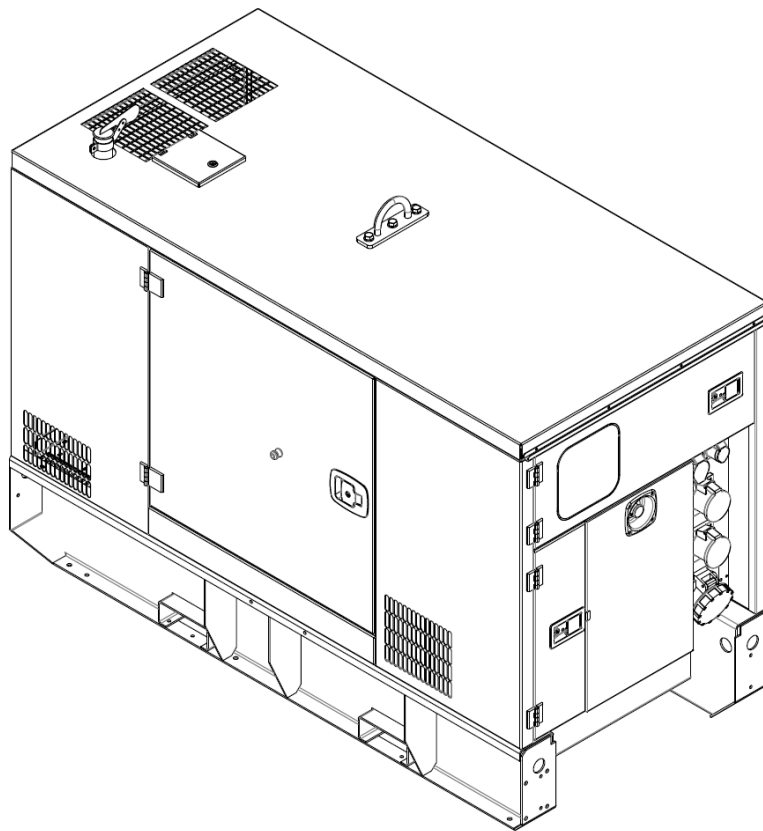




SSDP30 – 70 (All models) Handbook **Deep Sea Electronics 6110MKII**



**DO NOT OPERATE THE GENERATOR BEFORE READING THIS MANUAL AND ENGINE
MANUFACTURER'S OWNER'S MANUAL AND WARNINGS.**

**THIS STEPHILL GENERATOR HAS BEEN DESIGNED TO PROVIDE SAFE AND EFFICIENT SERVICE IF
OPERATED AND MAINTAINED CORRECTLY.**

**MANY ACCIDENTS OCCUR THROUGH FAILURE TO ADHERE TO FUNDAMENTAL SAFETY
PROCEDURES.**

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1 SPECIFICATION

	SSDP30/33 SSDP36A		SSDP50 SSDP50A		SSDP70 SSDP70A	
	Standby	Prime	Standby	Prime	Standby	Prime
kVA	33	30	50	50	67	60
kW	26.4	24	40	40	53.6	48
400/230V	33kVA	30kVA	50kVA	45kVA	67kVA	60kVA
Engine Perkins	1103A-33G - SSDP33 1103D-33G2 - SSDP36A		1103A-33TG1 - SSDP50 1104D-44TG2 - SSDP50A		1103A-33TG2 - SSDP70 1104D-44TG2 - SSDP70A	
Alternator	ECP32-3S/4		ECP32-1L/4		ECP32-3L/4	

	SSDP30/33 SSDP36A		SSDP50 SSDP50A		SSDP70 SSDP70A	
	Skid	Road Trailer	Skid	Road Trailer	Skid	Road Trailer
Wet Weight	1490Kg	1690Kg	1670Kg	1880Kg	1700Kg	1910Kg
Length	2050mm	3800mm	2300mm	4000mm	2300mm	4000mm
Width	1000mm	1620mm	1000mm	1620mm	1000mm	1620mm
Height	1450mm	1950mm	1450mm	1950mm	1450mm	1950mm
Fuel tank Litres	280		350		350	
Fuel tank working capacity	260		330		330	
	SSDP30/33	SSDP36A	SSDP50	SSDP50A	SSDP70	SSDP70A
Hours run 100% load prime	36	33	31	31	24	20
Hours run 75% load prime	48	42	40	40	31	26
LWA	90	90	89	88	89	88
dBA @ 7M	65	65	64	63	64	63
Sockets						
400V	1 x 32A		1 x 32A 1 x 63A		1 x 32A 1 x 63A	
230V	3 x 32A		2 x 32A 1 x 16A		2 x 32A 1 x 16A	

Note

Fuel tank working capacity
P33 = 260 Litres P50/67 = 330 Litres
Hours run are based on these figures.

2 GENERAL SAFETY

2.1 Warning signs

Warnings shown on the machine should be observed at all times. The warning signs should be checked for legibility and any that have become damaged should be replaced.

2.2 Safety hazards

Do not climb on the generator, as dents may cause overheating of the acoustic lining.
It is important to keep the generator clean and well serviced, in particular keep all air vents / louvers clear of debris to prevent poor performance or possible overheating and permanent damage to the generator. Keep well clear of moving parts on the generator at all times.

3 POTENTIAL HAZARDS

3.1 Auxiliary power

The electricity produced by an engine driven Generator is very similar to mains electricity and should be treated accordingly.

Do not remove covers and attempt to work on the Generator while the engine is running.

Check the rating and electrical safety of the load before connecting the Generator.

Equipment should never be connected that in total exceeds the specified rating of the Generator.

Installation of the generator as a standby or secondary power source should only be undertaken by a fully qualified electrician using the appropriate means of isolation from the mains supply. Installation must comply with all applicable laws and electrical codes.

3.2 Operating Environment

The Generator should always be operated on ground level.

3.3 Temperature Range

A temperature range between -15°C and +45°C are the normal limits of operation. Operating outside the range will require additional modifications.

3.4 Reference Relative Humidity

The standard reference condition for relative humidity is 30%. Above this value the rated power must be reduced.

3.5 Reference Barometric Pressure

The standard reference condition for total barometric pressure is 1 bar.

This corresponds to an altitude of approximately 100m. Above 100m the rated power must be reduced.

3.6 Flammable Environment

Stephill Generators must not be used in a flammable environment.

3.7 Saline Environment

Operation of the machine in a saline environment will require additional corrosion protection.

4 SAFETY CONSIDERATIONS

4.1 General

All Stephill Generators comply with all the current EEC directives including:

2006/42/EC Machinery Directive

2000/14/EC Noise Emission in the Environment by Equipment for use Outdoors

2004/108/EC EMC Directive

2006/95/EC Low Voltage Directive

4.2 Fuel

Fuels and lubricants are a potential source of fire. Be careful not to spill fuel, clean up any spillages. Inhalation or swallowing of Diesel should be avoided. If in doubt seek medical advice. All other forms of contact are irritant and therefore should also be avoided. If skin contact is made wash with soap and water.

4.3 Bunded tank

This generator is fitted with a secondary containment system (Bunded tank). The bund will need to be inspected on a regular basis and drained accordingly. Any liquid drained from the Bund/Tank will have to be treated as Oil/Fuel contaminated waste and disposed of accordingly.

Warning

Although this generator is fitted with a Bunded tank it is the duty of the owner to ensure that it meets with Local/National regulations dependant on site location etc.

4.4 Lubricating Oil

New oil presents no hazard following short term exposure. Lubricants in particular used engine oil, are potentially carcinogenic. Direct contact should always be avoided by wearing suitable rubber gloves when handling them. Used oil should not be allowed to contact the skin. If this does occur, wash off quickly with a proprietary hand cleanser.

4.5 Safe Lifting

Where mechanical assistance is used in lifting machines, ensure the lifting eye is used, and that all components used to lift the machine are within their Safe Working Load (SWL).

The integral lifting beam and associated lifting eye on the generator should be regularly checked for signs of damage or gross corrosion.

All Nuts and Bolts associated with the lifting beam should be regularly checked for tightness and corrosion.

Lifting equipment should not be attached directly to the Engine/Alternator except for lifting of Engine/Alternator only.

4.6 Earth connection

All Stephill products are fitted with an earth stud on the control panel this must be connected to an earthing system or spike. Any earth spike required is dependant on the local conditions of use. The size is determined by reference to current IEE regulations or to a competent electrician.

4.7 Fumes

Make sure that the Generator is at least 2 metres away from any building during operation. Operate in a well ventilated unconfined area, so that fumes can be properly dispersed. Silencer outlet should be facing an open area to prevent fumes being recirculated. There is the danger of asphyxiation due to exhaust gases. Inhalation of poisonous exhaust fumes can lead to serious injury or death. The generator must not be used in a poorly ventilated or enclosed area.

4.8 Noise

Ear protection may be required depending on the combined noise level of the Generator, auxiliary load and the operator's distance from it and the length of exposure. (Noise at Work Regulations 1989)

4.9 Battery Acid

This is corrosive and irritant by all forms of exposure. If skin contact is made wash with clean water.

4.10 Fire

Ensure that suitable fire extinguishers (AFFF or CO₂) are kept within close proximity of the generator. Do not cover, enclose, or obstruct the airflow to the generator during or shortly after use, due to fire hazard or damage to the generator from overheating. Allow the generator to cool after use before storing away. Keep all inflammable objects clear of the Generator.

4.11 Hot parts

There is the danger of burns as parts of the generator will become very hot during use. No part of the engine, alternator or exhaust must be touched during or shortly after operation. Do not operate the generator unless all guards are in place. There is a risk of burns or serious mechanical injury.

5 OPERATING INSTRUCTIONS

5.1 Pre-start checks

Before starting the generator please read the engine owners manual. Check Fuel 'Water & Oil level before attempting to start. Ensure 3 way valve is in correct position. This engine is equipped with an oil' temperature and low water level switch and will shutdown for any of these fault conditions. Inspect the generator visually for signs of fault or damage. Ensure battery isolator switch is switched on.

5.2 Emergency stop

The generator is equipped with an emergency stop button which should only be used in an emergency and not for general stopping.

