



The Egyptian Co. For Trading & Contracting

Technical Offer

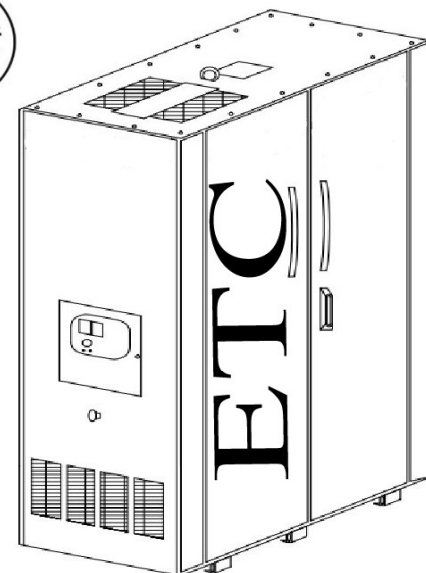
Specifications Sheet for 45kVA Diesel Generator

Salient Features

- Worlds compact and first ever **VERTICAL** model generator
- Turbocharge aspiration enhances the fuel efficiency and improves the output power
- Exclusive integral vibration isolation pads provided for alternator and engine
- Walls of the enclosure are insulated with fire retardant foam
- Powder coated for long lasting life and superior finish
- Alternators are self excited and can be regulated through DSR
- Micro-processor based control panel with AMF logic
- Suitable for sensitive electronic equipments (Generated power has Less than 5% THD)
- FIP, Starter Motor, Dynamo, Filters are Mounted on one side (Easy to repair)

Why Choose Us?

- Occupies 60% less space than any conventional generators
- Color of your choice, 365 colors to choose from
- Inbuilt carbon arrester with super sound reducer
- AMF panel is a standard scope of supply
- Completely sealed bottom to compress noise.
- Fuel filling point is within the enclosure to prevent theft
- Hydraulic spring Anti Vibration isolators are available (optional)
- Fresh air intake is at the bottom and hot air outlet is at the top
- Manufactured in a global standard facility at Bangalore
- One point contact for Sales, Services, Maintenance and Accessories
- NO exhaust, NO cladding , NO piping required for DG sets kept open to sky
- Legs are provided at the bottom to detect any leakages, clean under the genset and easy lifting by fork lift.



Generator Set Ratings

Genset Model	Engine	Alternator	Voltage	Phase	Frequency (Hz)	Prime Rating		Amps
						kWe	kVa	
GVT-45	1103A-33TG1	S1L2-N	415	3	50	39.7	45	63

Alternator Specifications

Parameters	45kVA - Stamford
Model No.	S1L2-N
Type	4Pole
Exciter type	Brushless
Voltage regulator	AVR VITA01
Insulation Material	Class H
Bearing type	Single Bearing SAE 3
Protection Class	IP 23
Excitation	Self Excitation
Frequency, fixed(Hz)	50
Efficiency	90 %
coupling	Flexible disk
Voltage regulation	± 0.5%
Short circuit ratio	0.53
Full load current -3 phase	63
Prime at 125 °C , kVA	45



Engine Specifications

Parameters	45kVA
Engine: model	1103A-33TG1
Engine Type	Compression Ignition, Direct Injection
Engine Layout	INLINE
No. of cylinders	3
Type of Aspiration	Turbocharged
Working Principle	Four Stroke
Firing Order	1-2-3
Type of fuel used	Diesel
Gross rated Power (kW)	42.2
Engine Displacement (L)	3.3
Rated Speed (RPM)	1500
Rated Frequency (Hz)	50
Piston Speed (m/s)	6.4
Bore and Stroke (mm)	105 x 127
Compression ratio (With tolerance)	17.25:1
Governor: type, Class	Mechanical, Class-G2
Max. Dry Weight Kg	420
Max. Wet Weight Kg	438
Frequency regulation, Steady state	ISO 8528
Modified radiator ambient Temperature °C (°F)	50(122)
Overload Capability (RPM)	Rating is with Overload
Rated power kWm (BHP)	46.5 (62)

Diesel Fuel Consumption *	
100% load (Lph)	10.52
75% load (Lph)	7.98

Air Intake Syatem	
Air filter type	Dry Type

Lube Oil Consumption	
100% load	0.1% of SFC

Lubrication System	
Type of Lubrication	Forced Lubrication
Minimum Oil Pressure	4.7
Maximum Oil Pressure	7.5
Oil Sump Capacity Low	6.2
Oil Sump Capacity High	7.8
Total System oil Capacity	8.3

Cooling System	
Type	Liquid Cooled
Nature of liquid & Proportion	water: coolant (50:50)
Coolant Water Capacity (L)	12
Circulating Pump yes/no	Yes
Circulating pump type	Centrifugal
Drive Ratio	1.38:1
Thermostat Type & Setting	Wax type, 76°C ± 2°C
Minimum Cap Pressure (Psi)	7
Max. Top Tank Temperature	110 °C
Water pump type	Impeller
Fan daimeter,including blades,mm	457



Exhaust System	
Max. allowable back pressure, Kpa	10
Exhaust outlet size at engine hookup, mm	56
Silencer type , Qty	Residential, 2

Operating Module: Deep Sea 7320 MKII

Standard features :-

- Master Switch with on/off control
- Remote two-wire start/stop capability
- Auto Start with programmed cranking cycle
- Real Time Clock.
- User settable mains low and High EB settings.
- Powerful manual mode with DG & EB contactor control
- Event logging of last 100 events/fault with date and time stamp.
- Oil pressure, Temperature and Fuel Level sensor interface with display.



Optional Features :

- GPRS based generator monitoring system
- AMF panel can be shifted outside the enclosure and placed elsewhere.

Controller Information

LCD Display	LCD display Faults	Display Warnings
Mains 1/3 phase voltages	DG Overspeed/Underspeed	Low Battery Voltage
Generator 1/3 phase RMS voltage	Over and under voltage	High Battery Voltage
Generator 1/3 phase RMS current	Over and under frequency	Low Fuel Level
Generator Power Factor	Emergency Stop	Maintenance alarm
Generator Power (KW)	Over load current	
Generator KWH	Low lube oil pressure	
Generator Frequency	High water temperature	
Generator RPM	Low fuel	
Generator Battery voltage	Charge fail	
Engine Oil Pressure	Phase reversal	
Engine Temperature		
Engine Fuel Level		
Engine Run Hours		

Fuel System	45 kVA
Type of Injection System	Mechanical Inline
Fuel Filter: Type	Spin-On type Water Separator
Recommended Fuel	Eur RF75-T-96 - Class A2
Fuel tank capacity , Lt	175

Fuel Tank Unit

- Fuel tank unit LR45 is a combo unit which is a consolidation of the following features:

- 1) Electrical resistance output
- 2) Mechanical level indicator
- 3) Low fuel level signal (PFC)
- 4) Mid / High fuel signal (PFC)
- 5) Suction with Strainer
- 6) Return
- 7) Breather
- 8) Dip Stick

