FORTRUST®

GEC6110D/6120D

GENSET CONTROLLER USER MANUAL

SHANGHAI FORTRUST POWER ELECTRIC CO.,LTD.

GEC6100D GENSET CONTROLLER USER MANUAL V1.2

This document provides a brief operation instruction for using GEC6110D series controllers. Please refer to the standard user manual for details.

GEC6100D series include the following two types:

Type	Function
GEC6110D	It is used for single machine automation, controlling the start and stop of genset by remote signal.
GEC6120D	It adds the functions of mains monitoring and AMF on the basis of GEC6110D.

1. KEY DESCRIPTIONS

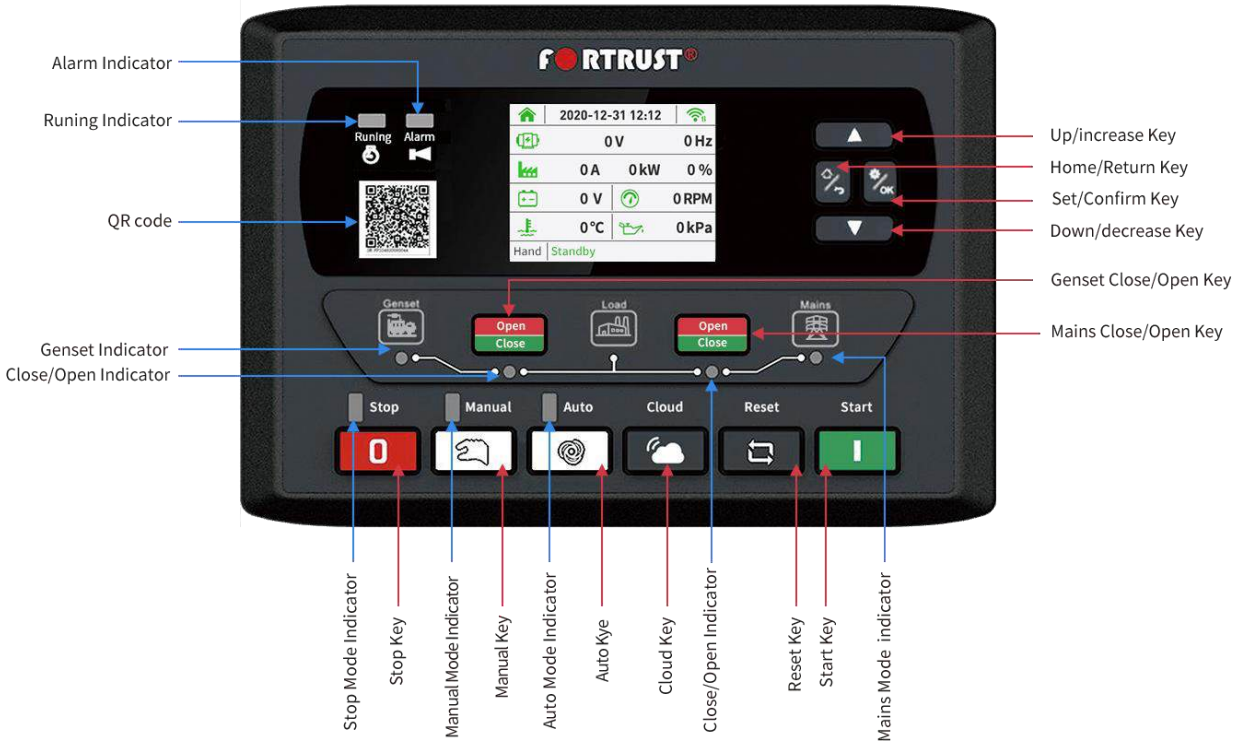
	Stop	In manual/auto mode, it can stop the running genset. During stopping process, press this key again can stop generator immediately.
	Start	In manual mode, pressing this key can start the genset.
	Manual	Pressing this key will set the controller as Manual mode.
	Auto	Pressing this key will set the controller as Auto mode.
	Close/Open	Can control gens to switch on or off in Manual mode. NOTE: It is only fit for GEC6120D.
	Close	Can control gens to switch on in Manual mode. NOTE: It is only fit for GEC6110D.
	Open	Can control gens to switch off in Manual mode. NOTE: It is only fit for GEC6110D.
	Set/Confirm	Pressing this key to enter menu interface; Shift cursor to confirm in parameters setting menu.
	Up/Increase	Screen scroll; Up cursor and increase value in setting menu.
	Down/Decrease	Screen scroll; Down cursor and decrease value in setting menu.
	Home/Return	Return to homepage when in main interface; Exit when in parameters setting interface.
	Reset	In the state of alarm, the alarm light is on, the sixth line of the screen shows the alarm. Press this key to reset, and the screen alarm display bar disappears; If the fault still exists, the screen alarm is still displayed, and the alarm light is still on.
	Cloud Service	Press this key to enter the cloud service mode. Press this key to enter the Interface of WIFI connection with TWO-DIMENSIONAL code. Press it again to exit and enter the main interface. This key only takes effect on the home page of the controller. You can item 10 of Mobile cloud Service Functions For more details.

