KAMA by REİS

USER MANUAL

PLEASE READ THIS BOOKLET CAREFULLY.

THE BOOKLET CONTAINS IMPORTANT SAFETY INFORMATION.

www.kamabyreis.com

DIESEL PORTABLE GENERATOR

Three-Phases (400V)
KDK12SCA3

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 CD or CF oil . Change the oil after the first 50 hours operation. Afterwards, change it each 200 hours.
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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KDK12SCA3

Diesel Portable Generator

GENERAL SPECIFICATIONS

Engine Model	2V80
Stand By (kVA)	12
Stand By (kW)	10
Prime (kVA)	11
Prime (kW)	9
Rated Current (A)	15,9

1) Standby power: The max power available during a variable electrical power sequence, under the stated operating conditions, for which a generating set is capable of delivering in the event of a utility power outage. Overloading isn't permissible.
2) Prime Power: The maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load. Average load should be 70%. The generator can be overloaded 10% for 1 hour per 12 hrs.

TECHNICIAL SPECIFICATIONS

Maximum Power	kW / kVA	10/12
Continous Power	kW / kVA	9/11
Rated Current	A	15,9
Number of phases		3 (three-phase)
Voltage	V	230/400
Power Factor	Cos φ	1 /0.8
Frequency	Hz	50
Display		Digital
Engine Type		Double Cylinder Water Cooled
Engine Model		**2V80**
Engine Power	hp	20
Displacement	CC	794
Starting System		Electric
Fuel Type		Diesel
Fuel Tank Capacity	Lt	26
Fuel Consumption	Lt / Hour	3
Oil Capacity	Lt	2,3
Oil Type		15W40
Noise Level	dBA-7m	70
Weight	Kg	310
Dimensions (LxWxH)	mm	1100x660x780

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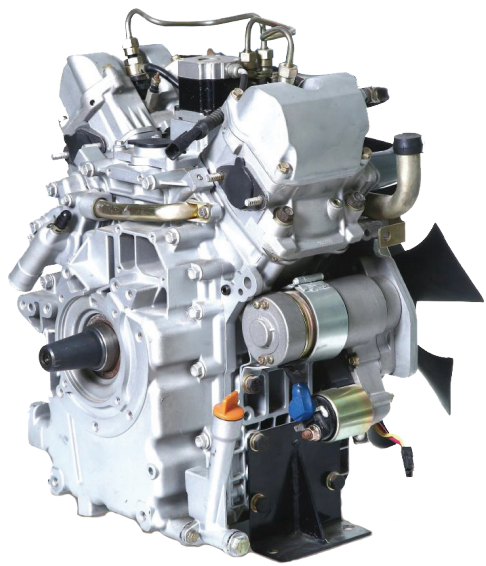
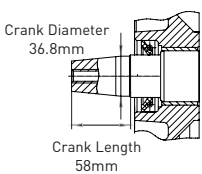
KDK2V80GE

Diesel Motor
20hp, Conical (G2)





TECHNICIAL SPECIFICATIONS

Rotation	hp	3,600
Maximum Power	hp	20
Bore x Stroke	mm	80x79
Displacement	cc	794
Way of Working		Electric
Cylinders / Cooling		4 Stroke, 2 Cylinder / Water Cooled
Crank Type		Conical (G2)
rank Dimensions (Lenght x Diameter)	mm	58 x 36.8
Contact Set		Not Available
Exhaust		Not Available
Radiator		Not Available
Crankcase Oil Capacity	Lt	2,3
Oil Type		15W40
Weight	Kg	58
Dimensions (LxWxH)	mm	520x470x552

1. MAIN TECHNICAL SPECIFICATIONS AND DATA

Model Specifications:

XE: Open-frame type

Q: Silent type

3: Three-phase

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. PREPARE STEPS FOR OPERATION

1. Environment 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 lever 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 lever 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

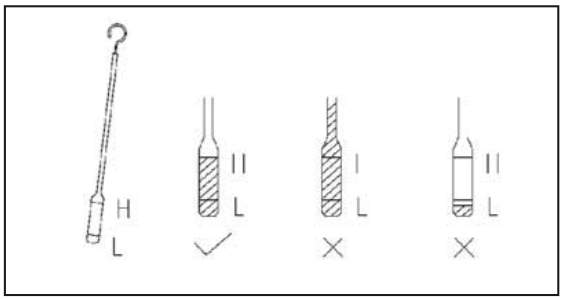
The rotary parts are dangerous!

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

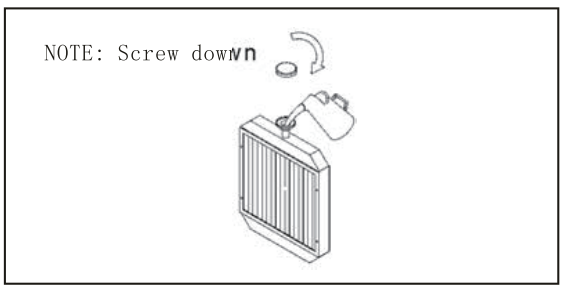
- Close the side doors when running the unit.
- Service the unit after its engine stops completely.

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.

CAUTION

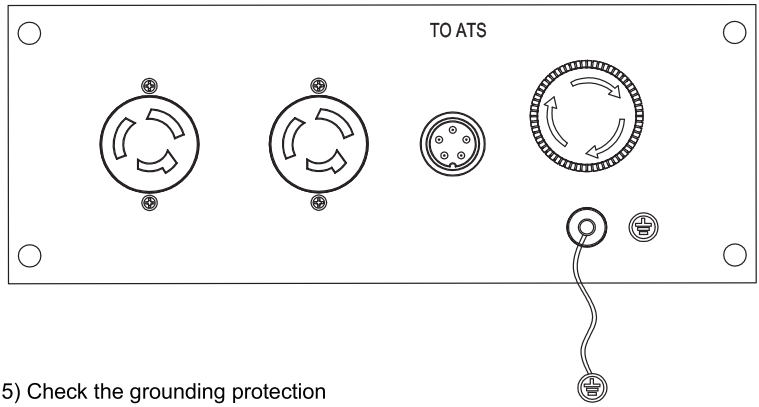
Tighten the radiator cover by turn it in right after checking. Otherwise, the cooling water may be vaporized, causing a fatal fault.

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.

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 MM^2 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 PROCEDURE 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.

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 PROCEDURE AND RUNNING

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.

