STEPHILL GENERATORS SSDP30-70 DSE 6110 MK3 Control Module User Manual

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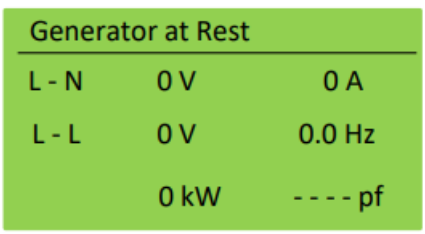
STEPHILL GENERATORS SSDP30-70 DSE 6110 MK3 Control Module

How to" guide.

This user guide has been assembled to aid with the basic aspects of the DSE6110 MK3 module as configured on Stephill Generators and to gain access to the information available. It has been produced as a "How to" guide. Below is a description of the front panel on the DSE 6110 MK3 module.

Status

Once the 12V supply has been connected to the module (battery isolator key switched on), the LCD screen will illuminate. The module will then load up with the Status screen if no alarms are present Fig.1. This is the "home page" that is displayed when no other page has been selected

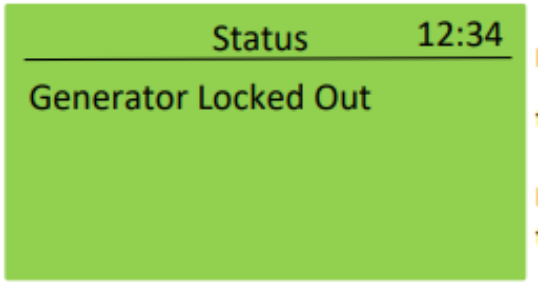


Button Description

Icon	Description
	**Stop/Reset Mode** This button places the module into its Stop/Reset Mode. This clears any alarm conditions for which have triggered and criteria have been removed. If the engine is running and the module is put into Stop mode, the fuel supply de-energises and the engine comes to a standstill.
	**Manual Mode** This button places the module into its *Manual Mode* . Once in *Manual Mode* the module will then respond to the *Start* button to start the generator and run it off load.
	**Start** Pressing the *Start* button in *Manual Mode* will begin the generator starting process and run the generator in *Manual Mode* .
	**Menu Navigation** Used for navigating the instrumentation and configuration screens. It is possible to scroll to display the different pages of information by repeatedly operating the ***Next*** and ***Previous*** page buttons.  **Example** ***Status*** (page)  ***Engine*** (page)  ***Generator*** (page) ...And so on until the desired page is reached. Once selected, the page remains on the LCD display until the user selects a different page, or after an extended period of inactivity (LCD Page Timer), the module reverts to the status display. If no buttons are pressed upon entering an instrumentation page, the instruments displayed are automatically subject to the setting of the *LCD Scroll Timer* . Alternatively, to scroll manually through all instruments on the currently selected page, press the ***Instrumentation Scroll*** buttons.  If an alarm becomes active while viewing the status page, the display shows the ***Alarms*** page to draw the operators attention to the alarm.
	**Auto Mode** This button places the module into it's *Auto Mode* . This mode allows the module to control the function of the generator automatically. The module monitors the *Remote Start Input* and once a start request is made, the set is automatically started. Upon removal of the start signal the generator will stop.
	**Alarm Mute / Lamp Test** This button silences the audible alarm in the controller and illuminates all of the LED's on the module's facia as a lamp test function.

Generator Locked Out

If Generator Locked Out is displayed on the screen – Fig.2 then this indicates that the generator cannot be started due to an active Shutdown on the module.



Status Display

Once you have issued a start request and the generator has started and running, the DSE 6110 MK3 module will then begin checking that the engine instruments and the AC generator output are correct and are within the pre-set parameters. After the “Saftey on Delay ” of 10 seconds has elapsed and all is operating correctly, the Status screen will typically look like the following Fig.3.