2. DIMENSION

Overall Dimension	Panel Cutout
221mm x 152mm x 56.8mm	185mm x 139mm

3. CONTROLLER PANEL

GEC6110D



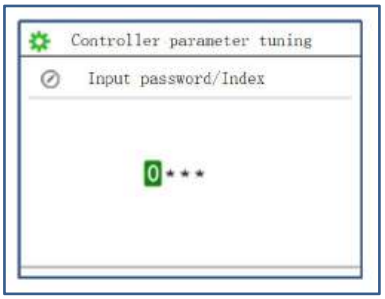
GEC6120D

4. PARAMETER SETTING

1. Parameters Setting

1) After the controller starts up, press the button to enter the menu, as chart 1.

2) Press the cursor (up/increase) or (down/decrease) to select the controller' s information.



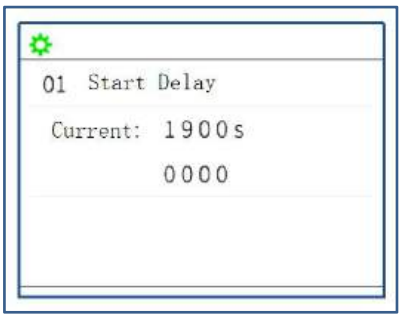
3) Press the button transferring setting the parameter to imputing the password, as chart 2.

4) Press the button to enter the interface for parameter setting and password input, and then enter the password" 1921" to set all the parameters. The setting method is as step 5 and 6.

5) Press the button (up/increase) or (down/decrease) to move the item up and down or modify the value. Press the button (set/confirm) to confirm the current value and move the cursor to the right.

6) Press the button (home/return) to return to the previous menu.

7) If the input configuration password is correct, then we enter the parameter setting interface (the first line is setting page flag line, the second is setting parameter item, the third is the current value, the fourth is setting parameter value). Press the button (up/increase) or (down/decrease) to select the parameter configuration items. Click the button to enter the correct parameter configuration mode as chart 3.



8) Set the parameter according to the step 5 and 6. If the value is within the range, it will be saved. If it is out of the range, it cannot be saved.

