallel operation of two sets: When the users have to weld much thicker steel plate, the maximum welding current of single set won't be sufficient, then the users can connect two sets in parallel, as the result, the larger welding current will be got.

Operation method: Select two generating&welding sets with same model and same output, then connect the welding terminals in parallel with a parallel cable (+ pole to + , - to -).The parallel cable must be approx.1.2 meters long with the diameter not less than 25mm^2 . After connection, start two sets respectively for welding. As for the two sets in parallel, the rated welding current is 240A, the maximum welding current is380A and the adjusting range of the welding current is 100-380A. Be sure to adjust the welding current of both sets simultaneously, on other word, both current-adjusting knobs must be the same value position to balance the loads. If the required welding current is less than 100A, you can stop one of sets, and disconnect the cable. Do not run one of the sets with another stopped whiled they are in parallel.

Welding current of diverse diameter welding rods in parallel:

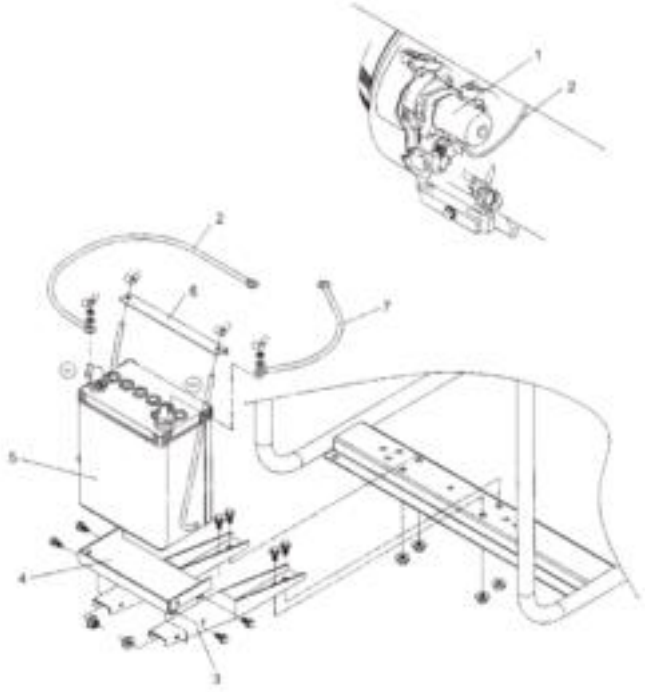
Welding rod dia (mm)	4.0	5.0	5.8
Welding current (A)	160-210	200-270	260-380



11. DESCRIPTION OF ACCUMULATOR UNIT

1. Assemble the accumulator unit with bolt, nut, and washer.
2. Connect the electric starting cable to the starting electromagnet, by crossing the former under the fuel tank.
3. Connect the grounding cable to the back end of the generator.
4. First connect the electric starting cable to the positive pole the accumulator, then the negative pole, while disconnect the electric starting cable in reverst

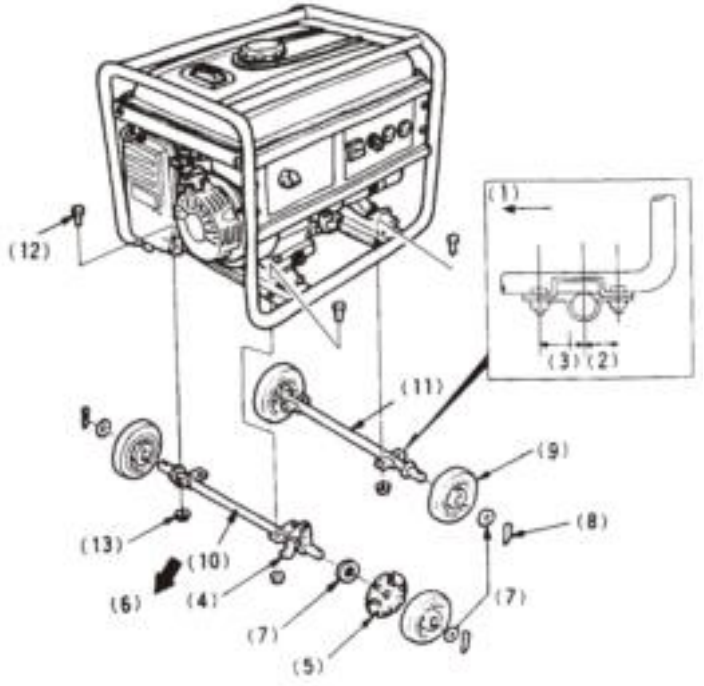
(1) Switch of starting electromagnet valve
(2) Starting cable
(3) Guard frame of the accumulator
(4) Guard plate of the accumulator
(5) Accumulator
Note: Please use the accumulator which value is above 12V-35AH
(6) Holding down holder
(7) Cable



