# DC8xD MK3
# GENSET CONTROLLER
# USER MANUAL

**DC80D MK3**


**DC82D MK3**

Software Version

| No. | Version | Date | Note |
|---|---|---|---|
| 1 | V1.0 | 2020-10-1 | Original release. |
| 2 | V1.1 | 2021-02-01 | Name of unified input and output port. |

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Symbol Description

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


Warning

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


Be Care

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

**Catalogue**

## 1.Summary

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

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

## 2.Main Features

There are four Models under DC8xD MK3 series.

DC80D MK3: used for single machine automation. Start/Stop through remote start signal.

DC82D MK3: Based on DC80D MK3, it adds Mains monitoring and AMF (Mains/Generator automatic switching control), especially suitable for the automation system composed by mains and genset.

DC80DR MK3: Based on DC80D MK3, it adds RS485 port.

DC82DR MK3: Based on DC82D MK3, it adds RS485 port.

- ◆ Dual core 32bit high performance single chip microcomputer.
- ◆ 4.3inch TFT colorful big screen LCD, Available in 5 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 USD port to monitor in real time.
- ◆ With RS485 communication port, can achieve "Three Remote" functions via MODBUS protocol.
- ◆ Various kinds of parameters display.
- ◆ Input/output function, status can be shown directly.
- ◆ More categories of surface setting.
- ◆ Real time clock inside.
- ◆ Maintenance countdown function, can set maintenance timing or date.
- ◆ The black box function can save the relevant parameters of the unit when the fault alarm occurs in real time, and it is convenient to find the cause of the fault.
- ◆ Totally 7 relay's output, among which 5 relay output can be self-configurable, each relay can be set as max 50 functions, besides, there are 2 groups as non-contact terminals.
- ◆ 5 relays can be set as switch value input, and function configurable.
- ◆ 3 sensor simulation input connectors, various kinds of units can be set.
- ◆ 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 IP54
- 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
- Mains Frequency (only for DC82D MK3)
- Mains phase voltage L-N (only for DC82D MK3)
- Mains phase voltage L-L (only for DC82D MK3)
- Generator 3 Phase voltage L-N
- Generator 3 Phase voltage L-L
- Generator phase
- Generator 3 phase current A
- Generator Frequency Hz
- Generator Power Factor COS φ
- Generator active power KW
- Generator apparent power KVA
- Generator reactive power K Var
- Real-time load rate %
- Current load rate%
- Average loading rate %
- Current consumption KWH
- Total consumption KWH
- Total Crank times
- Current running time
- Total running time
- Maintenance notice
- 5 switches input status display
- Output status display of 7 relays

**Protection**

- Over speed
- Under speed
- Low oil pressure
- High temperature
- Low fuel level
- Low oil level
- External emergency alarm

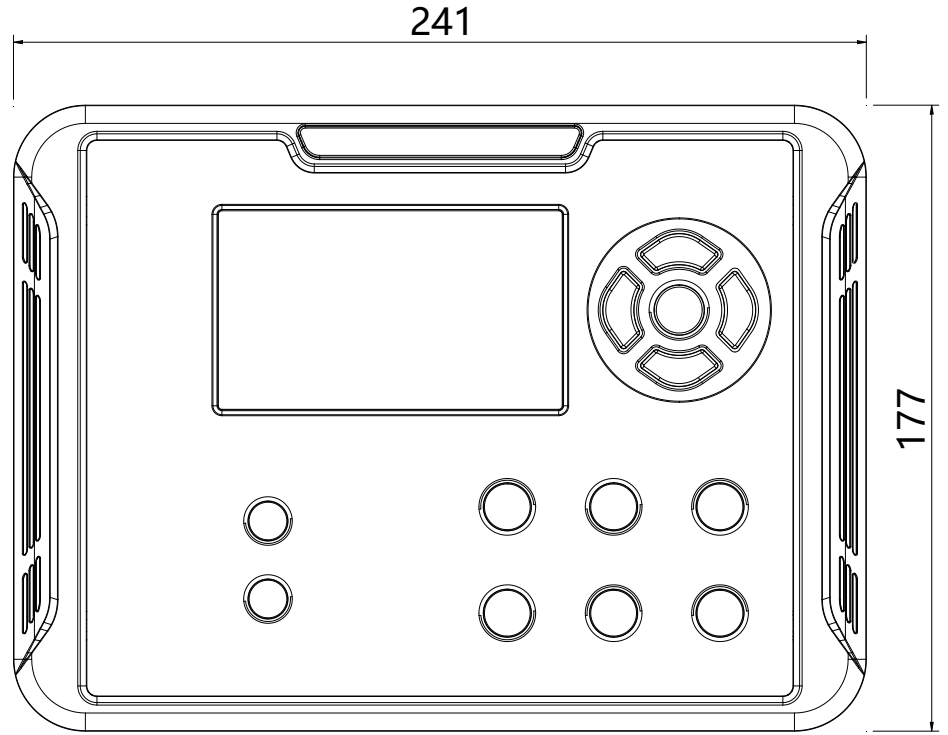
- RPM Lost
- Sensor Open
- Over Frequency
- Under Frequency
- Over voltage
- Under voltage
- Over current
- Over power
- Maintenance expire
- Low water level alarm
- Emergency Stop
- Crank failure
- Stop Failure

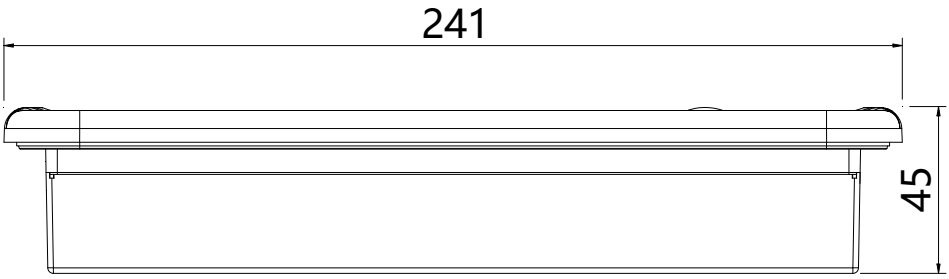
**4.Parameters**

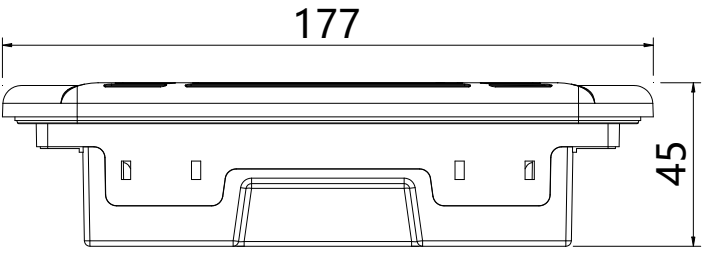
| Options | Parameters |
|---|---|
| Working voltage | DC8V----36V Continuous |
| Power consumption | Standby：24V：MAX 1W |
| | Working：24V：MAX 7W |
| AC Voltage Input | 1P2W 30VAC-276VAC (ph-N) |
| | 2P3W 30VAC-276VAC (ph-N) |
| | 3P4W 30VAC-276VAC (ph-N) |
| Rotate speed sensor Frequency | 200-10000Hz |
| MAX Accumulating Time | 99999.9Hours（Min Store time:6min） |
| Fuel Relay Output | Max 16Amp DC+VE Supply voltage |
| Start Relay Output | Max 16Amp DC+VE Supply voltage |
| AUX. OUPUT1 | Max 5Amp DC+VE Supply voltage |
| AUX. OUPUT2 | Max 5Amp DC+VE Supply voltage |
| AUX. OUPUT3 | Max 5Amp DC+VE Supply voltage |
| AUX. OUPUT4 | 5AMP Non-contact normal close output |
| AUX. OUPUT5 | 5AMP Non-contact normal open output |
| Excitation output | Max 0.9AMP DC+VE supply voltage |
| Switch value input | Available if connecting with Battery - |
| Working condition | -25-65℃ |
| Storage condition | -40-85℃ |
| Protection Level | IP54：when waterproof rubber gasket is added between controller and its panel |
| Insulation strength | Apply AC1.5kV 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 | 0.9Kg |

