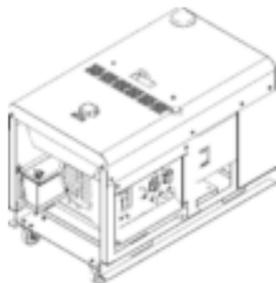


KIPOR

Single-phase: KDE12E / KDE12T
 KDE12EA/KDE12TA
 KDE12ST/KDE12STA
 Three-phase: KDE12E3/KDE12T3
 KDE12EA3/KDE12TA3
 KDE12ST3/KDE12STA3



GENERATOR OPERATION MANUAL

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PREFACE

Congratulation and thank you for your purchase of KIPOR 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 dealing with the generator side of the unit, gives all basic information to ensure satisfactory and reliable operation of KIPOR unit. Please use this manual as a companion to the other manual covering the engine side.

CAUTION

1. Use SAE 10W-30 lubrication oil. After the first oil change at 10 hours operation.
2. Do not connect the generator output to commercial AC outlets.
3. For information about the engine operation and maintenance, please see KIPOR engine's manual.

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1. Main Technical Specifications and Data

ITEM	MODEL	KDE12E KDE12T		KDE12E3 KDE12T3	
		KDE12EA KDE12TA	KDE12ST KDE12STA	KDE12EA3 KDE12TA3	KDE12ST3 KDE12STA3
Generator	Rated Frequency(Hz)	50	60	50	60
	Rated Power (KVA)	8.5	9.5	9.5	10.5
	Max Power (KVA)	9.5	10.5	10.5	11.5
	Rated Voltage (V)	230	240/120	400/230	416/240
	Rated Current (A)	37.0	39.6/79.2	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; T: silent type			
	Connecting Mode	Rotation Shaft Steel Connection			
	Dry Weight (kg)	E: 155		T: 250	
Overall Dimension (L x W x H) (mm)	E: 1000x600x650		T: 1100X615X810		
Fuel Consumption (g/kw.h)	≤340				

ITEM	MODEL	KDE12E KDE12T		KDE12E3 KDE12T3	
		KDE12EA KDE12TA	KDE12ST KDE12STA	KDE12EA3 KDE12TA3	KDE12ST3 KDE12STA3
Engine	Mode	KM2V80			
	Type	Two-cylinder, V-twins, Air-cooled, 4-stroke, Bow-wave type			
	Discharge capacity (ml)	794			
	Cylinder diameter x Stroke (mm)	80 X 79			
	Combustion Oil	0 ~ 35 Diesel			
	Combustion Oil Tank Volume (L)	2.27			
	Decompression	23			
	Standard Power (KVA)	12	14.5	12	14.5
	Starting Mode /Battery Volume	12V Electric Starter /36AH or 50AH			
	Tank Volume (L)	26			

Model Specifications:

E: open-frame type T: silent type ST: Super silence
 A: digital panel 3: three-phase

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 safety, 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 to avoid noise hurt and any unexpected accident

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

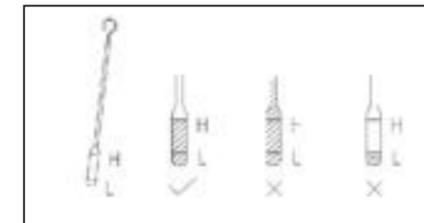
DANGER The rotary parts are dangerous!

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.

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 electrolyte.
- (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.



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.

(please refer to the other manual)



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.



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.

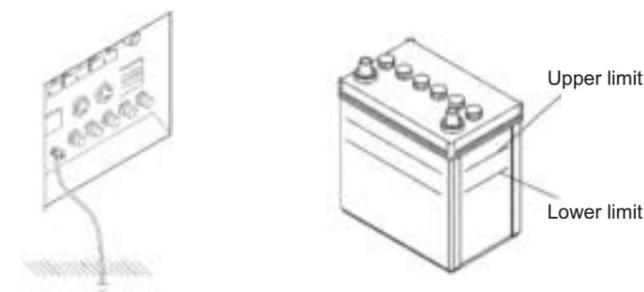
5) Check the battery electrolyte



The usage of the battery

The battery electrolyte contains sulfur acid. It may cause fire hazard if handle it by mistaken.

As a most serious result, it may cause blindness. Take off the cover of the battery, check the electrolyte level if up to the specified level. If not, add the distilled water.



6) Check the grounding protection

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

7) 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.

8) 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.

9) 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.

(10) Electrical connection with load

■ Make sure that load does not exceed the power capacity of your KIPOR unit. Connect electrical connections properly.

■ Connect the welding cable according to the prescribed cable size.

3. SAFETY PRECATIONS FOR SERVICING

1. Only qualified persons should test, maintain, and repair this unit.
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. Do not breathe exhaust gas.
6. Stop engine and let it cool off before checking or adding fuel.
7. Do not add fuel while smoking or unit is near any sparks or open flames.
8. Observe correct polarity (+& -) on batteries.
9. Do not tip battery.
10. Use equipment of adequate capacity to lift and support unit and components.

4. WARM-UP PROCEDURE

1. Check the fuel oil every day.
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. Turn the fuel cock to ON position.
6. Set the main switch to OFF.
7. Turn the engine start key to START position.
8. Warm-up time is about 3-5 minutes.

NOTE: 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.

5. STARTING-UP&RUNNING PROCEDURE

1. According to the step of 1-9, 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.



■ If the engine has been running, the muffler will be very hot. Be careful not to touch the muffler.
■ Never refill the fuel tank while the engine is running.