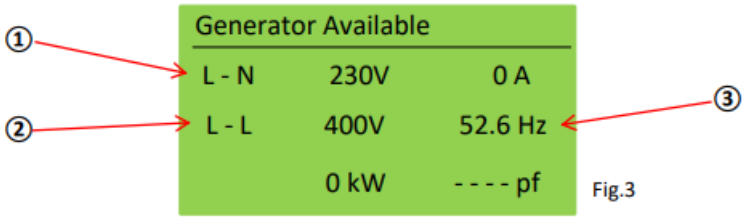


Fig.3

Typical No-Load Values

- Fig.3 above is showing the typical no-load (nothing connected to the generator outputs) values.
- L-N is showing the average AC voltage between (Phase or Live) L1 to Neutral, L2 to Neutral and L3 to Neutral – 230V
- = L-L is showing the average AC voltage between phases, L1 to L2, L2 to L3 and L3 to L1 – 400V
- = Showing the alternator frequency – Hz – This should be between 52.0 to 53.0 at no-load.

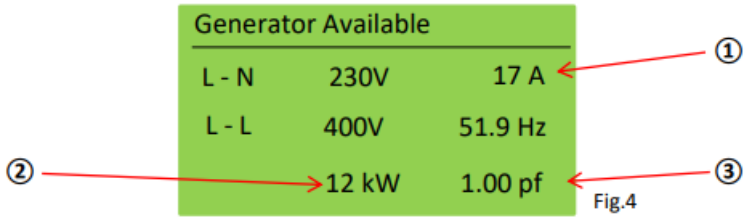


Fig.4

Typical Load Values

- = Is showing the average amps between all three phases (Live).
- = Is showing the total load in kW that the generator is under.
- = Is showing the alternator power factor – pf cosφ

How to Check the Generator AC Voltage is Correct

To check the AC voltage output from the generator is correct, firstly you must isolate the load from the generator (remove any AC plugs connected to the generator outputs). Either before you start the generator or while the generator is running, use the Next or Previous page button until across the top of the screen it reads Generator .

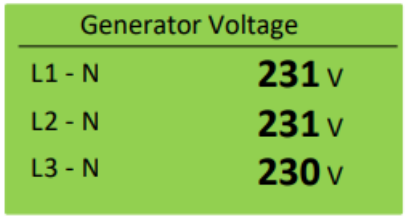
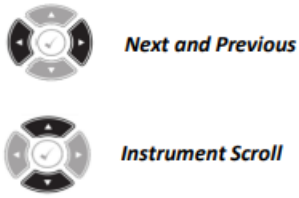
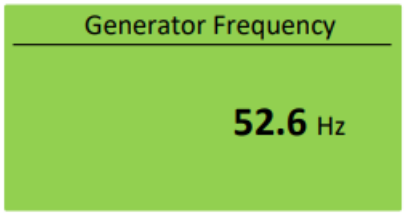


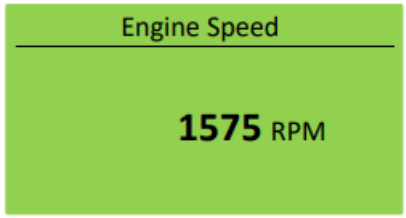
Fig.6 below shows the typical no-load voltage between Phase and Phase L1-L2, L2-L3 and L3-L1.