## 5.Overall Dimension and Wiring Diagram

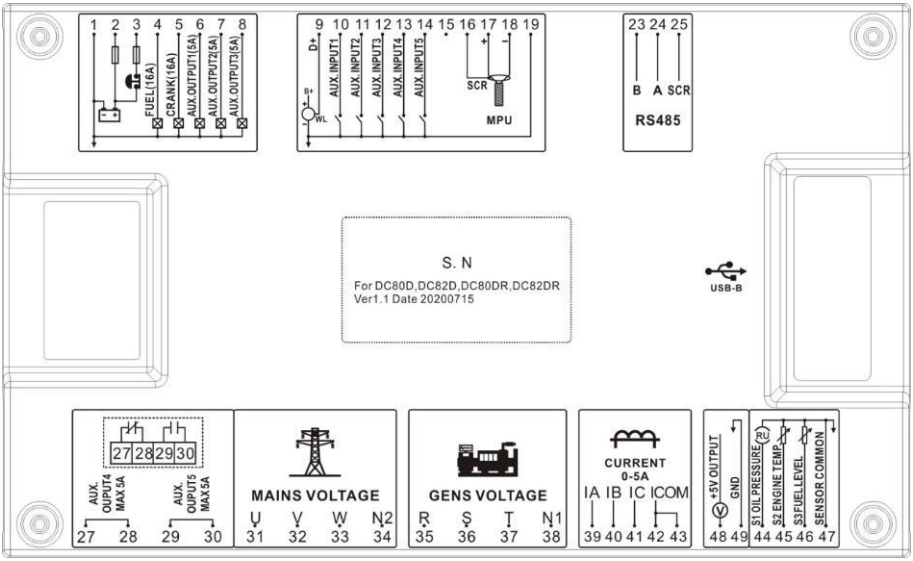
◆ **Overall Dimension:**



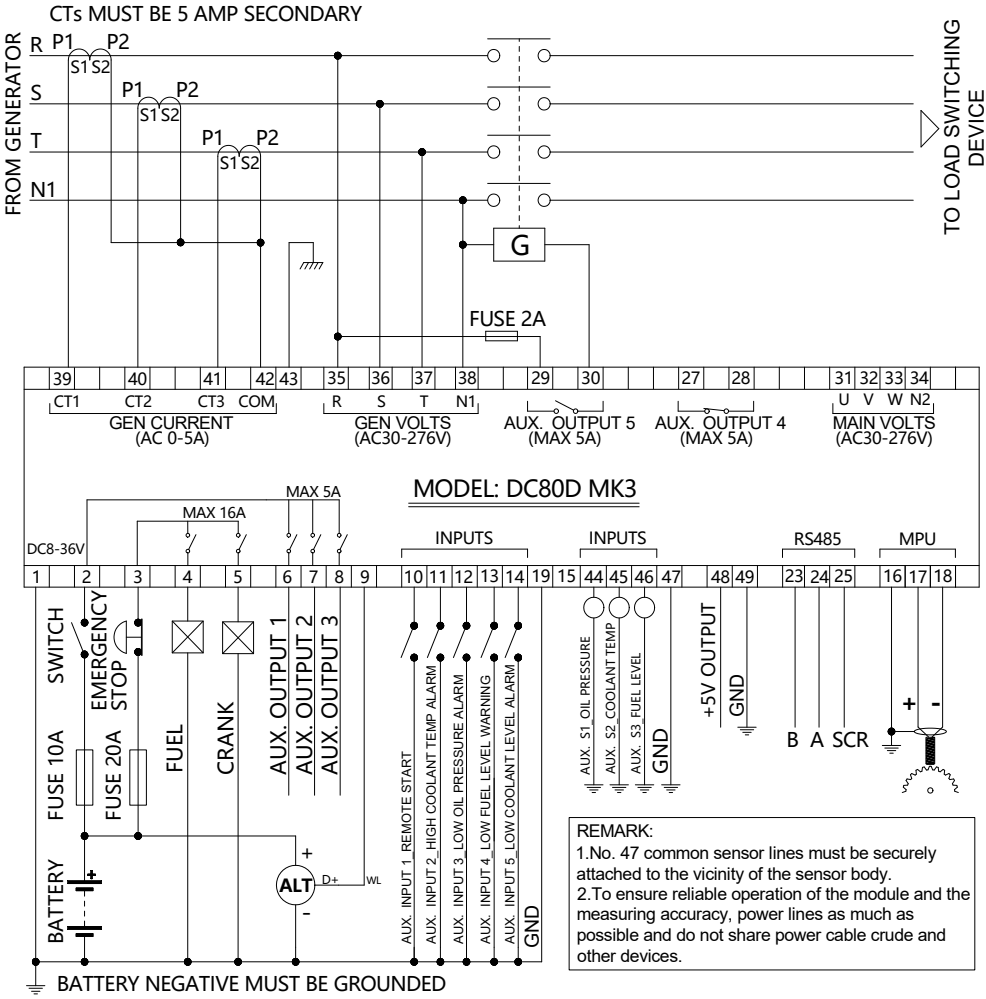
## ◆ Descriptions of terminal connection




| No. | Function | Description | Cable cross sectional area |
|---|---|---|---|
| 1 | Battery Negative Input B- | Controller power supply input B-. | 2.5mm$^2$ |
| 2 | Battery Negative Input B+ | Controller power supply input B+. | 2.5mm$^2$ |
| 3 | Emergency Stop Input | B+ voltage input is active, and connected to emergency stop normal closed button. | 2.5mm$^2$ |
| 4 | Fuel Output | Active output, Max 16Amp | 1.5mm$^2$ |
| 5 | Crank Output | Active output, Max 16Amp. | 1.5mm$^2$ |
| 6 | Aux. Ouput1 | Active output, Max 5Amp. | 1.5mm$^2$ |
| 7 | Aux. Ouput2 | Passive Output, Max 5Amp. | 1.5mm$^2$ |
| 8 | Aux. Ouput3 | Passive Output, Max 5Amp. | 1.5mm$^2$ |
| 9 | Charging excitation output | Active output, Max 0.9Amp. | 1.0mm$^2$ |
| 10 | Aux. Input1 | The grounding is valid according to the function selection switch input. | 1.0mm$^2$ |
| 11 | Aux. Input2 | | 1.0mm$^2$ |
| 12 | Aux. Input3 | | 1.0mm$^2$ |
| 13 | Aux. Input4 | | 1.0mm$^2$ |
| 14 | Aux. Input5 | | 1.0mm$^2$ |
| 15 | Reserved | Reserved. | |

