

SmartGen

MAKING CONTROL SMARTER

HGME62 SERIES

(HGME62/E62CAN)

GENSET CONTROLLER

USER MANUAL



郑州众智科技股份有限公司
SMARTGEN(ZHENGZHOU)TECHNOLOGY CO.,LTD.

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No. 28 Xuemei Street, Zhengzhou, Henan, China

Tel: +86-371-67988888/67981888/67992951

+86-371-67981000(overseas)

Fax: +86-371-67992952

Web: www.smartgen.com.cn/

www.smartgen.cn/

Email: sales@smartgen.cn

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Table 1 Software Version

Date	Version	Content
2024-04-25	1.0	Original release.

Table 2 Notation Clarification

Sign	Instruction
 NOTE	Highlights an essential element of a procedure to ensure correctness.
 CAUTION!	Indicates a procedure or practice, which, if not strictly observed, could result in damage or destruction of equipment.
 WARNING!	Indicates a procedure or practice, which could result in injury to personnel or loss of life if not followed correctly.

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1 OVERVIEW

HGME62 series genset controller, integrating digital, intelligent and network techniques, is used for automatic control and monitoring system of single genset. It can carry out functions of automatic start/stop, data measurement, alarm protection and “Three Remote” (remote control, remote measurement and remote communication). The controller employs a large size of LCD screen, with optional language interface including Chinese, English, Spanish, Russian, Portuguese, Turkish, Polish and French. It is easy and reliable to operate.

HGME62 series genset controller uses micro-processor to achieve precision measurement, value adjustment, timing and threshold setting, etc. All the parameters can be configured from the front panel, or adjusted and monitored in the PC via USB interface or RS485 interface). The controller is equipped with internal fuse, and Fuel Relay Output, Start Relay Output, Aux. Relay Output 3 and Aux. Relay Output 4 are pluggable. With compact structure and easy wiring, it will simplify the wiring connection with the control panel, and improve the productivity of genset control panel. It can be widely used in all types of automatic control system for gensets.

2 MODEL COMPARISON

Table 3 Model Comparison

Item	HGME62	HGME62CAN
Mains Monitoring	●	●
CAN BUS Port		●
MPU Port	●	

HGME62: With MPU port, it is suitable for engines controlled by electronic governor.

HGME62CAN: With CAN BUS port, it is suitable for electronic fuel injection engines controlled by ECU.

Different length of wiring harnesses are optional:

XS-HGME62(standard installation of backpack-type control panel), **XS-HGME62-S** (installation of silent control box). See details in Section 7.2 Instruction of HGME62 Wiring Harnesses.

Additional length demand requires special order.

HGME62/HGME62CAN : It has mains monitoring and genset generation electricity monitoring functions, which are applied in the AMF system between mains power and genset. And it is suitable for single genset automation system of mains power and genset. The automatic start/stop of genset can be controlled by the remote start/stop signal.

3 PERFORMANCE FEATURES

The main features are as follows:

- 132x64 LCD screen with backlight, and optional language interface (Chinese, English, Spanish, Russian, Portuguese, Turkey, Polish and French). Press the keys to operate;
- Hard acrylic protection layer for the screen to improve the performance of abrasion and scratch resistance;
- The panel and keys employ silicone rubber to well adapt to extreme high and low temperature environment;

- RS485 communication port enables “Three Remote” functions via MODBUS protocol;
- The CANBUS port can be connected to ECU engines with J1939. With the port, the controller not only can monitor frequently-used data (such as water temperature, oil pressure, speed and fuel consumption, etc.) but also control the start, stop, high speed and low speed via the CANBUS port (controller with the CANBUS port is required);
- Suitable for 50Hz/60Hz AC system of 3P4W, 3P3W, 1P2W and 2P3W (120V/240V);
- Collect and display parameters of 3-phase voltage, 3-phase current, frequency, power of mains/genset;

Mains

Line voltage (Uab, Ubc, and Uca)
 Phase voltage (Ua, Ub, and Uc)
 Frequency Hz
 Phase sequence

Generator

Line voltage (Uab, Ubc, and Uca)
 Phase voltage (Ua, Ub, and Uc)
 Frequency Hz
 Phase sequence

Load

Current IA, IB, IC
 Each phase and total active power kW
 Reactive power kvar
 Apparent power kVA
 Power factor PF
 Generator accumulated energy kWh
 Output percentage with load %

- Functions of over/undervoltage and loss of phase for mains;
- Functions of over/under voltage, over/under frequency, over current and over power for genset;
- Precise measurement of parameters from engine:

Temperature °C/°F
 Oil pressure (OP) kPa/psi/bar
 Fuel level (FL) % Fuel remained L
 Speed r/min
 Battery Voltage V
 Charger Voltage V
 Accumulated running time
 Accumulated start times

- Control and protection functions: Automatic start/stop of genset, close/open (ATS control) and perfect fault display and protection;
- With ETS, idle control, pre-heat control, speed raise/drop control, all of them are relay outputs;
- Parameters setting: Allow user to set parameters and store the setting in the internal FLASH memory. The parameters will not be lost even if power off. All the parameters can be configured from the front panel, or adjusted in the PC via USB interface or RS485 interface);
- With built-in button battery to supply the clock and memory on PCB, which makes the controller’s time correct and the data non-lost.
- Multiple sensors, like temperature, pressure and fuel level, can be connected and used directly, and parameters can be defined by users;
- Multiple conditions of crank disconnection (speed, oil pressure, frequency) are optional;
- Emergency start function;
- Automatic identification of flywheel teeth numbers function;
- Wide power supply range:(8~35) VDC, which is compatible with different starting battery voltage;

- All parameters employ digital modulation, instead of analog modulation by conventional potentiometer, to improve the reliability and stability of genset;
- Maintenance function. Types (date or running time) can be selected and actions (warning or shutdown) can be set when maintenance time is out;
- Functions of event log, real-time clock, and scheduled start/stop (which can be set as once a day/week/month, and on-load or off-load);
- Add rubber gasket between enclosure and screen, which makes the IP rating to reach IP65;
- Controller can be fixed by metal screws;
- Modular design, flame-retardant ABS enclosure, pluggable terminals, embedded mounting, and compact structure, it is easy to install.

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4 SPECIFICATION

Table 4 Technical Parameters

Item	Content
Operating Voltage	Continuous power supply of 8V-35VDC, protection for DC reverse connection Resolution: 0.1V Accuracy: 1%
Power Consumption	<8W (Standby mode: ≤5W)
AC Voltage Input: 3P4W 3P3W 1P2W 2P3W	Phase Voltage Range: 15VAC-360VAC (ph-N) Resolution: 1V Accuracy: 1%
	Line Voltage Range: 30VAC-620VAC (ph-ph) Resolution: 1V Accuracy: 1%
AC Frequency	50Hz/60Hz
Speed Sensor	Voltage Range: 1-24V (RMS) Frequency Range: 5-10000Hz
Analog Sensor	Resistance input Range: 0Ω - 6000Ω Resolution: 0.1Ω Accuracy: 1Ω (Below 300Ω)
Fuel Relay Output	10A@24VDC of power supply output (Pluggable when relay is energized)
Start Relay Output	10A@24VDC of power supply output (Pluggable when relay is energized)
Digital Output 1	7A@24VDC of power supply (Relay is energized)
Digital Output 2	7A@250VAC of passive output (Relay is energized)
Digital Output 3	10A@24VDC of power supply output (Pluggable when relay is energized)
Digital Output 4	10A@24VDC of power supply output (Pluggable when relay is energized)
Digital Input 1-5	Low threshold voltage is 1.2V, and max. voltage input is 60V
RS485 Port	Isolated, half-duplex, baud rate at 9600, max. communication distance at 1000m
CAN Port	Isolated, max. communication distance at 250m, Belden 9841 cable or other equal rating cable is required
CE-EMC Certification	EN 55032, EN 55024
Vibration Test	5-8Hz: Amplitude=±17mm 8-100Hz: Acceleration=4g 100-500Hz: Acceleration=2g Refer to the IEC 60068-2-6
Shock Test	A _{peak} =50g, D=11ms, half-sine pulse shape, apply three shocks successively in each direction of three mutually perpendicular axes of the specimen, which means 18 shocks in total Refer to the IEC 60068-2-27
Bump Test	A=20g, D=16ms, half-sine pulse shape

Item	Content
	Refer to the IEC 60255-21-2
Safety Requirements	Refer to EN61010-1 Category III (Overvoltage), 300V, Pollution Degree 2, altitude at 3000m
Case Dimensions	250mm x 200mm x 81mm
Panel Cutout	192mm x 143mm Screw hole distance: 230mm x 180mm Screw hole diameter: $\Phi 6$
CT Secondary Current	Rated: 5A
Working Temperature	(-25~+70) $^{\circ}$ C
Working Humidity	(20~93)%RH
Storage Temperature	(-30~+80) $^{\circ}$ C
IP Rating	Front enclosure: IP65 when water-proof rubber gasket is installed between control panel and enclosure.
Dielectric Strength	Apply voltage of 2.2kV AC between AC high voltage terminal and low voltage terminal, and the leakage current is below 3mA in one minute.
Product Standard	GB/T 37089 Reciprocating Internal Combustion Engine Driven Alternating Current Generator Sets - Controller
Weight	1.2kg

5 OPERATION

5.1 KEYS FUNCTION

Table 5 Description of Keys

Icon	Key	Description
	Stop/Reset	Press it to stop the running genset under Manual/Auto mode; Press it to reset any shutdown alarm when the genset alarms; Press and hold it for at least 3 seconds to test whether panel indicators are normal or not (lamp test); During stopping process, press this key again to stop the genset quickly.
	Start	Start genset under Manual mode; During starting process, press this key to make genset transfer to next status.
	Manual	Press this key to set the controller as Manual mode.
	Auto	Press this key to set the controller as Auto mode.
	Close/Open	Press it to control genset switch on or off in Manual mode.
	Setting/Confirm	Press this key to enter menu interface; Shift cursor and confirm the setting in parameters setting menu.
	Page Up/Increase	Scroll up pages, or move the cursor up and increase the value of the cursor position.
	Page Down/Decrease	Scroll down pages, or move the cursor down and decrease the value of the cursor position.
	Home/Return	Press it to return to the homepage in main interface, or exit the parameters setting interface.

5.2 CONTROLLER PANEL



Fig. 1 HGME62 (HGME62/CAN) Front Panel Indicators

▲NOTE: Instruction of partial indicators.

Table 6 Alarm Indicators Instruction

Type	Instruction
Warning	Slow flashes (1 time/s)
Shutdown	Fast flashes (5 times/s)

NOTE 1: Status indicator: It won't light up when the genset is on standby, and will flash 1 time per second during start or stop process, and will always light up when the genset runs normally; For HGME62CAN controller, press start key in auto mode or manual mode, ECU power outputs and status indicator always light up.

NOTE 2: Genset Normal indicator: It will always light up when genset is normal, flash when genset is abnormal, and go out when there is no power from genset;

NOTE 3: Mains Normal indicator: It will always light up when mains is normal, flash when mains is abnormal, and go out when there is no power from mains;

5.3 AUTOMATIC START/STOP OPERATION

5.3.1 INSTRUCTION

Press the  key, and the indicator besides it will light up, which means the genset is in auto start mode.

