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1. Description

GU308B is an economical Genset auto controller, can select control mode by key switch on controller panel. In manual mode, can manual start and stop Genset by start and stop button on the panel, also can set the key switch on the panel in auto mode, start and stop Genset by remote signal is active or not.

Display the running status of Genset by panel LED.

Display the measured parameter of engine by LED. Controller has base protection function, make sure engine will not damage during running.

Flexible configure running protection parameters by buttons and LCD on panel.

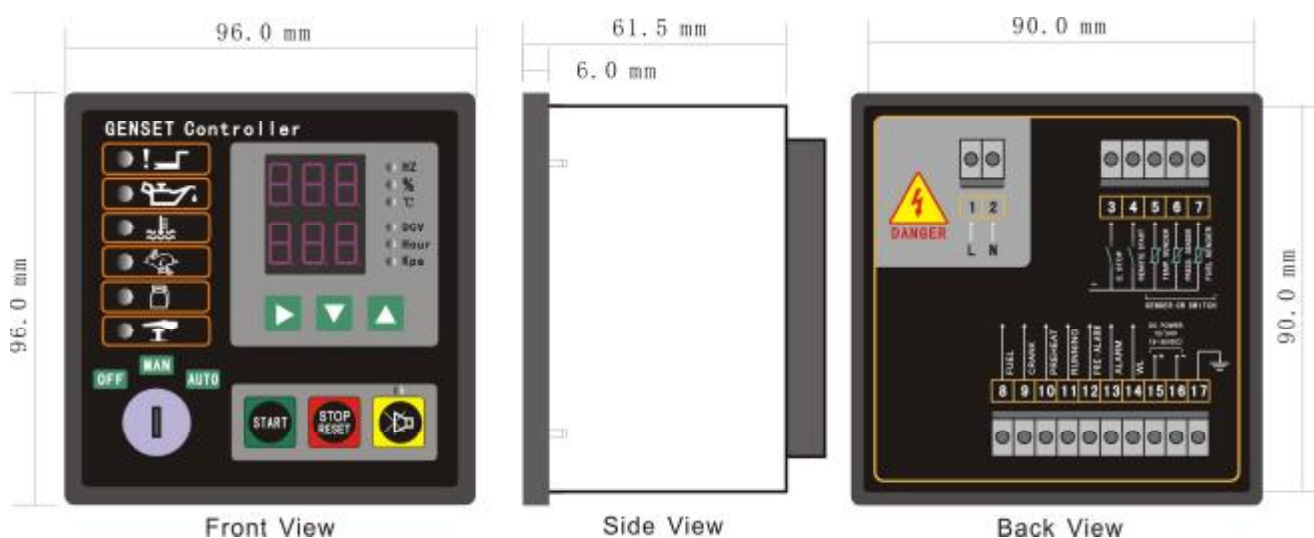
The controller adopted DIN96 standard enclosure, all connections are connected by pin-like and locked up terminal, easier and more convenient to install, connect, move and displace the device.

This manual only suitable for GU308B controller, user must carefully see this manual first.

2. The Outline Dimensional Drawings and wirings of Controller

2.1 Following Details:

Operation Panel	W96mm×H96mm
Install Hatch	W91mm ×H91mm
Thickness	D61.5mm (unconnected)