| | | | |
|---|---|---|---|
| 16 | Speed sensor SCR | Connecting speed sensor shielded wire ground. | 1.0mm$^2$ |
| 17 | Speed sensor + | Use a shielded wire to connect the speed sensor. | 1.0mm$^2$ |
| 18 | Speed sensor - | | 1.0mm$^2$ |
| 19 | Common GND | Connect the battery negative or outer casing. | 1.5mm$^2$ |
| 23 | RS485 B | A 120 Ω shielded wire and good grounding are recommended. | 1.0mm$^2$ |
| 24 | RS485 A | | 1.0mm$^2$ |
| 25 | RS485 SCR | | 1.0mm$^2$ |
| 27 | Aux.Output4 | Passive normally closed output, Max 5Amp. | 1.5mm$^2$ |
| 28 | Aux.Output4 | | 1.5mm$^2$ |
| 29 | Aux.Output5 | Passive normally open output, Max 5Amp. | 1.5mm$^2$ |
| 30 | Aux.Output5 | | 1.5mm$^2$ |
| 31 | Mains Voltage R | Connected to the mains U phase. | 1.0mm$^2$ |
| 32 | Mains Voltage S | Connected to the mains V phase. | 1.0mm$^2$ |
| 33 | Mains Voltage T | Connected to the mains W phase. | 1.0mm$^2$ |
| 34 | Mains Voltage N1 | Connected to the mains N phase. | 1.0mm$^2$ |
| 35 | Generator Voltage U | Connected to the power generation output R phase. | 1.0mm$^2$ |
| 36 | Generator Voltage V | Connected to the power generation output S phase. | 1.0mm$^2$ |
| 37 | Generator Voltage W | Connected to the power generation output T phase. | 1.0mm$^2$ |
| 38 | Generator Voltage N2 | Connected to the power generation output N phase. | 1.0mm$^2$ |
| 39 | Load CT Secondary L1 | Current Transformer Secondary Rated 5A. | 1.5mm$^2$ |
| 40 | Load CT Secondary L2 | | 1.5mm$^2$ |
| 41 | Load CT Secondary L3 | | 1.5mm$^2$ |
| 42 | Load CT Secondary ICOM | Connect to the common GND instead of the neutral line N. | 1.5mm$^2$ |
| 43 | Load CT Secondary ICOM | | 1.5mm$^2$ |
| 44 | Temperature Sensor | Connect sensor input. | 1.0mm$^2$ |
| 45 | Oil pressure sensor | | 1.0mm$^2$ |
| 46 | Fuel level sensor | | 1.0mm$^2$ |
| 47 | Sensor common GND | Connect the battery negative or outer. | 1.5mm$^2$ |
| 48 | +5V Output | Connect the power supply of the oil pressure sensor with the output voltage signal, with a maximum of 50mA. | 1.0mm$^2$ |
| 49 | GND | Connect the battery negative. | 1.0mm$^2$ |

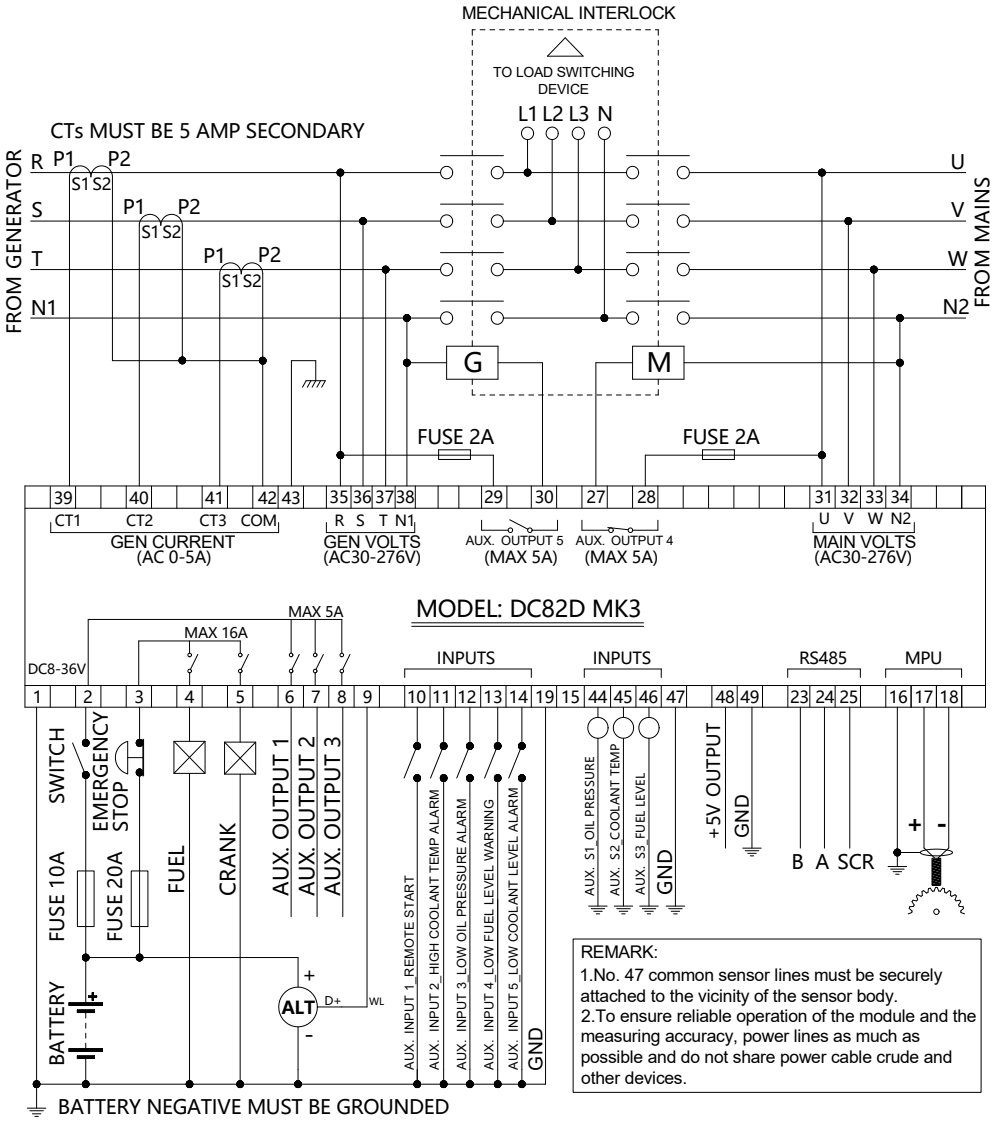
## ◆ DC80D MK3 3-phase 4-wire Typical Wiring Diagram




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

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

## ◆ DC82D MK3 3-phase 4-wire Typical Wiring Diagram

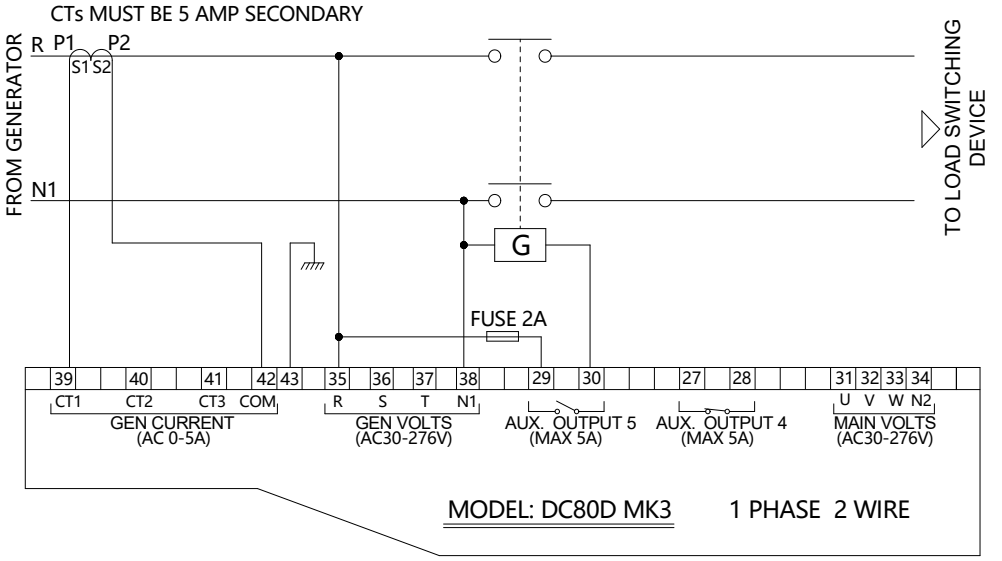



REMARK:
1.No. 47 common sensor lines must be securely attached to the vicinity of the sensor body.
2.To ensure reliable operation of the module and the measuring accuracy, power lines as much as possible and do not share power cable crude and other devices.