5.3.2 AUTO START SEQUENCE

- a) When mains is abnormal (over/under voltage, loss of phase), it enters "Mains Abnormal Delay" and LCD screen displays the countdown time. When the delay is over, "Start Delay" begins; Or when Remote Start (On-load) input is active, it enters "Start Delay";
- b) Countdown of Start Delay is displayed in the status page of LCD screen.
- c) When start delay is over, preheat relay will output (if configured), and "Preheat Delay XXs" is displayed in the status page of LCD screen.
- d) When preheat delay is over, fuel relay outputs for 1s, and then start relay outputs; if genset failed to start during "Crank Time", the fuel and start relay stop outputting and enter "Crank Rest Time" and wait for the next cranking.
- e) If the genset fails to start within set start times, the controller will send out start failure shutdown signal and the alarm will be displayed in the alarm page of LCD screen.
- f) If the genset starts successfully in any one time, it will enter "Safety Running Time". During this period, alarms of low oil pressure, high temperature, under speed, and charge failure are disabled. As soon as this delay is over, the genset will enter "Start Idle Delay" (if configured).
- g) During the start idle delay, alarms of under speed, under frequency, under voltage are disabled. As soon as this delay is over, the genset will enter "Warming Up Delay" (if configured).
- h) When warming up delay is over, the indicator lights up if genset works normally. If voltage and frequency of genset meet the load requirement, the close relay of genset outputs, and genset will supply the load and the genset power indicator lights up; If voltage or frequency is abnormal, the controller will alarm and shutdown (The alarm information will be displayed in the alarm page of LCD screen).

5.3.3 AUTO STOP SEQUENCE

- a) When the genset is under normal running, if mains power returns to normal, the genset will enter "Mains Normal Delay". After the delay, mains is still normal, then the mains status indicator lights up, and the "Stop Delay" begins; Or when remote start input is inactive, the "Stop Delay" begins.
- b) When "Stop Delay" is over, the genset enters "Cooling Delay". The close relay of genset is opened. After "Switch Transfer Delay" is over, the close relay of mains will output, mains will supply the load, genset power indicator will go out while mains power indicator lights up.
- c) When entering "Stop Idle Delay" (if configured), idle relay is energized to output.
- d) When entering "ETS Delay", ETS relay is energized to output, fuel relay output is disconnected.
- e) When entering "After Stop Time", the controller will automatically judge if the genset has stopped.
- f) When the genset has stopped, it enters standby mode; if the genset fails to stop, the controller will send alarms ("Stop Failure" alarm will be displayed in LCD screen).

5.4 MANUAL START/STOP OPERATION

- a) Press the  key, the controller enters "Manual Mode", and the manual mode indicator lights up. In manual mode, press the  key, then the genset will be started, and the controller will automatically judge if the genset has started successfully. If so, it will raise the speed and enters high speed running. If there are alarms of high temperature, low oil pressure, over speed and abnormal voltage during running, the controller can stop the genset quickly to protect it (See details in procedure d-h of automatic start operation). Under "Manual Mode", load switch won't transfer automatically, it is necessary to press the  key to open/close the load switch.
- b) Manual Stop: Press the  key to stop the running genset (See details in procedure c-f of automatic stop operation).

5.5 EMERGENCY START

In manual mode, press the  and  key at the same time to force the genset to start. The controller won't judge whether the genset has started successfully according to disconnection conditions and the disconnection of starter will be controlled by the operator. When the operator confirms the genset has started successfully, release the keys, start output is inactive and the controller enters safety running delay.

6 PROTECTION

6.1 WARNING ALARMS

When the controller detects the warning signal, the controller only sends out alarm and doesn't stop. The warning alarms are displayed in the LCD screen.

Table 7 Warning Alarms

No.	Type	Description
1	Loss of Speed Signal	When the controller detects the speed of genset is 0 and speed loss delay is set as 0, it will send warning signal and the warning will be displayed in the LCD screen.
2	Genset Overcurrent Warning	When the controller detects the current of genset is higher than the threshold, the overcurrent type is definite time, and the delay is set as 0, it will send warning signal and the warning will be displayed in the LCD screen.
3	Stop Failure Warning	When the ETS delay/after stop delay is over, if the genset cannot stop, the controller will send warning signal and the warning will be displayed in the LCD screen.
4	Low Fuel Level Warning	When the controller detects the fuel level of genset is lower than threshold or low fuel level warning input is active, it will send warning signal and the warning will be displayed in the LCD screen.
5	Fail to Charge Warning	During genset normal running process, when the voltage difference between B+ and the charger D+ (WL) is above the charging failure voltage difference for 5s, the controller will send the "Fail to Charge" warning, and the warning will be displayed in the LCD screen.
6	Battery Undervoltage Warning	When the controller detects the battery voltage of genset is lower than threshold, it will send warning signal and the warning will be displayed in the LCD screen.
7	Battery Overvoltage Warning	When the controller detects the battery voltage of genset is higher than threshold, it will send warning signal and the warning will be displayed in the LCD screen.
8	Low Coolant Level Warning	When the controller detects the low coolant level warning input is active, it will send warning signal and the warning will be displayed in the LCD screen.
9	Temp. Sensor Open Warning	When the sensor hasn't been connected to the correct port, the controller will send warning signal and the warning will be displayed in the LCD screen.
10	OP Sensor Open Warning	When the sensor hasn't been connected to the correct port, the controller will send warning signal and the warning will be displayed in the LCD screen.

No.	Type	Description
11	Maintenance Timeout Warning	Maintenance type is running time. When the genset running time is longer than the maintenance time set by user, or the maintenance type is date, the current date is past the setting date and the maintenance action is set as warning, the controller sends warning signal and the warning will be displayed in the LCD screen.
12	High Temp. Warning	When the controller detects the water/cylinder temperature of genset is higher than threshold and Enabled High Temp. Stop Inhibit or Input High Temp. Stop Inhibit is active, it will send warning signal and the warning will be displayed in the LCD screen.
13	Low OP Warning	When the controller detects the oil pressure of genset is less than threshold and Enabled Low Oil Pressure Stop Inhibit or Input Low Oil Pressure Stop Inhibit is active, it will send warning signal and the warning will be displayed in the LCD screen.
14	Input Warning	When the controller detects external warning input is active, it will send warning signal and the warning will be displayed in the LCD screen.
15	Charger Charging Failure Warning	When the controller detects charger charging failure warning input is active, it will send warning signal and the warning will be displayed in the LCD screen.
16	Overpower Warning	When the controller detects the power value (power is positive) of genset has exceeded the pre-set value and the overpower action is set as warning, it will send warning signal.
17	ECU Warning	If the controller receives warning signal from ECU of engine via J1939, it will send warning signal.

6.2 SHUTDOWN ALARMS

When the controller detects shutdown signal, it will open the switch and stop the genset, and the alarms will be displayed.

Table 8 Shutdown Alarms

No.	Type	Description
1	Emergency stop	When the controller detects emergency stop signal, it will send shutdown signal and the emergency stop will be displayed in the LCD screen.
2	High Temp. Shutdown	When the controller detects the water/cylinder temperature of genset is higher than preset shutdown threshold, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
3	Low OP Shutdown	When the controller detects the oil pressure is lower than preset shutdown threshold, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
4	Overspeed Shutdown	When the controller detects the genset speed is higher than preset shutdown threshold, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
5	Underspeed Shutdown	When the controller detects the genset speed is lower than preset shutdown threshold, it will send shutdown signal and the shutdown

No.	Type	Description
		will be displayed in the LCD screen.
6	Loss of Speed Signal Shutdown	When the controller detects the genset speed is 0 and the delay is not 0, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
7	Gen. Overvoltage Shutdown	When the controller detects the genset voltage is higher than preset shutdown threshold, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
8	Gen. Undervoltage Shutdown	When the controller detects the genset voltage is under preset shutdown threshold, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
9	Gen. Overcurrent Shutdown	When the controller detects the genset current is higher than preset shutdown threshold and the delay is not 0, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
10	Fail to Start Shutdown	If the controller fails to start within set start times, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
11	Gen. Overfrequency Shutdown	When the controller detects the genset frequency is higher than preset shutdown threshold, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
12	Gen. Underfrequency Shutdown	When the controller detects the genset frequency is under preset shutdown threshold, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
13	Genset Failed Shutdown	When the controller detects the genset frequency is 0, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
14	Low Fuel Level Shutdown	When the controller detects the low fuel level shutdown input is active, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
15	Low Coolant Level Shutdown	When the controller detects the low coolant level shutdown input is active, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
16	Temp. Sensor Open Shutdown	When the sensor hasn't been connected to the correct port, the controller will send shutdown signal and the shutdown will be displayed in the LCD screen.
17	OP Sensor Open Shutdown	When the sensor hasn't been connected to the correct port, the controller will send shutdown signal and the shutdown will be displayed in the LCD screen.
18	Maintenance Timeout Shutdown	Maintenance type is running time. When the genset running time is longer than the maintenance time set by user, or the maintenance type is date, the current date is past the setting date and the maintenance action is set as shutdown, the controller sends shutdown signal and the shutdown will be displayed in the LCD screen. Maintenance alarm can be reset by setting parameters via password.
19	Input Shutdown	When the controller detects external shutdown input is active, it will

No.	Type	Description
		send shutdown signal and the shutdown will be displayed in the LCD screen.
20	Overpower Shutdown	When the controller detects the power value (power is positive) of genset has exceeded the pre-set value and the overpower action is set as shutdown, it will send shutdown signal.
21	ECU Shutdown	If the controller receives shutdown signal from ECU of engine via J1939, it will send shutdown signal.
22	ECU Comm. Failure Shutdown	If the controller can't receive data via J1939 after it has started the engine, it will send the shutdown signal.
23	Overcurrent Fault Shutdown	When the controller detects overcurrent fault shutdown input is active, it will send shutdown signal and the shutdown will be displayed in the LCD screen.
24	Overspeed Shutdown Input Alarm	When the controller detects the overspeed shutdown input is active, it will send shutdown signal and the shutdown will be displayed in the LCD screen.

 NOTE: ECU warning and Shutdown alarms require to check the engine according to the detailed alarm contents; otherwise please refer to the engine user manual according to the SPN code for more information.

7 WIRING CONNECTION

7.1 HGME62CAN CONTROLLER PANEL

The back panel of HGME62CAN controller is as below.