5.3 Three Way valve

This unit is equipped with a 3 Way valve (3/8" BSP fittings) which needs to be set to the correct position for the Generator to operate 'an instruction label is located next to the fuel filler.

The Engine is fitted with a lift pump for fuel delivery but this is not capable of lifting fuel above 1524mm height with a maximum length of 3048mm and minimum internal diameter of 8mm, this means you can only have the fuel tank 300mm below the level of the generator with 910mm of hose. It is therefore advisable to have the remote fuel tank at a higher level than the generator fuel tank to allow gravity feed to the lift pump. If this is not possible a remote fuel pump with a bypass valve fitted will suffice. If in any doubt please consult manufacturer.

5.4 Fuel lift pump priming

If engine runs out of fuel do not attempt to start until fuel bowl is full of diesel this can be achieved by pressing FUEL PUMP button until bowl is full of diesel, if this is not fitted use manual lever on fuel lift pump. The engine should then self bleed and start.

5.5 Control panel

This generator is equipped with an RCD on the 400/230 Volt supply only. Before connecting plugs into generator please ensure the load is turned off.

If this is not possible turn the circuit breaker to the off position.
 Connect the plugs into the generator.
 Switch on the load / Circuit breaker.
 This unit is also fitted with individual Circuit Breakers on each socket.

Warning

Always switch load off before disconnecting plugs.
 To switch power off at Generator always use circuit breaker.

5.6 Variable RCD ELR-3C

The RCD and Bypass switch should only be adjusted or switched by an electrician with the appropriate test equipment.

ELR-3C Earth Leakage Relay Description

Its wide setting ranges allows user to select the tripping current, in order that the contact voltage values are maintained below 50V as required by the CEI 64-8Standard.

This is also the suitable answer for a proper selectivity, whenever there are other ELR's or/and RCD's downstream or upstream in the line to be protected.

An outstanding characteristic of the present relays, is the permanent control of the Toroidal - ELR circuit.

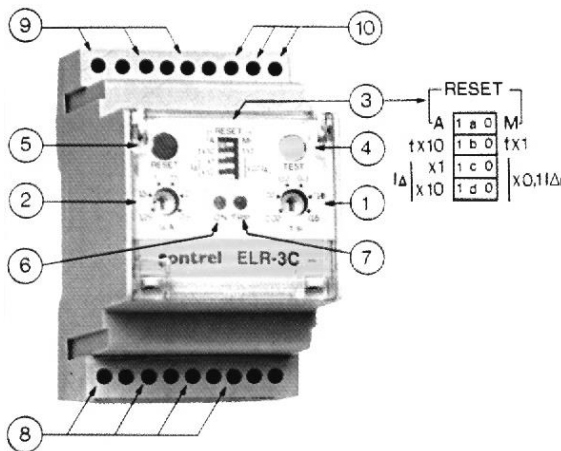
Its interruption brings along the immediate trip of the protection. This allows to identify the anomaly, without waiting to the periodical control, made with the Test push button.

The instrument, fitted with filters at the input circuits, is practically immune to external disturbances, so as the pulse currents with dc components, complying with the requirements of VDE 0664 and project IEC 23 Standards.

The ELR-3C has the possibility of an automatic or manual reset, selectable by a microswitch and to protect the settings by its sealable transparent front cover.

- 1) Current tripping setting potentiometer.
- 2) Tripping time setting potentiometer.
- 3) Micro switches for programming:
 - a In position 1 automatic reset, In position 0 manual reset.
 - b Selection of the multiplying constant.
- Tripping time, in position 1 K=10 in position 0 K=1
- c,d Selection of the multiplying constant of tripping current:
 - With c d in position 0 K=0.1
 - With c in position 1, d in position 0 K=1
 - With c,d in position 1 K=10
- 4) Push button for Test.
- 5) Push button for manual reset.
- 6) Signalling green LED for Aux. Supply presence.
- 7) Signalling red LED for relay tripped.
- 8) Terminals for Aux. Supply.

- 9) Output terminals for end relays
- 10) Connection terminals to T/T CT-1



5.7 Hard wire terminals

Do not attempt to work on the hard wire terminals while the set is running, hard wire door is fitted with a micro switch to shut down generator if door is opened.

The generator is fitted with hard wire terminals which are located under the Circuit breakers, the terminals are clearly marked for 400Volt. They can be accessed by either drilling the steel gland plate or passing the cables through the rubber gland plate. If cables are passed through the rubber gland plate they must be secured with the cable clamp to prevent strain on terminals. The gland plate should be re-fitted prior to running generator.

5.8 Remote start terminals

The generator is equipped with a pair of normally open contacts which will start the generator when closed.

5.9 Long term storage

For storage or long periods of inactivity, Stephill Generators recommend the following: Generators should be stored with oil filled to the correct capacity; Storage periods of 18 months and over may require special lubricants and treatments. If so please seek further advice from the engine manufacturer. Before the generator is used after long term storage, all fuels and oils should be replaced. Generator mounts, pipes and hoses should be checked to ensure that they are un-perished following extended periods of storage. The generator should be stored in a clean dry area, ideally having a reasonable constant ambient temperature, and ideally not below freezing. The battery isolator switch should be switched off.

6 DEEP SEA 6110 MKII Operating instructions





6.1 Controls



CAUTION: The module may instruct an engine start event due to external influences. Therefore, it is possible for the engine to start at any time without warning. Prior to performing any maintenance on the system, it is recommended that steps are taken to remove the battery and isolate supplies.



NOTE: The following descriptions detail the sequences followed by a module containing the standard 'factory configuration'. Always refer to your configuration source for the exact sequences and timers observed by any particular module in the field.

Control of the module is via push buttons mounted on the front of the module with *Stop/Reset Mode* , *Manual Mode* , *Auto Mode*  and *Start*  functions. For normal operation, these are the only controls which need to be operated. Details of their operation are provided later in this document.



DSE 6110 MKII







Control push buttons

Icon	Description
	Stop / Reset Mode This button places the module into its <i>Stop/Reset Mode</i> . This clears any alarm conditions for which the triggering criteria have been removed. If the engine is running and the module is put into Stop mode, the module automatically instructs the generator to unload (<i>Close Generator and Delayed Load Output 1, 2, 3 & 4 become inactive (if used)</i>). The fuel supply de-energises and the engine comes to a standstill. Should any form of <i>remote start signal</i> be present when in <i>Stop Mode</i> the generator remains at rest
	Manual Mode This button places the module into its <i>Manual Mode</i> . Once in <i>Manual Mode</i> , the module responds to the <i>Start</i> button to start the generator and run it off load.
	Auto Mode This button places the module into its <i>Auto Mode</i> . This mode allows the module to control the function of the generator automatically. The module monitors the <i>remote start</i> input and once a start request is made, the set is automatically started and placed on load. Upon removal of the starting signal, the module removes the load from the generator and shut the set down observing the <i>stop delay</i> timer and <i>cooling</i> timer as necessary. The module then waits for the next start event.
	Alarm Mute / Lamp Test This button de-activates the audible alarm output (if configured) and illuminates all of the LEDs on the module's fascia.
	Start This button is only active in the <i>Stop/Reset Mode</i> and <i>Manual Mode</i> . Pressing the <i>Start</i> button in <i>Manual Mode</i> starts the generator and runs it on load.

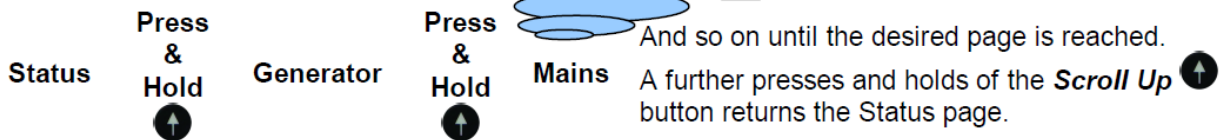
	<p>Menu Navigation Used for navigating the instrumentation, event log and configuration screens.</p>
	<p><i>For further details, please see section entitled 'Operation' elsewhere in this manual.</i></p>

6.2 VIEWING THE INSTRUMENT PAGES

It is possible to scroll to display the different pages of information by pressing and holding either of the **Menu Navigation**   buttons for two seconds to move to the next or previous page.

If you want to view one of the instrument pages towards the end of the list, it may be quicker to scroll down through the pages rather than right!

Example

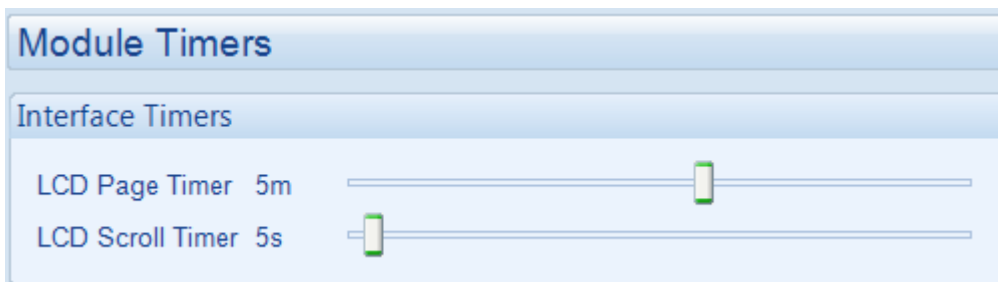




The complete order and contents of each information page are given in the following sections.



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*.

The screenshot below shows the factory settings for the timers, taken from the DSE Configuration Suite PC Software.



Alternatively, to scroll manually through all instruments on the currently selected page, press either of the **Menu Navigation**   buttons. The 'auto scroll' is disabled.

To re-enable 'auto scroll' press and hold either of the **Menu Navigation**   buttons to scroll to the 'title' of the instrumentation page (ie Engine). A short time later (the duration of the *LCD Scroll Timer*), the instrumentation display begins to auto scroll.

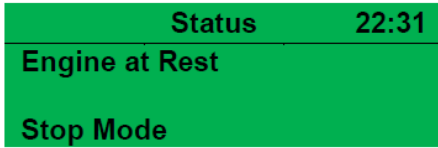
When scrolling manually, the display automatically returns to the Status page if no buttons are pressed for the duration of the configurable *LCD Page Timer*.