8. Load



■ 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 heave-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 below the rated load as well as the current must 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.

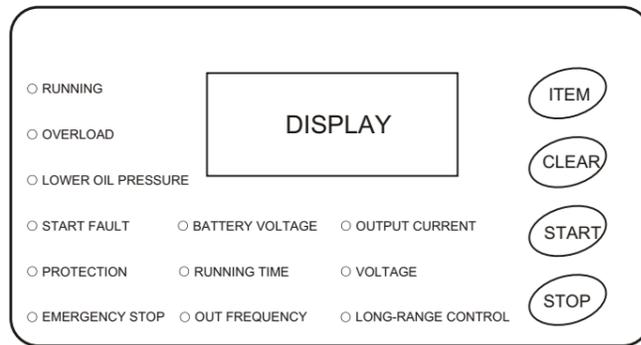
CAUTION

■ 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 engine start key to STOP position.
3. Close the fuel cock.

7. THE FUNCTIONS OF THE DIGITAL PANEL



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: indicate battery voltage

RUNNING TIME: indicate generator-running time

OUTPUT FREQUENCY: indicate generator frequency.

9. 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.

10. 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						●

OUTPUT CURRENT: indicate generator current

VOLTAGE: indicate generator voltage

LONG-RANGE CONTROL: indicate long-range control using if or not

RUNNING: indicate electric power exist if or not

OVERLOAD: indicate overload, the generator will self-braking

LOWER OIL PRESSURE: indicate lower oil pressure, the generator will self-braking

START FAULT: indicate failure start

PROTECTION: indicate voltage & frequency higher (lower), the generator will self-braking

EMERGENCY STOP: indicate stop generator according to emergency Measure

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
• 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 40W	80VA (W)	60VA (W)
• Motor-driven equipment	X3~5	X2	Refrigerator Electric fan	Refrigerator 150W	450-750VA (W)	300VA
• Projection lamp Sodium lamp Halide lamp	X2	X2	Halide lamp Projection lamp	400W	800VA (W)	800VA (W)
• Switch power Eliminator Power	X2	X2	Rectifier cabinet Converter cabinet	1kVA	2kVA (kW)	2kVA (kW)

	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					◇
Generator	Check if the relay can work					◇
	Check protection for electrical leakage	◇				
	Measure insulated resistance			◇		
	Check circuit terminal and connection				◇	

※ : Consult with KIPOR 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 form its engine type. Please read the operation manual carefully.

2. 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.
- Don't service the electric fan until it stops entirely.

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

- Let the engine cool before storing the generator indoors.
- 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.

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.

3. Judge and eliminate troubles

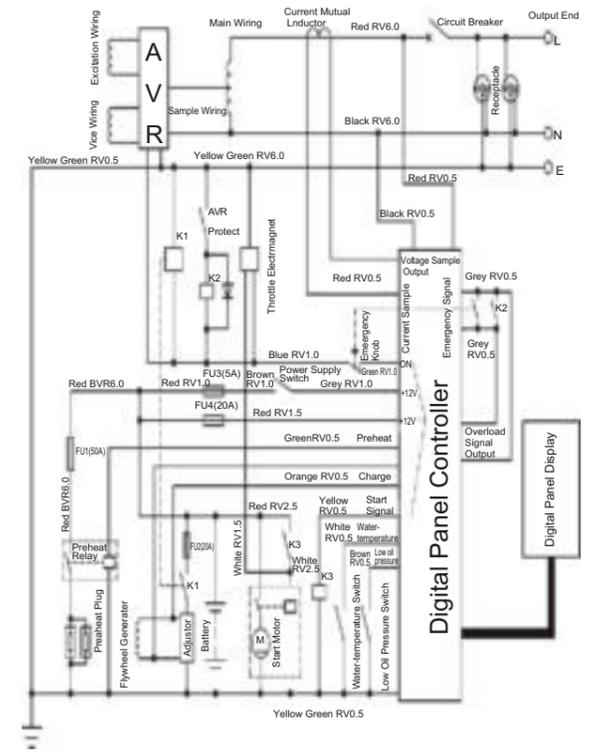
Engine doesn't run	Start motor doesn't run or it's speed is so slow	Battery leakage	Liquid measure
		Battery unclamped or rut	Install after cleaning
		The earth terminal is imperfect	Repair
	Start motor run but doesn't start	Start switch badness	Replace
		Starter badness	Replace
		The wire breaks	Repair
		No fuel oil	Fill oil
Ambient temperature is very low	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	
Stop automatic, rotate speed doesn't rise	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	
	Badness water of pipe oil	Mend the engine	
	Air cleaner is clogged.	Replace air cleaner element	

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	

Fault	Reason	Solution
The voltage value is not right or there is no voltage.	Bad voltmeter	Replace voltmeter
	Bad AVR	Consult with KIPOR dealer
	Loading short circuit	Eliminate it
	Generator rotate speed is too low	Adjust the speed
	Rotor circuitry break	
	Engine circuitry is burnt.	Replace
The generator can't reach rated voltage	Bad voltmeter	Replace
	Bad AVR	Consult with KIPOR 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 KIPOR 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	
	Main winding is burnt.	Change motor
Welding current is abnormal	Welding current is abnormal	Change motor
	IGBT is burned	Change IGBT
Welding current is too small	Rotation speed is too low	Increase rotation speed

11. ELECTRICAL WIRING DIAGRAM

1. KDE12E



1. KDE12E3

