# DC92x GENSET CONTROLLER
# USER MANUAL

**DC92x**



Software Version

| No. | Version | Date | Note |
|---|---|---|---|
| 1 | V1.0 | 2024-04-07 | Original release. |
| 2 | | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |

Chongqing Mebay Technology Co.,Ltd
Add: No6-2,Building 4, Gangan Rd, Jiangbei District, Chongqing.
Tel:+86-23-6869 3061
Fax:+86-23-6765 8207
Web:http://www.mebay.cn
http://www.cqmb.cn
E_mail:sales@mebay.cn

**Controller models to which this manual applies:**
DC92D MK3
DC92DR MK3
DC92MR

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. 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**

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**Notes:**

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## 1. Summary

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

4.3inch colorful 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 USB\RS485\ETHERNET to adjust via PC. It can be widely applied for all kinds of auto control system of gensets.

## 2. Main Features

There are three Models under DC92x series.

| Model | USB | CAN | BT | MBC | 485-1 | 485-2 | TF | ET | -40°C |
|---|---|---|---|---|---|---|---|---|---|
| DC92D MK3 | ● | ● | ● | — | — | — | — | — | — |
| DC92DR MK3 | ● | ● | ● | ● | ● | — | — | — | — |
| DC92MR | ● | ● | ● | ● | ● | ● | ● | ● | ● |

- ◆ 32bit high performance single chip microcomputer.
- ◆ 4.3inch TFT colorful big screen LCD, Available in 16 languages, user"s language set if necessary.
- ◆ Wide temperature working range (-40-70℃), suitable for harsh working environment. (Only for DC92MR)
- ◆ Indicator and number display through UI surface.
- ◆ Acrylic material is adapted to protect the screen.
- ◆ Silicone panels;
- ◆ **AMF:** Mains monitoring and AMF (Mains/Generator automatic switching control), especially suitable for the automation system composed by mains and genset.
- ◆ USB Port: parameters can be set even without power through USB port to monitor in real time.
- ◆ With RS485 communication port, can achieve "Three Remote" functions via MODBUS protocol.
- ◆ Standard CAN communication port, built-in J1939 protocol, has matched more than 40 kinds of engines;
- ◆ The standard ETHERNET communication interface can be connected to the GSCLOUD generator cloud control platform, and the status of the generator set can be monitored remotely through the WEB platform and mobile APP; the ETHERNET interface supports the Modbus-RTU protocol, and the controller parameters can be set through the PC;
- ◆ Equipped with MBC communication interface, which can be used for master and backup power-on communication and connection of expansion modules;
- ◆ Various kinds of parameters display.
- ◆ 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.

- Three class protection countdown function, which can set the maintenance time or date.
- With event recording function, it can save 100 groups of alarm records, including relevant parameters of the unit in case of fault alarm; 5000 system logs can be saved to find the cause of failure;
- Totally 10 relay"s output, among which 8 relay output can be self-configurable, each relay can be set as max 50 functions, besides, there are 2 groups as non-contact terminals.
- With 8 switches input, up to 40 functions optional;
- 6 sensor simulation input connectors, 6 input types is configurable and various kinds of units can be set.
- Battery charging control function,which can protect the battery according to battery voltage status.
- Sensor can be self-defined by front face button or PC software.
- Adapt to 3P4W,1P2W,2P3W(120V/240V,50/60HZ)
- Various of crank conditions (RPM, Frequency, Oil Pressure) can be chosen.
- Control Protection: Auto Start/Stop of genset, load transfer (ATS control) and perfect failure display and protection.
- Standard water-proof rubber gasket. The waterproof can reach IP65.
- Module design: All the connections are adapted with European connectors so that installation, connection, repair and replacement can be more easily.

## 3. Parameters Display

- Engine RPM
- Engine oil pressure
- Engine water temperature
- Engine fuel level
- Engine battery voltage
- Charging voltage
- Mains Frequency
- Mains phase voltage
- Mains phase voltage
- Generator 3 Phase voltage L-N
- Generator 3 Phase voltage L-L
- Generator Phase Sequence
- 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
- Real-time load rate %
- Current consumption KWH
- Total consumption KWH
- Total Crank times
- Current running time
- Total running time
- Maintenance notice
- 8 switches input status display
- Output status display of 10 relays
- Module temperature
- Networking in progress
- RS485 Status
- Bluetooth Status
- CAN Status
- SD Card
- USB Disk

## 4. Protection

- Emergency stop
- Over speed
- Under speed
- Over frequency
- Under frequency
- Over voltage
- Under voltage
- Low oil pressure sensor
- Instant alarm switch
- Non-balance of current
- Over power
- Reverse phase sequence
- 1st maintain end
- 2nd maintain end
- 3rd maintain end
- ECU Alarm

- Low oil pressure switch
- Oil pressure sensor open
- High WT sensor
- High WT switch
- WT sensor open
- High OT switch
- Low water level switch
- Fail To Start
- RPM Signal lost
- Fail To Stop -RPM
- Fail To Stop -Oil pres
- Fail To Stop -Oil pres
- Gen onload fail
- Gen unload fail
- Main onload fail
- Main unload fail
- Fuel level sensor open
- Low fuel level switch
- Instant load switch
- ECU Comms. fail
- Shades open abnormal
- Fail To Stop -D+
- Fail To Stop -Hz
- Over current
- Low fuel level sensor
- Mains over frequency
- Mains under frequency
- Mains over voltage
- Mains under voltage
- Host Comms. fail
- Alternative config conflict
- AUX.SENSOR low
- AUX.SENSOR high
- AUX.SENSOR Disconnect
- Fuel leakage
- AUX.INPUT fault
- Earth Fault

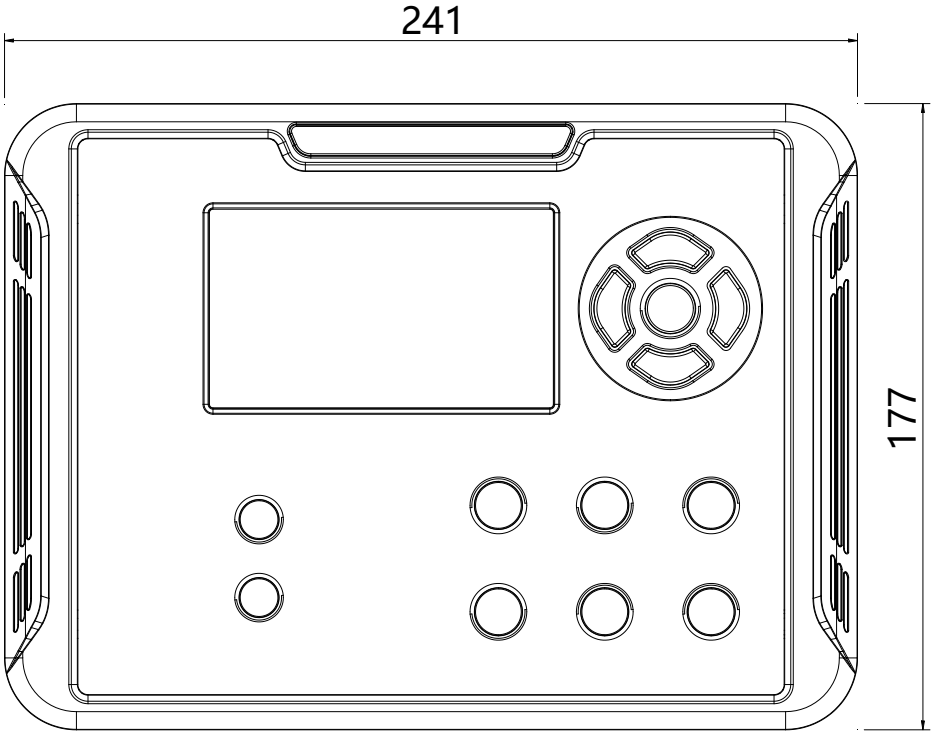
## 5. Parameters

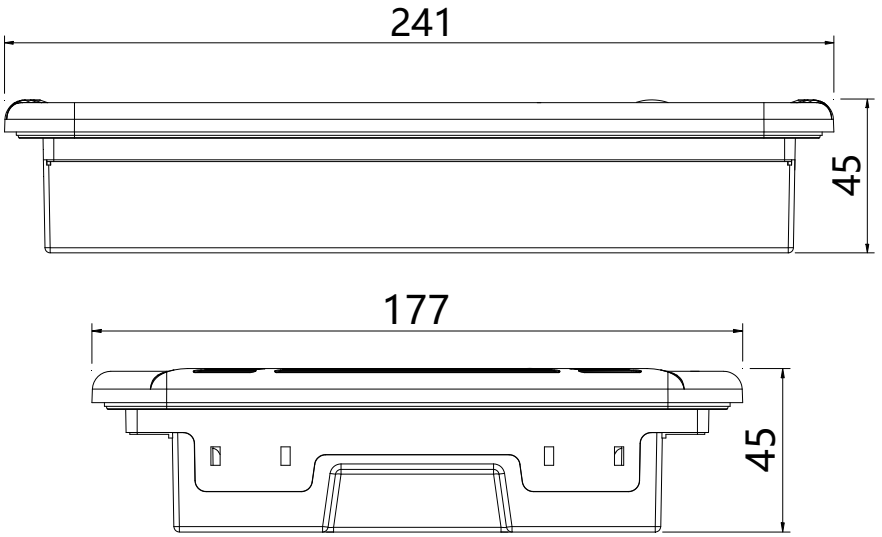
| Options | Parameters | |
|---|---|---|
| Working voltage | DC8V----36V Continuous | |
| Power consumption | Standby:24V:MAX 4W | |
| | Working:24V:MAX 8.5W(Heating<15W) | |
| AC Voltage Input | 1P2W 30VAC-360VAC (ph-N) | |
| | 2P3W 30VAC-360VAC (ph-N) | |
| | 3P4W 30VAC-360VAC (ph-N) | |
| Rotate speed sensor Frequency | 1-10000Hz | |
| MAX Accumulating Time | 99999.9Hours（Min Store time:0.01H） | |
| Fuel Relay Output | Max 16Amp DC+VE Supply voltage | |
| Start Relay Output | Max 16Amp DC+VE Supply voltage | |
| AUX. Output 1 | 250V/16 AMP Non-contact normally Closed output | |
| AUX. Output 2 | 250V/16 AMP Non-contact normally Open output | |
| AUX. Output 3-8 | Max 10Amp DC+VE Supply voltage | |
| Excitation output | DC+VE supply voltage | |
| Switch value input | Available if connecting with Battery - | |
| USB | Type-A , Type-B | |
| RS485-1 | Isolated Modbus-RTU protocol | |
| RS485-2 | Isolated Modbus-RTU protocol | |
| ETHERNET | RJ45 10Mbps adaptive network interface; Built-in GSCLOUD cloud Protocol, SNMP protocol and TCP/IP Modbus protocol. | |
| LCD display | Under the condition of -40℃, the controller can display normally within 10 seconds after power-on; the response speed of dynamic display is normal after 2 minutes of power-on.(Only for DC92MR) | |
| Working condition | DC92D/DC92DR | -30ºC ~+70 ºC |

| | | |
|---|---|---|
| | DC92MR | -40ºC ~+70 ºC |
| | Display Heater | -10ºC turn on; -5ºC turn off |
| Storage condition | -40-85℃ | |
| Protection Level | IP65: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 | 241mm*177mm*45mm | |
| Panel cutout | 220mm*160mm | |
| Weight | 1.3Kg | |

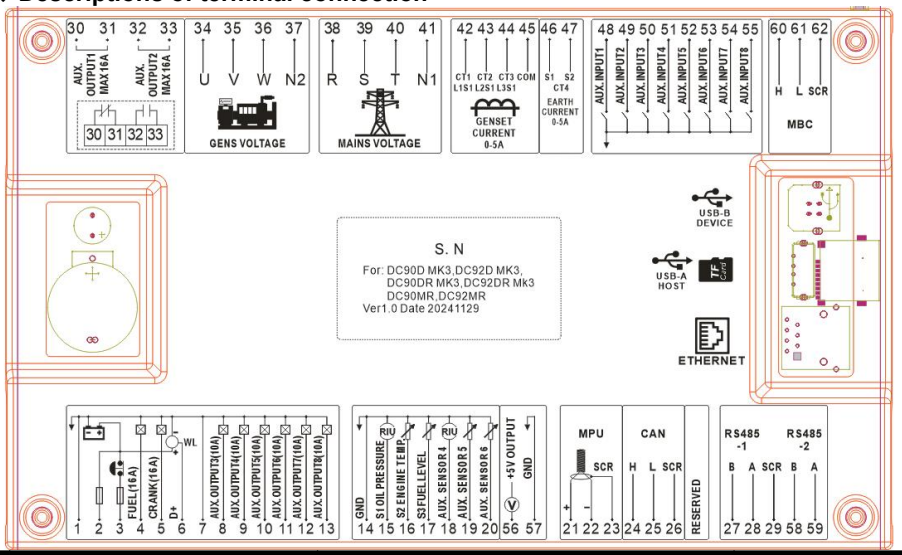
## 6. Overall Dimension and Wiring Diagram

◆ **Overall Dimension:**






◆ **Descriptions of terminal connection**

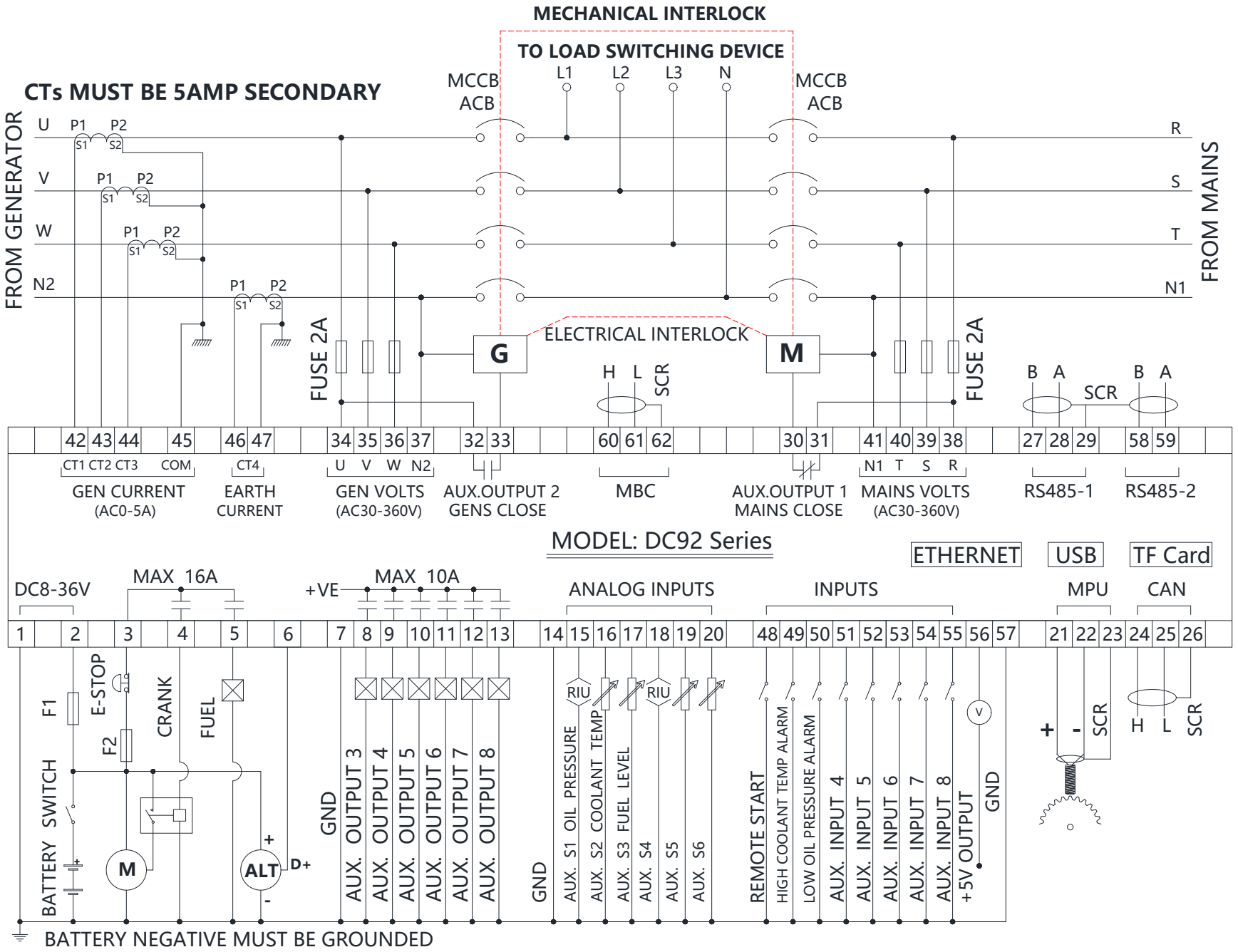



| No. | Function | Description | Cable cross sectional area |
|---|---|---|---|
| 1 | Battery Negative Input B- | Controller power supply input B-. | 2.5mm$^2$ |
| 2 | Battery Positive Input B+ | Controller power supply input B+. | 2.5mm$^2$ |
| 3 | Emergency Stop Input | B+ voltage input is active, and connected to emergency stop normal closed button. | 2.5mm$^2$ |
| 4 | Fuel Output | Active output, Max 16Amp | 1.5mm$^2$ |
| 5 | Crank Output | Active output, Max 16Amp. | 1.5mm$^2$ |