12. DESCRIPTION OF CASTOR UNIT

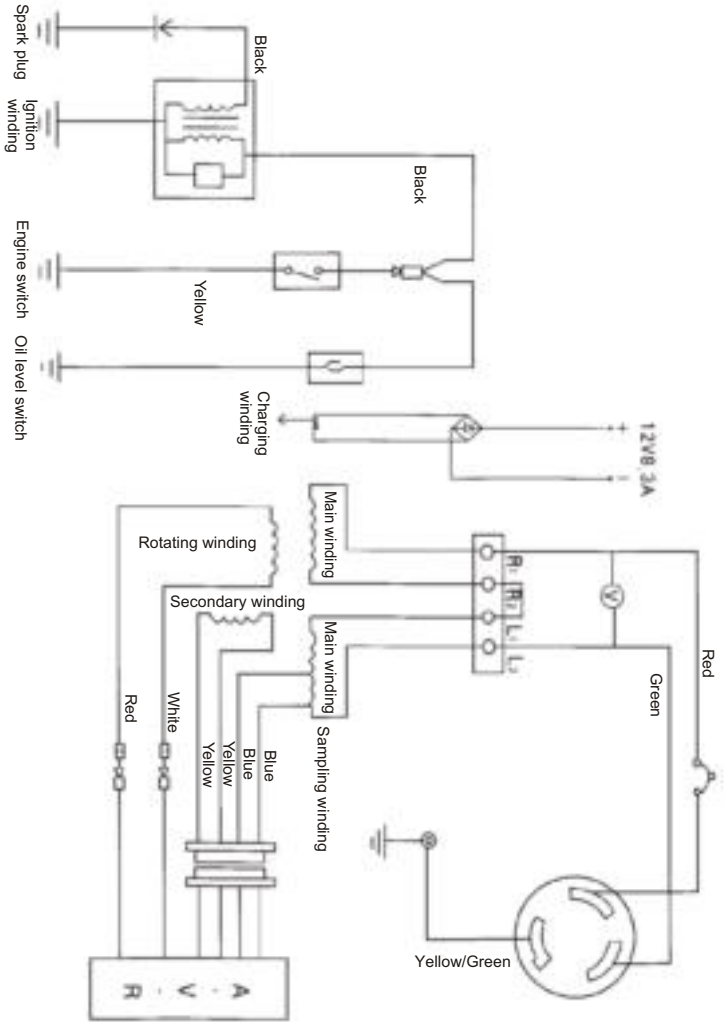
1. Fix the four castors on the axles with washer and pin.
2. Fix the axles on the generator with bolt and nut.