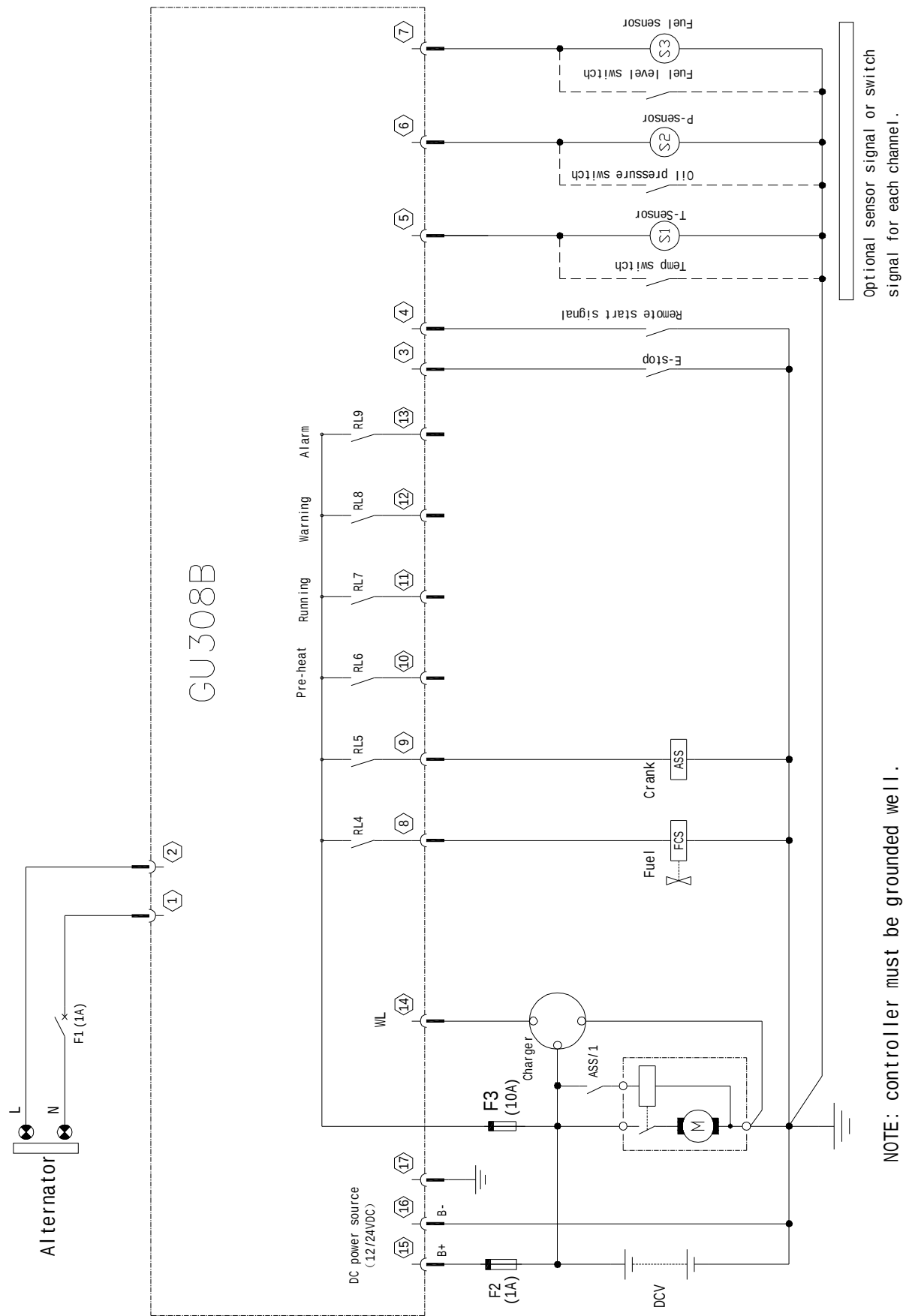
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2.2 Connecting Terminals:

Pin No.	Function Description	Signal	Dim
1	A-phase voltage input	0-300VAC	1mm ²
2	Neutral zero line		1mm ²
3	E-stop signal	Low potential is active	1mm ²
4	Start {external control} signal	Low potential is active	1mm ²
5	Temperature detect	Low potential is active / resistance sensor	1mm ²
6	Oil pressure detect	Low potential is active / resistance sensor	1mm ²
7	Fuel level signal	Low potential is active / resistance sensor	1mm ²
8	Fuel output	+B output, 3A/30VDC	1mm ²
9	Start output	+B output, 3A/30VDC	1mm ²
10	Preheat output	+B output, 3A/30VDC	1mm ²
11	Running output	+B output, 3A/30VDC	1mm ²
12	Warning output	+B output, 3A/30VDC	1mm ²
13	Alarm output	+B output, 3A/30VDC	1mm ²
14	Charger excitation output	If not use, do not connect to cathode	1mm ²
15	Working power source {+B}	12V/24V (8~35VDC continued)	1mm ²
16	Working power source {-B}		1mm ²
17	Grounded		1mm ²

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2.3 Typical Wiring Diagram:



3. Operation Panel

The whole operation panel includes 3 sections: measuring parameters and running status display by LED, operation buttons and key switch for selecting modes.