| | | | | |
|---|---|---|---|---|
| 6 | Charging excitation output | | DC+VE supply voltage. | 1.0mm² |
| 7 | Common GND | | Connect the battery negative or outer casing. | 1.5mm² |
| 8 | Aux. Output 3 | | Active output, Max 10Amp. | 1.5mm² |
| 9 | Aux. Output 4 | | Active output, Max 10Amp. | 1.5mm² |
| 10 | Aux. Output 5 | | Active output, Max 10Amp. | 1.5mm² |
| 11 | Aux. Output 6 | | Active output, Max 10Amp. | 1.5mm² |
| 12 | Aux. Output 7 | | Active output, Max 10Amp. | 1.5mm² |
| 13 | Aux. Output 8 | | Active output, Max 10Amp. | 1.5mm² |
| 14 | Sensor common GND | | Connect the battery negative or outer. | 1.5mm² |
| 15 | Aux. Sensor 1_OP | | Sensor input types can be configured as: disabled, oil pressure sensor, water temperature sensor, oil temperature sensor, cylinder temperature sensor, oil level sensor.<br><br>15,18 pin sensor inputs are compatible with resistive, voltage and current sensors. | 1.0mm² |
| 16 | Aux. Sensor 2_WT | | | 1.0mm² |
| 17 | Aux. Sensor 3_FL | | | 1.0mm² |
| 18 | Aux. Sensor 4 | | | 1.0mm² |
| 19 | Aux. Sensor 5 | | | 1.0mm² |
| 20 | Aux. Sensor 6 | | | 1.0mm² |
| 21 | Speed sensor + | | Use a shielded wire to connect the speed sensor. | 1.0mm² |
| 22 | Speed sensor - | | | 1.0mm² |
| 23 | Speed sensor SCR | | Connecting speed sensor shielded wire ground. | 1.0mm² |
| 24 | CAN-H | | Impedance-120Ω shielding wire is recommended, its single-end connect with ground. | 1.0mm² |
| 25 | CAN-L | | | 1.0mm² |
| 26 | CAN-SCR | | | 1.0mm² |
| 27 | RS485-1 B | | A 120 Ω shielded wire and good grounding are recommended. | 1.0mm² |
| 28 | RS485-1 A | | | 1.0mm² |
| 29 | RS485 SCR-COM | | | 1.0mm² |
| 30 | Aux. Output 1 | Normally Close | Passive normally closed output, Max 5Amp. | 1.5mm² |
| 31 | | COM | | 1.5mm² |
| 32 | Aux. Output 2 | Normally Open | Passive normally open output, Max 5Amp. | 1.5mm² |
| 33 | | COM | | 1.5mm² |
| 34 | Generator Voltage U | | Connected to the power generation output R phase. | 1.0mm² |
| 35 | Generator Voltage V | | Connected to the power generation output S phase. | 1.0mm² |
| 36 | Generator Voltage W | | Connected to the power generation output T phase. | 1.0mm² |
| 37 | Generator Voltage N2 | | Connected to the power generation output N phase. | 1.0mm² |
| 38 | Mains Voltage R | | Connected to the mains U phase. | 1.0mm² |

| | | | |
|---|---|---|---|
| 39 | Mains Voltage S | Connected to the mains V phase. | 1.0mm$^2$ |
| 40 | Mains Voltage T | Connected to the mains W phase. | 1.0mm$^2$ |
| 41 | Mains Voltage N1 | Connected to the mains N phase. | 1.0mm$^2$ |
| 42 | Load CT1 Secondary L1 | Current Transformer Secondary Rated 5A. | 1.5mm$^2$ |
| 43 | Load CT2 Secondary L2 | | 1.5mm$^2$ |
| 44 | Load CT3 Secondary L3 | | 1.5mm$^2$ |
| 45 | Load CT Secondary ICOM | Connect to the common GND instead of the neutral line N. | |
| 46 | Restricted earth fault measuring CT4 | Connect to the CT on the neutral conductor | 1.5mm$^2$ |
| 47 | | Connect to the common GND instead of the neutral line N. | 1.5mm$^2$ |
| 48 | Aux. Input 1 | The grounding is valid according to the function selection switch input. | 1.0mm$^2$ |
| 49 | Aux. Input 2 | | 1.0mm$^2$ |
| 50 | Aux. Input 3 | | 1.0mm$^2$ |
| 51 | Aux. Input 4 | | 1.0mm$^2$ |
| 52 | Aux. Input 5 | | 1.0mm$^2$ |
| 53 | Aux. Input 6 | | 1.0mm$^2$ |
| 54 | Aux. Input 7 | | 1.0mm$^2$ |
| 55 | Aux. Input 8 | | 1.0mm$^2$ |
| 56 | +5V Output | Connect voltage sensor power supply, with a maximum of 50mA. | 1.0mm$^2$ |
| 57 | GND | Connect the battery negative or outer casing. | 1.0mm$^2$ |
| 58 | RS485-1 B | A 120 Ω shielded wire and good grounding are recommended. | 1.0mm$^2$ |
| 59 | RS485-1 A | | 1.0mm$^2$ |
| 60 | MBC-H | It is mainly used for internal communication or expansion module.CAN interface Impedance-120Ω shielding wire is recommended, its single-end connect with ground. | 1.0mm$^2$ |
| 61 | MBC-L | | 1.0mm$^2$ |
| 62 | MBC-SCR | | 1.0mm$^2$ |

◆ **DC92 series 3-phase 4-wire Typical Wiring Diagram**



***Note:*** When using sensor , No. 7/14 common sensor lines must be securely attached to the vicinity of the sensor body.

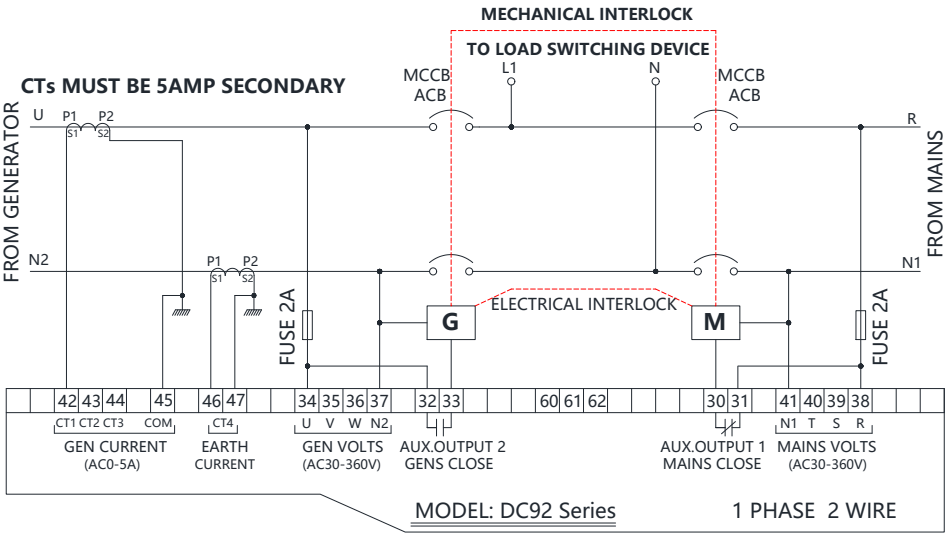
To ensure reliable operation of the module and the measuring accuracy, power lines as much as possible and do not share power cable crude and other devices.

***Note: Please don"t move during running status or it may cause the controller broken!***

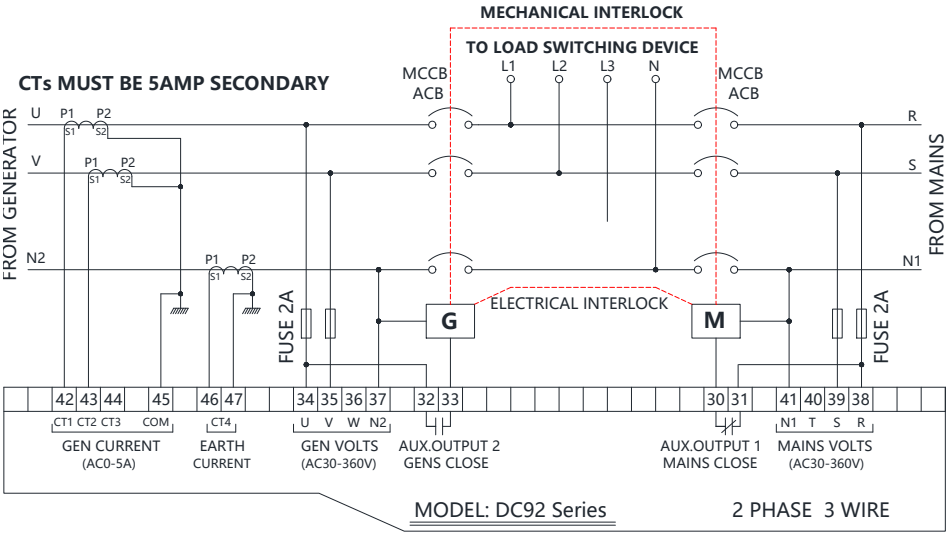
***Note:*** **F1 FUSE:** connect to the positive terminal of the battery, recommended maximum 20A fuse.
**F2 FUSE:** Due to the high current draw of the valves and motor relays, a maximum 20A fuse is recommended.

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.

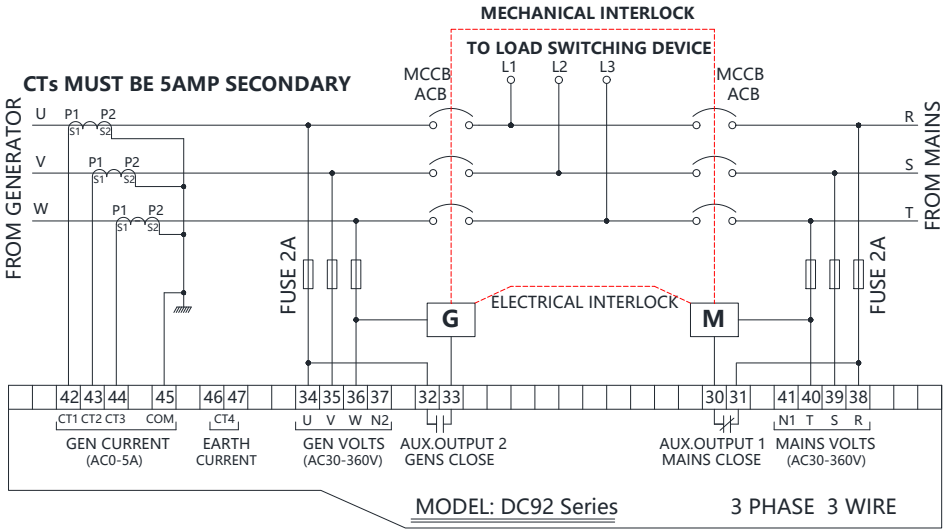
### ◆ DC92 series 1-phase 2-wire Typical Wiring Diagram



## ◆ DC92 series 2-phase 3-wire Typical Wiring Diagram




## ◆ DC92 series 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: W220mm*H160mm.




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

**◆Battery Voltage Input**

DC92x 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**

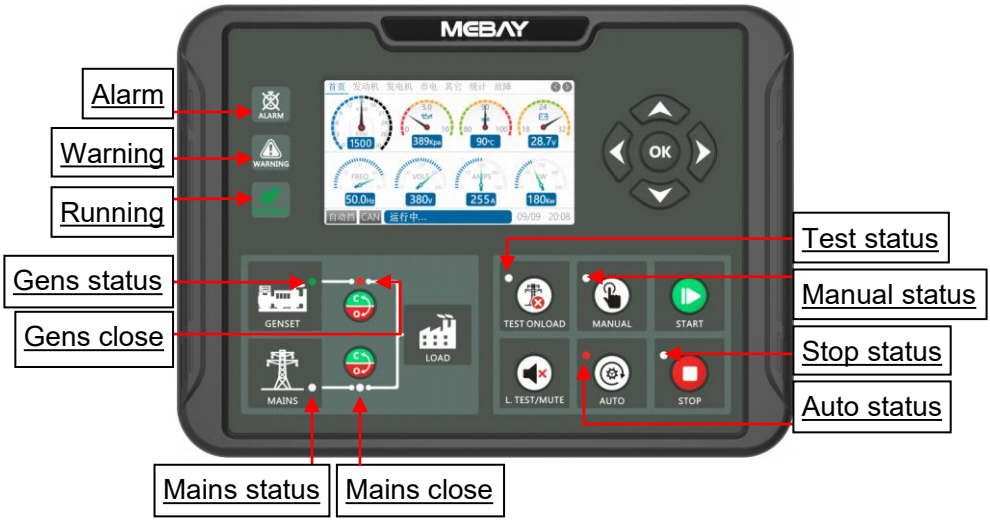
Current transformer with rated secondary current 5A must be externally connected to the controller current input.

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




## 9. Control and operation instruction

**◆ Key Function Description**

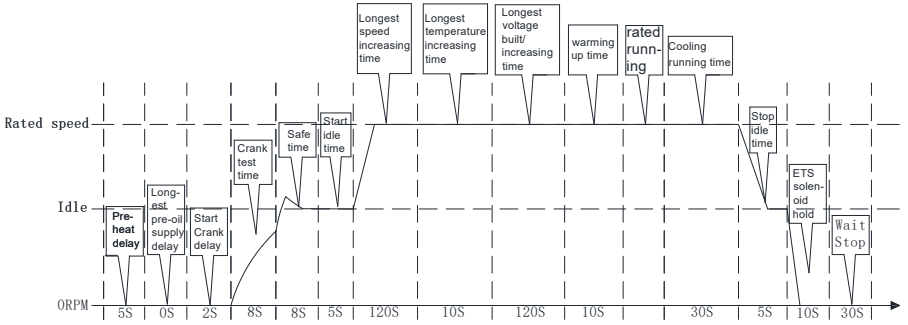
| KEYS | NAME | Main Function |
|---|---|---|
|  | Stop<br>Reset<br>Revert | ◆ Can stop generator under manual/auto mode;<br>◆ Can reset shutdown alarm<br>◆ During stop procession, pressing this key again can stop generator immediately.<br>◆ Pressing this key can cancel the setting and back to upper class under edition.<br>◆ Under the setting mode with checking data, the data can be saved and system will exit after pressing. |
|  | Start | ◆ Start the genset under manual mode.<br>◆ Pressing this key can start the genset under manual testing mode.<br>◆ In STOP mode, Press this key, "Fuel output" and "ECU power" will output.<br>◆ Idle runtime process, press the start button again, then the idle runtime process will be jumped out. |

| | | |
|---|---|---|
|  | Manual | ◆Pressing this key will set the module into manual mode. |
|  | Auto | ◆Pressing this key will set the module into auto mode. |
|  | Test | ◆Pressing this key to come into manual testing mode.<br>◆Under testing mode, pressing MANUAL can start the genset and transfer to normal loading after running which is to test if the auto start is in normal status. |
|  | LED Test/<br>Warning clear | ◆Test if all LED lights are ok, pressing this key to test if all lighted, all off when loosen it.<br>◆Under warning, pressing this key can clear warning and controller will re-check warning.<br>◆Under alarm, pressing this key can clear the buzzer call.<br>◆Pressing this key in 3 seconds can clear the buzzer call, pressing it again in 3 seconds can recover the buzzer call. |
|  | Gens/ Mains<br>Close/On | ◆Under manual mode, pressing this key can transfer load to genset/mains. |
|  | Left | ◆Under display mode, pressing this key to turn left page.<br>◆Under edition mode, pressing this key to move the digit. |
|  | Right | ◆Under display mode, pressing this key to turn right page.<br>◆Under edition mode, pressing this key to move the digit. |
|  | Up | ◆Under display mode, parts of the page can move up.<br>◆Under edition mode, pressing this key to move the digit or increase the numbers.<br>◆Under records mode, pressing this key to move the digit. |
|  | Down | ◆Under display mode, parts of the page can move down.<br>◆Under edition mode, pressing this key to move the digit or decrease the numbers.<br>◆Under records mode, pressing this key to move the digit. |
|  | OK<br>UI Change | ◆Confirm the change under edition mode.<br>◆Page exited under records checking mode.<br>◆Press this key, Black UI and white UI can be switched and return to the home screen display.<br>◆In standby state, press for 3 seconds to enter the parameter setting mode. |
|  | Setting mode | ◆Pressing OK and STOP simultaneously to come into setting mode |
|  | Alarm Records checking | ◆Pressing STOP and RIGHT to check the records and any buttons pressed to exit from the page. |

◆**Manual test mode:**

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

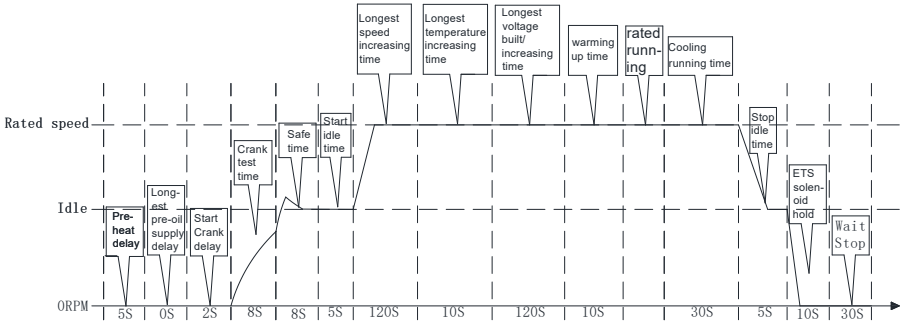
Press "" and the test file indicator is on. At this time, it is detected whether the connection of each sensor is normal. If the sensor is open, the sensor opens an alarm. If it is normal, the unit start process is executed in the following sequence after pressing the "". automatically switch to Generator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



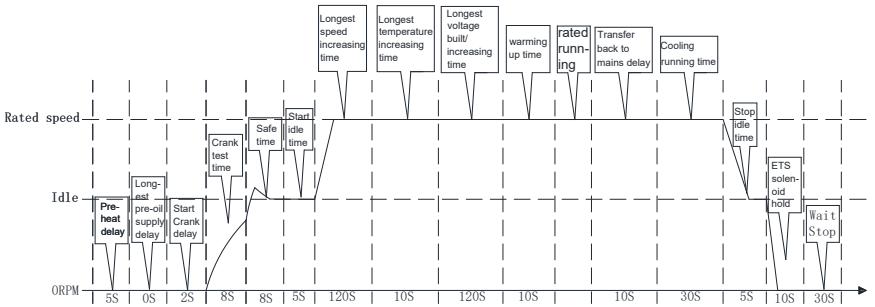

**◆ Manual Start Mode**

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

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 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:

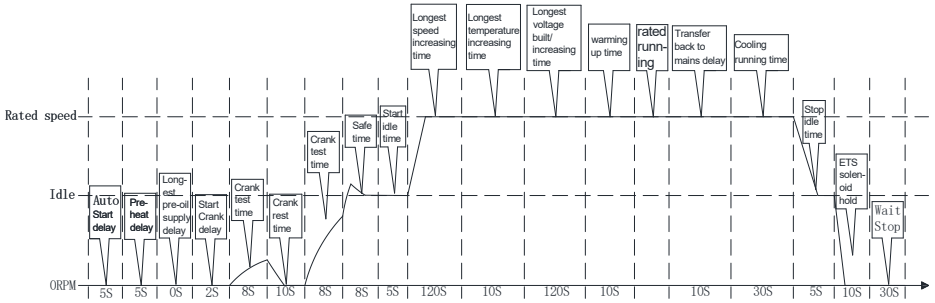



◆ **Automatic starting mode:**

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 (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. When the remote start signal fails and the mains provide the power returns to normal, the shutdown process after the "Back to Mains" is performed.