- Multiple openings are eliminated needing only one round hole which resolves leakage issues
- Flanges, gaskets and other hardware components are not required





Engine Electrical Sysytem	45kVA
Starter Motor rated voltage VDC	12V
Battery type	automotive lead acid
Battery charging alternator	12V, 12A
Battery Rating	12v -100Ah
Starter Motor Type	Positive Engagement

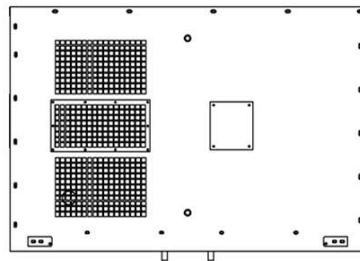
Dimensions and weight

Parameters	
Overall size L x W x H (mm)	1100 x 1550 x 2150
Dry weight (kg)	1350

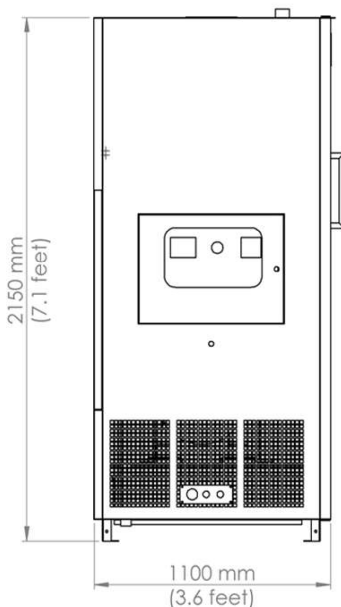
Regulatory Compliance

Parameters	Values / Description
As per ISO 8178 model cycle(Engine Emission)	CPCB II Compliant
Noise level measured at 1 Meter distance	< 75 dB (A)

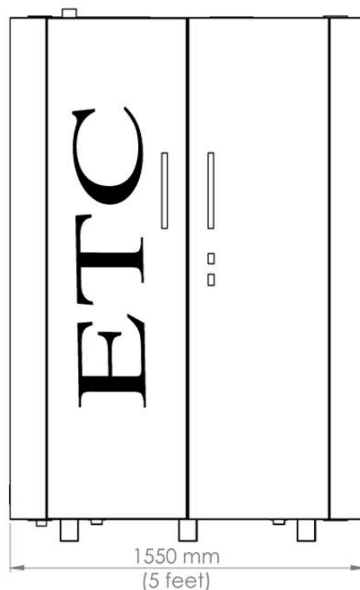
45 kVA SPECIFICATION					
SI NO.	CAPACITY	FREQUENCY	ENGINE MODEL	ALTERNATOR MODEL	RPM
1	45 kVA	50 Hz	1103A-33TG1	S1L2	1500



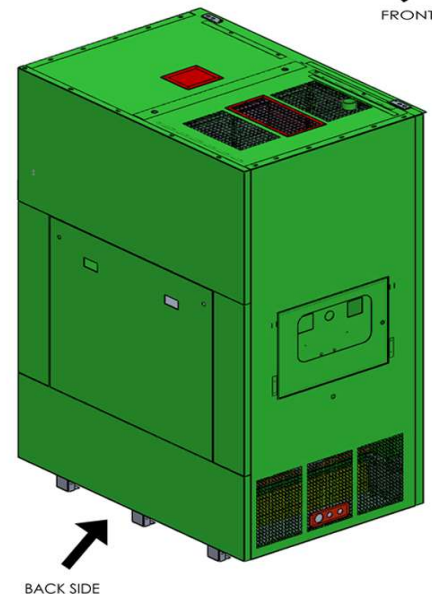
TOP VIEW



LEFT SIDE VIEW



FRONT VIEW



1103A-33TG1

1100

46.5 kWm @ 1500 rpm

54.5 kWm @ 1800 rpm

Genset

Series

Basic technical data

Number of cylinders	3
Cylinder arrangement	Vertical in-line
Cycle	Four stroke
Induction system	Turbocharged
Compression ratio	17.25 : 1
Bore	105 mm (4.13 in)
Stroke	127 mm (4.99 in)
Cubic capacity	3.3 litres
Direction of rotation	Clockwise view from front
Firing order	1,2,3

Weight of Genset (engine only)

Dry	420 kg
Wet	438 kg

Overall dimensions

Height	951 mm (37.44 inches)
Length	1049 mm (41.29 inches)
Width (including mounting brackets)	634 mm (24.96 inches)

Moment of inertia

Engine:

- longitudinal	25 kgm ²
- horizontal	42 kgm ²
- axial	25 kgm ²
Flywheel (polar)	1.14 kgm ²

Centre of gravity (wet)

Forward from rear of block	215 mm (8.46 inches)
Above centre line of block	120 mm (4.72 inches)
Offset of RHS of centre line	25 mm (0.98 inches)

Performance

Steady state speed stability at constant load: G2 $\pm 0.75\%$

Note: All data based on operation to ISO 3046/1, BS 5514 and DIN 6271 standard reference conditions.

Test conditions

Air temperature	25°C
Barometric pressure	100 kPa
Relative humidity	30%

Sound Level

Overall sound pressure level (cooling pack and air cleaner fitted):

@1500 rpm	88.2 dB(A)
@1800 rpm	92.1 dB(A)

Note: Sound pressure level from the mean of 4 microphones at the front, left, right and above the engine. Exhaust was piped away out of the test cell.

Note: If the engine is to operate in ambient conditions other than those of the test conditions, suitable adjustments must be made for these changes. For full details, contact Perkins Technical Service Department.

Cyclic irregularity (for engine and flywheel)

Prime power:

@1500 rpm	$\pm 0.045\%$
@1800 rpm	$\pm 0.031\%$

General installation

1103A-33TG1

Designation	Units	Type of operation and application			
		Prime power 50 Hz	Standby power 50 Hz	Prime power 60 Hz	Standby power 60 Hz
Gross engine power	kWm	42.2	46.5	50.5	54.5
Brake mean effective pressure	kPa (lbf/in ²)	1023 (148.3)	1128 (163.6)	1020 (147.9)	1124 (163.0)
Mean piston speed	m/s (ft/s)	6.35 (20.8)		7.62 (25.0)	
ElectropaK nett engine power	kWm	41.3	45.6	48.8	53.9
Engine coolant flow 35 kPa restriction	litres/min (UK gal/min)	125.5 (27.6)		151.0 (33.2)	
Combustion air flow	m ³ /min (ft ³ /min)	2.9 (102.4)	3.1 (109.4)	3.7 (130.6)	3.9 (137.7)
Exhaust gas flow (maximum)	m ³ /min (ft ³ /min)	7.0 (247.2)	7.7 (271.9)	8.8 (310.7)	9.5 (335.4)
Exhaust gas temperature (maximum) in manifold	°C (°F)	492 (917.6)	537 (999.6)	510 (950.0)	551 (1023.8)
Cooling fan air flow	m ³ /min (ft ³ /min)	53.0 (1871.6)		70.0 (2472.0)	
Overall thermal efficiency (nett)	%	39.8	38.7	39.3	39.1
Typical Genset electrical output (0.8pf 25°C)	kWe	36.0	39.7	42.5	46.9
	kVA	45.0	49.6	53.1	58.7
Assumed alternator efficiency	%	87			