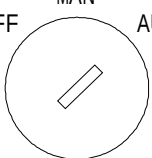
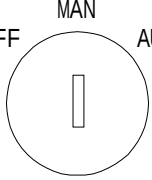
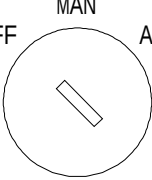
3.1 LCD Display and Control Buttons:

LCD with 3 digits and 2 lines can display data information, such as Gen frequency, oil pressure, coolant temp, fuel level, battery voltage, running time in the same time, and combined with control buttons provide a friendly operation interface for operator to set operating parameters.

3.2 LCD Displays Menu System and Running Status

Function Description	Tag
Enter into submenu/modify/confirm modification	
Scroll up menu/ value ascend	
Scroll down menu/ value descend	

3.3 Control Buttons and LED

Function Description	Tag
AUTO Status Select AUTO operation mode by key switch, when controller is running in AUTO mode, According to the “remote start signal” is active or not, controller controls generator start and stop.	
MAN Status Select MAN operation mode by key switch, when controller is running in MAN mode, controller controls generator start or stop by “START” and “STOP” buttons.	
OFF Status Select OFF operation mode by key switch, when controller is running in OFF mode, controller will not be controlled by external signal or press key.	

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START button/LED The button is used for MAN start Genset. When controller is set in MAN mode, press this button can start generator.	
STOP/RESET button The button is used for MAN stop generator. When controller is set in MAN mode, press this button can stop Genset. If occur failure output, controller can release from failure shutdown locked by continuously press this button over 2s.	
MUTE button Failure alarm sound-proof button, when controller occurs warning or failure alarm, alarm buzzer sounds, press this button can mute buzzer, if controller hold on fault status press the button again, alarm buzzer keeping sound.	
Fail to Start LED: If the number of engine crank attempt over preset times and still can not start, then it occur start failure, failure LED on, and alarm buzzer sounds.	
Low Oil Pressure LED: After safety-on delay counting over, controller detects that oil pressure still falls below the oil pressure alarm value or oil pressure switch in close status, engine stop immediately, failure LED on, and alarm buzzer sounds.	
High Temperature LED: Controller detects that engine coolant temp excesses the high coolant temp alarm value or temp switch in close status, engine stop immediately, failure LED on, and alarm buzzer sounds.	
Overspeed LED: Controller detects that engine running frequency excesses the high frequency alarm value, engine stop immediately, failure LED on, and alarm buzzer sounds.	
Low Fuel level LED: LED for fuel level too low, when LED on, it means fuel level too low, alarm buzzer sounds, and engine stop.	
E-stop LED: When emergency stop input signal is active, controller stop immediately, failure LED on, and alarm buzzer sounds.	