5. PARAMETER SETTING

NO.	ITEM	Range	Default	Description
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	Mains Abnormal Delay	(0-3600)S	5	
3	Mains Under Voltage	(30-60000) V	184	When mains voltage is under the point, mains under voltage active. When the value is 30, mains under voltage disabled. voltage .
4	Mains Over Voltage	(30-60000) V	276	When mains voltage is higher than the point, mains over voltage active. When the point is 60000V, mains over voltage disabled.
5	Transfer Delay	(0-99.9)S	1.0	It' s the delay from mains open to generator closed or from generator open to mains closed.
6(1)	Start Delay	(0-3600)s	1	Time from mains abnormal or remote start signal is active to start genset.
7(2)	Stop Delay	(0-3600)s	1	Time from mains normal or remote start signal is inactive to stop genset.
8(3)	Start Times	(1-10)T	3	When engine start failure, it' s the maximum cranking times. When setting crank times out, controller sends start fail signal.
9(4)	Preheat Delay	(0-300)s	0	Time of pre-powering heat plug before starter is powered up.
10(5)	Cranking Time	(3-60)s	8	Time of starter power up each time.
11(6)	Crank Rest Time	(3-60)s	10	The second waiting time before power up when engine start fail.
12(7)	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(8)	Start Idle Time	(0-3600)s	0	Idle running time of genset when starting.
14(9)	Warm-up Time	(0-3600)s	10	Warming time between genset switch on and high speed running.
15(10)	Cooling Time	(3-3600)s	10	Time for cooling before stopping.
16(11)	Stop Idle Time	(0-3600)s	0	Idle running time when genset stop.
17(12)	ETS Solenoid Hold	(0-120)s	20	Stop electromagnet ' s power-on time when genset is stopping.
18(13)	Wait for Stop Time	(0-120)s	0	If "ETS Solenoid Hold" set as 0, it is the time from end of idle delay to genset at rest; if not 0, it is from end of ETS solenoid delay to genset at rest.
19(14)	Switch Close Delay	(0.0-10.0)s	5.0	Mains' or generator' s switch closing pulse width, when it is 0, output is continuous.
20(15)	Flywheel Teeth	(10-300)	118	Number of flywheel teeth, it can detect disconnection conditions and engine speed.
21(16)	Gen Abnormal Delay	(0-20.0)s	10.0	Over or under voltage alarm delay.

22(17)	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(18)	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(19)	Under Speed Shutdown	(0-6000)r/min	1200	When the engine speed is under the point for 10s, shutdown alarm signal is sent.
25(20)	Over Speed Shutdown	(0-6000)r/min	1710	When the engine speed is over the point, shutdown alarm signal is sent.
26(21)	Engine Rated Idle	(0-6000)r/min	750	The engine started successfully and reached the required rated idle.
27(22)	Engine Rated Speed	(0-6000)r/min	1500	Rated speed required by high speed engine operation.
28(23)	Gen Under Frequency Shutdown	(0-75.0)Hz	45	When generator frequency is lower than the point (not equal to 0) for 10s, shutdown alarm signal is sent.
29(24)	Gen Over Frequency Shutdown	(0-75.0)Hz	57	When generator’s frequency is over the point and continues for 2s, generator overfrequency is active.
30(25)	High Temperature Shutdown	(80-300)°C	98	When the temperature sensor value is over this point, it sends out high temp. alarm. 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.)
31(26)	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. When the value is 0, warning alarm won’t be sent. (only suited for oil pressure sensor, except for low oil pressure alarm signal inputted by programmable input port.)
32(27)	Low Fuel Level Alarm	(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.
33(28)	Low Fuel Level Stop	(0-100)%	5	If the liquid level of the external liquid level sensor is lower than this value and lasts for 5 seconds, the shutdown signal will be sent.
34(29)	Speed Signal Loss Delay	(0-20.0)s	5.0	When the delay setting as 0s, it only warn but not shutdown.
35(30)	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.
36(31)	Battery Over Voltage	(12.0-40.0)V	33	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.
37(32)	Battery Under Voltage	(4.0-30.0)V	8	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.
38(33)	CT Ratio	(5-6000)/5	500	External current transformer ratio.