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±5% (50Hz) for single-phase generating set; 400V±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 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.

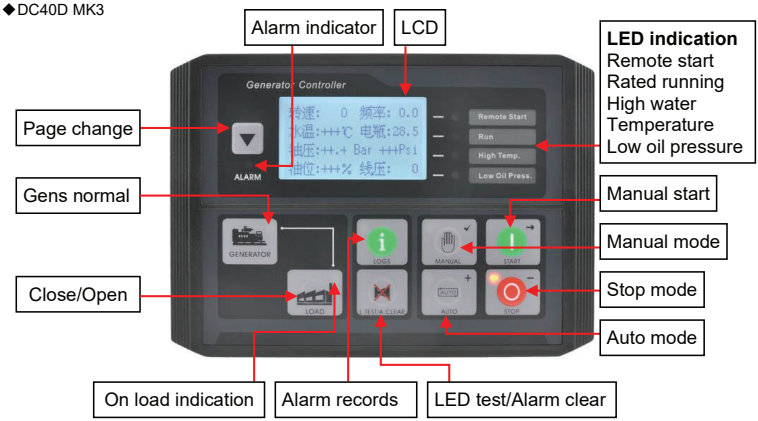
CAUTION

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

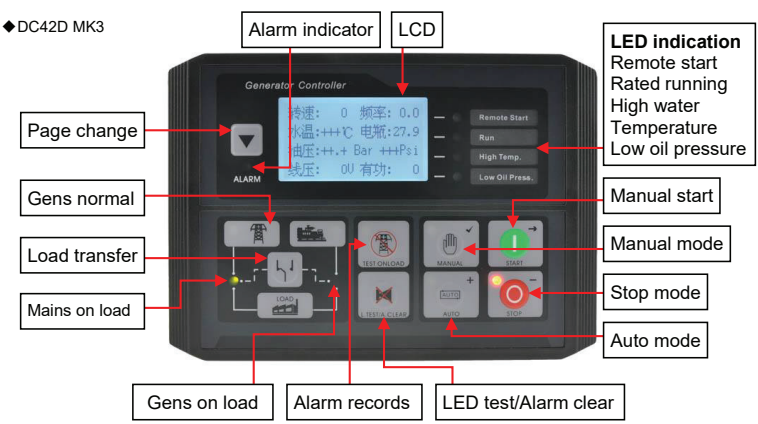
7. THE FUNCTIONS OF THE DIGITAL PANEL

1. Panel introduction

◆DC40D MK3



◆DC42D MK3



2. Installation

◆If the controller is installed directly in the genset or other equipment with vibration, please add shockproof of devices.

◆Shape size: W189mm*H134mm,Cutout:W160mm*H120mm

3. Operation

◆Keys description

Button	Name	Main function
	Stop Reset —	◆Can stop generator under manual/auto mode. ◆Can reset shutdown alarm. ◆During stop procession,pressing this key again can stop generator immediately. ◆Pressing this key can turn into the next digit or decrease the number under edition mode. ◆Choose alarm records under records checking mode.

	Start Shift to the righe	◆Start the genset under manual mode. ◆Start the genset under the test mode. ◆Pressing this key can make the digit turn into right position.
	Manual Confirm	◆Pressing this key will set the module into manual mode ◆Set the parameter under edition mode. ◆Confirm the alarm record under records checking mode and turn into records history checking page.
	Auto +	◆Pressing this key will set the module into auto mode. ◆Pressing this key can turn into the previous page or increase the number under edition mode. ◆Choose alarm records under records checking mode.
	DC40D MK3 Alarm record	◆Alarm records checking under stop mode. ◆Alarm records checking and exit if pressing again.
	DC42D MK3 TEST	◆Pressing this key to come into manual test mode. ◆Press Manual start key, genset will come into start under test mode and supply power if running normally in order to check if the auto start procession is OK.
	Page ESC	◆Page change. ◆ESC function under edition mode. ◆ESC function under alarm records checking.
	LED test Alarm clear	◆Check if all the LED are ok,Press this button to light all LED lights, and LED will be extinguished after loosening the key. ◆In the warning status, press this button to cancel the warning relay output, and the controller detects the warning again. ◆In the alarm status, pressing this button can cancel the buzzer's ringing. ◆In standby status, press this button continuously for 3 seconds, the buzzer ringing can be cancelled, and press this button for 3 seconds longer, the buzzer ringing can be restored.
	DC40D MK3 Load on/off	◆ Pressing this key to control the load on or off.
	DC42D MK3 Load transfer	◆Pressing this key to transfer the load from Mains and genset under Manual mode .
	Setting Mode	◆Pressing “Page” and “Stop”simultaneously to come into setting mode.
	DC42D MK3 Alarm record	◆Press load-transfer key and page key to check the alarm records under stop mode. ◆In the view of the alarm record mode, exit to view the alarm record.

◆Alarm records checking

DC4xD MK3 controller can save three group of alarm records which contains time, voltage, current and oil pressure,temperature etc.

How to check the alarm records:

1）Under stop mode: Press  to come into alarm records page(DC40D MK3); press  and  simultaneously to come into alarm records page(DC42D MK3).

2）Press  to turn upper digit and press  to turn lower digit in order to choose the record you need.

Press  to confirm the record and come into history records checking page.

3）Press  to turn lower records under records checking page. Press  to turn upper records and press  to revert back to alarm history records page.

4）In the history records page and checking page, for DC40D MK3: press  to exit; for DC42D MK3, press  and  simultaneously to exit.

4. Parameter setting

◆Please set the parameters according to below steps:

1）In the stop mode, please  and  simultaneously, then loose  so that you can come to configuration mode.

2）Select the “Set Parameters” menu and press  ,then you can come to enter password interface,the default password is “***07623***”.

3）Press  and add number 1, press  to reduce number 1, press  to turn the digit into right, press  once done.coming into menu after confirmation of password setting. The screen will display error if password is wrong. The correct password should be put after pressing any button.

4）Press  to turn the digit into upper position, press  to turn the digit into lower position, press  to get into parameters setting page.

5）Press  to shift up the parameters, press  to shift down the parameters, press  to get into parameter changing page.

6）Press  to add number 1, press  to reduce number 1, press  to turn the digit into right and press  once done. If the parameters setting is in the valid setting range,then it can be saved, if not, it can not be saved.

7）Press  and  to save the parameters and exit from edition page.

8）Press  to revert back to last menu if in any setting position.