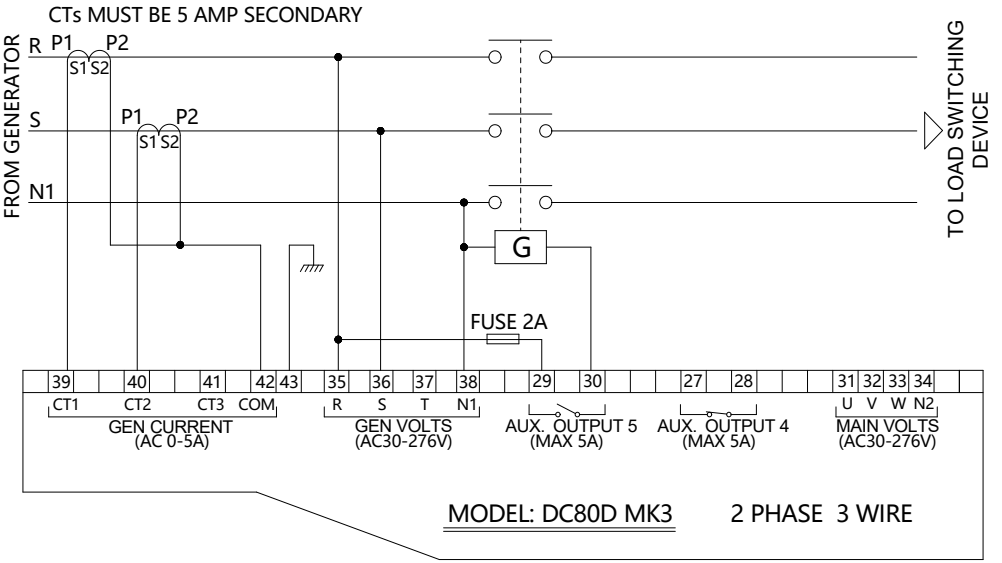
***Note: Please don't move during running status or it may cause the controller broken!***

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

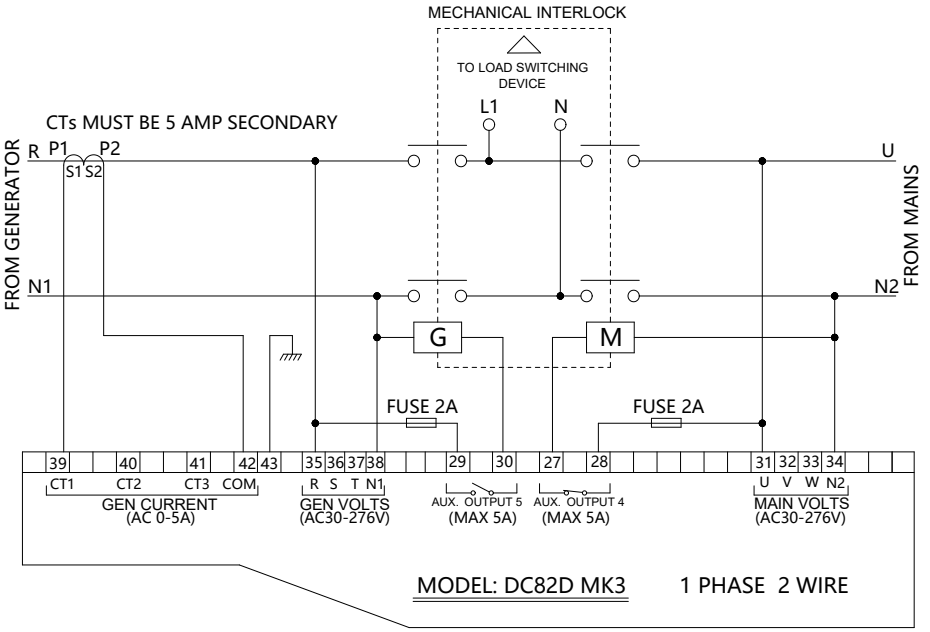
### ◆ DC80D MK3 1-phase 2-wire Typical Wiring Diagram



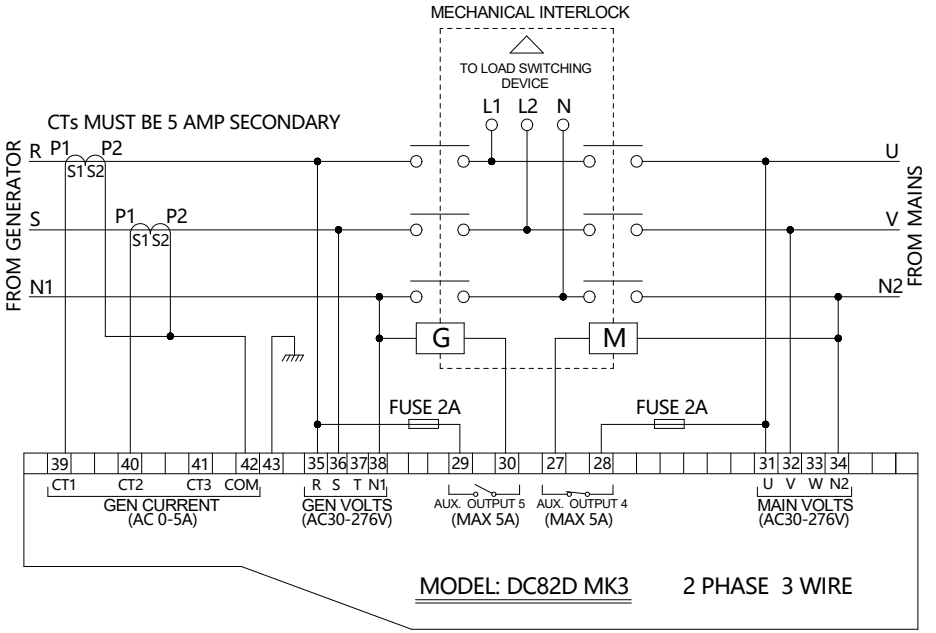

### ◆ DC80D MK3 2-phase 3-wire Typical Wiring Diagram



## ◆ DC82D MK3 1-phase 2-wire Typical Wiring Diagram



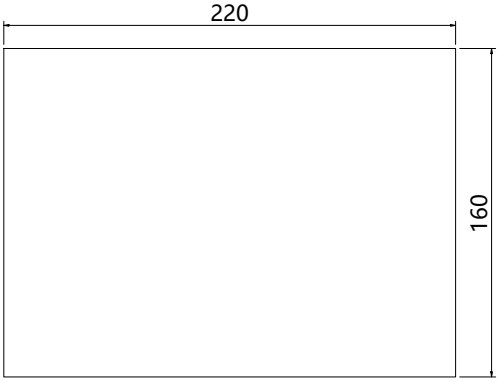

## ◆ DC82D MK3 2-phase 3-wire Typical Wiring Diagram



## 6.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

DC8xD MK3 controller is suitable for 8-36V DC battery voltage. Battery negative must be reliably connected to the enclosure of the engine. The controller power supply B+ and B- must be connected to battery positive and negative, and the wire size must not be less than 2.5mm$^2$.