If an alarm becomes active while viewing the status page, the display shows the Alarms page to draw the operator's attention to the alarm condition.

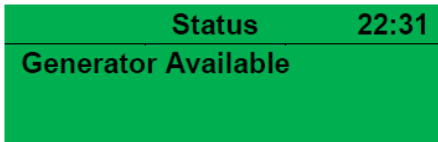
6.2.1 STATUS

This is the 'home' page, the page that is displayed when no other page has been selected, and the page that is automatically displayed after a period of inactivity (*LCD Page Timer*) of the module control buttons.

This page changes with the action of the controller, when the engine is running, that target speed is displayed.

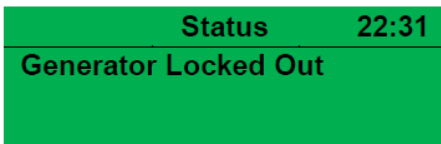





Factory setting of Status screen showing engine stopped...



...and engine running

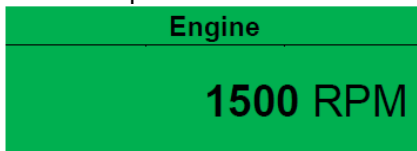
6.2.2 GENERATOR LOCKED OUT



Generator Locked Out indicates that the Generator cannot be started due to an active *Shutdown* or *Electrical Trip Alarm* on the module. Press and hold either of the **Menu Navigation**   buttons to scroll to the alarms page to investigate. Press the **Stop/Reset Mode**  button to clear the alarm, if the alarm does not clear the fault is still active.

6.2.3 ENGINE

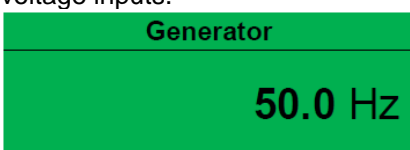
These pages contain instrumentation gathered about the engine measured or derived from the module's inputs.



- Engine Speed
- Oil Pressure
- Coolant Temperature
- Engine Battery Volts
- Engine Run Time
- Fuel Consumption
- Fuel Used
- Fuel Level
- Flexible Sensors
- Engine Maintenance Alarm 1
- Engine Maintenance Alarm 2
- Engine Maintenance Alarm 3

6.2.4 GENERATOR

These pages contain electrical values of the generator, measured or derived from the module's voltage inputs.




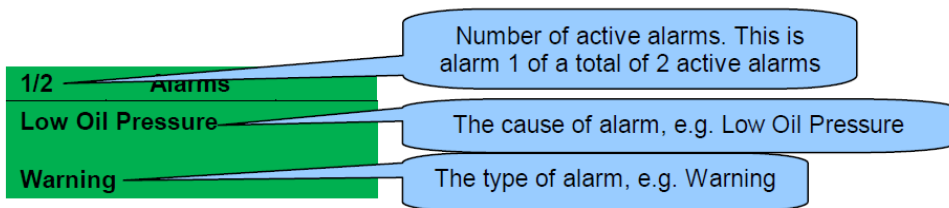
- Generator Voltage (ph-N)
- Generator Voltage (ph-ph)
- Generator Frequency

- Generator Current (A)
- Generator Load ph-N (kW)
- Generator Total Load (kW)
- Generator Load ph-N (kVA)
- Generator Total Load (kVA)
- Generator Power Factor Average
- Generator Load ph-N (kVAr)
- Generator Total Load (kVAr)
- Generator Accumulated Load (kWh, kVAh, kVArh)
- Generator Phase Sequence
- Active Configuration

6.2.5 ALARMS

When an alarm is active, the Common Alarm LED, illuminates and a message appears on the module's display. If configured, the external audible alarm also sounds.

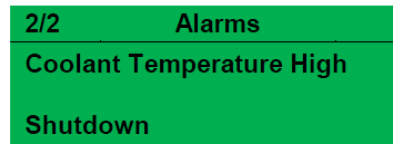
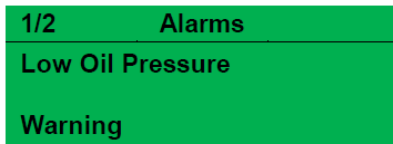
The external audible alarm is silenced by pressing the **Alarm Reset / Lamp Test**  button. The LCD display jumps from the 'Information page' to display the Alarm Page



The LCD displays multiple alarms such as "Coolant Temperature High", "Emergency Stop" and "Low Coolant Warning". These automatically scroll in the order that they occurred.

In the event of an alarm, the LCD displays the appropriate text. If an additional alarm then occurs, the module displays the appropriate text.

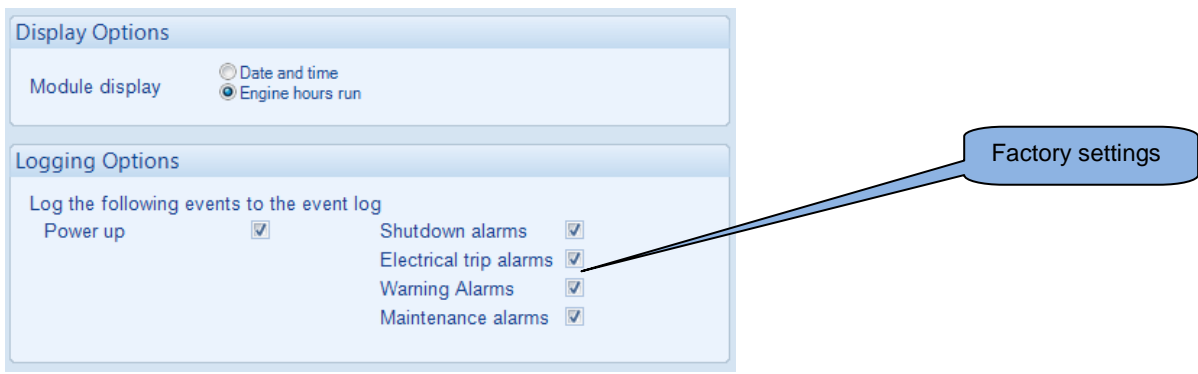
Example:



6.2.6 EVENT LOG

 **NOTE:** For further details of module configuration, refer to DSE Publication: *057-224 DSE6110 MKII & DSE6120 MKII Configuration Software Manual.*

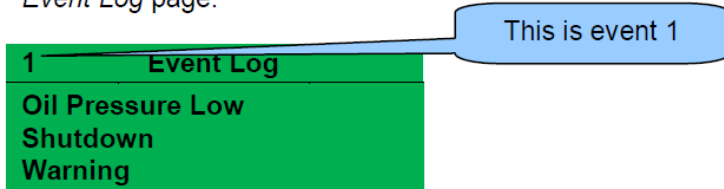
The module maintains a log of past alarms and/or selected status changes. The log size has been increased in the module over past module updates and is always subject to change. At the time of writing, the modules log is capable of storing the last 50 log entries. Under default factory settings, the event log is configured to include all possible options; however, this is configurable by the system designer using the DSE Configuration Suite software.





When the event log is full, any subsequent event overwrites the oldest entry. Hence, the event log always contains the most recent events. The module logs the event type, along with the date and time (or engine running hours if configured to do so).



To view the event log, press and hold either of the **Menu Navigation**   buttons to scroll to the Event Log page.

Event Log page.



Press the **Scroll Down**  button to view the next most recent event.

Continuing to press the **Scroll Down**  button cycles through the past events after which, the display shows the most recent alarm and the cycle begins again.

To exit the event log and return to viewing the instruments, press and hold either of the **Menu Navigation**   buttons to select the next instrumentation page.

7 OPERATION


7.1 STARTING THE ENGINE

Manual Start

Press the **Manual Mode**  button.


Press the **Start**  button.

7.2 STOPPING THE ENGINE

Press Stop/Reset  mode. The generator is stopped.

7.3 STOP/RESET MODE


Stop/Reset Mode is activated by pressing the *Stop/Reset Mode*  button.

In *Stop/Reset Mode* , the module removes the generator from load (if necessary) before stopping the engine if it is already running.


If the engine does not stop when requested, the *Fail To Stop* alarm is activated (subject to the setting of the *Fail to Stop* timer). To detect the engine at rest the following must occur :

- Engine speed is zero.
- Generator AC Voltage and Frequency must be zero.
- Engine Charge Alternator Voltage must be zero.
- Oil pressure sensor must indicate low oil pressure.

When the engine has stopped, it is possible to send configuration files to the module from DSE Configuration Suite PC software and to enter the Front Panel Editor to change parameters.

Any latched alarms that have been cleared are reset when *Stop/Reset*  Mode is entered.

The engine is not started when in *Stop/Reset Mode* . If remote start signals are given, the input is ignored until *Auto Mode* is entered.


When left in *Stop/Reset Mode*  with no presses of the fascia buttons and configured for *Power Save Mode*, the module enters *Power Save Mode*. To 'wake' the module, press any fascia control buttons.


Power Save Mode in the DSE Configuration Suite Software


Power Save Mode Enable




7.4 MANUAL MODE

Manual Mode is activated by pressing the *Manual Mode*  button.

In *Manual Mode* , the set does not start automatically

To begin the starting sequence, press the *Start*  button.

7.4.1 STARTING SEQUENCE

 **NOTE:** There is no *start delay* in this mode of operation.

The fuel relay is energised and the engine is cranked.

If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the *Crank Rest Timer* duration after which the next start attempt is made. Should this sequence continue beyond the set *Number Of Attempts*, the start sequence is terminated and the display shows *Fail to Start*.




The starter motor is disengaged when the engine fires. Speed detection is factory configured to be derived from the AC alternator output frequency.

Additionally, rising oil pressure can be used to disconnect the starter motor (but cannot detect underspeed or overspeed).

After the starter motor has disengaged, the *Safety On Delay* timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilise without triggering the fault.