Energy balance

Designation	Units	Prime power 50 Hz	Standby power 50 Hz	Prime power 60 Hz	Standby power 60 Hz
Power in fuel (Fuel heat of combustion)	kW (Btu/min)	106.0 (6033.4)	120.0 (6830.3)	129.0 (7342.6)	142.0 (8082.5)
Power output (gross)	kW (Btu/min)	42.2 (2402.0)	46.5 (2646.7)	50.5 (2874.4)	55.6 (3164.7)
Power to cooling fan	kW (Btu/min)	0.9 (51.2)		1.7 (96.7)	
Power output (nett)	kW (Btu/min)	41.3 (2350.7)	45.6 (2595.5)	49.0 (2789.0)	53.9 (3067.9)
Power to coolant and lubricating oil	kW (Btu/min)	26.0 (1479.9)	30.0 (1707.5)	31.0 (1764.5)	34.0 (1935.2)
Power to exhaust	kW (Btu/min)	30.0 (1707.5)	35.0 (1992.1)	39.0 (2219.8)	43.0 (2447.5)
Power to radiation	kW (Btu/min)	7.0 (398.4)	8.0 (455.3)	8.0 (455.3)	9.0 (512.2)

Note: The airflows shown in this table will provide acceptable cooling for an open power unit operating in ambient temperatures of up to 53 °C (127 °F) or 46 °C (114.8 °F) if a canopy is fitted. If the power unit is to be enclosed totally, a cooling test should be done to check that the engine cooling is acceptable. If there is insufficient cooling, contact Perkins Technical Service Department.

Cooling system

Radiator

Face area 0.276 m² (2.97 ft²)
Rows and materials..... Single row aluminium
Matrix density and material Aluminium 12,5 fins/inch
Width of matrix. 526 mm (20.7 inches)
Height of matrix 524 mm (20.6 inches)
Pressure cap setting 107 kPa

Fan

Diameter 457mm (18 in)
Drive ratio 0.85:1
Number of blades 7
Material Composite
Type Pusher

Coolant

Recommended coolant: 50 % ethylene glycol with a corrosion inhibitor (BS 658 : 1992 or MOD AL39) and 50% clean fresh water.

Total system capacity level corresponds to 'coolant at bottom end of the filler neck'.

Total system capacity, without oil cooler:

With radiator 11.8 l (24.9 pt)
Without radiator 6.3 l (13.3 pt)

Total system capacity, with oil cooler:

With radiator 12.0 l (25.3 pt)
Without radiator 6.5 l (13.7 pt)

Maximum top tank temperature 110 °C (230 °F)
Thermostat operating range..... 82 - 93 °C (180 - 199 °F)

Lubrication system

Lubricating oil capacity

Total system 8.3 litres (17.5 pt)
Sump minimum 6.2 litres (13.1 pt)
Sump maximum 7.8 litres (16.4 pt)
Maximum engine operating angles:
Front up, front down, right side or left side 25°

Lubricating oil pressure

Relief valve opens 415 - 470 kPa
- at maximum no-load speed..... 276 - 414 kPa
Maximum continuous oil temperature 125 °C (257 °F)
Oil consumption at full load as a % of fuel consumption 0.15%

Exhaust system

Maximum back pressure
1500 rpm. 10 kPa
1800 rpm 15 kPa
Exhaust outlet size 56 mm (2.2 inches)

Fuel System

Type of injection Direct
Fuel injection pump Rotary
Fuel atomiser..... Multi-hole
Nozzle opening pressure 29.0 MPa (290 bar)

Fuel lift pump

Type Mechanical
Flow/hour 120 - 150 litres/h (211 - 264 pt/m)
Pressure 30 - 75 kPa (4.4 - 10.9 psi)
Maximum suction head:
1500 rpm. 20 kPa

Governor type

Mechanical and electronic governor speed control to ISO 8528, G2

Fuel specification

Fuel Specification	European RF75-T-96 / DIN EN590 / BS2869 class A2
Density (kg/l @ 15 °C)	0.835 - 0.845
Viscosity (mm ² /s @ 40 °C)	2.5 - 3.5
Sulphur content (%)	0.1 - 0.2
Cetane number	45 - 50

Fuel consumption litres/hour (UK gals/hr)

Power rating						
Speed	Unit	110%	100%	75%	50%	25%
1500	Litres	11.77	10.52	7.98	5.58	3.28
	Gallons	2.59	2.31	1.76	1.23	0.72
	SFC (g/kwh)	210.6	206.9	209.4	220.4	261

Induction system

Maximum air intake restriction

Clean filter 5 kPa
Dirty filter 8 kPa
Air filter type Dry

Electrical system

Type	Negative ground
Alternator voltage	12 volts
Alternator output	65 amps
Starter motor voltage	12 volts
Starter motor power	3 kW
Number of teeth on flywheel	126
Pull in current of starter motor solenoid	60 amps
Hold in current of starter motor solenoid	15 amps
Engine stop solenoid	12 volts
Stop solenoid (minimum):	
Pull in current	10 amps
Hold in current	10 amps

Cold start recommendations

Minimum cranking speed	105 rpm
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Starter specification

Starter motor type	Minimum starting temperature °C (°F)	Lubricating oil viscosity SAE / battery type - values in CCA			
		15W/40	10W/40	5W/40	5W/30
12 volt 3.0 kW	-10 (14)*	1 x 660			
	-15 (5)*		1 x 660		
	-20 (-4)*			1 x 660	
	-25 (-13)*				2 x 570

* Starting aid fitted

Note: CCA - Cold Cracking Amps to SAEJ537.

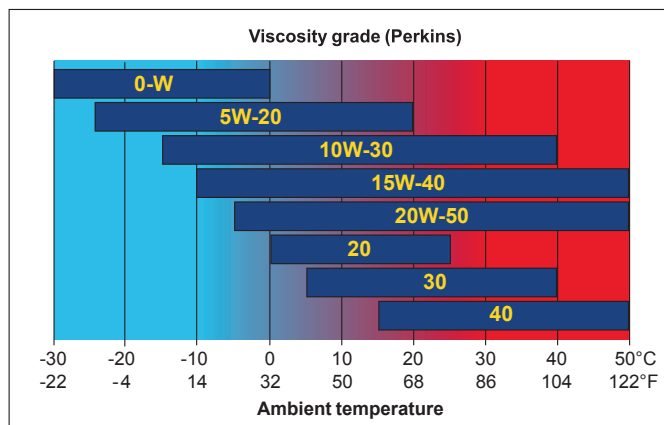
Note: Battery capacity is defined by the 20 hour rate.

Note: If a change to a low viscosity oil is made, the cranking torque necessary at lower ambient temperatures is much reduced. The starting equipment has been selected to take advantage of this. It is important to change the appropriate multigrade oil in anticipation of operating in low ambient temperatures.

