DC4xD MK3
GENSET CONTROLLER
USER MANUAL

DC40D MK3

DC42D MK3

Software Version

No.	Version	Date	Note
1	V1.0	2020-07-09	Original release.
2	V1.7	2019-4-2	1.Optimization of over current inverse time function. 2.Add over current fault delay function. 3.Add 6 kinds of oil pressure sensor curve. 4.Add high speed control function.
3	V1.9	2019-8-22	1.Increase RS485 communication baud rate setting. 2.Add CRC setting of RS485 communication.
4	V2.0	2020-8-1	1.Add "fuel output delay" setting function. 2.Configurable relay output increases "rated operation output". 3.Add "manual gear automatic closing" setting option.
5	V2.1	2021-2-1	1.Name of unified input and output port. 2. Add the language function of "Turkish"; 3. Increase the setting of "load pulse width" and "unload pulse width"; 4. The relay function adds "unload control"; 5. The temperature sensor curve is "465"; 6.Add "YD-001 (10-180)" to the oil level sensor curve;

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Symbol Description

Symbol	Description
 Note	Remind operators to operate correctly, otherwise it may cause the equipment not to work correctly.
 Be care	It is indicated that potential hazards can damage equipment without proper precautions.
 Warning	It is indicated if appropriate preventive measures are not taken, potentially dangerous situations may result in death, serious personal injury or significant property losses.


Warning

1.The installation of this equipment must be carried out by professionals.
2.When installing and operating the controller, please read the entire instruction manual first.
3.Any maintenance and commissioning of the equipment must be familiar with all the equipment.
4.t, safety standards and precautions in advance, otherwise it may cause personal injury or damage to related equipment.
5.The engine must have an overspeed protection device independent of the controller system to avoid casualties or other damage caused by engine out of control.
6.After the installation of the controller is completed, please verify that all protection functions are valid.


Be Care

1.Please keep the good connection of the power supply of the controller. Do not share the connection lines of the positive and negative electrodes of the battery with the floating charger.
2.During the operation of the engine, do not disconnect the battery, otherwise it may cause damage to the controller.

Catalogue

1.Summary

This series controller is specialized for Diesel / Gasoline / Gas Genset Start, Stop, Parameters monitoring, faults-checking as well as data setting.

3.0 inch LCD screen display with brand new UI design is adapted in this controller that the relative failures can be displayed directly. All the parameters can be displayed by simulated indicators and words. Besides, LCD screen can display various faults in the same time that the genset will be stopped once it can't work smoothly.

There are Chinese/English interface options, more language can be set according to user's request. All the parameters can be configured through the front face buttons or use programmable interface by RS485 or USB to adjust via PC. It can be widely applied for all kinds of auto control system of gensets.

2.Main Features

There are four Models under DC4xD MK3 series.

DC40D MK3: used for single machine automation. Start/Stop through remote start signal.

DC42D MK3: Based on DC40D MK3, it adds Mains monitoring and AMF (Mains/Generator automatic switching control), especially suitable for the automation system composed by mains and genset.

DC40DR MK3: Based on DC40D MK3, it adds RS485 port.

DC42DR MK3: Based on DC42D MK3, it adds RS485 port.

DC42DR- MK3: Based on DC42DR MK3, it adds ABF backup battery pack detection and generator set control functions.

◆Dual core 32bit high performance single chip microcomputer.
◆3.5 inch 128 * 64 high-resolution LCD screen, Available in 5 languages, user's language set if necessary.
◆Indicator and number display through UI surface.
◆Various of crank conditions (RPM, Frequency, Oil Pressure) can be chosen.
◆Various kinds of parameters display.
◆Adapt to 3P4W,1P2W,2P3W(120V/240V,50/60HZ)
◆Sensor can be self-defined by front face button or PC software.
◆With RS485 communication port, can achieve "Three Remote" functions via MODBUS protocol.
◆USB Port: parameters can be set even without power through USD port to monitor in real time.
◆Input/output function, status can be shown directly.
◆More categories of surface setting.
◆Real time clock inside: preset time operate and auto maintenance is available. Genset working plan can be set as per week or month.
◆Maintenance countdown function, can set maintenance time or date.
◆The black box function can save the relevant parameters of the unit when the fault alarm occurs in real time, and it is convenient to find the cause of the fault.

◆Totally 6 relay's output, among which 4 relay output can be self-configurable, each relay can be set as max 20 functions, besides, there are 2 groups as non-contact terminals.
◆With 5 switches input, up to 40 functions optional;
◆3 sensor simulation input connectors,and various display units can be configured.
◆Standard water-proof rubber gasket. The waterproof can reach IP54.
◆Module design: All the connections are adapted with European connectors so that installation, connection, repair and replacement can be more easily.
◆Control Protection: Auto Start/Stop of genset, load transfer (ATS control) and perfect failure display and protection.

3.Parameters Display

- Engine RPM
- Engine oil pressure
- Engine water temperature
- Engine fuel temperature
- Engine cylinder temperature
- Engine Tank temperature
- Engine fuel level
- Engine battery voltage
- Charging voltage
- UPS voltage(only for DC42DR-ABF MK3)
- Mains phase voltage L-N (only for DC42D MK3)
- Mains phase voltage L-L (only for DC42D MK3)
- Generator 3 Phase voltage L-N
- Generator 3 Phase voltage L-L
- Generator 3 phase current A
- Generator Frequency Hz
- Generator Power Factor COS φ
- Generator active power KW
- Generator apparent power KVA
- Generator reactive power KVar
- Current consumption KWH
- Total consumption KWH
- Total Crank times
- Current running time
- Total running time
- Maintenance notice
- Input status display
- Output status display
- Current date and time;

4.Protection

- Over speed

- Under speed
- Low oil pressure
- High water temperature
- High Oil temperature
- High Cylinder Temperature
- High Tank temperature
- Low fuel level
- Low oil level
- External instant unloading shutdown
- External emergency alarm
- RPM Lost
- Sensor Open
- Over Frequency
- Under Frequency
- Over voltage
- Under voltage
- Over current
- Non-balance of current
- Over power
- Maintenance expire
- Low water level alarm
- Emergency Stop
- Crank failure
- Battery over voltage
- Battery under voltage
- The charger fails to charge
- Charger charging failure
- Stop Failure