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 Warming-up time.

Note 5: After entering rated operation, the Gens load relay output.

Note 6: 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 7: If the stop key is pressed again during idle time, the idle time will be canceled and the stop operation will be executed directly.

◆ **Engine flywheel teeth automatic adjustment**

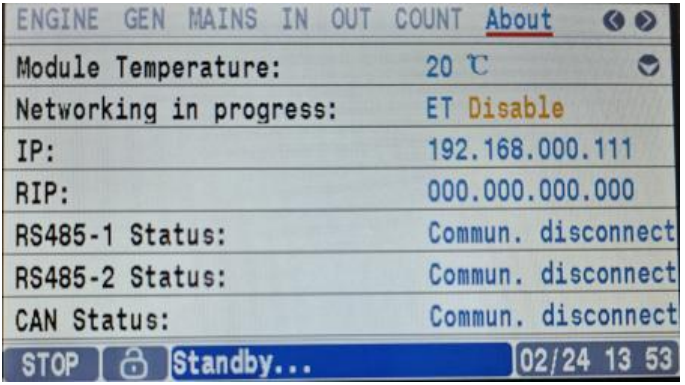
1) Crank disconnect must be set to include both "speed" and "frequency" options.

2) When the generator frequency and engine speed are not zero, press and for more than 0.5 seconds, the controller will automatically calculate and save the number of flywheel teeth according to the generation frequency and generator poles.

3) After calculating and saving the number of flywheel teeth successfully, the controller shows: " **Flywheel xxx teeth, saved successfully!**"

◆ **ETHERNET network status view**

When the ETHERNET interface is enabled, the screen input and output page: network signal input can check the ETHERNET network status, when the ET network connection fails, "ET X" will be displayed; when the ET network is being connected, "Networking in progress" will be displayed with a flash. "When the ET network is connected normally, it will display "ET Success", and the network data will display ↑ when uploading and ↓ when downloading. (The reference diagram is as follows:)



◆ **Emergency Start**

In the manual mode, press the "manual" button and the "start" button at the same time to start the generator set in case of emergency.
At this time, the controller does not judge whether the engine has been started successfully according to the successful starting conditions. The disengagement of the starter must be controlled by the operator. When the operator observes that the unit has been started successfully, release the key, the starter stops output, and the controller enters the safety delay.

◆ **Cycle start**

This function is available only for DC92DR and DC92DMR.
Cycle start is to control two gensets to start circularly. Two gensets are connected by MBC or RS485-1. Master can control backup to start/stop genset by sending commands and check backup fault status. Master and backup can be set by parameter configurations, or decided by input setting. It is only active in Auto mode.
Operation procedure:
a) Master waits for start and when remote start input is active, it starts automatically. Running time is the pre-set “Master Running Time”;
b) “Master Running Time” is over or shutdown alarm occurs, master sends start command to backup; and when backup remote start input is active, backup starts; when backup runs normally, master stops; backup running time is the pre-set time;
c) In the whole process, master and backup can change current status information at real time by MBC and RS485-1; when running time is over or backup shutdown alarm occurs, master starts again and it goes like this circularly;
d) When communication is interrupted, controller issues “Cycle Communication Failure” warn; when master remote start input is active, master starts; when backup remote start input is active, backup starts.

## 10. Setting Menu instructions

The steps to enter the **Menu** setting are as follows:

1) Press the key OK for more than 3 seconds.Or press the stop key without releasing, press the OK key OK again, and then release all the keys to enter the setting menu page; The menu contents are as follows:

◆ **Fast Set Parameters:** This menu is for commonly used setup options and does not require a password to enter, making it easy for users to debug the unit.
◆ **Set Parameters: please refer to "Parameter".**
◆ **Language/语言: please refer to "Language".**
◆ **Information: Can view the product model, release date, Cloud ID, TCP/IP, TCP Port, UDP port, Bluetooth name and other information.**
◆ **System logs**

DC92x series generator set controller can save 5000 system logs, including operation time, generator set startup, key operation, parameter modification, controller power on and other records.
The steps to view the system log are as follows:

1) Press the key OK for more than 3 seconds.Or press the stop key without releasing, press the OK key OK again, and then release all the keys to enter the setting menu page;

2) In the setting menu page, select "**System logs**" and press the OK key to enter the password input page;
3) Enter the controller parameter setting password, and the default factory password is "**07623**"; after entering the password, press the OK key once to enter the system log page;
4) In the system log page, press the up key and down key to browse the operation log, and the latest operation is recorded in the front; press the STOP key to exit the system log page.

◆ **Operational Records**

DC92x controller can save 5000 system operation records, including power-on time, date, cumulative time, starting mode (manual, automatic, unknown,), running time, stopping mode (manual, automatic, alarm stop, unknown), and writing running time and mode at intervals.
The steps to view the system log are as follows:

2) Press the key for more than 3 seconds.Or press the stop key without releasing, press the OK key again, and then release all the keys to enter the setting menu page;
3) In the setting menu page, select "**System Operational Records**" and press the OK key once to enter the System Operational Records page;
4) In the System Operational Record page, press the up key and down key to browse the operation log, and the latest operation is recorded in the front; press the STOP key to exit the System Operational Records page.

◆ **Alarm records**

DC92x series controller can save 100 groups of detailed historical alarm records, alarm record data details refer to the following: "Alarm record data details: the controller real-time record data, the unit in alarm state according to: according to the alarm data record interval time to store. Only the latest 10 groups are recorded for each data. (e.g.: RPM data, the interval time is set to 1 second, you can view 10 groups of RPM change data during the alarm)".

How to check the alarm records:

1) Enter alarm record page: Press and simultaneously to come into alarm records page;
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) When browsing the alarm record data detail interface, press to scroll down the alarm record item, press to scroll up the alarm record item, press or to switch to view the 10 groups of detailed records of the item; press the key to return to the interface of historical alarm record list;
4) Exit from records page: In the records page, press to exit.

◆ **Maintenance Reset**

The controllers are equipped with a quick reset maintenance countdown function, which is operated as follows:

1) Press the key OK for more than 3 seconds to enter the setting menu interface.
2) In the setting menu interface, press key to move down, select "Maintenance Countdown Reset", and input "Maintenance Countdown Reset Password".
3) In the pop-up dialogue box, select **"Yes"**, the controller will reset the maintenance countdown to the set value.
4) After the maintenance countdown is reset successfully, press the STOP key to exit the setting interface.

Note: The maintenance countdown password cannot be set as the same as the parameter setting password!

◆ **DPF Regeneration**

| No | Parameters | Range*(defaults)* |
|---|---|---|
| 01 | DPF Active | ***0-Disable;*** 1-Enable |
| 02 | DPF Regeneration Requested | ***0-Disable;*** 1-Enable |
| 03 | DPF Regeneration Inhibit | ***0-Disable;*** 1-Enable |
| 04 | DPF Regeneration Bus Control | ***0-Disable;*** 1-Enable |
| 05 | HEST Active | ***0-Disable;*** 1-Enable |
| 06 | Urea Level Low Warning Value | 0.0-100.0% ***(10.0%)*** |

**Available for ECU which require the engine speed to drop during a manual regeneration cycle. During this time, the generator is not available to supply power and the under speed and under frequency alarms are not active.**

There are two ways to enable and disable the regeneration function:
**1:**Controller parameter setting page to enable or disable, after re-power on **DPF Regeneration Inhibit**, **DPF Regeneration**" will be reset to disable.

**2: AUX.Input control:**
**DPF Regeneration Inhibit:**This input is used to override the ECU function and prevent the regeneration of the diesel particulate filter.
**DPF Regeneration:** This input is used to override the ECU function and activate the regeneration of the diesel particulate filter.

Regeneration is divided into hardware regeneration control and bus regeneration control; hardware regeneration is controlled by module relay Output;

**DPF Regeneration Inhibit Request:** when the output is active **,** the diesel particulate filter regeneration inhibit.
**DPF Regeneration Requested:** Outputs an indication when diesel particulate filter

regeneration is requested;
**DPF Forced Regeneration:** When the output is valid: forced regeneration of the diesel particulate filter.
**DPF Regeneration In Progress:** Output indication when diesel particulate filter regeneration is in progress.

Bus regeneration is realized by sending CAN commands; when the controller regeneration function is turned on, CAN commands are automatically sent to realize DPF forced regeneration.

◆ **USB Disk Operation**
After the USB Disk is successfully connected: when you enter the USB Disk operation interface, there are two options: **"Import"** and **"Export"**.

When you select **"Import"**, you can view the tab and tae files in the USB Disk and load the corresponding files to the controller. When selecting **"Export"**, the controller configuration parameters are saved to the root directory folder <<U:MEBAY >>.

Note: For the import and export configuration function, the file path must be in the root directory folder <<U:MEBAY >>.

## 11. 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.

**Note:** When a warning fault occurs, the warning indicator **"WARNING"** is always on, and the current fault interface displays the warning description, Generators will not stop.

| Code | Display name | Description |
|---|---|---|
| A0 | Over speed | When the controller detects that the engine speed is higher than "**Over speed warning**", after the warning delay, it will report the"**Over speed**" warning. |
| A1 | Under speed | When the controller detects that the engine speed is lower than "**Under speed warning**", after the warning delay, it will report the"**Under speed**" warning. |
| A2 | Over frequency | When the controller detects that the generator frequency is higher than "**Over frequency warning**", after the warning delay, it will report the"**Over frequency**" warning. |
| A3 | Under frequency | When the controller detects that the generator frequency is lower than "**Under frequency warning**", after the warning delay, it will report the "**Under frequency**" warning. |

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|---|---|---|
| A4 | Over voltage | When the controller detects that the generator voltage is higher than "**Over voltage warning**", after the warning delay, it will report the "**Over voltage**" warning. |
| A5 | Under voltage | When the controller detects that the generator voltage is lower than "**Under voltage warning**", after the warning delay, it will report the "**Under voltage**" warning. |
| A7 | Low oil pressure sensor | When the controller parameter "Low Oil Pressure Sensor Alarm Action" is set to "Warning", detected sensor less than the "Warning Threshold", after the warning delay, it will report the "**Low oil pressure sensor**" warning. |
| A8 | High WT sensor | When the controller parameter "**High water temperature** Sensor Alarm Action" is set to "Warning", detected sensor higher than the "Warning Threshold", after the warning delay, it will report the **"High WT sensor"** warning. |
| A11 | Low fuel level sensor | When the controller parameter "Low fuel level Sensor Alarm Action" is set to "Warning", detected sensor less than the "Warning Threshold", after the warning delay, it will report the "**Low fuel level sensor**" warning. |
| A12 | Low fuel level switch | When the controller detects that the AUX. Input "**Low fuel level warning input"** switch is active, after the warning delay, it will report the "**Low fuel level switch**" warning. |
| A13 | Under battery voltage | When the controller detects that the battery voltage is lower than the "**Under battery voltage warning"**, after the warning delay, it will report the "**Under battery voltage**" warning. |
| A14 | Non-balance of current | When the controller parameter **"Non-balance current action"** is set to **"Warning"**, the controller is 2 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 "**Non-balance current ratio warnin**g". after the warning delay, it will report the "**Non-balance of current**" warning. |
| A19 | High WT switch | When the controller detects that the AUX. Input "**High water temperature warning"** switch is active, after the warning delay, it will report the **"High WT switch"**. |
| A25 | Instant unload switch | When the controller detects that the AUX. Input "**External instant unload input"** switch is active, after the warning delay, it will report the **"Instant unload switch"**. |
| A26 | Instant warning switch | When the controller detects that the AUX. Input "**External instant warning input"** switch is active, after the warning delay, it will report the **"Instant warning switch"**. |

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|---|---|---|
| A28 | RPM Signal lost | When the controller parameter "**Action if RPM lost**" is set to "**warning**", the detected speed value is 0, after the warning delay, it will report the "**RPM Signal lost**" warning. |
| A29 | Oil Pressure sensor open | When the controller parameter "**Action if oil pressure sensor disconnected**" is set to "**warning**", When the oil pressure sensor is detected to be disconnected, it will report the **"Oil Pressure sensor open"** |
| A30 | WT sensor open | When the controller parameter "**Action if water temperature sensor disconnected**" is set to "**warning**", When the water temperature sensor is detected to be disconnected, it will report the **"WT sensor open"** |
| A34 | Fuel level sensor open | When the controller parameter "**Action if Fuel level sensor disconnected**" is set to "**warning**", When the fuel level sensor is detected to be disconnected, it will report the "Fuel level sensor open**"** |
| A 35 | Over power | When the controller parameter **"Over power action"** is set to **"Warning"**, the controller detects that the generator power is higher than "**Over total power warning**", after the warning delay, it will report the "**Over power**" warning. |
| A 36 | Loss of Phase | When the controller **"Loss of Phase"** is set to **"Enable"** and Generator phase Loss is detected, it will report the **"Loss of Phase"** warning. |
| A 37 | Phase Sequence Wrong | When the controller parameter "**Phase Sequence Wrong**" is set to **"warning"**, detects that the generator "**Phase Sequence Wrong**" , it will report the **"Phase Sequence Wrong"** warning. |
| A 38 | Gens close fail | When the controller gens close output, controller does not detect the " **Gens close signal**" within the warning time, it will report the **"Gens close fail"** warning. |
| A 39 | Gens open fail | When **"Action if gens open fail "** is set to **"warning"** the controller gens open output, controller does not detect the " **Gens open signal**" with in the warning time, it will report the **"Gens open fail"** warning. |
| A 40 | Mains close fail | When the controller mains close output, controller does not detect the " **Mains close signal**" within the warning time, it will report the **"Mains close fail"** warning. |
| A 41 | Mains open fail | When **"Action if mains open fail "** is set to **"warning"** the controller mains open output, controller does not detect the " **Mains open signal**" within the warning time, it will report the **"Mains open fail"** warning. |
| A 42 | 2nd maintain end | When the controller parameter "**Secondary maintenance expire**" is set to "**warning**", when the secondary countdown to maintenance is detected as |

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|---|---|---|
| | | "0" or second maintenance date less than current date, it will report the "**2nd maintain end**" warning. |
| A 43 | 3rd maintain end | When the controller parameter "**Third maintenance expire**" is set to "**warning**", when the third countdown to maintenance is detected as "0" or third maintenance date less than current date, it will report the"**3rd maintain end**"warning. |
| A 44 | ECU Warn | When the controller detects a warning message from the ECU, after the warning delay, an ECU warning is reported (The corresponding ECU warning code displayed). |
| A 45 | ECU Comms. fail | When the controller parameter "**ECU failure**" Action is set to "**warning**", and no message is received from the ECU within a fixed period of time, it will report **"ECU Comms.fail"** warning. |
| A 46 | Low water level switch | When the controller detects that the AUX. Input "**Low water level warning"** switch is active, after the warning delay, it will report the **"Low water level switch"** warning. |
| A 47 | Over battery voltage | When the controller detects that the battery voltage is over than the "**Over battery voltage warning"**, after the warning delay, it will report the "**Over battery voltage**" warning. |
| A 48 | Charger fault | When the controller detects that the voltage difference between D+ and B+ is greater than the **" Charger warning voltage difference",** after the warning delay, it will report " **charger fault**" warning. |
| A 49 | Battery charger fault | When the controller detects that the AUX. Input "**Charging failure warning"** switch is active, after the warning delay, it will report **"Battery charger fault"** warning. |
| A 51 | Over current | When the controller parameter "**Action in case of over current"** is set to **"Warning"**, the controller detects that the generator current is higher than **"Phase current over-load warning"**, after the warning delay, it will report the "**over current**" warning. |
| A 52 | 1st maintain end | When the controller parameter **"Primary maintenance expire"** is set to **"warning"**, when the primary countdown to maintenance is detected as "0" or primary maintenance date less than current date, it will report the "**1st maintain end**" warning. |
| A 68 | Fuel filling system fault | When the controller **"Fuel Pump Output "** is active, if no increase in fuel level is detected during the **"**Fuel Pump Filling detection time **"**, it will report the **"Fuel filling system fault"** warning. |
| A 70 | AUX.Sensor 1 low | When the controller parameter "**Sensor alarm Action** " is set to "**Warning**", and the controller detects that the sensor value is lower than "**Warning Threshold**", after the warning delay, it will report the "**AUX.Sensor** |
| A 71 | AUX.Sensor 2 low | |
| A 72 | AUX.Sensor 3 low | |
| A 73 | AUX.Sensor 4 low | |