Note: Breakaway current is dependent on battery capacity available. Cables should be capable of handling the transient current which may be up to double the steady cranking current.

Recommended SAE viscosity

A single or multigrade oil must be used which conforms to API-CG4 / CH4, see illustration below.



Mountings

Maximum static bending moment at rear face of block...791 Nm (583 lb/ft)

Load acceptance

Initial load application: When engine reaches rated speed (15 seconds maximum after engine starts to crank)			
	Units	1500 rpm	1800 rpm
Prime power	%	90	90
Load	kWm (kWe)	38.0 (32.3)	45.5 (38.2)
Transient frequency deviation	%	< 10	< 10
Frequency recovery	Seconds	< 5	< 5

The above complies with requirements of Classification 3 and 4 of ISO 8528 - 12 and G2 operating limits stated in ISO 8528 - 5.

The above figures were obtained under the test conditions as follows:

Engine block temperature... 105 °C

Alternator efficiency... 87%

Minimum ambient temperature ... 10 °C

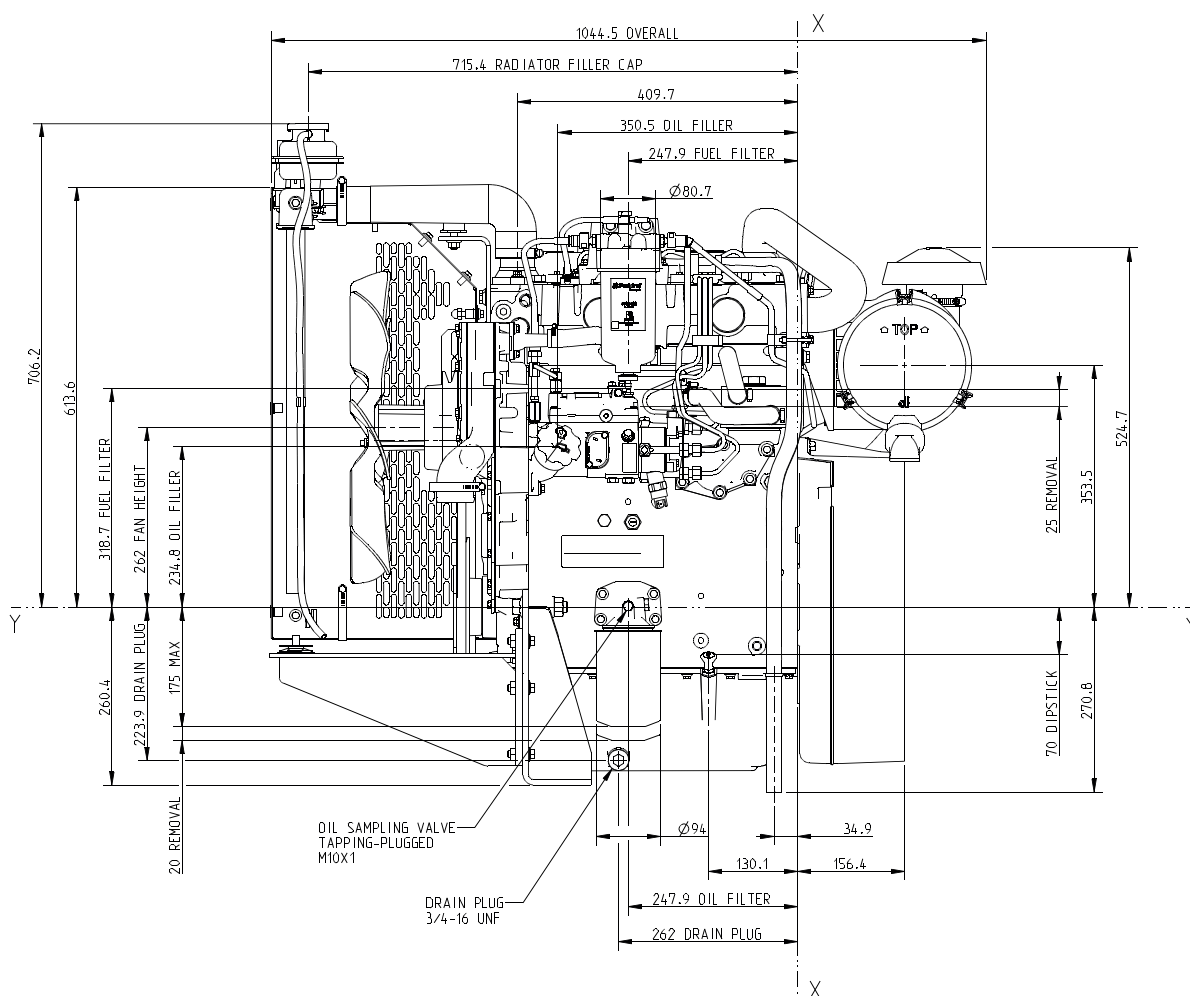
Isochronous governing:

Typical alternator inertia ... 0.364 kgm²

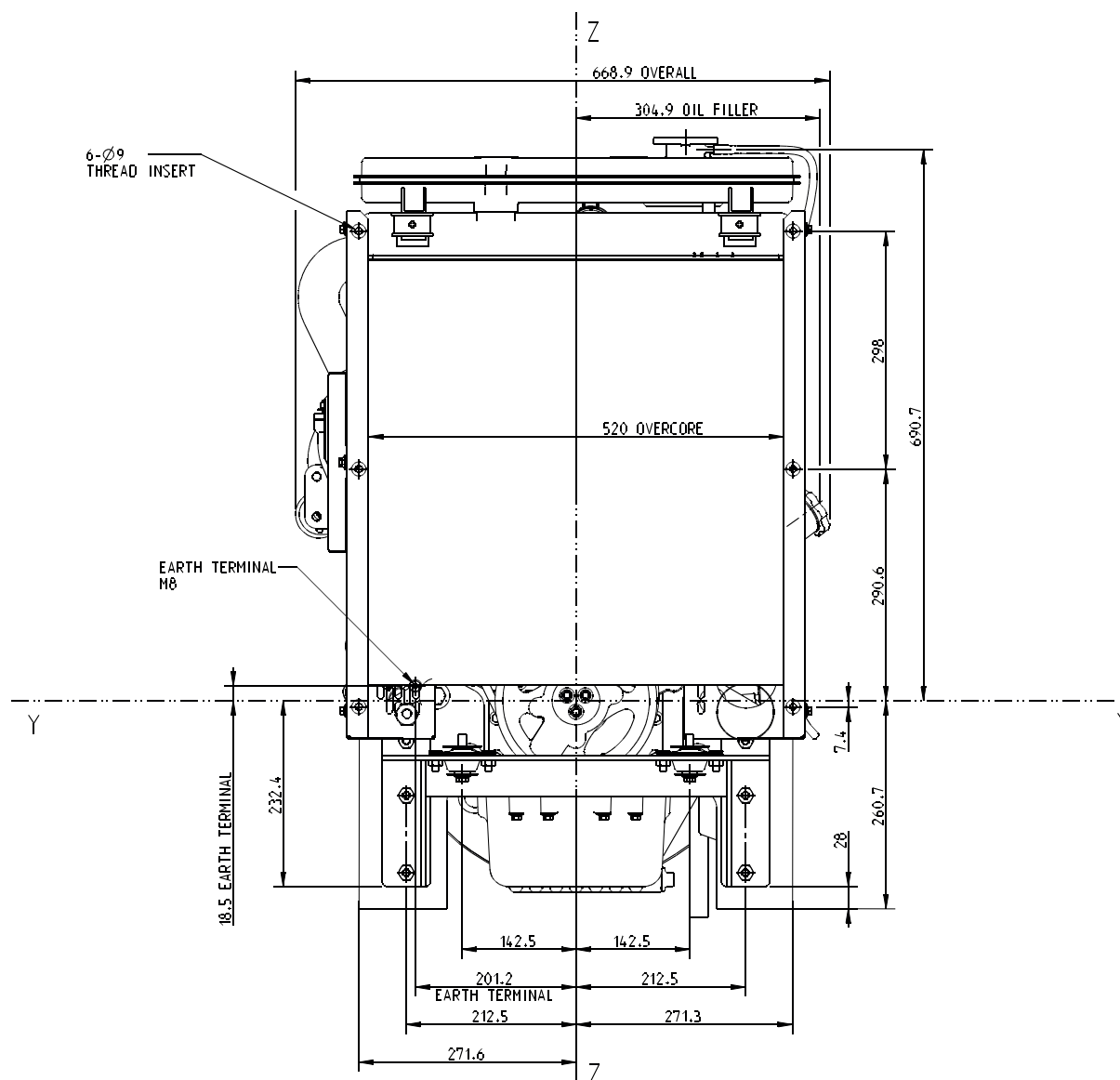
All tests were conducted using an engine installed and serviced to Perkins Engine Company Limited recommendations.