(1) Inner side
(2) Short side
(3) Long side
(4) Castor stopper pin
(5) Stopper plate
(6) Generator side
(7) Gasket
(8) Pin
(9) Castor
(10) Axle (engine side)
(11) Axle (generator side)
(12) Bolt
(13) Nut

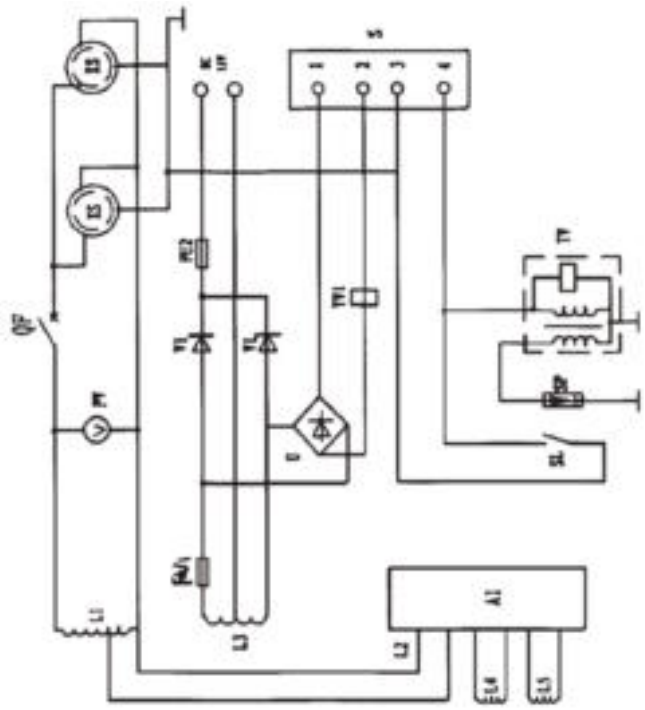


13. WIRING DIAGRAM

13-1 Wiring diagram of single-phase generating set (X model)



13-2 Electric skeleton diagram of KGE6500X



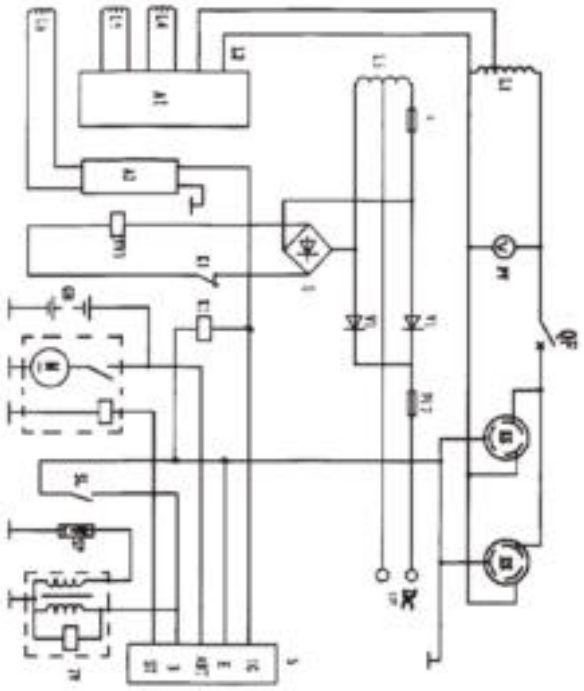
No.	Parts No.	Description
1	A1	AVR
2	FU1	Fuse
3	FU2	Fuse
4	L1	Main winding
5	L2	Sampling winding
6	L3	Low pressure winding
7	L4	Secondary winding
8	L5	Excitation winding
9	PV	AC voltmeter
10	QF	Air breaker
11	S	Control switch
12	SL	Low oil level switch
13	SP	Spark plug

ON-OFF relations of control switch

	1	2	3	4
OFF	○—○		○—○	
ON				

No.	Parts No.	Description
14	U	Gratz rectifier
15	V	Commutation diode
16	XS	Single-phase receptacle
17	YUI	Carburetor solenoid
18	TV	High pressure producer