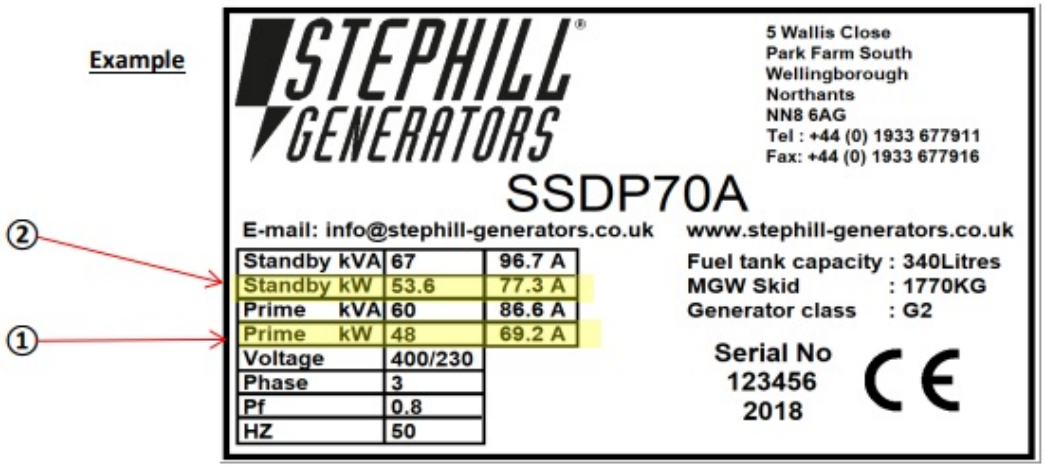


How to Check If the Applied Current is Balanced

An unbalanced current can cause the generator voltages to become unstable and possibly shutdown the set. To check the current applied to the generator use the Next or Previous buttons until across the top of the screen it reads Generator . Then press one of the Instrument Scroll buttons until Generator Current is displayed at the top of the screen



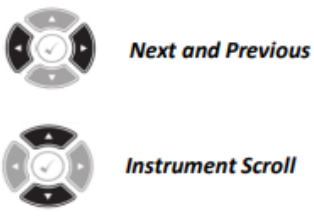
How to Check the Total and Applied Load is Balanced

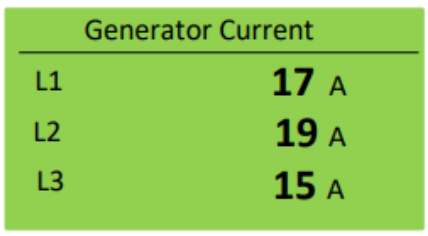


- = Prime kW This is the rated load of the generator, up to this load the generator will run continuously.
- = Standby kW Is the maximum load the generator will take for 1 hour in 12. The generator can take this load for one hour before shutting down. If the total kW load rises above this value the generator will shutdown immediately.

Load Per Phase

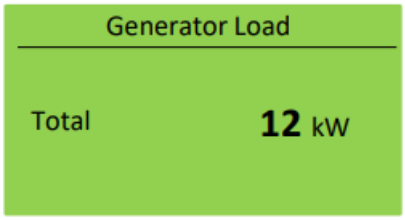
To check the load applied to the generator use the Next or Previous buttons until across the top of the screen it reads Generator . Then press one of the Instrument Scroll buttons until Generator Load is displayed at the top of the screen Fig.9





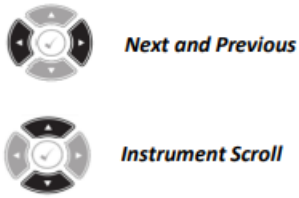
Total Load

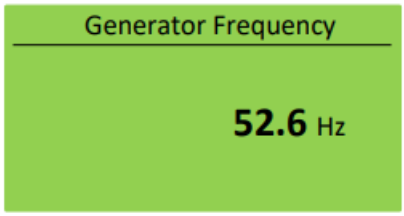
Fig.10 shows the next Generator Load screen, this shows the combined average total kW load applied.



How to Check Generator Frequency – Hz

The generator frequency can be found on two pages, on the Status page, as shown in Fig.3 Status display. Also the frequency has it's own instrument screen in the Generator page(s). To access the frequency in the Generator pages, use the Next or Previous buttons until across the top of the screen it reads Generator . Then press one of the Instrument Scroll buttons until Generator Frequency is displayed at the top of the screen page Fig.11

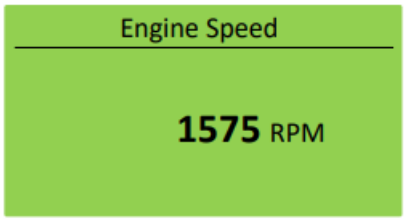




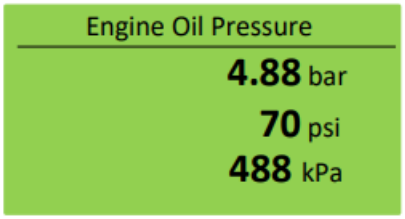
How to Check the Engine Instruments

Most of the engine instruments will only be active once the engine is running. To check the engine instruments press either the Next or Previous buttons until across the top of the screen it reads Engine . Then press one of the Instrument Scroll buttons to scroll through all the engine instruments.