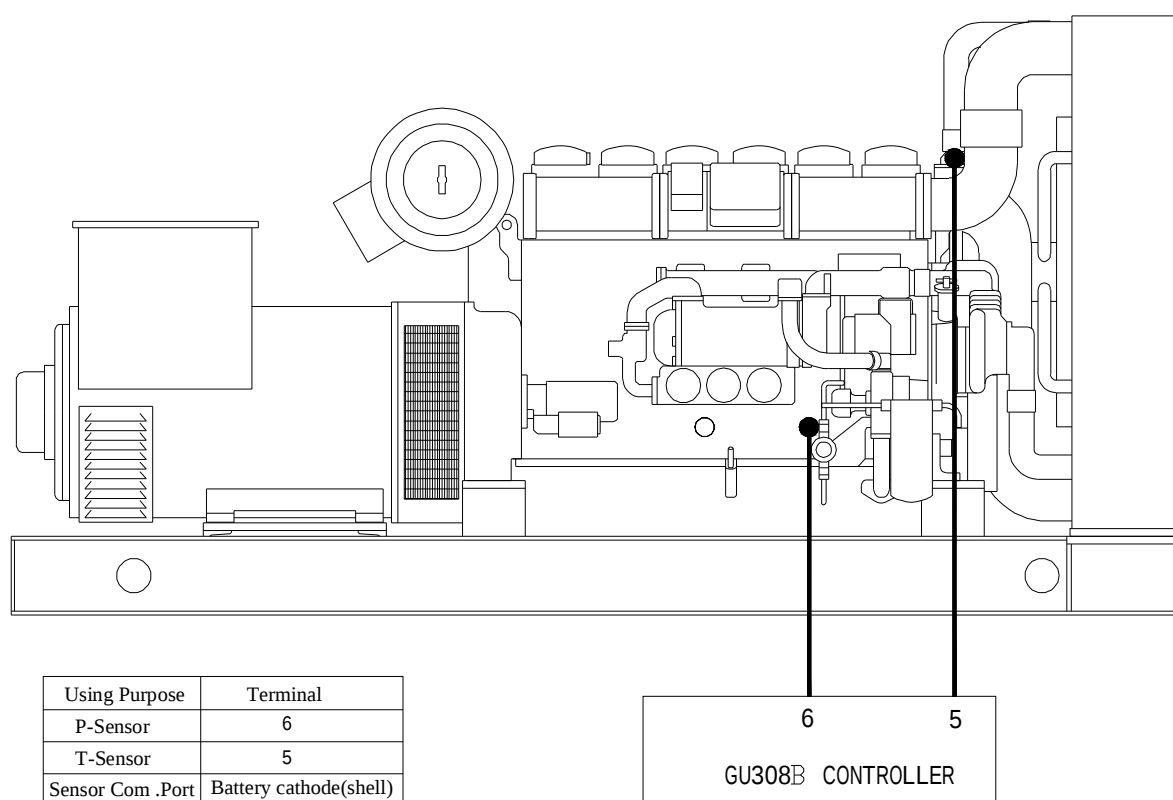
4. Installation Guide

4.1 The dimensional drawing of install hatch on panel, showing as above attached.

The controller is fixed by 2 special mounting fittings. The shock-proof equipment must be installed if the enclosure that installed on controller is directly installed on Genet body or other heavy vibrant device.

4.2 Please see above 2.3 Typical Wiring Diagram or attached drawing for wiring connecting.

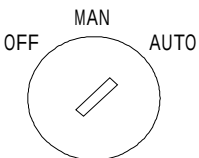
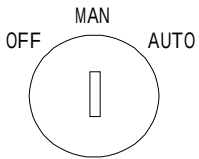
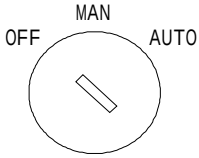
4.3 The installations of P-sensor and T-sensor for engine:



5. Control and Operation Instruction

The controller has 3 control modes: AUTO operation mode, MAN operation mode and OFF stop mode.

5.1 Operation Mode Setting:

Operation	Description
Select "AUTO" operation mode by key switch, controller then running in "AUTO" mode.	
Select "MAN" operation mode by key switch, controller then running in "MAN" mode.	
Select "OFF" stop mode by key switch, controller then running in "OFF" mode.	

NOTE: Only can select 1 mode from above 3 modes.

5.2 The Process of Start Control:

Operation	Description
When controller running in AUTO status and remote start input signal is active; (according to the setting delay) or in MAN status press "START" button (inset 3s), controller begins start procedure.	(Stt) Start delay
	8
Fuel relay takes action, engine fuel solenoid valve open, after delay 200 ms, start relay takes action, the start motor begins action, cranking begins. When engine running speed reaching the condition of crank disconnection, controller will stop start output and the safety-on delay begins counting.	SAF (SAFETY-ON DELAY)
	59
When controller detects that the normal data such as voltage frequency, oil pressure, coolant temp of Genset has been set up, and no other failure, then LED display running status: (Scroll page can refer more details)	Run

When remote start signal is active, the start delay will be enabled and begin to counting. During the period of counting, if the remote start signal is inactive, start delay will stop counting immediately, controller stop start procedure, and return to original status after finishing the counting of fail to stop.

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After engine start, start motor will follow below signal performs power off and lock up: oil pressure signal and the voltage frequency of engine output. The oil pressure signal only as stop signal for the continuous action of start motor, can not as the signal of underspeed or overspeed.

5.3 The Process of Fail to Start and Restart:

Operation	Description
During the period of crank time counting, engine can not ignite, controller will not output starting signal during crank rest. FAIL TO START LED flash.	Crr (CRK-RST)
	15
Once crank rest time out, controller will attempt to restart engine again.	Crn (CRANK)
	2

Above start phenomena repeat again and again until engine successful ignition and or reach the preset crank times. If any stop failures occur during start process, controller stops control output immediately, until failure eliminated and reset, then it can be operated again.