Revert back to default: put password “**97011**” when coming into parameters setting, then all the parameters can be set as defaults.

Note: the data can not be saved if the user didn’t press OK and STOP to confirm the setting.

◆**Parameter list.**

1)Basic setting

No	Parameter	Range ***(default)***	Notes
0	Language	*English/**简体中文**/*繁体中文	Language option.
1	Gens poles	2/4/6/8***(4)***	When the flywheel teeth is set as 0,the RPM will be resulted by frequency. Pole 2: 50Hz---3000RPM.Pole 4: 50Hz---1500RPM. Pole 6: 50Hz---1000RPM.Pole 8: 50Hz---750RPM
2	Gens AC system	Disable 1 phase 2 wire 2 phase 3 wire 3 phase 3 wire ***3 phase 4 wire***	Gens phases: No gens parameters can be displayed if setting as disable, which is applied to water pump genset.
3	CT rate	5-6000A/5A ***(500A/5A)***	Used for setting genset CT primary current, secondary rated current 5A.
4	Rated frequency	40.0-80.0Hz***(50.0Hz)***	Calculate the alarm value.
5	Rated voltage	80-360V***(230V)***	Calculate the alarm value.
6	Rated current	5-6000A***(500A)***	Calculate the alarm value.
7	Rated battery voltage	8.0-36.0V***(24.0V)***	Calculate the alarm value. One battery gens should be set as 12V, two batteries gens should be set as 24V.
8	Rated RPM	500-4500RPM***(1500)***	Calculate the alarm value.
9	Flywheel teeth	0-300***(0)***	If the setting is 0, (RPM sensor Disabled), then RPM is resulted by Hz.
10	Oil pressure sensor	***0. VDO 0-10Bar*** 1. MEBAY-003B 2. SGH 3. SGD 4. SGX 5. CURTIS 6. DATCON 10Bar 7. VOLVO-EC 8. 3015237 9. User-defined	Choose the usual oil pressure sensor, if the sensor users choose is not the 9 types, it can be User-defined.
11	Coolant temperature	***0. VDO 40-120***	Choose the usual water temperature sensor, if the

	sensor	***1.*** MEBAY-001B 2. SGH 3. SGD 4. SGX 5. CURTIS 6. DATCON 7. VOLVO-EC 8. 3015238 9. PT100 10. MEBAY-Mier 11.User-defined	sensor users choose is not the 11 types, it can be User-defined.
12	Oil temperature sensor	***0. VDO 40-120*** ***1.*** MEBAY-001B 2. SGH 3. SGD 4. SGX 5. CURTIS 6. DATCON 7. VOLVO-EC 8. 3015238 9. PT100 10. MEBAY-Mier 11.User-defined	Choose the usual oil temperature sensor, if the sensor users choose is not the 11 types, it can be User-defined.
13	Cylinder temperature sensor	0. MEBAY-Mier 1. ***PT100*** ***2.*** User-defined	If the sensor users choose is not the 2 types, it can be User-defined.
14	Fuel level sensor	0. SGH 1. SGD ***2. MEBAY150*** 3. ECU-Q7 4. User-defined *5. ZP61-10* 6. VDO ohm range 10-180 7. VDO TUBE TYPE 90-0 8. US ohm range 240-33 9. GM ohm range 0-90 10. GM ohm range 0-30 *11.*Ford(73-10)	If the sensor users choose is not the 3 types, it can be User-defined.
15	Action if oil pressure sensor disconnected	Disable ***Warning*** Alarm and stop	Action if oil pressure sensor disconnected.
16	Action if water temperature sensor disconnected	Disable ***Warning*** Alarm and stop	Action if Water temperature sensor disconnected.
17	Action if oil temperature sensor disconnected	Disable ***Warning*** Alarm and stop	Action if oil temperature sensor disconnected.
18	Action if cylinder temperature sensor disconnected	Disable ***Warning*** Alarm and stop	Action if cylinder temperature sensor disconnected.
19	Action if fuel Leve l sensor disconnected	Disable ***Warning*** Alarm and stop	Action if Fuel level sensor disconnected.
20	Pressure/Temperatur e unit	℃/KPA ***℃/BAR*** ℃/PSI F/KPA F/BAR F/PSI	Unit display.
21	Standby battery start condition	0.0V-60.0V***(0.0V)***	The genset will crank successfully when there is mains failure and ABF is lower than preset value. When it is set as 0 that ABF voltage can not be checked,then genset will be cranked once mains failure.(genset will be stopped once mains normal).

2)Basic Setting 2

NO	Parameter	Range***(defaults)***	Notes

1	Primary Modes	***STOP*** Manual Auto Auto save	The primary modes on power, easy for user operation. Note: auto record function can not record the mode with load.
2	Manual crank times	1-30 ***(1 time)***	Crank times under mode and test mode.
3	Auto start crank times	1-30 ***(3 times)***	Crank times under auto mode.
4	E.T.S. hold times	1-10***(2 times)***	The max E.T.S. hold on power shall be canceled once stop success under auto mode . the output interval time is " Fail to stop ".
5	Crank disconnet	RPM Hz Oil pressure(delay) ***RPM/Frequency*** RPM/Oil Pressure Frequency/Oil Pressure RPM/Frequency/Oil press.	1.If there is no oil pressure sensor, please dont choose it. 2.Oil pressure switch input is not the crank condition 3.Please check if the running status, stop condition are according with crank condition. 4.Means either of the conditions can be acceptable as crank condition. But all of them should be meet together to regard as stop condition.
6	Frequency disconnect	0-200%***(28%)***	Rated frequency multiplying by this value is regarded as crank success condition. When the gens frequency is over the condition value, then system regards it as crank success.
7	Oil pressure disconnect	0-400kpa***(200kpa)***	When the engine oil pressure is over the condition value, then system regards it as crank success, motor escaped.
8	RPM disconnect	0-200%***(24%)***	Rated RPM multiplying by this value is regarded as crank success condition. When the RPM is over the condition value, then system regards it as crank success, motor escaped.
9	OP pre-supply stop	50-600kpa***(200kpa)***	When the oil pressure is over the condition value, then pre-oil supply is stopped.
10	RPM-up stop	0-200%***(90%)***	Rated RPM multiplying by this value is regarded as speed-up stop value. When the RPM is over this value, then the RPM-Up procession is stopped in time.
11	Temperature-up stop	20-200℃***(68℃)***	When the water temperature is over the preset value, then temperature-up procession is stopped in time.
12	Voltage-up stop	0-200%***(85%)***	Rated voltage multiplying by this value is regarded as voltage-up stop value. When the voltage is over this value, then the voltage-Up procession is stopped in time.
13	Fan Control condition	***Water temperature*** Oil temperature Cylinder temperature	Radiator Fan control output condition
14	Temperature for Fan open	20－200℃***(75℃)***	Used for controlling radiator: when the temperature reaches the set temperature, then the radiator is opened.
15	Temperature for Fan close	20－200℃***(60℃)***	Used for controlling radiator: when the temperature is lower than the set temperature, then the radiator is closed.
16	Maintenance countdown	0-5000h***(800h)***	When it is set as 5000, then this function is disabled.
17	User password	00000-65535***(07623)***	Change the password.
18	Maintenance expire	***Warning*** /Alarm and stop	The action after the primary maintenance expired.
19	Maintenance date	***2000/01/01***-2099/12/31	When it is set as 2000/01/01, this function is disabled.

