LXC620

Generator controller user manual

Ver1.1 Date: 2012/08/08

LXC620 Series

LXC610 Series

Software Version

Date	Version	Note
2010-10-20	1.0	Start publishing
2012-08-08	1.1	Increased DTU binding and remote monitoring function

☎: T:+86-769-23836636 📠: F:+86-769-23166296 :www.lixise.com

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 error operation may cause death, serious injury and significant property damage.

Contents

1. Performance and characteristics

LXC610：Auto Start Module. It controls gen-set to start or stop automatically by remote start signal.

LXC620：Auto Main Failure, updates based on LXC610, especially for automatic system composed by gens and mains.

- With ARM-based 32-bit MCU, highly integrated hardware, new reliability level;
- 132x64 LCD with backlight, multilingual interface (including English, Chinese or other
- languages)which can be chosen at the site, making commissioning convenient for factory personnel;
- Equipped with advanced networking capabilities,via GPRS mobile network and Internet connectivity,in any place where the network can be remotely monitor；
- Leasing industry applications: management provides the perfect solution: leased out via PC remote Management of the unit, you can monitor all operating parameters (oil pressure, water temperature, voltage, current, power, etc),you can always change the configuration to protect the unit is not proper application, can record 200 detailed fault information, including: time to failure, because ,when the voltage, current, power, oil pressure, water temperature and other key parameters, and ready to upload to the monitoring machine. Another multi-level password management options to facilitate the lease management;
- RS485 communication port enabling remote control, remote measuring, remote communication via ModBus protocol;
- Protection, automatic Start & Stop gen-set, ATS(Auto Transfer Switch) control with perfect fault indication and protection function;
- Parameter setting: parameters can be modified and stored in internal FLASH memory and cannot be lost even in case of power outage; most of them can be adjusted using front panel of the controller and all of them can be modified using PC via USB；
- Equipped with SMS (Short Message Service) function. When gen-set is alarming, controller can send short messages via SMS automatic to max. 5 telephone numbers. User can control or check genset by sending Short Message；
- Adjust the controller `s configuration by the computer via USB, RS232, RS485 interface;
- More kinds of curves of temperature, pressure, fuel level can be used directly and users can define the sensor curves by themselves;
- Multiple crank disconnect conditions (speed sensor, oil pressure, generator frequency) are optional;
- Event log, real-time clock, scheduled start & stop generator (can be set as start gen-set once a day/week/month with load or not);
- All output ports are relay-out;

- For Mains, controller has over and under voltage, over and under frequency, loss of phase and phase sequence wrong functions; For generator, controller has over and under voltage, over and under frequency, loss of phase, phase sequence wrong, over and reverse power, over current functions;
- 3 fixed analog sensors (temperature, oil pressure and liquid level);
- 2 configurable sensors can be set as sensor of temperature, pressure or fuel level;
- Widely power supply range DC(8~35)V, suitable to different starting battery voltage environment;
- Can be used for the pumping unit as an indicating instrument (indicate and alarm are enable only, relay is inhibited);
- Fully functional,and can detect almost all the generating units of electrical parameters and non-electrical parameters.

DETECT PROJECT ：

Mains

Line voltage Uab，Ubc，Uca
Phase voltage Ua，Ub，Uc
Frequency Hz

Gens

Line voltage Uab，Ubc，Uca
Phase voltage Ua，Ub，Uc
Frequency Hz
Load current IA，IB，IC
Each phase and total active power kW
Each phase and total reactive power kVar
Each phase and total apparent power kVA
Each phase and average power factor PF
Accumulate total gens power kWh、kVarh、kVAh

Sensor

Temperature WT °C、 °F Choose to display
Oil pressure OP kPa、Psi、Bar Choose to display
Fuel level FL %(unit)
Speed SPD RPM(unit)
Voltage of Battery VB V (unit)
Voltage of Charger VD V (unit)
Hour count HC can accumulate Max.65535 hours.
Start times can accumulate Max.65535 times

MAINS AND GENERATOR ABNORMAL CONDITIONS：

Voltage is too high
Voltage is too low
Frequency is too high
Frequency is too low
Phase loss
Loss of power

THE FAULT DISPLAY AND PROTECTION FUNCTION PROJECT：

High water temperature warn
High water temperature shutdown alarm
Low oil pressure warning
Low oil pressure shutdown
Over speed shutdown alarm
Box high temperature warn
Low fuel level warn
Battery voltage is too high warn
Battery voltage is too low warn
Load over current shutdown alarm
Failed to stop alarm
Emergency stop alarm
Oil pressure sensor open circuit

2. Technical parameters

Items	Contents
Operating Voltage	DC 8.0V to DC 35.0V, Continuous Power Supply.
Power Consumption	＜3W(standby：≤2W）
Alternator Input Range 3-Phase 4-Wire 3-Phase 3-Wire Single-Phase 2-Wire 2-Phase 3-Wire	 12V AC - 360 V AC (ph-N) 3 Phase 4wire 23V AC - 620 V AC (ph-ph) 3 Phase 3wire 12V AC - 360 V AC (ph-N) 12V AC - 360 V AC (ph-N)
Alternator Frequency	50/60Hz
Speed sensor voltage Vpp	1.0 - 70Vpp(Peak to peak)
Speed sensor Frequency	10000Hz(max.)
Start Relay Output	10Amp DC28V
Fuel Relay Output	10Amp DC28V
Programmable Relay Output 1	10Amp DC28V
Programmable Relay Output 2	10Amp DC28V
Gens Closed Programmable Relay Output 3	10Amp 250VAC Free output
Mains Closed Programmable Relay Output 4	10Amp 250VAC Free output
Case Dimension	209mm x 146mm x 33mm
Panel Cutout	182mm x 137mm
C.T. Secondary	5A Rated
Working Conditions	Temperature:(-25～＋70)℃ Humidity:(20～90)%
Storage Condition	Temperature:(-40～＋70)℃
Protection Level	IP55: when waterproof rubber seal installed between controller and panel fascia.
Insulating Intensity	Object: input/output/power Quote standard: IEC688-1992 Test way: AC1.5kV/1min leakage current: 3mA
Net Weight	LXC620=0.448Kg LXC610=0.433Kg

3. Operation

3.1. Key functions

	Stop/Reset key	This button places the module into its Stop/reset mode. When engine is running,pressing this key will stop the engine. When a shutdown alarm occur,pressing this key will reset alarm. his button is for testing the LEDs and screen.Press for a long time to light them.
	Start key	Start genset in Manual mode or Test mode.
	Manual mode key/ Config“-”key	Pressing this key will set the module into manual mode. In setting parameter status,pressing this key will decease setting value.
	Manual test mode/ Config“+”key	Pressing this key will set the module into manual test mode. In setting parameter status,pressing this key will increase setting value.
	Auto key/ Config“enter”key	Pressing this key will set the module into automatic mode. In setting parameter status,pressing this key will shift cursor or confirm Setting value.
	View history record key	In the parameter display and record query screen,press this key to make a scroll operation. Press this button more then three seconds, it show genset abnormal shutdown record.If long press again, display back to main page.
	Scroll key	In the parameter display and record query screen,press this key to make a scroll operation.

Tips: Press and simultaneously, enter into advanced parameters setting menu if password is correct.

Tips: default password is 0000, user can change it in event of others change the senior parameters setting.Please closely remember it after changing If you forget your password, please contact our customer service, at the same time press the key all the information back to the service personnel.

Note: the lights indicate

Configurable indicating lamp: a total of 4, but the action needed by PC configuration, very flexible;

Gens normal indicator: it brights when gens is normal .it flickers when gens abnormal .it extinguished when there is no gens.

Gens load indicator lamp: indicator when load is on gens.

Mains normal indicator: it brights when mains is normal .it flickers when mains abnormal .it extinguished when there is no mains.

Mains load indicator lamp: indicator when load is on mains.

3.2. Automatic start/stop operation

Press ,and the indicator besides the key illuminates, which indicates unit is in auto start mode.

3.2.1. Starting sequence:

Press ， then the button indicating lamp bright. The generator is in "automatic start mode". In the automatic mode, the generator will be auto to start and stop according requirement (no need any human action). In this mode, three type starting request can trigger starting process.

The 1st one is mains failure (over voltage, under voltage, over frequency, under frequency , simulation of mains failure enter valid).(This condition is valid only for LXC620)

The 2nd one is the remote start input or SMS remote start .

The last one is the schedule running.

Once the start request is triggered and no fault, began to perform automatic boot sequence:

- Start Delay timer is shown on Status page of LCD；
- When start delay is over, preheat relay outputs (if this be configured),"preheat start delay XX s"is shown in LCD;
- When preheat delay is over, fuel relay outputs 1s and then start relay output; if engine crank fails during"cranking time", the fuel relay and start relay deactivated and enter into"crank rest time"to wait for next crank;
- If engine crank fails within setting times, the controller sends Fail to Start signal and "Fail To Start" message appears on LCD alarm page;
- In case of successful crank attempt,"safety on timer"starts. During this period, low oil pressure, high water temperature, under speed, charge failure alarms are disabled. As soon as this delay is over,"start idle delay"is initiated (if configured);
- During"start idle delay", under speed, under frequency, under voltage alarms are inhibited. When this delay is over,"warming up delay"starts (if configured);
- When"warming up delay"is over, if generator state is normal, its indicator will be illuminated. If voltage and frequency has reached on-load requirements, the closing relay will be energized, generator will accept load, generator power indicator will turn on, and generator will enter Normal Running state; if voltage and frequency are abnormal, the controller will initiate alarm (alarm type will be displayed on LCD alarm page).

✧ **NOTE:** In case of "Remote Start (off Load)", the procedure is the same, except for step NO. 7: the closing relay will NOT be energized, generator will NOT accept load.