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|---|---|---|
| A 74 | AUX.Sensor 5 low | **low**" warning. |
| A 75 | AUX.Sensor 6 low | |
| A 76 | AUX.Sensor 1 high | When the controller parameter "**Sensor alarm Action** " is set to "**Warning**", and the controller detects that the sensor value is higher than "**Warning Threshold**", after the warning delay, it will report the "**AUX.Sensor low**" warning. |
| A 77 | AUX.Sensor 2 high | |
| A 78 | AUX.Sensor 3 high | |
| A 79 | AUX.Sensor 4 high | |
| A 80 | AUX.Sensor 5 high | |
| A 81 | AUX.Sensor 6 high | |
| A 82 | AUX.Sensor 1 Disconnect | When the controller parameter "**Action if sensor disconnected**" is set to "**warning**", When the sensor is detected to be disconnected, after the warning delay, it will report the "**AUX.Sensor Disconnect**" warning. |
| A 83 | AUX.Sensor 2 Disconnect | |
| A 84 | AUX.Sensor 3 Disconnect | |
| A 85 | AUX.Sensor 4 Disconnect | |
| A 86 | AUX.Sensor 5 Disconnect | |
| A 87 | AUX.Sensor 6 Disconnect | |
| A 88 | AUX.Input 1 fault | When the controller detects that the **"AUX. Input"** switch is active,after the warning delay, it will report the **"AUX.Input "** warning. |
| A 89 | AUX.Input 2 fault | |
| A 90 | AUX.Input 3 fault | |
| A 91 | AUX.Input 4 fault | |
| A 92 | AUX.Input 5 fault | |
| A 93 | AUX.Input 6 fault | |
| A 94 | AUX.Input 7 fault | |
| A 95 | AUX.Input 8 fault | |
| A 96 | Earth Fault | When the controller parameter **"Earth Fault"** Action is set to "Warning", and the detected earth current of the generator set is greater than the set Earth fault value, it will report the **"Earth Fault"** warning. |
| A 98 | DPF Regeneration Requested | When the DPF function is on, when the controller receives the corresponding ECU telegram warning information, it reports the corresponding warning. |
| A 99 | DPF Regeneration Inhibit Request | |
| A 100 | High Exhaust System Temperature | |
| A 101 | DPF Regeneration In Progress | |
| A 102 | Low DEF level | |
| A106 | Cycle Start Comm. Fail | Cycle start is enabled, when controller cannot receive the communication data of another controller, controller issues alarm signal. It is detected when controller is in auto mode. |

◆ **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.

| Code | Display name | Description |
|---|---|---|
| E0 | Emergency stop | When the controller detects that the input voltage of PIN 3 is less than 2V, then start alarm delay and the duration (0.5s) have not returned to normal, it will report the **"Emergency stop "** alarm. |
| E1 | Over speed | When the controller detects that the engine speed is higher than "**Over speed alarm**", after the alarm delay, it will report the **"Over speed "** alarm. |
| E2 | Under speed | When the controller detects that the engine speed is under than "**Under speed alarm**", after the alarm delay, it will report the **"Under speed "** alarm, after the alarm delay, it will report the **"Under speed "** alarm. |
| E3 | Over frequency | When the controller detects that the generator frequency is higher than "**Over frequency alarm**", after the alarm delay, it will report the **"Over frequency"** alarm. |
| E4 | Under frequency | When the controller detects that the generator frequency is lower than "**Under frequency alarm**", after the alarm delay, it will report the **"Under frequency"** alarm. |
| E5 | Over voltage | When the controller detects that the generator voltage is higher than "**Over voltage alarm**", after the alarm delay, it will report the **"Over voltage"** alarm. |
| E6 | Under voltage | When the controller detects that the generator voltage is lower than "**Under voltage alarm**", after the alarm delay, it will report the **"Under voltage"** alarm. |
| E8 | Low oil pressure sensor | When the controller parameter **"Low Oil Pressure Sensor Alarm Action"** is set to **"Alarm and stop"**, detected sensor less than the **"Alarm Threshold"**, after the alarm delay, it will report the "**Low oil pressure sensor**"alarm. |
| E9 | Low oil pressure switch | When the controller detects that the AUX. Input **"Low oil pressure alarm"** switch is active, after the alarm delay, it will report the **"Low oil pressure switch"** alarm. |
| E10 | Oil Pressure sensor open | When the controller parameter "**Action if oil pressure sensor disconnected**" is set to "**Alarm** |

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| | | **and stop**", When the oil pressure sensor is detected to be disconnected, it will report the **"Oil Pressure sensor open"** |
| E11 | High WT sensor | When the controller parameter **"High coolant temperature Sensor Alarm Action"** is set to **"Alarm and stop"**, detected sensor less than the **"Alarm Threshold"**, after the alarm delay, it will report the "**High WT sensor**"alarm. |
| E12 | High WT switch | When the controller detects that the AUX. Input **"High coolant temperature alarm"** switch is active, after the alarm delay, it will report the **"High WT switch"** alarm. |
| E13 | WT sensor open | When the controller parameter "**Action if coolant temperature sensor disconnected**" is set to "**Alarm and stop**", When the coolant temperature sensor is detected to be disconnected, it will report the **"WT sensor open".** |
| E15 | High OT switch | When the controller detects that the AUX. Input **"High oil temperature alarm"** switch is active, after the alarm delay, it will report the **"High OT switch"** alarm. |
| E20 | Low water level switch | When the controller detects that the AUX. Input **"Low coolant level alarm"** switch is active, after the alarm delay, it will report the **"Low water level switch"** alarm. |
| E21 | Fail To Start | If the number of cranks exceeds the predetermined number of cranks, the **"Fail To Start"** will be reported if the start-up of the generating unit is still unsuccessful. |
| E22 | RPM Signal lost | When the controller parameter "**Action if RPM lost**" is set to "**Alarm and stop**", the detected speed value is 0, after the alarm delay, it will report the "**RPM Signal lost**" alarm. |
| E23 | Fail To Stop -RPM | When the controller detects that the speed is not "0" after the execution of the shutdown, it will report the "**Fail To Stop-RPM**" alarm. |
| E24 | Fail To Stop-Oil pres | When the controller detects that the oil pressure switch has not returned after the stop, it will report the "**Fail To Stop-Oil pres**" alarm. |
| E26 | Fail To Stop-Oil pres | When the controller detects that the Oil Pressure is not "0" after the execution of the shutdown, it will report the "**Fail To Stop-Oil pres**" alarm. |
| E27 | Gens close fail | When the controller gens close output, controller does not detect the " **Gens close signal**" within the alarm time, it will report the **"Gens close fail"** alarm. |
| E28 | Gens open fail | When **"Action if gens open fail "** is set to **"Trip and stop"** the controller gens open output, controller does not detect the " **Gens open signal**" with in the alarm time, it will report the **"Gens open fail"** alarm. |

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|---|---|---|
| E29 | Mains close fail | When the controller mains close output, controller does not detect the " **Mains close signal**" within the alarm time, it will report the **"Mains close fail"** alarm. |
| E30 | Mains open fail | When **"Action if mains open fail "** is set to **"Trip and stop"** the controller mains open output, controller does not detect the " **Mains open signal**" within the alarm time, it will report the **"Mains open fail"** alarm. |
| E32 | Fuel level sensor open | When the controller parameter "**Action if Fuel level sensor disconnected**" is set to "**Alarm and stop**", When the Fuel level sensor is detected to be disconnected, it will report the **"Fuel level sensor open"** |
| E34 | Low fuel level switch | When the controller detects that the AUX. Input **"Low Fuel level alarm"** switch is active, after the alarm delay, it will report the **"Low fuel level switch"** alarm. |
| E38 | Instant unload switch | When the controller detects that the AUX. Input "**External instant trip and stop alarm input"** switch is active, after the alarm delay, it will report the **"Instant unload switch"** alarm. |
| E39 | Instant alarm switch | When the controller detects that the AUX. Input "**External instant alarm input"** switch is active, after the alarm delay, it will report the **"Instant alarm switch"** alarm. |
| E42 | Non-balance of current | When the controller parameter **"Non-balance current action"** is set to **"Trip and stop"**, the controller is 2 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 "**Non-balance current ratio Alarm**". after the alarm delay, it will report the "**Non-balance of current**" alarm. |
| E43 | Over power | When the controller parameter **"Over power action"** is set to **"Trip and stop"**, the controller detects that the generator power is higher than "**Over total power Alarm**", after the alarm delay, it will report the "**Over power**" alarm. |
| E45 | Phase Sequence Wrong | When the controller parameter "**Phase Sequence Wrong**" is set to **"Alarm and stop"**, detects that the generator "**Phase Sequence Wrong**" , it will report the **"Phase Sequence Wrong"** alarm. |
| E46 | 1st maintain end | When the controller parameter **"Primary maintenance expire"** is set to **""Alarm and stop"**, when the primary countdown to maintenance is detected as "0" or primary maintenance date less than current date, it will report the "**1st maintain end**" alarm. |
| E47 | 2nd maintain end | When the controller parameter "**Secondary** |

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|---|---|---|
| | | **maintenance expire**" is set to "**Alarm and stop**", when the secondary countdown to maintenance is detected as "0" or second maintenance date less than current date, it will report the "**2nd maintain end**" alarm. |
| E48 | 3rd maintain end | When the controller parameter "**Third maintenance expire**" is set to "**Alarm and stop**", when the third countdown to maintenance is detected as "0" or third maintenance date less than current date, it will report the"**3rd maintain end**" alarm. |
| E49 | ECU Alarm | When the controller detects a alarm message from the ECU, after the alarm delay, an ECU alarm is reported (The corresponding ECU alarm code displayed). |
| E50 | ECU Comms. fail | When the controller parameter "**ECU failure**" Action is set to "**Alarm and stop**", and no message is received from the ECU within a fixed period of time, it will report **"ECU Comms.fail"** alarm. |
| E51 | Louver opening exception | When opening the Louver control , the controller detects that the AUX. Input **"Louver status input"** switch is inactive, after the alarm delay, it will report the **"Louver opening exception"** alarm. |
| E53 | Fail To Stop-D+ | When the controller detects that the D+ is not "0" after the execution of the shutdown, it will report the **"Fail To Stop-D+"** alarm. |
| E54 | Fail To Stop-Hz | When the controller detects that the frequency is not "0" after the execution of the shutdown, it will report the "**Fail To Stop-Hz**" alarm. |
| E55 | Over current | When the controller parameter "**Action in case of over current"** is set to **"Trip and stop"**, the controller detects that the generator current is higher than **"Phase current over-load alarm"**, after the alarm delay, it will report the "**over current**" alarm. |
| E56 | Low fuel level sensor | When the controller parameter **"Low fuel level Sensor Alarm Action"** is set to **"Alarm and stop"**, detected sensor less than the **"Alarm Threshold"**, after the alarm delay, it will report the "**Low fuel level sensor**"alarm. |
| E72 | Mains over frequency | When the controller detects that the mains frequency is higher than "**Mains over frequency alarm**", after the alarm delay, it will report the **"Mains Over frequency"** alarm. |
| E73 | Mains under frequency | When the controller detects that the Mains frequency is lower than "**Mains under frequency alarm**", after the alarm delay, it will report the **"Mains under frequency"** alarm. |
| E74 | Mains over voltage | When the controller detects that the Mains voltage is higher than "**Mains over voltage alarm**", after the alarm delay, it will report the **"Mains over voltage"** alarm. |

| | | |
|---|---|---|
| E75 | Mains under voltage | When the controller detects that the Mains voltage is lower than "**Mains Under voltage alarm**", after the alarm delay, it will report the **"Mains under voltage"** alarm. |
| E79 | Broken fan belt | When the controller detects that the AUX. Input "**Broken fan belt input"** switch is active, after the alarm delay, it will report the **"Broken fan belt"** alarm. |
| E81 | Host Comms. fail | When the controller working mode is set to **"Slave mode"**,and no message is received from the **Host** within a fixed period of time, it will report **"Host Comms. fail"** alarm. |
| E82 | Alternative config conflict | When the controller detects that several "**Alternative config conflict**"are valid before startup or during operation, it will report the **"Alternative config conflict"** alarm. |
| E83 | AUX.Sensor 1 low | When the controller parameter "**Sensor alarm Action** " is set to "**Alarm and stop**", and the controller detects that the sensor value is lower than "**Alarm Threshold**", after the alarm delay, it will report the "**AUX.Sensor low**" alarm. |
| E84 | AUX.Sensor 2 low | |
| E85 | AUX.Sensor 3 low | |
| E86 | AUX.Sensor 4 low | |
| E87 | AUX.Sensor 5 low | |
| E88 | AUX.Sensor 6 low | |
| E89 | AUX.Sensor 1 high | When the controller parameter "**Sensor alarm Action** " is set to "**Alarm and stop**", and the controller detects that the sensor value is higher than "**Alarm Threshold**", after the alarm delay, it will report the "**AUX.Sensor low**" alarm. |
| E90 | AUX.Sensor 2 high | |
| E91 | AUX.Sensor 3 high | |
| E92 | AUX.Sensor 4 high | |
| E93 | AUX.Sensor 5 high | |
| E94 | AUX.Sensor 6 high | |
| E95 | AUX.Sensor 1 Disconnect | When the controller parameter "**Action if sensor disconnected**" is set to "**Alarm and stop**", When the sensor is detected to be disconnected, after the alarm delay, it will report the "**AUX.Sensor Disconnect**" alarm. |
| E96 | AUX.Sensor 2 Disconnect | |
| E97 | AUX.Sensor 3 Disconnect | |
| E98 | AUX.Sensor 4 Disconnect | |
| E99 | AUX.Sensor 5 Disconnect | |
| E100 | AUX.Sensor 6 Disconnect | |
| E101 | Fuel leakage | When the controller detects that the AUX. Input "**Fuel leakage alarm input"** switch is active, after the alarm delay, it will report the **"Fuel leakage"** alarm. |
| E102 | AUX.Input 1 fault | When the controller detects that the **"AUX. Input"** switch is active,after the alarm delay, it will report the **"AUX.Input "** alarm. |
| E103 | AUX.Input 2 fault | |
| E104 | AUX.Input 3 fault | |
| E105 | AUX.Input 4 fault | |
| E106 | AUX.Input 5 fault | |

| | | |
|---|---|---|
| E107 | AUX.Input 6 fault | |
| E108 | AUX.Input 7 fault | |
| E109 | AUX.Input 8 fault | |
| E110 | Earth Fault | When the controller parameter **"Earth Fault"** Action is set to **"Trip and stop",** and the detected earth current of the generator set is greater than the set Earth fault value, it will report the **"Earth Fault"** alarm. |

◆**Trip Warning**

**Note:** When a fault occurs, the warning indicator light is always on, and the current fault interface displays a warning statement, but trips without stopping the machine.

| | | |
|---|---|---|
| A 38 | Gens close fail trip and running | When the controller gens close output, controller does not detect the " **Gens close signal**" within the warning time, it will report the **"Gens close fail"** warning. |
| A 39 | Gens open fail trip and running | When **"Action if gens open fail "** is set to **"Trip and running"** the controller gens open output, controller does not detect the " **Gens open signal**" with in the warning time, it will report the **"Gens open fail"** warning. |
| A 40 | Mains close fail trip and running | When the controller mains close output, controller does not detect the " **Mains close signal**" within the warning time, it will report the **"Mains close fail"** warning. |
| A 41 | Mains open fail trip and running | When **"Action if mains open fail "** is set to **"Trip and running"** the controller mains open output, controller does not detect the " **Mains open signal**" within the warning time, it will report the **"Mains open fail"** warning. |
| A 51 | Over current Trip and running | When the controller parameter "**Action in case of over current"** is set to **"Trip and running"**, the controller detects that the generator current is higher than **"Phase current over-load warning"**, after the warning delay, it will report the "**over current**" warning. |
| A14 | Non-balance of current Trip and running | When the controller parameter **"Non-balance current action"** is set to **"Trip and running"**, the controller is 2 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 "**Non-balance current ratio warnin**g". after the warning delay, it will report the "**Non-balance of current**" warning. |
| A 35 | Over power | When the controller parameter **"Over power action"** is set to **"Trip and running"**, the controller detects that the generator power is |

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| | | higher than "**Over total power warning**", after the warning delay, it will report the "**Over power**" warning. |
| A25 | Instant unload switch | When the controller detects that the AUX. Input "**External instant unload input**" switch is active, after the warning delay, it will report the **"Instant unload switch"**. |
| A 96 | Earth Fault | When the controller parameter **"Earth Fault"** Action is set to "**Trip and running**", and the detected earth current of the generator set is greater than the set Earth fault value, it will report the **"Earth Fault"** warning. |

## 12. Parameters setting

◆ **Enter the edition page**

Please set the parameters according to below steps:

1) In the stop mode, please and simultaneously, then loose so that you can come to password interface, the default password is "**07623**".

2) Press and add number 1, press to reduce number 1, press to turn the digit into right, press to turn the digit into left, press once done. Then system comes 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.

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

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

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

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

7) Press to revert back to last class 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"t be saved if the user didn’t press OK and STOP to confirm the setting.