3)Delay time setting

NO	Parameter	Range***(default)***	Notes
1	Start delay	0-6500.0s***(5.0s)***	The time during the genset starts after the mains failure or remote signal is valid.
2	Preheat time	0-6500.0s***(0.0s)***	The time needed to be preheat before the starter on power.
3	Longest pre-oil supply	0-180.0s***(0.0s)***	Under pre-oil supply, if the oil pressure is higher than setting value, then pre-oil supply stopped.
4	Cranking time	3.0-60.0s***(8.0s)***	The time when the starter is on power.
5	Crank rest time	3.0-60.0s***(10.0s)***	If crank failure, the waiting time before the second test time.
6	Safety delay	1.0-60.0s***(8.0s)***	Low oil pressure, high water temperature, under speed, under frequency, under voltage, charge failure are all invalid during this time except for emergency stop ,over speed, over freq.
7	Start idle time	0-3600.0s***(5.0s)***	Idle running time when crank successfully.

8	Longest RPM-up time	0-3600.0s ***(120.0s)***	The longest speed-up time,during which time the system will exit once speed increased successfully .
9	Longest Temp.-up time	0-3600.0s***(0.0s)***	The longest warming-up time,during which time the system will exit once temperature increased successfully .
10	Longest Volt.-up time	0-3600.0s ***(120.0s)***	The longest voltage-up time,during which time the system will exit once voltage increased successfully .
11	Warming-up time	0-3600.0s***(10.0s)***	The time needed for loading.
12	Back to Mains time	0-3600.0s***(10.0s)***	To avoid the switch actions if the mains unstable.If the remote start signal is invalid (DC42D will check if the mains normal), genset will not switch immediately, after the delay time, it will transfer to mains. during the delay, if the remote start signal is valid, then genset will come into rated running.
13	Back to Gens time	0-3600.0s***(5.0s)***	There shall be loading delay from Mains to Gens if the remote start signal valid or Mains abnormal under Cooling time.
14	Cooling time	0-3600.0s***(30.0s)***	After unloading, the time of cooling down by radiator before stop. During the delay, if the remote start signal is valid, then genset will come into rated running.
15	Stop idle time	0-3600.0s***(5.0s)***	Idle-speed running time.
16	E.T.S. hold time	0-600.0s***(10.0s)***	Stop solenoid on power time.
17	Fail to stop	5-180.0s***(30.0s)***	If the RPM is 0 during the stop failure time, then the stop failure time is no needed.
18	Emergency delay	0-10.0s***(1.0s)***	Emergency and over frequency alarm delay.
19	Normal alarm delay	2.0-20.0s***(5.0s)***	The alarm delay except for emergency stop and over frequency
20	Over current 【inverse time】	0.1-36.0 ***(36.0)***	This option will not take effect until the [24-Over phase current delay] is set to 0. The overcurrent delay is inverse time, and the formula is T=t/((IA/IT) -1)^2.
21	Choke close delay	0-200.0s***(3.0s)***	Choke close delay.
22	Load / unload pulse width	1.0-60.0s***(60.0s)***	Mains and Gens loading and unloading pulse width, when it is 10s, it is regarded as continuous output.
23	Standby battery charging time	10-600min ***(600min)***	When the standby battery charged well, the power input will be stopped.
24	Over phase current delay	0-3600.0s**(1296s)**	When this parameter is set to 0, the over current delay is the inverse time; if not, the over current delay is the time set for this parameter.

4)Engine Alarm setting

NO	Parameter	Range ***(defaults)***	Notes
1	Over speed alarm	0-200% ***(114%)***	Rated RPM multiplying by this value is regarded as over speed alarm value.When the RPM is higher than the alarm value and comes into over speed delay but still higher(emergency faults delay), then over speed alarms. if the value is set as 200, then the over speed alarm is disabled.
2	Under speed alarm	0-200% ***(80%)***	Rated RPM multiplying by this value is regarded as under speed alarm value.When the RPM is lower than the alarm value and comes into under speed delay but still lower (normal faults delay), then under speed alarms. if the value is set as 0, then the under speed alarm is disabled.
3	Low oil pressure alarm	0-999kpa ***(103kpa)***	When the oil pressure is lower than the alarm value and comes into low oil pressure delay but still lower (normal faults delay), then low oil pressure alarms. If the value is set as 0, then the under speed alarm is disabled.
4	High water temperature alarm	20-200℃ ***(98℃)***	When the water temperature is higher than the alarm value and comes into high temperature delay but still higher (normal faults delay), then high temperature alarms. If the value is set as 200, then the high temperature alarm is disabled.
5	High oil temperature alarm	20-200℃ ***(100℃)***	When the temperature is higher than the alarm value and comes into high temperature delay but still higher (normal faults delay), then high temperature alarms. If the value is set as 200, then the high temperature alarm is disabled.
6	High cylinder temperature alarm	20-200℃ ***(150℃)***	When the temperature is higher than the alarm value and comes into high temperature delay but still higher (normal faults delay), then high temperature alarms. if the value is set as 200, then the high temperature alarm is disabled.
7	Low fuel level warning	0-100% ***(20%)***	When the fuel level is lower than the value and comes into low fuel level warning delay but still lower (normal warning delay), then low fuel level warns. If it is higher than the value then warning clears. If the

			value is set as 0, then the low fuel level warning is disabled.
8	Low fuel level alarm	0-100% ***(0%)***	When the fuel level is lower than the alarm value and comes into low fuel level delay but still lower (normal faults delay), then low fuel level alarms. if the value is set as 0, then the under speed alarm is disabled.
9	Over battery voltage warning	0-200% ***(135%)***	Rated battery voltage multiplying by this value is regarded as over battery voltage warning value.When the battery input is higher than the warning value and comes into over battery voltage delay but still higher (normal faults delay), then over battery voltage warns. if the value is set as 200, then the over battery voltage is disabled.
10	Under battery voltage warning	0-200% ***(67%)***	Rated battery voltage multiplying by this value is regarded as under battery voltage warn value.When the battery input is lower than the warning value and comes into under battery voltage delay but still lower (normal faults delay), then under battery voltage warns. if the value is set as 0, then the under battery voltage is disabled.