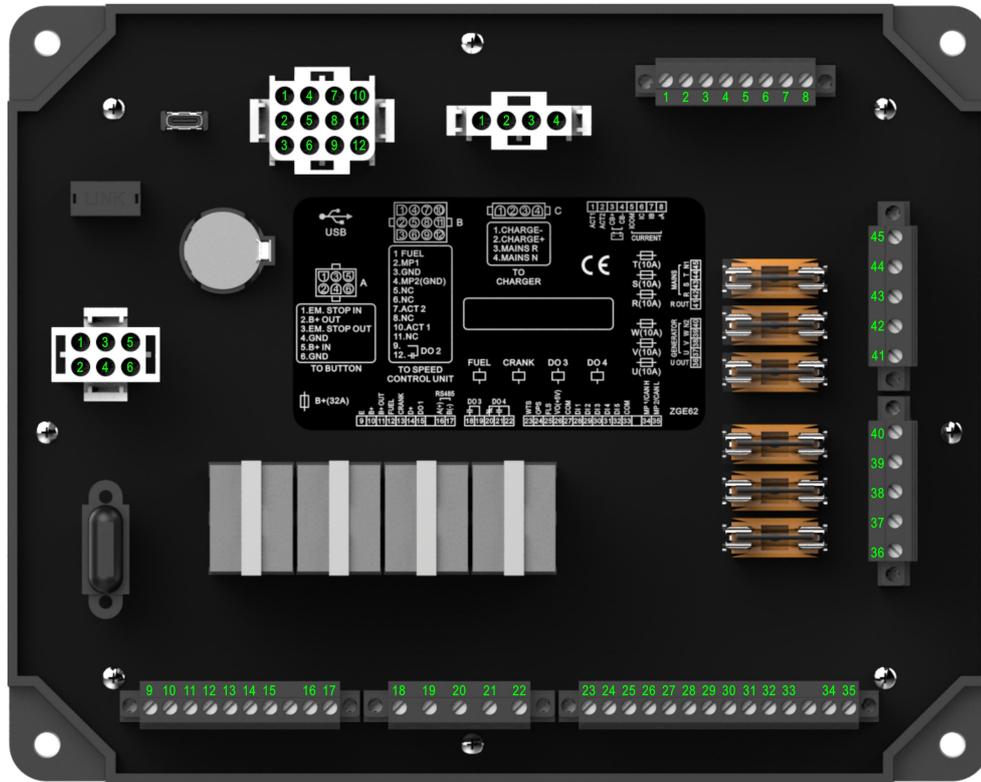


Fig. 2 Back Panel of Controller

Table 9 Wiring Connection of Terminals

No.	Function	Cable Size	Remarks
1	ACT1	1.5mm ²	Connect with the external actuator. The terminal inside the controller will be connected with Terminal 10 of connector B.
2	ACT2	1.5mm ²	Connect with the external actuator. The terminal inside the controller will be connected with Terminal 7 of connector B.
3	CB+	1.5mm ²	Connect with the positive of external starting battery. The terminal inside the controller will be connected with Terminal 2 of connector C.
4	CB-	1.5mm ²	Connect with the negative of external starting battery. The terminal inside the controller will be connected with Terminal 1 of connector C.
5	ICOM (common port of CT)	2.5mm ²	Connect with the secondary coil of CT (rated 5A).
6	IC (sensing input of CT C Phase)	2.5mm ²	
7	IB (sensing input of CT B Phase)	2.5mm ²	

No.	Function	Cable Size	Remarks
8	IA (sensing input of CT A Phase)	2.5mm ²	
9	DC Power Supply Input B-	2.5mm ²	Connect with the negative of starting battery.
10	DC Power Supply Input B+	2.5mm ²	Connect with the positive of starting battery, and 32A fuse is required inside the controller.
11	B+ OUT	2.5mm ²	Connect with Terminal 10 (DC Power Supply Input B+) with one fuse.
12	FUEL (fuel relay output)	1.5mm ²	Both are supplied by Terminal 10 B+, rated 10A. Relay ratings: 24VDC (pluggable).
13	CRANK (start relay output)	1.5mm ²	
14	Charger D+ Input	1.0mm ²	Connect with charger D+ (WL) terminal. It will not be in use if there is no D+ terminal on the charger.
15	Aux. Relay Output 1	1.5 mm ²	It is supplied by Terminal 10 B+, rated 7A.
16	RS485(A+)	0.5mm ²	120Ω impedance shielded cable is recommended, and one end of the cable must be grounded.
17	RS485(B-)	0.5mm ²	
18	Aux. Relay Output 3	1.5mm ²	Passive normally open output of 250VAC, rated 10A.
19		1.5mm ²	Common port of relay.
20	Aux. Relay Output 4	1.5mm ²	Passive normally closed output of 250VAC, rated 10A.
21		1.5mm ²	Passive normally open output of 250VAC, rated 10A.
22		1.5mm ²	Common port of relay.
23	WTS (temp. sensor input)	1.0mm ²	Connect with the water/cylinder temperature sensor (resistance type).
24	OPS (pressure sensor input)	1.0mm ²	Connect with the oil pressure sensor (resistance type).
25	FLS (level sensor input)	1.0mm ²	Connect with the level sensor (resistance type).
26	VO(+5V) 5VDC Output	1.0mm ²	Supply 5V for voltage type sensor.
27	COM (common port of sensor)	1.0mm ²	The terminal has been connected to the B- inside the controller.
28	DI1 (Aux. Input 1)	1.0mm ²	Active when it is grounded (B-).
29	DI2 (Aux. Input 2)	1.0mm ²	
30	DI3 (Aux. Input 3)	1.0mm ²	
31	DI4 (Aux. Input 4)	1.0mm ²	
32	DI5 (Aux. Input 5)	1.0mm ²	
33	COM (common port of input)	1.0mm ²	The terminal has been connected to the B- inside the controller.
34	MP1/CANH	0.5mm ²	HGME62CAN : It is connected with ECU CANBUS port. 120Ω impedance shielded cable is

No.	Function	Cable Size	Remarks
35	MP2/CANL	0.5mm ²	recommended, and one end of the cable must be grounded. HGME62: Connect to the speed sensor, shielded cable is recommended. The terminal has been connected to the B- inside the controller.
36	UOUT	1.5mm ²	Connect with Terminal 37 with one fuse.
37	U (sensing input of genset U Phase voltage)	1.5mm ²	Connect with genset U phase output, and the controller employs 10A fuse.
38	V (sensing input of genset V Phase voltage)	1.0mm ²	Connect with genset V phase output, and the controller employs 10A fuse.
39	W (sensing input of genset W Phase voltage)	1.0mm ²	Connect with genset W phase output, and the controller employs 10A fuse.
40	N2 (genset N2 input)	1.0mm ²	Connect with the N-wire of generator output.
41	ROUT	1.5mm ²	Connect with Terminal 42 with one fuse.
42	R (sensing input of mains R Phase voltage)	1.5mm ²	Connect with mains R phase, and the controller employs 10A fuse.
43	S (sensing input of mains S Phase voltage)	1.0mm ²	Connect with mains S phase, and the controller employs 10A fuse.
44	T (sensing input of mains T Phase voltage)	1.0mm ²	Connect with mains T phase, and the controller employs 10A fuse.
45	N1 (mains N1 input)	1.0mm ²	Connect with the N-wire of mains.

Table 10 Wiring Connection of Connector A

No.	Function	Cable Size	Remarks
1	EM.STOP IN	0.75mm ²	Emergency stop input, connect with the emergency stop button.
2	B+ OUT	1.5mm ²	Connect with Terminal 10 (DC Power Supply Input B+) with one fuse.
3	EM.STOP OUT	0.75mm ²	Emergency stop output, connect with the emergency stop button.
4	GND	0.5mm ²	Connect with the negative of controller power supply internally.
5	B+ IN	1.5mm ²	Connect with Terminal 2 (B+ OUT) via power switch to supply the positive of module.
6	GND	0.5mm ²	Connect with the negative of controller power supply internally.

Table 11 Wiring Connection of Connector B (Connect with electronic governor)

No.	Function	Cable Size	Remarks
1	FUEL (fuel relay output)	1.5mm ²	It is supplied by Terminal 10 B+, rated 10A. Connect with the positive of electronic governor

No.	Function	Cable Size	Remarks
			power supply.
2	MP1 Speed Output	0.5mm ²	It has been connected with the Terminal 34 inside the controller. Connect with the speed sample terminal of electronic governor.
3	GND	1.5mm ²	Connect with the negative of controller power supply internally.
4	MP2 Speed Output (GND)	0.5mm ²	Connect with the negative of controller power supply internally.
5	NC		
6	NC		
7	ACT2	1.5mm ²	Connect with the ACT2 terminal of electronic governor.
8	NC		
10	ACT1	1.5mm ²	Connect with the ACT1 terminal of electronic governor.
11	NC		
9	Aux. Output 2	0.75mm ²	Common port of relay.
12			Normally open output of relay , rated 7A.

Table 12 Wiring Connection of Connector C (Connect with charger)

No.	Function	Cable Size	Remarks
1	Charger Output -	1.5mm ²	It has been connected with the Terminal 4 inside the controller. Connect with the charger B-.
2	Charger Output +	1.5mm ²	It has been connected with the Terminal 3 inside the controller. Connect with the charger B+.
3	Mains R Input	0.75mm ²	It has been connected with the Terminal 42 inside the controller. Connect with the Terminal L of charger.
4	Mains N Input	0.75mm ²	It has been connected with the Terminal 45 inside the controller. Connect with the Terminal N of charger.

NOTE 1: USB ports on the back of controller are used for parameter programming, and users can directly program via PC.

Requirement of cable size: B+, B-, and EM.STOP IN are 2.5mm²;

AC current input is 1.5mm²;

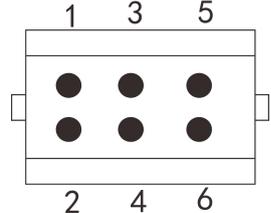
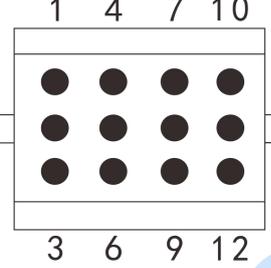
Digital input, analog input, D+ and AC voltage sampling input are 1.0mm²;

Outputs are based on relay output current: 10-16A (2.5mm²), 5-10A (1.5mm²), and below 5A (1.0mm²);

RS485 and CAN communication cable are 0.5mm².