◆ **Parameter list.**

**1)Delay time setting**

| No | Parameter | Range***(default)*** | Notes |
|---|---|---|---|
| 1 | Start delay | 0-65000s***(5s)*** | The time during the genset starts after the remote signal is valid. |
| 2 | Stop delay | 0-65000s ***(10s)*** | The time from when the remote start signal is invalid to when the unit stops. |
| 3 | Preheat time | 0-6500.0s ***(0.0s)*** | The time needed to be preheated before the starter on power. |
| 4 | Fuel output delay | 0-60.0s***(2.0s)*** | The output time of fuel valve relay before crank. |
| 5 | Cranking time | 3.0-60.0s ***(8.0s)*** | The time when the starter is on power. |
| 6 | Crank rest time | 3.0-60.0s ***(10.0s)*** | If crank failure, the waiting time before the second test time. |
| 7 | 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 and over speed. |
| 8 | Start idle time | 0-3600.0s ***(5.0s)*** | Idle running time when crank successfully. |
| 9 | Warming-up time | 0-3600.0s ***(10.0s)*** | The time needed for loading. |
| 10 | 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. |
| 11 | Stop idle time | 0-3600.0s ***(5.0s)*** | Idle-speed running time. |
| 12 | E.T.S. hold time | 0-600.0s ***(10.0s)*** | Stop solenoid on power time. |
| 13 | 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. |
| 14 | Normal alarm delay | 1.0-20.0s ***(5.0s)*** | The alarm delay except for over speed and over frequency |
| 15 | Normal warning delay | 1.0-20.0s ***(2.0s)*** | The warning delay. |
| 16 | Pulse speed up delay | 0.1－60.0s ***(0.1s)*** | The interval time of the pulse speed up relay change. |
| 17 | Pulse speed down delay | 0.1－60.0s ***(0.1s***) | The interval time of the pulse speed down relay change. |
| 18 | Closing output time | 1.0-10.0s ***(5.0s)*** | Gens Closing output and Opening output time, when it is 10s, it is regarded as continuous output. |
| 19 | Opening output time | 1.0-10.0s ***(3.0s)*** | |
| 20 | Close times | 1-10 ***(1 time)*** | Sets the maximum number of closures allowed. |
| 21 | Close interval time | 0-3600.0s***(5.0s)*** | The interval between re-closure. |
| 22 | Gens closing delay | 0-3600.0s***(1.0s)*** | The time from Mains to Gens. |
| 23 | Mains closing delay | 0-3600.0s***(1.0s)*** | The time from Gens to Mains. |
| 24 | 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. |
| 25 | Alarm data Interval | 0.5－60.0s | During alarm status: Record real-time data |

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|---|---|---|---|
| | | ***(1s)*** | intervals. |
| 26 | Standby Memory Interval | 1.0－600s***(60s)*** | The time interval at which detailed data is logged to an external storage device (USB, TF) during standby. |
| 27 | Running Memory Interval | 1.0－600s***(1s)*** | The time interval at which detailed data is recorded to an external storage device (USB, TF) during running. |

**2)Engine setting**

| No | Parameter | Range***(defaults)*** | | Notes |
|---|---|---|---|---|
| 1 | CAN Protocol | ***0- Disabled***<br>1: J1939<br>2: Cummins ISB<br>3: Cummins-CM850<br>4: Cummins QSX15-CM570<br>5: Cummins-CM850-PCC13X<br>6: Cummins-DCEC-QSZ13<br>7: Cummins-CCEC-QSN<br>8: Perkins<br>9: Perkins-1100<br>10: Volvo<br>11: **.....**193:Zenith ECU | | Built-in more than 190 ECU communication protocols, **11~193 CAN protocol** (**please refer to the detailed list**)<br><br>CAN protocol Option : the Engine parameters like RPM, oil pressure, water temperature are all from ECU data after choosing the relative protocol. |
| 2 | Flywheel teeth | 0-300***(0)*** | If the setting is 0, (RPM sensor Disabled), then RPM is resulted by Hz. | |
| 3 | Rotation speed setting | Rated RPM | 500-4500RPM ***(1500)*** | Choose the meter range and calculate the alarm value.<br>The number of the flywheel teeth is not 0 before checking the speed loss action. |
| | | Action if RPM lost | ***Warning*** Alarm and stop | |
| | | Loss of Speed Signal | 0-3600.0s***(5.0s)*** | |
| 4 | Engine over speed setting | Warning value | 0-200%***(107%)*** | Sets the generator rated speed percentage. Disables the generator over speed alarm when set to 200. |
| | | Warning delay | 0-3600.0s***(5.0s)*** | |
| | | Alarm value | 0-200%***(114%)*** | |
| | | Alarm delay | 0-3600.0s***(2.0s)*** | |
| 5 | Engine under speed setting | Warning value | 0-200%***(86%)*** | Sets the generator rated speed percentage. Disables the generator under speed alarm when the set value is 0. |
| | | Warning delay | 0-3600.0s***(5.0s)*** | |
| | | Alarm value | 0-200%***(80%)*** | |
| | | Alarm delay | 0-3600.0s***(3.0s)*** | |
| 6 | Battery setting | Rated voltage | 8.0-36.0V ***(24.0V)*** | Used to calculate the battery voltage alarm value. |
| | | Charging start | 8.0-30.0***(25.6V)*** | When the battery voltage is lower than start value and remains 10s under non-running status, then the relay is opened. When it is higher than the close value and remains 20Min, relay is closed. Once coming into running mode, there is no output. |
| | | Charging stop | 10.0-36.0 ***(27.8V)*** | |
| | | Charger warning | 1.0-30.0V ***(30.0V)*** | Detects D+ and B+ when their difference, and disables the charge |

| | | | | |
|---|---|---|---|---|
| | | Charger warning delay | 0-3600.0s ***(10.0s)*** | failure warning when set to 30. |
| 7 | Over battery voltage setting | Warning value | 0-200%***(135%)*** | Sets the percentage of rated battery voltage. Disables the battery over voltage warning when set to 200. |
| | | Warning delay | 0-3600.0s ***(60.0s)*** | |
| 8 | Under battery voltage setting | Warning value | 0-200%***(67%)*** | Sets the percentage of rated battery voltage. Disables the battery under voltage warning when the set value is 0. |
| | | Warning delay | 0-3600.0s ***(60.0s)*** | |
| 9 | Manual crank times | 1-30 ***(1 time)*** | Crank times under mode and test mode. | |
| 10 | Auto start crank times | 1-30 ***(3 times)*** | Crank times under auto mode. | |
| 11 | 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 ". | |
| 12 | Crank disconnect | RPM<br>Frequency<br>Oil pressure<br>***RPM/Frequency***<br>RPM/Oil Pressure<br>Frequency/Oil Pressure<br>RPM/Frequency/Oil press. | 1.If there is no oil pressure sensor, please don"t choose the type.<br>2.Oil pressure switch input is not the crank condition<br>3.Please check if the running status, stop condition are according with crank condition.<br>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. | |
| 13 | Crank disconnect conditions | Frequency | 0-200% ***(28%)*** | According to the judgement of starting success conditions, the judgement conditions are met, the starting is considered successful, and the crank disconnect. |
| | | RPM disconnect | 0-200% ***(24%)*** | |
| | | D+ disconnect | 3.0-32.0V ***(8.0V)*** | |
| | | Oil pressure disconnect | 0-400kpa***(200kpa)*** | |
| | | Oil pressure delay | 0-20.0s ***(0.0s)*** | |
| 14 | Pre-oil supply setting | Oil pressure stop | 50-600kpa***(200kpa)*** | When the oil pressure value is greater than the set value, the pre-oil supply stopped. |
| | | Longest delay | 0-180.0s ***(0.0s)*** | |

**3)Gens setting**

| No | Parameter | Range***(defaults)*** | Notes |
|---|---|---|---|
| 1 | Gens AC system | Disable<br>1 phase 2 wire<br>2 phase 3 wire<br>3 phase 3 wire<br>***3 phase 4 wire*** | Gens phases:<br>No bus parameters can be displayed if setting as disable, which is applied to water pump Bus. |
| 2 | Gens poles | 2-64***(4)*** | When the flywheel teeth are set as 0, the RPM will be resulted by frequency. (Calculation formula RPM=F*120/N) |

| | | | | |
|---|---|---|---|---|
| 3 | Rated phase voltage | 30-30000V ***(230V)*** | Setting bus phase voltage to choose the meter range and calculate the alarm value. | |
| 4 | Gens Volt. Trans.(PT) set | Volt. Trans.(PT) | ***0-Disable*** 1- Enable | Whether to open the voltage transformer function. |
| | | Volt.Primary(PT) | 30-30000V ***(10000V)*** | Voltage transformer primary voltage. |
| | | Volt.Secondary (PT) | 30-1000V ***(100V)*** | Voltage transformer secondary voltage. |
| 5 | Gens over voltage setting | Warning value | 0-200% ***(112%)*** | Sets the generation rated voltage percentage. Disables the generation over voltage alarm when the setting is 200. |
| | | Warning delay | 0-3600.0S***(5.0S)*** | |
| | | Alarm value | 0-200% ***(120%)*** | |
| | | Alarm delay | 0-3600.0s***(3.0s)*** | |
| 6 | Gens under voltage setting | Warning value | 0-200% ***(90%)*** | Sets the generation rated voltage percentage. Disables the generation under voltage alarm when the setting is 0. |
| | | Warning delay | 0-3600.0S***(5.0S)*** | |
| | | Alarm value | 0-200% ***(80%)*** | |
| | | Alarm delay | 0-3600.0s***(3.0s)*** | |
| 7 | Rated frequency | 40.0-80.0Hz ***(50.0Hz)*** | Setting bus rated frequency to choose the meter range and calculate the alarm value. | |
| 8 | Gens over freq setting | Warning value | 0-200% ***(110%)*** | Sets the freq percentage of power generation over freq. Disable the over freq alarm when the setting is 200. |
| | | Warning delay | 0-3600.0S***(5.0S)*** | |
| | | Alarm value | 0-200% ***(114%)*** | |
| | | Alarm delay | 0-3600.0s***(2.0s)*** | |
| 9 | Gens under freq setting | Warning value | 0-200% ***(90%)*** | Sets the generation under freq percentage. Disable the generation under freq alarm when the setting is 0. |
| | | Warning delay | 0-3600.0S***(5.0S)*** | |
| | | Alarm value | 0-200% ***(80%)*** | |
| | | Alarm delay | 0-3600.0s***(3.0s)*** | |
| 10 | Action if gens close fail | 0:Warning ***1:Trip and stop*** 2:Trip and running | Action if bus load close fail, unit will trip and stop. | |
| 11 | Action if gens open fail | 0:Warning ***1:Trip and stop*** 2:Trip and running | Action if bus unload open fail, unit will trip and stop. | |
| 12 | Loss of Phase | 0-Disable ***1- Enable*** | Monitor the phase loss of the Gens. | |
| 13 | Phase Sequence | ***0- Disable*** 1-Warning 2-Alarm and stop | Monitor whether the phase sequence is normal. | |
| 14 | Harmonic Display | ***0-Disable*** 1- Enable | When enabled, the homepage displays the harmonics of generation. | |

**4)Mains setting**

| No | Parameter | Range ***(defaults)*** | Notes |
|---|---|---|---|
| 1 | Mains options | Disable ***AMF*** Display only | Select the mains function, if disabled it will no longer detect and display mains related parameters. |
| 2 | Mains AC system | 1 phase 2 wire 2 phase 3 wire | Mains phases: No mains parameters can be displayed if setting |

| | | | | |
|---|---|---|---|---|
| | | 3 phase 3 wire<br>***3 phase 4 wire*** | as disable, which is applied to water pump mains set. | |
| 3 | Mains rated phase voltage | 30-30000V<br>***(230V)*** | Setting mains phase voltage to choose the meter range and calculate the alarm value. | |
| 4 | Mains rated frequency | 40.0-80.0Hz<br>***(50.0Hz)*** | Setting mains rated frequency to choose the meter range and calculate the alarm value. | |
| 5 | Mains normal time | (0-3600)s***(10s)*** | The delay from mains abnormal to normal. | |
| 6 | Mains abnormal time | (0-3600)s***(5s)*** | The delay from mains normal to abnormal. | |
| 7 | Mains volt.Trans.(PT) set | Volt. Trans.(PT) | ***0-Disable***<br>1- Enable | Whether to open the voltage transformer function. |
| | | Volt.Primary(PT) | 30-30000V<br>***(10000V)*** | Voltage transformer primary voltage. |
| | | Volt.Secondary (PT) | 30-1000V<br>***(100V)*** | Voltage transformer secondary voltage. |
| 8 | Mains over voltage setting | Alarm value | 0-200%***(120%)*** | Sets the percentage of the mains voltage rating.<br>Setting a value of 200 disables the mains overvoltage alarm. |
| | | Alarm delay | 0-3600.0S***(3.0S)*** | |
| 9 | Mains under voltage setting | Alarm value | 0-200%***(120%)*** | Sets the percentage of the mains voltage rating.<br>Setting a value of 0 disables the mains under voltage alarm. |
| | | Alarm delay | 0-3600.0S***(3.0S)*** | |
| 10 | Mains over freq setting | Alarm value | 0-200%***(114%)*** | Sets the mains over-freq percentage.<br>A value of 200 disables the mains over-freq alarm. |
| | | Alarm delay | 0-3600.0S***(2.0S)*** | |
| 11 | Mains under freq setting | Alarm value | 0-200%***(80%)*** | Sets the mains under-frequency percentage.<br>A value of 0 disables the mains under-freq alarm. |
| | | Alarm delay | 0-3600.0S***(3.0S)*** | |
| 12 | Action if mains close fail | 0:Warning<br>***1:Trip and stop***<br>2:Trip and running | Action if mains load close fail, unit will trip and stop. | |
| 13 | Action if mains open fail | 0:Warning<br>***1:Trip and stop***<br>2:Trip and running | Action if mains unload open fail, unit will trip and stop. | |
| 14 | Loss of Phase | ***Loss of Phase 1***<br>Loss of Phase 2<br>Loss of Phase 3 | Set the phase loss condition to judge whether the mains is abnormal. | |

**5)Loading setting**

| No | Parameter | Range ***(default)*** | Notes |
|---|---|---|---|
| 1 | CT rate | 5-6000A/5A<br>***(500A/5A)*** | Used for setting genset CT primary current, secondary rated current 5A. |
| 2 | Rated phase current | 5-6000A***(500A)*** | Setting generator phase current to choose the meter range and calculate the alarm value. |

| | | | | |
|---|---|---|---|---|
| 3 | Current overload setting | Action if over current | Warning<br>***Trip and stop***<br>Trip and running | Mode of action for over current faults |
| | | Alarm value | 0-200% ***(100%)*** | Sets the percentage of rated current. Disables the over current alarm when the set value is 200. |
| | | Revert value | 0-200% ***(95%)*** | |
| | | Alarm 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. |
| | | 【inverse time】 | 0.1-36.0***(36.0)*** | This option will not take effect until the **[Over current delay]** is set to 0. The over current delay is inverse time, and the formula is **T=t/((IA/IT) -1)^2.** |
| 4 | Non-balance current setting | Action if non-balance current | Warning<br>***Trip and stop***<br>Trip and running | 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 faults delay), then non-balance current ratio warns, If the value is set as 100, then the alarm is disabled. |
| | | Alarm value | 10-100% ***(100%)*** | |
| | | Revert value | 10-100% ***(100%)*** | |
| 5 | Rated total power | 5-20000Kw<br>***（276Kw）*** | Set total power of generator to choose the meter range and calculate the average loading rate and alarm value. | |
| 6 | Power overload setting | Action if over power | Warning<br>***Trip and stop***<br>Trip and running | Mode of action for over power faults |
| | | Alarm value | 0-200% ***(100%)*** | Sets the percentage of rated power. Disables the overpower alarm when the set value is 200. |
| | | Revert value | 0-200% ***(95%)*** | |
| | | Alarm Delay | 0-3600.0s***(10s)*** | When this parameter is set to 0, the over power delay is the inverse time; if not, the over current delay is the time set for this parameter. |
| | | 【inverse time】 | 0.1-36.0***(36.0)*** | This option will not take effect until the **[Over total power delay]** is set to **0**. The over power delay is inverse time, and the formula is **T=t/((IA/IT) -1)^2.** |
| 7 | Earth Fault setting | Rated current | 0－100%***(10%)*** | Earth current fault related settings.<br>Disabled when Rated Current |
| | | CT rate | 5-6000A/5A<br>***(500A/5A)*** | |

| | | | | |
|---|---|---|---|---|
| | | Ratio | 0-1.6***(0.1)*** | Percentage is set to 0. |
| | | Action if earth fault | ***Warning***<br>Trip and stop<br>Trip and running | |
| 8 | Load rate based on | Current A<br>Active power kW<br>Apparent power kVA | Calculation basis for selecting generation load rate. | |