39(34)	Full Load Rating	(5-6000)A	500	Rated current of generator, used for calculating over load current.
40(35)	Over Current Protection	(0-2)	2	According to the selected action, action for the power generation over current 0: no action, 1: break or 2: alarm shutdown.
41(36)	Over Current Percentage	(50-130)%	120	When load current is over the point, the over current delay is initiated.
42(37)	Over Current Delay	(0-3600)s	30	When load current is over the point, over current signal is sent. When the delay is 0, only warn but not shutdown.
43(38)	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.
44(39)	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.
45(40)	Aux. Output 1 Function	(0-25)	2	Factory default: Energized to stop. See table 8.
46(41)	Aux. Output 2 Function	(0-25)	3	Factory default: Idle control. See table 8.
47(42)	Aux. Output 3 Function	(0-25)	5	Factory default: Gens closed. See table 8.
48(43)	Aux. Output 4 Function	(0-25)	6	Factory default: Mains closed. See table 8.
49(44)	Aux. Input 1 Function	(0-25)	1	Factory default: High temperature alarm input. See table 9.
50(45)	Aux. Input 1 Effective	(0-1)	0	Factory default: closed.
51(46)	Aux. Input 1 Delay	(0-20.0)s	2	Input signal active delay
52(47)	Aux. Input 2 Function	(0-25)	2	Factory default: low oil pressure alarm input.See table 9.
53(48)	Aux. Input 2 Effective	(0-1)	0	Factory default: closed.
54(49)	Aux. Input 2 Delay	(0-20.0)s	2	Input signal active delay
55(50)	Aux. Input 3 Function	(0-25)	10	Factory default: remote start input. See table 9.
56(51)	Aux. Input 3 Effective	(0-1)	0	Factory default: closed.
57(52)	Aux. Input 3 Delay	(0-20.0)s	2	Input signal active delay
58(53)	Aux. Input 4 Function	(0-25)	11	The factory default: low fuel level alarm input. See table 9.
59(54)	Aux. Input 4 Effective	(0-1)	0	Factory default: closed.
60(55)	Aux. Input 4 Delay	(0-20.0)s	2	Input signal active delay
61(56)	Aux. Input 5 Function	(0-25)	12	The factory default: low cooling liquid level alarm input. See table 9.
62(57)	Aux. Input 5 Effective	(0-1)	0	Factory default: closed.
63(58)	Aux. Input 5 Delay	(0-20.0)s	2	Input signal active delay
64(59)	Power On Mode	(0-2)	0	0：Stop；1：Manual；2：Auto
65(60)	Module Address	(1-254)	1	Module communication address.
66(61)	Password	(0-9999)	1921	All parameters can be set. See note 4.
67(62)	Engine Speed of Crank Disconnect	(0-3000)r/min	360	When engine speed is over this point, starter will disconnect.
68(63)	Frequency of Crank Disconnect	(0.0-30.0)Hz	14	When generator frequency is over this point, starter will disconnect.
69(64)	Oil Pressure of Crank Disconnect	(0-400)kPa	200	When engine oil pressure is over this point, starter will disconnect.

70(65)	High Temp. Stop Inhibit	(0-1)	0	Default: when temperature is overheat, the genset alarm and shutdown. Details see NOTE2.
71(66)	Low OP Inhibit Stop Inhibit	(0-1)	0	Default: when oil pressure is too low, it sends alarm and shutdown. Details see NOTE3.
72(67)	Communication Wire	(0-2)	0	0 Three phase four wire(3P4W); 1 Two phase three wire(2P3W); 2 Single phase two wire(1P2W);
73(68)	Temp. Sensor Curve Type	(0-10)	8	SGX See table 10.
74(69)	Pressure Sensor Curve Type	(0-9)	8	SGX See table 10.
75(70)	Fuel Level Sensor Curve Type	(0-3)	3	SGD See table 10.
76(71)	Generator Poles	(2-64)	4	Number of magnetic poles, used for calculating rotating speed of generator without speed sensor.
77(72)	Temp. Sensor Open Circuit Action	(0-2)	1	0: Not used; 1: Warning; 2: Shutdown
78(73)	Oil Pressure Sensor Open Circuit Action	(0-2)	1	0: Not used; 1: Warning; 2: Shutdown
79(74)	Fuel Level Sensor Open Circuit Action	(0-2)	1	0: Not used; 1: Warning; 2: Shutdown
80(75)	Disconnect Oil Pressure Delay	(0-20.0)s	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.
81(76)	Over Power	(0-2)	0	0: Not used; 1: Warning; 2: Shutdown When the power is greater than the set value and the duration is greater than the delay value, the overpower alarm is effective. The return value and delay value can also be set.
82(77)	Start Interface	(0-1)	1	0: Disabled; 1: Enabled. Start interface delay can be set.
83(78)	Maintenance Password	(0-9999)	1234	Enter password interface of maintenance configuration.
84(78)	Date/Time			Set the date/time of controller.
85(79)	Fuel Output Time	(1-60)s	1	It is the time of the genset fuel output during power on.
86(80)	Manual Mode ATS	(0-1)	0	0: Key Switch; 1: Auto Switch.
87(81)	Speed Raise Pulse	(0-20.0)s	0.2	It is the speed-up pulse output time, when the unit enters the high-speed warm-up.
88(83)	Speed Drop Pulse	(0-20.0)s	0.2	It is the speed-drop pulse output time, when the unit enters the stop idling.
89(84)	ATS Open Time	(1.0-60.0)s	3.0	ATS Open Time
90(85)	Flexible Sensor Curve Type	(0-2)	0	0 User-defined temperature sensor 1 User-defined pressure sensor 2 User-defined level sensor