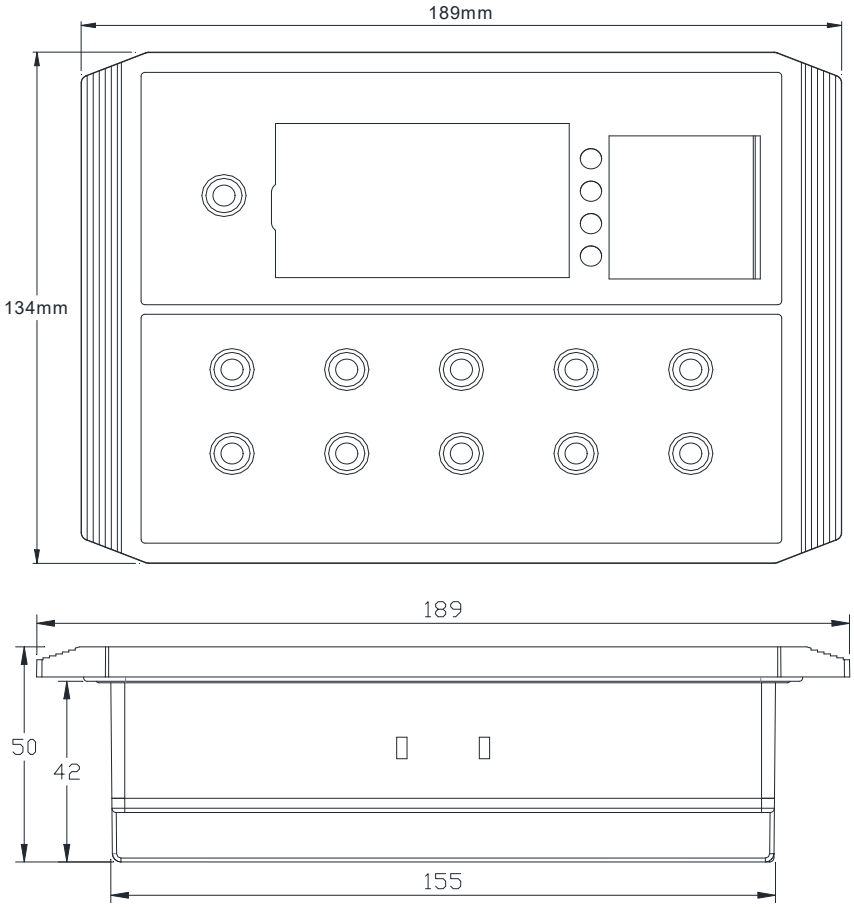
5.Parameters

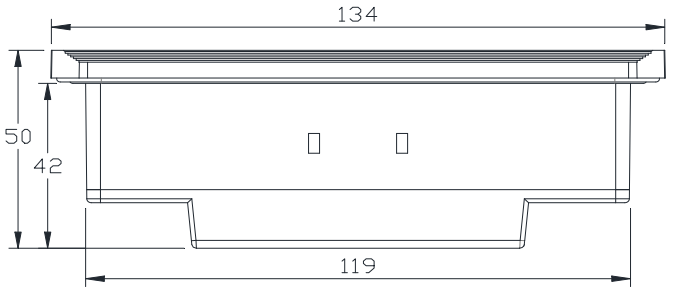
Options	Parameters
Working voltage	DC8V---36V Continuous
Power consumption	Standby：24V：MAX 1W
	Working：24V：MAX 5W
AC Voltage Input	1P2W 30VAC-300VAC (ph-N)
	2P3W 30VAC-300VAC (ph-N)
	3P4W 30VAC-300VAC (ph-N)
Rotate speed sensor Frequency	50-9000Hz
MAX Accumulating Time	99999.9Hours（Min Store time:6min）
Fuel Relay Output	Max 5Amp DC+VE Supply voltage
Start Relay Output	Max 5Amp DC+VE Supply voltage
AUX. OUTPUT1	Max 5Amp DC+VE Supply voltage
AUX. OUTPUT2	5AMP Non-contact normal open&normal close output
AUX. OUTPUT3	5AMP Non-contact normal open output

AUX. OUTPUT4	5AMP Non-contact normal open output
Excitation output	Max 1AMP DC+VE supply voltage
Switch value input	Available if connecting with Battery -
Working condition	-25-65℃
Storage condition	-40-85℃
Protection Level	IP54：when waterproof rubber gasket is added between controller and its panel
Insulation strength	Apply AC2.2kV voltage between high voltage terminal and low voltage terminal; The leakage current is not more than 3mA within 1min.
Overall dimension	210mm*160mm*50mm
Panel cutout	186mm*142mm
Weight	0.9Kg

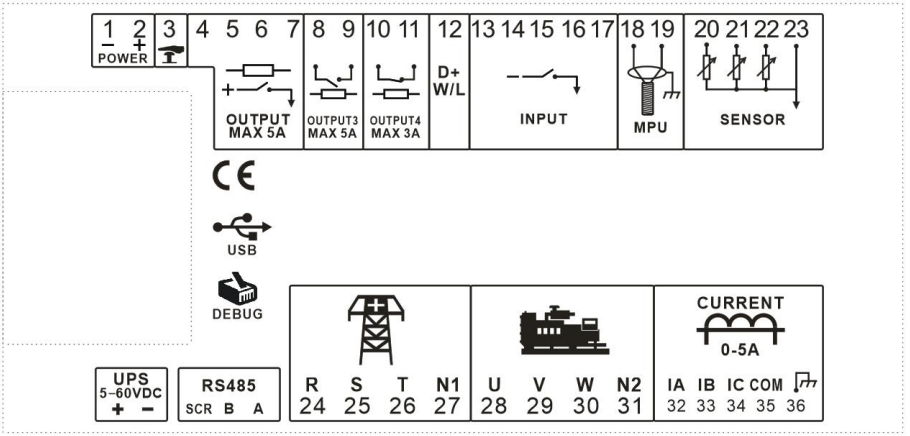
6.Overall Dimension and Wiring Diagram

◆Overall Dimension:





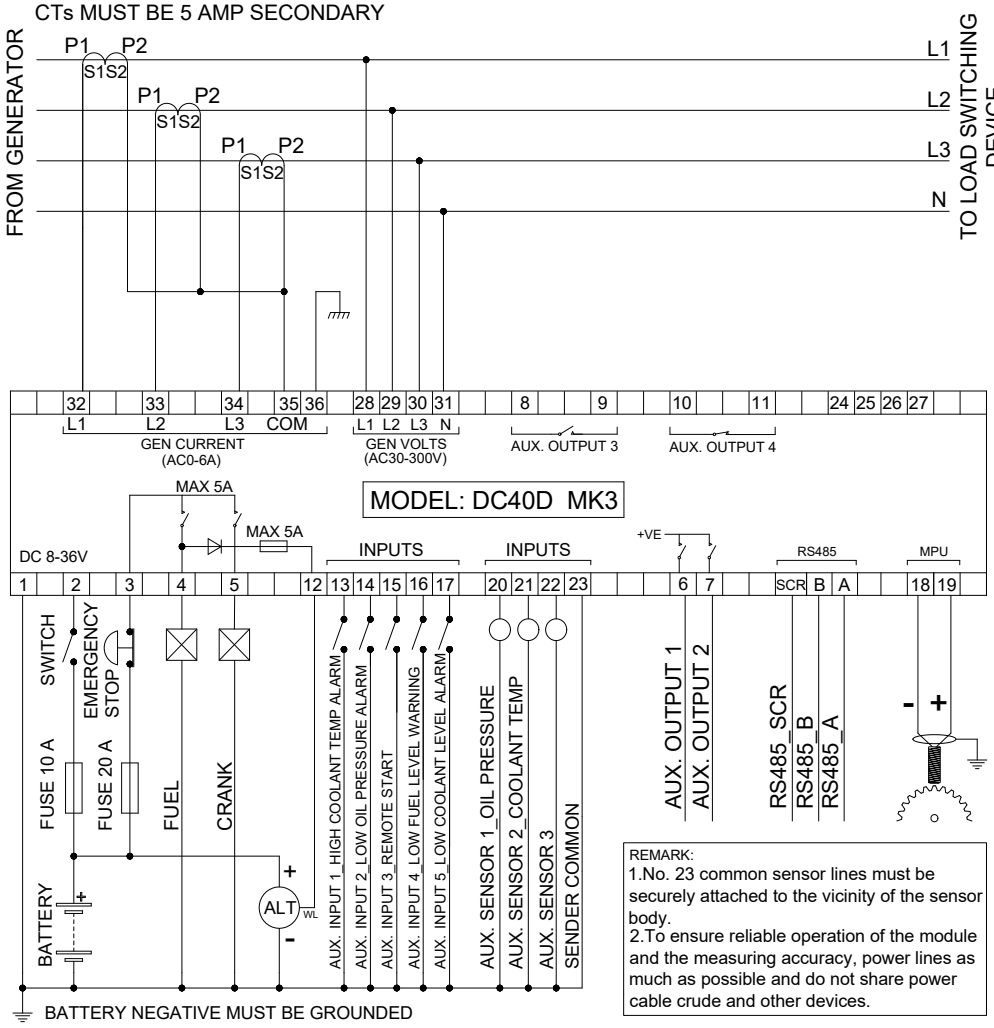
◆**Descriptions of terminal connection**



No.	Function	Description	Cable cross sectional area
1	Battery Negative Input B-	Controller power supply input B-.	2.5mm^2
2	Battery Negative Input B+	Controller power supply input B+.	2.5mm^2
3	Emergency Stop Input	B+ voltage input is active, and connected to emergency stop normal closed button.	2.5mm^2
4	Fuel Output	+VE output, Max 16Amp	1.5mm^2
5	Crank Output	+VE output, Max 16Amp.	1.5mm^2
6	AUX. OUTPUT1	+VE output, Max 5Amp.	1.5mm^2
7	AUX. OUTPUT2	+VE output, Max 5Amp.	1.5mm^2
8	AUX. OUTPUT3 Normal open	Passive Output, Max 5Amp	1.5mm^2
9	AUX. OUTPUT3 Normal open		1.5mm^2
10	AUX. OUTPUT4 Normal open	Passive Output, Max 5Amp	1.5mm^2