7.2 INSTRUCTION OF HGME62 WIRING HARNESS

Table 13 HGME62 Wiring Harness Cable Size

Wiring Harness Connector				Wiring Harness Length		
Connector Type	No.	Function	Cable Size	XS-HGME62	XS-HGME62-S	
	1	CHARGE-	2.5mm ²	0.55m	1.05m	
	2	CHARGE+	2.5mm ²			
	3	MAINS R	1.0mm ²			
	4	MAINS N	1.0mm ²			
	1	EM.STOP IN	2.5.mm ²	0.75m	1.5m	
	2	B+ OUT	2.5.mm ²	0.85m	1.0m	
	3	EM.STOP OUT	2.5.mm ²	0.75m	1.5m	
	4	GND	1.0mm ²	0.85m	1.0m	
	5	B+ IN	2.5mm ²			
	6	GND	1.0mm ²			
	1	FUEL	1.5mm ²	0.4m	1.0m	
	2	MP1	1.0mm ²			
	3	GND	1.0mm ²			
	4	MP2(GND)	1.0mm ²			
	7	ACT2	1.5mm ²			
	10	ACT1	1.5mm ²			
	9	DO2	1.0mm ²			
	12					
	5	NC				
	6	NC				
	8	NC				
11	NC					

8 PARAMETER SETTING AND DEFINITION

8.1 PARAMETER SETTING CONTENTS AND RANGE

Table 14 Parameter Content and Range

No.	Item	Range	Default	Description
1(1)	Mains Normal Delay	(0-3600)s	10	The delay from abnormal to normal or from normal to abnormal. It is used for ATS (automatic transfer switch) control.
2(2)	Mains Abnormal Delay	(0-3600)s	5	
3(3)	Mains Undervoltage	(30-60000)V	184	When mains voltage is under the point, mains under voltage active. When the value is 30, mains under voltage disabled. Return difference is 10V.
4(4)	Mains Overvoltage	(30-60000)V	276	When mains voltage is greater than the point, mains over voltage active. When the point is

No.	Item	Range	Default	Description
				60000V, mains over voltage disabled. Return difference is 10V.
5(5)	ATS Transfer Delay	(0-99.9)s	1.0	It's the interval from mains open to generator closed or from generator open to mains closed.
6(6)	Start Delay	(0-3600)s	1	Time from mains abnormal or remote start signal is active to start genset.
7(7)	Stop Delay	(0-3600)s	1	Time from mains normal or remote start signal is inactive to stop genset.
8(8)	Start Times	(1-10)	3	When the engine fails to start, it's the maximum cranking times. When the preset crank times are out, the controller sends start failure signal.
9(9)	Preheat Delay	(0-300)s	0	Time of pre-powering heat plug before starter is powered up.
10(10)	Cranking Time	(3-60)s	8	Time of starter power up each time.
11(11)	Crank Rest Time	(3-60)s	10	The second waiting time before power up when engine start fail.
12(12)	Safety On Time	(1-60)s	10	Alarm for low oil pressure, high temp, under speed, under frequency/voltage, failed to charge are all inactive.
13(13)	Start Idle Time	(0-3600)s	0	Idle running time of genset when starting.
14(14)	Warming Up Time	(0-3600)s	10	Warming time between genset switch on and high speed running.
15(15)	Cooling Time	(3-3600)s	10	Time for cooling before stopping.
16(16)	Stop Idle Time	(0-3600)s	0	Idle running time when genset stop.
17(17)	ETS Solenoid Hold	(0-120)s	20	Stop electromagnet's power-on time when genset is stopping.
18(18)	Wait for Stop Time	(0-120)s	0	If "ETS Solenoid Hold" set as 0s, it is the time from end of idle delay to genset at rest; if not 0s, it is from end of ETS solenoid delay to genset at rest.
19(19)	Switch Close Delay	(0.0-10.0)s	5.0	Mains' or generator's switch closing pulse width, when it is 0s, output is continuous.
20(20)	Flywheel Teeth Number	(10.0-300.0)	118.0	Number of flywheel teeth, it can detect disconnection conditions and engine speed.
21(21)	Gen Abnormal Delay	(0-20.0)s	10.0	Over or under voltage alarm delay.
22(22)	Gen Over Voltage Shutdown	(30-60000)V	264	When genset voltage is over the point, generator over voltage is active. When the point is 60000V, generator over voltage is disabled.
23(23)	Gen Under Voltage Shutdown	(30-60000)V	196	When generator voltage is under the point, generator under voltage is active. When the point is 30V, generator under voltage is disabled.
24(24)	Under Speed	(0-6000)	1200	When generator's Speed is over the point and

No.	Item	Range	Default	Description
	Shutdown	r/min		continues for 2s, generator over frequency is active.
25(25)	Over Speed Shutdown	(0-6000) r/min	1710	When generator's Speed is over the point and continues for 2s, generator over frequency is active.
26(26)	Gen Under Frequency Shutdown	(0-75.0)Hz	45.0	When generator frequency is lower than the point (not equal to 0) for 10s, shutdown alarm signal is sent.
27(27)	Gen Over Frequency Shutdown	(0-75.0)Hz	57.0	When generator's frequency is over the point and continues for 2s, generator over frequency is active.
28(28)	High Temperature Shutdown	(80-300)°C	98	When the value of temperature sensor is higher than the threshold, it will send high temperature signal. The value is judged only after the safety on delay, and only the external temperature sensor which connects with the temperature sensor input will be judged. When the value is 300, warning alarm won't be sent. (only suited for temperature sensor, except for high temp. pressure alarm signal inputted by programmable input port.)
29(29)	Low Oil Pressure Shutdown	(0-400)kPa	103	When the oil pressure sensor value is under this point, Low Oil Pressure alarm is sending out. The value is judged only after the safety on delay. When the value is 0, warning alarm won't be sent. (It is only suitable for pressure sensor, except for low pressure alarm signal inputted by aux. input port.)
30(30)	Low Fuel Level Warning	(0-100)%	10	When fuel level sensor value is under this point and remains for 10s, genset sends out warning alarm, only warn but not shutdown.
31(31)	Loss of Speed Signal Delay	(0-20.0)s	5.0	When the delay is set as 0s, it only sends warning but does not stop the genset.
32(32)	Charging Failure Volt. Difference	(0-30)V	6.0	During genset normal running, when B+ and charger D+ (WL) voltage difference is above this value for 5s, the controller issues "Charging Failure" warning.
33(33)	Battery Overvoltage Warning	(12-40)V	33.0	When generator battery voltage is over the point and remains for 20s, battery over voltage signal is active. it only sends warn but not shutdown.
34(34)	Battery Undervoltage Warning	(4-30)V	8.0	When generator battery voltage is under the point and remains for 20s, battery under voltage signal is active. it only sends warn but not shutdown.
35(35)	CT Ratio	(5-6000)/5	500	External current transformer ratio.

No.	Item	Range	Default	Description
36(36)	Full Load Current	(5-6000)A	500	Rated current of generator, which is used for calculating overload current.
37(37)	Overcurrent Percentage	(50-130)%	120	When load current is over the point, the overcurrent delay is initiated.
38(38)	Overcurrent Delay	(0-3600)s	30	Definite time of overcurrent. When load current is over the point, over current signal is sent. When the delay is set as 0, it only sends warning but does not stop the genset.
39(39)	Fuel Pump On	(0-100)%	25	When the fuel level lower than the set value for 2s, it sends a signal to open fuel pump.
40(40)	Fuel Pump Off	(0-100)%	80	When the fuel level higher than the set value for 2s, it sends a signal to close fuel pump.
41(41)	Aux. Output 1 Set	(0-49)	2	Default: Energize to stop (ETS) control, see details in Table 15
42(42)	Aux. Output 2 Set	(0-49)	3	Default: Idle control. See details in Table 15.
43(43)	Aux. Output 3 Set	(0-49)	5	Default: Genset closed. See details in Table 15.
44(44)	Aux. Output 4 Set	(0-49)	6	Default: Mains closed. See details in Table 15.
45(45)	Aux. Input 1 Set	(0-26)	1	Default: High temp. shutdown input. See details in Table 16.
46(46)	Aux. Input 1 Active	(0-1)	0	Default: Closed
47(47)	Aux. Input 1 Delay	(0-20.0)s	2.0	
48(48)	Aux. Input 2 Set	(0-26)	2	Default: Low oil pressure shutdown input. See details in Table 16.
49(49)	Aux. Input 2 Active	(0-1)	0	Default: Closed
50(50)	Aux. Input 2 Delay	(0-20.0)s	2.0	
51(51)	Aux. Input 3 Set	(0-26)	10	Default: Remote start input, See details in Table 16.
52(52)	Aux. Input 3 Active	(0-1)	0	Default: Closed
53(53)	Aux. Input 3 Delay	(0-20.0)s	2.0	
54(54)	Aux. Input 4 Set	(0-26)	11	Default: Low fuel level warning input. See details in Table 16.
55(55)	Aux. Input 4 Active	(0-1)	0	Default: Closed
56(56)	Aux. Input 4 Delay	(0-20.0)s	2.0	
57(57)	Aux. Input 5 Set	(0-26)	12	Default: Low coolant level warning input. See details in Table 16.
58(58)	Aux. Input 5 Active	(0-1)	0	Default: Closed
59(59)	Aux. Input 5 Delay	(0-20.0)s	2.0	
60(60)	Power On Mode	(0-2)	0	0: Stop Mode; 1: Manual Mode; 2: Auto Mode
61(61)	Module Address	(1-254)	1	The communication address of controller.
62(62)	Password	(0-9999)	0318	See details in NOTE4 .

No.	Item	Range	Default	Description
63(63)	Crank Disconnection Condition	(0-6)	2	The disconnection conditions of starter. They are generator, magnetic pickup sensor, and oil pressure). It is to disconnect the starter motor and genset as soon as possible.
64(64)	Speed of Crank Disconnection	(0-3000) r/min	360	When the engine speed is over this value, the starter will disconnect.
65(65)	Frequency of Crank Disconnection	(0.0-30.0)Hz	14.0	When the generator frequency is over this value, the starter will disconnect.
66(66)	Oil Pressure of Crank Disconnection	(0-400)kPa	200	When the engine oil pressure is over this value, the starter will disconnect.
67(67)	High Temp. Stop Inhibit Enable	(0-1)	0	Default: When the temperature is over the preset value, the controller will shutdown the genset. See details in NOTE 2
68(68)	Low OP Stop Inhibit Enable	(0-1)	0	Default: When the temperature is below the preset value, the controller will shutdown the genset. See details in NOTE 3
69(69)	AC System	(0-3)	0	0: 3P4W; 1: 2P3W; 2: 1P2W; 3: 3P3W.
70(70)	Temp. Sensor Curve Type	(0-14)	8	SGX. See details in Table 17.
71(71)	Pressure Sensor Curve Type	(0-14)	8	SGX. See details in Table 17.
72(72)	Level Sensor Curve Type	(0-7)	3	SGD. See details in Table 17.
73(73)	Generator Poles	(2-64)	4	Number of magnetic poles, used for calculating rotating speed of generator without speed sensor.
74(74)	Temp. Sensor Open Action	(0-2)	1	0: Invalid; 1: Warning; 2: Shutdown.
75(75)	Oil Pressure Sensor Open Action	(0-2)	1	
76(76)	Disconnection Oil Pressure Delay	(0-20.0)s	0.0	When disconnect conditions include oil pressure and engine oil pressure is higher than disconnect oil pressure delay, the genset is regarded as start successfully and starter will disconnect.
77(77)	Scheduled Start Set	(0-1)	0	0: Disabled; 1: Enable.
78(78)	Scheduled Cycle Start Set	(0-1)	0	Cycle condition: monthly/weekly/daily. Start time and duration can be set.
79(79)	Auto Start Inhibit	(0-1)	0	0: Disabled; 1: Enable.
80(80)	Auto Cycle Start	(0-2)	0	Cycle condition: monthly/weekly/daily.