				Choose sensor which need to be set, input every point resistance (or current, voltage) and corresponding value of curve, 8 points need to be input
91(86)	Engine Type	(0-29)	00	00 Conventional Gen-set 01 Standard J1939 See Table 11 for others
92(87)	CAN Address	(0-255)	3	
93(88)	Rated Active Power	(0-6000)kW	100	Used to calculate active power/rated power percentage
94(89)	Crank Disconnect Condition	(0-6)	04	Conditions of disconnecting starter (generator, magnetic pickup sensor, oil pressure), each condition can be used alone and simultaneously to separating the startermotor and genset as soon as possible.
95(90)	Over Speed Alarm	(0-6000)r/min	1650	When the engine speed is over the point for 2s, alarm signal is sent.
96(91)	Under Speed Alarm	(0-6000)r/min	1300	When the engine speed is under the point for 10s, alarm signal is sent.
97(92)	Gen Under Voltage Alarm	(30-60000)V	200	Gen A/B/C phase low voltage alarm value
98(93)	Gen Over Voltage Alarm	(30-60000)V	260	Gen A/B/C phase high voltage alarm value
99(94)	Gen Under Frequency Alarm	(0-75.0)Hz	43	When generator frequency is lower than the point (not equal to 0) for 5s, alarm signal is sent.
100(95)	Gen Over Frequency Alarm	(0-75.0)Hz	54	When generator’ s frequency is over the point and continues for 1s, alarm signal is sent.
101(96)	D+ Enable		Disable	

Note:The value in first line of “Number” column is for GEC6120D and the value in brackets is for GEC6110D.

6. DEFINED CONTENTS OF PROGRAMMABLE OUTPUT

NO.	Items	Description
0	Non used	Output is disabled when this item is selected.
1	Common Alarm	Including all shutdown alarm and warning alarm. 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 gen-set with stop solenoid. Pick-up when idle speed is over while disconnect when ETS delay is over.
3	Idle Control	Used for the gen-set with idle speed. Pick-up when crank while disconnect when enter into warming up. Pick-up when stop idle while disconnect when gen-set stop completely.

NO.	Items	Description
4	Preheat Control	Close before started and disconnect before powered on.
5	Close Gen Output	When close time is set as 0, it is continuous closing.
6	Close Mains Output	GEC6110 without.
7	Open Breaker	When close time is set as 0, Open Breaker is disabled.
8	Speed Raise Relay	Pick-up when enter into warming up time. Disconnect when raise speed auxiliary input active.
9	Speed Drop Relay	Pick-up when enter into stop idle or ETS solenoid stop (shutdown alarm). Disconnect when droop speed auxiliary input active.
10	Run Output	Output when gen-set is in normal running, disconnect when rotating speed is lower than engine speed after fired.
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	Auto Mode	The controller is in Auto Mode.
14	Shutdown Alarm	Output when shutdown alarm 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	Non used	
17	Fuel Output	Action when genset is starting and disconnect when stop is completed.
18	Start Output	Genset output in start output status and open in other status.
19	Non used	
20	Non used	
21	Non used	
22	Non used	
23	Non used	
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.

