DC42S&CR GENSET CONTROLLER USER MANUAL

Disable Mains

Enable Mains

Software Version

No.	Version	Date	Note
1	V1.0	2021-02-01	Original release.
2	V1.1	2022-01-24	Increase the charging coil signal detection function; Increase public open-circuit output, mains phase loss setting
3	V1.2	2022-04-07	Increase the relay output function;
4	V1.3	2022-07-20	Additional models: DC42ST, DC42STR;
5	V1.4	2022-09-01	Add the system log function, increase the number of alarm records, add the recovery hysteresis width of over-current and over-power alarm, and add the remote start without load function for the switching value input.Add Emergency start function. Add display language: Français. DC40S/C adds mains power detection function. Correct the AC voltage input range.
6	V1.5	2022-12-20	Add display language: Polski.
7	V1.6	2023-05-08	Add display language: Português, Românesc
8	V1.7	2023-12-11	Increase speed changeover setting. Add languages: German, Korean, Vietnamese, Arabic, BahasaIndonesia, Persian.
9	V1.8	2024-07-19	Add: Run Record, Alternate Parameters, Ukrainian languages and other functions to optimise parameter settings.
10	V1.9	2024-12-20	Add alarm code display, relay output and other functions.
11	V2.0	2025-06-18	Add warning functions for over frequency, low frequency, over voltage, and low voltage.
12	V2.1	2025-07-09	Optimize product models and integrate the 40 series into the 42 series. Add display languages: Bengali, Italian, Hindi. Add current imbalance warning, load rate calculation basis, and buzzer switch function. Add a temperature sensor curve.

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Controller models to which this manual applies:

DC42S
DC42SR
DC42CR

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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1. Summary

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

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

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

2. Main Features

DC42S series model description

Model	Auto Start	AMF	USB	CAN	MPU	RS485
DC42S	●	●	●	—	●	—
DC42SR	●	●	●	—	●	●
DC42CR	●	●	●	●	—	●

- 32bit high performance single chip microcomputer.
- 2.8 inch 240 * 128 high-resolution LCD screen, Available in 6 languages, user's language set if necessary.
- Indicator and number display through UI surface.
- Acrylic material is adapted to protect the screen.
- Silicone panels;
- 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;
- Various kinds of parameters display.
- Input/output function, status can be shown directly.
- Real time clock inside: preset time operate and auto maintenance is available. Genset working plan can be set as per week or month.
- Maintenance countdown function, can set maintenance time or date.
- 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;
- The black box function can save the relevant parameters of the unit when the fault alarm occurs in real time, and it is convenient to find the cause of the fault.
- Totally 6relay's output, among which 4 relay output can be self-configurable, each relay can be set as max 80 functions.
- With 4 switches input, up to 30 functions optional;
- 3 sensor simulation input connectors, the oil pressure sensor is compatible with voltage signal input, and various display units can be configured.
- 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 temperature
- Engine fuel level
- Engine battery voltage
- Charging voltage
- CAN related parameters(C series only)
- Mains Frequency
- Mains phase voltage L-N
- Mains phase voltage L-L
- Generator 3 Phase voltage L-N
- Generator 3 Phase voltage L-L
- Generator 3 phase current A
- Generator Frequency Hz
- Generator Power Factor COS φ
- Generator active power KW
- Generator apparent power KVA
- Generator reactive power KVar
- Real-time load rate %
- Current consumption KWH
- Total consumption KWH
- Total Crank times
- Cumulative power on time of controller
- Current running time
- Total running time
- Maintenance notice
- Switches input status display
- Output status display of relays
- Current date and time;

4. Protection

- Emergency stop
- Over speed
- Under speed
- Over frequency
- Under frequency
- Over voltage
- Under voltage
- Low oil pressure sensor
- Low oil pressure switch
- Oil pressure sensor open
- High temperature sensor
- Fail To Stop-Oil pres
- Fuel level sensor open
- Low fuel level switch
- Instant alarm switch
- Non-balance of current
- Over power
- Reverse phase sequence
- Maintain end
- ECU Alarm
- ECU Comms. fail
- Shades open abnormal

- High temperature switch
- Temperature sensor open
- Low water level switch
- Fail To Start
- RPM Signal lost
- Fail To Stop -RPM
- Fail To Stop-Hz
- Over current
- Low fuel level sensor
- Broken fan belt
- Alternative config conflict

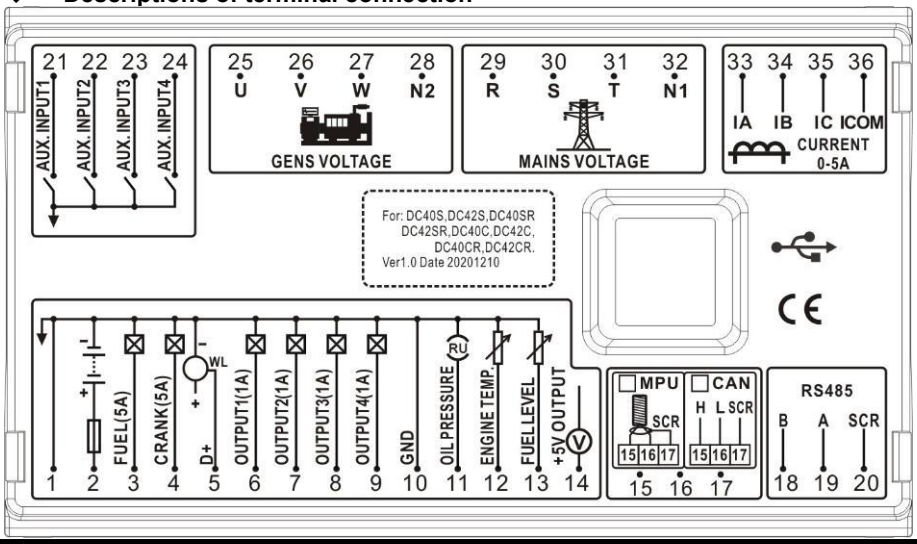
5. Parameters

Options	Parameters
Working voltage	DC8V----36V Continuous
Power consumption	Standby：24V：MAX 2W
	Working：24V：MAX 5W
AC Voltage Input	1P2W 30VAC-360VAC (ph-N)
	2P3W 30VAC-360VAC (ph-N)
	3P4W 30VAC-360VAC (ph-N)
Rotate speed sensor Frequency	50-10000Hz
MAX Accumulating Time	99999.9Hours（Min Store time:0.01H）
The maximum inaccuracy	≤5%
Fuel Relay Output	Max 5Amp DC+VE Supply voltage
Start Relay Output	Max 5Amp DC+VE Supply voltage
AUX.OUTPUT 1	Max 1Amp DC+VE Supply voltage
AUX.OUTPUT 2	Max 1Amp DC+VE Supply voltage
AUX.OUTPUT 3	Max 1Amp DC+VE Supply voltage
AUX.OUTPUT 4	Max 1Amp DC+VE Supply voltage
Excitation output	DC+VE supply voltage
AUX. Input	Available if connecting with Battery -
Working condition	-25-65℃
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	142mm*105mm*45mm
Panel cutout	116mm*90mm
Weight	0.6Kg

6. Overall Dimension and Wiring Diagram

◆ **Overall Dimension:**

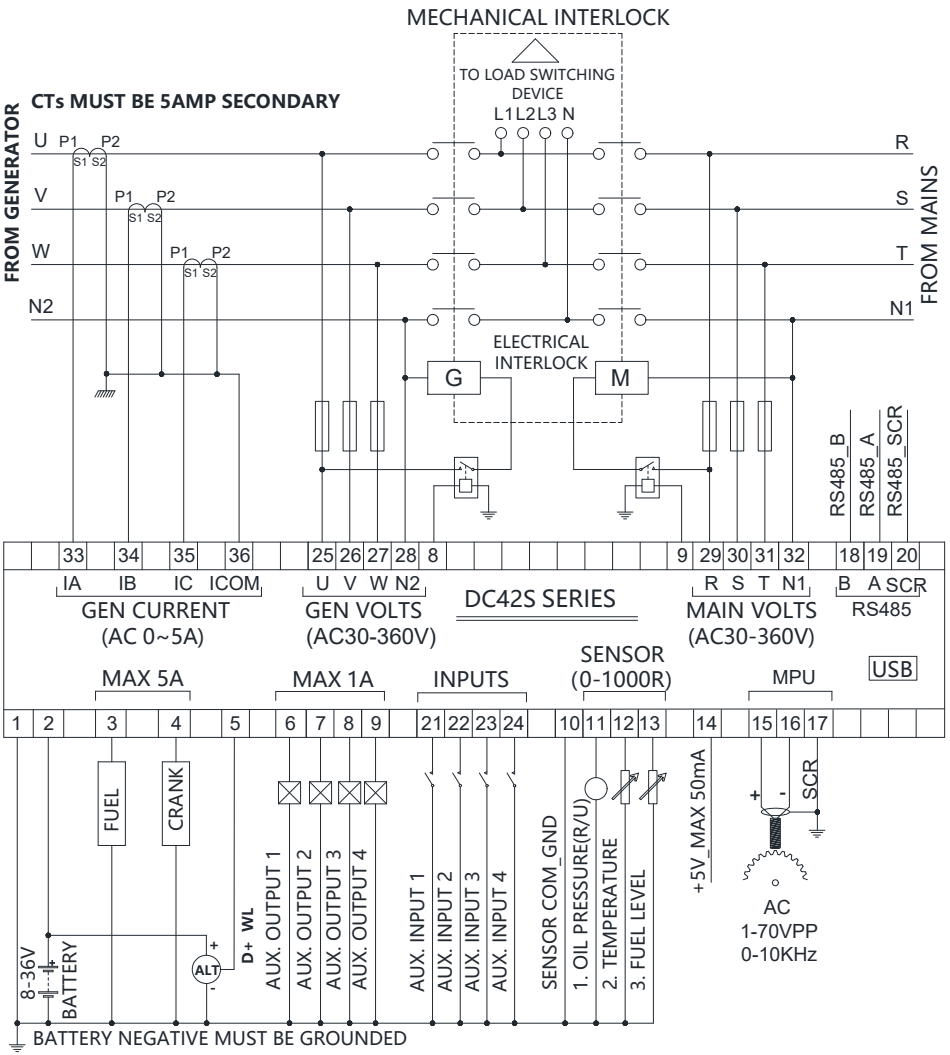
◆ **Descriptions of terminal connection**