11	AUX. OUTPUT4 Normal open		1.5mm²
12	Charging excitation output	+VE output, Max 0.9Amp.	1.0mm²
13	Aux. Input 1	The grounding is valid according to the function selection switch input.	1.0mm²
14	Aux. Input 2		1.0mm²
15	Aux. Input 3		1.0mm²
16	Aux. Input 4		1.0mm²
17	Aux. Input 5		1.0mm²
18	Speed sensor -	Use a shielded wire to connect the speed sensor.	1.0mm²
19	Speed sensor +		1.0mm²
20	Temperature Sensor	Connect sensor input.	1.0mm²
21	Oil pressure sensor		1.0mm²
22	Fuel level sensor		1.0mm²
23	Sensor common GND	Connect the battery negative or outer.	1.0mm²
24	Mains Voltage L1	Connected to the mains L1 phase.	1.0mm²
25	Mains Voltage L2	Connected to the mains L2 phase.	1.0mm²
26	Mains Voltage L3	Connected to the mains L3 phase.	1.0mm²
27	Mains Voltage N	Connected to the mains N phase.	1.0mm²
28	Generator Voltage L1	Connected to the generator L1 phase.	1.0mm²
29	Generator Voltage L2	Connected to the generator L2 phase.	1.0mm²
30	Generator Voltage L3	Connected to the generator L3 phase.	1.0mm²
31	Generator Voltage N	Connected to the generator N phase.	1.0mm²
32	Load CT Secondary L1	Current Transformer Secondary Rated 5A.	1.5mm²
33	Load CT Secondary L2		1.5mm²
34	Load CT Secondary L3		1.5mm²
35	Load CT Secondary ICOM	Connect to the common.	1.5mm²
36	GND	Connect to the common ground wire.	1.5mm²
SCR	RS485 B	A 120 Ω shielded wire and good grounding are recommended.	1.0mm²
B	RS485 A		1.0mm²
A	RS485 SCR		1.0mm²
+	UPS battery pack positive	Connected to the can communication port of ECU.	1.0mm²
-	UPS battery pack negative		1.0mm²

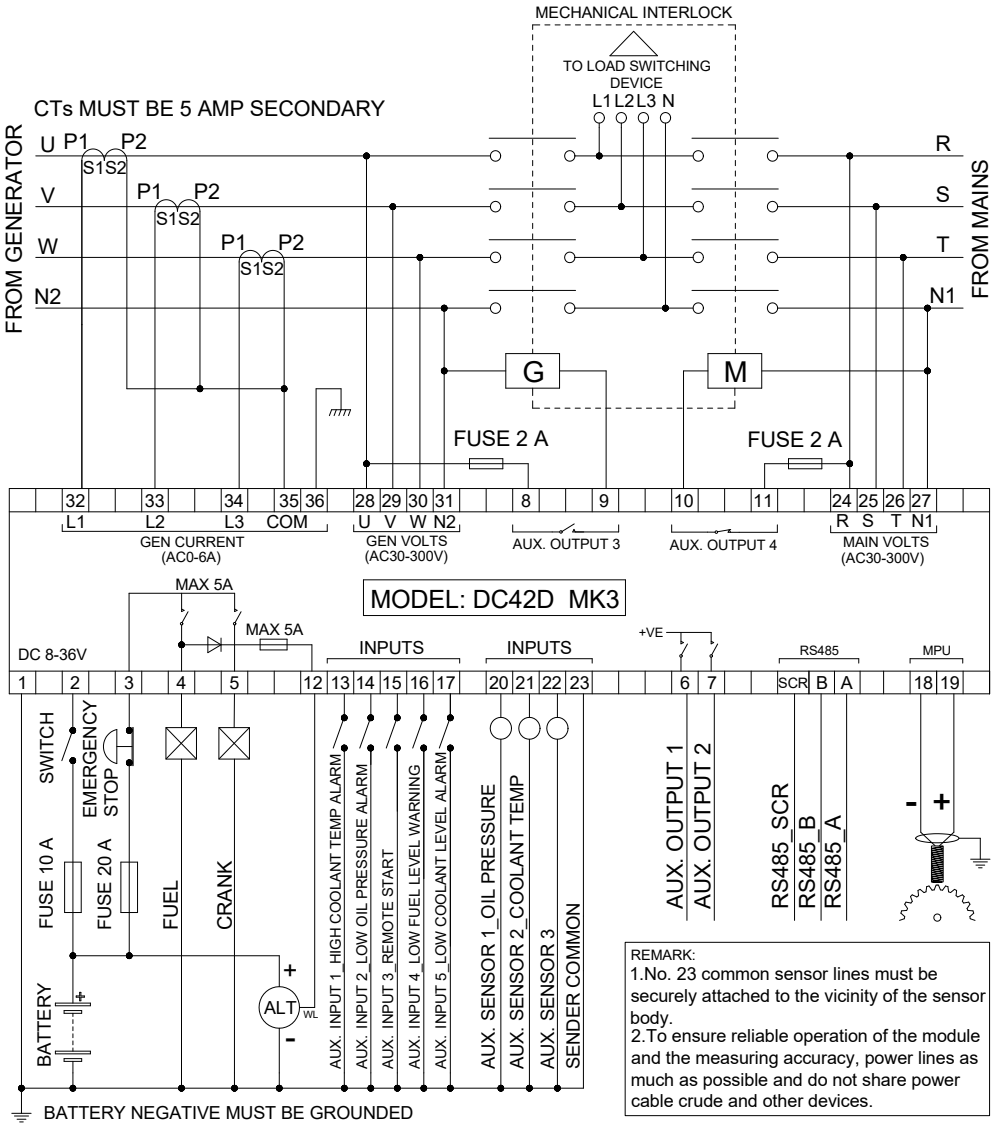
◆DC40D MK3 3-phase 4-wire Typical Wiring Diagram



Note: Please don't move battery during running status or it may cause the controller broken!

WARNING: When generator is on-load, C. T. secondary must not be open circuit, Otherwise, the high voltage generated will pose a danger to personal safety.

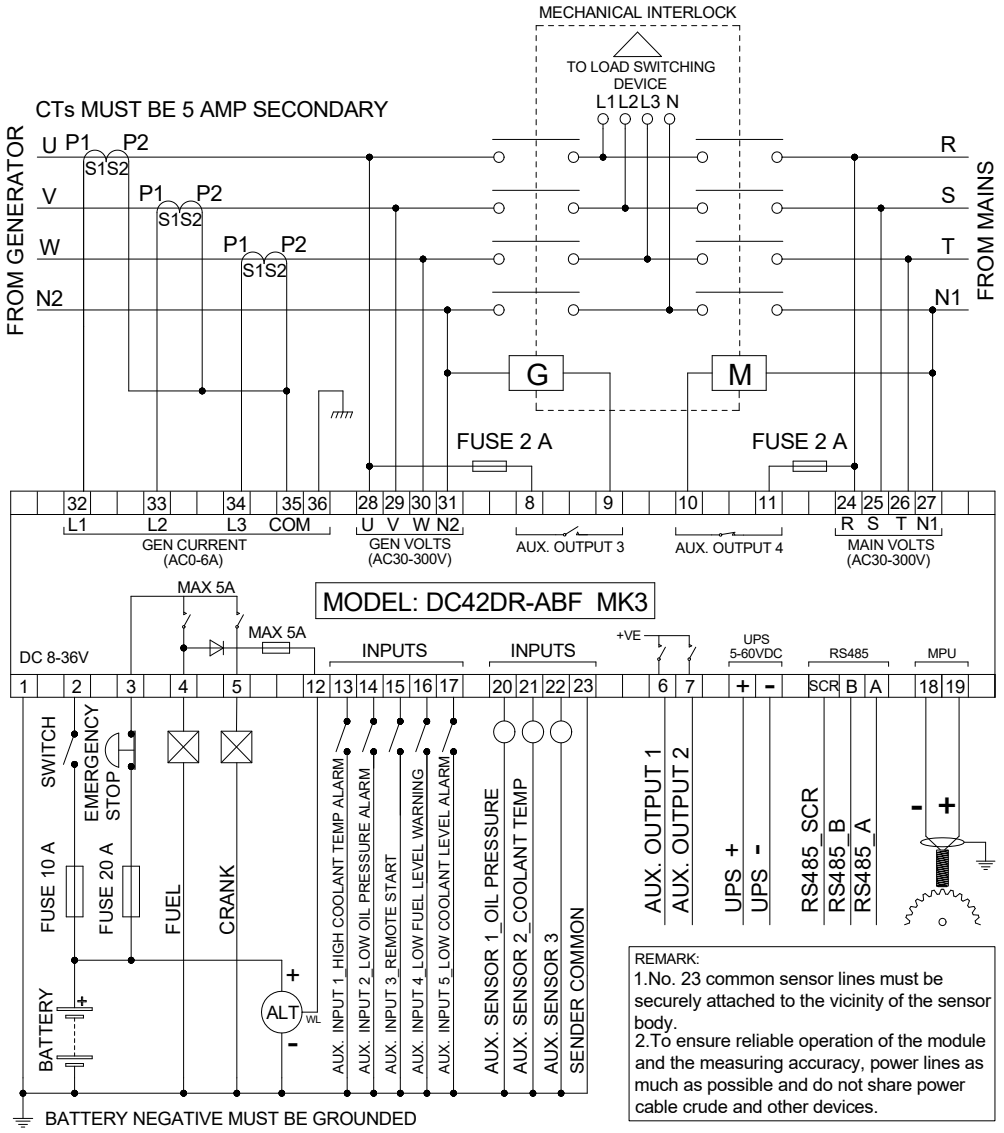
◆DC42D MK3 3-phase 4-wire Typical Wiring Diagram



Note: Please don't move during running status or it may cause the controller broken!