5.4 The Status of Fail to Start:

Operation	Description
When above start phenomena repeat again and again and over the preset crank times, controller will stop control output, FAIL TO START LED from flash to keep on, related LED on.	ALA (ALARM)
	8

NOTE:

If occur start failure, operator must check the whole Genet system to make sure failure reason, only after eliminating the failure can press “ STOP/RESET” button to unlock fault-locked status, and restart the Genet.	
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5.5 The Process of Auto Stop:

Operation	Description
When the remote start input signal is inactive, cooling delay begins count down, cut off running signal.	COL (COOL)
	300
When cooling delay time out, controller switch off fuel solenoid valve immediately, the counter for fail to stop begins count down.	STP (STOP)
	20
When fail to stop time out and if engine still running, controller will sent out an alarm.	ALA (ALARM)
	9
If during allowed fail to stop delay engine stop running.	rdy (READY)

5.6 The Control Process of MAN Stop:

Operation	Description
When Genset in normal running, in “MAN” mode continuously press “STOP/RESET” button one time, controller begins cooling delay stop process, which same as auto stop. Press “STOP/RESET” button again, controller switch off fuel solenoid valve immediately, Genset start stop.	

NOTE: In tow conditions can be treated as generator stop running: one is oil pressure switch closed; another is the voltage frequency of generator output is falls below the measuring range of controller output, namely frequency is falls below 3Hz.

5.7 The start and stop processes of engine, which fuel solenoid valve is N. O. type (difference from N.C. type):

Start control process:

When start running, the fuel relay of controller no action, fuel solenoid valve no power, means the electromagnet of solenoid valve no action.

Stop control process:

When controller starts at stop control process, output the power of fuel solenoid valve, fuel solenoid valve take action, engine begins stop. After delay (according to the setting fail to stop delay) fuel relay breaking, disconnect the power of fuel solenoid valve.

Other control process same as engine fuel solenoid valve is N. C. type.

6. Measure and Display Data

Generator frequency (Hz)	L1 phase
Oil pressure (kPa)	This data from an external sensor
Coolant temp (°C)	This data from an external sensor
Fuel level (%)	This data from an external sensor
Running hours (RUN Hour)	Displayed by LED with 3 digits and 2 lines
Battery voltage (V)	This data obtain from working power source

7. Warning and Shutdown Alarm

7.1 Warning

(**NOTE:** Warnings are non-critical failure conditions and do not affect the operation of the generator system, they serve to draw the operators' attention to an undesirable condition and remove it to make sure system continuous running. When Warnings occur, the status indicator light flash, but failure will not be locked and the unit will not shutdown. Once failure removed warning indicator auto turn off.)

Fail to Charge if controller detects that voltage has fallen below the "low battery warning value" from the excitation contact of auxiliary AC charger, status page displays failure code: "PAL 11", alarm buzzer sounds.

Battery Low Voltage controller detects that battery voltage has fallen below the "low battery warning value", status page displays failure code: "PAL 10", alarm buzzer sounds.

Low Oil Pressure controller detects that the engine oil pressure has fallen below the "low oil pressure warning value" after the safety-on timer has expired, status page displays failure code: "PAL 5", alarm buzzer sounds.

High Temperature controller detects that engine coolant temperature has exceeded the "high coolant temperature warning value", status page displays failure code: "PAL 7", alarm buzzer sounds.

Low Frequency controller detects that engine working frequency has fallen below the "low frequency warning value", status page displays failure code: "PAL 3", alarm buzzer sounds.

High Frequency controller detects that engine working frequency has exceeded the "high frequency default warm value", status page displays failure code: "PAL 2", alarm buzzer sounds.

7.2 Shutdown Alarm

(**NOTE:** shutdown failures immediately lock system and stop generator, it only can operate controller again after removing failures and press rest button to unlock)

Fail to Start if engine does not fire after the preset number of crank attempts has been made, means fail to start. "FAIL TO START LED" lights up, status page displays failure code: "ALA 8", alarm buzzer sounds.

Fail to Stop if engine does not stop after the stop delay expires, status page displays failure code: "ALA 9", alarm buzzer sounds.

E-Stop when emergency stop input signal is active, controller immediately stops all relay control output except alarm. Status page displays failure code: "ALA 0", alarm buzzer sounds.

Low Oil Pressure if controller detects that the oil pressure level still falls below oil pressure alarm value or oil pressure switch is closing after the safety-on timer has expired, engine stop immediately, "LOW OIL PRESSURE FAILURE LED" lights up, status page displays failure code: "ALA 5", alarm buzzer sounds.