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	Fuel Output	+VE output, Max 5Amp	1.5mm^2
4	Crank Output	+VE output, Max 5Amp.	1.5mm^2
5	Charging excitation output	+VE output, Max 0.9Amp.	1.0mm^2
6	Aux. Output 1	+VE output, Max 1Amp.	1.0mm^2
7	Aux. Output 2	+VE output, Max 1Amp.	1.0mm^2
8	Aux. Output 3	+VE output, Max 1Amp.	1.0mm^2
9	Aux. Output 4	+VE output, Max 1Amp.	1.0mm^2
10	Sensor common GND	Connect the battery negative or outer.	1.0mm^2
11	Oil pressure sensor	Connect sensor input. Oil pressure sensor compatible with resistance/voltage sensors;	1.0mm^2
12	Temperature Sensor		1.0mm^2
13	Fuel level sensor		1.0mm^2
14	+5V Output	Connect the power supply of the oil pressure sensor with the output voltage signal, with a maximum of 50mA.	1.0mm^2
15	Speed sensor +	Use a shielded wire to connect the speed	1.0mm^2

16	Speed sensor -	sensor.	1.0mm²
17	Speed sensor SCR		1.0mm²
15	CAN _H	A 120 Ω shielded wire and good grounding are recommended.	1.0mm²
16	CAN_ L		1.0mm²
17	CAN _SCR		1.0mm²
18	RS485_B	A 120 Ω shielded wire and good grounding are recommended.	1.0mm²
19	RS485_A		1.0mm²
20	RS485_SCR		1.0mm²
21	Aux. Input 1	The grounding is valid according to the function selection switch input.	1.0mm²
22	Aux. Input 2		1.0mm²
23	Aux. Input 3		1.0mm²
24	Aux. Input 4		1.0mm²
25	Generator Voltage U	Connected to the power generation output R phase.	1.0mm²
26	Generator Voltage V	Connected to the power generation output S phase.	1.0mm²
27	Generator Voltage W	Connected to the power generation output T phase.	1.0mm²
28	Generator Voltage N2	Connected to the power generation output N phase.	1.0mm²
29	Mains Voltage R	Connected to the mains U phase.	1.0mm²
30	Mains Voltage S	Connected to the mains V phase.	1.0mm²
31	Mains Voltage T	Connected to the mains W phase.	1.0mm²
32	Mains Voltage N1	Connected to the mains N phase.	1.0mm²
33	Load CT Secondary L1	Current Transformer Secondary Rated 5A/50mA.	1.5mm²
34	Load CT Secondary L2		1.5mm²
35	Load CT Secondary L3		1.5mm²
36	Load CT Secondary ICOM	Connect to the common.	1.5mm²

◆ **DC42S 3-phase 4-wire Typical Wiring Diagram**

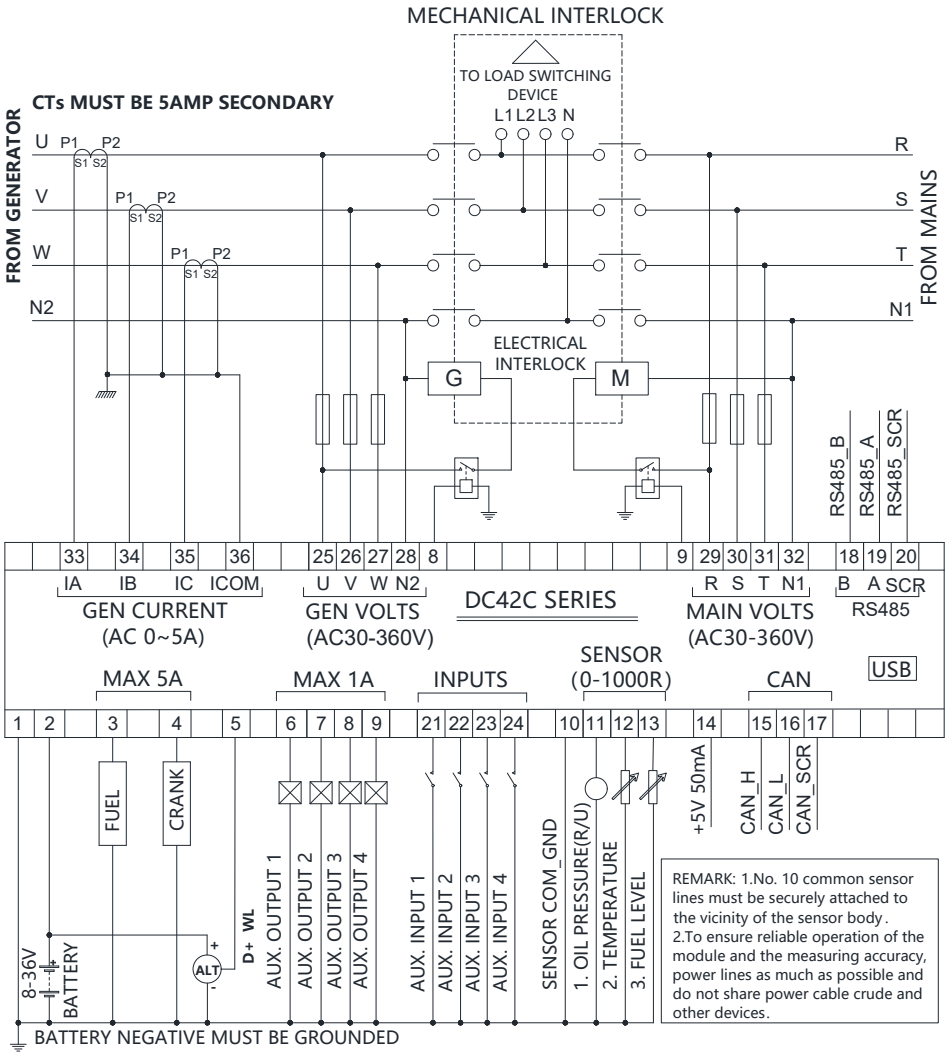


REMARK: 1.No. 10 common sensor lines must be securely attached to the vicinity of the sensor body
2.To ensure reliable operation of the module and the measuring accuracy, power lines as much as possible and do not share power cable crude and other devices

The charging coil can only be connected to pin 15 ,the speed sensor is connected to pins 15, 16 or 15, 17.

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

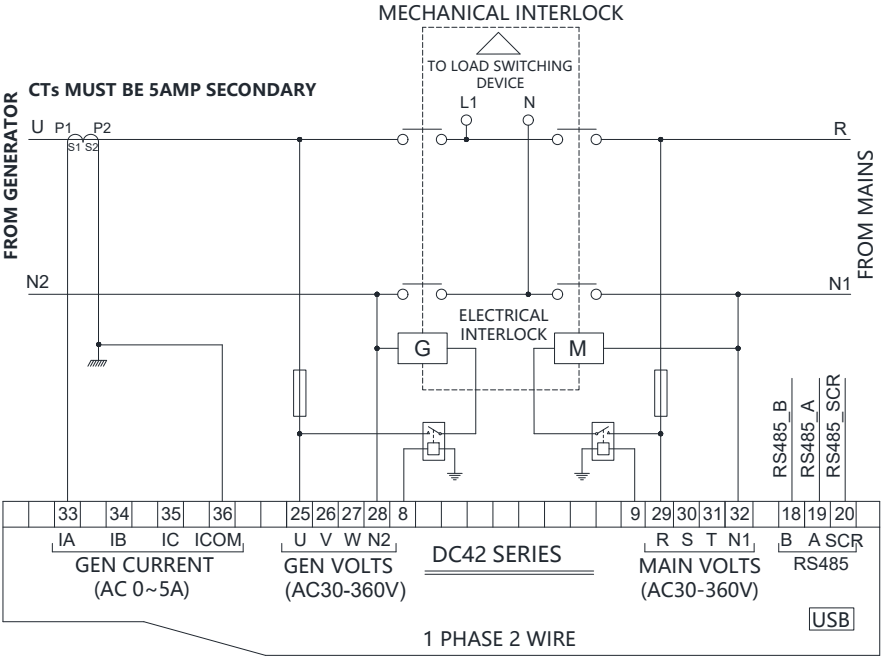
◆ **DC42CR 3-phase 4-wire Typical Wiring Diagram**