7.4.2 STOPPING SEQUENCE

In *Manual Mode*  the set does not continue to run until either:

- The *Stop/Reset Mode*  button is pressed – The delayed load outputs are de-activated immediately and the set immediately stops.
- The *Auto Mode*  button is pressed. The set observes all *Auto Mode*  start requests and stopping timers before beginning the *Auto Mode Stopping Sequence*.

7.5 AUTOMATIC MODE

Auto Mode is activated by pressing the *Auto Mode* button.

Auto Mode allows the generator to operate fully automatically, starting and stopping as required with no user intervention.

7.5.1 WAITING IN AUTO MODE

If a starting request is made, the starting sequence begins.

Starting requests can be from the following sources:

- Activation of an auxiliary input that has been configured to *Remote Start*.
- Activation of the inbuilt exercise scheduler.

7.5.2 STARTING SEQUENCE

To allow for 'false' start requests, the *start delay* timer begins.

Should all start requests be removed during the *start delay* timer, the unit returns to a stand-by state.

If a start request is still present at the end of the *start delay* timer, the fuel relay is energised and the engine is cranked.

If the engine fails to fire during this cranking attempt then the starter motor is disengaged for the *Crank Rest* duration after which the next start attempt is made. Should this sequence continue beyond the *Set Number Of Attempts*, the start sequence is terminated and the display shows *Fail to Start*.

The starter motor is disengaged when the engine fires. Speed detection is factory configured to be derived from the AC alternator output frequency, but can additionally be measured from a Magnetic Pickup mounted on the flywheel or from the CAN link to the engine ECU depending on module. Additionally, rising oil pressure can be used to disconnect the starter motor (but cannot detect underspeed or overspeed).

7.5.3 STOPPING SEQUENCE

After the starter motor has disengaged, the *Safety On Delay* timer activates, allowing Oil Pressure, High Engine Temperature, Under-speed, Charge Fail and any delayed Auxiliary fault inputs to stabilise without triggering the fault.


The *Return Delay* timer operates to ensure that the starting request has been permanently removed and isn't just a short term removal. Should another start request be made during the cooling down period, the set returns on load.

If there are no starting requests at the end of the *Return Delay* timer, the load is removed from the generator to the mains supply and the *cooling* timer is initiated.

The *Cooling Down* timer allows the set to run off load and cool sufficiently before being stopped. This is particularly important where turbo chargers are fitted to the engine.

After the *Cooling Down* timer has expired, the set is stopped.

7.6 STOP MODE

- Scheduled runs do not occur when the module is in *Stop/Reset Mode* .


7.7 MANUAL MODE

- Scheduled runs do not occur when the module is in *Manual Mode* waiting for a start request.

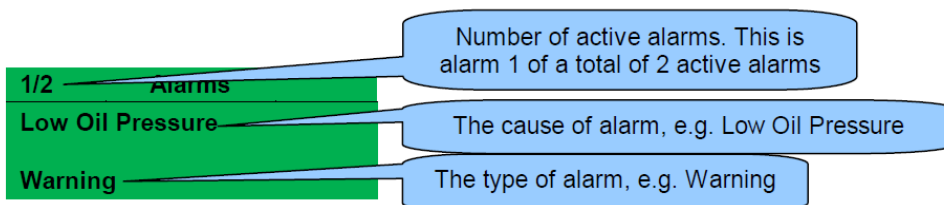
8 PROTECTIONS

8.1 ALARMS

When an alarm is active, the Common Alarm LED, illuminates and a message appears on the module's display. If configured, the external audible alarm also sounds.

The external audible alarm is silenced by pressing the **Alarm Reset / Lamp Test**  button.

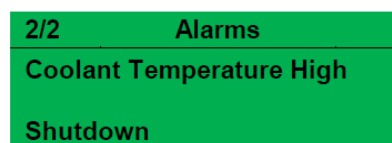
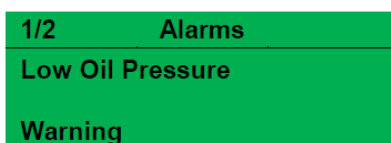
The LCD display jumps from the 'Information page' to display the Alarm Page



The LCD displays multiple alarms such as "*Coolant Temperature High*", "*Emergency Stop*" and "*Low Coolant Warning*". These automatically scroll in the order that they occurred.

In the event of an alarm, the LCD displays the appropriate text. If an additional alarm then occurs, the module displays the appropriate text.

Example:



8.2 WARNING ALARMS


Warnings are non-critical alarm conditions and do not affect the operation of the engine system, they serve to draw the operators attention to an undesirable condition.

Example:


1/2	Alarms
High Coolant Temperature	
Warning	

In the event of an alarm the LCD jumps to the alarms page, and scroll through all active alarms.

By default, warning alarms are self-resetting when the fault condition is removed.

Fault	Description
Analogue Input A to D	The module detects that an input configured to create a fault condition has become active and the appropriate LCD message is displayed.
Battery Over Voltage	The DC supply has risen above the <i>high volts pre-set</i> pre-alarm setting.
Battery Under Voltage	The DC supply has fallen below or risen above the <i>low volts preset</i> pre-alarm setting.
Charge Alternator Failure	The auxiliary charge alternator voltage is low as measured from the W/L terminal.
Coolant Temperature Sensor Fault	The module detects that the circuit to the coolant temperature sensor has been broken.
Delayed Over Current	The measured current has risen above the configured trip level for a configured duration.
Digital Inputs A to F	The module detects that a digital input which has been user configured to create a fault condition has become active and the appropriate LCD message is displayed.
Expansion Unit Failure	The module detects the DSE Net link to the expansion module has failed or communications to the expansion module has been lost.
Fail To Stop	<div data-bbox="544 1066 1254 1178" style="border: 1px solid black; padding: 5px;"> NOTE: Fail to Stop could indicate a faulty oil pressure sensor. If engine is at rest check oil sensor wiring and configuration.</div> <p>The module has detected a condition that indicates that the engine is running when it has been instructed to stop.</p>
Low Fuel Level	The level detected by the fuel level sensor is below the <i>low fuel level pre-set</i> pre-alarm setting.
Maintenance Alarm 1	The module detects that the Maintenance Alarm 1 is due creating a fault condition, the appropriate LCD message is displayed.
Maintenance Alarm 2	The module detects that the Maintenance Alarm 2 is due creating a fault condition, the appropriate LCD message is displayed.
Maintenance Alarm 3	The module detects that the Maintenance Alarm 3 is due creating a fault condition, the appropriate LCD message is displayed.
Oil Pressure Sensor Fault	The module detects that the circuit to the oil pressure sensor has been broken.


8.3 ELECTRICAL TRIP ALARMS

 **NOTE: The alarm condition must be rectified before a reset takes place. If the alarm condition remains, it is not possible to reset the unit (The exception to this is the *Low Oil Pressure alarm* and similar *active from safety on* alarms, as the oil pressure is low with the engine at rest).**

Electrical trips are latching and stop the Generator but in a controlled manner. On initiation of the electrical trip condition the module de-energises all the *Delayed Load Output* and the *Close Gen Output* outputs to remove the load from the generator. Once this has occurred the module starts the Cooling timer and allows the engine to cool off-load before shutting down the engine. The alarm must be accepted and cleared, and the fault removed to reset the module.


Example:

1/2	Alarms
Generator Overcurrent	
Electrical Trip	

Electrical trips are latching alarms and to remove the fault, press the *Stop/Reset Mode*  button on the module.

Fault	Description
Analogue Input A to D	The module detects that an input configured to create a fault condition has become active and the appropriate LCD message is displayed.
Digital Inputs A to F	The module detects that a digital input which has been user configured to create a fault condition has become active and the appropriate LCD message is displayed.
Expansion Unit Failure	The module detects the DSE Net link to the expansion module has failed or communications to the expansion module has been lost.
Low Fuel Level	The level detected by the fuel level sensor is below the low fuel level pre-set pre-alarm setting.


8.4 SHUTDOWN ALARMS

 **NOTE:** The alarm condition must be rectified before a reset takes place. If the alarm condition remains, it is not possible to reset the unit (The exception to this is the *Low Oil Pressure alarm* and similar *active from safety on* alarms, as the oil pressure is low with the engine at rest).

Shutdown alarms are latching and immediately stop the Generator. On initiation of the shutdown condition the module de-energises all the Delayed Load Output and the Close Gen Output outputs to remove the load from the generator. Once this has occurred, the module shuts the generator set down immediately to prevent further damage. The alarm must be accepted and cleared, and the fault removed to reset the module.

Example:

1/2	Alarm
Low Oil Pressure	
Shutdown	

Shutdowns are latching alarms and to remove the fault, press the *Stop/Reset Mode*  button on the module.

Fault	Description
Analogue Input A to D	The module detects that an input configured to create a fault condition has become active and the appropriate LCD message is displayed.
Charge Alternator Failure	The auxiliary charge alternator voltage is low as measured from the W/L terminal.
Coolant Temperature Sensor Fault	The module detects that the circuit to the coolant temperature sensor has been broken.
Emergency Stop	The emergency stop button is pressed. This failsafe (normally closed to emergency stop) input and immediately stops the set when the signal is removed.
Delayed Over Current	The measured current has risen above the configured trip level for a configured duration.
Digital Inputs A to F	The module detects that a digital input which has been user configured to create a fault condition has become active and the appropriate LCD message is displayed.

Expansion Unit Failure	The module detects the DSE Net link to the expansion module has failed or communications to the expansion module has been lost
Generator kW Overload	The measured kW has risen above the configured trip level for a configured duration.
Generator Over Frequency	The generator output frequency has risen above the trip alarm setting.
Generator Over Voltage	The generator output voltage has risen above the trip alarm setting.
Generator Under Frequency	The generator output frequency has fallen below the trip alarm setting after the Safety On timer has expired.
Generator Under Voltage	The generator output voltage has fallen below the pre-set alarm setting after the Safety On timer has expired.
High Coolant Temperature	The module detects that the engine coolant temperature has exceeded the high engine temperature trip alarm setting level after the Safety On timer has expired.
Low Fuel Level	The level detected by the fuel level sensor is below the low fuel level trip alarm setting.
Low Oil Pressure	The module detects that the engine oil pressure has fallen below the low oil pressure trip alarm setting level after the Safety On timer has expired.
Oil Pressure Sensor Fault.	The module detects that the circuit to the oil pressure sensor has been broken.
Over Speed	The engine speed has risen above the over speed trip alarm setting.
Under Speed	The engine speed has fallen below the under speed trip alarm setting.