5)Generator alarm parameters

NO	Parameter	Range***(defaults)***	Notes
1	Over freq alarm	0-200%***(114%)***	Rated frequency multiplying by this value is regarded as under over frequency alarm value. When the Freq is higher than the value and comes into over freq delay but still higher (emergency faults delay), then over frequency alarms.If the value is set as 200, then the alarm is disabled.
2	Under freq alarm	0-200%***(80%)***	Rated frequency multiplying by this value is regarded as under frequency alarm value. When the Freq is lower than the value and comes into under freq delay but still lower (normal faults delay), then under frequency alarms.If the value is set as 0, then the alarm is disabled.
3	Over voltage warning	0-200%***(120%)***	Rated voltage multiplying by this value is regarded as over voltage alarm value. When the voltage is higher than the value and comes into over voltage delay but still higher (normal faults delay), then over voltage alarms.If the value is set as 200, then the alarm is disabled.
4	Under voltage alarm	0-200%***(80%)***	Rated voltage multiplying by this value is regarded as under voltage alarm value. When the voltage is lower than the value and comes into under voltage delay but still lower (normal faults delay), then under voltage alarms.If the value is set as 0, then the alarm is disabled.
5	Phase current over-load alarm	0-200%***(100%)***	Rated current multiplying by this value is regarded as over current alarm value. When the current is higher than the value and comes into over current delay but still higher (over current faults delay), then over current alarms.If the value is set as 200, then the alarm is disabled.
6	Non-balance current ratio warning	10-100%***(100%)***	It is valid for 2P3W or 3P4W.When the non-balance current ratio is higher than the value and comes into delay but still higher(normal warn delay), then non-balance current ratio warns.If the value is set as 100, then the warning is disabled.

6)Output/input setting

NO	Parmeters	Range***(defaults)***	Notes
1	Programmable output 1	0-30 ***(2.* Public alarm*)***	**0. Disable.** **1. Public warning output:** when there is any warning output. **2. Public alarm output:** when there is any alarm output, alarm locks till revert back. **3. Shades control:** there is output once genset starts and stop till stable. **4. Preheat mode 1:** preheat before start. **5. Pre-oil supply control:** Under pre-oil supply,if the oil pressure is higher than setting value or pre-oil supply time ends, then pre-oil supply stopped. **6. Choke control:** choke will be started after crank success and off after delay. **7. Fuel output:** output once gens starts and off till stable. **8. Crank output:** output once cranking. **9. Idle speed control:** used for speed controller, there is no output under idle but output under high speed. **10.Gens load:** there is continuous output once the conditions can be meet, which can control the switch with load. **11.Fan Control:** used to control radiator electrical fan. there is output when the preset temperature is higher than " **Temperature for Fan open**" and no output when the preset temperature is lower
2	Programmable output 2	0-30 ***(12.* E.S.T. hold*)***	
3	Programmable output 3	0-30 ***(10.Gens load)***	
4	Programmable output 4	0-30 ***(9.*Idle speed control*)***	

			than "**Temperature for Fan close**". **12. E.S.T. hold:** shutdown output, it is used for gens with stop solenoid. when the setting value of shutdown delay is over, then it is off. **13.System in stop:** there is output under stop mode. **14.System in manual:** there is output under manual mode. **15.System in auto:** there is output under auto mode. **16.Mains load:** continuous or pulse type according to time setting. Only for DC42D MK3. **17.Working plan running output:** when the working plan is started, there is output in running status if the genset meets conditions, if not, there is no output. **18.Speed-up control:** there is output when coming into high speed up, which time is RPM up delay. **19.Speed-down control:** the output time is shutdown idle delay during shutdown idle or shutdown on power procession. 20.**High speed control:** output after the idle delay is completed, and disconnected after high-speed heat dissipation. **21.-24. Reserved.** **25.Excitation output:**Stop status is off when coming into voltage-up processio
5	Programmable input 1	0-20***(1. Remote start)***	**0. Disable.** **1. Remote start (on load).** **2. Low oil pressure alarm switch.** **3. High water temperature alarm switch.** **4. High oil temperature alarm switch.** **5. High cylinder temperature alarm switch.** **6. Low water level alarm switch.** **7. Low fuel level warning input.** **8. Low fuel level alarm input.** **9. Low oil pressure level warning input.** **10. Low oil pressure level alarm input.** **11.Shades status input.** **12. External instant warning input.** **13. External instant alarm input.**
6	Programmable input 2	0-20***(2. Low oil pressure alarm)***	
7	Programmable input 3	0-20***(3. High water temperature alarm)***	
8	Programmable input 4	0-20***(6. Low water level alarm)***	
9	Programmable input 5	0-20***(7. Low fuel level warning)***	
10	Programmable LED 1	0-15***(6. Remote start)***	**0. Disabled.** **1. Low oil pressure alarm indication.** **2. High water temperature alarm indication.** **3. High oil temperature alarm indication .** **4. High cylinder temperature alarm indication .** **5. Low water level alarm indication.** **6. Remote start indication.** **7. Switch input 1 indication, light for valid.** **8. Switch input 2 indication, light for valid.** **9. Switch input 3 indication, light for valid.** **10. Switch input 4 indication, light for valid.** **11.Switch input 5 indication, light for valid.** **12. Normal running indication.**
11	Programmable LED 2	0-15***(12.* Normal running*)***	
12	Programmable LED 3	0-15***(2.* High water temperature alarm*)***	
13	Programmable LED 4	0-15***(1.* Low oil pressure alarm*)***	
14	Programmable sensor 1	0-6***(1. Oil pressure sensor)***	**0. Disable.** **1. Oil pressure sensor input.** **2. Water temperature sensor input.** **3. Oil temperature sensor input.** **4. Cylinder temperature sensor input.** **5. Fuel level sensor input.** ⚠ *Note: every sensor input can be set as same function.(oil pressure, fuel level warns and alarm will be judged according to the lowest value. Water temperature, oil temperature, cylinder temperature, genset box temperature warns and alarm will be judged by the highest value. Either of the inputs for alarm opened.)*
15	Programmable sensor 2	0-6***(2. Water temperature sensor)***	
16	Programmable sensor 3	0-6***(0.Disable)***	

7) Working plan and maintenance setting

NO	Parameter	Range***(defaults)***	Notes
1	Working plan format	***Disable*** Every month Every week	This mode must be under auto mode.Working plan is disabled once setting as disable.The working plan will be executed according the chosen date when setting as every month.The working plan will be executed according the chosen date when setting as every week.