NOTE:

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

**◆Output and relay expansion**

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

◆ AC current input

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

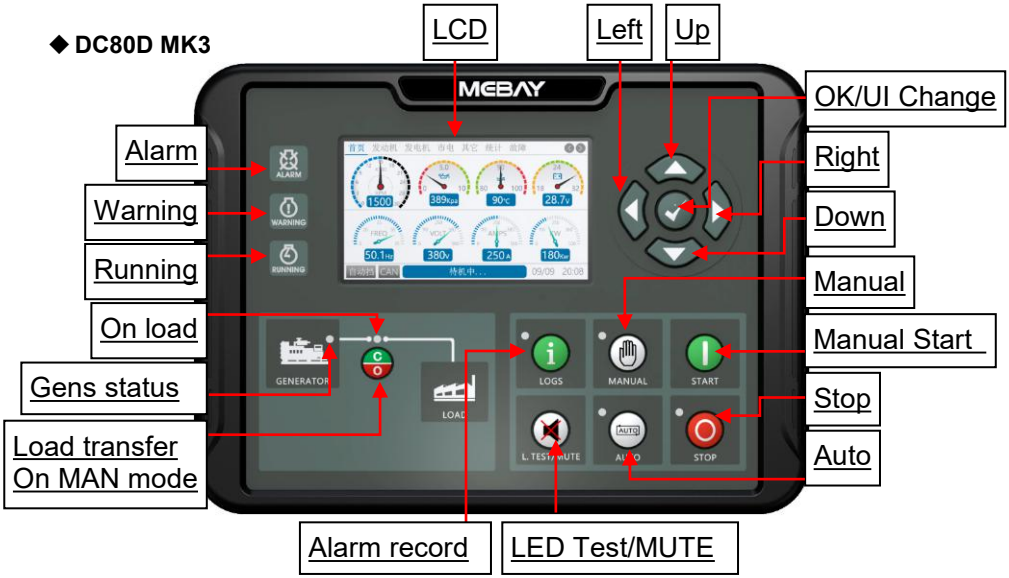
WARNING: When generator is on-load, C. T. secondary must not be open circuit, Otherwise, the high voltage generated will pose a danger to personal safety.

◆Withstanding voltage test

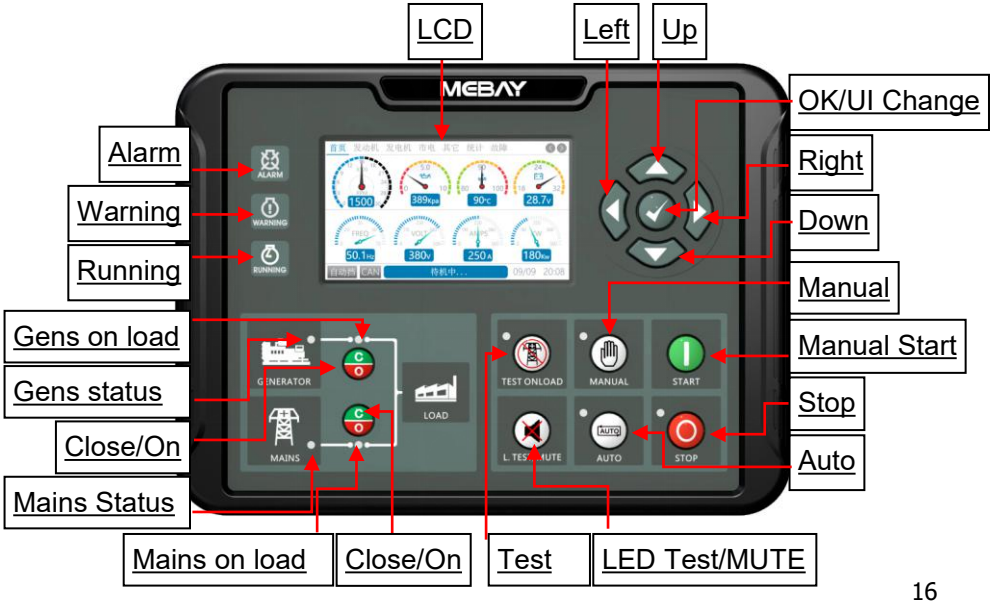
If withstanding voltage test is conducted after the controller has already been installed onto the control panel, please unplug all controller terminal connections in order to prevent high voltage from damaging it.

## 7.Panel and display

◆ **DC80D MK3**




◆ **DC82D MK3**



◆ **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. |
|  | Manual | ◆ Pressing this key will set the module into manual mode. |
|  | Auto | ◆ Pressing this key will set the module into auto mode. |
|  | DC80D MK3<br>Records | ◆ Pressing this key to check the alarm records under stop mode. |
|  | DC82D MK3<br>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>◆ Black UI and white UI can be switched when Pressing.<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 |
|  | DC82D MK3 Alarm Records checking | ◆ Pressing STOP and RIGHT to check the records and any buttons pressed to exit from the page. |

◆ **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!**"

◆ **Alarm records checking**

DC8xD MK3 controller can save 40 group of alarm records which contains the alarm record data includes detailed data such as alarm time, generator parameters, engine parameters, etc.

How to check the alarm records:

1)Enter alarm record page:

a)DC80D MK3: under stop mode, press  to come into alarm records page;

b)DC82D MK3: 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)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.

## 8.Control and operation instruction

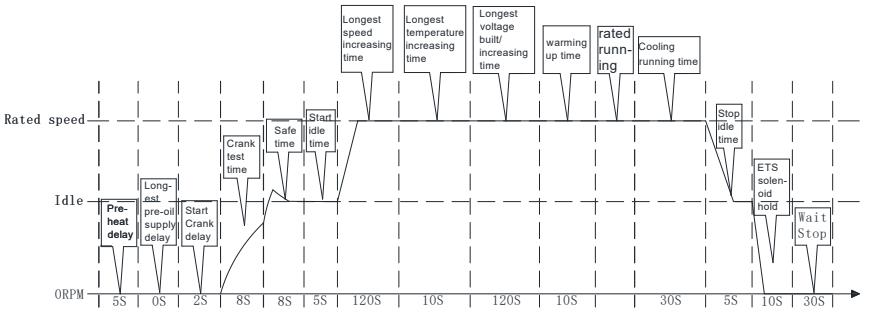
◆ **Manual test mode: (only DC82D MK3 has this function)**

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

Press “  ” and the test file indicator is on. At this time, it is detected whether the connection of each sensor is normal. If the sensor is open, the sensor opens an

alarm. If it is normal, the unit start process is executed in the following sequence after pressing the "". automatically switch to Generator provide the power when the unit is running normally.