8.5 HIGH CURRENT SHUTDOWN

The overcurrent alarm combines a simple warning trip level with a fully functioning IDMT curve for thermal protection. Alarm is set at Overload maximum limit.

8.5.1 IMMEDIATE WARNING

The *Immediate Warning* is enabled, the controller generates a *warning alarm* as soon as the *Trip* level is reached. The alarm automatically resets once the generator loading current falls below the *Trip* level. Alarm is set at Prime load maximum limit.


8.5.2 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 the *IDMT Alarm* triggers (*Shutdown* or *Electric trip* as selected in *Action*).

High current shutdown is a latching alarm and stops the Generator.

Remove the fault then press the *Stop/Reset Mode*  button to reset the module.

High current electrical trip is a latching alarm and stops the Generator.

Remove the fault then press the *Stop/Reset Mode*  button to reset the module.

The higher the overload, the faster the trip. The speed of the trip is dependent upon the fixed formula:

$$T = t / ((IA / IT) - 1)^2$$

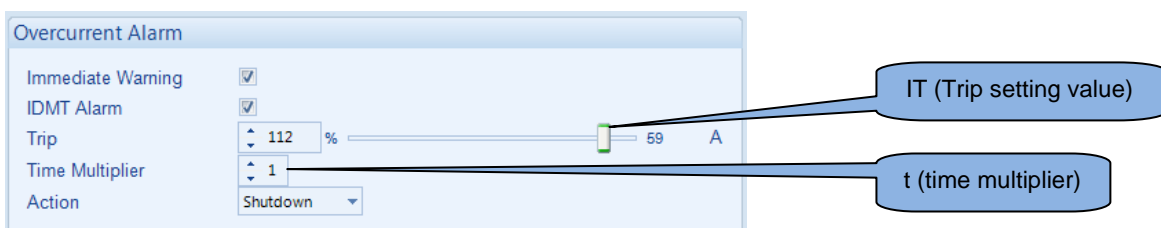
Where: T is the tripping time in seconds

IA is the actual current of the most highly loaded line (L1 or L2 or L3)

IT is the delayed over-current trip point

t is the time multiplier setting and also represents the tripping time in seconds at twice full load (when IA / IT = 2).

Factory settings for the *IDMT Alarm* when used on a brushless alternator are as follows (screen capture from the DSE Configuration Suite PC software :



These settings provide for normal running of the generator up to 100% full load. If full load is surpassed, the *Immediate Warning* alarm is triggered, the set continues to run.

The effect of an overload on the generator is that the alternator windings begin to overheat; the aim of the *IDMT alarm* is to prevent the windings being overloaded (heated) too much. The amount of time that the set can be safely overloaded is governed by how high the overload condition is.

With typical settings as above, this allows for overload of the set to the limits of the *Typical Brushless Alternator* whereby 110% overload is permitted for 1 hour.

8.6 MAINTENANCE ALARM

Maintenance alarms are configured as follows:




- Maintenance alarm 1: Service required 500 Hour intervals
- Maintenance alarm 2: Not used
- Maintenance alarm 3: Not used

When activated, the maintenance alarm is a **Warning** and set continues to run.


Resetting the maintenance alarm is actioned by the site service engineer after performing the required maintenance. The method of reset is by breaking the connection between wires 43 & 1 which are located at the side of the MCCB. Panel must be powered up for re-set to operate.

9.0 FRONT PANEL CONFIGURATION EDITOR




9.1.1 ACCESSING THE FRONT PANEL CONFIGURATION EDITOR

- Ensure the engine is at rest and the module by pressing the **Stop/Reset Mode**  button.
- Press the **Stop/Reset Mode**  and **Tick**  buttons together to enter the front panel configuration editor.




9.1.2 ENTERING PIN







 **NOTE:** The PIN is not set by DSE when the module leaves the factory. If the module has a PIN code set, this has been affected by your engine supplier who should be contacted if you require the code. If the code has been 'lost' or 'forgotten', the module must be returned to the DSE factory to have the module's code removed. A charge is made for this procedure. **NB - This procedure cannot be performed away from the DSE factory.**

 **NOTE:** The PIN is automatically reset when the editor is exited (manually or automatically) to ensure security.

- Pin number 1234.
- If a module security PIN has been set, the PIN request is then shown.
- Press the **Tick**  button, the first '#' changes to '0'. Press the **Previous - & Next +** buttons to adjust it to the correct value.
- Press the **Next +** button when the first digit is correctly entered. The digit you have just entered now shows as '#' for security.
- Press the **Scroll Down**  button to move back to adjust one of the previous digits.
- After editing the final PIN digit, press the **Tick**  button. The PIN is then checked for validity. If the number is not correct, the PIN must be re-entered.
- If the PIN has been successfully entered the editor is displayed.



9.1.3 EDITING A PARAMETER

 **NOTE:** Pressing and holding the **Menu Navigation**   buttons provides the auto-repeat functionality. Values can be changed quickly by holding the navigation buttons for a prolonged period of time.


- Press and hold either of the **Menu Navigation**   buttons to cycle to the section which is required to be edited.
- Press the **Menu Navigation**   buttons to cycle to the parameter within the section chosen to be edited.
- Press the **Tick**  button to edit the parameter. The parameter begins to flash to indicate that the parameter is being edited.
- Press the **Previous – & Next +** buttons to adjust the parameter to the required value.
- Press the **Tick**  button to stop editing the parameter. The parameter ceases flashing to indicate that it the parameter is no longer being edited.

9.1.4 EXITING THE FRONT PANEL CONFIGURATION EDITOR

 **NOTE: The editor automatically exits after 5 minutes of inactivity to ensure security.**

- Press and hold the **Stop/Reset Mode**  button to exit the editor without saving changes.
- Press and hold the **Tick**  button to exit the editor and save the changes.

10 Fault finding 6110

Sympton	Possible Remedy
Unit is inoperative Read/Write configuration does not operate	Check the battery and wiring to the unit. Check the DC supply. Check the DC fuse.
Unit shuts down	Check DC supply voltage is not above 35 Volts or below 9 Volts Check the operating temperature is not above 70°C. Check the DC fuse.
Fail to Start is activated after pre-set number of attempts to start	Check wiring of fuel solenoid. Check fuel. Check battery supply. Check battery supply is present on the Fuel output of the module. Check the speed-sensing signal is present on the module's inputs. Refer to engine manual.
Continuous starting of generator when in the <i>Auto Mode</i> 	Check that there is no signal present on the "Remote Start" input. Check configured polarity is correct. Check the mains supply is available and within configured limits
Generator fails to start on receipt of Remote Start signal.	Check Start Delay timer has timed out. Check signal is on "Remote Start" input. Confirm correct configuration of input is configured to be used as "Remote Start". Check that the oil pressure switch or sensor is indicating low oil pressure to the controller. Depending upon configuration, the set does not start if oil pressure is not low.
Pre-heat inoperative	Check wiring to engine heater plugs. Check battery supply. Check battery supply is present on the Pre-heat output of module. Check pre-heat configuration is correct.
Starter motor inoperative	Check wiring to starter solenoid. Check battery supply. Check battery supply is present on the Starter output of module. Ensure oil pressure switch or sensor is indicating the "low oil pressure" state to the controller.

10.1 ALARMS

Low oil Pressure fault operates after engine has fired	Check engine oil pressure. Check oil pressure switch/sensor and wiring. Check switch is Normally Closed at rest and opens when running.
High engine temperature fault operates after engine has fired.	Check engine temperature. Check switch/sensor and wiring. Check switch is Normally Open and closes to fault.
Shutdown fault operates	Check relevant switch and wiring of fault indicated on LCD display.
Electrical Trip fault operates	Check relevant switch and wiring of fault indicated on LCD display.
Warning fault operates	Check relevant switch and wiring of fault indicated on LCD display.
Incorrect reading on Engine gauges	Check engine is operating correctly. Check sensor and wiring paying particular attention to the wiring to terminal 10 (refer to appendix).
Fail to stop alarm when engine is at rest	Check that Oil sender wiring is correct and correctly earthed.