WARNING: When generator is on-load, C. T. secondary must not be open circuit, Otherwise, the high voltage generated will pose a danger to personal safety.

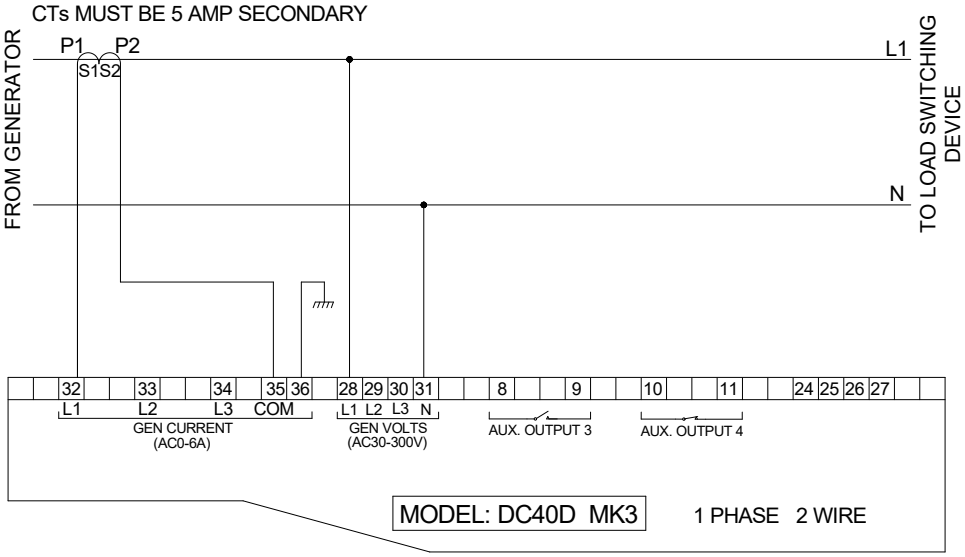
◆DC42DR-ABF MK3 3-phase 4-wire Typical Wiring Diagram



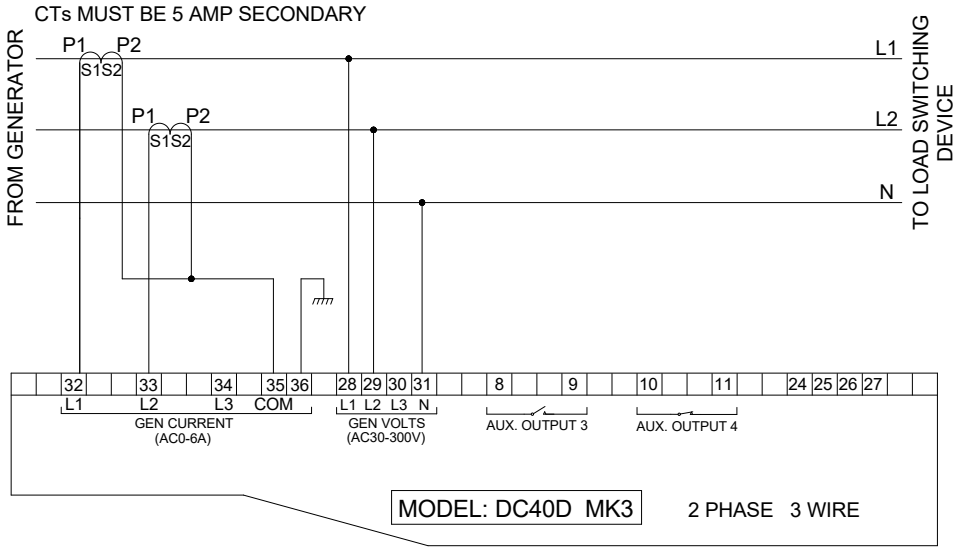
Note: Please don't move during running status or it may cause the controller broken!

WARNING: When generator is on-load, C. T. secondary must not be open circuit, Otherwise, the high voltage generated will pose a danger to personal safety.

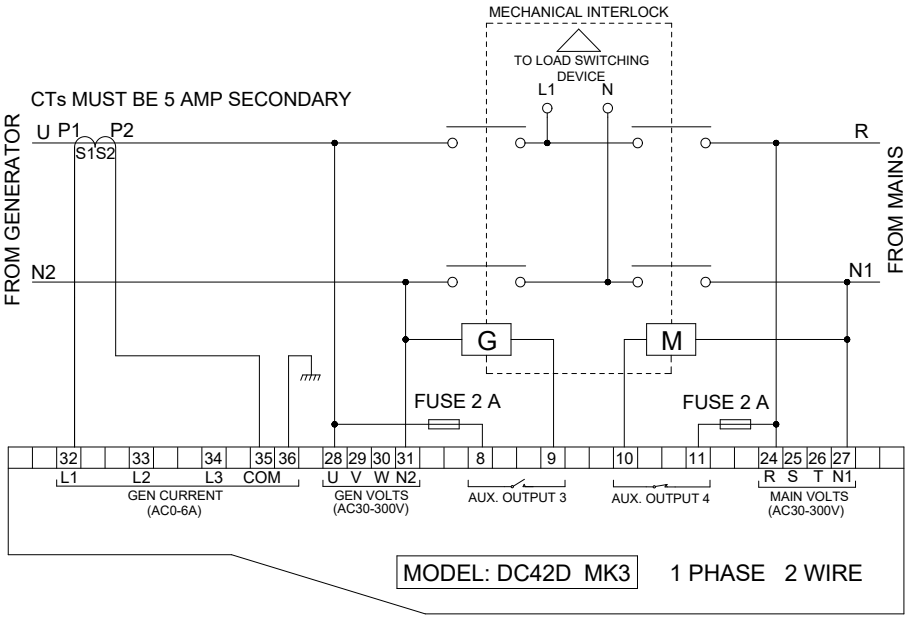
◆DC40D MK3 1-phase 2-wire Typical Wiring Diagram



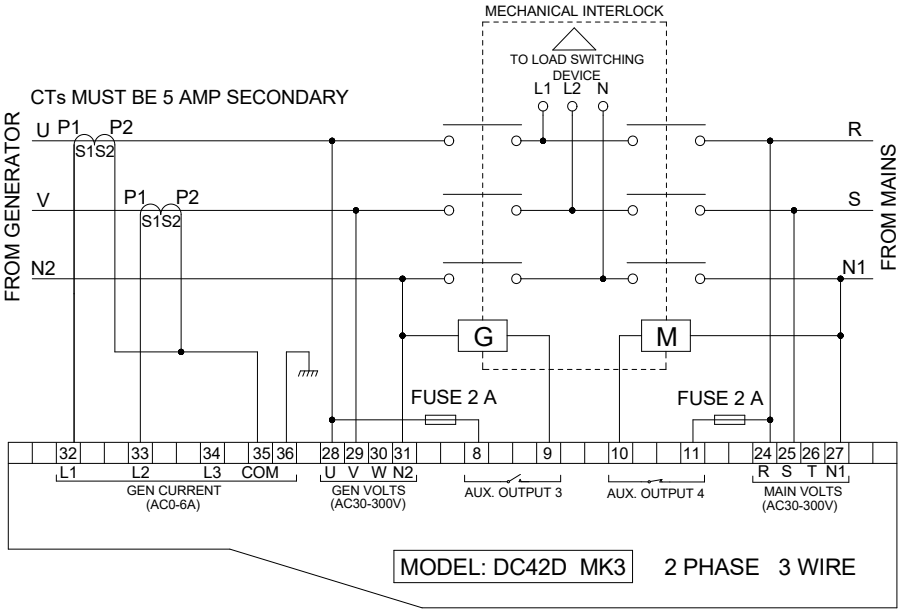
◆DC40D MK3 2-phase 3-wire Typical Wiring Diagram