2	Maintenance date per month	From 1st to 31st ***(1st)***	The date chosen for every month.
3	Maintenance date per week	Monday to Sunday ***Default: Sunday***	The date chosen for every week.
4	Maintenance with load or not	***Disabled***/with load	To choose if the genset starts with load or not.
5	Maintenance start time	00:00-23:59***(00:00)***	Maintenance start time setting.
6	Maintenance running time	1-120m***(5m)***	Maintenance running time setting.

8)Mains protection

No	Parameter	Range***(defaults)***	Notes
1	Phase	Disable 1 Phase 2 Wire 2 Phase 3 Wire 3 Phase 3 Wire ***3 Phase 4 Wire***	Choose the input, there is no display if setting as disable.
2	Mains under volt	55-330V***(184V)***	When the mains voltage is lower than the "low voltage crank threshold" and comes into mains low voltage delay(normal failure delay) but still lower, then mains becomes invalid. If the voltage become higher than "low voltage revert threshold" during normal failure delay time, then it will not alarm.
3	Revert under volt	55-330V***(207V)***	
4	Mains over volt	55-330V***(276V)***	When the mains voltage is higher than the" high voltage crank threshold" and comes into mains high voltage delay(normal failure delay) but still higher, then mains becomes invalid. If the voltage become lower than "low voltage revert threshold" during normal failure delay time, then it will not alarm.
5	Revert over volt	55-330V***(253V)***	
6	Mains normal delay	0.0-3600.0S***(10.0S)***	The time from abnormal to normal, which is used for ATS transfer.
7	Mains abnormal delay	0.0-3600.0S***(5.0S)***	

9) LCD setting

No	Parameter	Range***(defaults)***	Notes
1	Start screen display	0-20.0s***(5.0s)***	Start screen display time,0: No-display.
2	Saving mode	5.0-6000.0s (***600.0s)***	LCD light will be closed automatically without any button pressed after delay.If setting as 200.0s, back light always lighted.
3	Homing display	5.0-600.0s ***(600.0s)***	The time when the page reverts back to the home page .If setting as 600.0s:disabled.
4	LOGO delay display under standby	5.0-6000.0 ***(6000.0s)***	Start screen will be opened without any button pressed after delay.If setting as 6000.0s: disabled.

10) RS485 PORT

No	Parameter	Range***(default)***	Notes
1	Controller adress	1-255***(16)***	The IP built by controller and PC.

11) Working plan

No	Parameter	*Range****(default)***	Notes
1	Working plan	***Disable*** Enable 1:remote start Enable 2:mains failure Enable 3:the above 1 or 2 Enable 4:running always	Working plan must be under auto mode.During the working time, the genset start if the conditions reached and shall stop if the conditions not reached. The genset shall not start when out of the working time wheather the conditions reached or not.
2	Start time	00:00-23:59	The start time allowed.
3	End time	00:00-23:59	The end time allowed (the next day is valid)..
4	Dates	1-31	Multiple choices according to the reality. The longest running time is 24 hours.

12) Data/time setting

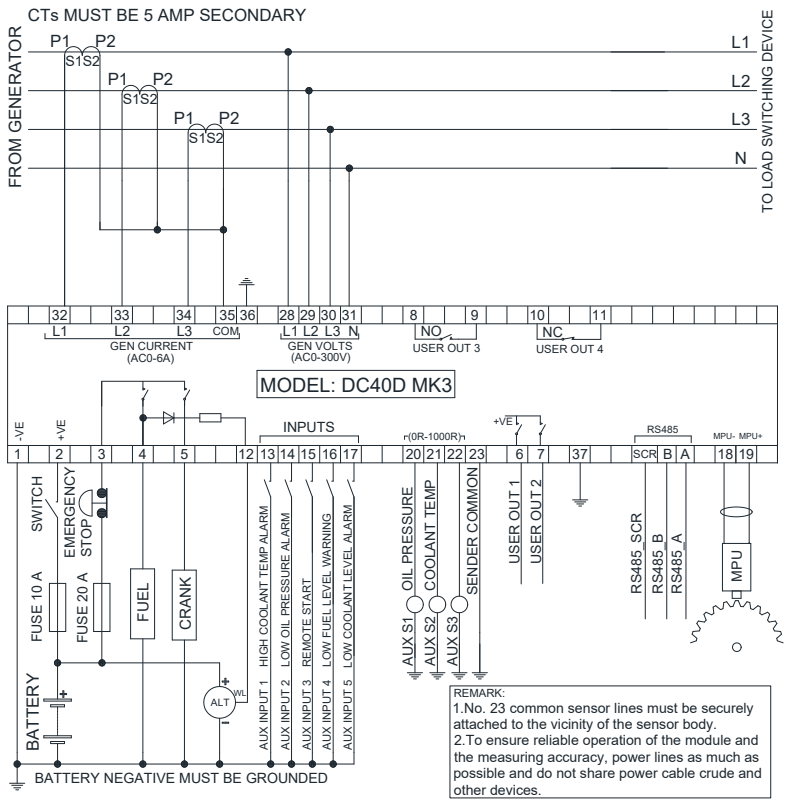
No	Parameter	Range***(defaults)***	Notes
1	Date/Time	2016/01/01-2099/12/31	Permanent calendar inside, please correct the time timely.
2	Current time	00:00:00-23:59:59	Permanent calendar inside, please correct the time timely.