11 Fault finding general

Fault	Action
High engine temperature	<p>Check Water/Antifreeze level in the radiator.</p> <p>Check for loose wires on the temperature switch & DC loom connector block.</p> <p>Check the continuity of the earth wire. (Refer to wiring diagram)</p> <p>Check radiator surface (both sides) and fins are not obstructed.</p> <p>Check operation of the Temperature switch.</p> <p>Check that the generator air inlets and outlets are not obstructed.</p> <p>Check the fan belt is not damaged, broken or loose. (Refer to handbook)</p> <p><u>Note</u> you may experience low charge if fan belt is loose.</p>
Low oil pressure	<p>Check Oil level and fill to correct level if necessary</p> <p>Check for loose wires on the Oil switch & DC loom connector block.</p> <p>Check the continuity of the earth wire. (Refer to wiring diagram)</p> <p>Check operation of Oil switch.</p>
HZ & Voltage shutdown	<p>Check reset button not tripped and reset if required.</p> <p>Check AC Input at module. 115V or 230V (Dependant on type of generator)</p> <p>Check engine speed is set to 52.5Hz at no load. Adjust if required (Speed should be set when engine is cold)</p> <p>Check AC supply from alternator. (If no output refer to alternator handbook)</p> <p>Check fuse on AVR.</p> <p>Check engine has been regularly serviced.</p>
No power to control module	<p>Check fuse.</p> <p>Check 12V DC supply to module. If supply present but not operational try new unit.</p> <p>Check battery voltage.</p> <p>Check battery isolator switch is on.</p> <p>Check for loose wires on battery isolator.</p> <p>Check for loose wires on the DC connector plug and socket.</p> <p>Check continuity on +VE and -VE wires to battery.</p>
Battery not charging	<p><u>Note</u> you may experience low charge if fan belt is loose.</p> <p>Check for loose wires on the DC connector plug / socket & charge alternator.</p> <p>Check continuity of all wires from charge alternator. (Refer to wiring diagram)</p> <p>Check voltage at battery while generator is running, voltage should be 13.4 - 14.4V.</p> <p>Check battery voltage is above 12.5V.</p>
Engine not starting	<p>Check Oil level and fill to correct level if necessary.</p> <p>Check fuel level.</p> <p>Check 3 way valves are in correct position. (If fitted)</p> <p>Check operation of fuel lift pump.</p> <p>Check fuel is reaching the injectors. When running correctly fuel should be running freely from the injector return pipe. If no fuel running from return check the fuel filters & check condition of fuel.</p> <p>Check no air in system. Keep fuel pump running using prime button for 60 secs.</p>
Glow plugs not operating	<p>Check Emergency stop.</p> <p>Check the fuses.</p> <p>Check battery voltage is above 12.5V.</p> <p>Check for loose wires on the Glow plug, relays, fuses, module terminals, plug and socket.</p>
Glow plugs not operating	<p>Check -VE supply.</p> <p>Check +VE on Glow plug & trace back to battery via relay.</p> <p>Check +VE on Glow plug & trace back to module via relay, plug & socket.</p>
Starter Motor not operating	<p>Check Emergency stop.</p> <p>Check the fuses.</p> <p>Check battery voltage is above 12.5V.</p>
Starter Motor not operating	<p>Check for loose wires on the solenoid, relays, fuses, module terminals, plug and socket.</p> <p>Check +VE supply from battery to starter motor via isolator switch.</p> <p>Check -VE supply.</p> <p>Check start terminal on Starter motor & trace back to module via relay, plug & socket.</p>

Fuel solenoid not operating	<p>Does the Fuel solenoid energises when the starter motor turns over.</p> <p>Check Emergency stop.</p> <p>Check the fuses.</p> <p>Check battery voltage is above 12.5V.</p> <p>Check for loose wires on the solenoid, relays, fuses, module terminals, plug and socket.</p> <p>Check -VE supply.</p> <p>Check +VE on Fuel solenoid & trace back to battery via relay.</p> <p>Check +VE on Fuel solenoid & trace back to module via relay, plug & socket.</p>
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12 SPARES

12.1 Perkins consumable spares

Owing to the amount of times Perkins amends the parts they fit to each engine we will require the full engine build list and serial number. The build list number is generally two letters followed by five numbers with the serial number usually beginning with a J, N or a U followed by six numbers and a final letter. E.g.: AA12345U123456X.

Usually the part numbers are on the filters or in the case of air filters on the air cleaner cover.

We have implemented writing the part numbers to the test sheet should the numbers become illegible in which case quote the Stephill Generators serial number.

12.2 SSDP33-70 Spares

Description	P30/33 1103A- 33G	P36A 1103C- 33TG1	P50 1103A- 33TG1	P70 1104C- 44NA	P70A 1104D- 44TG3
Perkins Engine	011-0018	011-0019	011-0007	011-0020	011-0035
Meccalte ECP Alternator	018-0043	018-0043	018-0059	018-0059	018-0059
Reactive silencer MK1 (1 st Silencer)	016-0133	016-0133	016-0175	016-0175	016-0175
Absorption Silencer MK1 (With tail pipe)	016-0135	016-0135	016-0176	016-0176	016-0176
U Pipe (with above)	016-0136	016-0136	016-0177	016-0177	016-0177
Reactive Silencer MK2 (No U pipe)	016-0269	016-0269	016-0315	016-0315	016-0315
Absorption Silencer MK2 (With tail pipe)	016-0270	016-0270	016-0316	016-0316	016-0315
Manifold flex pipe	016-0145	016-0145	016-0178	016-0178	016-0218
Rain cap	016-1054	016-1054	016-1069	016-1069	016-1069
Transit mount Qty 4	027-0050	027-0050	027-0050	027-0050	027-0050

12.3 General spares

Part Number	Description	Qty
045-0004	Key FT105	1
048-0008	Fuel cap	1
016-0148	Polycarbonate door (Does not include steel door)	1
023-1047	Exhaust bandage	3M
016-1052	Temperature sender	1
045-0063	Deep sea 6110	1
016-1081	Handle slam lock (Canopy door)	3
024-1001	Control panel slam lock (Control panel and Hard wire door)	2
023-1027	Hinge Black 76mm (Canopy door)	6
023-1021	Housing radiator lock	1
023-1020	Insert slot 2 x 4 radiator lock	1
023-1019	Cam 28mm radiator lock	1
023-1023	Door seal	6
023-1025	Radiator flap seal	0.5
014-1000	Door hinge M5 (Control panel door)	4
016-1051	Liquid level sensor (Radiator)	1
014-1007	Packard mating kit (Liquid level sensor)	1
016-1050	Emergency stop pan (Housing only)	1
045-0018	Emergency stop button	1
045-0024	Push button and mounting collar Blue	1
045-0032	Auxiliary contact block N/C	2
056-0002	1 Pole 30Amp relay	1

Part Number	Description	Qty
056-0005	Relay base 30Amp	1
036-0069	Fuse holder	1
036-0101	30Amp fuse	1
036-0058	50 Amp fuse	1
045-0031	150/5 Current transformer	3
036-0023	50Amp 4 Pole MCB	1
036-0037	63Amp 4 Pole RCD 30mA	1
036-0016	32Amp 3 Pole MCB	1
036-0014	32Amp 1 Pole MCB	3
038-0103	M8 Terminal stud	5
036-1050	Barrier terminal	2
036-1051	Barrier terminal end plate	1
027-0007	M10 Rubber foot (Door stop)	2
054-0010	Battery 660 CCA – Cold cranking amps to SAEJ537	1
038-0105	Battery terminal cover Red	1
038-0106	Battery terminal cover Black	1
045-0020	Battery isolator switch	1
044-0014	400V 32Amp Socket	1
044-0004	230V 32Amp Socket	3
039-0001	DC Engine wiring loom	1
039-0002	DC Panel loom	1

13 SERVICE AND MAINTENANCE

IMPORTANT WARNING:

After any service on the generator, ensure that all piping and electrical cables are correctly routed and secured away from hot parts. Failure to observe this warning may result in damage to the piping and cables which could result in a fire.

Do not service or work on generator whilst the engine is running. Ensure battery isolator switch is in the off position when working on generator, this will prevent generator from starting.

13.1 Engine service

Service the engine strictly in accordance with the instructions given in the relevant operator manual / handbook. An approved specialist must carry out any maintenance. Any spare parts required should be of genuine manufacturer's origin. Note: failure to adhere to manufacturer's recommended service schedules may invalidate the warranty. Please consult engine operator's manual for full service intervals.

<http://www.perkins.com/>

13.2 Light Load Operation on Diesel Engines

Operating this generator at light loads for long periods can result in carbon build up in the engine, which could cause over heating, poor efficiency and excessive smoking. High levels of carbon in the exhaust outlet and reduced diameter of tail pipe will be an indicator of this, please call Perkins for further information.

13.3 Alternator service

Brushless alternators employed on Stephill Generators are maintenance free. Service must be carried out by competent qualified personnel strictly in accordance with the instructions given in the handbook. Any spare parts required should be of genuine manufacturer's origin. <http://www.meccalte.com/>

14 WARRANTY

All equipment supplied by STEPHILL GENERATORS LTD carries a warranty of 12 months from date of despatch.

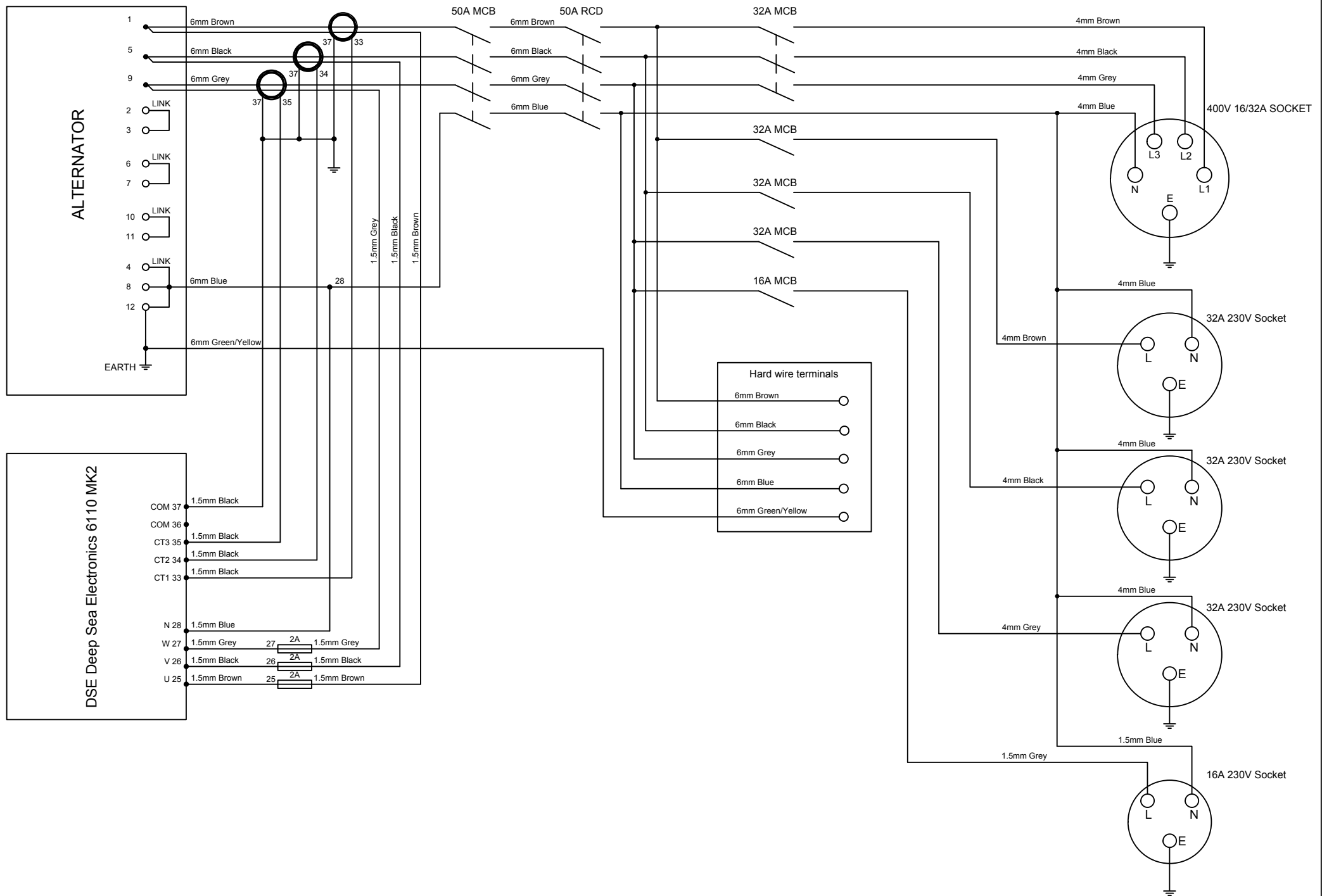
During the warranty period, should the plant fail due to faulty design, materials or workmanship by STEPHILL GENERATORS LTD or it's sub-contractors, we undertake to rectify the fault.