The information given in this document is for guidance only.

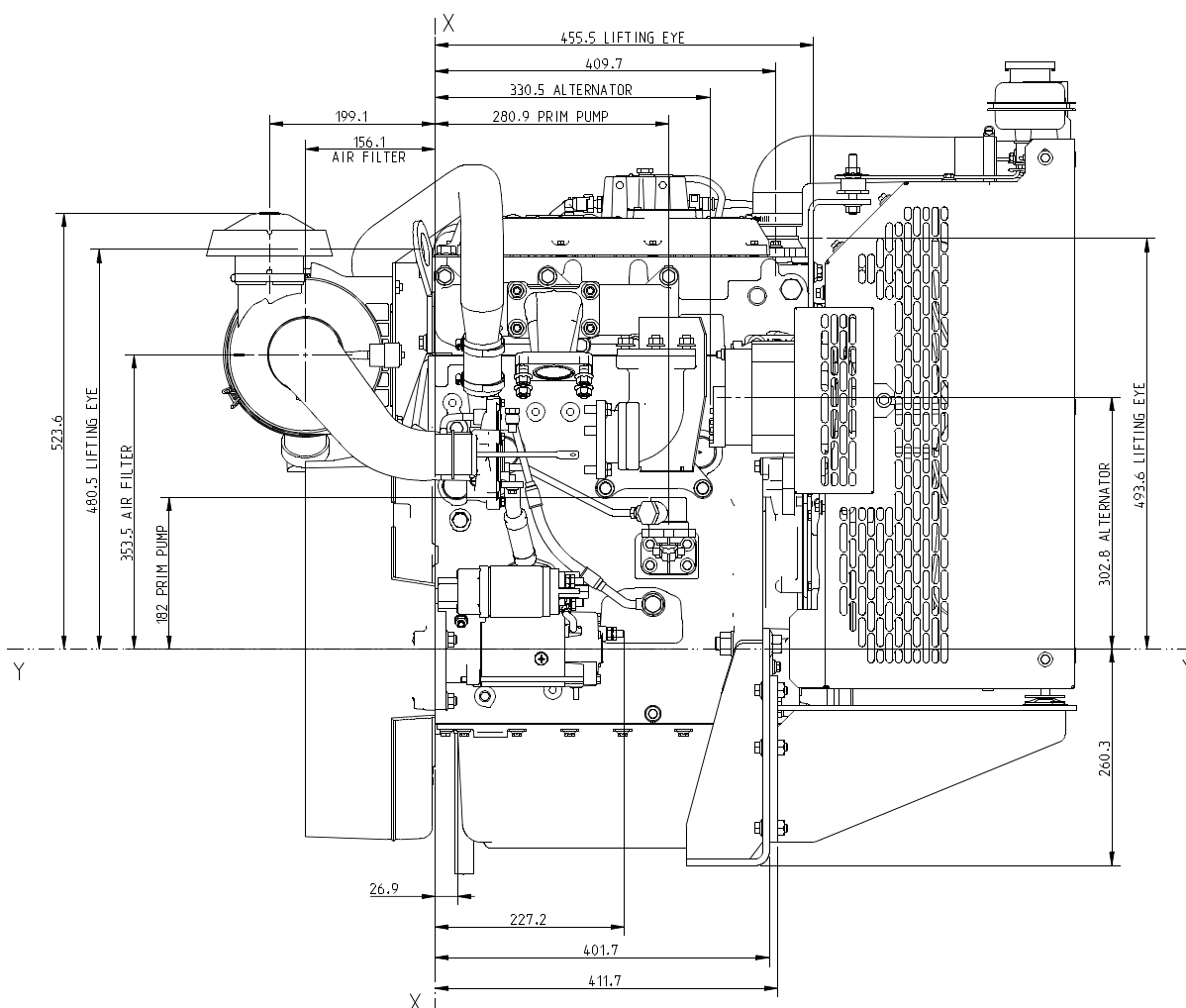
1103A-33TG1 - Left side view



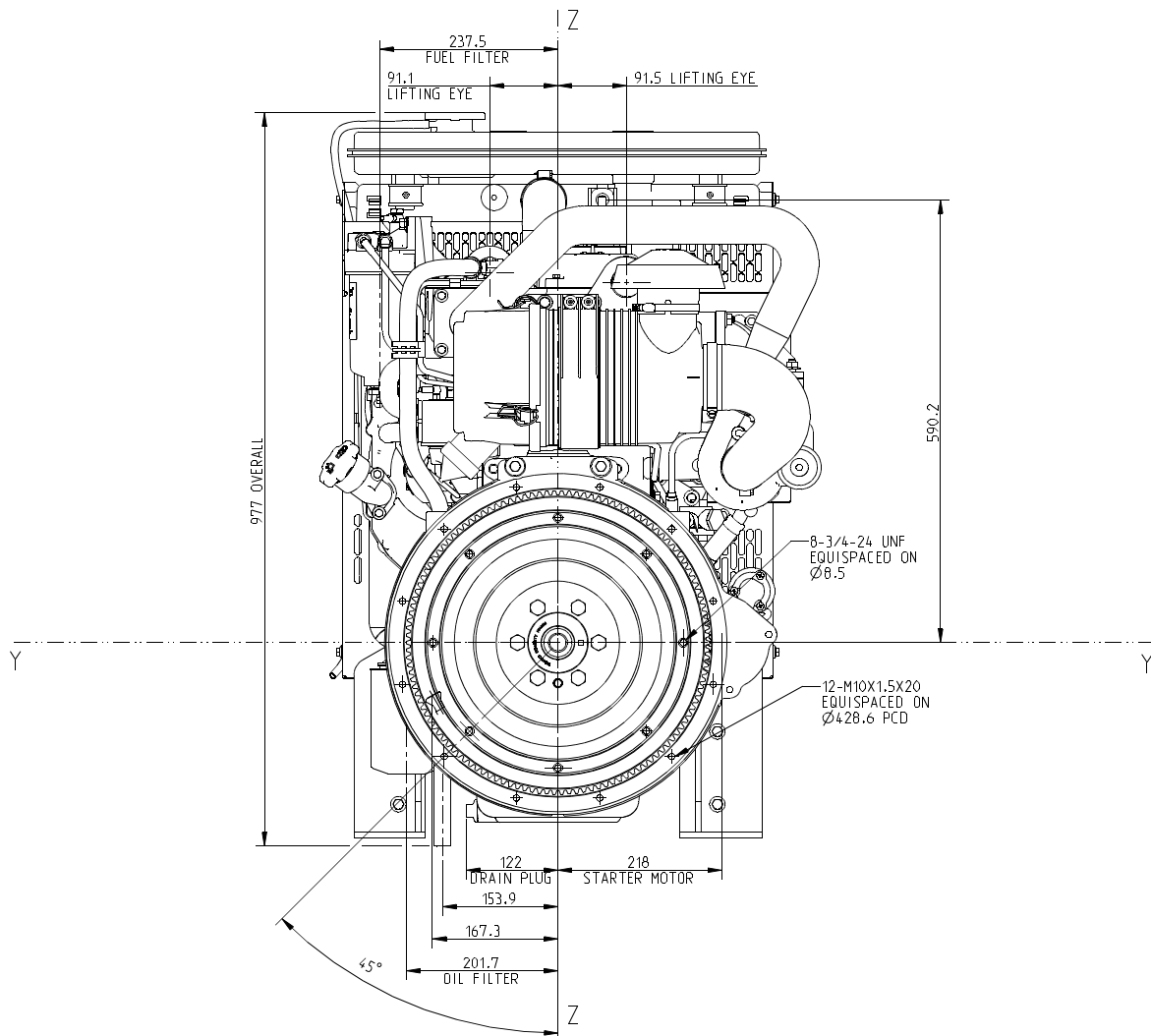
1103A-33TG1 - Front side view



1103A-33TG1 - Right side view



1103A-33TG1 - Rear side view



S1L2-N - Technical Data Sheet

Standards

STAMFORD industrial alternators meet the requirements of IEC EN 60034 and the relevant section of other international standards such as BS5000, VDE 0530, NEMA MG1-32, IEC34, CSA C22.2-100 and AS1359. Other standards and certifications can be considered on request.

Quality Assurance

Alternators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.



Excitation and Voltage Regulators

Excitation System	
AVR Type	AVR Power
VITA01	Self-Excited / Aux winding
Voltage Regulation	± 0.5%
No Load Excitation Voltage (V)	18 V
Full Load Excitation Voltage (V)	47 V

STAMFORD®

S1L2-N Winding 311 / 711

Electrical Data								
Insulation System	Class H							
Stator Winding	Double Layer Concentric							
Winding Pitch	Two Thirds							
Winding Leads	12							
Winding Number	311 / 711							
Number of Poles	4							
IP Rating	IP23							
RFI Suppression	EN 61000-6-2 & EN 61000-6-4, refer to factory for others							
Waveform Distortion	NO LOAD < 2% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%							
Short Circuit Ratio	1/Xd							
Steady State X/R Ratio	8.0							
	50 Hz				60 Hz			
Telephone Interference	THF<2%				TIF<50			
Voltage Series Star	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