13) Self-define curve

NO	Parameter	Notes
1	Self-define oil pressure curve	*Sensor curve can be User-defined by panel buttons, resistance and according value should be input,MAX 15 groups ,MIN 2 groups.* ***Rule: resistance should be input from small to large.***
2	Self-define water temperature curve	
3	Self-define oil temperature curve	
4	Self-define cylinder temperature curve	
5	Self-define genset box temperature curve	
6	Self-define fuel level curve	

5. Typical diagram

◆Diagram for DC40D MK3

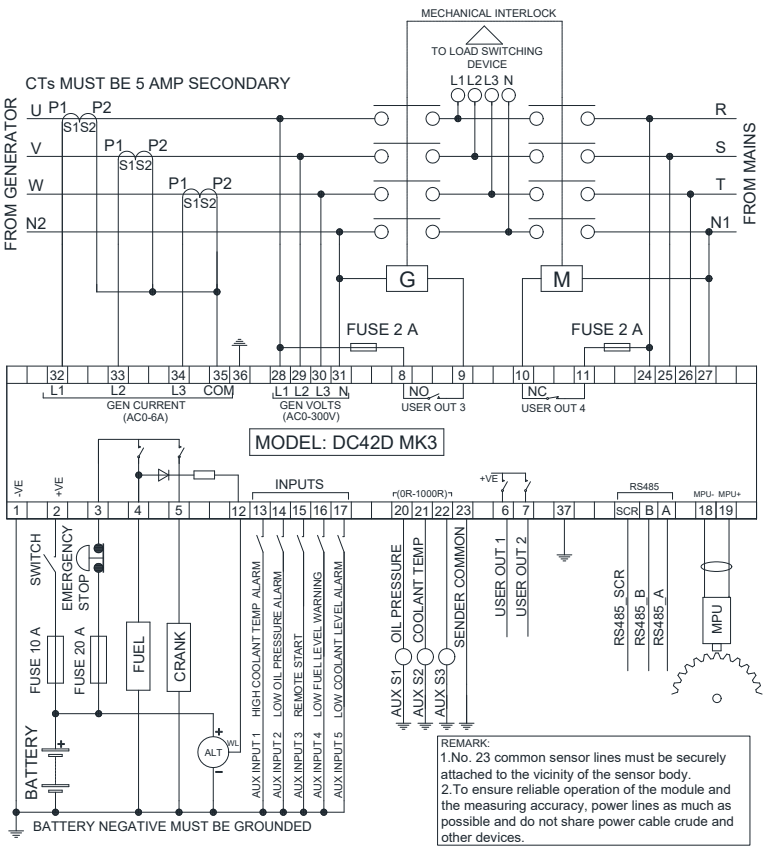


Notes:

1. Please don't move battery during running status or it may cause the controller broken.
2.The CT public terminal ICOM should connect to public ground, on the mean time, please don't connect to Line Nero, or the controller may be burnt.

Warning: the secondary CT can not be opened under current loading, or the high voltage may cause damage and safety problem for workers.

◆Diagram for DC42D MK3



Note: only DC40DR and DC42DR are equipped with RS485 port.

Notes:

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3. This manual is only for the quick operation, please read the specific standard manual for your reference .

AUTO PROTECTION

In auto protection mode, except for low oil pressure protection, all the other protections (voltage, frequency, overload, temperature) are active.

1. Voltage Protection

When the limits of rated voltage are exceeded by ±10%, V oltage LED starts flashing; after 7 seconds delay in case of under voltage or 3 seconds delay in case of over voltage, alarm shutdown is initiated. After that voltage LED continues to flash and shows pre-alarm value.

2. Frequency Protection

50Hz：(45~55)Hz
60Hz：(55~65)Hz
When the set value is exceeded, frequency LED starts flashing; after 7 seconds delay in case of under frequency and 3 seconds delay in case of over frequency , alarm shutdown is initiated. After that frequency LED continues to flash and shows pre-alarm value.

3. Overload Protection

If the set value is exceeded by 5% or less, alarm will not be initiated;
If the set value is exceeded by more than 5%, power LED will start flashing;
If the set value is exceeded by 5-7.5% and continuous for more than 3 hours, then alarm shutdown will be initiated;
If the set value is exceeded by 7.5-10% and continues for more than 1 hours, alarm shutdown will be initiated;
If the set value is exceeded by more than 10%, the gen-set will be shut down immediately (approximately 2 seconds);
After alarm shutdown is initiated power LED continues to flash and shows pre-alarm value.

4. Low Oil Pressure Protection

Irrespective of whether auto protection mode is enabled or not, low oil pressure will lead to automatic disconnection of oil circuit;
5 High engine temperature protection
If engine temperature exceeds 108℃, LED window starts flashing; after 7 second delay , protection begins; LED window continues to flash and shows pre-protection value (for air-cooled engine);

5. High Engine Temperature Protection

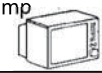
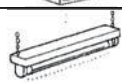
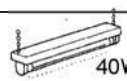
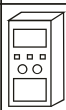
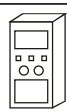
If engine temperature exceeds 98℃, LED window starts flashing; after 7 second delay , protection begins; LED window continues to flash and shows pre-protection value (for air-cooled engine);

NOTE: During Safety On delay , protection is disabled; after Safety On Delay, when voltage, frequency, overload, high temperature protection is initiated, fuel output deactivates.

WARNING: When the engine is running, start battery must not be removed.

8. ELECTRICAL 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	WA TTAGE		TYPICAL APPLIANCE	EXAMPLE		
	STARTING	RA TE D		APPLIANCE	STARTING	RA TED
• Incande-scent lamp • Heating appliance	X1	X1	 Incandescent lamp  TV	 Incandescent lamp 100W	100VA (W)	100VA (W)
· Fluoresc-ent lamp	X2	X1.5	 Fluorescent lamp	 Fluorescent lamp	80VA (W)	60VA (W)
· Motor-driven equip-ment	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)

⚠ 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 1.5mm^2, and less than 100m for cables of 2.5mm^2

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 w-arming 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				●	
	Clean the inner of the fuel tank.					◇
	Replace the air cleaner element					●
	Check valve clearance.			☆ First		◇
	Adjust fuel nozzle.					◇
	Checkfuel 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 !he time for !he first check. From !hen on, check the items according to the normal period. The check time is different form its engine type. Please read the operation manual carefully.

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.