STEPHILL GENERATORS LTD will accept no responsibility whatsoever for equipment that has failed due to;

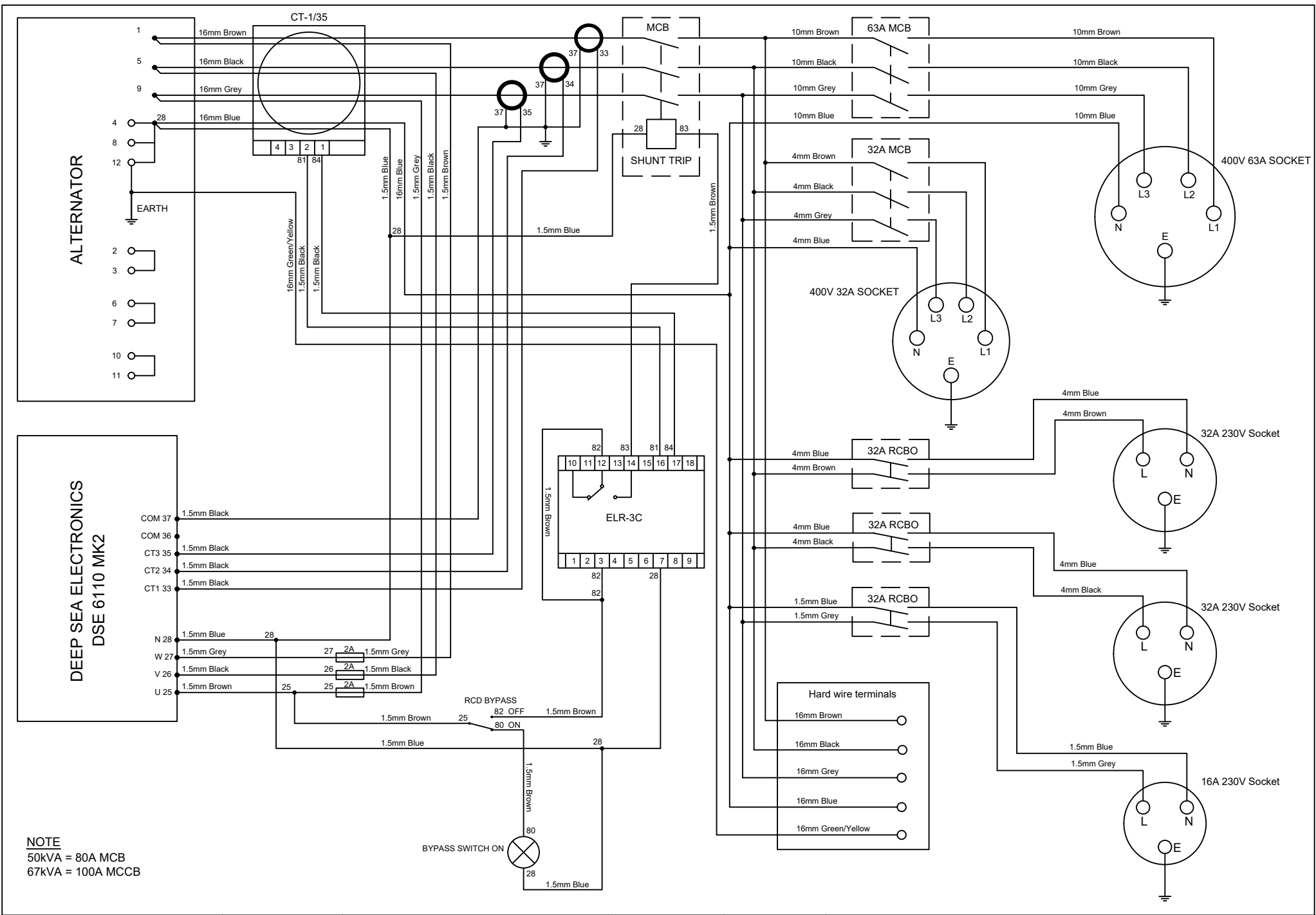
- Operation with incorrect fuel, lubricating oil or coolant.
- Improper repair or use of parts not supplied by STEPHILL GENERATORS LTD.
- Lack of, or incorrect maintenance.
- Fair wear and tear, misuse, negligence, accidental damage, improper storage, incorrect starting / warm-up / run-in or shutdown.

No warranty claim will be considered by STEPHILL GENERATORS LTD unless any defective parts are available for inspection by us, or our nominees, to determine the reason or cause of failure, and STEPHILL GENERATORS LTD is given the option of repair or replacement.


STEPHILL GENERATORS LTD are not responsible for incidental or consequential damages, downtime, or other costs due to warrantable failure, and unauthorised alterations made to any product supplied by STEPHILL GENERATORS LTD.



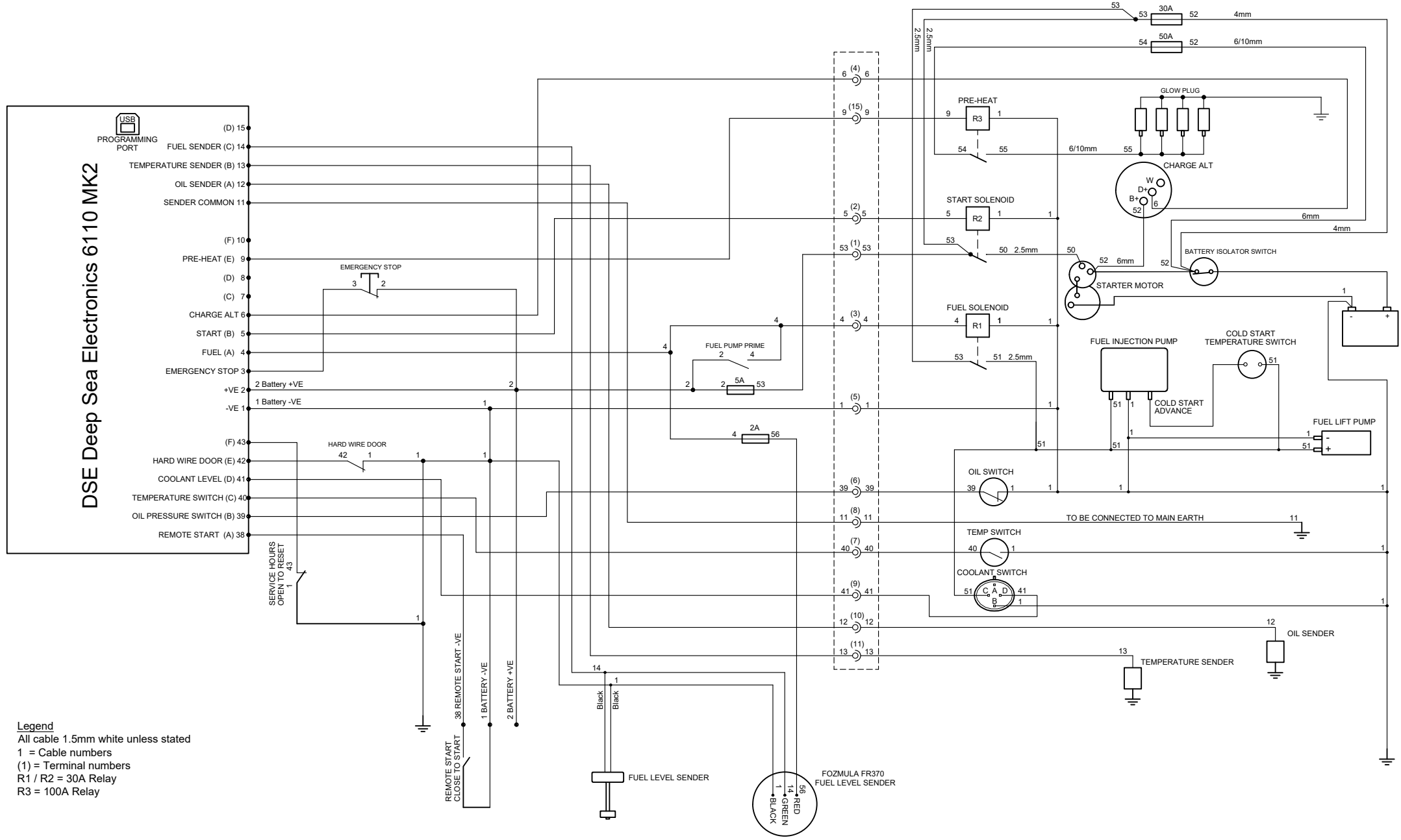
Issue	Date	Revision
A	09-03-15	New drawing.