3.2.2. Stopping sequence:

- LXC620：when mains return normal during gen-set running, enters into mains voltage “Normal delay”.When mains normal delay are over, enter into “stop delay” and mains indicator lights; also can be into this mode when “remote start on load” is inactive.
- LXC610：generator enters into“stop delay”as soon as“Remote Start” is inactive.
- When stop delay is over, close generator relay is un-energized; generator enters into “cooling time relay”. After “transfer rest time”, close mains relay is energized. Generator indicator extinguishes while mains indicator lights.Then began "cooling delay", and during the period if mains failure or remote start is active,generator return to the gens on load.
- Idle relay is energized as soon as entering “stop idle delay”.
- In the "stop idle delay" after the end,if enter“ETS hold delay”, ETS relay is energized. Fuel relay is deactivated and decides whether generator is stopped or not automatically.;
- In the "ETS delay" after the end,then enter genset "Fail to stop timer",auto decides whether generator is stopped or not.
- When the generator stopped,enter the standby generator;If the generator does not stop the controller alarm(LCD Screen Display Shutdown failure warning).

3.2.3. Manual start/stop operation:

- LXC620: Press, controller enters into Manual mode and its indicator lights. Press then controller enters into "Manual Test Mode"and its indicator lights. In the both mode, press to start generator, can automatically detect crank disconnected, and generator accelerates to high-speed running. With high temperature, low oil pressure and abnormal voltage during generator running, controller can protect genset to stop quickly (please refer to No.4~9 of Auto start operation for detail procedures). In“manual mode”, the procedures of ATS please refer to ATS procedure of generator in this manual.In“Manual Test Mode”, generator runs well, whether mains normal or not, loading switch must be transferred to generator side.
- LXC610: Press, controller enters into Manual starts mode and its indicator lights. Then press to start generator, can automatically detect crank disconnected, and generator accelerates to high-speed running. With high temperature, low oil pressure and abnormal voltage during generator running, controller can protect genset to stop quickly (please refer to No.4~9 of Auto start operation for detail procedures). After generator runs well, if remote start signal is active, controller will send closing gens signal; if the remote signal is inactive, controller won‟t send closing signal.
- Manual shop:press can shutdown the running generator(please refer to No.3~8 of stopping sequence for detail procedures）

3.3. Switch control procedures

3.3.1. LXC620 ATS switch control procedures

Auto transfer procedures:

When controller is in Manual Test, Auto or Stop mode, switch control procedures will start through automatic transfer.

Note: When the input port has the following configuration of situations:

① **If input port is configured as Close Mains/Gens Auxiliary**

When transferring load from mains to generator, controller begins detecting “fail to transfer”, then the open delay and transfer rest delay will begin. When detecting time out, if switch open failed, the generator will not switch on, otherwise, generator switch on. Detecting transfer failure while gens switch on. When detecting time up, if switch on fail, it is need to wait for generator to switch on. If transfer failed and warning“SELECT Enable”, there is alarming signal whatever switch on or off failure.

The way to transfer from generator load to mains load is as same as above.

✧ ***Note:*** *the above is in the middle position switch.*

② **If input port is not configured as Close Mains/Gens Auxiliary**

Mains load be transferred into gens load, after switch off and transfer interval delay, gens switch on.

The way to transfer gens load to mains load is as same as above.

✧ ***Note:*** *The above configuration is for an no-air-hang type ATS. But it can also be used for an air-hang type ATS.*

When controller is in Manual mode, manual transfer will be executive. After the generator normal starting, when mains failure or remote start input is valid, mains switch off, then gens switch on.If you have configured closing state input, during switching transitions also need to check the input state of closing signals. If fail to close or open it will generate an alarm.

3.3.2. LXC610 Switch control procedures

Auto control procedures,

When controller is in manual test, auto or stop mode, switch control procedures will start auto transfer.

After the generator starting successfully, gens switch on. When the remote start signal fail, gens switch off.

If input port is configured as Close Mains Auxiliary，Gens load is transferred into generator un-load, after the delay of switch off, detecting transfer failure while switch off output. When detecting time up, if switch off failed, to wait for switch off. Otherwise, switch off is completed. Gens unload is transferred into gens load, after the delay of switch on, detecting transfer failure while switch on outputting. When detecting time up, if switch on failed, to wait for switch on. Otherwise, switch on is completed.If transfer failed and warning “SEL Enable”, there is alarming signal whatever switch on or off failure.

If input port is not connected with closing breaker signal，gens un-load is transferred into gens load, gens switch on and output. Gens load is transferred into gens un-load, gens switch off and output.

Manual control procedures:

When controller is in Manual mode, manual transfer will be executive:

After the generator starting successfully,when remote start input is active, gens switch.on.When gens is on load, if the remote start input fail, it will not uninstall or shutdown. But uninstall or shutdown will happen when the conversion to automatic mode or pressing the Stop button . If you have configured the switch status input, you also need to check the input state of signals. If fail to close it will generate an alarm.

4. SMS remote control、wireless remote control

This feature allows users to use GSM mobile communication terminal device for remote control.When generators are running , if you want to stop the genset unit, you can send text messages to mobile phone code“ SMS STOP MODE”. When the controller return code “SMS STOP MODE OK”, it means that genset has got the command and try to stop.

SMS Code is described as follows:

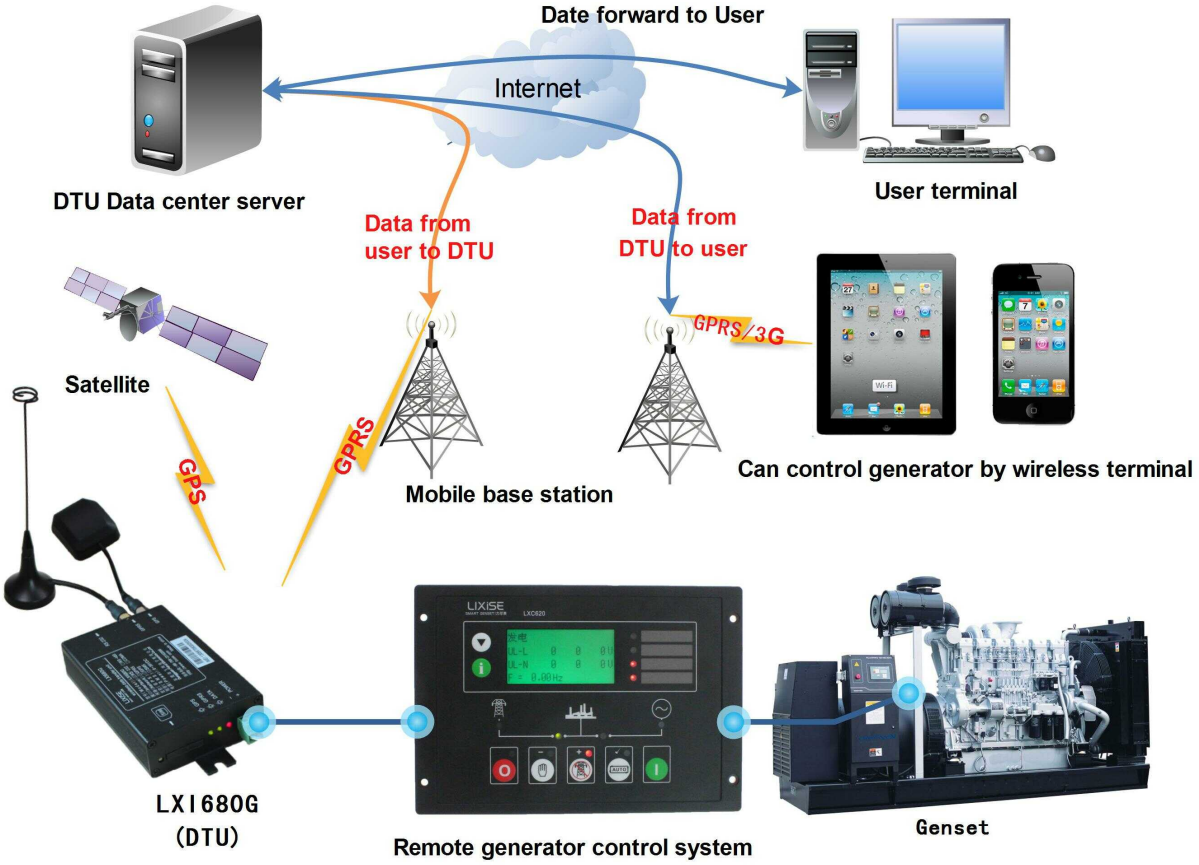
<table>
<tr><th>NO.</th><th>SMS Command</th><th colspan="2">Description</th></tr>
<tr><td>1</td><td>SMS STOP MODE</td><td colspan="2">Set as stop mode</td></tr>
<tr><td>2</td><td>SMS MANUAL MODE</td><td colspan="2">Set as manual mode</td></tr>
<tr><td>3</td><td>SMS TEST MODE</td><td colspan="2">Set as trial test mode</td></tr>
<tr><td>4</td><td>SMS AUTO MODE</td><td colspan="2">Set as auto mode</td></tr>
<tr><td>5</td><td>SMS START</td><td colspan="2">Start in manual or auto mode</td></tr>
<tr><td rowspan="11">6</td><td rowspan="11">SMS GENSET</td><td colspan="2">Query command, query the current state of the controller:</td></tr>
<tr><td>item</td><td></td></tr>
<tr><td>Description (controller user custom description, can only be defined on the PC software)</td><td>feirui1234567890abcd</td></tr>
<tr><td>Working mode</td><td>MANUAL MODE</td></tr>
<tr><td>Working state</td><td>GENSET AT REST</td></tr>
<tr><td>Mains (without the LXC620)</td><td>MAINS=230V</td></tr>
<tr><td>Gens voltage</td><td>GENS=230V</td></tr>
<tr><td>Gens frequency</td><td>F=50.0Hz</td></tr>
<tr><td>Oil pressures</td><td>OPS=4.35Bar</td></tr>
<tr><td>Temperature</td><td>WTP=55C</td></tr>
<tr><td>Level Fuel</td><td>FLE=85%</td></tr>
<tr><td>Battery voltage</td><td>BAT=27.5V</td></tr>
</table>

✧ **Note:**Write text messages are not case sensitive, but must be written in strict accordance with the instructions in the format, the spaces between all the words are a bit of spaces, all commands have to wait until the return code indicates that the operation is valid only.