◆DC42D MK3 1-phase 2-wire Typical Wiring Diagram



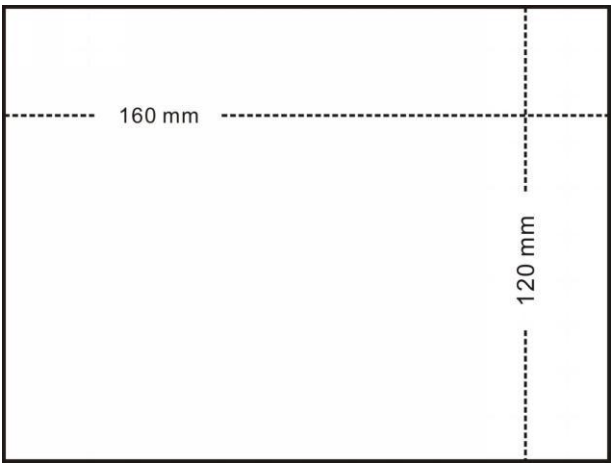
◆DC42D MK3 2-phase 3-wire Typical Wiring Diagram



7.Installation instruction

◆The controller is fixed by four special fixing members and screws, and the screws of the metal fasteners cannot be too tight.

◆Panel Cutout: W160mm*H120mm.



Note: If the controller is installed directly in the genset shell or other fluctuated equipment, the rubber pad must be installed.

◆Battery Voltage Input

DC4xD MK3 controller is suitable for 8-36V DC battery voltage. Battery negative must be reliably connected to the enclosure of the engine. The controller power supply B+ and B- must be connected to battery positive and negative, and the wire size must not be less than 2.5mm^2.

NOTE:

In case of floating charger connect charger output to battery positive and negative directly, then, connect battery positive and negative poles to controller positive and negative power supply.

◆Output and relay expansion

Note: All outputs of the controller are relay contacts. The maximum current capacity is described in the "Parameters" in this manual. Please use it in the relay current capacity. If an extended relay is needed, add a continuous current diode (when the extended relay coil is DC) or a resistance-capacitance loop (when the extended relay coil is AC) to both ends of the coil to prevent interference with the controller or other equipment.

◆AC current input

Current transformer with rated secondary current 5A must be externally connected to the controller current input.

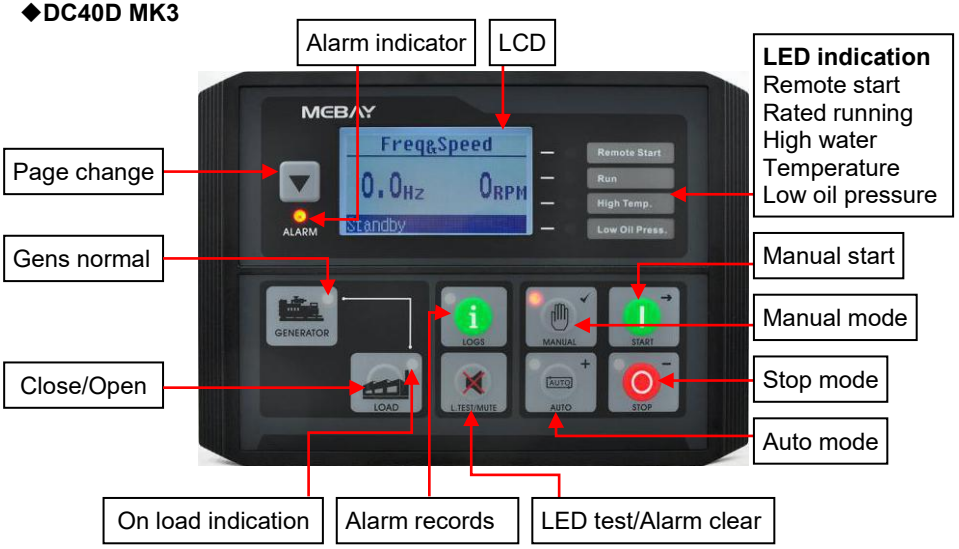
WARNING: When generator is on-load, C. T. secondary must not be open circuit, Otherwise, the high voltage generated will pose a danger to personal safety.

◆Withstanding voltage test

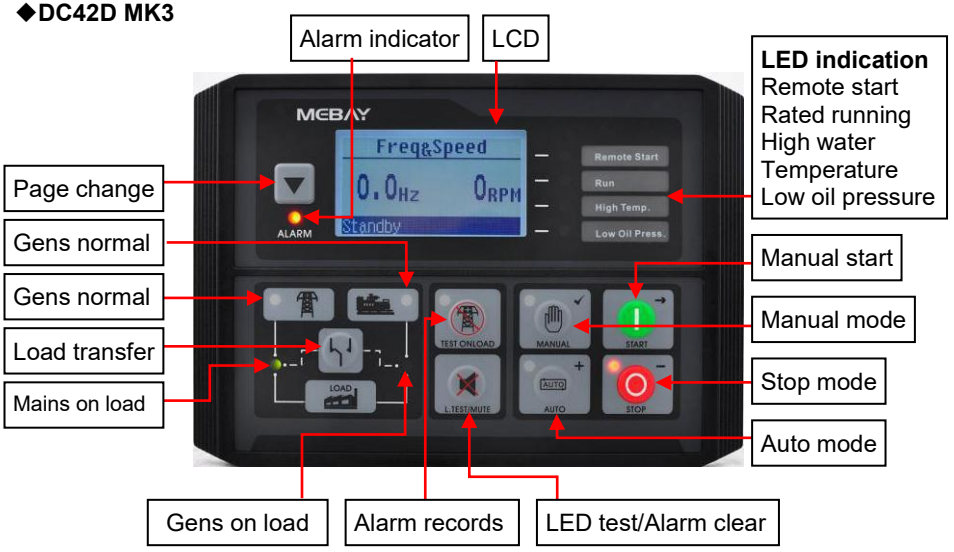
If withstanding voltage test is conducted after the controller has already been installed onto the control panel, please unplug all controller terminal connections in order to prevent high voltage from damaging it.

8.Panel and display

◆DC40D MK3

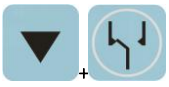


◆DC42D MK3



◆**Key Function Description**

KEYS	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.

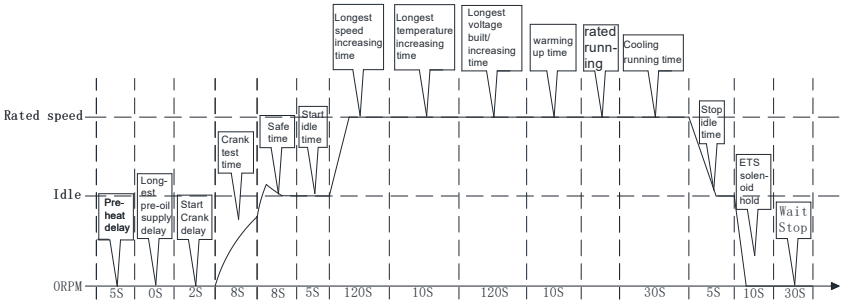
4）In the history records page and checking page, for DC40D MK3: press  to exit; for DC42D MK3, press  and  simultaneously to exit.

9.Control and operation instruction

◆Manual test mode: (only DC42D MK3 has this function)

Press  and make sure it is in the stop position before starting.

Press “  ” and the test file indicator is on. At this time, it is detected whether the connection of each sensor is normal. If the sensor is open, the sensor opens an alarm. If it is normal, the unit start process is executed in the following sequence after pressing the "  ". automatically switch to Generator provide the power when the unit is running normally. Press “  ” The controller performs the parking process at the following timing:



◆Manual Start Mode

press  and make sure it is in the stop position before starting.