NOTE
 50kVA = 80A MCB
 67kVA = 100A MCCB

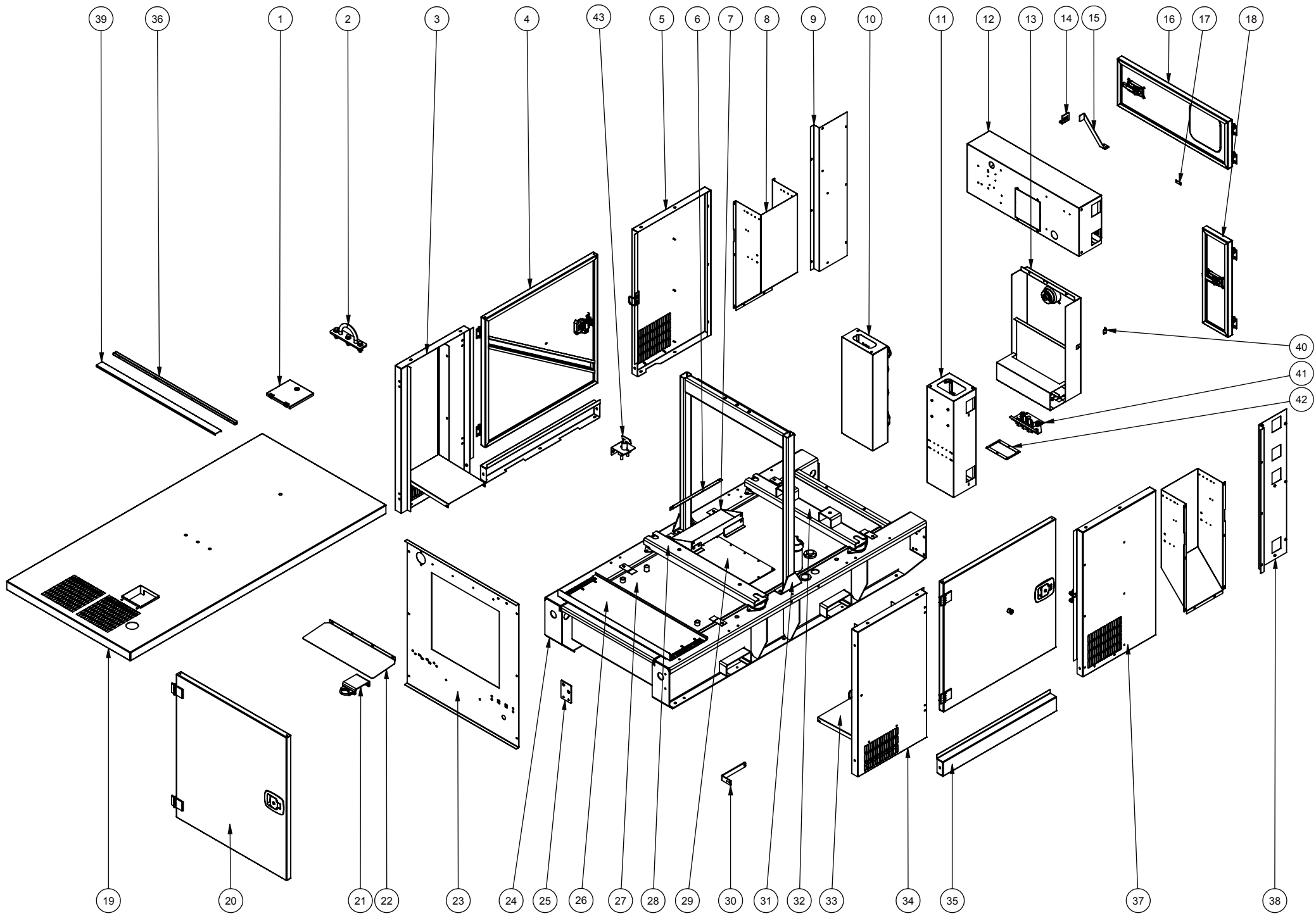
 STEPHILL GENERATORS Phone 01933 677911 Fax 01933 677916	Drawing Number SW30070	Description 50/67kVA 3 Phase wiring with Deep Sea 6110 MK2 1 x 63/32A 400V, 2 x 32A & 1 x 16A 230V sockets with RCBO & variable RCD	Last Number Used 47	Issue A	Date 28-10-16	Revision New drawing.
	Drawn R Golding					


Note
 Glow plug fuse / cable
 4 Cylinder = 80A 10mm
 3 Cylinder = 50A 6mm



Legend
 All cable 1.5mm white unless stated
 1 = Cable numbers
 (1) = Terminal numbers
 R1 / R2 = 30A Relay
 R3 = 100A Relay

<p>STEPHILL GENERATORS Phone 01933 677911 Fax 01933 677916</p>	Drawing Number SW17019	Description Perkins 1100 Series DSE 6110 MK2 with Pre-Heat	Last Number Used 57	Issue	Date	Revision
	Drawn R Golding			D	26-10-16	Wiring added for FR370.
			C	15-07-15	DSE 890 removed & service reset added.	
			B	24-04-15	DSE 890 added.	

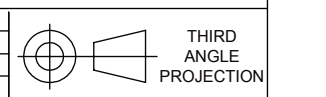



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Drawing Number
 16-313
 Drawn
 R Golding

Description
 SSDP33-70 Mk2 Exploded view

Issue	Date	Revision
A	30/06/14	New drawing



SSDP33 MK2 Canopy		
Item No	Part No	Description
1	016-0132	SSD30 Radiator flap
2	016-0125	SSD30 Lifting eye
3	016-0277	SSD30 MK2 Engine non service side panel
4	016-0101	SSD30 Door
5	016-0262	SSD30 MK2 Alternator non service side panel
6	016-0237	SSD30 MK2 Battery bracket
7	016-0273	SSD30 MK2 Battery tray
8	016-0257	SSD30 MK2 Alternator air inlet duct
9	016-0259	SSD30 MK2 Non service side plate
10	016-0251	SSD30 MK2 Socket panel housing
11	016-0267	SSD30 MK2 Hard wire box
12	016-0264	SSD30 MK2 Control box
13	016-0256	SSD30 MK2 Alternator end panel
14	016-0254	SSD30 MK2 Control panel door catch
15	016-0253	SSD30 MK2 Control panel door stop
16	016-0260	SSD30 MK2 Control panel door
17	016-0265	SSD30 MK2 Hinge spacer
18	016-0250	SSD30 MK2 Hard wire door
19	016-0276	SSD30 MK2 Roof
20	016-0279	SSD30 MK2 Radiator door
21	016-0121	SSD30 Silencer bracket
22	016-0272	SSD30 MK2 Air outlet deflector plate
23	016-0119	SSD30 Radiator plate
24	016-0102	SSD30 Base
25	016-0289	SSD30 MK2 3 Way valve bracket
26	016-0128	SSD30 Bund blank plate
27	016-0274	SSD30 MK2 Fuel tank
28	016-0123	SSD30 Engine channel
29	016-0275	SSD30 MK2 Fuel tank inspection plate
30	016-0305	SSD30 MK2 Fuel filter bracket
31	016-0124	SSD30 Lifting beam
32	016-0122	SSD30 Alternator channel
33	016-0271	SSD30 Mk2 Silencer plate
34	016-0278	SSD30 MK2 Engine service side panel
35	016-0116	SSD30 Door base
36	016-0268	SSD30 MK2 Control panel rain guard
37	016-0261	SSD30 MK2 Alternator service side panel
38	016-0258	SSD30 MK2 Service side plate
39	016-0155	SSD30 Roof foam bracket
40	016-0255	SSD30 MK2 Hard wire door striker
41	016-0286	SSD30 MK2 Cable clamp
42	016-0263	SSD30 MK2 Cable inlet plate
43	016-0290	SSD30 MK2 Battery isolator bracket

SSDP70 MK2 Canopy		
Item No	Part No	Description
1	016-0132	SSD30 Radiator flap
2	016-0125	SSD30 Lifting eye
3	016-0282	SSD70 MK2 Engine non service side panel
4	016-0216	SSD70 Door
5	016-0285	SSD70 MK2 Alternator non service side panel
6	016-0237	SSD30 MK2 Battery bracket
7	016-0273	SSD30 MK2 Battery tray
8	016-0296	SSD70 MK2 Alternator air inlet duct
9	016-0259	SSD30 MK2 Non service side plate
10	016-0251	SSD30 MK2 Socket panel housing
11	016-0267	SSD30 MK2 Hard wire box
12	016-0264	SSD30 MK2 Control box
13	016-0256	SSD30 MK2 Alternator end panel
14	016-0254	SSD30 MK2 Control panel door catch
15	016-0253	SSD30 MK2 Control panel door stop
16	016-0260	SSD30 MK2 Control panel door
17	016-0265	SSD30 MK2 Hinge spacer
18	016-0250	SSD30 MK2 Hard wire door
19	016-0281	SSD70 MK2 1104 Roof
20	016-0279	SSD30 MK2 Radiator door
21	016-0121	SSD30 Silencer bracket
22	016-0272	SSD30 MK2 Air outlet deflector plate
23	016-0119	SSD30 Radiator plate
24	016-0212	SSD70 MK2 Base
25	016-0289	SSD30 MK2 3 Way valve bracket
26	016-0167	SSD70 Bund blank plate
27	016-0287	SSD70 MK2 Fuel tank
28	016-0123	SSD30 Engine channel
29	016-0275	SSD30 MK2 Fuel tank inspection plate
30	016-0305	SSD30 MK2 Fuel filter bracket
31	016-0124	SSD30 Lifting beam
32	016-0122	SSD30 Alternator channel
33	016-0314	SSD70 Mk2 Silencer plate
34	016-0283	SSD70 MK2 Engine service side panel
35	016-0215	SSD70 MK2 Door base
36	016-0268	SSD30 MK2 Control panel rain guard
37	016-0284	SSD70 MK2 Alternator service side panel
38	016-0258	SSD30 MK2 Service side plate
39	016-0155	SSD30 Roof foam bracket
40	016-0255	SSD30 MK2 Hard wire door striker
41	016-0286	SSD30 MK2 Cable clamp
42	016-0263	SSD30 MK2 Cable inlet plate
43	016-0290	SSD30 MK2 Battery isolator bracket