5. Based on the GPRS DTU remote online monitoring

- The scheme is based on LXI680G provide wireless data transmission network, remote control operation of the generator on the Internet; and through the increase in the generator controller LXI680G Room communication protocol, so that the controller can the use of LXI680G SMS via SMS to control the generator run and generators receive alarm SMS.
- Remark：LXI680G is Dongguan Feirui Electronics Co.,Ltd designed tailor-made for the generator controller wireless data transmission module, in particular to optimize the data exchange between the controller and the DTU, truly a fast and reliable data transmission.
- Brief introduction:LXI680G is an industrial grade with GPS global satellite positioning function GPRS DTU product. The product integrates a high-performance, low-power industrial-grade GPS module and GPRS module, GPS global positioning technology and GPRS wireless communication technology the perfect combination of a product.
- LXI680G platform based on ARM and embedded operating system, built-in industrial-grade module, it can be used in harsh environments, working temperature range can be up to -40℃ ~ + 85℃.LXI680G provide standard RS232 serial interface, can be quickly and PLC, industrial control, instruments, meters, RTU equipment is linked together, through the GPRS network will be linked to LXI680G equipment data transmission to a host on the Internet, realize the data remote transparent transmission, at the same time to the front-end equipment of GPS location information reported to host, realize positioning of the equipment.
- LXI680G with positioning, wireless data communications and data processing capabilities in a compact, rugged, reliable, easy to install, can be widely used in construction, transportation and other industries. Particularly suitable for tower crane monitoring, heavy machinery management, but also can be used in the field of taxi operations management, transport vehicles, special vehicles, vehicle rental management and leasing.

WIRELESS CONNECTION SCHEMATIC DIAGRAM



5.1. DTU with the binding of the controller

Controller and LXI680G after binding, it is only through the password to unbundling, if forced the controller and the DTU apart, the controller will record the alarm and displayed on the LCD panel and the warning information, or refuse the next start generator (the user can set up the binding deal) after failure, this feature is especially suitable for generator leasing industry.

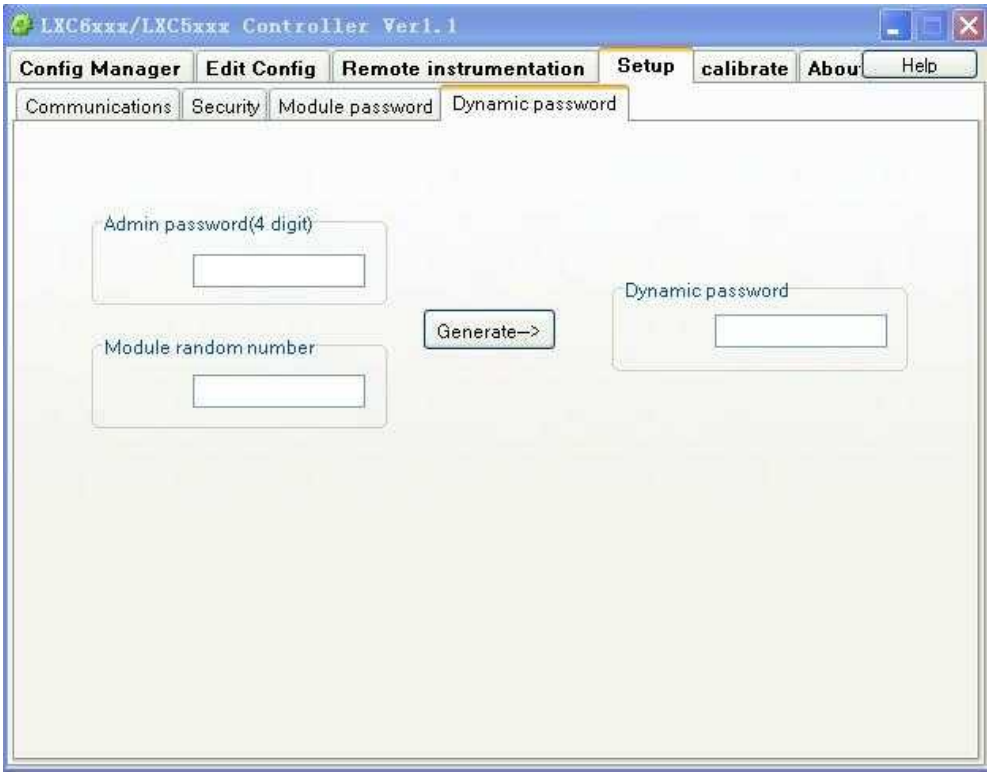
Multilevel password management

Users need to configure the parameters,through different permissions password input, the parameters of the controller will present different configuration interface.

No.	Password type	Extend of competence	Password modification	Unbound	Parameter configuration	Password Managers	Deadline
1	manager	All change permissions (dynamic password Based on the password And the application code For calculating income)				Leasing companies	Long time

2	technician	Only have the parameter Configure permissions (not can unbound）				Leasing Companies、Client	Long time
3	Dynamic password	Disposable(only has a one-time password Parameter configure permissions, and unbound) can't change password				Dynamic calculations （Dynamic code providedby The customer）	Certain time effectively

5.2. Password generation and change the interface



6. History query

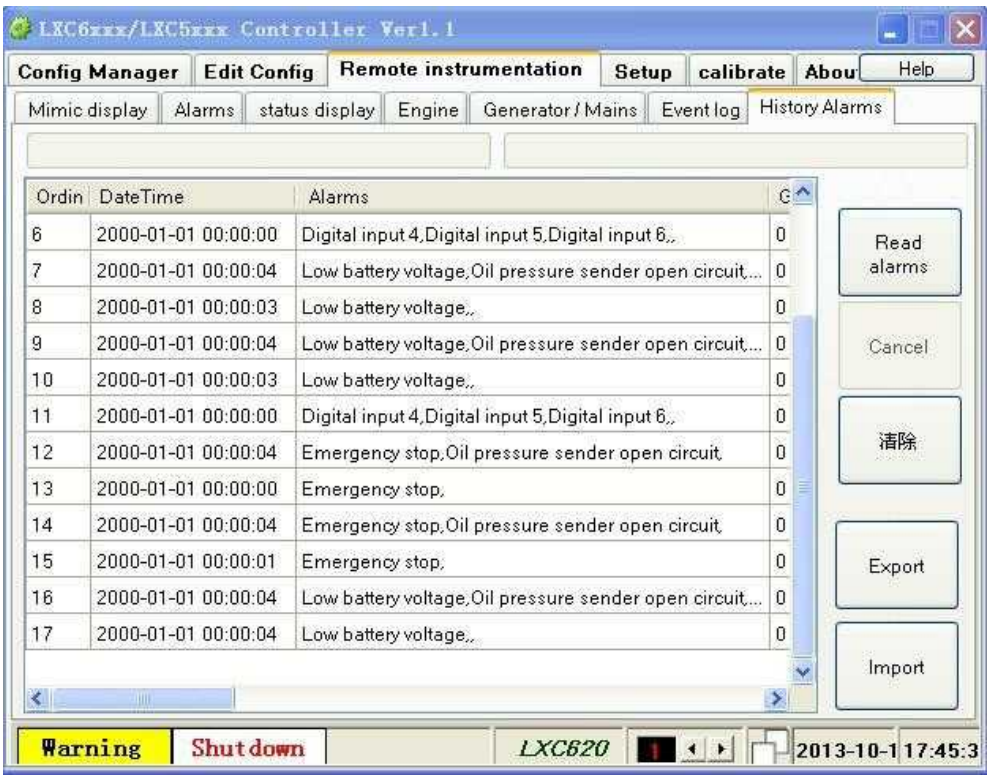
6.1. Event log

In the control panel, press keys to view controller before abnormal shutdown record, including the time of the outage warning content display and the state,press keys can search record back.Return according to state controller real-time show press key again.LXC620 controller can record99 abnormal downtime record recently.

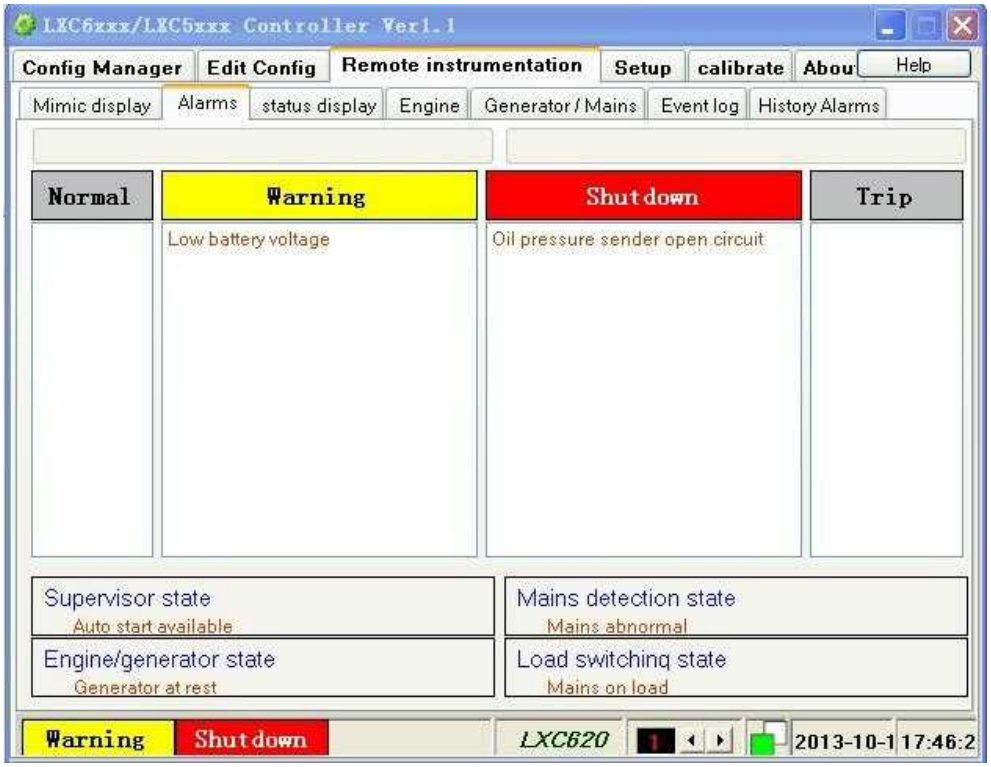
6.2. History alarm

Controller will record the momentary generator all monitoring parameters. Users can remote access,easy to cause analysis,due to a single record data is more, the record can only be through monitoring software review,monitoring software can be through the DTU wireless remote read data.