Voltage Parallel Star	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
Voltage Series Delta	220/110	230/115	240/120	254/127	240/120	254/127	266/133	277/138
kVA Base Rating (Class H)	41.2	45	45	N/A	47.5	50.4	N/A	54
Saturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	1.987	1.959	1.820		1.912	1.813		1.633
X'd Dir. Axis Transient	0.120	0.118	0.110		0.116	0.110		0.099
X" d Dir. Axis Subtransient	0.131	0.129	0.120		0.126	0.120		0.108
Xq Quad. Axis Reactance	1.096	1.081	1.004		1.055	1.000		0.901
X" q Quad. Axis Subtransient	0.144	0.142	0.132		0.139	0.132		0.118
XL Stator Leakage Reactance	0.071	0.070	0.065		0.068	0.065		0.058
X2 Negative Sequence Reactance	0.191	0.188	0.175		0.184	0.174		0.157
X0 Zero Sequence Reactance	0.041	0.041	0.038		0.040	0.038		0.034
Unsaturated Values in Per Unit at Base Ratings and Voltages								
Xd Dir. Axis Synchronous	2.556	2.519	2.341		2.459	2.332		2.099
X'd Dir. Axis Transient	0.138	0.136	0.127		0.133	0.126		0.113
X" d Dir. Axis Subtransient	0.153	0.151	0.140		0.147	0.140		0.126
Xq Quad. Axis Reactance	1.129	1.113	1.034		1.086	1.030		0.928
X" q Quad. Axis Subtransient	0.173	0.171	0.158		0.166	0.158		0.142
XL Stator Leakage Reactance	0.080	0.079	0.073		0.077	0.073		0.066
X2 Negative Sequence Reactance	0.229	0.226	0.210		0.221	0.209		0.188
X0 Zero Sequence Reactance	0.049	0.048	0.044		0.047	0.044		0.040
Time Constants (Seconds)								
T'd TRANSIENT TIME CONST.	0.026							
T" d SUB-TRANSTIME CONST.	0.003							
T'do O.C. FIELD TIME CONST.	0.172							
Ta ARMATURE TIME CONST.	0.008							

