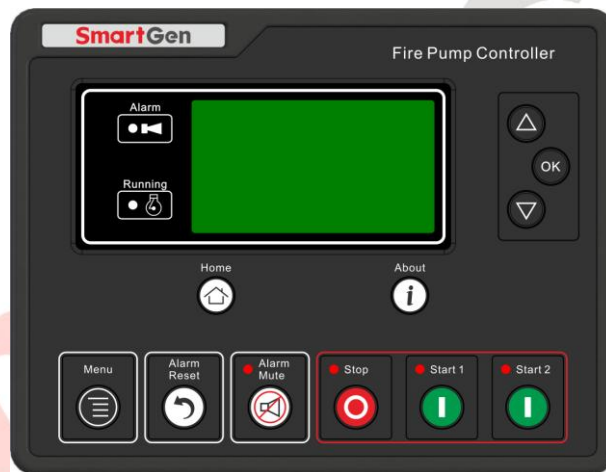




SmartGen
ideas for power

FPC615 FIRE PUMP CONTROLLER USER MANUAL



SMARTGEN (ZHENGZHOU) TECHNOLOGY CO.,LTD.

4 OPERATION

4.1 INDICATOR LIGHT



Fig.1 – FPC615 Front Panel











▲ Note: Selected indicators description:

Alarm indicator: flash slowly when warning alarms occur; flash quickly when shutdown alarms occur;

Running indicator: after genset start up, it is always light before energize to stop; for other periods, it is extinguished.

4.2 PUSH BUTTONS DESCRIPTION

Table 4 – Keys Function


Icons	Function	Description
	Menu	Press and hold it for 1s to enter into menu configuration screen; Return to the previous level of menu while configuring settings.
	Reset Alarm	Press it to reset shutdown alarms while unit is in standby mode.
	Mute	Press it to mute controller alarms when alarms occur, meanwhile, alarm screen will be displayed.
	Stop	Stop running pump unit in auto/manual mode; Press it again in stop process will stop pump unit quickly; Press at least 3 seconds to test lights are normal or not.
	Start 1	Use different battery pack to start the unit.
	Start 2	Press it, starter relay starts output; Release it, starter relay stops output.
	Homepage	Press it to return to the 1 st screen quickly.
	Event Log	Press it to enter into event log screen quickly.
	Up	Screen scroll
	Confirm	Confirm setting information.
	Down	Screen scroll

4.3 MAINS SCREEN DISPLAY

Table 5 – Display Description

Operation	Display Content	Remark
<p>1st Screen:</p> <p>Press enters this screen</p>	35°C 1 27.6V 35°C 2 27.6V 100kpa 1500r/min Engine Status And Alarm	<p>Engine temp. 1# Battery voltage</p> <p>Raw water temp. 2# Battery voltage</p> <p>Oil pressure</p> <p>Engine speed</p> <p>Engine status and alarm display in turn.</p>
<p>2nd Screen:</p> <p>Press or to display this screen</p>	D+ Voltage 27.6V Total Runing 00:00 Total Starts 1000 2016-03-05(6) 10:00:00 Engine Status And Alarm	<p>Voltage of chrger</p> <p>Total running time</p> <p>Total start times</p> <p>Current time of controller</p>
<p>3rd Screen:</p> <p>Press or to display this screen</p>	Maint. 1 Countdown 30:00 Maint. 2 Countdown 30:00 Maint. 3 Countdown 30:00 Engine Status And Alarm	<p>It is maintenance countdown time display; if disabled maintenance function, this screen is not display.</p>
<p>4th Screen:</p> <p>Press or to display this screen</p>	Genset Status Auto Mode Start Delay 1s Engine Standby	<p>Genset status display screen, controller working mode and engine status.</p>
<p>5th Screen:</p> <p>Press or to display this screen</p>	Alarm 1/2 Warning Low Oil Pressure Shutdown	<p>Alarms display, and scroll screen based on the pages. The maximum alarm amount is 30 items.</p>
<p>Press to display this screen, and press again (or) to exit</p>	Event Log 1/3 Shutdown Alarm High Temp. Shutdown 2016-03-05(6) 10:00:00 Engine Status And Alarm	<p>Event logs display, and one screen displays one piece of event log. The maximum event log amount is 99 pieces.</p>
<p>User Manu:</p> <p>Long-pressed enters into this screen, and press again to exit</p>	Exit Parameter Set Controller Information	<p>1. Check controller software version, hardware version and input/output port status.</p> <p>2. Setting parameters</p>

4.4 PARAMETER SET SCREEN












Hold and press  enters into menu screen, and select “Set Parameter” item enters into parameter setting screen after entering the correct password (default:00318).