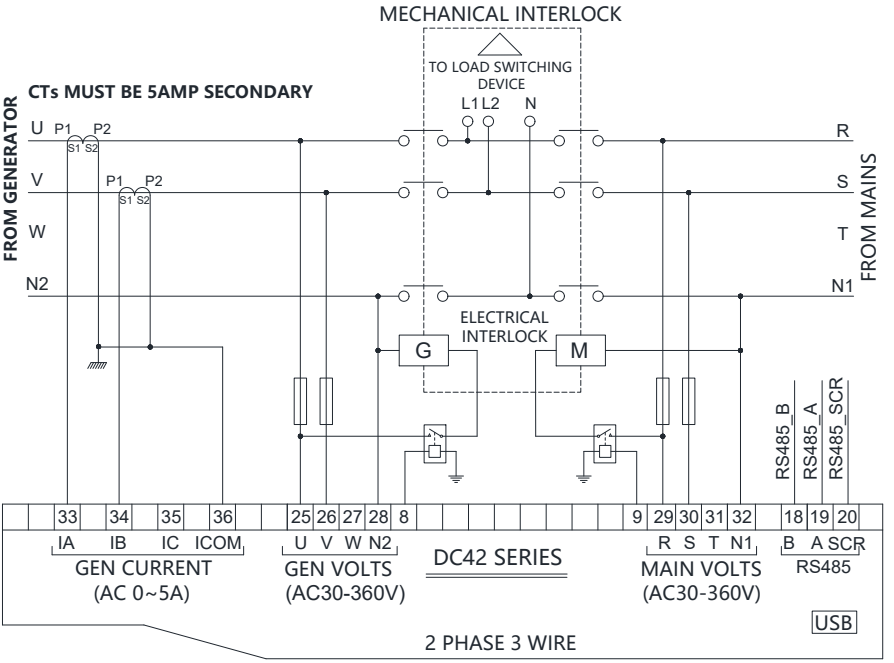
Note: Please don't move battery during running status or it may cause the controller broken!

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

◆ **DC42 Series 1-phase 2-wire Typical Wiring Diagram**



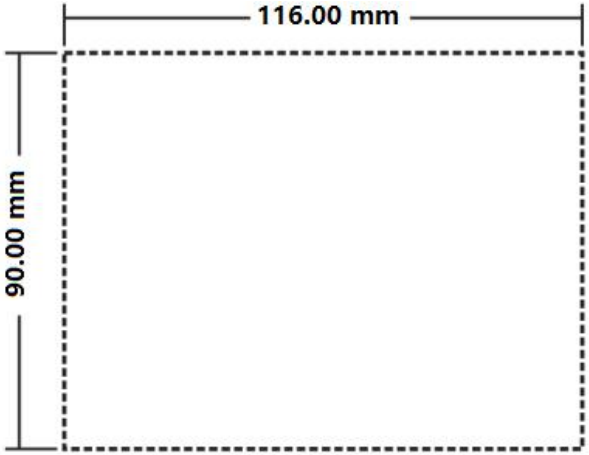
◆ **DC42 Series 2-phase 3-wire Typical Wiring Diagram**



7. Installation instruction

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

◆ Panel Cutout: W1160mm*H90mm.



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

◆Battery Voltage Input

DC42S&CR 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

◆ **Disable mains**

◆ **Enable mains**

9. Control and operation instruction

◆ Key Function Description

KEYS	NAME	Main Function
	Stop Reset Revert	◆ Can stop generator under manual/auto mode; ◆ Can reset shutdown alarm ◆ During stop procession, pressing this key again can stop generator immediately. ◆ Pressing this key can cancel the setting and back to upper class under edition. ◆ Under the setting mode with checking data, the data can be saved and system will exit after pressing. ◆ In the standby state of the stop gear without any alarm, press this key for 3 seconds to view the alarm record.
	Start	◆ Start the genset under manual mode. ◆ Pressing this key can start the genset under manual testing mode. ◆ In the stop gear, press this key, the oil valve and ECU power supply will output;(Only DC4xC series has) ◆ 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.
	Gens/ Mains Close/On	◆ Under manual mode, pressing this key can transfer load to genset/mains. ◆ Press this key for 3 seconds,public unload of Gens and Mains.
	Up	◆ Under display mode, parts of the page can move up. ◆ Under edition mode, pressing this key to move the digit or increase the numbers. ◆ Under records mode, pressing this key to move the digit.
	Down	◆ Under display mode, parts of the page can move down. ◆ Under edition mode, pressing this key to move the digit or decrease the numbers. ◆ Under records mode, pressing this key to move the digit.
	OK UI Change	◆ Confirm the change under edition mode. ◆ Shift right under edition mode. ◆ Page exited under records checking mode. ◆ Black UI and white UI can be switched when Pressing. ◆ In standby state, press for 3 seconds to enter the parameter setting mode.
	LED Test	◆ Test if all LED lights are OK, pressing this key to test if all lighted, all off when loosen it. ◆ Press and hold for more than 3 seconds to turn on or off the buzzer.

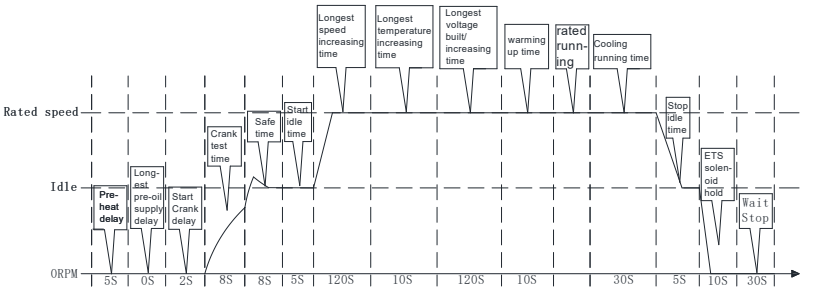
OK + STOP	Setting mode	◆ Pressing OK and STOP simultaneously to come into setting mode

Manual Start Mode

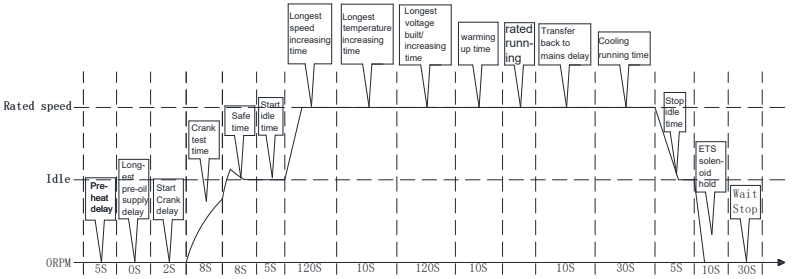
press STOP and make sure it is in the stop position before starting.

Press “ MANUAL ” 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 " START ". automatically switch to Generator provide the power when the unit is running normally. Press “ STOP ” 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" ATUO can be converted into an automatic file. The specific working time is as follows:



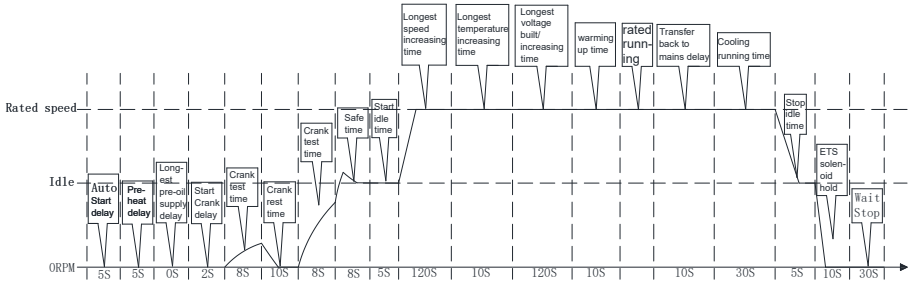
Automatic starting mode:

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

Press “ ATUO ” 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 (DC42 series 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 (DC42 series is available). When the remote start signal fails and the mains provide the power returns to normal, the shutdown process after the "loop time delay" is

performed (DC42 series is available).

Auto start and stop process:



◆ **Notices in Starting Process**

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

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

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

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

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

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

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

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

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

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

◆ **Emergency start mode:**

In manual mode, pressing the "MANUAL "button and the "START" button at the same time can force the generator to start. At this time, the controller will no longer automatically judge the successful start condition, and the operator will judge the separation of the starter by himself. The operator observes that the unit has started successfully. After releasing the "START" button, the starter motor will be disconnected immediately, and the controller will enter the "safety protection delay" state.

◆ **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 START 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!**"

10. Setting Menu instructions

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

Press the key OK for more than 3 seconds.Or press the stop key STOP 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:** You can view the status information of the controller such as product model, version, and release time.

◆ **Alarm records**

DC42S&CR controller can save **100** groups of alarm records which contains time, gens parameter, engine parameter and so on.How to check the alarm records:

1) Enter alarm record page:

a) Under stop mode, press this STOP key for 3 seconds come into alarm records page;

b) Enter the setting mode: Select the alarm record and press OK key to 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) Press  to turn lower records under records checking page. Press  to turn upper records and press  to revert back to alarm history records page.

4) Exit from records page: In the history records page and checking page, press  to exit;

◆ **System log**

DC42S&CR 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  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;

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**

DC42S&CR series 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:

1) 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;

2) In the setting menu page, select "**System Operational Records**" and press the OK key  once to enter the System Operational Records page;

3) 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.