7. DEFINED CONTENTS OF PROGRAMMABLE INPUT

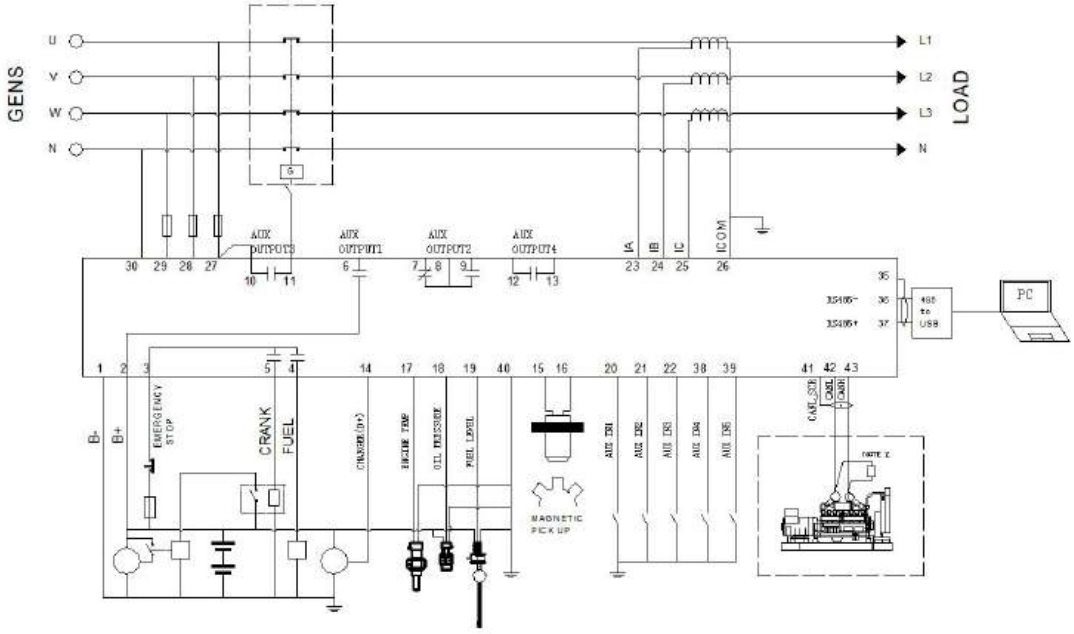
NO.	Items	Description
0	Non Used	
1	High Temperature Shutdown	If the signal is active after safety run delay over, gen-set will immediately alarm to shutdown.
2	Low Oil Pressure Shutdown	If the signal is active after safety run delay over, gen-set will immediately alarm to shutdown.
3	Warn Input	Only warning, not shutdown.
4	Shutdown Input	If the signal is active, gen-set will immediately alarm to shutdown.
5	WTH STOP by Cool	During engine running and the input is active, if high temperature occurs, controller will stop after high speed cooling; when the input is disabled, controller will stop immediately. ()
6	Generator Closed Auxiliary	Connect to auxiliary port of gen load breaker.
7	Mains Closed Auxiliary	Connect to auxiliary port of mains load breaker.
8	Inhibit WTH STOP	When it is active, high oil temperature stop is inhibited.
9	Inhibit OPL STOP	When it is active, low oil pressure stop is inhibited.
10	Remote Start	In Auto mode, when input active, gen-set can start and take load after gen-set is OK; when input inactive, gen-set will stop automatically.
11	Fuel Level Low Warning	Connected to sensor digital input. The controller sends an warning alarm signal when active.
12	Coolant Level Low Warning	
13	Fuel Level Low Shutdown	Connected to sensor digital input. The controller sends an shutdown alarm signal when active.
14	Coolant Level Low Shutdown	
15	Inhibit Auto Start	In Auto Mode, when the input is active, no matter mains normal or not, gen-set won't start. If gen-set is in normal running, stop process won't be executed. When input is disabled, gen-set will automatically start or stop judging by mains normal or not.
16	Remote Control	All buttons in panel is inactive except and Remote Mode is displayed on LCD. Remote module can switch module mode and start/stop operation via panel buttons.
17	Charge Alt Fail IN	Connect to failed to charge output.
18	Panel Lock	All keys in panel are inactive except set-keys and there is in the first row of the front page in LCD when input is active.
19	Alarm Mute	Can prohibit "Audible Alarm" output when input is active.
20	Idle Contro	In this mode, under voltage, under frequency and under speed

NO.	Items	Description
	l Mode	are not protected.
21	Fuel Leakage	When input is active, controller will initiate Fuel leakage alarms.
22	Raise Speed Pulse	If engine type is common J1939, when input is active, engine target speed will increase 5RPM.
23	Drop Speed Pulse	If engine type is common J1939, when input is active, engine target speed will decrease 5RPM.
24	Over Current Fault Shutdown	When input is active, controller will initiate shutdown alarms.
25	Over Speed Shutdown	When input is active, controller will initiate shutdown alarms.