Parameter settings include contents as below,

- Timers
- Engine
- Maintenance
- Sensors
- Digital Inputs
- Output
- Module



Taking the example of setting engine overspeed shutdown:

Table 6 – Parameter Setting

1 st Step	2 nd Step	3 rd Step
>Exit >Timers >Engine >Scheduler And Maintenance > Sensors	>Return >Flywheel Teeth >Engine Rated Speed >Loss Speed Signal >Over Speed Shutdown	Over Speed Shutdown Enable: Enabled Set Value: 00114% Delay Value: 00005
Press  or  key select “Engine” Setting and press  enters into parameter setting screen.	Press  or  key select “Over Speed Shutdown” Setting and press  enters into this setting screen.	Press  to adjust cursor position and press  or  key to adjust delay value, and then press  to confirm the parameter setting.
In all processes, press  can cancel the current setting or return to the previous menu.		

4.5 MANUAL START/STOP OPERATION

Manual start sequence:

- a) Take start 1 as example, hold and press  (start 1), start I indicator illuminate and start1 relay starts output simultaneously.
- b) Release  after genset started successfully (through configure engine crank disconnect conditions) and starter relay stops output. Then genset enters into safety on delay state, in which time, alarms of high temperature, low oil pressure, and under speed are inactive. After safety on delay expired, unit enters into high-speed warming up delay.
- c) When warming up delay is expired, pump unit enters into normal running status.

Manual stop sequence:

6 CONNECTIONS

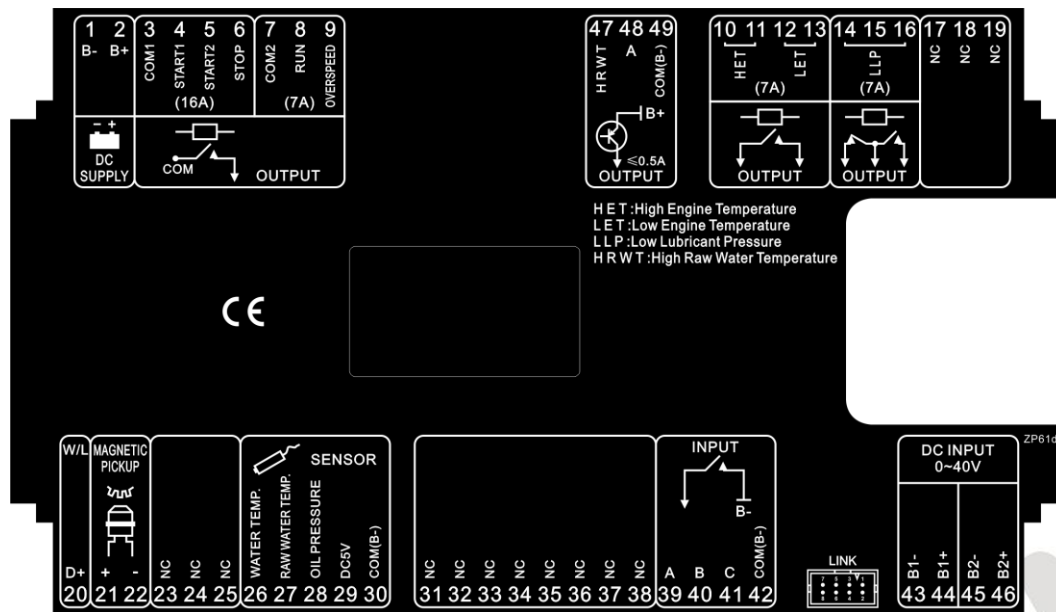


Fig.2 – FPC615 Back Panel

Description of terminal connections:

Table 9 – Terminal Connection

No.	Function	Cable Size	Description
1	B-	2.5mm ²	Connected with negative of starter battery.
2	B+	2.5mm ²	Connected with positive of starter battery. If wire length is over 30m, better to double wires in parallel. Max. 20A fuse is recommended.
3	COM1 Relay Common Port	2.5mm ²	Relay output common port of No.4, No.5 and No.6.
4	Start 1	2.5mm ²	Rated 16A. Connect to starter coil
5	Start 2	2.5mm ²	Rated 16A. Connect to starter coil
6	Stop Relay Output	2.5mm ²	Rated 16A. connect to stop electromagnet
7	COM2 Relay Common Port	1.5mm ²	Relay output common port of No.8 and No.9.
8	Running Relay Output	1.5mm ²	Rated 7A It is output when genet meet with the crank disconnect conditions.
9	Over Speed Relay Output	1.5mm ²	Rated 7A It is output after genset sending over speed alarm signals.
10	High Water Temperature Relay Output	1.5mm ²	Rated 7A It is output after genset sending high water temperature alarm signals.
11	Low Water Temperature Relay Output	1.5mm ²	Rated 7A It is output after genset sending low water temperature alarm signals.
12	Low Lubricant Pressure Relay Output (Normally Close)	1.5mm ²	Rated 7A
13	Low Lubricant Pressure Relay Common Output	1.5mm ²	Rated 7A