◆ **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!

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.
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.
A6	Emergency stop warning	When the controller detects that the AUX. Input **"Emergency stop warning"** switch is active, after the warning delay, , it will report the **"Emergency stop warning "** 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 temperature sensor	When the controller parameter "**High temperature** Sensor Alarm Action" is set to "Warning", detected sensor higher than the "Warning Threshold", after the warning delay, it will report the **"High temperature 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 warn	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** is enable, 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**" warning.
A19	High temperature switch	When the controller detects that the AUX. Input "**High temperature warning"** switch is active, after the warning delay, it will report the **"High temperature 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"**.
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	Temperature sensor open	When the controller parameter "**Action if temperature sensor disconnected**" is set to "**warning**", When the temperature sensor is detected to be disconnected, it will report the **" Temperature 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 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 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 warn	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.
A50	Low OP switch	When the controller detects that the AUX. Input "**Low oil pressure warning"** switch is active, after the warning delay, it will report the **"Low OP switch"** 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	Maintain end	When the controller parameter **"Maintenance expire"** is set to **"warning"**, when the countdown to maintenance is detected as "0" or maintenance date less than current date, it will report the "**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.

◆ **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 AUX. Input **"Emergency stop"** switch is active, after the alarm delay, , 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 and stop**", When the oil pressure sensor is detected to be disconnected, it will report the **"Oil Pressure sensor open"**
E11	High temperature sensor	When the controller parameter **"High 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 temperature sensor**"alarm.
E12	High temperature switch	When the controller detects that the AUX. Input **"High temperature alarm"** switch is active, after the alarm delay, it will report the **"High temperature switch"** alarm.
E13	Temperature sensor open	When the controller parameter "**Action if Temperature sensor disconnected**" is set to "**Alarm and stop**", When the coolant temperature sensor is detected to be disconnected, it will report the **"Temperature sensor open".**
E20	Low water level	When the controller detects that the AUX. Input

	switch	**"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.
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.
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.
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 warning switch"** alarm.
E42	Non-balance of current	When the controller parameter **Non-balance current alarm** is is enable, 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	Maintain end	When the controller parameter **"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 "**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.
E54	Stop failure-Hz	When the controller detects that the frequency is not "0" after the execution of the shutdown, it will report the "**Stop failure-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.
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.
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.
E205	Over battery voltage alarm	When the controller detects that the battery voltage is over than the "**Over battery voltage alarm"**, after the alarm delay, it will report the "**Over battery voltage**"alarm.
E206	Under battery voltage alarm	When the controller detects that the battery voltage is lower than the "**Under battery voltage** alarm**"**, after the alarm delay, it will report the "**Under battery voltage**" alarm.

12. Parameters setting

◆ Enter the edition page

Please set the parameters according to below steps:

1) The setting mode can be active after pressing  and  simultaneously, under the status of standby without any alarm. The default password is "***07623***".

2)Press and add number 1, press to reduce number 1, press OK to turn the digit into right, press OK 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 OK to get into parameters setting page.

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

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

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

7)Press STOP 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 setting**

1)Delay time setting

No	Parameter	Range***(default)***	Notes
1	Start delay	0-65000s***(5.0s)***	The time during the genset starts after the remote signal is valid.
2	Preheat time	0-6500.0s ***(0.0s)***	The time needed to be preheated before the starter on power.
3	Longest pre-oil supply	0-180.0s***(0.0s)***	Under pre-oil supply, if the oil pressure is higher than setting value, then pre-oil supply stopped.
4	Fuel output delay	1.0-60.0s ***(2.0s)***	The time the fuel valve relay outputs before the motor operates.
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	Longest RPM-up time	0-3600.0s ***(120.0s)***	The longest speed-up time,during which time the system will exit once speed

			increased successfully .
10	Longest Temp.-up time	0-3600.0s***(0.0s)***	The longest warming-up time,during which time the system will exit once temperature increased successfully .
11	Longest Volt.-up time	0-3600.0s ***(120.0s)***	The longest voltage-up time,during which time the system will exit once voltage increased successfully .
12	Warming-up time	0-3600.0s***(10.0s)***	The time needed for loading.
13	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.
14	Stop idle time	0-3600.0s ***(5.0s)***	Idle-speed running time.
15	E.T.S. hold time	0-600.0s ***(10.0s)***	Stop solenoid on power time.
16	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.
17	Emergency delay	0-10.0s ***(1.5s)***	Over speed and over frequency alarm delay.
18	Normal alarm delay	2.0-20.0s ***(5.0s)***	The alarm delay except for over speed and over frequency.
19	Normal warning delay	1.0-20.0s ***(2.0s)***	The warning delay.
20	Pulse speed up delay	0.1－60.0s***(0.2s)***	The interval time of the pulse speed up relay change.
21	Pulse speed down delay	0.1－60.0s***(0.2s)***	The interval time of the pulse speed down relay change.
22	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.
23	Opening output time	1.0-10.0s ***(3.0s)***	
24	Gens/Mains closing delay	0-3600.0s***(1.0s)***	The time from Mains to Gens.
25	AC Voltage abnormal delay	2.0-20.0s***(10.0s)***	Over / under voltage delay.
26	Back to Mains time	0-3600.0s***(10.0s)***	To avoid the switch actions if the mains unstable.If the remote start signal is invalid (DC42 series will check if the mains normal), genset will not switch immediately, after the delay time, it will transfer to mains. during the delay, if the remote start signal is valid, then genset will come into rated running.
27	Back to Gens time	0-3600.0s ***(5.0s)***	There shall be loading delay from Mains to Gens if the remote start signal valid or Mains abnormal under Cooling time.

2)Engine setting

No	Parameter	Range ***(defaults)***	Notes
1	CAN Protocol	***0- Disabled*** 1:J1939 2:Cummins ISB	Built-in more than 180 ECU communication protocols, **11~186 CAN protocol (****please refer to the**

		3:Cummins-CM850 4:Cummins QSX15-CM570 5:Cummins-CM850-PCC13X 6:Cummins-DCEC-QSZ13 7:Cummins-CCEC-QSN 8:Perkins 9:Perkins-1100 10:Volvo 11.....186:Zenith ECU	detailed list) 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	Rated RPM	500-4500RPM ***(1500)***	Choose the meter range and calculate the alarm value.
4	Action if RPM lost	***Warning*** Alarm and stop	This fault can be checked only if there is gens frequency checked as one condition of crank successfully.
5	RPM-up stop	0-200% ***(90%)***	Rated RPM multiplying by this value is regarded as speed-up stop value. When the RPM is over this value, then the RPM-Up procession is stopped in time.
6	Overspeed alarm	0-200% ***(114%)***	Rated RPM multiplying by this value is regarded as over speed alarm value. When the RPM is higher than the alarm value and comes into over speed delay but still higher (emergency faults delay), then over speed alarms. if the value is set as 200, then the over speed alarm is disabled.
7	Under speed alarm	0-200% ***(80%)***	Rated RPM multiplying by this value is regarded as under speed alarm value. When the RPM is lower than the alarm value and comes into under speed delay but still lower (normal faults delay), then under speed alarms. if the value is set as 0, then the under speed alarm is disabled.
8	Battery Rated Voltage	8.0-36.0V ***(24.0V)***	Standard for detecting of over/under voltage of battery.
9	Over battery voltage warning	0-200% ***(135%)***	Rated battery voltage multiplying by this value is regarded as over battery voltage warning value. When the battery input is higher than the warning value and comes into over battery voltage delay but still higher (normal warn delay), then over battery voltage warns. if the value is set as 200, then the over battery voltage is disabled.
10	Under battery voltage warning	0-200% ***(67%)***	Rated battery voltage multiplying by this value is regarded as under battery voltage warn value. When the battery input is lower than the warning value and comes into under battery voltage delay but still lower (normal warn delay), then under battery voltage warns. if the value is set as 0, then the under battery voltage is disabled.
11	Charger warning	1.0-30.0V ***(30.0V)***	When the gap between D+ and B+ is over than this value, and there is charging failure but still

			high (normal warning delay), then charge failure warns. Once the gap is lower than the value, warns clear. If the value is set as 300, then the charge failure is disabled.
12	Manual crank times	1-30 ***(1 time)***	Crank times under mode and test mode.
13	Auto start crank times	1-30 ***(3 times)***	Crank times under auto mode.
14	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 ".
15	Crank disconnect	RPM Frequency Oil pressure ***RPM/Frequency*** RPM/Oil Pressure Frequency/Oil Pressure RPM/Frequency/ Oil press.	1.If there is no oil pressure sensor, please don't choose the type. 2.Oil pressure switch input is not the crank condition 3.Please check if the running status, stop condition are according with crank condition. 4.Means either of the conditions can be acceptable as crank condition. But all of them should be meet together to regard as stop condition.
16	Frequency disconnect	0-200% ***(28%)***	Rated frequency multiplying by this value is regarded as crank success condition. When the gens frequency is over the condition value, then system regards it as crank success.
17	RPM disconnect	0-200% ***(24%)***	Rated RPM multiplying by this value is regarded as crank success condition. When the RPM is over the condition value, then system regards it as crank success, motor escaped.
18	Oil pressure disconnect	0-400kpa ***(200kpa)***	When the engine oil pressure is over the condition value, then system regards it as crank success, motor escaped.
19	Oil pressure delay	0-20.0s ***(0.0s)***	When the crank condition contains oil pressure, if the oil pressure is higher than the presets value and continue for few seconds, then it is regarded as crank success.
20	OP pre-supply stop	50-600kpa ***(200kpa)***	When the oil pressure is over the condition value, then pre-oil supply is stopped.
21	Fuel pump open	0-100% ***(25%)***	When the fuel level is lower than preset value and remains 10S, fuel pump opened signal output
22	Fuel pump close	0-100% ***(80%)***	When the fuel level is higher than preset value and remains 1S, fuel pump closed signal output.
23	Maximum fuel pump on time	0-65000s ***(65000s)***	The maximum output time of the fuel pump.
24	Fuel pump filling detection	0-600s ***(30S)***	Fuel pump filling detection time, the sensor oil level change is detected.
25	Temperature for Fan open	20-200℃ ***(75℃)***	Used for controlling radiator: when the water temperature reaches the set temperature, then the radiator is opened.
26	Temperature	20-200℃	Used for controlling radiator: when the water