Record reading window



Recorded data display window



7. Protection

7.1. Warnings

When the controller detects warning signal,controller only warning does not stop,and the LCD display a warning alarm type.

The following table warning volume controller:

No.	Warning type	Description
1	High Temp.Warn	When controller detects the temperature is higher than the set value, it will send a warn alarm signal and it will be displayed in LCD.
2	Low oil pressure warn	When controller detects the oil pressure is lower than the set value,it will send a warn alarm signal and it will be displayed in LCD.
3	Over Speed Warn	When controller detects the speed is higher than the set value,it will send a warn alarm signal and it will be displayed in LCD.
4	Under Speed Warn	When controller detects the speed is lower than the set value,it will send a warn alarm signal and it will be displayed in LCD.
5	Loss of Speed Signal Warn	When controller detects the speed is 0 and the action select"Warn", it will send a warn alarm signal and it will be displayed in LCD.
6	Over Frequency Warn	When controller detects the frequency is higher than the set value,it will send a warn alarm signal and it will be displayed in LCD.
7	Under Frequency Warn	When controller detects the frequency is lower than the set value,it will send a warn alarm signal and it will be displayed in LCD.
8	Over Voltage Warn	When controller detects the voltage is higher than the set value,it will send awarn alarm signal and it will be displayed in LCD.

9	Under Voltage Warn	When controller detects the voltage is lower than the set value,it will send awarn alarm signal and it will be displayed in LCD.
10	Over Current Warn	When controller detects the current is higher than the set value,it will send awarn alarm signal and it will be displayed in LCD.
11	Fail to Stop	When generator can not stop after the“stop delay”/”ETS delay”, controller will send warning alarm signal and it will be displayed in LCD.
12	Low Level Warn	When controller detects the oil lever is lower than the set value,it will send a warn alarm signal and it will be displayed in LCD.
13	Charge Alt Fail	When controller detects the charger voltage is lower than the set value,it will send awarn alarm signal and it will be displayed in LCD.
14	Battery Under Voltage	When controller detects the battery voltage is lower than the set value,it will send a warn alarm signal and it will be displayed in LCD.
15	Battery Over Voltage	When controller detects the battery voltage is higher than the set value,it will send a warn alarm signal and it will be displayed in LCD.
16	Auxiliary input port 1-6warning	When digit input port1-6is set as warning and active,controller sends corresponding warning signal.
Note: the auxiliary input port warning types,must be user configuration,to be effective.		

7.2. Shutdown alarm

When controller detects shutdown alarm,it will send signal to stop the generator to load out,and the Display alarm type.

Shutdown alarms as following:

No.	Warning types	Description
1	Emergency Stop	When controller detects emergency stop signal,it will send a stop alarm signal and it will be displayed in LCD.
2	High Temperature	When controller detected the temperature of water/cylinder is higher than preset,it will send a stop alarm signal and it will be displayed in LCD.
3	Low Oil Pressure	When controller detected oil pressure is lower than the preset,it will send a stop alarm signal and it will be displayed in LCD.
4	Over Speed	When controller detected genset speed is over the preset,it will send a stop alarm signal and it will be displayed in LCD.
5	Under Speed	When controller detected genset speed is under the preset,it will send a stop alarm signal and it will be displayed in LCD.
6	Loss Of Speed Signal	When controller detected genset speed is 0,it will send a stop alarm signal and it will be displayed in LCD.
7	Over Frequency	When controller detected genset frequency is over the preset,it will send a stop alarm signal and it will be displayed in LCD.
8	Under Frequency	When controller detected genset frequency is under the preset,it will send a stop alarm signal and it will be displayed in LCD.
9	Over Voltage	When controller detected genset voltage is over the preset,it will send a stop alarm signal and it will be displayed in LCD
10	Under Voltage	When controller detected genset voltage is under the preset,it will send a stop alarm signal and it will be displayed in LCD
11	Over Current	When controller detected genset current is over the preset and delay is not0,it will send a stop alarm signal and it will be displayed in LCD
12	Fail To Start	During the start at tempt times, if genset start failed, it will send a stop alarm signal and it will be displayed in LCD
13	Oil Pressure Sensor Open	When oil pressure sensor opens circuit and the input is active,controller will send a stop alarm signal and it will be displayed in LCD.

14	Input Port 1-6	When controller detected the input port1-6external warning is active, controller will send shutdown alarm signal and it will be displayed in LCD.
Note: the input port shutdown alarm types,must be user configuration,to be effective.		

7.3. Trip alarm

When controller detects shutdown alarm signal,it will shutdown generator quickly and stop after high speed cooling.

Trips shutdown alarm as following:

No.	Warning type	Detection range	Description
1	Over Current	Remain valid	When controller detects the value is higher thant he set value, and the action select"trip and shutdown",it will send a trip alarm signal and it will be displayed in LCD.
2	Input port1-6	The user setting range	When digital input port1-6 is set as"trip and shutdown", and the action is active,it will send atrip alarm signal and it will be displayed in LCD.
Note: the input port trip alarm types,must be user configuration,to be effective.			

7.4. SMS alarm

These items are sent via SMS to the user to set the GSM mobile communication terminal.

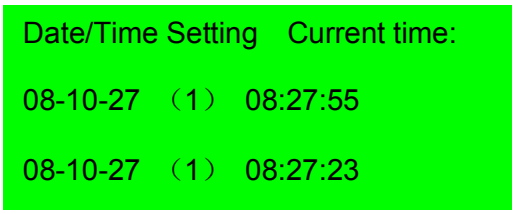
No.	Condition
1	Emergency stop
2	High temperature1 shutdown
3	Low oil pressure1shutdown
4	Over speed shutdown
5	Under speed shutdown
6	Speed signal loss shutdown
7	Over frequency shutdown
8	Under frequency shutdown
9	Over voltage shutdown
10	Under voltage shutdown
11	Over current shutdown
12	Starting failure shutdown
13	Oil pressure sensor open shutdown
14	Input 1 shutdown
15	Input 2 shutdown
16	Input 3 shutdown
17	Input 4 shutdown
18	Input 5 shutdown
19	Input 6 shutdown
20	Over current trip alarm
21	Input port 1 trip alarm
22	Input port 2 trip alarm
23	Input port 3 trip alarm
24	Input port 4 trip alarm
25	Input port 5 trip alarm
26	Input port 6 trip alarm
27	High temperature 2 shutdown

28	Low oil pressure 2 shutdown

8. Parameter setting

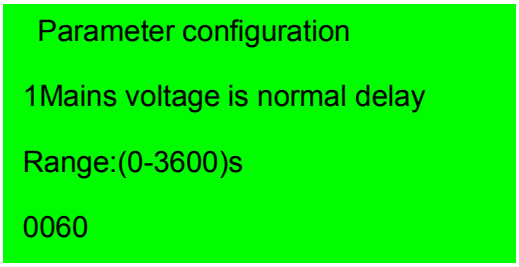
Date and time setting:

In the controller start and press and In the controller start and press.The interface will display two lines,date and time,the current date and time display, second user be havior modification status display,the black display digital for current user can modify the number, press the + key and key changes to the digital reverse black display ,press button can be modified to confirm and tick to the right one.intermediate parentheses 1 week display,which is composed of microprocessor based on the current set date calculated,the user does not need to be amended.



Operating parameters:

Pressed on the controller start and ,Enter the password to confirm the parameter configuration interface, press the+ key or key input corresponding password value 0-9,bit shift by button,press the ball bond in position fourth,password checking,the password is correct according to the parameters of the main interface of different access password to enter different permissions, password error directly from the.(factory default password is : 0000) the factory default password users can modify.Press the+ key and key parameters can be configured on the screen turning operations, according to tick button on the configuration parameters screen under the present,into the current configuration mode,the current values of the first black display, press the+ key or button for the numerical adjustment,shift by√button,the last one to tick button to confirm this setting. The value is stored permanently to the control device of FLASH.



✧ **Note:**In the setup process,any time according to Key can immediately interrupt the current setting of parameters,and returns the operation of standby.