No.	Item	Range	Default	Description
	Inhibit			Non-start time and duration can be set.
81(81)	Overpower Set	(0-2)	0	0: Invalid; 1: Warning; 2: Shutdown. When power is higher than preset value and duration exceeds than delay, over power warning is active. Return and delay value can be set.
82(82)	Bootup Interface	(0-1)	0	0: Disabled; 1: Enable. Bootup interface delay can be set.
83(83)	Maintenance Password	(0-9999)	0	Password to enter the interface of maintenance configuration.
84(84)	Date	Set the date of controller.		
85(94)	Self-defined Sensor Curve	(0-2)	0	0: Self-defined temperature sensor; 1: Self-defined pressure sensor; 2: Self-defined level sensor. Choose sensor which need to be set, input every point (8 points need to be input) resistance and corresponding value (or current, voltage) of curve.
86	Engine Type	(0-69)	0	0: General genset
87	SPN Alarm Version	(0-3)	0	SPN Alarm Version
88	Custom Theme	(0-2)	0	0: Default theme; 1: OEM theme; 2: End user theme
89 (85)	Fuel Output Time	(1-60)s	1	It is the time of the genset fuel output during power on.
90(86)	ATS Action in Manual Mode	(0-1)	0	0: Manual transfer; 1:Auto transfer.
91(87)	Speed Raise Pulse Time	(0-20.0)s	0.2	It is the speed-up pulse output time, when the genset enters the high-speed warm-up.
92(88)	Speed Drop Pulse Time	(0-20.0)s	0.2	It is the speed-drop pulse output time, when the genset enters the stop idling.
93(89)	Low Fuel Level Shutdown	(0-100)%	5	When fuel level of external level sensor falls below the setting limit and lasts for 5s, low fuel shutdown alarm will be initiated; if limit value set as 0, low fuel shutdown alarm will not be initiated.
94(90)	ATS Open Time	(1.0-60.0)s	3.0	
95(91)	Genset PT Ratio	(0-1)	0	0: Disabled; 1: Enable. The primary and secondary voltage can be set.
96 (92)	Mains PT Ratio	(0-1)	0	0: Disabled; 1: Enable. The primary and secondary voltage can be set.
97(93)	Active Power On-load Percentage	(0-1)	0	0: Disabled; 1: Enable. When it is enabled, the percentage is : active power/rated power*100; When it is disabled, the percentage is : average current of three phases/rated current*100.

Note: It is only suitable for HGME62CAN.

No.	Item	Range	Default	Description
98	Charger Voltage Sampling	(0-1)	0	0: Controller; 1: ECU.
99	Speed Sampling	(0-1)	1	0: Controller; 1: ECU.
100	Temp. Sampling	(0-1)	1	0: Controller; 1: ECU.
101	Oil Pressure Sampling	(0-1)	1	0: Controller; 1: ECU.
102	CAN Baud Rate	(0-1)	0	0: 250kbps; 1: 500kbps.
103	Rated Speed	(0-6000) r/min	1500	Rated speed sent by TSC1 message.
104	Rate Idle Speed	(0-6000) r/min	750	Rate idle speed sent by TSC1 message.
105	ECU Comm. Address	(0-255)	3	Communication address ID sent by TSC1 message.
106(95)	RS485 Baud Rate	(0-4)		0: 9600bps; 1: 4800bps; 2: 2400bps; 3: 19200bps; 4: 115200bps;

Engine type: 44 GTSC1 PLUS.

NOTE 1: The No. column is the number of HGME62CAN parameters, and the No. in round brackets is the number of HGME62 parameters. If there is only one No. in one table cell, that means the parameter is not available in HGME62.

NOTE 2: If select high temperature inhibit, or set programmable input as High Temperature Inhibit (this input is active), when temperature is higher than pre-setting threshold, controller sends warning signal only and not shutdown.

NOTE 3: If select low oil pressure inhibit, or set programmable input as Low Oil Pressure Inhibit (this input is active), when low oil pressure is lower than pre-setting threshold, controller sends warning signal only and not shutdown.

NOTE 4: If default password (0318) isn't changed, it doesn't need to input when configuring parameters via PC software; if the password is changed for the first time via PC software, it needs to input password in password window.

NOTE 5: Between input correct password and LCD back light haven't got dark, input parameter numbers can enter parameter setting interface when enters "Password Input" again.

NOTE 6: In teeth configuration interface, if being in teeth configuration status and frequency is larger than 20Hz, press start key for auto calculating teeth numbers and press confirm key for changing teeth numbers.

8.2 DEFINED CONTENTS OF AUX. OUTPUT 1-4

Table 15 Defined Content of Aux. Output 1-4

No.	Item	Description
0	Not Used	The output is not active if this item is selected.
1	Common Alarm Output	Including all shutdown alarms and warning alarms. When warning alarm occurs, the alarm won't self-lock; When a shutdown alarm occurs, the alarm will self-lock until alarm is reset.
2	Energize to Stop	Used for the genset with stop solenoid. Pick-up when idle speed is over while disconnect when ETS delay is over.
3	Idle Control	Used for the genset with idle speed. Pick-up when crank while disconnect when enter into warming up. Pick-up when stop idle while disconnect when genset stop completely.

No.	Item	Description	
4	Preheat Control	Close before started and disconnect before powered on.	
5	Genset Close	When close time is set as 0, it is continuous closing.	
6	Mains Close	Close the Mains switch.	
7	Open	When close time is set as 0, it is disabled.	
8	Speed Raise Relay	Pick-up when enter into warming up time. The pick-up time is warming up delay.	
9	Speed Drop Relay	Pick-up when enter into stop idle or ETS (shutdown). The pick-up time is stop idle delay.	
10	Genset Running Output	Output when genset is in normal running, disconnect when the speed is lower than crank speed.	
11	Fuel Pump Control	Pick-up when the fuel level lower than the open threshold or low fuel level warning is active; disconnect when the fuel level over the close threshold and the low fuel level warning input is disabled.	
12	High Speed Control	Output when it enters into warming up time, and disconnect after cooling.	
13	In Auto Mode	The controller is in Auto Mode.	
14	Shutdown Output	Output when shutdown occurs.	
15	Audible Alarm	When shutdown alarm and warn alarm occur, audible alarm is set as 300s. In audible alarm output duration, when panel any key or "alarm mute" input is active, it can remove the alarm.	
16	Coolant Heating Control	It is controlled by the temperature sensor's limited threshold.	
17	Fuel Output	Action when genset is starting and disconnect when stop is completed.	
18	Start Output	Output in start output status and disconnect in other status.	
19	ECU Shutdown	Used for ECU engine and control the ECU to stop.	
20	ECU Power	Used for ECU engine and control its power supply.	
21	ECU Warning	Indicate ECU sends a warning signal.	
22	ECU Shutdown	Indicate ECU sends a shutdown signal.	
23	ECU Comm. Failure	Indicate the controller can't communicate with ECU.	
24	Speed Raise Pulse	Raising speed time is output while the unit entering into high-speed warming up.	
25	Speed Drop Pulse	Dropping speed time is output while the unit entering into stop idling.	
26	Oil Pump Control	This function only suits for HGME62AN with engine type of Yuchai-LMB. When unit is standby, pump control output per 30 minutes. If oil pressure is above 100kPa or output delay is more than 1minute, it will stop output; if unit is in re-heating state, oil pump control will always output.	Available only in HGME62CAN
27	Fuel Pre-supply	Output for 3s before fuel output.	

No.	Item	Description
28	ECU Key Switch	Suitable for electrical injection engines. Ignition switch and ECU power are not allowed to supply power simultaneously, it should be ECU power supply first, then ignition switch is supplied after a delay of 3s.
29	Cooling Fan	Output when water temperature is higher than the open threshold of cooling fan, and disconnect when lower than the close threshold of cooling fan.
30	ECU Running Output	It outputs to control the engine start/stop after the fuel output is active, later the start output becomes active. It disconnects when the engine is in the status of stop idle.
31	Fuel 1 Output	It outputs after the fuel output is active, and the delay time is 1s. The function of this port is suitable for the CAN type controller only.
32~49	Reserved	Reserved

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8.3 DEFINABLE CONTENTS OF DIGITAL INPUT 1-5

Table 16 Definable Contents of Digital Inputs (Active When GND (B-) is Connected)

No.	Item	Description
0	Not Used	
1	High Temp. Shutdown Input	If the signal is active after safety on delay is over, the genset will immediately shutdown.
2	Low Oil Pressure Shutdown Input	
3	External Warning Input	If the signal is active, the controller will send warning, but not shutdown.
4	External Shutdown Input	If the signal is active, the genset will immediately shutdown.
5	High Temp. Cooling Shutdown	When the genset is running and the signal is active, if high temperature occurs, the controller will shutdown the genset after high speed cooling delay is over; when the input is inactive, the controller will shutdown the genset immediately if high temperature occurs.
6	Genset Closed Status Input	Connect with the auxiliary port of genset on-load switch.
7	Mains Closed Status Input	Connect to auxiliary port of mains on-load switch.
8	High Temp. Stop Inhibit	If the signal is active, high temperature stop is inhibited. See NOTE 2 of Table 14 for more information.
9	Low Oil Pressure Shutdown Inhibit	If the signal is active, low oil pressure shutdown is inhibited. See NOTE 3 of Table 14 for more information.
10	Remote Start Input	In Auto mode, if the signal is active, the controller will start the genset automatically, and the genset will supply the load after it works normally. If the signal is inactive, the controller will stop the genset automatically.
11	Low Fuel Level Warning Input	Connect to the sensor digital input. The controller sends warning signal if the signal is active.
12	Low Coolant Level Warning Input	
13	Low Fuel Level Shutdown Input	Connect to the sensor digital input. The controller sends shutdown signal if the signal is active.
14	Low Coolant Level Shutdown Input	
15	Auto Start Inhibit	In Auto Mode, when the input is active, no matter mains is normal or not, the genset won't start. If the genset is in normal running, stop operation won't be executed. When the input is inactive, the genset will automatically start or stop judging by mains normal or not.
16	Remote Control Input	When the input is active, all panel keys will be invalid except for     . And auto mode will be displayed in the LCD screen.

No.	Item	Description	
		Remote control module can change the working mode, start or stop the genset through panel keys.	
17	Charger Charging Failure Warning	Connect to the charger charging failure warning output.	
18	Panel Keys Disabled	All panel keys are invalid except for     and the  will be displayed in the right of fifth row in LCD when the input is active.	
19	Alarm Mute	The "Audible Alarm" output will be disabled when the input is active.	
20	Idle Control Mode	In this mode, under voltage, under frequency and under speed are not protected.	Available in HGME62CAN, and unused in HGME62.
21	60Hz Valid	It is used for J1939 engines with CANBUS port, when input is active, frequency is 60Hz.	
22	Speed Raise Pulse Input	If engine type is general J1939 type, when input is active, engine target speed will increase 5RPM.	
23	Speed Drop Pulse Input	If engine type is general J1939 type, when input is active, engine target speed will decrease 5RPM.	Available in HGME62CAN
24	Torque Limit Removed Input	If the signal is active, the torque limit is removed. Only valid for 52 WEICHAI-WISE13-T4 genset.	
25	Regeneration Input	If the signal is active, engine aftertreatment system will regenerate.	
26	Regeneration Inhibit Input	If the signal is active, engine aftertreatment system will forbid the regeneration.	Available in HGME62.
24	Overcurrent Fault Shutdown Input	If the signal is active, the controller sends the shutdown signal.	
(25)	Overspeed Shutdown Input	When input is active, controller will initiate shutdown alarms.	