	for Fan close	***(60℃)***	temperature is lower than the set temperature, then the radiator is closed.
27	Battery 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.
28	Battery charging stop	10.0-36.0 ***(27.8V)***	
29	Speed type	***0-Speed sensor*** 1-Charging coil	Select the speed signal of different engine types.
30	RPM conversion	***Disable*** Frequency to RPM	Whether the speed is converted from frequency.
31	Temperature for choke close	20-200℃***(40℃)***	When the engine temperature falls below this setting, the Choke operates.
32	Choke close delay	0-200.0s ***(3.0s)***	Choke close delay.
33	Over speed warning	0-200% ***(107%)***	Rated RPM multiplying by this value is regarded as over speed warning value.When the RPM is higher than the warning value and comes into over speed delay but still higher, then over speed warns. if the value is set as 200, then the over speed alarm is disabled.
34	Under speed warning	0-200% ***(90%)***	Rated RPM multiplying by this value is regarded as under speed warning value.When the RPM is lower than the warning value and comes into under speed delay but still lower (normal warning delay), then under speed warns. if the value is set as 0, then the over speed alarm is disabled.
35	Over battery voltage	0-200% ***(200%)***	Rated battery voltage multiplying by this value is regarded as over battery voltage alarm value. When the battery input is higher than the alarm value and comes into over battery voltage delay but still higher (normal alarm delay), then over battery voltage alarm. if the value is set as 200, then the over battery voltage is disabled.
36	Under battery voltage	0-200% ***(0%)***	Rated battery voltage multiplying by this value is regarded as under battery voltage alarm value. When the battery input is lower than the alarm value and comes into under battery voltage delay but still lower (normal alarm delay), then under battery voltage alarm. if the value is set as 0, then the under battery voltage is disabled.

3)Generator parameters

No	Parameter	Range***(defaults)***	Notes
1	Gens poles	2/4/6/8***(4)***	When the flywheel teeth are set as 0, the RPM will be resulted by frequency. Pole 2: 50Hz---3000RPM. Pole 4: 50Hz---1500RPM. Pole 6: 50Hz---1000RPM.

			Pole 8: 50Hz---750RPM
2	Gens AC system	Disable 1 phase 2 wire 2 phase 3 wire 3 phase 3 wire ***3 phase 4 wire***	Gens phases: No gens parameters can be displayed if setting as disable, which is applied to water pump genset.
3	Rated frequency	40.0-80.0Hz ***(50.0Hz)***	Setting generator rated frequency to choose the meter range and calculate the alarm value.
4	Over freq alarm	0-200% ***(114%)***	Rated frequency multiplying by this value is regarded as under over frequency alarm value. When the Freq is higher than the value and comes into over freq delay but still higher (emergency faults delay), then over frequency alarms, If the value is set as 200, then the alarm is disabled.
5	Under freq alarm	0-200% ***(80%)***	Rated frequency multiplying by this value is regarded as under frequency alarm value. When the Freq is lower than the value and comes into under freq delay but still lower (normal faults delay), then under frequency alarms, If the value is set as 0, then the alarm is disabled.
6	Rated phase voltage	80-420V***(230V)***	Setting generator phase voltage to choose the meter range and calculate the alarm value.
7	Voltage-up stop	0-200%***(85%)***	Rated voltage multiplying by this value is regarded as voltage-up stop value. When the voltage is over this value, then the voltage-Up procession is stopped in time.
8	Over voltage alarm	0-200% ***(120%)***	Rated voltage multiplying by this value is regarded as over voltage alarm value. When the voltage is higher than the value and comes into over voltage delay but still higher (normal faults delay), then over voltage alarms, If the value is set as 200, then the alarm is disabled.
9	Under voltage alarm	0-200% ***(80%)***	Rated voltage multiplying by this value is regarded as under voltage alarm value. When the voltage is lower than the value and comes into under voltage delay but still lower (normal faults delay), then under voltage alarms, If the value is set as 0, then the alarm is disabled.
10	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.
11	Phase Sequence	***0- Disable*** 1-Warning 2-Alarm and stop	Monitor whether the phase sequence is normal.
12	Over freq warning	0-200%***(110%)***	Rated frequency multiplying by this value is regarded as under over frequency warn value. When the Freq is higher than the value and comes into over freq warning delay but still higher(normal warn delay), then over frequency

			warns. If it is lower than the value then warning clears. If the value is set as 200, then the warning is disabled.
13	Under freq warning	0-200%***(90%)***	Rated frequency multiplying by this value is regarded as under under frequency warn value. When the Freq is lower than the value and comes into under freq delay but still lower(normal warn delay), then under frequency warns..If the value is set as 0, then the warning is disabled.
14	Over voltage warning	0-200%***(112%)***	Rated voltage multiplying by this value is regarded as over voltage warn value. When the voltage is higher than the value and comes into over voltage delay but still higher(normal warn delay), then over voltage warns..If the value is set as 200, then the warning is disabled.
15	Under voltage warning	0-200%***(90%)***	Rated voltage multiplying by this value is regarded as under voltage warn value. When the voltage is lower than the value and comes into under voltage delay but still lower (normal warn delay), then under voltage warns.If the value is set as 0, then the warning is disabled.

4)Loading setting

No	Parameter	Range ***(default)***	Notes
1	CT rate	5-6000A***(500A)***	Used for setting genset CT primary current.
2	Rated phase current	5-6000A ***(500A)***	Setting generator phase current to choose the meter range and calculate the alarm value.
3	Rated total power	5-2000Kw ***（276Kw）***	Set total power of generator to choose the meter range and calculate the average loading rate and alarm value.
4	Phase current over-load alarm	0-200% ***(100%)***	Rated current multiplying by this value is regarded as over current alarm value. When the current is higher than the value and comes into over current delay but still higher (over current faults delay), then over current alarms, If the value is set as 200, then the alarm is disabled.
5	Over phase current delay	0-3600.0s ***(30s)***	When this parameter is set to 0, the over current delay is the inverse time; if not, the over current delay is the time set for this parameter.
6	Over current 【inverse time】	0.1-36.0 ***(36.0)***	This option will not take effect until the **[23-Over phase current delay]** is set to **0**. The over current delay is inverse time, and the formula is **T=t/((IA/IT) -1)^2.**
7	Over current recovery	0-500A ***(0A)***	When over current occurs, it will enter the over current alarm delay state; if the current is less than the over current alarm value minus this difference, the over current alarm delay can be exited.
8	Over total power alarm	0-200% ***(100%)***	Rated power multiplying by this value is regarded as over power alarm value. When the loading power is higher than the value and comes into

			delay but still higher (power faults delay), then over power alarms, If the value is set as 200, then the alarm is disabled.
9	Over total power 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.
10	Over power 【inverse time】	0.1-36.0 ***(36.0)***	This option will not take effect until the **[24-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.**
11	Over power recovery	0-500Kw ***(0Kw)***	When overpower occurs, it enters the overpower alarm delay state, the current power is less than the overpower alarm value minus this difference, and the overpower alarm delay can be exited.
12	Non-balance current ratio alarm	10-100%***(100%)***	It is valid for 2P3W or 3P4W.When the non-balance current ratio is higher than the value and comes into delay but still higher(normal alarm delay), then non-balance current ratio alarm.If the value is set as 100, then the alarm is disabled. IOOB =((I Max - I Ave)/Ave)*100%
13	CT Sec.current	***0-5A*** 1-50mA 2-62.5mA	Chose the secondary rated current.
14	Phase current over-load warning	0-200% ***(200%)***	Rated current multiplying by this value is regarded as over current warning value. When the current is higher than the value and comes into over current delay but still higher (over current faults delay), then over current warning. If the value is set as 200, then the warning is disabled.
15	Over total power warning	0-200% ***(200%)***	Rated power multiplying by this value is regarded as over power warning value. When the loading power is higher than the value and comes into delay but still higher (power faults delay), then over power warning. If the value is set as 200, then the warning is disabled.
16	Non-balance current ratio warning	10-100%***(100%)***	It is valid for 2P3W or 3P4W.When the non-balance current ratio is higher than the value and comes into delay but still higher(normal warn delay), then non-balance current ratio warns.If the value is set as 100, then the warning is disabled.
17	Load rate based on	***Current A*** Active power kW Apparent power kVA	Calculation basis for selecting generation load rate.