Press "" The controller performs the parking process at the following timing:

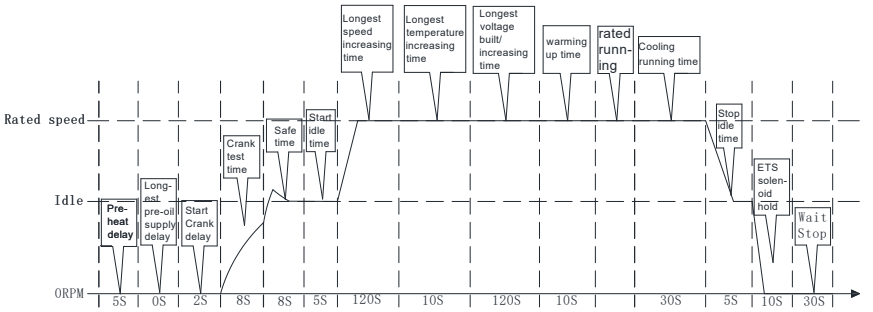



**◆ Manual Start Mode**

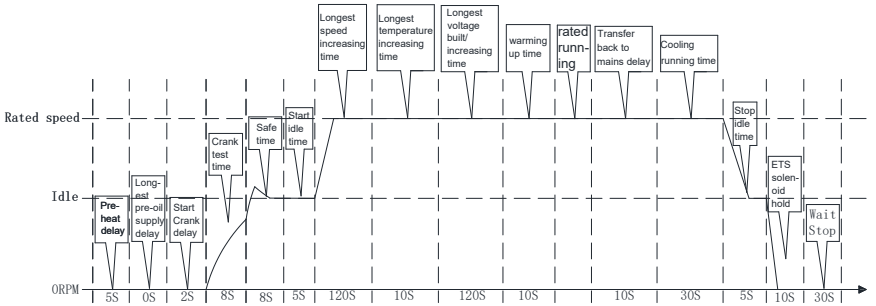
press and make sure it is in the stop position before starting.

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:

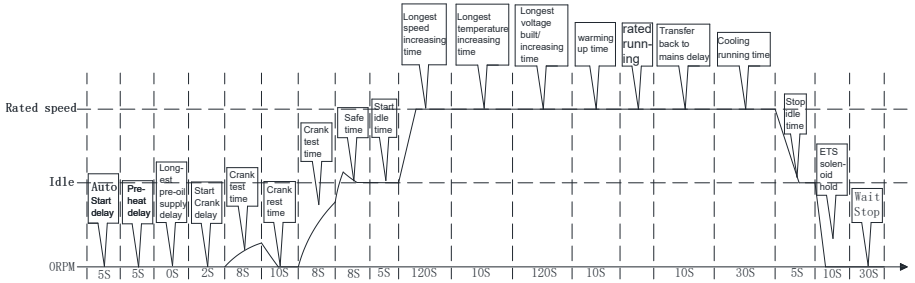



**Automatic starting mode:**

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 (DC82D MK3 detected the remote starting signal is valid or the mains provide the power is invalid). The unit will perform the starting process in the following sequence. When the unit enters the normal rated operation, it will automatically switch to the generator provide the power. The controller will detect the remote start signal and the mains status in real time (DC82D MK3 is available). When the remote start signal fails and the mains provide the power returns to normal, the shutdown process after the "loop time delay" is performed (DC82D MK3 is available).

Auto start and stop process:




◆ **Notices in Starting Process**

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

 Note 2: Within the safety delay, only respond to emergency stop, immediate stop, over speed, over frequency, Overvoltage, 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, overpower during start idle time.

 Note 4: No response to low frequency, under voltage, over current 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 cancelled and the stop operation will be executed directly.

## 9.Warnings and Shutdown Alarms

### ◆ Warnings

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

**Low fuel level sensor warning**

When the controller detects that the fuel level value is lower than the "**Low fuel level warning"**, Then start warning delay and the duration(2S) have not returned to normal, the warning of Low fuel level warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**Low fuel level-A**" on the current fault screen.

**Low fuel level switch warning**

When the controller detects that the AUX. INPUT "**Low fuel level warning input"** switch is active, it starts warning delay and lasts for 2 seconds. When the **"Low fuel level warning input"** switch is enabled, the engine low fuel level switch warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**Low fuel level-D**" on the current fault screen.

**External instant warning**

When the controller detects that the AUX. INPUT "**External instant warning input"** switch is active, it starts warning delay and lasts for 2 seconds. When the **"External instant warning input"** switch is enabled, the warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**Instant warn**" on the current fault screen

**Speed signal lost warning**

When the controller parameter "**Action if RPM lost**" is set to "**warning**", the detected speed value is 0,Then start warning delay and the duration (2S) have not returned to normal, the warning of speed signal lost warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**Lose speed**" on the current fault screen.

**Oil pressure sensor disconnected warning**

When the controller parameter "**Action if low oil pressure sensor disconnected**" is

set to "**warning**", When the oil pressure sensor is detected to be disconnected,Then start warning delay and the duration (2S) have not returned to normal, the warning of Oil pressure sensor disconnected warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**OP sensor open**" on the current fault screen.

**Temperature sensor disconnected warning**
When the controller parameter "**Action if temperature sensor disconnected**" is set to "**warning**", When the temperature sensor is detected to be disconnected,Then start warning delay and the duration (2S) have not returned to normal, the warning of temperature sensor disconnected warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**WT sensor open**" on the current fault screen.

**Fuel Level sensor disconnected warning**
When the fuel Level sensor is detected to be disconnected,Then start warning delay and the duration (2S) have not returned to normal, the warning of fuel Level sensor disconnected warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**FL sensor open**" on the current fault screen.

**Over current warning**
When the controller detects that the generator current is higher than "**Phase current over-load warning**", Then start warning delay and the duration (2S) have not returned to normal, the warning of over current is reported. "**WARNING**" lights will light up, Generators will not stop, displays " **Over current** " on the current fault screen.

**Over power warning**
When the controller detects that the generator power is higher than "**Over total power warning**", Then start warning delay and the duration (2S) have not returned to normal, the warning of over power is reported. "**WARNING**" lights will light up, Generators will not stop, displays " **Over power** " on the current fault screen.

**Under battery voltage warning**
When the controller detects that the battery voltage is lower than the "**Under battery voltage warning"**, Then start warning delay and the duration (2S) have not returned to normal, the warning of Under battery voltage warning is reported. "**WARNING**" lights will light up, Generators will not stop, displays "**Under BATT volt**" on the current fault screen.

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

**◆ Shutdown Alarms**

 Warning: After the Shutdown Alarm occurs, the system will be locked immediately and the generator set will be stopped. Only after troubleshooting, press  key to clear the alarm, can it be re-operated.

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

**Over speed alarm**

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

**Under speed alarm**

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

**Low oil pressure sensor alarm**

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

**Low oil pressure switch alarm**

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

**High temperature sensor alarm**

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

**High Temperature Switch Alarm**

When the controller detects that the High temperature alarm switch input is valid to the ground, then start alarm delay and the duration (Normal alarm delay) have not returned to normal, the alarm of High Temperature Switch is reported. "**ALARM**" lights flicker, Generator stops running, and displays "**High Temp switch**" on the current fault screen.

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

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

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

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

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

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

**Over voltage alarm**
When the controller detects that the generator voltage is higher than “**Over voltage alarm**”, Then start alarm delay and the duration (Normal alarm delay) have not

returned to normal, the alarm of over voltage is reported. "**ALARM**" lights will light up, Generator stops running, displays " **Over voltage** " on the current fault screen.