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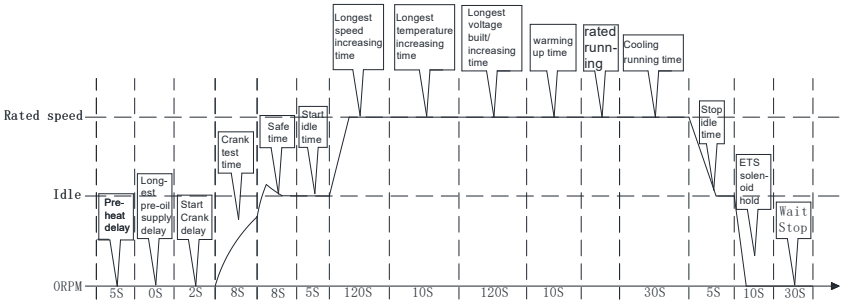
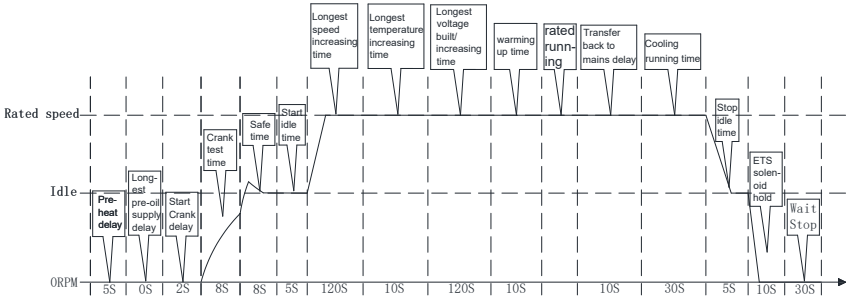
Manual start and stop process:



After the manual start is successful, pressing the "automatic key"  can be converted into an automatic file. The specific working time is as follows:



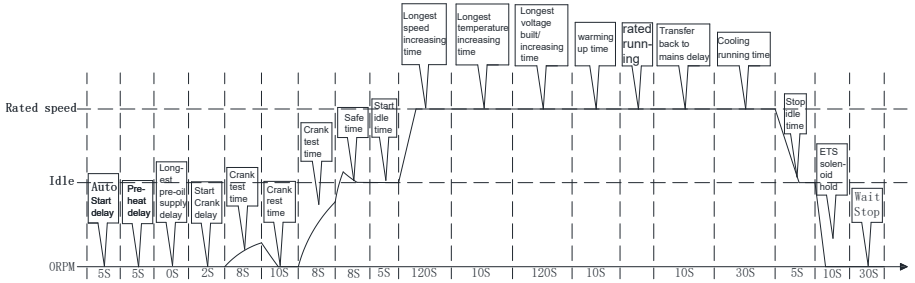
Automatic starting mode:

press  and make sure it is in the stop position before starting.

Press “  ” and the test file indicator is on. At this time, it is detected whether the connection of each sensor is normal. If the sensor is open, the sensor opens an alarm. If it is normal, wait for the remote start signal to be valid (DC42D MK3 detected the remote starting signal is valid or the mains provide the power is invalid). The unit will perform the starting process in the following sequence. When the unit enters the normal rated operation, it will automatically switch to the generator provide the power. The controller will detect the remote start signal and the mains status in real time (DC42D MK3 is available). When the remote start signal fails and the mains

provide the power returns to normal, the shutdown process after the "loop time delay" is performed (DC42D MK3 is available).

Auto start and stop process:



Notices in Starting Process

Note 1: During the Cranking time, the controller automatically detects the speed signal, frequency signal and oil pressure value or the charging voltage (according to the parameter setting) to reach the judgment condition of successful start, then the judgment is that the start is successful and the motor relay is closed.

Note 2: Within the safety delay, only respond to emergency stop, immediate stop, over speed, over frequency, Over voltage, ECU communication Failure,shutter open abnormal, other alarms are not responded to.

Note 3: No response to alarm and warning of under speed, low frequency, under voltage, over current, over power,non-balance of current,external instant unloading shutdown,during start idle time.

Note 4: No response to low frequency, under voltage, over current non-balance of current,external instant unloading shutdown and over power is required when entering the RPM-up time.

Note 5: No response to low frequency, under voltage, over current non-balance of current,external instant unloading shutdown and over power is required when entering the temperature-up time.

Note 6: No response to low frequency, under voltage, over current non-balance of current,external instant unloading shutdown and over power is required when entering the Voltage-up time.

Note 7: No response to low frequency, under voltage, over current non-balance of current,external instant unloading shutdown and over power is required when entering the Warming-up time.

Note 8: After entering rated operation, the Gens load relay output.

Note 9: In the process of shutdown, if the remote starting signal is restored to be valid within the " Cooling time", the rated operation will be entered again.

Note 10: If the stop key is pressed again during idle time, the idle time will be canceled and the stop operation will be executed directly.

10.Warnings and Shutdown Alarms

◆Warnings

Notes: Warning is a non-serious failure state, which will not harm the gensets system for the time being. It only reminds operators to pay attention to the situation that does not meet the requirements and solve it in time to ensure the continuous operation of the system. When the warning occurs, the gensets does not stop. Once the fault is removed, the warning is automatically canceled.

Low fuel level sensor warning

When the controller detects that the fuel level value is lower than the "**Low fuel level warning"**, Then start warning delay and the duration (Normal alarm delay) have not returned to normal, the warning of Low fuel level warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**Low fuel level-A**" on the current fault screen.

Low fuel level switch warning

When the controller detects that the AUX. INPUT "**Low fuel level warning input"** switch is active, it starts warning delay and lasts for Normal alarm delay. When the **"Low fuel level warning input"** switch is enabled, the engine low fuel level switch warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**Low fuel level-D**" on the current fault screen.

External instant warning

When the controller detects that the AUX. INPUT "**External instant warning input"** switch is active, it starts warning delay and lasts for Normal alarm delay. When the **"External instant warning input"** switch is enabled, the warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**Instant warn**" on the current fault screen.

Oil pressure sensor disconnected warning

When the controller parameter "**Action if low oil pressure sensor disconnected**" is set to "**warning**", When the oil pressure sensor is detected to be disconnected,Then start warning delay and the duration (Normal alarm delay) have not returned to normal, the warning of Oil pressure sensor disconnected warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**OP sensor open**" on the current fault screen.

Coolant temperature sensor disconnected warning

When the controller parameter "**Action if water temperature sensor disconnected**" is set to "**warning**", When the coolant temperature sensor is detected to be disconnected,Then start warning delay and the duration (Normal alarm delay) have not returned to normal, the warning of coolant temperature sensor disconnected warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**WT sensor open**" on the current fault screen.

Oil temperature sensor disconnected warning
When the controller parameter "**Action if oil temperature sensor disconnected** " is set to "**warning**", When the oil temperature sensor is detected to be disconnected,Then start warning delay and the duration (Normal alarm delay) have not returned to normal, the warning of oil temperature sensor disconnected warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**OT sensor open**" on the current fault screen.

Cylinder temperature sensor disconnected warning
When the controller parameter "**Action if cylinder temperature sensor disconnected** " is set to "**warning**", When the cylinder temperature sensor is detected to be disconnected,Then start warning delay and the duration (Normal alarm delay) have not returned to normal, the warning of cylinder temperature sensor disconnected warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**CT sensor open**" on the current fault screen.

Fuel Level sensor disconnected warning
When the controller parameter "**Action if fuel Level sensor disconnected** " is set to "**warning**", When the fuel Level sensor is detected to be disconnected,Then start warning delay and the duration (Normal alarm delay) have not returned to normal, the warning of fuel Level sensor disconnected warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**FL sensor open**" on the current fault screen.

Maintenance expiration warning
When the controller parameter "**Maintenance expire**" is set to "**warning**", when the primary countdown to maintenance is detected as "0" or primary maintenance date less than current date, then start warning delay and the duration (normal alarm delay), the warning of maintenance expiration is reported. "**WARNING**" lights on, without stopping the engine, and displays "**Maintain end**" on the LCD screen.

Over battery voltage warning
When the controller detects that the battery voltage is higher than the "**Over battery voltage warning "**, Then start warning delay and the duration (Normal alarm delay) have not returned to normal, the warning of Over battery voltage warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**Over voltage**" on the current fault screen.

Under battery voltage warning
When the controller detects that the battery voltage is lower than the "**Under battery voltage warning"**, Then start warning delay and the duration (Normal alarm delay) have not returned to normal, the warning of Under battery voltage warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**Under BATT volt**" on the current fault screen.

◆Starting fault
Oil pressure sensor disconnected alarm
When the controller parameter "**Action if low oil pressure sensor disconnected**" is

set to "**alarm**", When the oil pressure sensor is detected to be disconnected,Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of Oil pressure sensor disconnected alarm is reported. "**ALARM**" lights will light up, Generator stops running, displays "**OP sensor open**" on the current fault screen.