5)Mains protection

No	Parameter	Range***(defaults)***	Notes
1	Phase	Disable 1 Phase 2 Wire 2 Phase 3 Wire 3 Phase 3 Wire	Choose the input, there is no display if setting as disable.

		3 Phase 4 Wire	
2	Mains under volt	55-330V***(184V)***	When the mains voltage is lower than the "low voltage crank threshold" and comes into mains low voltage delay(normal failure delay) but still lower, then mains becomes invalid. If the voltage become higher than "low voltage revert threshold" during normal failure delay time, then it will not alarm.
3	Revert under volt	55-330V***(207V)***	
4	Mains over volt	55-330V***(276V)***	When the mains voltage is higher than the" high voltage crank threshold" and comes into mains high voltage delay(normal failure delay) but still higher, then mains becomes invalid. If the voltage become lower than "low voltage revert threshold" during normal failure delay time, then it will not alarm.
5	Revert over volt	55-330V***(253V)***	
6	Mains normal delay	0.0-3600.0S ***(10.0S)***	The time from abnormal to normal, which is used for ATS transfer.
7	Mains abnormal delay	0.0-3600.0S ***(5.0S)***	
8	Loss of Phase judgment	***Loss of Phase 1*** Loss of Phase 2 Loss of Phase 3	Set the phase loss condition to judge whether the mains is abnormal.
9	AMF setting	0-Display only ***1-AMF*** 2-Auto Start	When set to 0, only mains parameters are displayed.

6)Input setting

No	Parameters	Range***(defaults)***	Notes
1	Pressure/Temperature unit	℃/KPA ***℃/BAR*** ℃/PSI ℉/KPA ℉/BAR ℉/PSI	Unit display.
2	Coolant temperature sensor	0: Disable 1.Self-define resistance curve ***2.VDO 40-120℃*** 3: MEBAY-001B 4: SGH 5: SGD 6: SGX 7: CURTIS 8: DATCON 9: VOLVO-EC 10: 3015238 11:PT100 12: MEBAY-Mier 13: 13: WEICHAI 40-120℃ 14: GENCON 40-120℃ 15: From ECU	Choose the usual water temperature sensor, If the sensor used by the user is not the commonly used type, it can be User-defined.

		16: VDO -10-140℃	
3	Action if temperature sensor disconnected	Disable ***Warning*** Alarm and stop	Action if Water temperature sensor disconnected.
4	Temperature-up stop	20-200℃***(68℃)***	When the temperature is over the preset value, then temperature-up procession is stopped in time.
5	High water temperature alarm	20-200℃ ***(98℃)***	When the water temperature is higher than the alarm value and comes into high temperature delay but still higher (normal faults delay), then high temperature alarms. if the value is set as 200, then the high temperature alarm is disabled.
6	Action if high temperature	Warning ***Alarm and stop*** Alarm and stop after unloading Warning and alarm stop	Alarm and stop: when the temperature is higher than preset value or high temperature signal is valid, then controller will alarm and stop after normal faults delay. If setting as warning:the AUX. input should be set as high temperature stop disabled and input is valid. When the temperature value is higher than the preset value or high temperature alarm input signal is valid, then controller only display warning but not stop. If setting as alarm and stop after unloading:the AUX. input should be set as high temperature stop and input is valid. When the temperature value is higher than the preset value or high temperature alarm input signal is valid, then controller shall start the unloading procession and stop with alarm.
7	Oil pressure sensor	0: Disable 1: Self-define resistance curve 2: Self-define voltage curve 3: Voltage type 1MPa-0-5V 4: Voltage type 1MPa-05-4.5V ***5: VDO 0-10Bar*** 6: MEBAY-003B 7: SGH 8: SGD 9: SGX 10: CURTIS 11: DATCON 10Bar 12: VOLVO-EC 13: 3015237 14: WEICHAI 0-0.6Mpa	Choose the usual oil pressure sensor, If the sensor used by the user is not the commonly used type, it can be User-defined.

		15: GENCON 0-10BAR 16: From ECU	
8	Action if oil pressure sensor disconnected	Disable ***Warning*** Alarm and stop	Action if oil pressure sensor disconnected.
9	Low oil pressure alarm	0-999kpa ***(103kpa)***	When the oil pressure is lower than the alarm value and comes into low oil pressure delay but still lower (normal faults delay), then low oil pressure alarms. if the value is set as 0, then the under speed alarm is disabled.
10	Action if low oil pressure	Warning ***Alarm and stop*** Warning and alarm stop	If setting as warning,the AUX. input should be set as Low oil pressure stop disabled and input is valid. When the oil pressure value is lower than the preset value or low oil pressure alarm input signal is valid, then controller only display warning but not stop.
11	Fuel level sensor	***0: Disable*** 1. Self-define resistance curve 2. 0-100Ω 3. 100-0Ω 4. 0-107Ω 5. 107-0Ω 6. 0-180Ω 7. 180-0Ω 8. 180-10Ω 9. 10-180Ω 10. 120-10Ω 11.10-120Ω 12. 90-0Ω 13. 0-90Ω 14. 0-30Ω 15. 73-10Ω 16. 240-33Ω 17. 33-100Ω 18. 0-200Ω 19. 200-0Ω 20. 100-33Ω 21. 0-190Ω 22. 190-0Ω	If the sensor used by the user is not the commonly used type, it can be User-defined.
12	Action if fuel Level sensor disconnected	Disable ***Warning*** Alarm and stop	Action if Fuel level sensor disconnected.
13	Low fuel level warning	0-100% ***(20%)***	When the fuel level is lower than the value and comes into low fuel level warning delay but still lower (normal warning delay), then low fuel level warns. If it is higher than the value then

			warning clears. If the value is set as 0, then the low fuel level warning is disabled.
14	Low fuel level alarm	0-100% ***(0%)***	When the fuel level is lower than the alarm value and comes into low fuel level delay but still lower (normal faults delay), then low fuel level alarms. if the value is set as 0, then the low fuel level alarm is disabled.

15	AUX.INPUT 1	0-40 ***(18. Remote start)***	Set the default value (please refer to the AUX. input function table) Set the state when the AUX. input is valid.
16	AUX.INPUT 1 valid	***0-Normal close*** 1-Normal open	
17	AUX.INPUT 2	0-40 ***(24. Emergency stop alarm input)***	
18	AUX.INPUT 2 valid	***0-Normal close*** 1-Normal open	
19	AUX.INPUT 3	0-40 ***(1. Low oil pressure alarm switch)***	
20	AUX.INPUT 3 valid	***0-Normal close*** 1-Normal open	
21	AUX.INPUT 4	0-40***(2. High water temperature alarm switch)***	
22	AUX.INPUT 4 valid	***0-Normal close*** 1-Normal open	

AUX. input function table

0. **Disable.**
1. **Low oil pressure alarm switch.**
2. **High temperature alarm switch.**
3. **Low water level warning switch.**
4. **Low water level alarm switch.**
5. **Low fuel level warning input.**
6. **Low fuel level alarm input.**
7. **Charging failure warning:** output when charging failure.
8. **Low oil pressure shutdown disabled:** valid if there is signal input.
9. **High temperature shutdown disabled:** valid if there is signal input.
10. **External instant warning input.**
11. **External instant alarm input.**
12. **Gens un/loading input:** connect to the gens loading switchs auxiliary point.
13. **Mains un/loading input:** connect to auxiliary point of mains loading switch.
14. **Shades status input.**
15. **Auto start disabled:** gens will not start if there is signal input whatever mains normal or not.
16. **Auto stop disabled:** gens will not stop if there is signal input whatever mains normal or not.
17. **Stop by radiator if high temperature:**The controller will shutdown 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 shutdown the gens directly if the signal is not valid.
18. **Remote start(with load):** the gens comes into start procession if this signal is valid and under auto mode.
19. **Soundproof alarm:** audio alarm output is disabled if there is signal output.
20. **Front face button disabled:** any button except for page button is disabled if there is signal output.
21. **Meter mode:** all output are disabled, alarm and warns are invalid. any button except for page button is disabled.
22. **Remote control mode:** any button except for page button is disabled if the input is

valid, LCD will display remote mode.remote control module can start/stop and monitor parameters through front face buttons.

23. **Idle speed input:**When the input port is valid, the idle speed control is output, and the low speed alarm is invalid.
24. **Emergency stop alarm input;**
25. **Broken fan belt input;**
26. **Remote start(without load):** the gens comes into start procession(without load) if this signal is valid and under auto mode.
27. **Alarm shutdown prohibition** (War mode)**:** this mode, in addition to the "emergency shutdown", all other alarms are invalid.
28. **Alternative config 1:** Alternate configuration 1 and switch input active at the same time.
29. **Alternative config 2:** Alternate configuration 2 and switch input active at the same time.
30. **Alternative config 3:** Alternate configuration 3 and switch input active at the same time.
31. **Emergency stop warning:** When the input port is valid and lasts for a period of time (normal warning delay), the warning indicator light will light up and the screen will display: **"Emergency stop warning"**.
32. **– 40. Reserved.**

23	High water temperature warning	20-200℃ ***(95℃)***	When the water temperature is higher than the value and comes into high temperature warning delay but still higher r(normal warning delay), then high temperature warns. If it is lower than the value then warning clears. If the value is set as 200, then the high temperature warning is disabled.
24	Low oil pressure warning	0-999kpa ***(180kpa)***	When the oil pressure is lower than the value and comes into low oil pressure warning delay but still lower(normal warning delay), then low oil pressure warns. If it is higher than the value then warning clears. If the value is set as 0, then the low oil pressure warning is disabled.