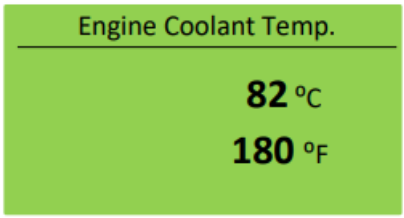
- **Engine Speed**



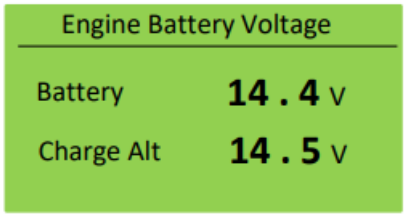
- **Engine Oil Pressure**



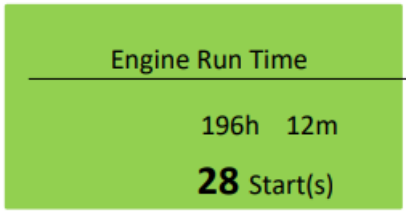
- **Engine Coolant Temperature**



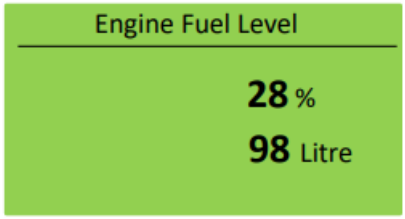
- **Engine Battery Voltage**



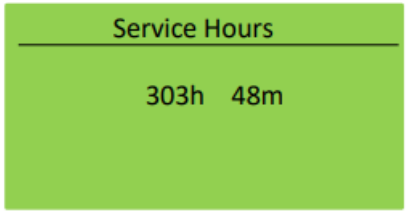
- **Engine Run Time**



- **Engine Fuel Level**

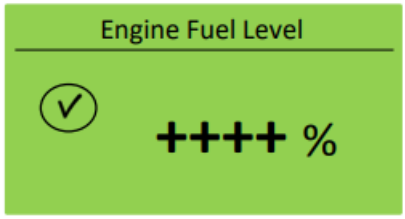


- **Service Hours**



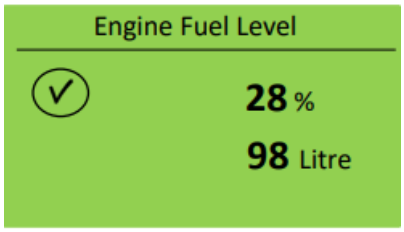
How to Check the Generator Fuel Level

To be able to view the fuel level page use the “How to Check the Engine Instruments” section elsewhere in this guide. Depending on the engine state, running or at standstill, you will see one of two screens showing the current fuel level. Fig.19 shows no registered fuel level, this is the fuel level screen when the generator is at standstill (not running). At this state the fuel level sensor is not energised.



Viewing the Fuel Level Without Starting the Generator

To view the fuel level you must first navigate to the Engine Fuel Level screen – as above. Then using the Tick Button, press and hold. After a few seconds the fuel level screen should then register a fuel level. You must continue to hold the Tick Button down to continue to view the fuel level – Fig.20.



How to Reset the "Service Hours Alarm " Warning

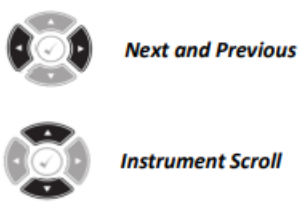
The Service Hours Alarm screen is a count down timer, when the timer reaches zero hours a Warning Alarm will be issued and displayed on the screen. The Warning Alarm will allow the user to operate the generator as normal but the Warning Alarm will be present until a service reset has been performed.