Coolant temperature sensor disconnected alarm
When the controller parameter "**Action if water temperature sensor disconnected**" is set to "**alarm**", When the coolant temperature sensor is detected to be disconnected,Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of coolant temperature sensor disconnected alarm is reported. "**ALARM**" lights will light up, Generator stops running, displays "**WT sensor open**" on the current fault screen.

Oil temperature sensor disconnected alarm
When the controller parameter "**Action if oil temperature sensor disconnected** " is set to "**alarm**", When the oil temperature sensor is detected to be disconnected,Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of oil temperature sensor disconnected alarm is reported. "**ALARM**" lights will light up, Generator stops running, displays "**OT sensor open**" on the current fault screen.

Cylinder temperature sensor disconnected alarm
When the controller parameter "**Action if cylinder temperature sensor disconnected** " is set to "**alarm**", When the cylinder temperature sensor is detected to be disconnected,Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of cylinder temperature sensor disconnected alarm is reported. "**ALARM**" lights will light up, Generator stops running, displays "**CT sensor open**" on the current fault screen.

Fuel Level sensor disconnected alarm
When the controller parameter "**Action if fuel Level sensor disconnected** " is set to "**alarm**", When the fuel Level sensor is detected to be disconnected,Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of fuel Level sensor disconnected alarm is reported. "**ALARM**" lights will light up, Generator stops running, displays "**FL sensor open**" on the current fault screen.

Fail to Start
If the number of cranks exceeds the predetermined number of cranks, the failure of start-up will be reported if the start-up of the generating unit is still unsuccessful. "**ALARM**" lights on, without stopping the engine, and displays " **Crank failure** " on the current fault screen.

◆Shutdown Alarms

 Warning: After the Shutdown Alarm occurs, the system will be locked immediately and the generator set will be stopped. Only after troubleshooting, press 

key to clear the alarm, can it be re-operated.

Notes：When the shutdown alarm failure occurs, the "**ALARM**" lights will light up and the generator unit automatically stops.

Over Speed Alarm

When the controller detects that the engine speed is higher than "**Over speed alarm**", Then start alarm delay and the duration (Emergency delay) have not lower than"**Over speed revert**", the alarm of over speed is reported. "**ALARM**" lights will light up, Generator stops running, and displays " **Over speed** " on the current fault screen.

Under Speed Alarm

When the controller detects that the engine speed is under than "**Under speed alarm**", Then start alarm delay and the duration (Normal alarm delay) have not higher than"**Under speed revert**", the alarm of under speed is reported. "**ALARM**" lights will light up, Generator stops running, and displays " **Under speed** " on the current fault screen.

Low Oil Pressure Sensor Alarm

When the controller detects that the engine Oil Pressure is lower than "**Low oil pressure alarm**", Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of low Oil Pressure is reported. "**ALARM**" lights will light up, Generator stops running, and displays "**Low OP sensor**" on the current fault screen.

Low oil pressure switch alarm

When the controller detects that the AUX. INPUT port "**Low oil pressure alarm input"** switch is active. Start low oil pressure switch alarm delay, for a period of time "Normal alarm delay" AUX. INPUT port "**low oil pressure alarm input**" switch is valid. Then the alarm, the public alarm light "**ALARM**" lights will light up, stop the unit operation, and display **"Low OP switch"** on the current fault screen.

High coolant temperature sensor alarm

When the controller detects that the coolant temperature value is higher than the "**High coolant temperature alarm"**, Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of High coolant temperature alarm is reported. "**ALARM**" lights will light up, Generator stops running,and displays "**High WT sensor**" on the current fault screen.

High coolant temperature switch alarm

When the controller detects that the AUX. INPUT port "**High coolant temperature alarm switch"** switch is active. Start low oil pressure switch alarm delay, for a period of time "Normal alarm delay" AUX. INPUT port "**High coolant temperature alarm switch**" is valid. Then the alarm, the public alarm light "**ALARM**" lights will light up, stop the unit operation, and display **"High WT switch"** on the current fault screen.

High oil temperature sensor alarm

When the controller detects that the oil temperature value is higher than the "**High oil**

temperature alarm", Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of High oil temperature alarm is reported. "**ALARM**" lights will light up, Generator stops running, and displays "**High OT sensor**" on the current fault screen.

High oil temperature switch alarm

When the controller detects that the AUX. INPUT port "**High oil temperature alarm switch"** switch is active. Start low oil pressure switch alarm delay, for a period of time "Normal alarm delay" AUX. INPUT port "**High oil temperature alarm switch**" is valid. Then the alarm, the public alarm light "**ALARM**" lights will light up, stop the unit operation, and display **"High OT switch"** on the current fault screen.

High cylinder temperature sensor alarm

When the controller detects that the cylinder temperature value is higher than the "**High cylinder temperature alarm"**, Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of High cylinder temperature alarm is reported. "**ALARM**" lights will light up, Generator stops running, and displays "**High CT sensor**" on the current fault screen.

High cylinder temperature switch alarm

When the controller detects that the AUX. INPUT port "**High cylinder temperature alarm switch"** switch is active. Start low oil pressure switch alarm delay, for a period of time "Normal alarm delay" AUX. INPUT port "**High cylinder temperature alarm switch**" is valid. Then the alarm, the public alarm light "**ALARM**" lights will light up, stop the unit operation, and display **"High CT switch"** on the current fault screen.

Low fuel level sensor alarm

When the controller detects that the fuel level value is lower than the "**Low fuel level alarm"**, Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of Low fuel level alarm is reported. "**ALARM**" lights will light up, Generator stops running,and displays "**Low fuel level-A**" on the current fault screen.

Low fuel level switch alarm

When the controller detects that the AUX. INPUT **"Low fuel level alarm input"** switch is active, it starts alarm delay and lasts for Normal alarm delay. When the **"Low fuel level alarm input"** switch is enabled, the engine low fuel level switch alarm is reported. "**ALARM**" lights will light up, Generator stops running,and displays "**Low fuel level-D**" on the current fault screen.

Low oil level switch alarm

When the controller detects that the AUX. INPUT "**Low oil level alarm input"** switch is active, it starts alarm delay and lasts for Normal alarm delay. When the **"Low oil level alarm input"** switch is enabled, the engine low oil level switch alarm is reported. "**ALARM**" lights will light up, Generator stops running,and displays "**Low oil level-D**" on the current fault screen.

External instant alarm

When the controller detects that the **“External instant alarm input”** switch of the AUX. INPUT port is valid, the external instant trip is started and the shutdown alarm delay is delayed for a period of time **“Normal alarm delay”** AUX. INPUT port **“External instant alarm input”** switch When it is valid, it will alarm, the public alarm light **"ALARM"** lights will light up,Generator stops running, and display **"Instant parking"** on the current fault screen.

Speed signal lost alarm
When the controller parameter "**Action if RPM lost**" is set to "**alarm**", the detected speed value is 0,Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of speed signal lost warning is reported. "**ALARM**" lights will light up, Generator stops running, displays "**Lose speed**" on the current fault screen.

Over frequency alarm
When the controller detects that the generator frequency is higher than “**Over frequency alarm**”, Then start alarm delay and the duration (Emergency delay) have not returned to normal, the alarm of over frequency is reported. "**ALARM**" lights will light up, Generator stops running, displays " **Over frequency** " on the current fault screen.

Under frequency alarm
When the controller detects that the generator frequency is lower than “**Under frequency alarm**”, Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of under frequency is reported. "**ALARM**" lights will light up, Generator stops running, displays " **Under frequency** " on the current fault screen

Over voltage alarm
When the controller detects that the generator voltage is higher than “**Over voltage alarm**”, Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of over voltage is reported. "**ALARM**" lights will light up, Generator stops running, displays " **Over voltage** " on the current fault screen.

Under voltage alarm
When the controller detects that the generator voltage is lower than “**Under voltage alarm**”, Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of under voltage is reported. "**ALARM**" lights will light up, Generator stops running, displays " **Under voltage** " on the current fault screen.

Over current alarm
When the controller detects that the generator phase current is higher than “**Phase current over-load alarm**”, Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of over current is reported. "**ALARM**" lights will light up, Generator stops running, displays " **Over current** " on the current fault screen.

Non-balance current ratio alarm
When the controller is t2 phase 3 wire or 3 phase 4 wire, the controller detects that the unbalance degree of the three-phase or two-phase current of the generator is higher than the "N**on-balance current ratio alarm**".Then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of Non-balance current ratio is reported. "**ALARM**" lights will light up, Generator stops running, displays " **Unbalance of AMP** " on the current fault screen.