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

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

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

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

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

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

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

**Stop failure with frequency alarm**

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

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

**Stop failure with oil pressure switch**
When the controller detects that the oil pressure switch has not returned after the stop, it will alarm, the public alarm light **"ALARM"** lights will light up, and the current fault screen displays **"Alarm: Stop fail-OP-D".**

## 10.Parameter 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) Basic setting**

| No | Parameter | Range ***(default)*** | Notes |
|---|---|---|---|
| 1 | Language | *0-English*<br>*1-简体中文* | Language option. |

| | | | |
|---|---|---|---|
| | | 2-繁体中文<br>3-Español<br>4-Русский | |
| 2 | Gens poles | 2/4/6/8***(4)*** | When the flywheel teeth is set as 0,the RPM will be resulted by frequency.<br>Pole 2: 50Hz---3000RPM.Pole 4: 50Hz---1500RPM.<br>Pole 6: 50Hz---1000RPM.Pole 8: 50Hz---750RPM |
| 3 | 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 gens parameters can be displayed if setting as disable, which is applied to water pump genset. |
| 4 | CT rate | 5-6000A/5A<br>***(500A/5A)*** | Used for setting genset CT primary current, secondary rated current 5A. |
| 5 | Rated frequency | 40.0-80.0Hz ***(50.0Hz)*** | Setting generator rated frequency to choose the meter range and calculate the alarm value. |
| 6 | Rated phase voltage | 80-360V***(230V)*** | Setting generator phase voltage to choose the meter range and calculate the alarm value. |
| 7 | Rated phase current | 5-6000A***(500A)*** | Setting generator phase current to choose the meter range and calculate the alarm value. |
| 8 | Rated total power | 5-2000K ***(276Kw）*** | Set total power of generator to choose the meter range and calculate the average loading rate and alarm value. |
| 9 | Rated battery voltage | 8.0-36.0V ***(24.0V)*** | Choose the meter range and calculate the alarm value. |
| 10 | Rated RPM | 500-4500RPM ***(1500)*** | Choose the meter range and calculate the alarm value. |
| 11 | Flywheel teeth | 0-300***(0)*** | If the setting is 0, (RPM sensor Disabled), then RPM is resulted by Hz. |
| 12 | Oil pressure sensor | 0:Disable<br>1:User defined-Resistance<br>2:User defined-Voltage<br>3:Volt In 1MPa-0-5V<br>4:Volt In 1MPa-0.5-4.5V<br>***5: VDO 0-10Bar***<br>6:MEBAY-003B<br>7:SGH<br>8:SGD<br>9:SGX<br>10:CURTIS<br>11:DATCON 10Bar<br>12:VOLVO-EC<br>13:3015237<br>14:WEICHAI 0-0.6MPa<br>15:GENCON 0-10Bar | Choose the usual oil pressure sensor, if the sensor users choose is not the 10 types, it can be User-defined. |

| | | | |
|---|---|---|---|
| 13 | Coolant temperature sensor | 0:Disable<br>1:User-defined<br>***2: VDO 40-120℃***<br>3:MEBAY-001B<br>4:SGH<br>5:SGD<br>6:SGX<br>7:CURTIS<br>8:DATCON<br>9:VOLVO-EC<br>10:3015238<br>11:PT100<br>12:MEBAY-Mier<br>13:WEICHAI 40-120℃<br>14:GENCON 40-120℃ | Choose the usual water temperature sensor, if the sensor users choose is not the 11 types, it can be User-defined. |
| 14 | Fuel level sensor | 0:Disable<br>1:User-defined<br>2:0-100Ω<br>3:100-0Ω<br>4:0-107Ω<br>5:107-0Ω<br>6:0-180Ω<br>7:180-0Ω<br>8:180-10Ω<br>***9: 10-180Ω***<br>10:120-10Ω<br>11:10-120Ω<br>12:90-0Ω<br>13:0-90Ω<br>14:0-30Ω<br>15:73-10Ω<br>16:240-33Ω<br>17:33-100Ω<br>18:0-200Ω<br>19:200-0Ω | If the sensor users choose is not the 10 types, it can be User-defined. |
| 15 | Action if over current | Warning<br>***Alarm and stop***<br>Trip stop | If the system is set as trip stop, then the unloading procession shall be acted ,then delays 1S, and then stops to alarm. |
| 16 | Action if over power | Warning<br>***Alarm and stop***<br>Trip stop | If the system is set as trip stop, then the unloading procession shall be acted and then stop with alarm. |
| 17 | Action if RPM lost | Warning<br>***Alarm and stop*** | This fault can be checked only if there is gens frequency checked as one condition of crank successfully. |
| 18 | Action if oil pressure sensor disconnected | Disable<br>***Warning***<br>Alarm and stop | Action if oil pressure sensor disconnected. |
| 19 | Action if temperature | Disable<br>***Warning*** | Action if temperature sensor disconnected. |

| | | | |
|---|---|---|---|
| | sensor disconnected | Alarm and stop | |
| 20 | Pressure/Temperature unit | ℃/KPA<br>***℃/BAR***<br>℃/PSI<br>F/KPA<br>F/BAR<br>F/PSI | Unit display. |
| 21 | Manual crank times | 1-30 ***(1 time)*** | Crank times under mode and test mode. |
| 22 | Auto start crank times | 1-30 ***(3 time)*** | Crank times under auto mode. |
| 23 | Crank disconnect | RPM<br>Hz<br>Oil pressure(delay)<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 dont choose the type.<br>2. The oil pressure switch input does not participate in the oil pressure return motor.<br>3. The operating status of the unit, the success condition of the shutdown are consistent with the successful conditions of the start, and the corresponding judgment is made.<br>4. "/" represents the relationship or the condition that any condition is satisfied when the motor is retracted. However, successful parking requires several conditions to be met at the same time. |
| 24 | 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. |
| 25 | 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. |
| 26 | 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. |
| 27 | Fuel pump open | 0-100% ***(25%)*** | When the fuel level is lower than preset value and remains 10S, fuel pump opened signal output |
| 28 | Fuel pump close | 0-100% ***(80%)*** | When the fuel level is higher than preset value and remains 1S, fuel pump closed signal output. |
| 29 | Maintenance countdown | 0-5000h ***(5000h)*** | When it is set as 5000, then this function is disabled. |
| 30 | maintenance | ***2000/01/01***-2099/12/31 | When it is set as 2000/01/01, this |

| | | | |
|---|---|---|---|
| | date | | function is disabled. |
| 31 | maintenance expire | ***Warning*** Alarm and stop | The action after the primary maintenance expired. |
| 32 | User password | 00000-65535***(07623)*** | Change the password. |
| 33 | 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. |

**2)Delay time setting**

| NO | Parameter | Range***(default)*** | Notes |
|---|---|---|---|
| 1 | Start delay | 0-65000s ***(5s)*** | The time during the genset starts after the mains failure or remote signal is valid. |
| 2 | Preheat time | 0-6500.0s ***(0.0s)*** | The time needed to be preheat before the starter on power. |
| 3 | Cranking time | 3.0-60.0s ***(8.0s)*** | The time when the starter is on power. |
| 4 | Crank rest time | 3.0-60.0s ***(10.0s)*** | If crank failure, the waiting time before the second test time. |
| 5 | Oil pressure delay | 0-20.0s ***(0.0s)*** | When the crank condition contains oil pressure, if the oil pressure is higher than the preset value and continue for few seconds, then it is regarded as crank success. |
| 6 | Safety delay | 1.0-60.0s ***(8.0s)*** | Low oil pressure, high water temperature, under speed, under frequency, under voltage, charge failure are all invalid during this time except for emergency stop and over speed. |
| 7 | Start idle time | 0-3600.0s ***(5.0s)*** | Idle running time when crank successfully. |
| 8 | Longest RPM-up time | 0-3600.0s ***(120.0s)*** | The longest speed-up time, during which time the system will exit once speed increased successfully. |
| 9 | Longest Warming-up time | 0-3600.0s ***(10.0s)*** | The time needed for loading. |
| 10 | 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 (DC8XD MK3will 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. |
| 11 | 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. |
| 12 | 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. |
| 13 | Stop idle time | 0-3600.0s ***(5.0s)*** | Idle-speed running time. |
| 14 | E.T.S. hold time | 0-600.0s ***(10.0s)*** | Stop solenoid on power time. |
| 15 | 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. |

| | | | |
|---|---|---|---|
| 16 | Emergency delay | 0-10.0s ***(1.5s)*** | Emergency and over frequency alarm delay. |
| 17 | Normal alarm delay | 2.0-20.0s ***(5.0s)*** | The alarm delay except for emergency stop and over frequency |
| 18 | AC Voltage abnormal delay | 2.0-20.0s ***(10.0s)*** | Over / under voltage delay. |
| 19 | 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. |
| 20 | Over total power delay | 0-3600.0s ***(30s)*** | 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. |
| 21 | Over current 【inverse time】 | 0.1-36.0***(36.0)*** | This option will not take effect until the **[19-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.** |
| 22 | Over power 【inverse time】 | 0.1-36.0 ***(36.0)*** | This option will not take effect until the **[20-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.** |
| 23 | Load / unload pulse width | 1.0-10.0s ***(10.0s)*** | Mains and Gens loading and unloading pulse width, when it is 10s, it is regarded as continuous output. |
| 24 | Fuel output delay | 1.0-60.0s***(2.0s)*** | The output time of fuel valve relay before crank. |