8.1. Parameter setting,content and scope of list

Menu	Range	Default	Description
01 Low oil pressure1(warning)	(1-399)kPa	124kPa	Return value:138kPa
02 Low oil pressure1(shutdown)	(0-398)kPa	103kPa	Low oil pressure 1 setting : stop value < warning value < return value
03 High temperature1(warning)	(81-139)℃	90℃	Return value:88℃
04 High temperature1(shutdown)	(82-140)℃	95℃	High temperature1setting : stop value>warning value>return value
05 Fuel level (warning)	(0-100)%	10%	Analog
06 Start delay	(0-9999s)	5s	Timer
07 Stop Delay	(0-300s)	0s	Timer
08 Cranking time	(3-60s)	5s	Timer
09 Crank Rest Time	(3-60s)	10s	Timer
10 Safety On Delay	(5-60s)	10s	Timer
11 Over Speed Delay	(0-10s)	2s	Timer
12 Start Idle Time	(0-3600s)	10s	Timer
13 warm-up Time	(0-3600s)	30s	Timer
14 Switching Transfer time	(0-600s)	2s	Timer
15 Return time	(0-9999s)	30s	Timer
16 Cooling time	(0-3600s)	60s	Timer
17 Stop idle time	(0-3600s)	10s	Timer
18 ETS Solenoid Hold	(0-120s)	20s	Timer
19 Fail To Stop Delay	(10-120)s	30s	Timer
20 Gens transient Delay	(0-30s)	5s	Timer
21 Mains transient Delay	(0-30s)	2s	Timer
22 Mains Under Voltage(Trip)	(50-360V/624) *1	184V	Returns: the return value of 207V > under voltage trip value
23 Mains Over Voltage(Trip)	(50-360V/624) *1	276V	Returns: the return value of 207V< Over voltage trip value
24 Mains Under Frequency (Trip)	(0-75Hz)	45.0Hz	Returns: the return value of 48.0Hz >under Frequency trip value
25 Mains Over Frequency(Trip)	(0-75Hz)	55.0Hz	Returns: the return value of 52.0Hz<over Frequency trip value
26 Gens Over Voltage (Shutdown)	(50-360V/624)	184V	
27 Gens Under Voltage (Warning)	(50-360V/624)	196V	Load values:207V Gens under voltage setting : stop value < warning value < load value
28 Gens Over Voltage (Warning)	(50-360V/624)	265V	Return value:253V
29Gens Over Voltage (Shutdown)	(50-360V/624)	273V	Gens voltage setting : stop value > warning value > return value
30 Gens Under Frequency (Shutdown)	(0-74.8 Hz)	40.0Hz	

31 Gens Under Frequency (Warning)	(0.1-74.9 Hz)	42.0Hz	Load values: 45.0Hz Gens under frequency setting: stop value < warning value < load value
32 Mains Over Frequency (Warning)	(0.1-74.9 Hz)	55.0Hz	Return value:52.0Hz
33 Mains Over Frequency (Shutdown)	(0.2-75 Hz)	57.0Hz	Gens over frequency setting:stop value > warning value > return value
34 Over current	(50-120%)	100%	Numerical simulation
35 Flywheel Teeth	(10-500)	118	
36 Under speed (shutdown)	(0-5998RPM)	1270RPM	
37 Under speed(warning)	(1-5999RPM)	1350RPM	Return value: 1380RPM Gens under speed setting : stop value < warning value < load value
38 Over speed(warning)	(1-5999RPM)	1650RPM	Return value:1620RPM
39 Over speed(shutdown)	(2-6000RPM)	1710RPM	Gens over speed setting : stop value > warning value > return value
40 Over speed shoot	(0-10%)	0	Numerical simulation
41 Battery Under Voltage (warning)	(0-39.9 V)	8.0V	Numerical simulation
42 Battery Over Voltage (warning)	(0.1-40V)	33.0V	Numerical simulation
43 Charging failure (warning)	(0-39V)	6.0V	Numerical simulation
44 Language	(0-1)	0	0 ： Chinese ： ENGLISH
45 Password Settings	(0-9999)	0000	Numerical
46 Low oil pressure2 (warning)	(1-399)kPa	Not used	
47 Low oil pressure 2 (shutdown)	(0-398)kPa	Not used	Low oil pressure 2 threshold setting specification: stop value < warning value < return value
48 High temperature 2 (warning)	(81-139)℃	Not used	
49 High temperature 2 (shutdown)	(82-140)℃	Not used	High temperature 2 setting : stop value > warning value > return value
50 Current transformer	5-6000:5A	500A	Load value: 500A
51 Oil pressure1sensor	1-14	VDO10 bar	
52 Temperature1sensor	1-13	VDO 120 ℃	
53 Fuel level sensor	1-11	VDO ohm(10-180)	
54 Oil pressure2 sensor	1-13	Not used	
55 Temperature2sensor	1-12	Not used	
56 Module Address	1-254	1	
57 Temperature unit selection	0-1	℃	Temperature sensor 2 effective
58 Pressure units election	0-1	kPa	Oil pressure sensor 2 effective
59 Phone number 1	Most 16	----------	Set of numbers, such as China need to add the area code 8613666666666
60 Phone number 2	Most 16	----------	
61 Phone number 3	Most 16	----------	

Note: 1: 360V phase voltage, 624V line voltage (three-phase three-wire).
2: low pressure (Shutdown) set the value to 0,does not stop.
3: High temperature (down) set the value to 140, does not stop.

The remaining parameters configuration: only by the PC software configuration (see the table below)

Parameter name	Factory Defaults
Alternator select	Yes
Generator Poles	4
Speed sensor select	Yes
AC Power Supply	3 phase 4 wire
Fast loading mode	Not
Crank Times	3
Enable immediate mains dropout	No action (only LXC620)
Volt Transformer	Not
Fuel pump control	Not
Digital Input 1	From pre-heat output to start
Digital Input 2	High water temperature input, shutdown, close to activate (from safety on over).
Digital Input 3	Low oil pressure input, shutdown, close to activate (from safety on over).
Digital Input 4	Low oil level input, warning, close to activate, (always activate).
Digital Input 5	High oil temperature input, shutdown, close to activate (from safety on over).
Digital Input 6	External alarm input, shutdown, close to activate (always activate).
Digital Output 1	From pre-heat output to start
Digital Output 2	Common alarm
Digital Output 3	ETS solenoid output
Digital Output 4	Idle /High speed control
LED1 configuration	The system in automatic mode
LED2 configuration	Common to Start Alarm
LED3 configuration	Common shutdown alarm
LED4 configuration	Common alarm
Time Multiplier	36
Over Current Action	Trip shutdown
Gens Freq. Of Crank Disconnect	15Hz
Gens Speed Of Crank Disconnect	450RPM
Gens Oil Pressure Of Crank Disconnect	Not use
Starting Oil Pressure Detect	Yes
Genset regular star	No
SMS function is activated	Yes
Phone number1-5	No

8.2. Programmable output port can be defined content table1-4

No.	Type	Function Description
1	Not used	
2	throttle control	Alarm stop and emergency stop action in overdrive, close the door.
3	audible alarm	The warning, stop, electric tripping action, can be an external alarm, configurable input port " alarm silence " effective, may prohibit its output.
4	The battery voltage is too high	The battery voltage too high alarm action.
5	The battery voltage is too low	Warning alarm when the battery voltage is too low.
6	save	
7	save	
8	save	
9	Starting relay output	Generator starting action, after successful starting off.
10	Fuel relay output	Generator startup action, wait stop disconnect.
11	Boot time effectively	Boot time running effective action, no action is invalid.
12	Charge failure	Charging generator failure alarm action.
13	Gens switch close	Can control the generator switch with overload.
14	Gens Pulse switch close	Pulse generator switch output, the output time from the closing time of the control pulse.
15	Mains switch close	Can be controlled mains switch with overload.
16	Mains Pulse switch close	Mains switch output pulse, the pulse output time from the closing time control.
17	Public under frequency frequent shutdown alarm	Generator under frequency frequent shutdown alarm action.
18	Public under frequency frequency alarm	Generator under frequency frequency alarm action.
19	Public under voltage overvoltage shutdown alarm	Generator under voltage shutdown alarm action.
20	Generator under voltage shutdown alarm action.	Generator under voltage alarm action.
21	Public alarm	Generator public warning, public parking, public electrical trip alarm action.
22	Public trip alarm	Public trip alarm action.
23	Public shutdown alarm	Public shutdown alarm action.
24	Public warning alarm	Public warning alarm action.
25	High temperature 1 warning	High temperature 1 warning alarm action.
26	High temperature 1 shutdown alarm	High temperature 1 shutdown alarm action.
27	The ongoing heat delay	The ongoing heat delay action.
28	save	
29-3	Input port 1-6	Input port 1-6 effective action.
35	Emergency shutdown alarm	Emergency shutdown alarm action.
36	ETS output	Time delay in the ETS within the movement.
37	Starting failure alarm	Starting failure alarm action.
38	Fuel pump control	The fuel level upper and lower limit to control its motion.
39	Gens effective	The generator cooling during normal operation and high-speed action.
40	Gens Over Frequency Warning	Gens over frequency warning action.
41	Gens over frequency shutdown	Gens over frequency shutdown has occurred.
42	Gens overvoltage warning	Gens overvoltage warning action.
43	Gens overvoltage shutdown	Gens overvoltage shutdown action.
44	Gens under frequency	Gens under frequency warning action.
45	Gens under frequent	Gens under frequency when stopping action.
46	Gens under voltage warning	Gens under voltage warning action.

47	Gens under voltage shutdown	Gens under voltage shutdown action.
48	Louver Control	Action in genset starting and disconnect when genset stopped completely.
49	Low fuel level	Low fuel level action.
50	Speed signal loss	In safe operation, the engine speed detection equal to 0 action.
51	Mains abnormal	Mains over and under frequency, overvoltage, under voltage, auxiliary mains abnormal input effective action.
52	Mains Over Frequency	Mains over frequency when the action.
53	Mains overvoltage	Mains overvoltage action.
55	Mains under frequency	Mains under frequency action.
56	Mains under voltage	Mains under voltage action.
57	Low oil pressure of 1 warning	Low oil pressure warning action 1.
58	Low oil pressure 1 shutdown	Low oil pressure shutdown action 1.
59	Oil pressure sensor open	Oil pressure sensor open action.
60	Gens switch open	Can control the switch to gens the unloading.
61	Gens Pulse switch open	Gens pulse switch output, output time divided by the gate pulse time control.
62	Mains switch open	Can control the switch to electric discharge.
63	Mains Pulse switch open	Mains pulse switch output, output time divided by the gate pulse time control
64	Over current warning	Generators over-current warning action.
65	Over current trip	Generators over-current tripping action.
66	Over speed warning	Engine over speed warning action
67	Over speed shutdown	Engine overspeed shutdown alarm action.
68	Preheating to start	Action from the preheating time delay to the start time.
69	Preheating to start over	From the preheating time delay to the starting end for movement between.
70	Preheat the oven to warm the end	From the preheating time delay to the starting end for movement between.
71	Preheating to the safe operation of the end	From the end of a preheating time delay to the safe operation, action.
72	switch open output	The switch is controlled to make electricity or power generation unloading.
73	In manual mode	System in the manual test machine mode of action.
74	System in automatic mode	System in the automatic mode of action.
75	The system is in manual mode	In manual mode of action.
76	System shutdown mode	System shutdown mode of action.
77	Under speed warning	The engine under speed warning action.
78	Less speed down	engine under speed stop action.
79	Automatic stop prohibited	In the automatic mode, the generator during normal operation, when the automatic shutdown disable input effective action.
80	Idle / high speed control	In the start and stop idle waiting for the boot idling stop time during operation action.
81	Pre-oil Supply Output	Action from“crank on”to“safety on”.
82	Raise Speed	Action in hi-speed warming run.
83	Excite Generator	Output in start period. If there is no gens frequency during hi-speed running, output 2 seconds again.
84	Drop Speed	Action in period of stop idle mode to time of wait for stopping completely.
85	Pre-Lubricate	Actions in period of pre-heating to safety run.
82	High temperature2 warning	Action when high temperature2warning alarm.
83	High temperature2 shutdown	Action when high temperature2shutdown alarm.
84	Low oil pressure2 warning	Action when low oil pressure 2 warning.
85	Low oil pressure2 shutdown	Action when low oil pressure 2. shutdown.