Maintenance Expiration Alarm
When the action after the primary maintenance expired set as “alarm”, When the countdown to maintenance is detected as "0", Then start warning delay and the duration (Normal alarm delay) have not returned to normal, the warning of Maintenance expiration is reported. "**ALARM**" lights on, Generator stops running, and displays "**Maintain end**" on the current fault screen.

Low coolant level switch alarm
When the controller detects that the AUX. INPUT "**Low water level alarm"** switch is active, it starts alarm delay and lasts for Normal alarm delay. When the **"Low water level alarm"** switch is enabled, the engine low coolant level switch alarm is reported. "**ALARM**" lights will light up, Generator stops running, displays "**Low water level**" on the current fault screen.

Louver opening exception alarm
When the controller detects that the AUX. INPUT "**Louver status input"** switch is active, it starts alarm delay and lasts for Normal alarm delay. When the **"Louver status input"** switch is enabled, the Louver status input alarm is reported. "**ALARM**" lights will light up, Generator stops running, displays "**Louver abnormal**" on the current fault screen.

Emergency stop alarm
When the controller detects that the input voltage of PIN 3 is less than 2V, then start alarm delay and the duration (Emergency delay) have not returned to normal, the alarm of Emergency Stop is reported. "**ALARM**" lights will light up, Generator stops running, and displays "**Emergency stop**" on the current fault screen.

Stop failure with speed alarm
When the controller detects that the speed is not "0" after the execution of the shutdown, the alarm of stop failure is reported. "**ALARM**" lights will light up and displays "**Stop fail-RPM**" on the current fault screen.

Stop failure with frequency alarm
When the controller detects that the frequency is not "0" after the execution of the shutdown, the alarm of stop failure is reported. "**ALARM**" lights will light up and displays "**Stop fail-Hz**" on the current fault screen.

Stop failure with pressure alarm
When the controller detects that the Oil **Pressure** is not "0" after the execution of the

shutdown, the alarm of stop failure is reported. "**ALARM**" lights will light up and displays " **Stop fail-OP-A** " on the current fault screen.

Stop failure with D+
When the controller detects that the D+ is not "0" after the execution of the shutdown, the alarm of stop failure is reported. "**ALARM**" lights will light up and displays "**Stop fail-D+**" on the current fault screen.

11.Parameters setting

◆Enter the edition page

◆Please set the parameters according to below steps:

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

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

3）Press AUTO and add number 1, press STOP to reduce number 1, press START to turn the digit into right, press MANUAL 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 AUTO to turn the digit into upper position, press STOP to turn the digit into lower position, press MANUAL to get into parameters setting page.

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

6）Press AUTO to add number 1, press STOP to reduce number 1, press START to turn the digit into right and press MANUAL 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 STOP 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 setting

1)Basic setting

No	Parameter	Range ***(default)***	Notes
0	Language	*English/简体中文/*繁体中文/TURKDILI	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 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.YD custom 12.ECU-Q7 13.User-defined 14.465	Choose the usual water temperature sensor, if the 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	Choose the usual oil temperature sensor, if the sensor users choose is not the 11 types, it can be User-defined.

		5.CURTIS 6.DATCON 7.VOLVO-EC 8.3015238 9.PT100 10.MEBAY-Mier 11.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) 12.YD-001(10-180)	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 Level sensor disconnected	Disable ***Warning*** Alarm and stop	Action if Fuel level sensor disconnected.
20	Pressure /Temperature unit	℃/KPA ***℃/BAR*** ℃/PSI F/KPA F/BAR	Unit display.

		F/PSI	
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).Only for DC42DR-ABF MK3.

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.
20	ATS in manual mode	***Disable***/Enable	When it is set to enabled, when the generator set meets the closing conditions, it will be loaded automatically.

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	0-3600.0s	The longest speed-up time,during which time the

	time	***(120.0s)***	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***(1.5s)***	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.Only for DC42DR-ABF MK3.
24	Over phase current delay	0-3600.0s***(30s)***	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.
25	Fuel output delay	1.0-60.0s***(2.0s)***	The output time of fuel valve relay before crank.
26	Load pulse width	1.0-10.0s***(5.0s)***	when it is 10s, it is regarded as continuous

			output.
27	Unload pulse width	0.0-10.0s***(0.0s)***	when it is 0s, it is regarded as disable unload output.

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	0-200%	Rated battery voltage multiplying by this value is

	voltage warning	***(135%)***	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	10-100%***(100%)***	It is valid for 2P3W or 3P4W.When the non-balance current ratio is higher than the value and comes into

	ratio warning		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	Parameters	Range***(defaults)***	Notes
1	AUX. OUTPUT 1(Functional of PIN 6)	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 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
2	AUX. OUTPUT 2(Functional of PIN 7)	0-30 ***(12.* E.S.T. hold*)***	
3	AUX. OUTPUT 3(Functional of PIN 8,9)	0-30 ***(10.Gens load)***	
4	AUX. OUTPUT 4(Functional of PIN 10,11)	0-30 ***(9.*Idle speed control*)***	

			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.Rated running:** there is output under rated running. **22.Unload control:**Public unload function, mains unload and genset unload will output. **23.-24. Reserved.** **25.Excitation output:**Enter the pressure build-up process output, shut down phase off.
5	AUX. INPUT 1 (Functional of PIN 13)	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	AUX. INPUT 2(Functional of PIN 14)	0-20***(2. Low oil pressure alarm)***	
7	AUX. INPUT 3(Functional of PIN 15)	0-20***(3. High water temperature alarm)***	
8	AUX. INPUT 4(Functional of PIN 16)	0-20***(6. Low water level alarm)***	
9	AUX. INPUT 5(Functional of PIN 17)	0-20***(7. Low fuel level warning)***	
10	AUX. 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	AUX. LED 2	0-15***(12.* Normal running*)***	
12	AUX. LED 3	0-15***(2.* High water temperature alarm*)***	
13	AUX. LED 4	0-15***(1.* Low oil pressure alarm*)***	
14	AUX. SENSOR 1(Functional of PIN 20)	0-6***(1. Oil pressure sensor)***	**0. Disable.** **1. Oil pressure sensor input.** **2. Water temperature sensor input.** **3. Oil temperature sensor input.**
15	AUX. SENSOR	0-6***(2. Water***	

	2(Functional of PIN 21)	***temperature sensor)***	**4. Cylinder temperature sensor input.** **5.Fuel level sensor input.**
16	AUX. SENSOR 3(Functional of PIN 22)	0-6***(0.Disable)***	⚠*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.)*

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
5	Revert over volt	55-330V***(253V)***	

			the voltage become lower than "low voltage revert threshold" during normal failure delay time, then it will not alarm.
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.
2	485 baud rate	0-4800 1-9600 ***2-19200*** 3-38400 4-57600 5-115200	RS485 communication baud rate selection.
3	485 CRC setting	0-CRC L_H ***1-CRC H_L***	Sequence selection of RS485 communication protocol CRC;

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-	Permanent calendar inside, please correct the

		2099/12/31	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	

12.Fault finding

Symptoms	Possible Solutions
Controller no response with power	Check DC voltage. Check DC fuse. Check if the terminal 1 and 2 is with battery voltage.
Genset shutdown	Check the water/cylinder temperature is too high or not. Check the genset AC voltage. Check DC fuse.
Genset Emergency Stop	Check the emergency stop button. Check that the voltage of the controller's 3 feet to the ground should be the battery voltage. Check the controller connection.
Low oil pressure alarm	Check oil pressure sensor and its wiring. Check the oil pressure sensor type and controller settings must be consistent. Check whether the low oil pressure sensor is normal.
High temperature alarm	Check temperature sensor and its wiring. Check the temperature sensor type and controller settings must be consistent. Check whether the temperature sensor is normal.
Shutdown Alarm in running	Check related switch and its connections according to the information on LCD. Check AUX. INPUTs.
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.
Unit operation but ATS does not switch	Check the ATS. Check the cable between the controller and the ATS.
USB communication is abnormal	Check the USB connection. Check whether the USB port of the computer is normal. Check whether the USB driver is installed.
RS485 cannot communicate normally	Check the connection. Check if the communication ID number setting is correct. Check if the A and B lines of RS485 are reversed. Check if the RS485 communication line driver is installed or not.

	Check if the communication port of the PC is damaged. Add a 120 Ω resistor between the AB of the controller RS485.