**6)Sensor setting**

| No | Parameters | Range***(defaults)*** | | Notes |
|---|---|---|---|---|
| 1 | AUX.SENSOR 1 | Users Configured name | Water Temperature Sensor | Related Settings Please refer to User Configurable Sensor Generality Settings |
| | | Sensor Type | ***1: Temperature type sensor*** | |
| | | Signal Type | ***1: Resistive type*** | |
| | | Display Unit | ***1:℃*** | |
| | | Curve Type | ***2:VDO 40-120℃*** | |
| | | Lower range limit | | |
| | | Upper range limit | | |
| | | Sensor Disconnect Action | ***1: Warning*** | |
| | | Alarm Action | ***2:Alarm and stop*** | |
| | | High Warn value | | |
| | | Low Warn Value | | |
| | | Warn Action Delay | | |
| | | High Alarm value | ***98℃*** | |
| | | Low Alarm Value | | |
| | | Alarm Action Delay | ***5.0S*** | |
| | | Users configured curve setting | | |
| 2 | AUX.SENSOR 2 | Users Configured name | Oil Pressure Sensor | Related Settings Please refer to User Configurable Sensor Generality Settings |
| | | Sensor Type | ***2: Pressure type sensor*** | |
| | | Signal Type | ***1: Resistive type*** | |
| | | Display Unit | ***2:kPa*** | |
| | | Curve Type | ***2:VDO 0-10Bar*** | |
| | | Lower range limit | | |
| | | Upper range limit | | |
| | | Sensor Disconnect Action | ***1: Warning*** | |
| | | Alarm Action | ***2:Alarm and stop*** | |
| | | High Warn value | | |
| | | Low Warn Value | | |
| | | Warn Action Delay | | |
| | | High Alarm Value | | |
| | | Low Alarm Value | ***103kpa*** | |
| | | Alarm Action Delay | ***5.0S*** | |

| | | | | |
|---|---|---|---|---|
| | | Users configured curve setting | | |
| 3 | AUX.SENSOR 3 | | Related Settings Please refer to User Configurable Sensor Generality Settings | |
| 4 | AUX.SENSOR 4 | | | |
| 5 | AUX.SENSOR 5 | | | |
| 6 | AUX.SENSOR 6 | | | |
| 7 | Heating Settings | Open Value | -50℃-300℃ ***(-50℃)*** | Heating Control Setting Minimum Disable |
| | | Close Value | -50℃-300℃ ***(-50℃)*** | |
| | | Maximum time | 0-7200Min ***(0Min)*** | |
| | | Associated connection Sensors | AUX.SENSOR1~6 | Associated Temperature Sensor Valid |
| 8 | Cooling Settings | Open Value | -50℃-300℃ ***(-50℃)*** | Cooling Control Setting Minimum Disable |
| | | Close Value | -50℃-300℃ ***(-50℃)*** | |
| | | Maximum time | 0-7200Min ***(0Min)*** | |
| | | Associated connection Sensors | AUX.SENSOR1~6 | Associated Temperature Sensor Valid |
| 9 | Fuel pump setting | Open Value | 0-100% ***(25%)*** | The fuel pump switches on when the fuel level is below the set value and lasts for 10s. The fuel pump switches off when it is higher than the set value and lasts 1s. Time minimum 0 disables the fuel pump output function. |
| | | Close Value | 0-100% ***(80%)*** | |
| | | Maximum fuel pump on time | 0-65000s ***(65000s)*** | |
| | | Filling detection | 0-600s ***(30S)*** | When the fuel pump is operating, if an increase in the sensor fuel level value of less than 3% is detected during this time, a fuel filler system fault warning is reported. |
| | | Tank volume | 0-10000L ***(0L)*** | |
| | | Associated connection Sensors | AUX.SENSOR1~6 | Associated Fuel Sensor Valid |
| 10 | Choke setting | Choke closing temperature | 20－200℃ ***(40℃)*** | Used to control the choke, which operates when the engine temperature falls below this setting. |
| | | Choke closing delay | 0－200.0s ***(3.0s)*** | Choke closing delay time. |
| | | Associated connection Sensors | AUX.SENSOR1~6 | Associated Temperature Sensor Valid |
| **User Configurable Sensor (1~6)Generality Settings** | | | | |
| Users Configured name | | 0: Disable ; 1:Users Configured sensor name; 2:Temperature sensor 3: Oil Pressure Sensor; 4: Fuel Level Sensor; | | |
| Sensor Type | | 0: Disable<br>1: Temperature type sensor | | |

| | | | |
|---|---|---|---|
| | 2: Pressure type sensor<br>3: Percentage sensor | | |
| Signal Type | 0: From ECU<br>1: Resistive type<br>2: Voltage type<br>3: Current type | | |
| Display Unit | Resistive type | 1:℃ 2:℉ | |
| | Voltage type | 1:Bar 2:kPa 3:PSI 4:MPa | |
| | Current type | 1:% 2:L | |
| Curve Type | Resistive type | Pressure type | 0:Disable<br>1:Users Configured Resistive Pressure Sensor<br>2:VDO 0-10Bar<br>3:MEBAY-003B<br>4:SGH<br>5:SGD<br>6:SGX<br>7:CURTIS<br>8:DATCON 10Bar<br>9:VOLVO-EC<br>10:3015237<br>11:WEICHAI 0-0.6Mpa<br>12:GENCON 0-10Bar |
| | | Temperature type | 0:Disable<br>1:Users Configured Resistive Temperature Sensor<br>2:VDO 40-120℃<br>3:MEBAY-001B<br>4:MEBAY-Mier<br>5:SGH<br>6:SGD<br>7:SGX<br>8:CURTIS<br>9:DATCON<br>10:VOLVO-EC<br>12:3015238<br>12:PT100<br>13:WEICHAI 40-120℃<br>14:GENCON 40-120℃<br>15:VDO -10-140℃ |
| | | Percentage | 0:Disable<br>1:Users Configured Resistive Percentage Sensor<br>2:0-100Ω 3:100-0Ω<br>4:0-107Ω 5:107-0Ω<br>6:0-180Ω 7:180-0Ω<br>8:10-180Ω 9:180-10Ω<br>10:10-120Ω 11:120-10Ω<br>12:0-90Ω 13:90-0Ω<br>14:0-30Ω 15:30-0Ω |

| | | | |
|---|---|---|---|
| | | | 16: 73-10Ω 17:240-33Ω<br>18:33-100Ω 19:0-200Ω<br>20:200-0Ω 21:0-190Ω<br>22:190Ω-0Ω 23:100Ω-33Ω |
| | Voltage type | 0: Disable<br>1: Users Configured voltage type<br>2: 0-5V<br>3: 0.5-4.5V | |
| | Current type | 0: Disable<br>1: Users Configured current type<br>2:4-20mA | |
| Lower/Upper Range limit setting | Pressure type sensor | 0-60MPa | |
| | Temperature type sensor | lower limit | -100 - 1000℃ |
| | | upper limit | -100 - 1000℃ |
| | Percentage sensor | lower limit | 0-200% |
| | | upper limit | 5-200% |
| Sensor Disconnect Action | 0:Disable 1:Warning 2:Alarm and stop | | |
| Alarm Action | 0: Warning 1:Alarm and stop 2:Warn/Alarm<br>3:Trip heat dissipation(valid only for temperature type sensors) | | |
| High Warn Value | 0 - 6000 | | |
| Low Warn Value | 0 - 6000 | | |
| Warn Action Delay | 0 - 6000s | | |
| High Alarm Value | 0 - 6000 | | |
| Low Alarm Value | 0 - 6000 | | |
| Alarm Action Delay | 0 - 6000s | | |
| Users configured curve setting | ***:Sensor curve can be Users Configured by panel buttons, resistance and according value should be input,MAX 15 groups ,MIN 2 groups.<br>Rule: resistance should be input from small to large.*** | | |

**7)input setting**

| No | Parameters | Range***(defaults)*** | Notes |
|---|---|---|---|
| 1 | AUX. INPUT 1 (Pin48) | ***20:Remote start (with load)*** | |
| 2 | AUX. INPUT 2 (Pin49) | ***3:High water temperature alarm switch*** | |
| 3 | AUX. INPUT 3 (Pin50) | ***2:Low oil pressure alarm switch*** | |
| 4 | AUX. INPUT 4 (Pin51) | ***0:Disable*** | |
| 5 | AUX. INPUT 5 (Pin52) | ***0:Disable*** | |
| 6 | AUX. INPUT 6 (Pin53) | ***0:Disable*** | |
| 7 | AUX. INPUT 7 (Pin54) | ***0:Disable*** | |
| 8 | AUX. INPUT 8 (Pin55) | ***0:Disable*** | |
| AUX. INPUT (1~8) setting | Function | 0-60 | **Fixed projects: Only fixed functions and valid methods can be selected** |
| | Valid Type | ***Normal close***<br>Normal open | |
| | Action | Warning | **Users Configured** |

| | | | |
|---|---|---|---|
| | | Alarm<br>Trip and running | **projects:** All options can be set when valid when **(Function 1: Users Configured)**.is selected. |
| | Point | Disable<br>Standby<br>From crank<br>From safety on<br>After rated running<br>Always | |
| | Delay | 0-3600S | |

**AUX. input function table**

**0. Disable.**
**1. Users Configured.**
**2. Low oil pressure alarm switch.**
**3. High water temperature alarm switch.**
**4. High oil temperature alarm switch.**
**5. Low water level warning switch.**
**6. Low water level alarm switch.**
**7. Low fuel level warning input.**
**8. Low fuel level alarm input.**
**9. Charging failure warning:** output when charging failure.
**10. External instant warning input.**
**11. External instant alarm input.**
**12. External trip and stop input.**
**13. External trip and running input.**
**14. Gens close/open input:** connect to the gens loading switch auxiliary point.
**15. Mains close/open Input:** connect to the mains loading switch auxiliary point.
**16. Louver status input.**
**17. Auto start disabled:** gens will not start if there are signal input whatever mains normal or not.
**18. Auto stop disabled:** gens will not stop if there are signal input whatever mains normal or not.
**19. Stop by radiator if high temperature:** The controller will shut down the gens after high speed cooling down delay when temperature is too high if this signal is valid and gens under normal running, the controller will shut down the gens directly if the signal is not valid.
**20. Remote start (with load):** the gens comes into start procession if this signal is valid and under auto mode.Closing with load.
**21. Soundproof alarm:** audio alarm output is disabled if there is signal output.
**22. Front face button disabled:** any button except for page button is disabled if there is signal output.
**23. Meter mode:** all output are disabled, alarm and warns are invalid. any button except for page button is disabled.
**24. Local/Remote control mode:** Remote control when input is valid: any button except for page button is disabled, LCD will display remote mode.Remote control of unit start/stop operation and monitoring of real-time unit parameters via RS485, USB and Ethernet only.When the input is invalid, Local control: the unit can only be controlled through the local panel for start/stop operation.
**25. Simulate Stop key:**An external button (automatic reset) can be connected, and the "STOP"key of the simulation panel can be pressed.
**26. Simulate Auto key:**An external button (automatic reset) can be connected, and the

"MANUAL"key of the simulation panel can be pressed.

27. **Simulate Manual key:**An external button (automatic reset) can be connected, and the "AUTO"key of the simulation panel can be pressed.
28. **Simulate Start key:**An external button (automatic reset) can be connected, and the "START"key of the simulation panel can be pressed.
29. **Simulate G-Load key:**An external button (automatic reset) can be connected, and the "Gens Close/On"key of the simulation panel can be pressed.
30. **Simulate M-Load key:**An external button (automatic reset) can be connected, and the "Gens Close/On"key of the simulation panel can be pressed.
31. **Remote start(without load):** the gens comes into start procession if this signal is valid and under auto mode,No closing with load.
32. **Preheat:**When the generator set enters the preheating state, when the input is valid, the generator set will always be in the preheating state.
33. **Gen Load Inhibit:**When the input is valid, the generator set will prohibit switching on.
34. **Mains Load Inhibit:**When the input is valid, the mains will prohibit switching on.
35. **Backlight off switch:**When the input is valid, the backlight of the controller LCD is turned off.
36. **Fuel leakage alarm input:**Connect the alarm output of the fuel leakage detection module. When it is effective, it will alarm and shut down.
37. **Raise Speed Pulse Input:** It is only applicable to the engine with EFI and speed regulation function enabled by ECU. When the can communication protocol is selected as "31:j1939-c", when the input is valid, the target engine speed increases (Speed increase or decrease step), and an external button (self-reset) can be connected to control the engine speed.
38. **Drop Speed Pulse Input:** It is only applicable to the engine with EFI and speed regulation function enabled by ECU. When the can communication protocol is selected as "31:j1939-c", when the input is valid, the target engine speed decreases (Speed increase or decrease step), and an external button (self-reset) can be connected to control the engine speed.
39. **Idle control:** When the input is valid, the engine enters the idle state, and there is no under voltage, Under frequency, and under speed protection at this time; When the input is invalid, the engine runs at the rated speed; An external self-locking button can be used to control the high and low speed of the engine.
40. **Lamp Test:** All LED indicators are illuminating when input is active.
41. **Reset Alarm:** Can reset shutdown alarm and trip alarm when input is active.
42. **Alarm shutdown prohibition** (War mode)**:** this mode, in addition to the "emergency shutdown", all other alarms are invalid.
43. **Alternative config 1:** Alternate configuration 1 and switch input active at the same time.
44. **Alternative config 2:** Alternate configuration 2 and switch input active at the same time.
45. **Alternative config 3:** Alternate configuration 3 and switch input active at the same time.
46. **DPF Regeneration Inhibit:**This input is used to override the ECU function and prevent the regeneration of the diesel particulate filter.
47. **DPF Regeneration:** This input is used to override the ECU function and activate the regeneration of the diesel particulate filter.
48. **First Priority:**When the cycle start function is on, the input is valid and the unit starts with priority.
49. **Broken fan belt input;**
50. **-60 Reserved.**

**8)Output setting**

| No | Parameters | | Range***(defaults)*** | Notes |
|---|---|---|---|---|
| 9 | AUX.OUTPUT 1 (Volts Free) Pin30,31 | Source | 0-110***(44:Mains close)*** | **Source:** Select the output source to control the state of the output.<br><br>See **AUX. Output function table** for details of all available functions.<br><br>**Polarity:** Select the AUX.OUTPUT polarity.<br><br>**De-Energise:** When the output source is true, the output deactivates.<br><br>**Energise:** When the output source is true, the output activates |
| | | Polarity | ***0-Energise***<br>1-De-Energise | |
| 10 | AUX.OUTPUT 2 (Volts Free) Pin32,33 | Source | 0-110***(40: Gens close)*** | |
| | | Polarity | ***0-Energise***<br>1-De-Energise | |
| 11 | AUX.OUTPUT 3 (DC Supply Out) Pin 8 | Source | 0-110***(36:E.S.T. hold)*** | |
| | | Polarity | ***0-Energise***<br>1-De-Energise | |
| 12 | AUX.OUTPUT 4 (DC Supply Out) Pin 9 | Source | 0-110***(15:Public warning output)*** | |
| | | Polarity | ***0-Energise***<br>1-De-Energise | |
| 13 | AUX.OUTPUT 5 (DC Supply Out) Pin 10 | Source | 0-110***(16: Public alarm output)*** | |
| | | Polarity | ***0-Energise***<br>1-De-Energise | |
| 14 | AUX.OUTPUT 6 (DC Supply Out) Pin 11 | Source | 0-110***(29:Idle speed control 1)*** | |
| | | Polarity | ***0-Energise***<br>1-De-Energise | |
| 15 | AUX.OUTPUT 7 (DC Supply Out) Pin 12 | Source | 0-110***(32:High speed control)*** | |
| | | Polarity | ***0-Energise***<br>1-De-Energise | |
| 16 | AUX.OUTPUT 8 (DC Supply Out) Pin 13 | Source | 0-110***(17:Audio alarm)*** | |
| | | Polarity | ***0-Energise***<br>1-De-Energise | |

**AUX. Output function table**

**0. Disable**
**1. Input 1 valid:** Action when input 1 is valid.
**2. Input 2 valid:** Action when input 2 is valid.
**3. Input 3 valid:** Action when input 3 is valid.
**4. Input 4 valid:** Action when input 4 is valid.
**5. Input 5 valid:** Action when input 5 is valid.
**6. Input 6 valid:** Action when input 6 is valid.
**7. Input 7 valid:** Action when input 7 is valid.
**8. Input 8 valid:** Action when input 8 is valid.
**9. Associated connection AUX.SENSOR 1 :** The association can users configured outputs of sensor 1 (Disconnect, warning, alarm, etc.).
**10. Associated connection AUX.SENSOR 2 :** The association can users configured outputs of sensor 1 (Disconnect, warning, alarm, etc.).
**11. Associated connection AUX.SENSOR 3 :** The association can users configured outputs of sensor 1 (Disconnect, warning, alarm, etc.).
**12. Associated connection AUX.SENSOR 4 :** The association can users configured outputs of sensor 1 (Disconnect, warning, alarm, etc.).
**13. Associated connection AUX.SENSOR 5 :** The association can users configured outputs of sensor 1 (Disconnect, warning, alarm, etc.).

14. **Associated connection AUX.SENSOR 6 :** The association can users configured outputs of sensor 1 (Disconnect, warning, alarm, etc.).
15. **Public warning output:** when there is any warning output.
16. **Public alarm output:** Action when genset common warning, common shutdown, common trips alarm.
17. **Audio alarm:** when there is any alarm output, the Audio controls.
18. **Preheat mode 1:** preheat before start.
19. **Preheat mode 2:** preheat before crank success.
20. **Preheat mode 3:** preheat after safety delay.
21. **Preheat mode 4:** preheat till speed-up end.
22. **Preheat mode 5:** preheat till speed-up end, but no preheat when motor starts.
23. **Louver control:** there is output once genset starts and stop till stable.
24. **Choke control:** choke will be started after crank success and off after delay.
25. **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.
26. **Fuel output:** output once gens starts and off till stable.
27. **Crank output:** output once cranking, no output in other mode.
28. **Genset running:** output under running, off once RPM is lower than cranking RPM. The crank success condition can be set.
29. **Idle speed control 1:** used for speed controller, there is output under idle but no output under high speed.
30. **Idle speed control 2:** used for speed controller, there is no output under idle but output under high speed.
31. **Speed-up control:** Output when entering high speed warm-up, and the output time is the high speed warm-up time.
32. **High speed control:** The output is valid after idle delay is completed, and the output is closed after high-speed heat dissipation.
33. **Speed-down control:** the output time is shutdown idle delay during shutdown idle or shutdown on power procession.
34. **Pulse speed up output:** the pulse shall be sent out in the interval of "Pulse speed up delay" under speed –up.
35. **Pulse speed down output：** the pulse shall be sent out in the interval of "Pulse speed down delay" under stop idle speed.
36. **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.
37. **Excitation output:** there is output during cranking procession and there is 2s output if there is no frequency under high speed status.
38. **Rated running:** there is output under rated running.
39. **Gens valid:** when there is voltage output between low voltage alarm revert value and high voltage alarm revert value, among which there is no output.
40. **Gens close:** continuous or pulse type according to time setting.
41. **Gens open:** continuous or pulse type according to time setting.
42. **Mains abnormal:** Outputs when the mains is judged to be abnormal;
43. **Mains normal:**Outputs when the mains is judged to be normal;
44. **Mains close:** continuous or pulse type according to time setting;
45. **Mains open:** continuous or pulse type according to time setting;
46. **Gens close fail:** Setting output based on Gens closing failure.
47. **Gens open fail:** Setting output based on Gens opening failure.
48. **Mains close fail:** Setting output based on Mains closing failure.
49. **Mains open fail:** Setting output based on Mains opening failure.