Note: Output port 1 - 4 can be configured to use computer software

8.3. Programmable input port 1-6 definition content list

No.	Type	Function Description
1	Users Configured	Including following functions: ---------- Warning: warn only, not shutdown. Shutdown: alarm and shutdown immediately. Trip and stop: alarm, generator unloads and shutdown after hi-speed cooling. Trip: alarm, generator unloads but not shutdown. Indication: indicate only, not warning or shutdown. ---------- From safety on: detecting after safety on run delay. From crank: detecting as soon as start. Always: input is active all the time. Never: input inactive
2	Alarm Mute	Can prohibit“Audible Alarm”output when input is active.
3	Reset Alarm	Can reset shutdown alarm and trip alarm when input is active.
4	Inhibit Auto Stop	In Auto mode, during generator normal running, when input is active, inhibit generator shutdown automatically.(This function is only LXC620）
5	Aux Mains Fail	In Auto mode,mains are abnormal when input is active.
6	Aux Mains Closed	Connect mains loading switch is Aux.Point
7	Aux Gens Closed	Connect generator loading switch's Aux. Point.
8	Inhibit Mains Load	When the input is valid, Forbidden City electric load, has been loaded immediately uninstall.
9	Lamp Test	All LED indicators are illuminating when input is active.
10	Aux Mains Closed	Connect mains loading switch is Aux.Point.
11	Inhibit Mains Load	When the input is valid, Forbidden City electric load,has been loaded immediately uninstall.
12	Panel key ban	When the input is valid,the panel all keys do not its role, the panel LCD The first screen the first line on the right shows.
13	Remote Start(Not On Load)	In the automatic mode,when the input is valid, and can automatically open the turbine, generator normal operation is not loaded. When the input is invalid, can automatically stop generating set.
14	Remote Start(on Load)	In the automatic mode,when the input is valid, and can automatically open the turbine, generator normal operation after loading. When the input is invalid, can automatically stop generating set.
15	Inhibit Scheduled	In Auto mode,inhibit scheduled run genset when input is active.
16	Aux Mains OK	In Auto mode,mains are normal when input is active.

8.4. Custom project name list

No.	Type	Description
1	High Water Temperature Input	When active,the panel displays the high water temperature input alarm.
2	Low Oil Pressure Input	When active,the panel displays the low oil pressure input alarm.

3	High Oil Temperature Input	When active,the panel displays the high oil temperature input alarm.
4	Box High Temperature Input	When active,the panel displays the box high temperature input alarm.
5	Low Level Input	When active,the panel displays the low level input alarm.
6	Low Oil Level Input	When active,the panel displays the low oil level input alarm.
7	Over Speed Input	When active,the panel displays the over speed input alarm.
8	External Alarm Input	When active,the panel displays t he external input alarm.
9	Over Current Input	When active,the panel displays the over current input alarm.
10	Half Oil Level Input	When active,the panel displays half the oil level level input alarm.
11	Monitor Mode Input	When active,the panel display system in the monitor mode,only the genset electric monitoring parameters and alarm signal(low speed,low voltage alarm is not monitored)
Note: The input port 1-6,only use computer software to configure.		

8.5. Sensor selection list

No.	entry	Content	Remarks
1	temperature sensor	1 Do not use 2 digital input low effective 3 digital input high effective 4 VDO 120 degrees C 5 Datcon high 6 Datcon low 7 SGX 120 degrees C 8 Cummins 9 SGH 120 degrees C 10 Curtis 11 SGD 120 degrees C 12 Pt100 13 User defined	Custom resistive input resistance range of 0-999 Europe, silently think factory VDO 120 degrees C curve. User defined temperature curve through the PC software settings.
2	pressure sensor	1 Do not use 2 digital input low effective 3 digital input high effective 4 VDO 5 bar 5 VDO 10 bar 6 Datcon 5 bar 7 Datcon 10 bar 8 Datcon 7 bar 9 SGX 10 bar 10 CMB812 11 SGH 10 bar 12 Curtis 13 SGD 10 bar 14 User defined	Custom resistive input resistance range of 0-999 Europe, the factory silence that VDO 10 bar curve. User defined pressure curve through the PC software settings.

3	fuel level sensor	1 Do not use 2 digital input low effective 3 digital input high effective 4 VDO Ohm range (10-180) 5 VDO Tube type (90-0) 6 US Ohm range (240-33) 7 GM Ohm range (0-90) 8 GM Ohm range Ohm range (0-30) 9 Ford (73-10) 10 NKZR12/24-1-04 Ohm range (100-0) 11 User defined	Custom resistive input resistance range of 0-999 Europe, the factory silence that VDO 10 bar curve. User defined pressure curve through the PC software settings.

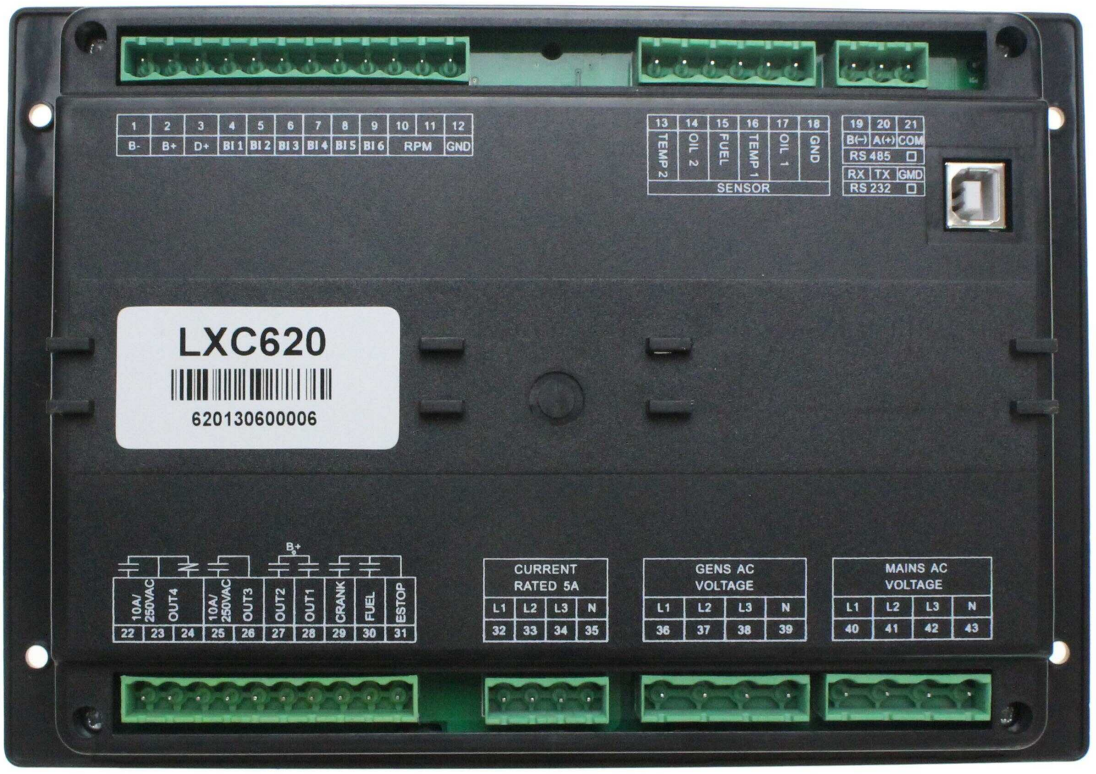
8.6. Conditions of crank disconnect selection

No.	Setting description
0	Speed sensor
1	Gen frequency
2	Speed sensor +Gen frequency
3	Oil pressure sensor
4	Speed sensor
5	Gen frequency +Oil pressure sensor
6	Gen frequency +Speed sensor+Oil pressure sensor

- There are 3 conditions to make starter disconnected with engine, that is, speed sensor, generator frequency and engine oil pressure. They all can be used separately. We recommend that engine oil pressure should be using with speed sensor and generator frequency together, in order to make the starter motor is separated with engine immediately and can check crank disconnect exactly.
- Speed sensor is the magnetic equipment which be installed in starter for detecting flywheel Teeth.
- When set as speed sensor, must ensure that the number of flywheel teeth is as same as setting, otherwise,“over speed stop”or“under speed stop” may be caused.
- If genset without speed sensor, please don“t select corresponding items, otherwise, “start fail” or “loss speed signal”maybe caused.
- If genset without oil pressure sensor, please don ‘t select corresponding items.
- If not select generator in crank disconnect setting, controller will not collect and display the relative power quantity (can be used in water pump set); if not select speed sensor in crank disconnect setting, the rotating speed displayed in controller is calculated by generator frequency and number of poles.