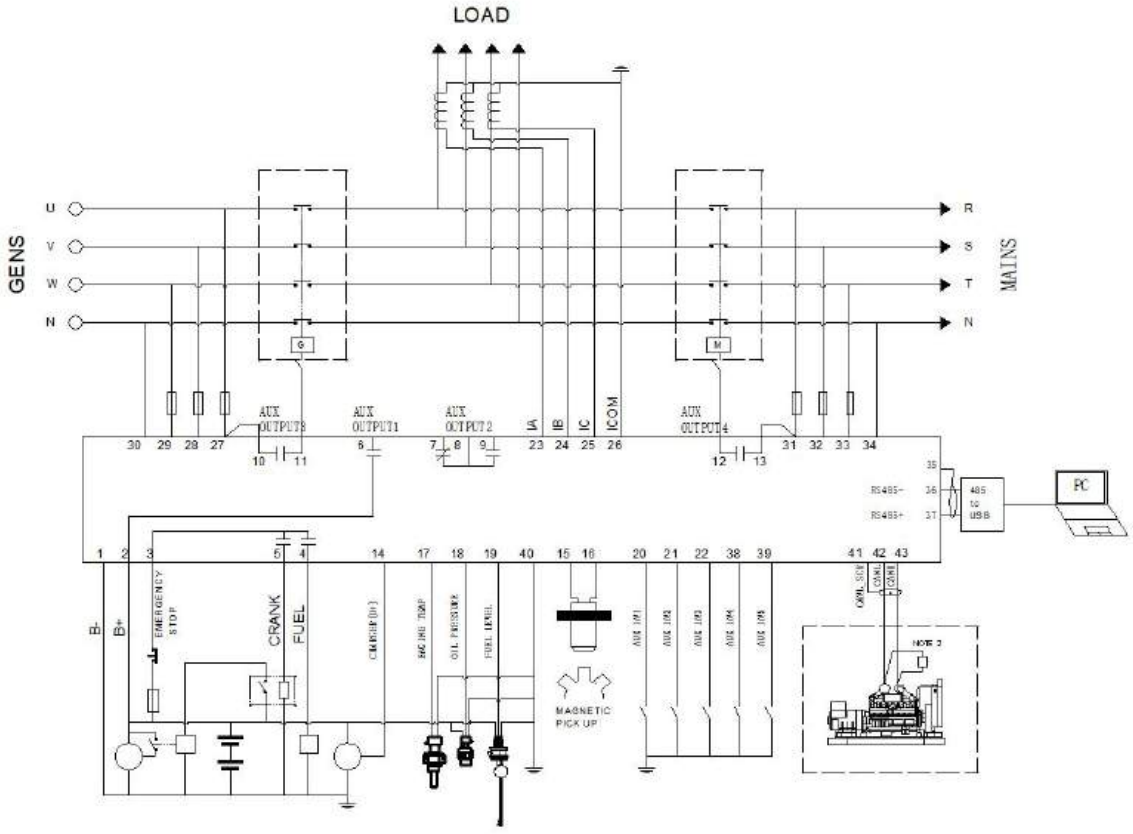
8. Sensors

No.		Contents	Notes
1	Temp. Sensor	0 Non used 1 User Configured 2 VDO 3 SGH 4 SGD 5 CURTIS 6 DATCON 7 VOLVO-EC 8 SGX 9 PT100 10 Euro III	Defined input resistance range is 0Ω ~6000Ω，factory default is SGX Sensor.
2	Press Sensor	0 Non Used 1 User Configured 2 VDO 10Bar 3 SGH 4 SGD 5 CURTIS 6 DATCON 10Bar 7 VOLVO-EC 8 SGX 9 Non Used 10 24V/12V Voltage Type	Defined input resistance range is 0Ω ~6000Ω，factory default is SGX Sensor.
3	Fuel Level Sensor	0 Non Used 1 User Configured 2 SGH 3 SGD	Defined input resistance range is 0Ω ~6000Ω，factory default is SGX Sensor.

9. Typical Application



GEC6110D Typical Application



GEC6120D Typical Application

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