13-3 Electric skeleton diagram of KGE6500E



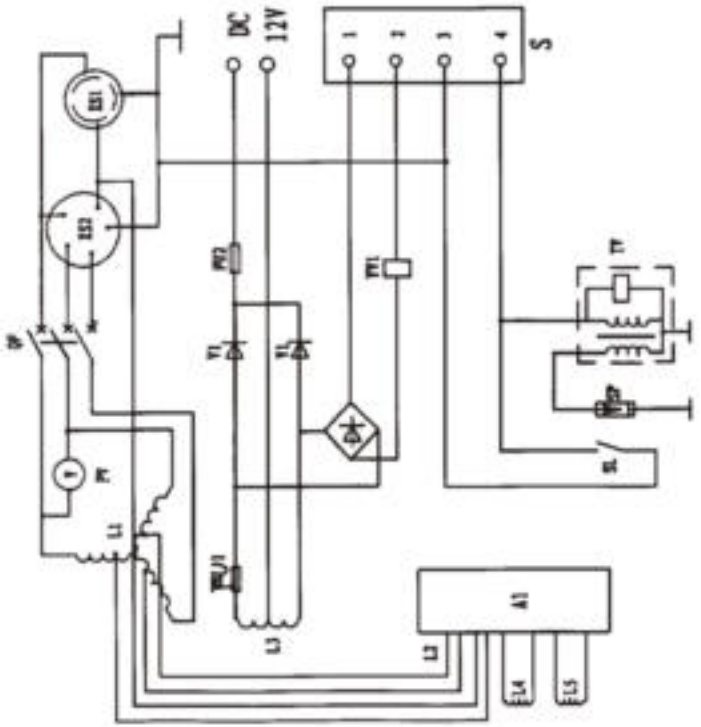
No.	Parts No.	Description
1	A1	AVR
2	A2	Stabilibvolt regulator
3	FU1	Fuse
4	FU2	Fuse
5	GB	Accumulator
6	L1	Main winding
7	L2	Sampling winding
8	L3	Low pressure winding
9	L4	Secondary winding
10	L5	Excitation winding
11	L6	Flywheel generating winding
12	K1	Relay
13	PV	AC voltmeter
14	QF	Air breaker

ON-OFF relations of control switch

	ABT	E	IG	B	ST
OFF		○		○	
ON	○		○		
ST	○		○		○

No.	Parts No.	Description
15	S	Starting key
16	SL	Low oil level switch
17	SP	Spark plug
18	U	Gratz rectifier
19	V	Commutation diode
20	XS	Single-phase receptacle
21	YUI	Carburetor solenoid
22	TV	High-pressure producer

13-4 Wiring skeleton diagram of KGE6500X3



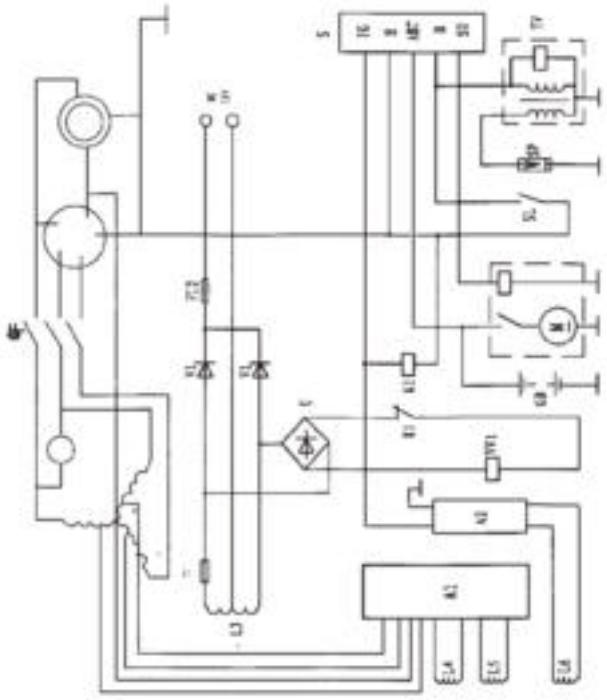
No.	Parts No.	Description
1	A1	AVR
2	FU1	Fuse
3	FU2	Fuse
4	L1	Main winding
5	L2	Sampling winding
6	L3	Low pressure winding
7	L4	Secondary winding
8	L5	Excitation winding
9	PV	AC voltmeter
10	QF	Air breaker
11	S	Control switch
12	SL	Low oil level switch
13	SP	Spark plug