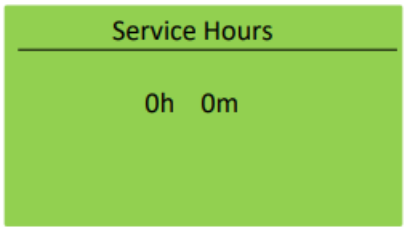
Before Resetting the Service Hours

Firstly, ensure an adequate service has been performed on the engine. Refer to the generator handbook or check on the Service section found on; The Service Hours should be showing 0h 0m, this idicates that the countdown timer from the last service has been achieved. To reset this timer; To check which alarm(s) have been triggered, use the Next or Previous buttons until across the top of the screen it reads Alarms. Fig.20 shows the Alarms page. To see each individual alarm that is currently activated, press one of the Instrument Scroll buttons to cycle through.

Resetting the Service Hours

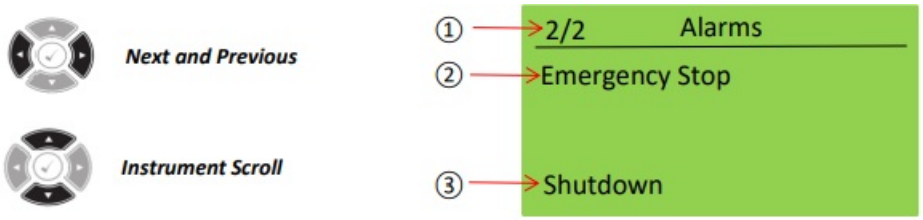
Firstly you will need to access the Service Hours in the Engine pages, use the Next or Previous buttons until across the top of the screen it reads Engine . Then press one of the Instrument Scroll buttons until Service Hours is displayed at the top of the screen page Fig.21





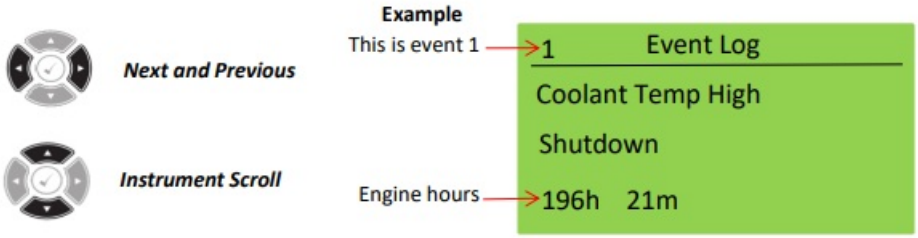
How to Check Which Alarms Have Been Triggered

- = Number of active alarms. This is alarm 1 of a total of 2 active alarms.
- = The cause of the alarm.
- = The type of alarm, e.g. Shutdown.



How to Check the Control Module "Event Log"

The module maintains a log of past alarms and selected status changes. Currently the module is capable of storing the last 250 log events. This is always subject to change with module updates. To view the Event Log , use the Next or Previous buttons until at the top of the screen it reads Event Log Fig.23, press one of either the Instrument Scroll buttons to view the next or last event. The Event Log always contains the most recent events, along with the engine hours



IDMT Alarm

- If the IDMT Alarm is enabled, the controller begins following the IDMT 'curve' when the trip level is passed.
- If the trip is surpassed for an excess amount of time (set at 1 hour) the IDMT Alarm triggers a shutdown.
- High Current Shutdown is a latching alarm and stops the generator.
- Remove the load then press the button to reset the module.
- The higher the overload the faster the trip. The speed of the trip is dependent upon the fixed formula.

Recommended Checks Before Attempting Any Fault Finding

- Unplug all load connected to the generator outputs.
- Check the engine oil level.
- Check the water/coolant level –
- Check the fuel level.
- Check the battery voltage.
- Check fuel pump operation

Generator Running

Once you have carried out the checks above and the engine has started, generator is running, you can then check the AC output values from the generator using the DSE 6110 MK3 module.