7) Output setting

1	AUX.OUTPUT 1 (DC Supply Out) Pin 6	0-80***(17. E.S.T. hold)***	See **AUX. Output function table** for details of all available functions. **Polarity:** Select the AUX.OUTPUT polarity. **De-Energise:** When the output source is true, the output deactivates. **Energise:** When the output source is true, the output activates
2	AUX.OUTPUT 2 (DC Supply Out) Pin 7	0-80***(10. Idle speed control 1)***	
3	AUX.OUTPUT 3 (DC Supply Out) Pin 8	0-80***(14.Gens load)***	
4	AUX.OUTPUT 4 (DC Supply Out) Pin 9	0-80***(23. Mains load)***	
5	AUX.OUTPUT 1 Polarity	***0-Energise*** 1-De-Energise	
6	AUX.OUTPUT 2 Polarity	***0-Energise*** 1-De-Energise	
7	AUX.OUTPUT 3 Polarity	***0-Energise*** 1-De-Energise	
8	AUX.OUTPUT 4 Polarity	***0-Energise*** 1-De-Energise	

AUX. Output function table

0. Disable.

1. **Public warning output:** when there is any warning output.
2. **Public alarm output:** when there is any alarm output, alarm locks till revert back.
3. **Audio alarm:** when there is any alarm output, the Audio controls.
4. **Shades control:** there is output once genset starts and stop till stable.
5. **Preheat mode 1:** preheat before start.
6. **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.
7. **Fuel output:** output once gens starts and off till stable.
8. **Crank output:** output once cranking, no output in other mode.
9. **Genset running:** output under running,off once RPM is lower than cranking RPM. The crank success condition can be set.
10. **Idle speed control 1:** used for speed controller, there is output under idle but no output under high speed.
11. **Speed-up control:** during the procession of speed increasing, the output time is the Longest RPM-up time.
12. **High speed control:** The output is valid after idle delay is completed, and the output is closed after high-speed heat dissipation.
13. **Excitation output:** there is output during cranking procession and there is 2s output if there is no frequency under high speed status.
14. **Gens load:** continuous or pulse type according to time setting.
15. **Gens unload:** continuous or pulse type according to time setting.
16. **Speed-down control:** the output time is shutdown idle delay during shutdown idle or shutdown on power procession.
17. **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.
18. **System in stop:** there is output under stop mode.
19. **System in manual:** there is output under manual mode.
20. **System in auto:** there is output under auto mode.
21. **Fuel pump output:** there is output if the oil capacity is lower than start condition for 10s and shutdown if it is higher than the shutdown condition for 1s.
22. **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.
23. **Mains load:** continuous or pulse type according to time setting.(No functionality when AMF is disabled)
24. **Mains unload:** continuous or pulse type according to time setting. (No functionality when AMF is disabled)
25. **Idle speed control 2:** used for speed controller, there is output under idle but no output under high speed.
26. **Rated running:** there is output under rated running.
27. **ECU power:** apply to electrical ECU engine, used for control ECU power.
28. **ECU stop:** apply to electrical ECU engine, used for control ECU shutdown.
29. **ECU warning:** there is a warn signal from ECU.
30. **ECU alarm:** there is an alarm signal from ECU.
31. **ECU communication failure:** Cannot communicate with ECU.
32. **Fan control:** When the engine temperature is higher than the "open fan temperature value", it will output, and it will be disconnected when it is lower than the "close fan temperature value".
33. **Pulse speed up output:** the pulse shall be sent out in the interval of “Pulse speed up delay” under speed –up.
34. **Pulse speed down output：** the pulse shall be sent out in the interval of “Pulse speed

down delay" under stop idle speed.
35. **Public unload:** Public unload of Gens and Mains.
36. **Preheat mode 2:** Preheat stops after successful start.
37. **Preheat mode 3:** Preheat stops after safety delay.
38. **Preheat mode 4:** Preheat stops after Temp.-up time.
39. **Preheat mode 5:** Preheat stops after Temp.-up time,no preheat start the motor;
40. **Choke control:** choke will be started after crank success and off after delay.
41. **Emergency stop:** Output when emergency stop alarm.
42. **Over speed alarm:** Output when Over Speed alarms.
43. **Under speed alarm:** Output when engine under speed alarm.
44. **Over frequency alarm:** Output when over frequency alarm.
45. **Under frequency alarm:** Output when under frequency alarm.
46. **Over voltage alarm:** Output when over voltage alarm.
47. **Under voltage alarm:** Output when under voltage alarm.
48. **Low oil pressure sensor alarm:** Output when low oil pressure sensor alarm.
49. **Low oil pressure switch alarm:** Output when low oil pressure switch alarm.
50. **Oil pressure sensor open alarm:** Output when oil pressure sensor open alarm.
51. **High temperature sensor alarm:** Output when high temperature sensor alarm.
52. **High temperature switch alarm:** Output when high temperature switch alarm.
53. **Temperature sensor open alarm:** Output when temperature sensor open alarm.
54. **Low water level switch alarm:** Output when low water level switch alarm.
55. **Fail To Start alarm:** Output when the engine fails to start.
56. **RPM Signal lost alarm:** Output when Speed signal lost alarm.
57. **Fail To Stop alarm-RPM:** Output when the engine shutdown fails to alarm.
58. **Fail To Stop alarm-Hz:** Output when the engine shutdown fails to alarm.
59. **Fail To Stop alarm-Oil pres:** Output when the engine shutdown fails to alarm.
60. **Fuel level sensor open alarm:** Output when Fuel level sensor open alarm.
61. **Low fuel level switch alarm:** Output when low Fuel level switch alarm.
62. **Low fuel level sensor alarm:** Output when low Fuel level sensor alarm.
63. **Instant alarm switch alarm:** Output when Instant alarm switch.
64. **Over current alarm:** Output when over current alarm.
65. **Non-balance of current alarm:** Output when non-balance current ratio alarm.
66. **Over power alarm:** Output when over power alarm.
67. **Phase Sequence alarm:** Output when Phase Sequence alarm.
68. **Shades open abnormal alarm:** Output when Shades open abnormal alarm.
69. **Maintain end alarm:** Output when maintain end alarm.
70. **Broken fan belt:** Output when Broken fan belt alarm.
71. **Alternative config conflict alarm:** Output when Alternative config conflict alarm.
72. **Under battery volt warn:** Output when over battery voltage warning.
73. **Over battery volt warn:** Output when under battery voltage warning.
74. **Under battery volt alarm:** Output when over battery voltage alarm.
75. **Over battery volt alarm:** Output when under battery voltage alarm.
76. **-80: Reserved**

8)CAN communication

NO	Parameter	Range***(default)***	Notes
1	CAN failure	Disable Warn ***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	Rated idle speed	500-4500rpm ***(750rpm)***	ECU idle speed value.
6	Slow rise time	0-120.0S***(5.0S)***	The time of ECU from idling to high speed.
7	ECU speed control address	0-255***(3)***	The TSC1 message ID address sent by the controller to the ECU, and the communication protocol must be 31: J1939-C.
8	CAN communication rate	***0-250Kbps*** 1-500Kbps	CAN communication rate

9)Module settings

NO	Parameter	Range***(default)***	Notes
1	Language	0-English ***1-简体中文*** 2-繁体中文 3-español 4-русский 5-Türk dili 6-Français 7-Românesc 8-Polski 9-Português 10-Deutsch 11-한국어 12-Tiếng Việt 13-بالعربية 14-Bahasa Indonesia 15--فارسی; 16-Україна 17-Italiano 18-বাংলা; 19-हिन्दी-Hindi	Display language selection. 0: English; 1: Simplified Chinese; 2: Traditional Chinese; 3: Spanish; 4: Russian; 5: Turkish; 6: French; 7: Romanian; 8: Polish; 9: Portuguese; 10: German; 11: Korean; 12: Vietnamese; 13:Arabic; 14: Bahasa Indonesia; 15:Persian; 16:Ukrainian (language) 17:Italian; 18:Bengali; 19:Hindi;
2	Host and slave mode	***0: Host mode*** 1: Slave mode	Select the instrument communication mode, the slave can read and display the parameters of the host through the RS485 port.
3	User password	00000-65535 ***(07623)***	Change the password.
4	Controller ID	1-255***(16)***	The IP built by controller and PC.
5	RS485 baud rate	0-4800 1-9600 ***2-19200*** 3-38400 4-57600 5-115200	RS485 communication baud rate.
6	Primary Modes	***STOP***	The primary modes on power, easy for

		Manual Auto Auto save	user operation. Note: auto record function can't record the mode with load.
7	Start screen display time	0-20.0s ***(5.0s)***	Start screen display time,0: No-display.
8	LCD contrast	50-127***(106)***	Set the LCD display contrast.
9	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.
10	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.
11	LOGO delay display under standby	5.0-6000.0 ***(6000.0s)***	Start screen will be opened without any button pressed after delay. If setting as 6000.0s: disabled.
12	ECU page	Disable/***Enable***	Set whether the ECU page is displayed.
13	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.