9. Wirings connection

The back panel of LXC620 controller is shown as below:



Back panel terminal block wiring description：

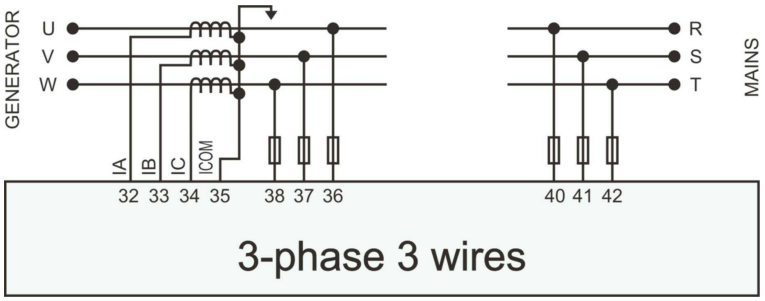
No.	Functions	Diameter	Remark
1	DC input B-	1.5mm	DC negative input ,connect to negative of starter battery.
2	DC input B+	1.5mm	DC positive input,connect to positive of starter battery.(20Afuserecommended).
3	Charge failure input /excitation	1.0mm	Charging D+ input, do not connect to ground
4-9	Aux. Input 1-6	1.0mm	Switch to B-.
10	Magnetic Pickup +	1.0mm	Connect to Magnetic Pickup device.
11	Magnetic Pickup-	1.0mm	
12	Magnetic Pickup	1.0mm	Common ground,which can be accessed chassis or starter battery negative.
13	Temperature 2 Sensor Input	1.0mm	Connect to Temperature Sensor.
14	Oil Pressure 2 Input	1.0mm	Connect to Oil pressure 2 sender.
15	Fuel level sensor input	1.0mm	Connect to fuel level sensor.
16	Temperature 1 sensor input	1.0mm	Connect to Temperature sender.
17	Oil pressure 1 sensor input	1.0mm	Connect to Oil pressure sender.
18	Sensor COM	1.0mm	Public terminals of sensor,(B-) have already. connected.
19	RS485-	0.5mm	Impedance-120Ω shielding wire is recommended, its single-end earthed.
20	RS485+	0.5mm	
21	RS485 COM	0.5mm	
22	Aux. Output 4	1.0mm	Free voltage contacts.16Amprated
23			
24			
25	Aux. Output 3	1.0mm	Free voltage contacts.16Amprated
26			
27	Aux. Output 2	1.0mm	B+output,rated 10A.
28	Aux. Output 1	1.0mm	B+output,rated 10A.
29	Start relay output	1.5mm	B+ is supplied by 31 points, rated16A.
30	Fuel relay output	1.5mm	
31	Emergency stop	2.5mm	Plant Supply B+.Also supplies fuel&start Outputs. (Recommendedmaximum20Afuse).
32	CT Secondary A Sensing	1.5mm	Connect to secondary of A (maximum 5A)
33	CT Secondary B Sensing	1.5mm	Connect to secondary of B (maximum 5A)
34	CT Secondary C Sensing	1.5mm	Connect to secondary of C (maximum 5A)
35	CT Secondary Common	2.5mm	Common GND, connecting to start battery negative.
36	Generator A Volt Sensing	1.0mm	Connect to generator A output (Recommend 2A fuse)
37	Generator B Volt Sensing	1.0mm	Connect to generator B output (Recommend 2A fuse)
38	Generator C Volt Sensing	1.0mm	Connect to generator C output (Recommend 2A fuse)
39	Generator Neutral Input	1.0mm	Connect to generator N line terminal.
40	Mains Phase A Volt Sensing	1.0mm	Connect to mains A output (Recommend 2A fuse)
41	Mains Phase B Volt Sensing	1.0mm	Connect to mains B output (Recommend 2A fuse)
42	Mains Phase C Volt Sensing	1.0mm	Connect to mains C output (Recommend 2A fuse) (Recommend 2A fuse)
43	Mains Neutral Input	1.0mm	Connect to mains neutral terminal
44	USB Connector		USB and computer communication（maximum4）

NOTE: Prohibited during operation of the engine starter batteries removed, otherwise it will cause the control system due to excessive DC input voltage and burned!

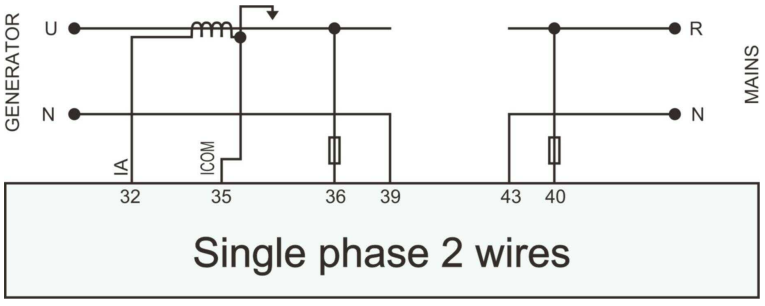
10. Typical applications

- GPRS MODEM recommended Dongguan Feirui Electronics Co., Ltd. is equipped with (need to buy separately), RS232 Communication lines connected correctly according to the figure.
- If the engine starter battery voltage is 24V, output, measuring starting fuel outlet and stop outlet (depending on the user configuration) of negative electrode resistance should not be less than 2 ohm, if less than 2 ohms in the output port and extend current greater than 30A relay. If the engine starter battery voltage is 12V, output, measuring starting fuel outlet and stop output port on the battery negative resistance should not be less than 1 ohm, if less than 1 ohm in the corresponding output port and extend current greater than 30A relay.

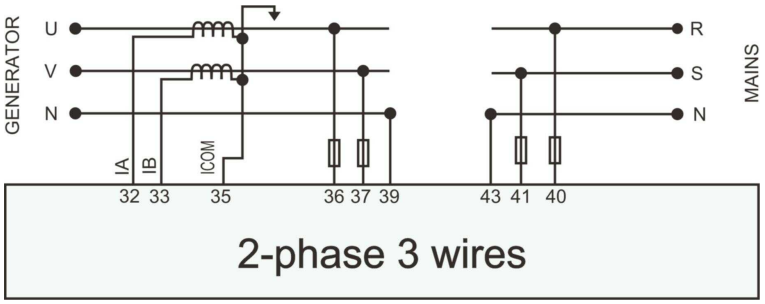
Three-phase three-wire connection wiring diagram (to LXC620 example)



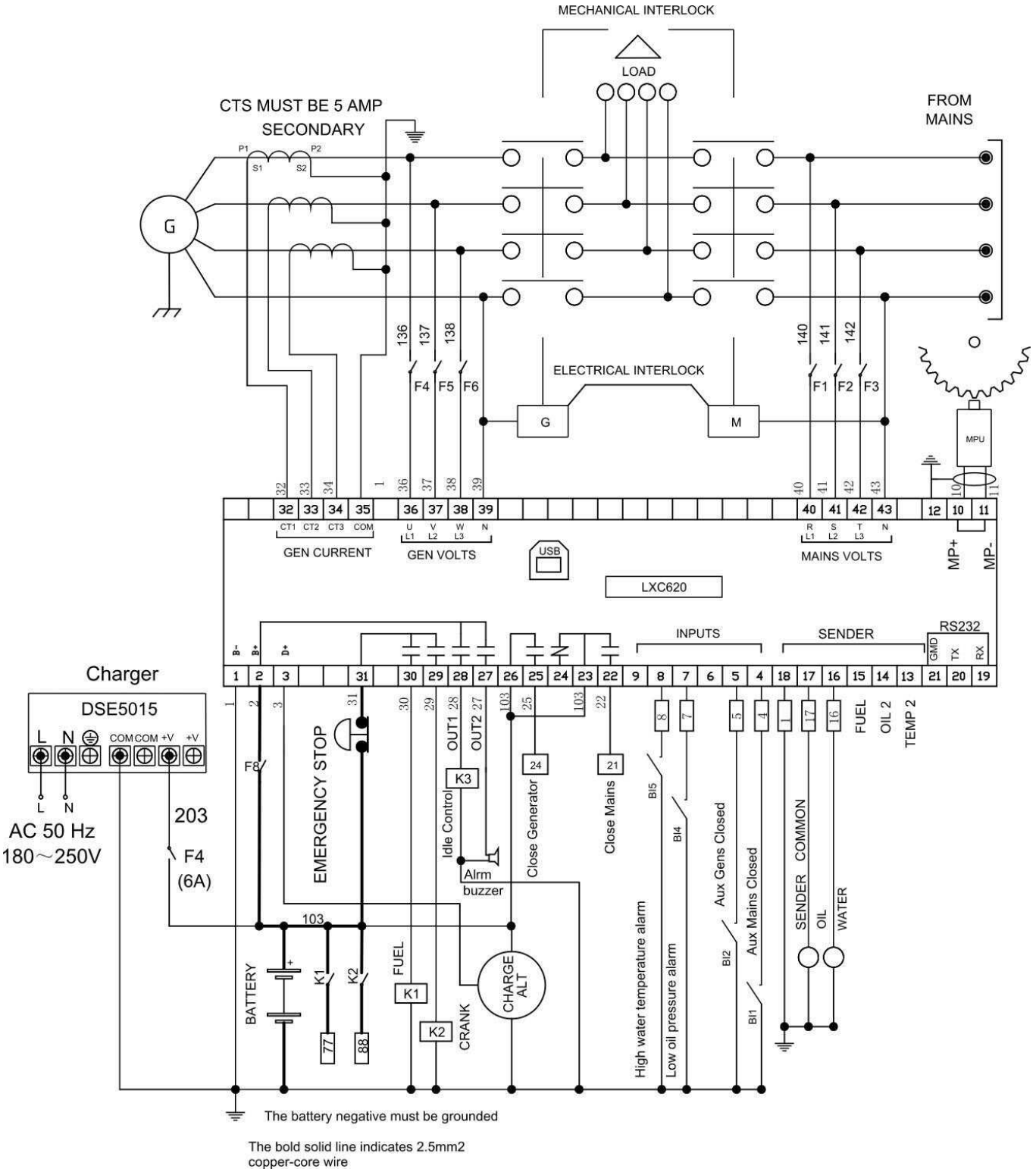
Single-phase two-wire connection wiring diagram (to LXC620 example)