7.6 SENSOR SELECT

- 1) When reselect sensors, the sensor curve will be transferred into the standard value. For example, if select the SGX (120°C resistor type), the sensor curve is SGX (120°C resistor type)curve; if temperature sensor is SGD (120°C resistor type), its sensor curve is SGD curve.
- 2) When there is difference between standard sensor curves and using sensor, user can adjust it in “curve type”.
- 3) When input the sensor curve, X value (resistor) must be input from small to large, otherwise, mistake occurs.
- 4) If select sensor type as “None”, sensor curve is not working.
- 5) If there is alarm switch only for the select sensor, user must set the sensor as “None”, otherwise, maybe shutdown or warning occurs.
- 6) The headmost or backmost values in the vertical coordinates can be set as same as below,

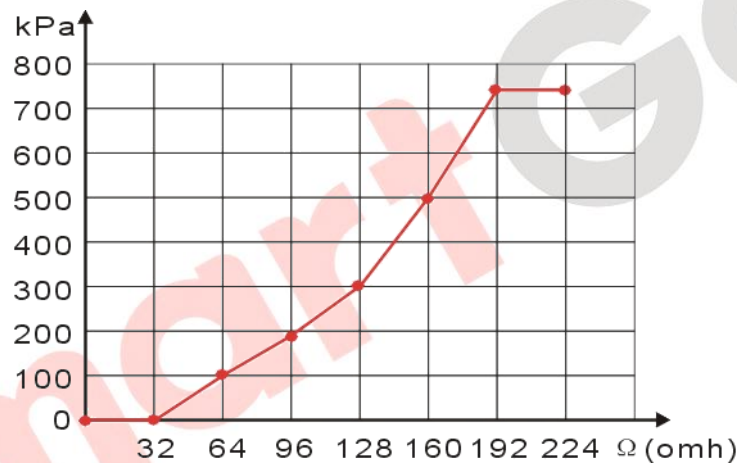


Fig.3 – Pressure Setting Curve

Table 15 - Common unit conversion table

Items	N/m ² (pa)	kgf/cm ²	bar	(p/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