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 Elimininate 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
		Thewire 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	Usewinter 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 aroundpipe	Empty air
Stop automatic, rotate speed doesn't rise		Fuel oil cleaner walled up	Replace fuel oil cleaner element, cleanor replace filter
		Badness water of pipe oil	Mend the engine
		Aircleaner is clogged	Replace air cleaner element

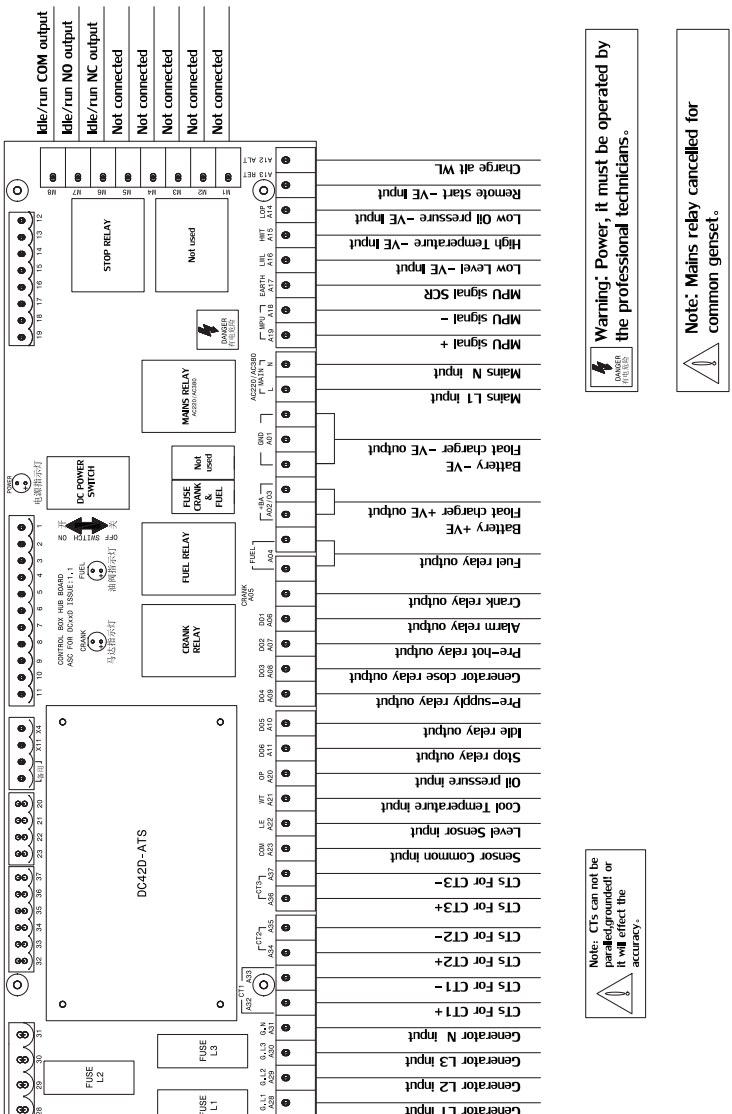
Fault		Reason	Solution
Engine stops because of low oil pressure.		engine oil isnot enough.	Fill engineoil
		Badness oil switch	Replace switch
		Engine air cleaner wall up	Replace filter
Engine can't reach the highest speed		Badness regulator	Adjust to short
		Airinthe oil pipe	Eliminate air
Idle speed is too high		Regulator lever regulator position is wrong	Adjust regulator lever
Vibration is too big		Regulator positionis wrong	Adjust regulator lever
		Airinthe 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 iflack 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 dealer
	Loading short circuit	Eliminate it
	Generator rotate speedis 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.

Controller Troubleshooting

Problem	Possible solution
Controller does not respond on power on	Check start battery. Check wiring to the controller Check DC fuse
Low oil pressure alarm after crank disconnect	Check oil pressure sensor and its wiring
Alarm shutdown during running	Check corresponding switch and wiring in accordance with the information on the display
Fail to start	Check fuel return circuit and wiring Check start battery Consult engine manual
Starter motor does not respond	Check the wiring to the starter Check start battery

11. ELECTRICAL WIRING DIAGRAM



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".

$$\text{Potential (v)} = \frac{1}{58} \times \frac{\text{Length}}{\text{Section area}} \times \text{Current (A)} \times 1.732$$

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.

Ambient temperature:25℃

No.	Cross-sectional area	Single-carrying capacity (25℃)(A)		Voltage drop mv/M	Three core ampacity (25℃)(A)		Voltage drop mv/M	Four core ampacity (25℃)(A)		Voltage drop mv/M
		VV22	YJV22		VV22	YJV22		VV22	YJV22	VV22
1	1.5mm²	20	25	30.86	13	18	30.86	13	13	20
2	2.5mm²	28	35	18.9	18	22	18.9	18	30	28
3	4mm²	38	50	11.76	24	32	11.76	25	32	38
4	6mm²	48	60	7.86	32	41	7.86	33	42	48
5	10mm²	65	85	4.67	45	55	4.67	47	56	65
6	16mm²	88	110	2.95	61	75	2.6	65	80	88
7	25mm²	113	157	1.87	85	105	1.6	86	108	113
8	35mm²	142	192	1.35	105	130	1.2	108	130	142
9	50mm²	171	232	1.01	124	155	0.87	137	165	171
10	70mm²	218	294	0.71	160	205	0.61	176	220	218
11	95mm²	265	355	0.52	201	248	0.45	217	265	265
12	120mm²	305	410	0.43	235	292	0.36	253	310	305
13	150mm²	355	478	0.36	275	343	0.3	290	360	355
14	185mm²	410	550	0.3	323	400	0.25	333	415	410
15	240mm²	490	660	0.25	381	480	0.21	400	495	490

Note:Changes in ambient temperature and changes in the wire and cable laying methods will affect the carrying capacity of the wire and cable,The table above only for reference.

2. Modified Coefficient Table of Ambient Condition Power

The conditions of generator rated output:

Altitude: ≤1000 m Ambient temperature: 5～25℃ Relative humidity: 30%

Ambient modified coefficient: C (Relative humidity 30%)

Altitude (m)	Ambient temperature（℃）				
	25	30	35	40	45
1000	1	0.97	0.94	0.91	0.87
2000	0.87	0.84	0.81	0.78	0.74
3000	0.73	0.70	0.67	0.64	0.60
4000	0.60	0.57	0.54	0.51	0.47

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=5KW, altitude is 1000m, ambient temperature is 35℃, relative humidity is 80%, the rated power of generator is:

$P=P_N \times (C-0.02) = 5 \times (1.0-0.02) = 4.9kW$

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KDK12SCA3

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