a） Working plan and maintenance setting

No	Parameter	Range***(defaults)***	Notes
1	Working plan format	***Disable*** Every month Every week	This mode must be under auto mode. Working plan is disabled once setting as disable. The working plan will be executed according the chosen date when setting as every month. The working plan will be executed according the chosen date when setting as every week.
2	Maintenance date per month	From 1st to 31st ***Default: the first day***	The date chosen for every month.
3	Maintenance date per week	Monday to Sunday ***Default: Sunday***	The date chosen for every week.
4	Maintenance with load or not	***Disabled***/with load	To choose if the genset starts with load or not.
5	Maintenance start time	00:00-23:59***(00:00)***	Maintenance start time setting.
6	Maintenance running time	1-120m***(5min)***	Maintenance running time setting.

b） working plan

No	Parameter	*Range****(default)***	Notes
1	Working plan	***Disable*** Enable 1: remote start Enable 2: mains failure Enable 3: the above 1 or 2 Enable 4:running always	Working plan 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.

c） Maintenance plan

No	Parameter	Range***(defaults)***	Notes
1	Maintenance countdown	0-5000h***(5000h)***	When it is set as 5000, then this function is disabled.
2	Maintenance date	2000/01/01-***2099/12/31***	When it is set as 2099/12/31, this function is disabled.
3	Maintenance expire	***Warning*** Alarm and stop	The action after the primary maintenance expired.

d） 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	

e） Self-define curve

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

f） 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; Rated RPM; Over speed alarm; Under speed alarm; Rated frequency; Over freq alarm; Under freq alarm; Rated Phase voltage; Over voltage warning; Under voltage alarm; Rated phase current; Phase current over-load alarm; Over current recovery hysteresis width; Rated total power; Over total power alarm; Over power recovery hysteresis width; Mains Phase; Mains under volt; Revert under volt; Mains over volt; Revert over volt; Loss of Phase judgment;			

◆ CAN Protocol Detailed Table

0. Disabled	**94. Isuzu 6H**
1. J1939	**95. Isuzu 6W**
2. Cummins ISB	**96. Isuzu Tier 4 Final**
3. Cummins-CM850	**97. Isuzu Tier 4 Final DOC Only**
4. Cummins QSX15-CM570	**98. Iveco EDC7C1**
5. Cummins-CM850-PCC13X	**99. Iveco EDC7UC31**

6. Cummins-DCEC-QSZ13	100. Iveco EDC62
7. Cummins-CCEC-QSN	101. Iveco T3
8. Perkins	102. JCB DCM3.3
9. Perkins-1100	103. JCB DCM7.24
10. Volvo	104. JCB DCM7.24 No SCR
11. Volvo-EMS2	105. John Deere
12. Volvo-EMS2b	106. John Deere iT4
13. Volvo-EDC4	107. John Deere T4f
14. Scania	108. John Deere T4f CVT
15. Scania-kw2000	109. John Deere T4f NoDPF
16. Scania-kw2k-coo	110. Kipor ECM
17. John Deere	111. Kipor V ECM
18. mtu-ADEC	112. KOEL
19. mtu-ADEC-SAM	113. KOEL 6K
20. mtu-ADEC-303	114. KOEL HA2
21. mtu-ADEC-304	115. KOEL K4300
22. BOSCH	116. KOEL N
23. GTSC1	117. Kohler HD
24. MTSC1	118. Kohler KDI Stage V
25. YUCHAI-YCECU	119. Kohler KDI Stage V SCR
26. Y&C ENGINE-YC6K	120. Kohler T4f
27. WEICHAI-WISE15	121. Kohler T4f + DPFREGST
28. CHANGCHAI-ECU15	122. Kohler T4f no DCU
29. YUCHAI-LMB	123. Kohler T4f no SCR
30. MAN	124. Kubota ECU
31. J1939-C	125. Kubota LSI
32. SDEC-H/D	126. Kubota Stage V
33. SDEC-E	127. Kubota T4f DOC Only
34. YTO	128. Lombardini KDI
35. DEUTZ EMR2-2001	129. Mahindra BS4
36. DEUTZ EMR2-2012	130. Mahindra N1
37. DEUTZ EMR3	131. Mahindra NG
38. DEUTZ EMR4	132. Mahindra NG A46
39. NEVED-ECU13	133. MAN EDC17
40. Cummins-CM2150	134. MAN MFR
41. Wuling CT4S010	135. MAXXFORCE
42. HSD-3M78	136. MTU ADEC

43. AgCo EEM4S5	137. MTU ECU8
44. Baudouin WISE10B	138. MTU ECU8 SAM
45. Baudouin Wise15	139. MTU ECU9
46. CAT A4E2	140. MWM16
47. CAT A4E2v2	141. Perkins 1300
48. CAT A4E2v3.1	142. Perkins 1600
49. CAT ADEM4	143. Perkins A4E2
50. CAT C3.4B T4f	144. Perkins A4E4 A5E2 Dual ECU T4F
51. Cummins CM558	145. Perkins A5E2
52. Cummins CM570	146. Perkins A5E2v2
53. Cummins CM570 Ind	147. Perkins A6E2
54. Cummins CM850	148. Perkins A6E2 EU3
55. Cummins CM2150E	149. Perkins A6E10
56. Cummins CM2250	150. Perkins A6E11
57. Cummins CM2350	151. Perkins ADEM3
58. Cummins CM2350 G-Drive Stage	152. Perkins ADEM4
59. Cummins CM2350 G-Drive T4f	153. Perkins EDC17C49
60. Cummins CM2350 Ind, Stage V	154. Perkins Generic T4F Dual ECU
61. Cummins CM2350 Ind	155. Powerlink Gas
62. Cummins CM2850	156. PowerLink Gas V1
63. Cummins CM2880 G-Drive	157. PowerLink Gas V2
64. Cummins CM2880 Ind	158. PSI 4G
65. Cummins QSZ	159. PSI IAT
66. Daimler CPC4	160. Scania E3
67. Detroit DDEC	161. Scania OCE
68. Deutz EMR2	162. Scania S6
69. Deutz EMR3	163. Scania S8
70. Deutz EMR4	164. Scania S8 Single
71. Deutz EMR4 CVT	165. Scania S8 Single-speed Stage V
72. Deutz EMR5	166. Scania S8 SS Stage V HEST
73. Doosan G2 Stage V	167. Siemens NG
74. Econtrols GCP	168. Sisu EEM3
75. FPT EDC7UC31 i T4	169. Volvo EDC3
76. FPT EDC17C49 T4B	170. Volvo EDC4
77. FPT EDC17CV41	171. Volvo EMS2
78. FPT MD1CE101	172. Volvo EMS2 VE
79. FPT MD1CE101 Tier3	173. Volvo EMS2.3

80. FPT MD1CS069	**174. Volvo EMS2.3 VE**
81. FPT MD1CS069 No SCR	**175. Volvo EMS2.4**
82. Generac STM Dual (SPTF-MotorT)	**176. Volvo EMS2b**
83. Generac STP Dua	**177. Weichai Wise 15**
84. Generic J1939	**178. Weifu ECU**
85. Generic Plus	**179. Woodward SECM70**
86. GM PSI	**180. Yammar ECO**
87. Hatz EDC17	**181. Yanmar 4TN88G**
88. Hatz EDC17 3K 1200 Idle	**182. Yanmar T4F TNV**
89. Hatz EDC17 SV	**183. Yanmar TNV Stage V**
90. Isuzu 4H	**184. Yuchai ECU**
91. IsuZu 4J	**185. Yuchai ECU 1000rpm**
92. Isuzu 4J T4f	**186. Zenith ECU**
93. Isuzu 4L	

13. Fault finding

Symptoms	Possible Solutions
Controller no response with power	Check DC voltage. Check DC fuse. Check if the terminal 1 and 2 is with battery voltage.
Genset shutdown	Check the water/cylinder temperature is too high or not. Check the genset AC voltage. Check DC fuse.
Genset Emergency Stop	Check whether the emergency stop button is normal; Check whether the AUX.IPUT is configured correctly; Check whether the controller cable is normal.
Low oil pressure alarm	Check oil pressure sensor and its wiring. Check the oil pressure sensor type and controller settings must be consistent. Check whether the low oil pressure sensor is normal.
High temperature alarm	Check temperature sensor and its wiring. Check the temperature sensor type and controller settings must be consistent. Check whether the temperature sensor is normal.
Shutdown Alarm in running	Check related switch and its connections according to the information on LCD. Check AUX.INPUT.
Fail to start	Check fuel return circuit and wiring. Check start battery. Consult engine manual.
Starter motor does not respond	Check the wiring to the starter. Check start battery.
Unit operation but ATS does not switch	Check the ATS. Check the cable between the controller and the ATS.
USB communication is abnormal	Check the USB connection. Check whether the USB port of the computer is normal.

	Check whether the USB driver is installed.
RS485 cannot communicate normally	Check the connection. Check if the communication ID number setting is correct. Check if the A and B lines of RS485 are reversed. Check if the RS485 communication line driver is installed or not. Check if the communication port of the PC is damaged. Add a 120 Ω resistor between the AB of the controller RS485.
ECU warning or stop	Get information from LCD of alarm page; If there is detailed alarm, check engine according to description. If not, please refer to engine manual according to SPN alarm code.