8 TYPICAL APPLICATION

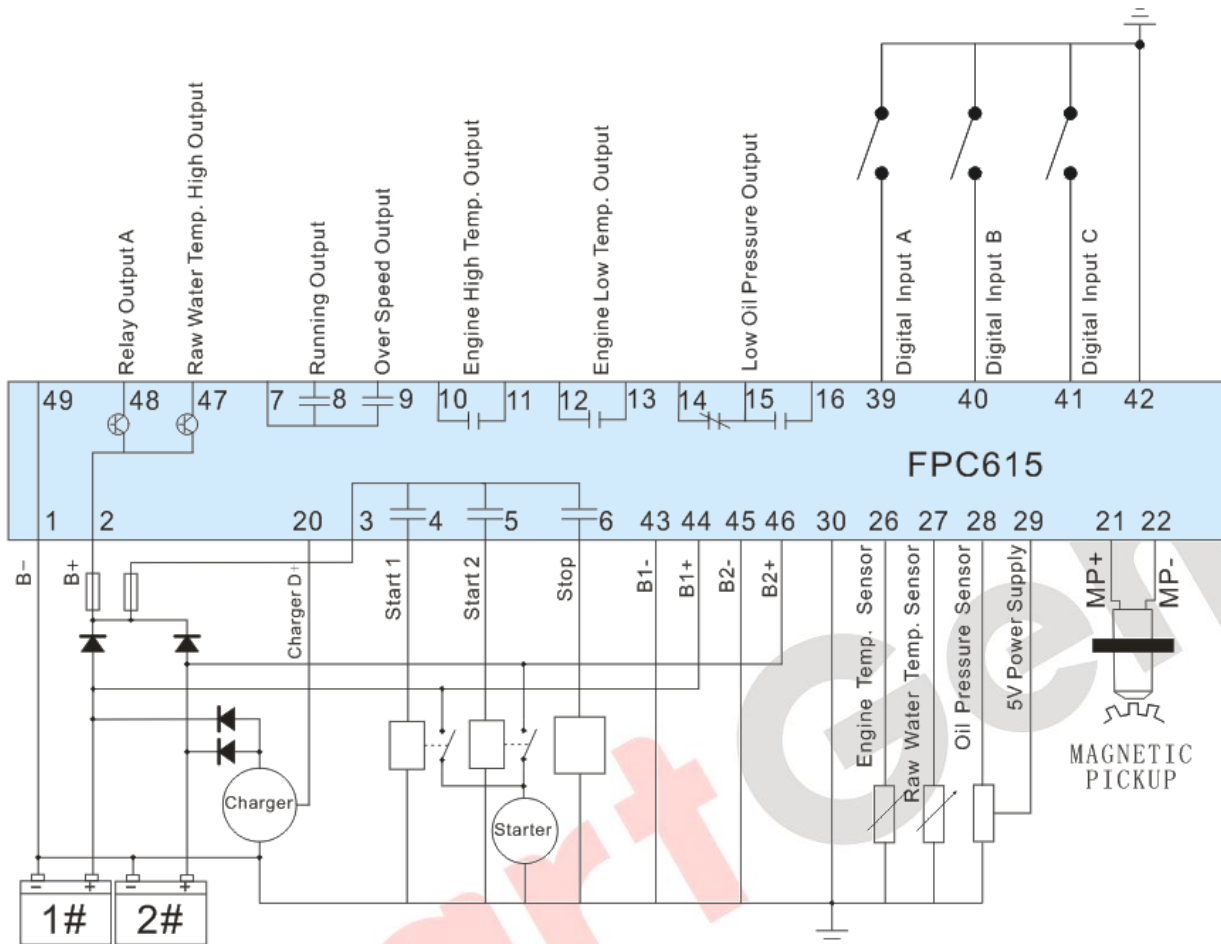


Fig.4 - FPC615 Typical Application Diagram

NOTE: relay output port A (terminal No.48) and high raw water temp. output port (terminal No. 47) are output B+, and output current cannot exceed 500mA.

9 COMMISSIONING

Please make sure the following checks are made before commissioning,

- Ensure all the connections are correct and wires diameter is suitable.
- Ensure that the controller DC power has fuse, controller's positive and negative connected to start battery are correct.
- Separately start genset with battery 1 and battery 2, observe whether starter disconnect immediately and genset is normal running. If errors occur, stop the unit and check wire connection according to the user manual.

If there is any other question, please contact SmartGen's service.

10 INSTALLATION

Controller is panel built-in design and it is fixed by clips when installed. Overall and cutout dimensions are as follows,

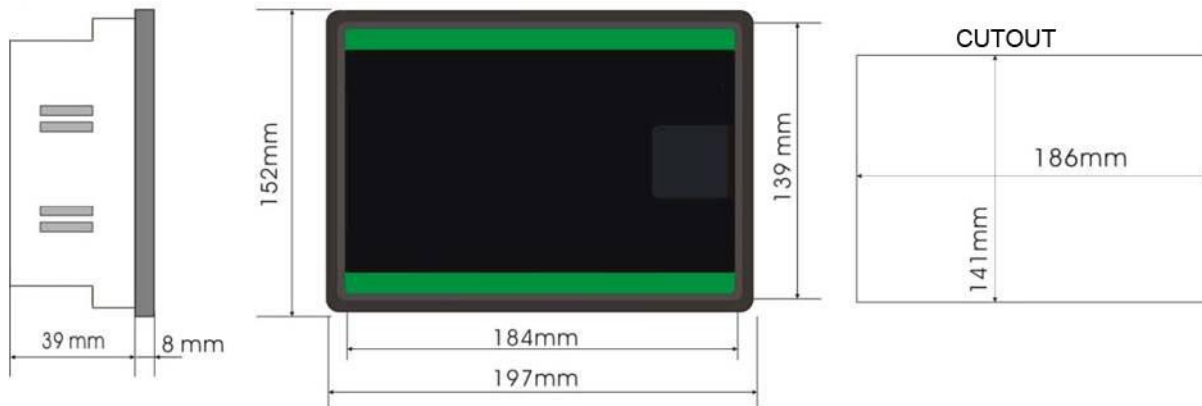


Fig.5 – Overall & Cutout Dimensions

1) Battery Voltage Input

▲ NOTE: FPC615 controller can suit for widely range of battery voltage DC(8~35)V. Negative of battery must be connected with the engine shell soundly. The diameter of wire that connects 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 corresponding input ports in order to prevent charge disturbing the controller's normal working.

2) Speed Sensor Input

▲ NOTE: Speed sensor is the magnetic equipment which be installed in starter and for detecting flywheel teeth. Its connection wires to controller should apply for 2 cores shielding line. One side is hanging in air and the else two signal wires are connecting to No. 21 and No. 22 terminals of controller and No. 22 terminal internal connected with B-. The output voltage of speed sensor should be within AC(1~24)V (effective value) during the full speed. AC12V is recommended (in rated speed). When install the speed sensor, let the sensor spun to contacting flywheel first, then, port out 1/3 lap, and lock the nuts of sensor at last.

3) Output And Expansion Relay

⚠ CAUTION: 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 add resistance-capacitance return circuit (when coils of relay has AC current), in order to prevent disturbance to controller or others equipment.