50. **Heating output:** output according to the heating condition setting;
51. **Cooling output:** output according to the cooling condition setting;
52. **Fuel pump output:** output according to fuel pump setting conditions;
53. **Oil pump control:** when the CAN protocol is Yuchai LMB. When the genset is in the standby state, the oil pump controls the output every 30 minutes. If the oil pressure is higher than 100kPa or the output is 1 minute (whichever comes first), the oil pump control output will stop; when the genset is in the preheating state, the oil pump control will always output.
54. **Battery charging control:** there is output if the voltage is lower than the preset value under standby status and shutdown after start and in running status.
55. **System in stop:** there is output under stop mode.
56. **System in manual:** there is output under manual mode.
57. **System in test:** there is output under test mode.
58. **System in auto:** there is output under auto mode.
59. **Public open unload:** Public unload of Gens and Mains.
60. **ECU power:** apply to electrical ECU engine, used for control ECU power.
61. **ECU stop:** apply to electrical ECU engine, used for control ECU shutdown.
62. **ECU warning:** there is a warn signal from ECU.
63. **ECU alarm:** there is an alarm signal from ECU.
64. **ECU communication failure alarm:** Cannot communicate with ECU.
65. **ECU communication failure warning:**Output when ECU Communication Failure Warning.
66. **Fail to start alarm:**Output when the engine fails to start.
67. **Stop failure alarm:**Output when the engine shutdown fails to alarm.
68. **Under battery voltage warning output :**Output when the battery voltage is low warning.
69. **Over battery voltage warning:**Output when the battery voltage is over warning.
70. **Charging failure warning:**Output when the engine charger fails to charge.
71. **Floating charger fault warning:**Output when the floating charger fails to charge.
72. **Emergency stop alarm:**Output when emergency stop alarm.
73. **Over speed warning:**Output when Over Speed Warning.
74. **Over speed output：** Output when Over Speed alarms.
75. **Under speed warning:**Output when engine under speed warning.
76. **Under speed alarm:**Output when engine under speed alarm.
77. **Speed signal lost warning:**Output when speed signal lost warning.
78. **Speed signal lost alarm:**Output when Speed signal lost alarm.
79. **Gens over frequency warning:**Output when over frequency warning.
80. **Gens over frequency alarm:**Output when over frequency alarm.
81. **Gens under frequency warning:**Output when under frequency warning.
82. **Gens under frequency alarm:**Output when under frequency alarm.
83. **Gens over voltage warning:**Output when over voltage warning.
84. **Gens over voltage alarm:**Output when over voltage alarm.
85. **Gens under voltage warning:**Output when under voltage warning.
86. **Gens under voltage alarm:**Output when under voltage alarm.
87. **Mains over voltage alarm:** Action when over-voltage.
88. **Mains under voltage alarm:** Action when under voltage.
89. **Mains over frequency alarm:** Action when over frequency.
90. **Mains under frequency alarm:** Action when under frequency.
91. **Over current warning:**Output when over current warning.
92. **Over current alarm:**Output when over current alarm.

93. **Non-balance current ratio warning:**Output when non-balance current ratio warning.
94. **Non-balance current ratio alarm:**Output when non-balance current ratio alarm.
95. **Over power warning:**Output when over power warning.
96. **Over power alarm:**Output when over power alarm.
97. **DPF Regeneration Inhibit Request:** when the output is active , the diesel particulate filter regeneration inhibit.
98. **DPF Regeneration Requested:** Outputs an indication when diesel particulate filter regeneration is requested;
99. **DPF Forced Regeneration:** When the output is valid: forced regeneration of the diesel particulate filter.
100. **DPF Regeneration In Progress:** Output indication when diesel particulate filter regeneration is in progress.
101. **Broken fan belt:** Output when Broken fan belt alarm.
102. **Alternative config 1 enable:** Output when alternate Alternative config 1 as valid.
103. **Alternative config 2 enable:** Output when alternate Alternative config 2 as valid.
104. **Alternative config 3 enable:** Output when alternate Alternative config 3 as valid.
105. **Phase Sequence alarm:** Output when Phase Sequence alarm.
106. **Alternative config conflict alarm:** Output when Alternative config conflict alarm.
107. **-110 Reserved.**

**9)CAN communication**

| NO | Parameter | Range***(default)*** | Notes |
|---|---|---|---|
| 1 | ECU failure | Disable<br>Warn<br>***Alarm and Stop*** | ECU communication failure. |
| 2 | ECU warning | Disable***/Enable*** | ECU warnings enable. |
| 3 | ECU alarm | Disable***/Enable*** | ECU alarms enable. |
| 4 | Mask SPN | 0-12 | Up to 12 sets of alarm codes can be input, and the controller will not respond to the input alarm codes. |
| 5 | Maximum speed value | 500-4500RPM **(2500RPM)** | Set the maximum speed for engine speed control. |
| 6 | RPM increase step | 1-200RPM ***(50RPM)*** | The step of engine speed is controlled by an external switch. |
| 7 | RPM reduction step | 1-200RPM ***(50RPM)*** | The step of engine speed is controlled by an external switch. |
| 8 | Rated idle speed | 500-4500rpm<br>***(750rpm)*** | ECU idle speed value. |
| 9 | Slow rise time | 0-120.0S***(5.0S)*** | The time of ECU from idling to high speed. |
| 10 | CAN Baud Rate | 0-Automatic detection<br>1-125Kbps<br>***2-250Kbps***<br>3-500Kbps | CAN communication rate |
| 11 | ECU speed control address | 00000000 — FFFFFFFF<br>***(0C000003)*** | For the TSC1 message ID address sent by the controller to the ECU. It is valid when the communication protocol is 31: J1939-C. |
| 12 | ECU speed control data | 00 00 00 00 00 00 00 00—<br>FF FF FF FF FF FF FF FF<br>***(01 xx xx 00 00 00 00 00)*** | For the message format of TSC1 speed control data sent by the controller to the ECU.It is valid when the communication protocol is 31: J1939-C. |

| | | | |
|---|---|---|---|
| 13 | ECU speed sending interval | 5-6000ms***(10ms)*** | The interval time of TSC1 speed control data message sent by the controller to the ECU.It is valid when the communication protocol is 31: J1939-C. |

**a） Configure Network (Only for DC92MR)**

| No | Parameter | Range***(defaults)*** | Notes |
|---|---|---|---|
| 1 | ET communication configuration | ***0:Disable***/1:Enable | Select whether to enable the ETHERNET interface. |
| 2 | Cloud monitoring settings | ***0:Disable***/1:Enable | Select whether to enable the cloud monitoring function of the ETHERNET interface. |
| 3 | Network protocol selection | ***1 -TCP***<br>2 -UDP<br>3 -SNMP | |
| 4 | TCPModbus settings | ***0:Disable***/1:Enable | Set whether the ETHERNET interface is connected to the controller via PC software. |
| 5 | TCP/TARP Port | 0-600***(502)*** | TCP/IP Modbus server dedicated port number or SNMP TARP port number |
| 6 | IP Set | DHCP settings | 0:Disable***/1:Enable*** |
| | | Local IP | 0-255***(192.168.0.111)*** |
| | | Subnet mask | 0-255***(255.255.255.0)*** |
| | | Default gateway | 0-255***(192.168.0.1)*** |
| | | DNS address | 0-255***(192.168.0.1)*** |
| 7 | Latitude and longitude set | East and west warp settings | ***0:East longitude***<br>1:Wast longitude |
| | | Set longitude | 0°-180°***(000.00000)*** |
| | | North and south latitude setting | 0:South latitude<br>***1:North latitude*** |
| | | Set latitude | 0°-90°***(000.00000)*** |
| | | Altitude | 0-9999m***(100.0m)*** |
| 8 | Running data upload interval | 10-170S***(10)*** | The interval between uploading data to the server while the generator is running. |
| 9 | Standby data upload interval | 90-170S***(90)*** | The interval between uploading data to the server while the generator is standby. |

**b） Module settings**

| NO | Parameter | Range***(default)*** | Notes |
|---|---|---|---|
| 0 | Language | 0-English<br>***1-简体中文***<br>2-繁体中文<br>3-Русский<br>4-Espanol<br>5-Türk dili<br>6-Français<br>7-Românesc<br>8-Polski<br>9-Português | Display language selection.<br>0: English, 1: Simplified Chinese,<br>2: Traditional Chinese, 3: Russian,<br>4: Spanish, 5: Turkish, 6: French, 7: Romanian,<br>8: Polish, 9: Portuguese, 10: German,<br>11: Korean, 12: Vietnamese,13:Arabic<br>14: Bahasa Indonesia, 15:Persian,<br>16:Ukrainian (language), 17:Italian. |

| | | | |
|---|---|---|---|
| | | 10-Deutsch<br>11-한국어<br>12-Tiếng Việt<br>13-بالعربية<br>14-Bahasa Indonesia;<br>15-فارسی<br>16-Укpаїна<br>17-Italiano | |
| 1 | User password | 00000-65535<br>***(07623)*** | Change the password. |
| 2 | RS485-1 Controller ID | 1-255***(16)*** | RS485-1 communication address.<br>**(Only for DC92DR,DC92MR)** |
| 3 | RS485-1 baud rate | 0-4800<br>1-9600<br>***2-19200***<br>3-38400<br>4-57600<br>5-115200 | RS485-1 communication baud rate.<br>**(Only for DC92DR,DC92MR)** |
| 4 | RS485-2 Controller ID | 1-255***(16)*** | RS485-2 communication address.<br>**(Only for DC92MR)** |
| 5 | RS485-2 baud rate | 0-4800<br>1-9600<br>***2-19200***<br>3-38400<br>4-57600<br>5-115200 | RS485-1 communication baud rate.<br>**(Only for DC92MR)** |
| 6 | Controller working mode | ***0-Host mode***<br>1-Slave mode | Slave mode can read and display parameters of slave controller through RS485-1 port. |
| 7 | Primary Modes | ***STOP***<br>Manual<br>Auto<br>Auto save | The primary modes on power, easy for user operation.<br>Note: auto record function can"t record the mode with load. |
| 8 | Start screen display time | 0-20.0s ***(2.0s)*** | Start screen display time,0: No-display. |
| 9 | Back lightness | 20-100% ***(80%)*** | Back lightness adjustment. |
| 10 | Saving mode | 5.0-6000.0s ***(600.0s)*** | LCD light will be closed automatically without any button pressed after delay. If setting as 6000.0s, back light always lighted. |
| 11 | 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. |
| 12 | LOGO delay display under standby | 5.0-6000.0<br>***(6000.0s)*** | Start screen will be opened without any button pressed after delay. If setting as 6000.0s: disabled. |
| 13 | ECU page | Disable/***Enable*** | Set whether the ECU page is displayed. |
| 14 | Display UI selection | Dark mode<br>Bright mode<br>***Auto memory*** | Set the default display mode of the display interface after the controller is powered on. |
| 15 | Display QR code | ***0-Disable***<br>1-Enable | Whether to display the QR code for Bluetooth connection; |

| | | | | |
|---|---|---|---|---|
| 16 | Cycle Start Setting | Priority Selection | ***0-Disable***<br>1-Host (Master)<br>2-Slave (Backup) | Refer to <<10.Special features description>> detailed description of Cycle Start. |
| | | Host Run Time | 0-3600*Min* ***(720)Min*** | |
| | | Slave Run Time | 0-3600*Min* ***(720)Min*** | |
| | | Comm. Port | ***0-MBC***<br>1-RS485-1 | |

**c） Working maintenance plan setting**

| No | Parameter | Range***(defaults)*** | Notes |
|---|---|---|---|
| 1 | Working plan format | ***Disable***<br>Every month<br>Every week | This mode must be under auto mode.<br>Working plan is disabled once setting as disable.<br>The working plan will be executed according the chosen date when setting as every month.<br>The working plan will be executed according the chosen date when setting as every week. |
| 2 | Maintenance date per month | From 1st to 31st<br>***Default: the first day*** | The date chosen for every month. |
| 3 | Maintenance date per week | Monday to Sunday<br>***Default: Sunday*** | The date chosen for every week. |
| 4 | Maintenance with load or not | ***Disable***/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***(5min)*** | Maintenance running time setting. |

**d） Duty Plan setting**

| No | Parameter | *Range****(default)*** | Notes |
|---|---|---|---|
| 1 | Working plan | ***Disable***<br>Enable 1: remote start<br>Enable 2: running always | Working plan start condition. |
| 2 | Start time | 00:00-23:59 ***(08:00)*** | The start time allowed. |
| 3 | End time | 00:00-23:59 ***(17:00)*** | 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. |

**e） Maintenance plan setting**

| No | Parameter | Range***(defaults)*** | | Notes |
|---|---|---|---|---|
| 1 | Primary Maintenance | Maintenance countdown | 0-5000h***(5000h)*** | Set the maintenance related action and time.<br><br>Set 5000 to disable the maintenance countdown timer function.<br><br>Set 2099/12/31 to |
| | | Maintenance date | 2000/01/01-***2099/12/31*** | |
| | | Maintenance Expire action | ***Warning***<br>Alarm and stop | |
| 2 | Secondary Maintenance | Maintenance countdown | 0-5000h***(5000h)*** | |
| | | Maintenance | 2000/01/01-***2099/12/31*** | |

| | | | | |
|---|---|---|---|---|
| | | date | | disable the expiration time maintenance. |
| | | Maintenance Expire action | ***Warning*** Alarm and stop | |
| 3 | Third Maintenance | Maintenance countdown | 0-5000h***(5000h)*** | When the maintenance countdown timer is used at the same time, the first-come condition prevails. |
| | | Maintenance date | 2000/01/01-***2099/12/31*** | |
| | | Maintenance Expire action | ***Warning*** Alarm and stop | |
| 4 | Maintenance expiry reset password | | 0-65535（***06869***） | When the maintenance countdown time arrives, enter the password to reset the maintenance countdown time, this password cannot be the same as the parameter setting password. |

**f） Data/time setting**

| No | Parameter | Range***(defaults)*** | Notes |
|---|---|---|---|
| 1 | Date/Time | 2000/01/01-***2099/12/31*** | Internal calendar, please calibrate regularly. |
| 2 | Current time | 00:00:00-23:59:59 | |
| 3 | Current week | Monday to Sunday | |
| 4 | Universal Time Coordinate | UTC+8 | Set the parameters based on the time zone. |

**g） Alternative config setting**

| No | Parameter | Range***(defaults)*** | Notes |
|---|---|---|---|
| 1 | Alternative config 1 | ***Disable***/ Enable | Sets whether Alternative config 1 is enabled. |
| 2 | Alternative config 2 | ***Disable***/ Enable | Sets whether Alternative config 2 is enabled. |
| 3 | Alternative config 3 | ***Disable***/ Enable | Sets whether Alternative config 3 is enabled. |
| Detailed list of Alternative config parameter settings (only via the host computer) | | | |
| Gens AC system; Mains AC system phases, various types of ratings, various types of warning values, various types of alarm values. | | | |