**3)Engine Alarm setting**

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

| | | | |
|---|---|---|---|
| | | | the value is set as 200, then the high temperature alarm is disabled. |
| 5 | 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. |
| 6 | Under battery voltage warning | 0-200% ***(100%)*** | Rated battery voltage multiplying by this value is regarded as under battery voltage warn value. when the battery input is lower than the warning value and comes into under battery voltage delay but still lower (normal faults delay), then under battery voltage warns. if the value is set as 0, then under battery voltage is disabled. |
| 7 | 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. |
| 8 | 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. |
| 9 | Over voltage warning | 0-200% ***(120%)*** | Rated voltage multiplying by this value is regarded as over voltage alarm value. When the voltage is higher than the value and comes into over voltage delay but still higher (normal faults delay), then over voltage alarms. If the value is set as 200, then the alarm is disabled. |
| 10 | 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. |
| 11 | 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. |
| 12 | Over total power warning | 0-200% ***(90%)*** | Rated power multiplying by this value is regarded as over power warn value. When the loading power is higher than the value and comes into delay but still higher (normal warn delay), then over power warns. If the value is set as 200, then the warning is disabled. |

**4)Output/input setting**

| NO | Parameter | Range***(defaults)*** | Notes |
|---|---|---|---|
| 1 | AUX. OUTPUT 1(Functional of PIN 6) | 0-20 ***(4. Preheat mode 1)*** | **0.Disable.**<br>**1.Public warning output:** when there is any warning output.<br>**2.Public alarm output:** when there is any alarm output, alarm locks till revert back.<br>**3.Audio alarm:** when there is any alarm output, the Audio controls.<br>**4.Preheat mode 1:** preheat before start.<br>**5.Preheat mode 2:** preheat before crank success.<br>**6.Preheat mode 3:** preheat after safety delay.<br>**7.Preheat mode 4:** preheat till temperature-up end.<br>**8.Preheat mode 5:** preheat till temperature-up end, but no preheat when motor starts.<br>**9.Fuel output:** output once gens starts and off till stable.<br>**10.Crank output:** output once cranking, no output in other mode.<br>**11.Genset running:** output under running, off once RPM is lower than cranking RPM. The crank success condition can be set.<br>**12.Idle speed control 1:** used for speed controller, there is output under idle but no output under high speed.<br>**13.Rated running:** there is output under rated running.<br>**14.Gens load:** continuous or pulse type according to time setting.<br>**15.Gens unload:** continuous or pulse type according to time setting.<br>**16.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.<br>**17.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.<br>**18.Mains loading:** continuous or pulse type according to time setting. Not for DC80D MK3.<br>**19.Mains unloading:** continuous or pulse type according to time setting. Not for DC80D MK3 .<br>**20.Public un/loading:** continuous(loading) or unloading. |
| 2 | AUX. OUTPUT 2(Functional of PIN 7) | 0-20 ***(2. Public alarm output)*** | |
| 3 | AUX. OUTPUT 3(Functional of PIN 8) | 0-20 ***(16. Fuel pump output)*** | |
| 4 | AUX. OUTPUT 4(Functional of PIN 27,28) | 0-20 ***(DC80D MK3:12 Idle speed control 1) (DC82D MK3:19 Mains loading)*** | |
| 5 | AUX. OUTPUT 5(Functional of PIN 29,30) | 0-20 ***(14. Gens load)*** | |
| 6 | AUX. INPUT 1 (Functional of PIN 10) | 0-8 ***(7. Remote start (with load)*** | 0.**Disable.**<br>1.**Low oil pressure alarm switch.**<br>2.**High temperature alarm switch.**<br>3.**Low water level alarm switch.**<br>4.**Low fuel level warning input.**<br>5.**External instant warning input.**<br>6.**External instant alarm input.** |
| 8 | AUX. INPUT 2 (Functional of PIN 11) | 0-8 ***(2. High temperature alarm switch)*** | |
| 10 | AUX. INPUT 3 | 0-8 ***(1. Low oil*** | |

| | | | |
|---|---|---|---|
| | (Functional of PIN 12) | ***pressure alarm switch.)*** | 7.**Remote start(with load):** the gens comes into start procession if this signal is valid and under auto mode.<br>8.**Soundproof alarm:** audio alarm output is disabled if there is signal output. |
| 12 | AUX. INPUT 4 (Functional of PIN 13) | 0-8***(4. Low fuel level warning input)*** | |
| 14 | AUX. INPUT 5 (Functional of PIN 14) | 0-8***(3. Low water level alarm switch)*** | |
| 7 | AUX. INPUT 1 valid | ***0- Normal close*** 1- Normal open | The status of switch value input valid. |
| 9 | AUX. INPUT 2 valid | ***0- Normal close*** ***1-*** Normal open | |
| 11 | AUX. INPUT 3 valid | ***0- Normal close*** ***1-*** Normal open | |
| 13 | AUX. INPUT 4 valid | ***0- Normal close*** ***1-*** Normal open | |
| 15 | AUX. INPUT 5 valid | ***0- Normal close*** ***1-*** Normal open | |

**5)Mains protection**

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

**6)LCD setting**

| No | Parameter | Range(defaults) | Notes |
|---|---|---|---|
| 1 | Start screen display time | 0-20.0s***(5.0s)*** | Start screen display time,0: No-display. |
| 2 | Lightness of | 20-100%***(100%)*** | Lightness adjustment. |

| | | | |
|---|---|---|---|
| | LCD | | |
| 3 | Saving mode | 5.0-6000.0s (***600.0s)*** | LCD light will be closed automatically without any button pressed after delay. If setting as 200.0s, back light always lighted. |
| 4 | 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. |
| 5 | 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. |

**7)USB/485 PORT**

| No | Parameter | Range***(default)*** | Notes |
|---|---|---|---|
| 1 | Controller ID | 1-255***(16)*** | The IP built by controller and PC. |
| 2 | RS485 baud rate | 0-4800<br>1-9600<br>***2-19200***<br>3-38400<br>4-57600<br>5-115200 | RS485 communication baud rate. |

**8)Data/time setting**

| No | Parameter | Range***(defaults)*** | Notes |
|---|---|---|---|
| 1 | Date/Time | 2016/01/01-2099/12/31 | Permanent calendar inside, please correct the date timely. |
| 2 | Current time | 00:00:00-23:59:59 | Permanent calendar inside, please correct the time timely. |
| 3 | Current week | Monday-Sunday | Permanent calendar inside, please correct the date timely. |

**9)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.***<br>***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 | |

## 11.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 does not switch | Check the ATS.<br>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. |