ON-OFF relations of control switch

	1	2	3	4
OFF	○	○	○	○
ON				

No.	Parts No.	Description
14	U	Gratz rectifier
15	V	Commutation diode
16	XSI	Single-phase receptacle
17	YUI	Carburetor solenoid
18	TV	High-pressure producer
19	XS2	Three-phase five-hole receptacle
20	XS	Single-phase receptacle

13-5 Electric skeleton diagram of KGE6500E3



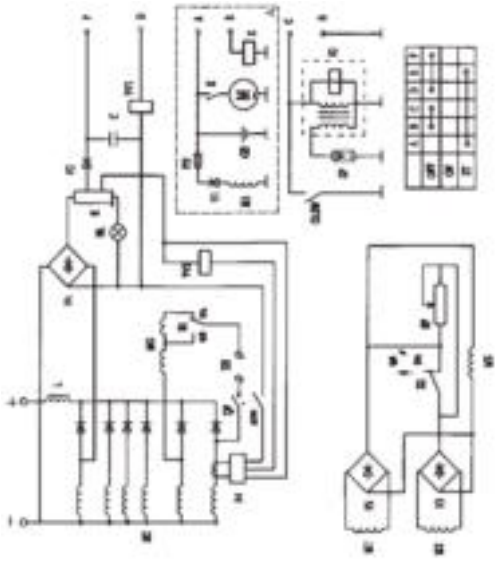
No.	Parts No.	Description
1	A1	AVR
2	A2	Stabilibvolt regulator
3	FU1	Fuse
4	FU2	Fuse
5	GB	Accumulator
6	L1	Main winding
7	L2	Sampling winding
8	L3	Low pressure winding
9	L4	Secondary winding
10	L5	Excitation winding
11	L6	Flywheel generating winding
12	K1	Relay
13	PV	AC voltmeter
14	QF	Air breaker

ON-OFF relations of control switch

	ABT	E	IG	B	ST
OFF		○		○	
ON	○		○		
ST	○		○		○

No.	Parts No.	Description
15	S	Starting key
16	SL	Low oil level switch
17	SP	Spark plug
18	U	Gratz rectifier
19	V	Commutation diode
20	XS	Single-phase receptacle
21	YUI	Carburetor solenoid
22	TV	High-pressure producer

13-6 Electric skeleton diagram of KGE6500XW/KGE6500EW



No.	Parts No.	Description
1	A4	Current inducing modular
2	SUTO	Auto switch
3	C	Capacitance
4	FU	Fuse
5	GB	Accumulator
6	HL	Working indicator light
7	IG	Ignition coil
8	K	Relay
9	M	Start motor
10	M1	Flywheel charging winding
11	M1	Bucking winding
12	M2	Main winding
13	M3	Secondary winding
14	M5	Excitation winding
15	MG	Generating winding
16	L	Induction

No.	Parts No.	Description
17	OLSW	Low oil level switch
18	R	Resistance
19	RP	Adjustable resistance
20	SP	Spark plug
21	S1	Select switch
22	S2	Select switch
23	V1	Commutation diode
24	V2	Commutation diode
25	V3	Gratz rectifier
26	V4	Gratz rectifier
27	V5	Gratz rectifier
28	QF	Air breaker
29	XS	AC single-phase receptacle
30	YV1	Carburetor solenoid
31	YV2	Throttle solenoid
32	MG	Generating winding

Note: EW model is electric starter type, XW model is recoil starter type. There's no components inside invisible A frame for XW model, other components same as EW model.

14. APPENDIX

NO.	NAME	QUANTITY	REMARK
1	Generator	1	
2	Electric plug receptacle	1/2	Number of control box socket

NO.	NAME	QUANTITY	REMARK
1	Gasoline generator set operation manual	1	
2	Gasoline engine operation manual	1	
3	Gasoline engine parts diagram	1	
4	Certificate of quality	1	
5	Packing list	1	