8.4 SENSOR SELECTION

Table 17 Sensor Selection

No.	Sensor Type	Curve Type	Remarks
1	Temp. Sensor	0 Not Used 1 Self-defined resistance-type curve 2 VDO 3 SGH 4 SGD 5 CURTIS 6 DATCON 7 VOLVO-EC 8 SGX 9 Self-defined 4-20mA (Special order required) 10 Self-defined 0-5V (Special order required) 11 Digital Low Input Active 12 Digital High Input Active 13 Reserved 14 Reserved	Self-defined resistance-type sensor range is 0Ω~6000Ω, factory default is SGX sensor.
2	Pressure Sensor	0 Not Used 1 Self-defined resistance-type curve 2 VDO 10Bar 3 SGH 4 SGD 5 CURTIS 6 DATCON 10Bar 7 VOLVO-EC 8 SGX 9 Self-defined 4-20mA (Special order required) 10 Self-defined 0-5V (Special order required) 11 Digital Low Input Active 12 Digital High Input Active 13 VDO 5Bar 14 Reserved	Self-defined resistance-type sensor range is 0Ω~6000Ω, factory default is SGX sensor.

No.	Sensor Type	Curve Type	Remarks
3	Fuel Level Sensor	0 Not Used 1 Self-defined resistance-type curve 2 SGH 3 SGD 4 Self-defined 4-20mA (Special order required) 5 Self-defined 0-5V (Special order required) 6 Digital Low Input Active 7 Digital High Input Active	Self-defined resistance-type sensor range is 0Ω~6000Ω, factory default is SGD sensor.

NOTE: It needs special instructions for ordering when the genset uses 4-20mA or 0-5V sensors.

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8.5 CONDITIONS OF CRANK DISCONNECTION

Table 18 Conditions of Crank Disconnection

No.	Conditions
0	Speed
1	Frequency
2	Speed + Frequency
3	Speed + Oil Pressure
4	Frequency + Oil pressure
5	Frequency + Speed + Oil pressure
6	Oil Pressure

- a) There are 3 kinds of crank disconnect conditions. Speed, Generator frequency and Oil pressure can be used alone. Oil pressure used with speed and generator frequency together is recommended, in order to make the starter and the engine disconnect as soon as possible.
- b) Speed is the signal measured by magnetic sensor, which is installed in the engine for testing flywheel teeth.
- c) When choosing speed, ensure the number of flywheel teeth is same as the pre-set, otherwise over or under speed shutdown may appear.
- d) If generator has no magnetic pickup sensor, don't choose speed item; otherwise Fail to Start or Loss of Speed Signal shutdown will occur.
- e) If the genset has no oil pressure sensor, don't choose the oil pressure item.
- f) If generator frequency has not been selected, controller will not measure and display the relative parameters (can be applied to the pump set); if speed has not been selected, the speed will be calculated by the generating AC signal.

9 PARAMETER SETTING

9.1 MENU

After controller powered on, press  to enter into the parameters setting menu:

1. Parameters Setting
2. Information
3. Language
4. Event Log
5. Maintenance Setting

9.2 PARAMETERS SETTING

“0318” can set all items in Table 12 during inputting password. When default password has been changed, it needs to input the same password with controller for parameter setting via PC software. If more parameter items need to be set or password is forgotten, such as voltage and current calibration, please contact the factory.

NOTES:

- a) Please modify the parameters in standby mode (crank conditions, auxiliary input and output configuration, multi delays, etc.) otherwise shutdown alarm or other abnormal conditions may appear.
- b) The over-voltage threshold must be greater than the under-voltage threshold; otherwise over-voltage and under-voltage will occur at the same time.
- c) The over-speed threshold must be greater than under-speed threshold, otherwise over speed and under speed will occur at the same time.
- d) Set frequency value (after crank disconnect) as low as possible, in order to disconnect starter quickly.
- e) Programmable input 1-5 cannot be set as the same items, otherwise it cannot realize correct function; programmable output 1-4 can be set as the same item.
- f) If need to shut down after cooling, please set any input as “stop after cooling”, then connect this input to ground; or set high temperature stop action as “cooling stop”.

9.3 INFORMATION

- a) LCD will display some information of controller, such as software version, issue date.
- b) Press the  key to display the status of digital inputs and outputs.

9.4 LANGUAGE

User may select display language as Chinese, English, Spanish, Russian, Portuguese, Turkey, Polish and French.

9.5 EVENT LOG

Check the event log in this item, maximum number is 99.

9.6 MAINTENANCE SETTING

Set the date and time of maintenance in this item.

9.7 LCD CONTRAST RATIO ADJUSTMENT

Press  and  (or  and ) and adjust LCD contrast ratio, which shall make the LCD characters clearer. Adjustment range is 0-9.

10 SENSOR SETTING

- When choosing sensor, standard value of sensor curve will be needed. If temperature sensor is set as SGH (120°C resistor type), sensor curve should be SGH (120°C resistor type); if it is set as SGD (120°C resistor type), sensor curve should be SGD curve.
- If there is difference between standard sensor curve and chosen sensor curve, select “defined sensor”, and then input defined sensor curve.
- When sensor curve is inputted, X value (resistance) must be in accordance with the order of higher to lower, otherwise errors will occur.
- When sensor is selected as “Not used”, temperature, pressure and fuel level will be display as “- -” in LCD.
- If there is no pressure sensor, but only has low pressure alarm switch, then you must set pressure sensor as “Not used”, otherwise oil pressure low alarm shutdown may appear.
- Can set several points of forehead or backmost as the same ordinate, as the following picture:

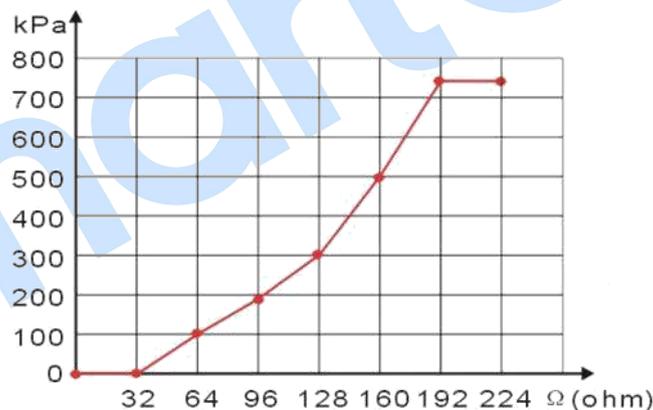


Fig. 3 Sensor Curve Diagram

Table 19 Pressure Unit Conversion

	N/m ² (Pa)	kgf/cm ²	bar	(1b/in ²) psi
1Pa	1	1.02x10 ⁻⁵	1x10 ⁻⁵	1.45x10 ⁻⁴
1kgf/cm ²	9.8x10 ⁴	1	0.98	14.2
1bar	1x10 ⁵	1.02	1	14.5
1psi	6.89x10 ³	7.03x10 ⁻²	6.89x10 ⁻²	1

11 COMMISSIONING

Before operation, the following checking should be carried out:

- Check and ensure all the connections are correct and wires diameter is suitable.
- Ensure that the controller DC power has fuse; battery positive and negative have correctly connected.
- Emergency stop input must be connected to positive of starting battery via normally close contact of emergency stop.
- Take proper actions to prevent engine to disconnect crank (e. g. Remove the connections of fuel valve). If checking is OK, connect start battery, select Manual Mode, controller will execute the program.
- Set controller as Manual Mode, press “start” key to start genset. If failed within the setting crank times, controller will send “Failed to Start” signal; then press “stop” to reset controller.
- Recover actions of preventing engine to disconnect crank (e. g. Connect wire of fuel valve), press “start” key again, genset will start. If everything goes well, genset will normally run after idle running (if configured). During this period, watch for engine’s running situations and voltage and frequency of alternator. If there is abnormal, stop genset and check all connections according to this manual.
- Select the Auto Mode from front panel, connect to mains signal. After the mains normal delay, controller will transfer ATS (if configured) into mains load. After cooling, controller will stop genset and into standby state until mains abnormal again.
- When mains abnormal again, genset will start automatically and into normal running, send signal to make gens close, transfer ATS and make genset take load. If it not likes this, please check connections of ATS according to this manual.
- If there are any other questions, please contact SmartGen’s service.