**◆ CAN Protocol Detailed Table**

| | |
|---|---|
| **0. Disabled** | **98. IsuZu 4J** |
| **1. J1939** | **99. Isuzu 4J T4f** |
| **2. Cummins ISB** | **100. Isuzu 4L** |
| **3. Cummins-CM850** | **101. Isuzu 6H** |
| **4. Cummins QSX15-CM570** | **102. Isuzu 6W** |
| **5. Cummins-CM850-PCC13X** | **103. Isuzu Tier 4 Final** |
| **6. Cummins-DCEC-QSZ13** | **104. Isuzu Tier 4 Final DOC Only** |
| **7. Cummins-CCEC-QSN** | **105. Iveco EDC7C1** |
| **8. Perkins** | **106. Iveco EDC7UC31** |

| | |
|---|---|
| 9. Perkins-1100 | 107. Iveco EDC62 |
| 10. Volvo | 108. Iveco T3 |
| 11. Volvo-EMS2 | 109. JCB DCM3.3 |
| 12. Volvo-EMS2b | 110. JCB DCM7.24 |
| 13. Volvo-EDC4 | 111. JCB DCM7.24 No SCR |
| 14. Scania | 112. John Deere |
| 15. Scania-kw2000 | 113. John Deere iT4 |
| 16. Scania-kw2k-coo | 114. John Deere T4f |
| 17. John Deere | 115. John Deere T4f CVT |
| 18. mtu-ADEC | 116. John Deere T4f NoDPF |
| 19. mtu-ADEC-SAM | 117. Kipor ECM |
| 20. mtu-ADEC-303 | 118. Kipor V ECM |
| 21. mtu-ADEC-304 | 119. KOEL |
| 22. BOSCH | 120. KOEL 6K |
| 23. GTSC1 | 121. KOEL HA2 |
| 24. MTSC1 | 122. KOEL K4300 |
| 25. YUCHAI-YCECU | 123. KOEL N |
| 26. Y&C ENGINE-YC6K | 124. Kohler HD |
| 27. WEICHAI-WISE15 | 125. Kohler KDI Stage V |
| 28. CHANGCHAI-ECU15 | 126. Kohler KDI Stage V SCR |
| 29. YUCHAI-LMB | 127. Kohler T4f |
| 30. MAN | 128. Kohler T4f + DPFREGST |
| 31. J1939-C | 129. Kohler T4f no DCU |
| 32. SDEC-H/D | 130. Kohler T4f no SCR |
| 33. SDEC-E | 131. Kubota ECU |
| 34. YTO | 132. Kubota LSI |
| 35. DEUTZ EMR2-2001 | 133. Kubota Stage V |
| 36. DEUTZ EMR2-2012 | 134. Kubota T4f DOC Only |
| 37. DEUTZ EMR3 | 135. Lombardini KDI |
| 38. DEUTZ EMR4 | 136. Mahindra BS4 |
| 39. NEVED ECU13 | 137. Mahindra N1 |
| 40. Cummins-CM2150 | 138. Mahindra NG |
| 41. Reserved | 139. Mahindra NG A46 |
| 42. Reserved | 140. MAN EDC17 |
| 43. Reserved | 141. MAN MFR |
| 44. Reserved | 142. MAXXFORCE |
| 45. Reserved | 143. MTU ADEC |

| | |
|---|---|
| 46. Reserved | 144. MTU ECU8 |
| 47. Reserved | 145. MTU ECU8 SAM |
| 48. Reserved | 146. MTU ECU9 |
| 49. Reserved | 147. MWM16 |
| 50. AgCo EEM4S5 | 148. Perkins 1300 |
| 51. Baudouin WISE10B | 149. Perkins 1600 |
| 52. Baudouin Wise15 | 150. Perkins A4E2 |
| 53. CAT A4E2 | 151. Perkins A4E4 A5E2 Dual ECU T4F |
| 54. CAT A4E2v2 | 152. Perkins A5E2 |
| 55. CAT A4E2v3.1 | 153. Perkins A5E2v2 |
| 56. CAT ADEM4 | 154. Perkins A6E2 |
| 57. CAT C3.4B T4f | 155. Perkins A6E2 EU3 |
| 58. Cummins CM558 | 156. Perkins A6E10 |
| 59. Cummins CM570 | 157. Perkins A6E11 |
| 60. Cummins CM570 Ind | 158. Perkins ADEM3 |
| 61. Cummins CM850 | 159. Perkins ADEM4 |
| 62. Cummins CM2150E | 160. Perkins EDC17C49 |
| 63. Cummins CM2250 | 161. Perkins Generic T4F Dual ECU |
| 64. Cummins CM2350 | 162. Powerlink Gas |
| 65. Cummins CM2350 G-Drive Stage | 163. PowerLink Gas V1 |
| 66. Cummins CM2350 G-Drive T4f | 164. PowerLink Gas V2 |
| 67. Cummins CM2350 Ind, Stage V | 165. PSI 4G |
| 68. Cummins CM2350 Ind | 166. PSI IAT |
| 69. Cummins CM2850 | 167. Scania E3 |
| 70. Cummins CM2880 G-Drive | 168. Scania OCE |
| 71. Cummins CM2880 Ind | 169. Scania S6 |
| 72. Cummins QSZ | 170. Scania S8 |
| 73. Daimler CPC4 | 171. Scania S8 Single |
| 74. Detroit DDEC | 172. Scania S8 Single-speed Stage V |
| 75. Deutz EMR2 | 173. Scania S8 SS Stage V HEST |
| 76. Deutz EMR3 | 174. Siemens NG |
| 77. Deutz EMR4 | 175. Sisu EEM3 |
| 78. Deutz EMR4 CVT | 176. Volvo EDC3 |
| 79. Deutz EMR5 | 177. Volvo EDC4 |
| 80. Doosan G2 Stage V | 178. Volvo EMS2 |
| 81. Econtrols GCP | 179. Volvo EMS2 VE |
| 82. FPT EDC7UC31 i T4 | 180. Volvo EMS2.3 |

| | |
|---|---|
| **83. FPT EDC17C49 T4B** | **181. Volvo EMS2.3 VE** |
| **84. FPT EDC17CV41** | **182. Volvo EMS2.4** |
| **85. FPT MD1CE101** | **183. Volvo EMS2b** |
| **86. FPT MD1CE101 Tier3** | **184. Weichai Wise 15** |
| **87. FPT MD1CS069** | **185. Weifu ECU** |
| **88. FPT MD1CS069 No SCR** | **186. Woodward SECM70** |
| **89. Generac STM Dual (SPTF-MotorT)** | **187. Yammar ECO** |
| **90. Generac STP Dua** | **188. Yanmar 4TN88G** |
| **91. Generic J1939** | **189. Yanmar T4F TNV** |
| **92. Generic Plus** | **190. Yanmar TNV Stage V** |
| **93. GM PSI** | **191. Yuchai ECU** |
| **94. Hatz EDC17** | **192. Yuchai ECU 1000rpm** |
| **95. Hatz EDC17 3K 1200 Idle** | **193. Zenith ECU** |
| **96. Hatz EDC17 SV** | |
| **97. Isuzu 4H** | |

## 13. Communication Ports

### ◆ ETHERNET PORT

Ethernet is used for point-to-point cable connection of more than one device and allows for connection to PCs, PLCs, Building Management Systems and SNMP Managers (to name just a few devices)

**MODBUS TCP**

One advantage of the Ethernet interface is the ability to interface into an existing LAN (Local Area Network) connection for remote connection via an internet connection. This allows for a large distance between the module and a PC running the DC92MR Configuration Suite software or any external device.The operator is then able to control the module, starting or stopping the engine, selecting operating modes, etc through various different means.

**SNMP**

The Ethernet port on the controller supports V2c of the Simple Network Management Protocol (SNMP) and is able to connect to two SNMP managers. SNMP is an international standard protocolfor managing devices on IP networks. It is used to monitor network-attached devices for conditions that warrant administrative attention.

Up to two administrative computers (SNMP managers) monitor the DC92MR module. Should an "event" occur, the DC92MR module reports information via SNMP TRAP messages to the SNMP manager. The SNMP TRAP messages that are sent are configured used the DC92MR Configuration Suite PC Software by the system integrator.

Additionally, the DC92MR module responds to GET / SET messages from the SNMP manager to allow the operating mode of the DC92MR module to be changed, or

instrumentation values to be retrieved. The SNMP manager knows how to communicate to the DC92MR module by using the .MIB file provided by DC92MR.

Many third party SNMP managers exist. MEBAY do not produce or supply SNMP managers.

The DC92MR MIB file for the controller is available upon request from the MEBAY Technical Support Department or by downloading it from the MEBAY website, http://www.mebay.cn

**UDP**
UDP has the disadvantage of not providing packet grouping, assembly and the inability to sort packets. UDP is fast because it does not have to establish a connection between the client and the server before transmitting the datagram and there are no mechanisms such as timeout retransmissions.

**Ethernet Cable Wiring Detail**
They can be purchased from any PC or IT store.

**Connection 1- T568B**

| Pin | Color |
|---|---|
| 1 | white /orange |
| 2 | orange |
| 3 | white /green |
| 4 | blue |
| 5 | white /blue |
| 6 | green |
| 7 | white /brown |
| 8 | brown |

**Connection 2- T568B**

| Pin | Color |
|---|---|
| 1 | white /orange |
| 2 | orange |
| 3 | white /green |
| 4 | blue |
| 5 | white /blue |
| 6 | green |
| 7 | white /brown |
| 8 | brown |

**◆ USB SLAVE PORT(Type-B)**
The USB port is provided to give a simple means of connection between a PC and the controller. Using the DC92MR Configuration Suite Software, the operator is then able to control the module, starting or stopping the engine, selecting operating modes, etc.
Additionally, the various operating parameters (such as coolant temperature, oil pressure, etc.) of the engine are available to be viewed or changed.

To connect a module to a PC by USB, the following items are required:
DC92X Controller

DC92X Configuration Suite PC Software
USB cable Type A to Type B.
(This is the same cable as often used between a PC and a USB printer)

**◆ USB HOST PORT(Type-A)**
USB Type A connection for an of external USB storage device of maximum 32 GB for instrumentation data update.

**◆ TF card port**
TF card supports up to 32 GB of external storage devices for the controller to record running data in real time.

**Insert the USB disk to achieve the function:**
1. Import and export function of controller configuration parameters
2. View the DC92x.tab configuration parameter file in the USB flash drive.
3. Load the DC92x.tab format configuration file to the controller.
4. Save the controller configuration parameters to the corresponding DC92x.tae file.
5. Save a new configuration file (DC92x.tae).

**Real-time running data storage (USB and TF card support):**
The data is stored in a .csv file with year and month as folder name and year, month and day as file name. The unit stores data every minute in standby mode and every second in other modes. If the storage space of USB memory stick is less than or equal to 200MB, the earliest stored data file of a month will be deleted. The stored data file is shown in the figure below:

**◆ RS485 PORT**
The RS485 port on the controller supports the MODBUS RTU protocol and is for connection to a single MODBUS master device only.

RS485 is used for point-to-point cable connection of more than one device (maximum 32 devices) and allows for connection to PCs, PLCs and Building Management Systems.

One advantage of the RS485 interface is the large distance specification. The operator is then able to control the module, starting or stopping the engine, selecting operating modes, etc.

The various operating parameters (such as coolant temperature, oil pressure, etc.) of the remote engine are viewed or changed.

Many PCs are not fitted with an internal RS485 serial port. DOES NOT recommend the use of USB to RS485 convertors can recommend PC add-ons to provide the computer with an RS485port.

**◆ MBC port**

NOTE: The MBC Port communication port is only applicable when the DC92x application is active on the DC92x module.

The standard configuration of the module is a CAN interface with built-in MEBAY communication protocol. It realizes the functions of unit communication, external expansion, and master and backup power-up.

### ◆ CAN PORT

NOTE: The CAN Port communication port is only applicable when the DC92x application is active on the DC92x module.

The modules are fitted with a CAN interface as standard and are capable of receiving engine data from engine ECU compliant with the CAN J1939 standard.

ECU monitor the engine"s operating parameters such as speed, oil pressure, coolant temperature (among others) in order to closely monitor and control the engine. The industry standard communications interface (CAN) transports data gathered by the engine"s ECU/ECM using the J1939 protocol. This allows engine controllers such as DC92X to access these engine parameters with no physical connection to the sensor device.

The ECU Port is used for point-to-point cable connection of more than one device and allows for connection to CAN Scanner, PLC and CAN controllers (to name just a few devices). The operator is then able to view the various operating parameters.

### ◆ Bluetooth control function

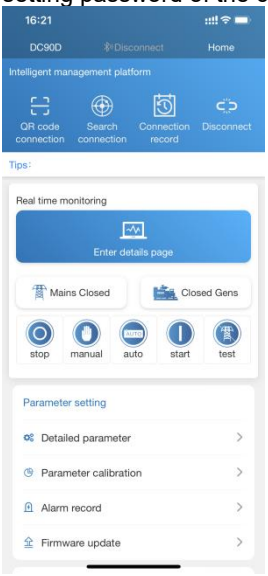
The controller is equipped with a built-in Bluetooth communication module, which can remotely set and monitor parameters through Bluetooth connection to the controller through the mobile phone APP provided free of charge by MEBAY.

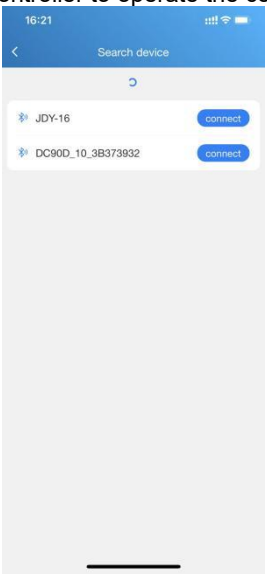
1. Bluetooth APP download
   1) Android Universal App Download
      a. Download address:https://g.mebay.cn/source/bleapp/bleapp_download.html
      b. Download QR code:
   2) Apple IOS system APP download
      a. APP Store:Open the App Store of the iPhone, search for "MEBAY BLE", click Download and Install, and you can use it.
      b. Download QR code:

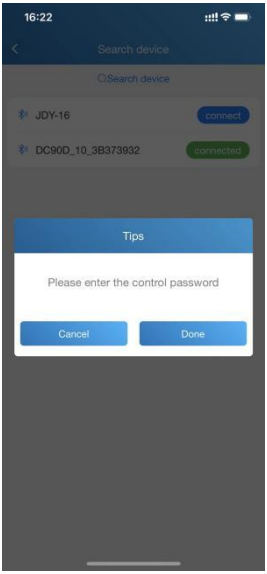
2. Connecting the controller

1) Connect via search

Open the mobile phone APP, as shown in Figure 1 below, click "Search Connection", click "Search Device" in the pop-up interface (as shown in Figure 2), click the "Connect" button on the right of the searched device "DC92D", and after the connection is successful, as shown in Figure 3, enter the parameter setting password of the controller to operate the controller.



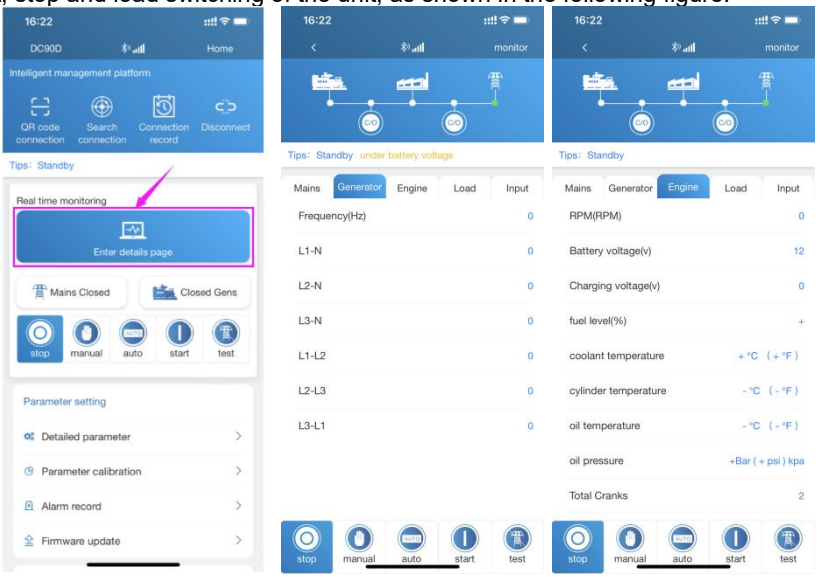

2) Connect by QR code scanning

The controller enters the setting interface (see "10. Parameter Setting" in this manual for details), and sets the "QR code display" in the "LCD setting" menu to "1-ON"; The controller will display the connection QR code, as shown in the figure below. Click "QR Code Connection" on the APP home page to scan the QR code displayed on the controller to connect the controller.



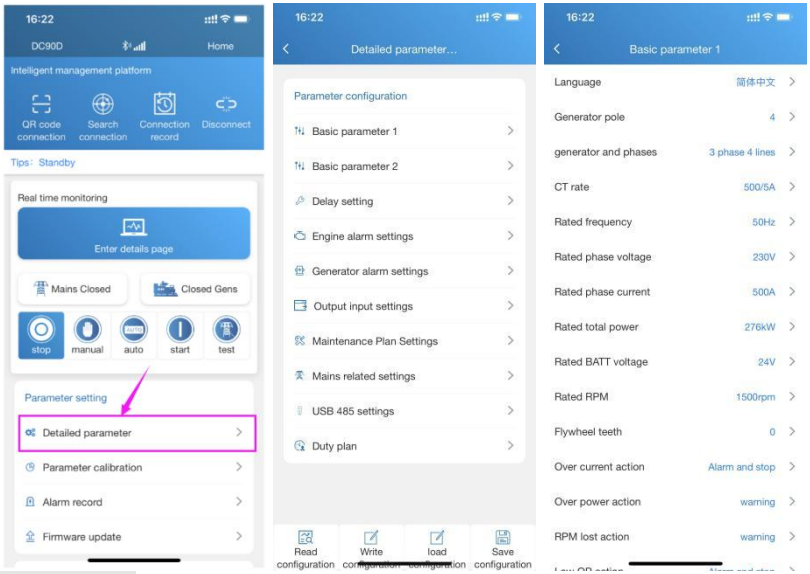

3. Remote monitoring

After the APP successfully connects to the controller, click the "Enter Details Page" on the home page to view the detailed parameters of the controller, and control the start, stop and load switching of the unit, as shown in the following figure:




4. Parameter setting

After the APP successfully connects to the controller, click "Detailed parameter" on the home page to enter the controller parameter setting interface, where you can read, view and modify the detailed setting parameters of the controller, as shown in the following figure:




## 14. Fault finding

| Symptoms | Possible Solutions |
|---|---|
| Controller no response with power | Check DC voltage.<br>Check DC fuse.<br>Check if the terminal 1 and 2 is with battery voltage. |
| Genset shutdown | Check the water/cylinder temperature is too high or not.<br>Check the genset AC voltage.<br>Check DC fuse. |
| Genset Emergency Stop | Check the emergency stop button.<br>Check that the voltage of the controller's 3 feet to the ground should be the battery voltage.<br>Check the controller connection. |
| Low oil pressure alarm | Check oil pressure sensor and its wiring.<br>Check the oil pressure sensor type and controller settings must be consistent.<br>Check whether the low oil pressure sensor is normal. |
| High temperature alarm | Check temperature sensor and its wiring.<br>Check the temperature sensor type and controller settings must be consistent.<br>Check whether the temperature sensor is normal. |
| Shutdown Alarm in running | Check related switch and its connections according to the information on LCD.<br>Check AUX. Inputs. |
| Fail to start | Check fuel return circuit and wiring.<br>Check start battery.<br>Consult engine manual. |
| Starter motor does not respond | Check the wiring to the starter.<br>Check start battery. |
| Unit operation but ATS | Check the ATS. |

| | |
|---|---|
| does not switch | Check the cable between the controller and the ATS. |
| USB communication is abnormal | Check the USB connection.<br>Check whether the USB port of the computer is normal.<br>Check whether the USB driver is installed. |
| RS485 cannot communicate normally | Check the connection.<br>Check if the communication ID number setting is correct.<br>Check if the A and B lines of RS485 are reversed.<br>Check if the RS485 communication line driver is installed or not.<br>Check if the communication port of the PC is damaged.<br>Add a 120 Ω resistor between the AB of the controller RS485. |