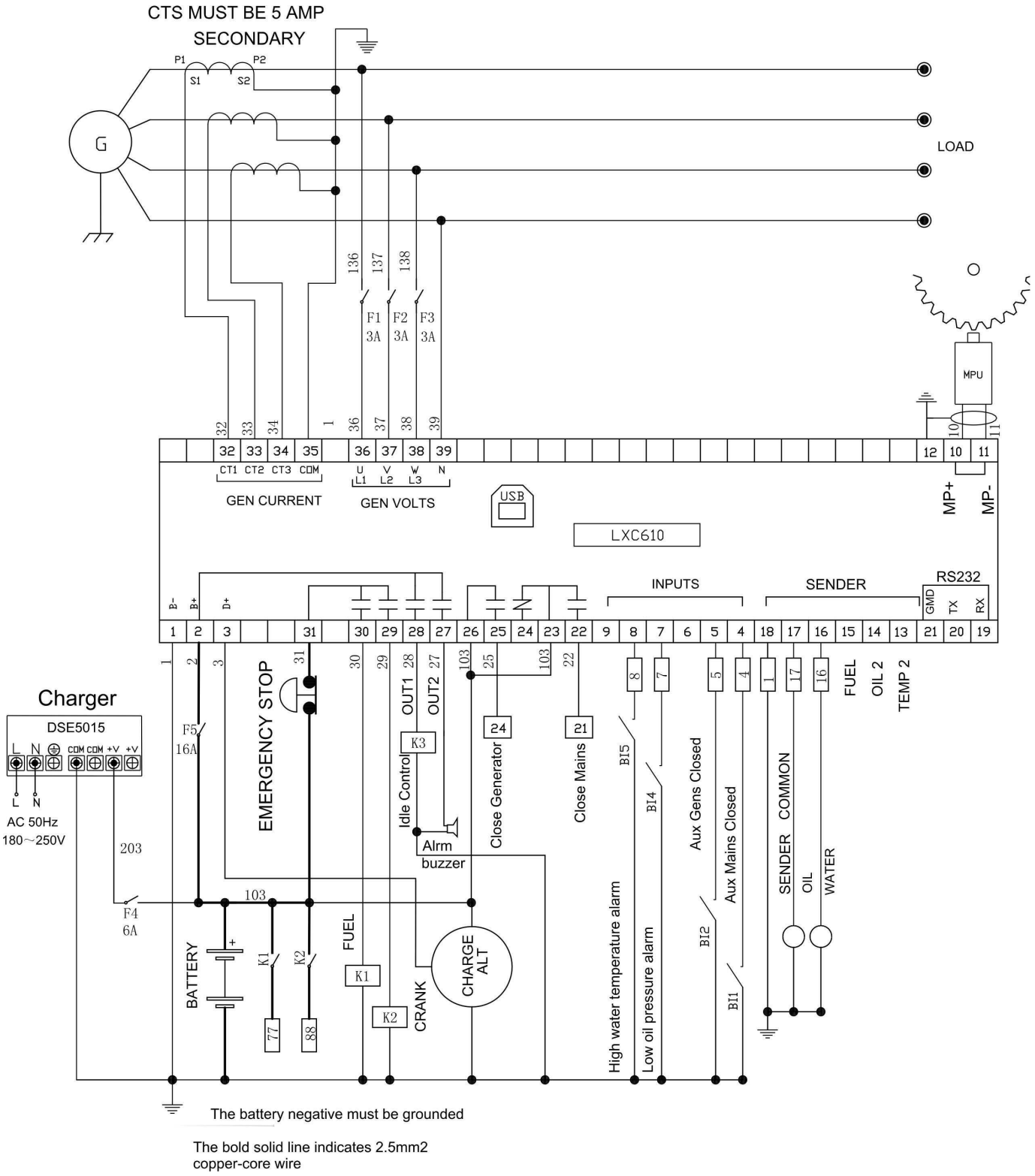
Two-phase three-wire connection wiring diagram (to LXC9220 example)


GENERATOR
U
V
N
IA
IB
ICOM
32 33 35
36 37 39
43 41 40
R
S
N
MAINS
2-phase 3 wires

LXC620 Typical application diagram



LXC610 Typical application diagram

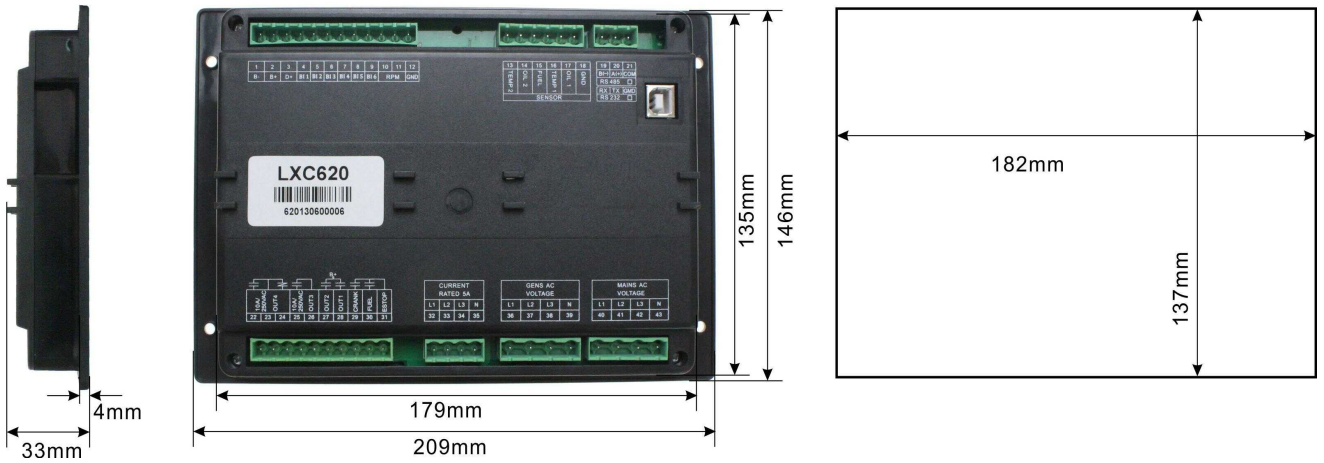


11. Installation

11.1. Case dimension and fixing size

LXC620 Controller is panel built-in design; it is fixed by clips when installed. The controller's overall dimensions and cutout dimensions for panel, please refers to as following.

Case Dimension **Cut Out**



11.2. Battery voltage input

LXC620 series controller can suit for widely range of battery voltage (8~35)VDC. Negative of battery must be connected with the shell of starter stable.The diameter of wire which from power supply to battery must be over 2.5mm 2. If floating charge configured, please firstly connect output wires of charger to battery's positive and negative directly,then,connect wires from battery's positive and negative to controller's positive and negative input ports in order to prevent charge disturbing the controller's normal working.

11.3. Speed sensor input

Speed sensor is the magnetic equipment which be installed in starter and for detecting flywheel teeth.Its connection wires to controllershouldapplyfor2coresshieldingline. The shielding layer should connect with No.16terminalin controller while another side is hanging in air. The else two signal wires are connected with No.17andNo.18terminalsin controller. The output voltage of speed sensor should be within(1~24)VAC(effective value)during the full speed.AC12Vis recommended (in rated speed).When install the speed sensor,let the sensor is spun to contacting flywheel first,then,port out1/3lap, and lock the nuts of sensor at last.

11.4. Output and expand relays

All outputs of controller are relay contact output type.If need to expand the relays,please add freewheel diode to both ends of expand relay's coils(when coils of relay has DC current) or, increase resistance-capacitance return circuit(when coils of relay has AC current),in order to prevent disturbance to controller or others equipment.

11.5. Ac input

LXC620 Current input of controller must be connected to outside current transformer. And the current transformer's secondary side current must be 5A. At the same time, the phases of current transformer and input voltage must correct. Otherwise, the current of collecting and active power maybe not correct.

✧ **Note:**a.ICOM port must be connected to negative pole of battery controller power.b.When there is load current,transformer's secondary side prohibit from open circuit.

Note：a.ICOM port must be connected to negative pole of battery controller power.
b.When there is load current,transformer's secondary side prohibit from open circuit.

11.6. Withstand voltage test

When controller had been installed in control panel,if need the high voltage test,pleased is connect controller's all terminal connections,in order to prevent high voltage into controller and damage it.

12. Common faults and exclusion method

Following in my company controller process more common failure and exclusion method,if there is a failure of the other can not be solved,please contact my company.

Faults	Possible Solutions
Controller no response with power.	Check starting batteries; Check controller connection wirings; Check DC fuse.
Genset shutdown	Check the water/cylinder temperature is too high or not; Check the genset AC voltage; Check DC fuse.
Controller emergency stop	Check emergence stop button is corrector not; Check whether the starting battery positive be connected with the emergency stop input; Check whether the circuit is open.
Low oil pressure alarm after crank disconnect	Check the oil pressure sensor and its connections.
High water temp alarm after crank disconnect	Check the temperature sensor and its connections.
Shutdown Alarm in running	Check related switch and its connections according to the information on LCD; Check programmable inputs.
Crank not disconnect	Check fuel oil circuit and its connections; Check starting batteries; Check speed sensor and its connections; Refer to engine manual.
Starter no response	Check starter connections; Check starting batteries
Genset running while ATS not transfer	Check ATS; Check the connections between ATS and controllers.

13. Product packaging

This product should be following sets:

(1) 1 piece of controller model LXC620/LXC610.

(2) 4 pieces of fixed cards.

(3) 1 piece of product certificate.

(4) 1 piece of product manual.

Dongguan Tuancheng Automation Equipment Co.,LTD.

Tel:+86-769-23836636
Fax:+86-769-23166296
http://www.lixise.com
http://www.lixise.net
E-mail:sales@lixise.com
Add: Wentang Road, Chashang industrial zone #18, Dongcheng, Dongguan, Guangdong, China