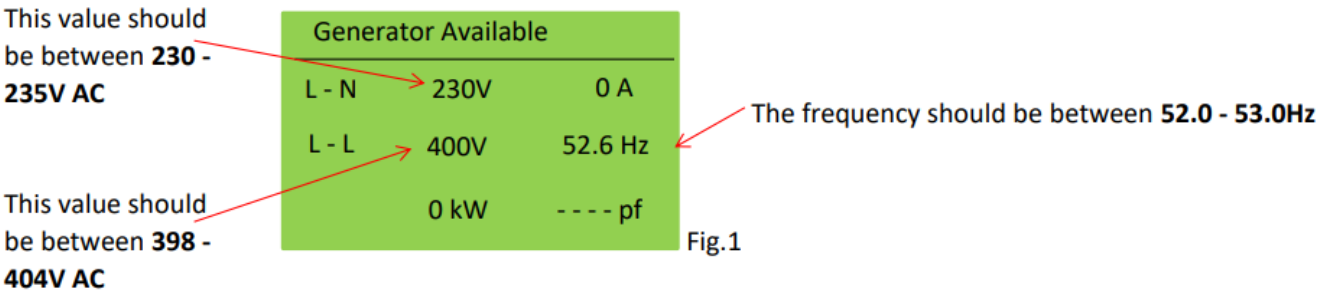


Fig.1

Generator Stops/Shuts down

If the generator stops/shuts down then this would usually because the DSE 6110 MK3 control module has detected a fault condition and has issued a Shutdown Alarm to stop the generator. The DSE 6110 MK3 control module will display an Alarm page to indicate an active alarm

Gen Under Voltage – Shutdown

No Frequency

- The frequency, in most cases, is dependant directly by the rotational speed of the engine. The slower the engine runs, the lower the frequency.
- The Gen Under Frequency shutdown will occur if the engine speed has slowed below a pre-set level. On most cases frequency shutdown will occur for a low frequency
- Check the 6-way diverter valve is in the correct position for the application – local or remote fuel tank.
- Check the condition of the fuel system –
- Fuel Hoses – are the fuel hoses in good condition – also check when generator is running.
- Hose Clips – are not loose from any previous services or are broken/damaged.
- Leaks – check for any fuel leaks.
- External Fuel Tank – check all external connections and fuel hoses for leaks and/or damage.
- Check the condition of the fuel. Try a new fuel source if possible.
- Is the engine due a service – replace the fuel filters and change/replace the water trap filter. It maybe also worth checking the air filter(s) are in good condition – replace is necessary.
- If the above fails to raise or rectify the issue it may be worth checking the engine for possible malfunctions or faults – e.g. injectors, fuel injector pump etc. Refer to engine handbook or engine specialist.

Common Fault Conditions

Fault Condition	Checks & Tests
	• Check E-stop has not been pressed in.
	• Check E-stop switch wires are not loose.
	• Check wiring is not open circuit – check for continuity between each side of the switc h on the back of the E-stop.

Emergency Stop Shutdown	• Check that both wires on the E-stop have continuity to the corresponding positions on the back of the DSE 6110 – wire No.2 & 3.
	• Check that 12V is present across between position 3 and 1 on the back of the DSE 6110 module.
Oil Pressure Shutdown Fault operates after the engine has fired.	• Check oil level and fill to the correct level if necessary.
	• Check engine oil pressure when running. On the DSE 6110 ***Engine*** page. (2 to 5 bar is normal)
	• Check oil pressure sender and switch assembly including pipework – remove & clean – **Oil &** **filter change would be advisable.**
	• Oil switch fault – see below.
	• Oil sender fault – see below.
Oil Pressure Low Switch	• Check continuity between wire No. 43 on the oil switch to the DSE 6110 module (remove from oil switch to test).
	• Check for continuity between the oil switch body to the engine earth.
	• To test the oil pressure switch first remove wire No.43 and link this wire to a clean earth point on the engine. Start the generator, as soon as the engine starts to run remove the wire No.43 from the earth point. If the generator continues to run then this would indicate that the wiring is good and the fault could possibly be the oil pressure switch.
	• Replace oil sender.
Oil Pressure Low Sender (####)	• Check connections at the oil sender
	• Check oil pressure sender and pipework – remove & clean – **Oil & filter change would be** **advisable.**
	• Check continuity between wire No.16 on the DSE 6110 to the oil sender.
	• Check continuity between wire No.15 on the DSE 6110 to engine earth.
	• Check continuity between wire No.1 on the oil sender to engine earth.
	• Replace oil sender.
	Fail to stop could indicate a faulty oil pressure switch!