12 TYPICAL APPLICATION

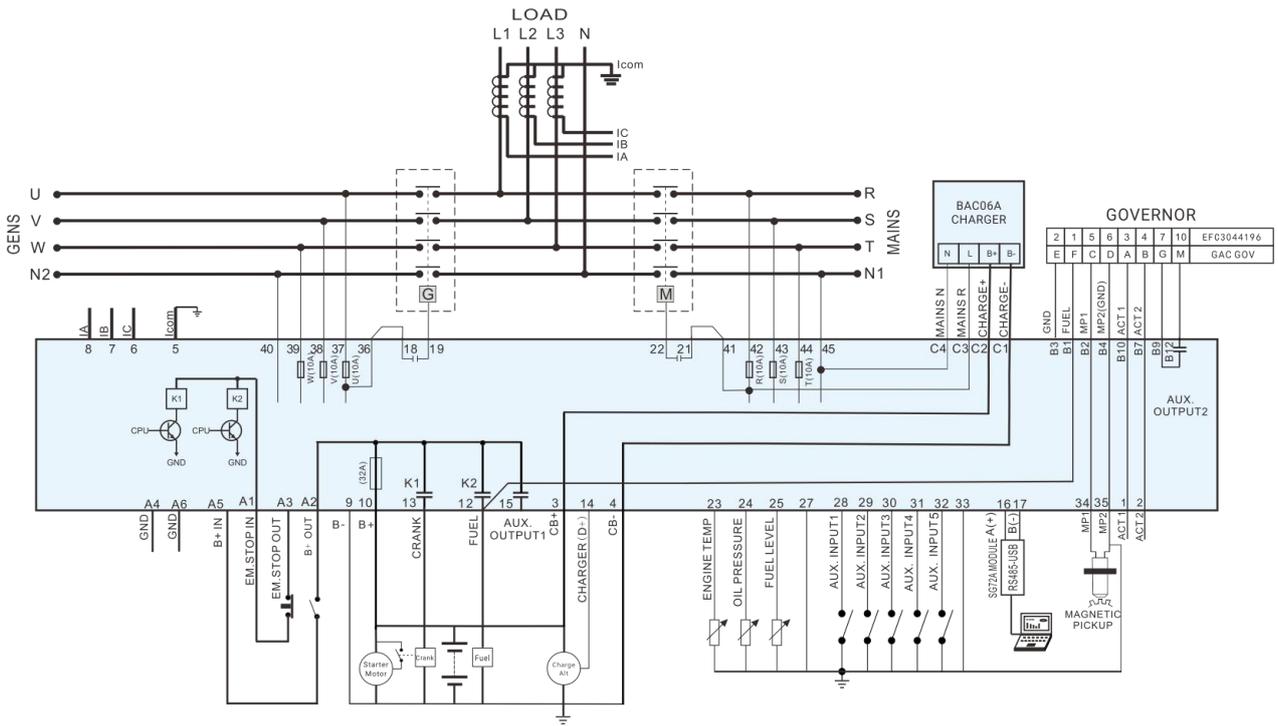


Fig. 4 HGME62 Typical Application Diagram

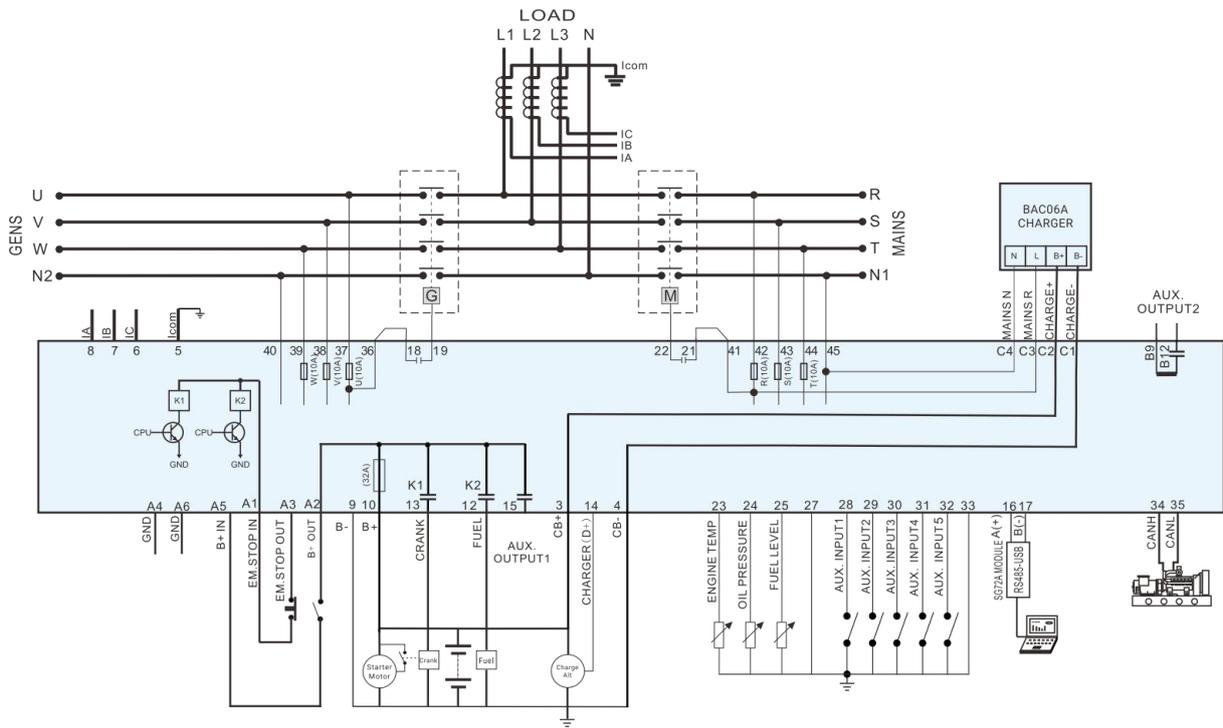


Fig. 5 HGME62CAN Typical Application Diagram

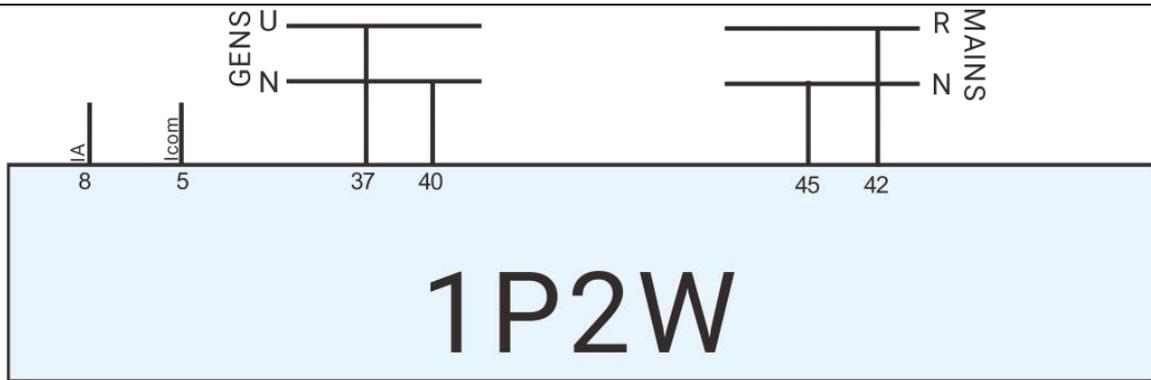


Fig. 6 1P2W Wiring Connection Diagram

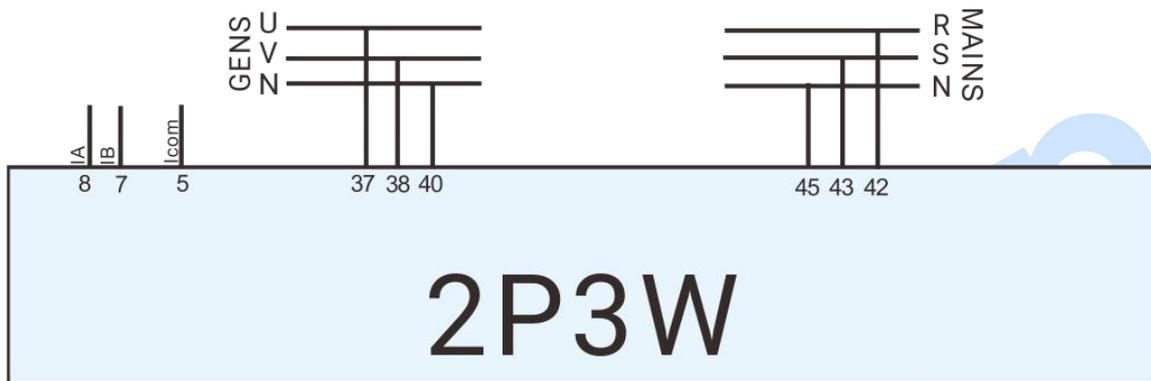


Fig. 7 2P3W Wiring Connection Diagram

13 INSTALLATION

13.1 INSTALLATION PROCEDURE

- The module is held into the panel fascia using the supplied fixing clips;
- Take the fixed frame apart from the front panel of the controller;
- There are four screw holes in the back of the controller, make sure each hole matched with correct screw position;
- Install four M5 screws in each hole;
- Turn the fixing clip screws clockwise until they make contact with the panel.
- Install the fixed frame on the front panel of the controller (a press-fit design with two positions, aligned with the outermost surface of panel).

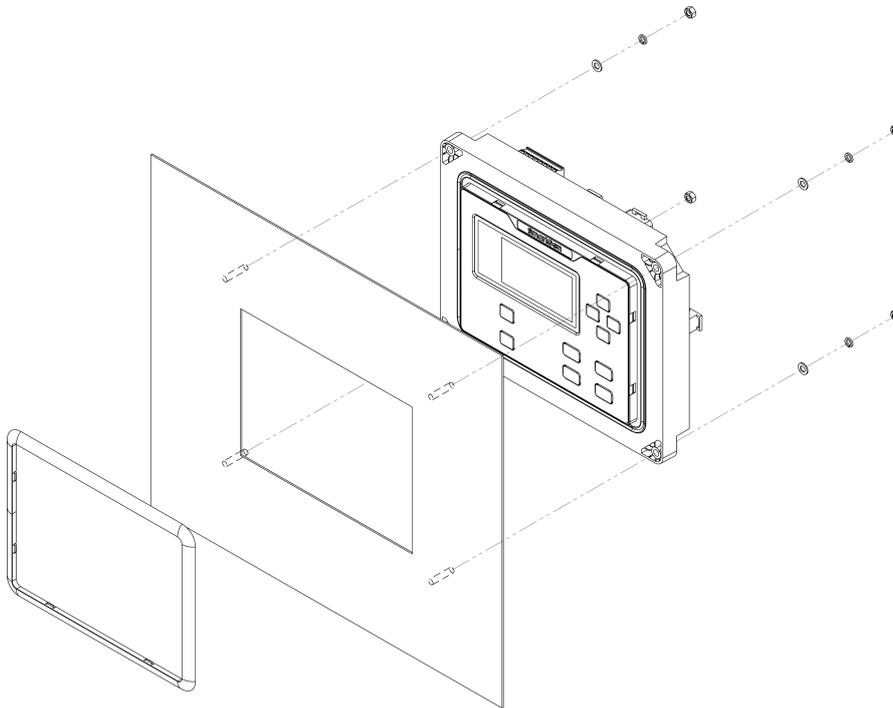


Fig. 8 Installation Diagram

13.2 OVERALL AND CUTOUT DIMENSIONS

Unit: mm

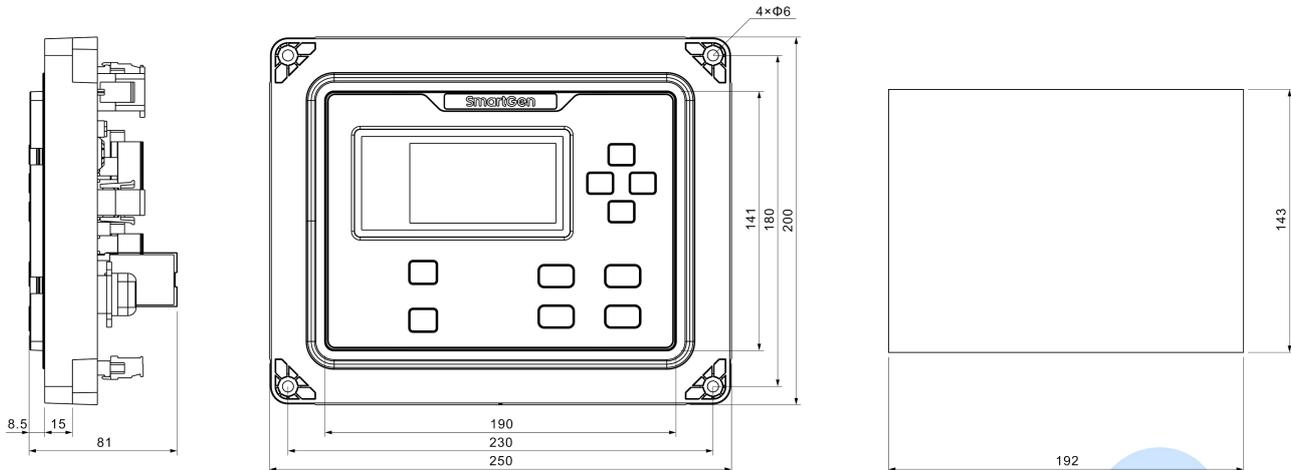


Fig. 9 Overall and Cutout Dimensions

HGME62 series controller can be applicable to (8-35) VDC battery voltage. Battery negative must be reliably connected to engine shell. The wiring cable size must be over 2.5mm^2 (from the power supply B+ and B- to the battery positive and negative). If there is a floating charger, please connect the output wires of charger to the battery's positive and negative directly, then connect separate wires from the battery's positive and negative to the controller's positive and negative input ports in order to prevent the charger interfering with the controller's normal working.

1) **Speed Sensor Input**

Speed sensor is installed in the engine for testing flywheel teeth. The connection with controller uses 2-core screen, shield layer should be connected to terminal 35 of controller and the other end vacant. The other two signal lines are respectively connected to terminal 34 and terminal 35. At full speed, output voltage range is (1-24) VAC (RMS), 12VAC is recommended (rated speed). During installing, make the speed sensor contact the flywheel firstly, then pour out 1/3 laps, finally lock nut on the sensor.

2) **Output and Expansion Relay**

All the outputs of controller are relay outputs. If need to expand relay, please add freewheeling diode in both ends of relay coil (when expansion relay coil links DC), or add RC loop (when expansion relay coil links AC), in case controller or other equipment are interfered.