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High Temperature controller detects that engine coolant temperature has exceeded the high coolant temperature alarm value or temperature switch is closing, engine stop immediately, “HIGH COOLANT TEMP FAILURE LED” lights up, status page displays failure code: “ALA 7”, alarm buzzer sounds.

Low Fuel level if controller detects that the fuel level still falls below fuel level alarm value, engine stop immediately, “LOW FUEL LEVEL FAILURE LED” lights up, status page displays failure code: “ALA 15”, alarm buzzer sounds.

High Frequency controller detects that engine working frequency has exceeded the “high frequency alarm value”, engine stop immediately, “OVERSPEED FAILURE LED” lights up, status page displays failure code: “ALA 2”, alarm buzzer sounds.

Low Frequency controller detects that engine working frequency has fallen below the “low frequency alarm value”, engine stop immediately, status page displays failure code: “ALA 3”, alarm buzzer sounds.

8. Parameters Setting and Menu System

For parameter setting and modify adopts gradually increase and decrease, when continuously press increase or decrease button, the single digit changed one by one, then the tens digit changed after ten single digit changed, follow this logic, and the hundreds digit changed after ten. Continuously press “” 2s can enter into setting status, can use “” and “” scroll page up and down at that time. Press “” enter into next submenu, select the required modify item, press “” enter into modify. When prompt key in password, key in “” “” “” “” “” “” (221313), continuously press “” 2s to quit setting status after finishing modification.

NO.	Item	LED	Default	Value Range
01	Fuel mode	Fmd	0	0~1 / 0(N. C.) /1 (N. O.)
02	T-sensor mode	T-S	1	0~3 / 0 (not used)
03	P-sensor mode	P-S	1	0~4 / 0 (not used)
04	Start delay	SdL	10s	0~300s
05	Crank attempt	CAt	3 times	1~10 times
06	Crank time	Ctl	8s	0~30 s
07	Crank rest	CrE	15s	0~300 s
08	Crank disconnect	CSP	300RPM	1-999 RPM
09	Idle delay	Idl	0	0~999s
10	Safety-on delay	SFt	60s	0~600s
11	Cooling delay	CoL	300s	0~600 s

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12	Stop delay	StP	20s	0~60s
13	HZ low alarm	FL	0 Hz	40.0-70.0 Hz / 0 (not set)
14	HZ low warning	FLP	45.0 Hz	40.0-70.0 Hz / 0 (not set)
15	HZ high warning	FHP	55.0 Hz	40.0-70.0 Hz / 99.9 (not set)
16	HZ high alarm	FH	57.0 Hz	40.0-70.0 Hz / 99.9 (not set)
17	Oil-P low alarm	PL	140KPa	50~300 kPa / 0 (not set)
18	Oil-P low warning	PLP	220KPa	50~300 kPa / 0 (not set)
19	Coolant warning	CHP	95℃	70~160℃ /999 (not set)
20	Coolant alarm	CL	105℃	70~160℃ /999 (not set)
21	Fuel level low alarm	LL	10%	0~100 % / 0 (not set)
22	Fuel level low warning	LLP	18%	0~100 % / 0 (not set)
23	Low battery warning	Bat	8.0V	5~25V / 0 (not set)
24	Oil-P correction	C-P		±9.9
25	Coolant temp correction	C-T		±9.9
26	Battery correction	C-B		±9.9
27	Quit	QUT		

NOTE: Due to controller no speed sensor detect, only has voltage frequency (Hz) measure, for user convenience, some data expressed by rpm, $RPM=HZ*30$.

When controller is used in N. O. fuel unit, stop delay is the maximum electrify time of the fuel magnet, the fuel output relay of controller no action after fail to stop is confirmed.

8.1 The Definitions of P-sensor and T-sensor

For P-sensor and T-sensor, according to below table different No. stand for different sensor mode, base on the practical sensor mode that specified No. in following table set the following No. at above No. 02 and No. 03 for the sensor mode in the parameters setting.