STAMFORD®

S1L2-N Winding 311 / 711

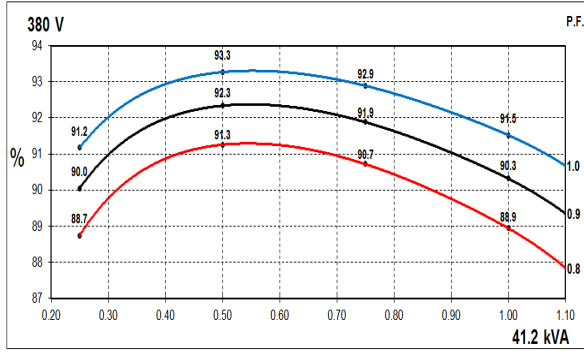
Resistances in Ohms (Ω) at 22 ^o C		
Stator Winding Resistance (Ra)	0.135 Ω per phase series star connected	
Rotor Winding Resistance (Rf)	1.06 Ω	
Exciter Stator Winding Resistance	14.3 Ω	
Exciter Rotor Winding Resistance	0.207 Ω per phase	
Positive Sequence Resistance (R1)	0.169 Ω	
Negative Sequence Resistance (R2)	0.194 Ω	
Zero Sequence Resistance (R0)	0.169 Ω	
Aux Winding Resistance (with winding 711 only)	3.9 Ω	
Mechanical data		
Cooling Air	0.176 m³/sec (50Hz)	0.211 m³/sec (60Hz)
Shaft and Keys	All alternator rotors are dynamically balanced to better than BS6861: Part 1 Grade 2.5 for minimum vibration in operation.	
Bearing	1 Bearing	2 Bearing
Weight Complete Alternator	194 kg	216 kg
Weight Wound Stator	83.6 kg	83.6 kg
Weight Wound Rotor	69.48 kg	71.52 kg
Moment of Inertia	0.3324 kgm2	0.3331 kgm2
Shipping weight in a Crate	240 kg	263 kg
Packing Crate Size	1050X570X960 mm	1050X570X960 mm
Maximum Over Speed	2250 RPM for two minutes	
Bearing Drive End	-	BALL. 6309-2RS (ISO)
Bearing Non-Drive End	Ball Bearing, 6306-2RS1	Ball Bearing, 6306-2RS1

STAMFORD®

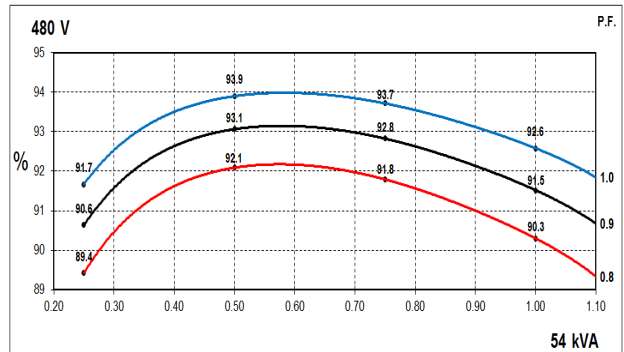
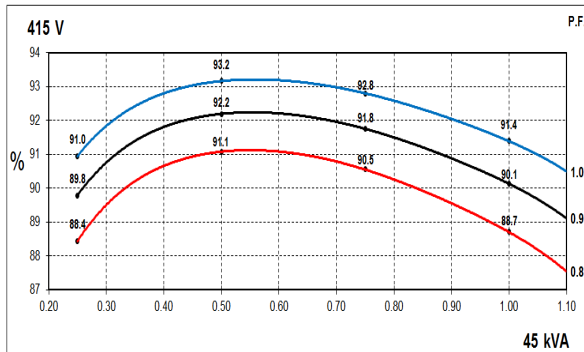
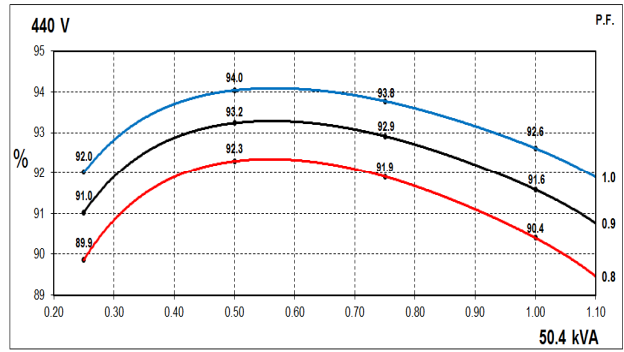
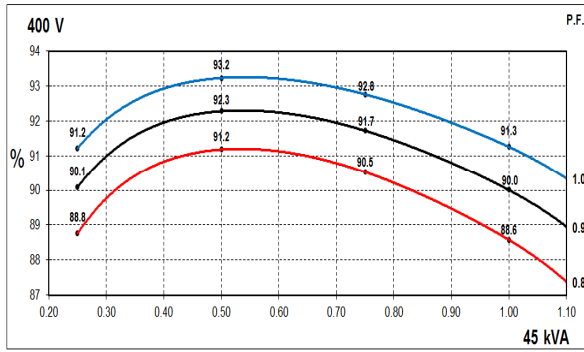
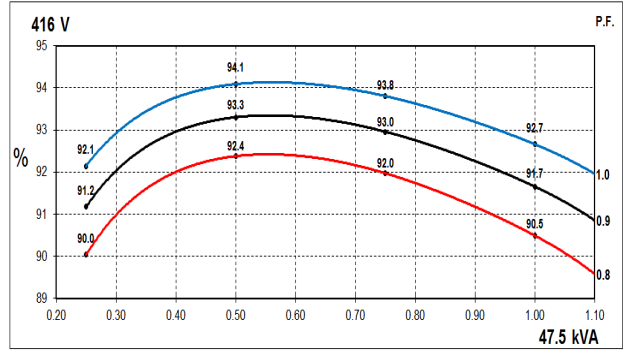
S1L2-N Winding 311 / 711