3) **AC Input**

HGM6110N series controller must externally connect to current transformer; CT secondary current must be 5A. Besides, the phase of CT and input voltage must be correct, or the sampling current and active power may be incorrect.

NOTE: a. Icom must be connected with the negative of battery controller power supply.

NOTE: b. When there is load current, open circuit is inhibited in the CT secondary side.

4) **Withstand Voltage Test**

When the controller has been installed in the control panel, during the test please disconnect all the terminals, in case high voltage damages the controller.

14 CONNECTIONS OF CONTROLLER WITH J1939 ENGINE

14.1 CUMMINS ISB/ISBE

Table 20 Connector B

Terminals of controller	Connector B	Remark
Fuel Relay Output	39	
Start Relay Output	-	Connect to starter coil directly.
Aux. Output 1	Expand 30A relay, battery voltage of 01, 07, 12, 13 is supplied by relay.	ECU power; Set configurable output 1 as "ECU power".

Table 21 9-Pin Connector

Terminals of controller	9-Pin Connector	Remark
CAN(H)	SAE J1939 signal-C	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	SAE J1939 return-D	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Cummins ISB.

14.2 CUMMINS QSL9

It is suitable for CM850 engine control module.

Table 22 50-Pin Connector

Terminals of controller	50-Pin Connector	Remark
Fuel Relay Output	39	
Start Relay Output	-	Connect to starter coil directly.

Table 23 9-Pin Connector

Terminals of controller	9-Pin Connector	Remark
CAN(H)	SAE J1939 signal-C	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	SAE J1939 return-D	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Cummins-CM850.

14.3 CUMMINS QSM11 (Import)

It is suitable for CM570 engine control module. Engine type is QSM11 G1, QSM11 G2.

Table 24 C1 Connector

Terminals of controller	C1 Connector	Remark
Fuel Relay Output	5&8	Expansion relay, when fuel output, making terminal 5 and 8 of C1 be connected.
Start Relay Output	-	Connect to starter coil directly.

Table 25 3-Pin Data Link Connector

Terminals of controller	3-Pin Data Link Connector	Remark
CAN(H)	A	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	B	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Cummins ISB.

14.4 CUMMINS QSX15-CM570

It is suitable for CM570 engine control module. Engine type is QSX15.

Table 26 50-Pin Connector

Terminals of controller	50-Pin Connector	Remarks
Fuel Relay Output	38	Oil spout switch.
Start Relay Output	-	Connect to starter coil directly.

Table 27 9-Pin Connector

Terminals of controller	9-Pin Connector	Remarks
CAN(H)	SAE J1939 signal-C	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	SAE J1939 return-D	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Cummins QSX15-CM570.

14.5 CUMMINS GCS-MODBUS

It is suitable for GCS engine control module. Use RS485-MODBUS to read information of engine. Engine types are QSX15, QST30, QSK23/45/60/78 and so on.

Table 28 D-SUB Connector 06

Terminals of controller	D-SUB Connector 06	Remarks
Fuel Relay Output	5&8	Expansion relay, when fuel output, connect the terminal 5 and 8 of the connector 06.
Start Relay Output	-	Connect to starter coil directly.

Table 29 D-SUB Connector 06

Terminals of controller	D-SUB Connector 06	Remarks
RS485+	21	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
RS485-	18	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Cummins QSK-MODBUS, Cummins QST-MODBUS, Cummins QSX-MODBUS.

14.6 CUMMINS QSM11

Table 30 Engine OEM Connector

Terminals of controller	Engine OEM Connector	Remark
Fuel Relay Output	38	
Start Relay Output	-	Connect to starter coil directly.
CAN(H)	46	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	37	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Common J1939.

14.7 CUMMINS QSZ13

Table 31 Engine OEM Connector

Terminals of controller	Engine OEM Connector	Remark
Fuel Relay Output	45	
Start Relay Output	-	Connect to starter coil directly.
Aux. Output 1	16&41	Setting to idle speed control, normally open output. Making 16 connect to 41 during high-speed running of controller via external expansion relay.
Aux. Output 2	19&41	Setting to pulse raise speed control, normally open output. Making 19 connect with 41 for 0.1s during high-speed warming of controller via external

Terminals of controller	Engine OEM Connector	Remark
		expansion relay.
CAN(H)	1	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	21	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Common J1939.

14.8 DETROIT DIESEL DDEC III/IV

Table 32 Engine CAN Port

Terminals of controller	Engine CAN Port	Remark
Fuel Relay Output	Expand 30A relay, battery voltage of ECU is supplied by relay.	
Start Relay Output	-	Connect to starter coil directly.
CAN(H)	CAN(H)	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	CAN(L)	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Common J1939.

14.9 DEUTZ EMR2

Table 33 F Connector

Terminals of controller	F Connector	Remark
Fuel Relay Output	Expanded 30A relay, and relay offers battery voltage to terminal 14. Fuse is 16A	
Start Relay Output	-	Connect to starter coil directly.
-	1	Connect to the negative of battery.
CAN(H)	12	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	13	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Volvo EDC4.

14.10 JOHN DEERE

Table 34 21-Pin Connector

Terminals of controller	21-Pin Connector	Remark
Fuel Relay Output	G, J	
Start Relay Output	D	
CAN(H)	V	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	U	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: John Deere.

14.11 MTU ADEC (SMART module)

It is suitable for MTU engine with ADEC (ECU8) and SMART module.

Table 35 ADEC (X1 port)

Terminals of controller	ADEC (X1 port)	Remark
Fuel Relay Output	X1 10	Connect X1 Terminal 9 to the negative of battery.
Start Relay Output	X1 34	Connect X1 Terminal 33 to the negative of battery..

Table 36 SMART (X4 port)

Terminals of controller	SMART (X4 port)	Remark
CAN(H)	X4 1	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	X4 2	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: MTU-ADEC.

14.12 MTU ADEC (SAM module)

It is suitable for MTU engine with ADEC (ECU7) and SAM module.

Table 37 ADEC (X1 port)

Terminals of controller	ADEC (X1 port)	Remark
Fuel Relay Output	X1 43	Connect X1 Terminal 28 to the negative of battery.
Start Relay Output	X1 37	Connect X1 Terminal 22 to the negative of battery.

Table 38 SAM (X23 port)

Terminals of controller	SAM (X23 port)	Remark
CAN(H)	X23 2	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	X23 1	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Common J1939.

14.13 PERKINS

It is suitable for ADEM3/ ADEM4 engine control mode. Engine type is 2306, 2506, 1106, and 2806.

Table 39 Connector

Terminals of controller	Connector	Remark
Fuel Relay Output	1, 10, 15, 33, 34	
Start Relay Output	-	Connect to starter coil directly.
CAN(H)	31	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	32	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Perkins.

14.14 SCANIA

It is suitable for S6 engine control mode. Engine type is DC9, DC12, and DC16.

Table 40 B1 Connector

Terminals of controller	B1 Connector	Remark
Fuel Relay Output	3	
Start Relay Output	-	Connect to starter coil directly.
CAN(H)	9	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	10	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Scania.

14.15 VOLVO EDC3

Suitable engine control mode is TAD1240, TAD1241, and TAD1242.

Table 41 “Stand Alone” Connector

Terminals of controller	“Stand Alone” Connector	Remark
Fuel Relay Output	H	
Start Relay Output	E	
Aux. Output 2	P	ECU power; Set configurable output 2 as “ECU power”.

Table 42 “Data bus” Connector

Terminals of controller	“Data bus” Connector	Remark
CAN(H)	1	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	2	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Volvo.

▲NOTE: When this engine type is selected, preheating time should be set to at least 3 seconds.

14.16 VOLVO EDC4

Suitable engine types are TD520, TAD520 (optional), TD720, TAD720 (optional), TAD721, TAD722, and TAD732.

Table 43 Connector

Terminals of controller	Connector	Remark
Fuel Relay Output	Expanded 30A relay, and relay offers battery voltage to terminal 14. Fuse is 16A	
Start Relay Output	-	Connect to starter coil directly.
	1	Connect to the negative of battery.
CAN(H)	12	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	13	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: VolvoEDC4.

14.17 VOLVO-EMS2

Volvo Engine types are TAD734, TAD940, TAD941, TAD1640, TAD1641, and TAD1642.

Table 44 Engine CAN Port

Terminals of controller	Engine CAN Port	Remark
Aux. Output 1	6	ECU stop; Configure the aux. output 1 as "ECU stop".
Aux. Output 2	5	ECU power; Configure the aux. output 2 as "ECU power".
	3	Negative of power.
	4	Positive of power.
CAN(H)	1(Hi)	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	2(Lo)	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: Volvo-EMS2.

▲NOTE: When this engine type is selected, preheating time should be set to at least 3 seconds.

14.18 YUCHAI

It is suitable for YUCHAI BOSCH common rail electronic-controlled engine.

Table 45 Engine 42-Pin Port

Terminals of controller	Engine 42-Pin Port	Remark
Fuel Relay Output	1.40	Connect to engine ignition switch.
Start Relay Output	-	Connect to starter coil directly.
CAN(H)	1.35	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	1.34	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Table 46 Engine 2-Pin Port

Battery	Engine 2-Pin Port	Remark
Negative of battery.	1	The cable size is 2.5mm ² .
Positive of battery.	2	The cable size is 2.5mm ² .

Engine Type: BOSCH.

14.19 WEICHAI

It is suitable for WEICHAI BOSCH common rail electronic-controlled engine.

Table 47 Engine Port

Terminals of controller	Engine Port	Remark
Fuel Relay Output	1.40	Connect to engine ignition switch.
Start Relay Output	1.61	
CAN(H)	1.35	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.
CAN(L)	1.34	Use 120Ω impedance wiring cable. 0.5 mm ² size of cable is recommended.

Engine Type: GTSC1.

▲NOTE: If there is any question of connection between controller and ECU communication, please feel free to contact SmartGen service.

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15 TROUBLESHOOTING

Table 48 Troubleshooting

Symptoms	Possible Solutions
No response when the controller is powered on	Check the starting battery; Check the wiring connection of controller; Check the DC fuse.
Genset Stops	Check if water/cylinder temperature is too high; Check the alternator voltage; Check the DC fuse.
Controller Emergency Stop	Check if the emergency stop button is normal; Check if battery positive is connected to the emergency stop input; Check if connection is open circuit.
Low Oil Pressure Alarm (After Crank Disconnect)	Check oil pressure sensor and wiring connections.
High Temp. Alarm (After Crank Disconnect)	Check temperature sensor and wiring connections.
Shutdown Alarm During Running	Check switch and connections according to information on LCD; Check configurable inputs.
Crank Disconnection Failed	Check connections of fuel solenoid; Check the starting battery; Check speed sensor and its connections; Check the engine manual.
Starter No Response	Check connections of starter; Check the starting battery.
Genset Running While ATS Not Transfer	Check ATS; Check connections between ATS and controller.
Abnormal RS485 communication	Check the wiring connections; Check the COM terminal setting is correct or not; Check if A and B of RS485 is connected reversely; Check the communication port of the PC is normal or not. The 120Ω resistor between controller RS485 terminal A and B is recommended.