No.	P-sensor Mode	T-sensor Type Mode
0	NOT USE	NOT USE
1	VDO 10 bar	VDO 120 degrees C
2	VDO 5 bar	Datcon high
3	Datcon 10 bar	Commis
4	Datcon 7 bar	

8.2 Static LED display:

When controller ready

Operation	Description	
If controller is not connected to P-sensor and T-sensor, the corresponding data display "OPEN", LED display:	oPn	℃
	oPn	Kpa

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When controller set without P-sensor and T-sensor

Operation	Description	
Controller on standby or running status the related data all display “----”, LED display:	---	°C
	---	Kpa

When controller normal running

Operation	Description	
Controller displays engine status and running information:	Run	
Press “  ” or “  ” can switch display page	50.0 24	HZ DCV
Press “  ” or “  ” can switch display page	40	%
Press “  ” or “  ” can switch display page	8	Hour
Press “  ” or “  ” can switch display page	70 450	°C Kpa

For example: (Set controller crank attempt at 2)

Operation	Description
Continuously press “  ” 2s, enter into parameters setting menu, then LCD display:	Fnd
Press “  ” 4 times and then press “  ”, then LCD display:	CAt 3
Press “  ” then LCD display:	CAt PAS
Key in changed password: “  ” “  ” “  ” “  ” “  ” “  ”	CAt PAS
Press “  ” or “  ” change parameter, modify at 2 at that time, press “  ” confirm modification, and then continuous press “  ” 2s can quit parameters setting menu	CAt 2

9. Preparation before Start the Controller

- 9.1** Make sure controller is fixed well and its install meet ambient requirement.
- 9.2** Confirm controller all wrings connection meet electric specification and according with the “typical wiring diagram”, and especially need confirm DC supply source has correct polarity. Otherwise, it maybe damage controller.
- 9.3** Controller must be grounded well.
- 9.4** We suggest external install “E- stop” button, connecting E-stop signal input terminal to the N. O. contact of “E- stop” button, and another contact connected to the cathode of battery source.
- 9.5** Switch on DC working power source, make sure the preset parameters meet practical condition, such as fuel mode, and the setting of high frequency and low frequency, etc.

10. Troubleshooting

Failure	Phenomenon	Failure Eliminate
Genset not start	In “MAN” mode press “START” button or in “AUTO” mode the remote start input signal is active or in “Test” mode no start action.	1. Check the status page of controller has failure prompt or not: 2. Check DC voltage on controller “8” and “9” terminals, if no voltage, it is controller failure, require change controller. If voltage is normal, check connection among controller, engine fuel and start motor.
Diesel start failure	Diesel rotates but can not start or diesel stop after start operating, controller displays fail to start.	1. Check fuel level. 2. Check connection between generator and the AC voltage input terminal of controller. 3. Check the connection of fuel control magnet and the voltage on magnet. 4. Check fuse on the side of alternator. 5. Both check fuel manifold and filter jam or not. 6. If has white smoke release from exhaust system, means fuel has gone into engine, but diesel not start. Please refer to “Diesel Manual” for further check. 7. Check if the using ambient temp over 50℃ or under -20℃.

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Diesel high temp shutdown	"High Temperature" LED on	1. Check if diesel over load 2. Check radiator jam or not. 3. Check fan belt loose or tighten. 4. Check if ambient temperature meets generator usage range. 5. Refer to "Diesel Manual" 6. Check the coolant switch input signal is N.O. or N. C.
Low oil pressure shutdown	"Low oil pressure" LED on	1. Check fuel level, if oil not enough, add oil. 2. Check oil pressure. 3. Refer to "Diesel Manual". 4. Check oil pressure switch input signal is N.O. or N. C. 5. Check connection between oil pressure switch and controller.
Diesel overspeed shutdown	"Overspeed" LED on	1. Check if the setting value of overspeed alarm correctly set. 2. Check generator speed adjust system.

11. Technical Parameters

DC working voltage	12V/24V (8~32VDC Continued)
Max. power consumption	≤3W
The input range of AC voltage	0~300VAC
The input range of AC voltage frequency	3~70Hz (30V≤voltage≤300V)
Control output current	3A/30VDC
Working ambient temperature	-30~70℃
Storage ambient temperature	-40~80℃

Appendix: Failure Code

Code	Failure Type		Code	Failure Type
0	NO ERROR		7	HIGH COOLANT TEMP
1	NO SPEED SIGNAL		8	FAIL TO START
2	OVER SPEED		9	FAIL TO STOP
3	UNDER SPEED		10	LOW BATTERY
4	PRESS SENSOR OPEN		11	FAIL TO CHARGE
5	LOW OIL PRESSURE		12	UNDER SPEED
6	TEMP SENSOR OPEN		15	LOW FUEL PRESSURE

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