Fail to Stop Alarm after 1 to 2 min utes when engine is a t rest.	• Check oil pressure switch and pipework – remove & clean – **Oil & filter change wou ld be** **advisable.**
	• Check for loose wires on the oil switch.
	• Check continuity between wire No.43 from the DSE 6110 to the oil switch.
	• Replace oil switch.

High Engine Temper ature	• Check engine temperature display on the DSE 6110 – ***Engine*** page. High engine te mperature shutdown is set at 110 °C.
	• Check water/antifreeze level in the radiator.
	<u>Caution</u> hot steam can burn!
	• Check the inside face of the radiator is not obstructed with oil/dirt or debris.
	• Check the condition of the fan belt, damaged, broken or loose.
	<u>Note</u> You may experience low battery charge DC if the fan belt is loose.
	• Check that the generator air inlets and outlets are not obstructed.
	• Check temp switch and sensor wiring.
	• Check wires 13 and 40 in the DSE 6110.
	• Check for continuity from the above wires at the DSE 6110 to the temperature switch and sender.
	If all the above has not solved the high engine temperature issue then the followi ng may apply;
	• Flush the radiator out and replace the water/antifreeze mix 50/50. Use the correct ant ifreeze as indicated near the filler.
	• Check the operation of the engine thermostat.
	• Radiator may be blocked – replace.
	• Possible faulty water pump.
Coolant Level Low Shutdown	• Check water/antifreeze level in the radiator.
	<u>Caution</u> hot steam can burn!
	• Check wiring into the coolant switch.
	• If the generator runs with the plug removed from the coolant sensor, replace the sens or.

	• If the symptoms persist check that the radiator has had the correct antifreeze utilised when serviced?
Charge Alternator F ailure Battery not changing	• Check the condition of the fan belt and tightness.
	Note you may experience low charge if fan belt is loose.
	• Check for loose wires on the charge alternator.
	• Check battery DC voltage while generator running, should be 13.0-15.0V.
	• Check for continuity of wire No.52 from the charge alternator to the starter motor.
	• Check for continuity of wire No.6 from the charge alternator to the DSE 6110.
	• Ensure the exciter wire (No.6) at the charge alternator is around 12V DC, but only wh en the generator is running.
	• Ensure the exciter wire (No.6) at the DSE 6110, is around 12V DC, but only when th e generator is running – no DC volts measured could indicate a faulty DSE 6110 contro l module.
	• Check the condition of the battery and change if necessary.
	• Check/replace the charge alternator.
Hardwire Door Shutdown	• Check the hardwire door is fitted securely
	• Check the magnetic connection behind the hardwire door and control box.
	• Check wiring from the switch to the DSE 6110 wire No.46.
	• Check switch operation. (Open from ground to fault).
Engine runs but gener ator will not take load.	• Check all MCCB/MCB's are in the ON (up) position.
	• Check wiring on the sockets, switches and circuit breakers.
	• Check the *Earth Leakage Relay* hasn't tripped (Ref. Generator handbook)- Bypass o r adjust if necessary.

30-70kVA Generator Not Starting Flow Chart

Documents / Resources

	STEPHILL GENERATORS SSDP30-70 DSE 6110 MK3 Control Module [pdf] User Manual SSDP30-70, DSE 6110 MK3 Control Module, SSDP30-70 DSE 6110 MK3 Control Module

References

- Home | Stephill Generators