Three Phase Efficiency Curves

50Hz Curves



60Hz Curves

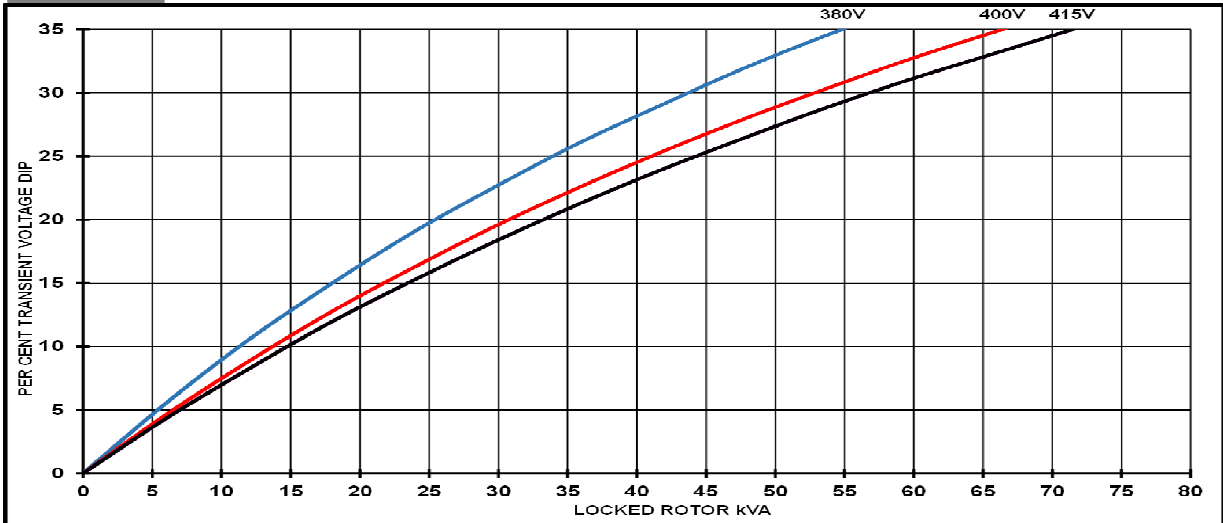


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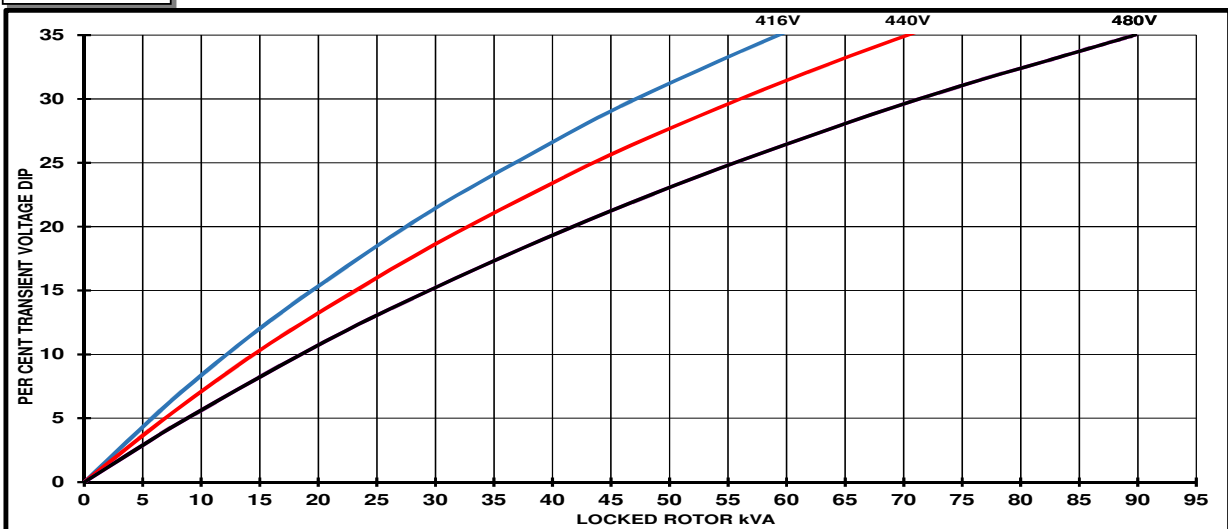
S1L2-N Winding 311 / 711

Locked Rotor Motor Starting Curves

50Hz



60Hz



Transient Voltage Dip Scaling Factor		Transient Voltage Rise Scaling Factor
PF	Factor	For voltage rise multiply voltage dip by 1.25
< 0.5	1.00	
0.5	0.97	
0.6	0.93	
0.7	0.90	
0.8	0.85	
0.9	0.83	
1.0	0.80	

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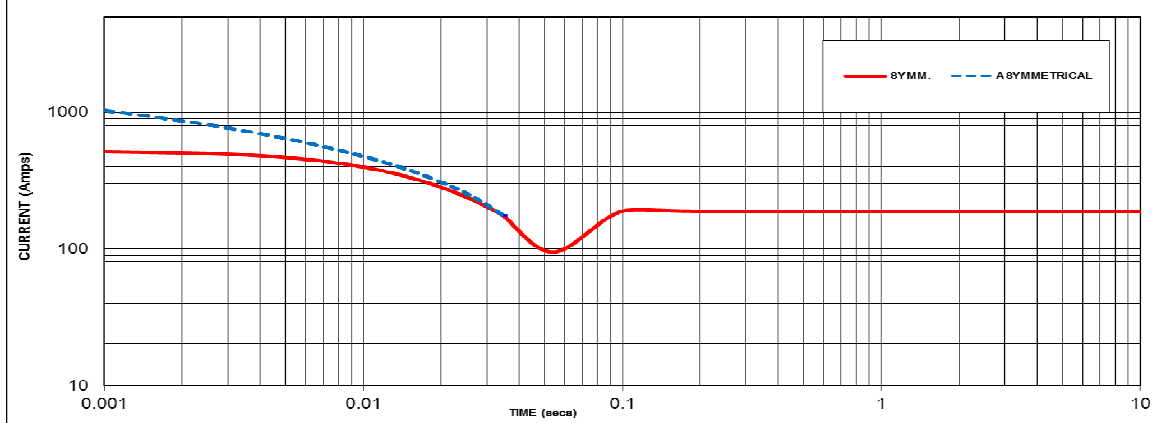
S1L2-N Winding 311 / 711

Three-phase Short Circuit Decrement Curve

Note: Applicable only for Winding 711 (Auxiliary winding).

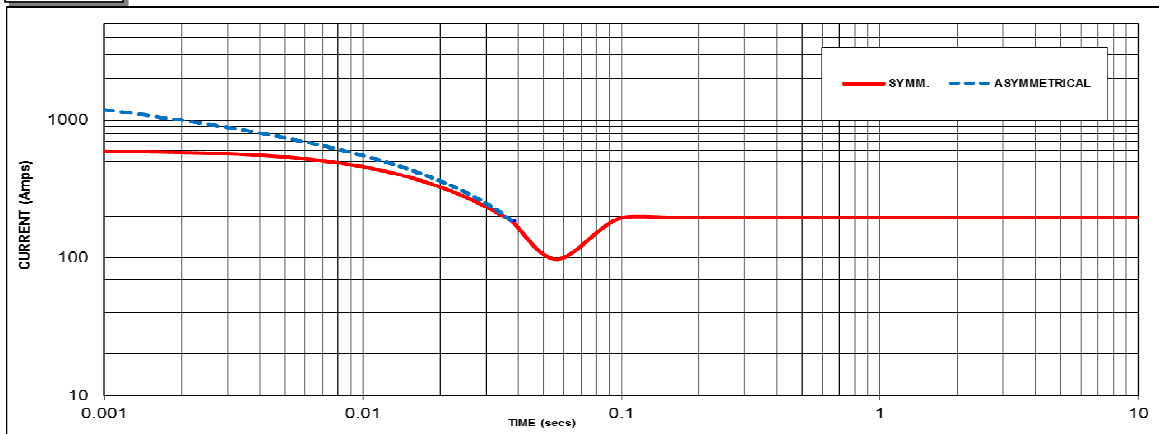
Winding 311 (no Auxiliary winding) will not provide sustained short circuit capability.

50Hz



Sustained Short Circuit = 189 Amps

60Hz



Sustained Short Circuit = 195 Amps

Note 1

The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50Hz		60Hz	
Voltage	Factor	Voltage	Factor
380V	N/A	416V	X 1.00
400V	X 1.00	440V	X 1.06
415v	X 1.04	460V	N/A
440V	N/A	480V	X 1.15

The sustained current value is constant irrespective of voltage level

This alternator is capable of achieving a balanced 300% sustained short circuit for up to 10 seconds.

Note 2

The following multiplication factor should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit :

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x 1.00	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged

Note 3

Curves are drawn for Star connected machines under no-load excitation at rated speeds. For other connection the following multipliers should be applied to current values as shown :

Parallel Star = Curve current value X 2

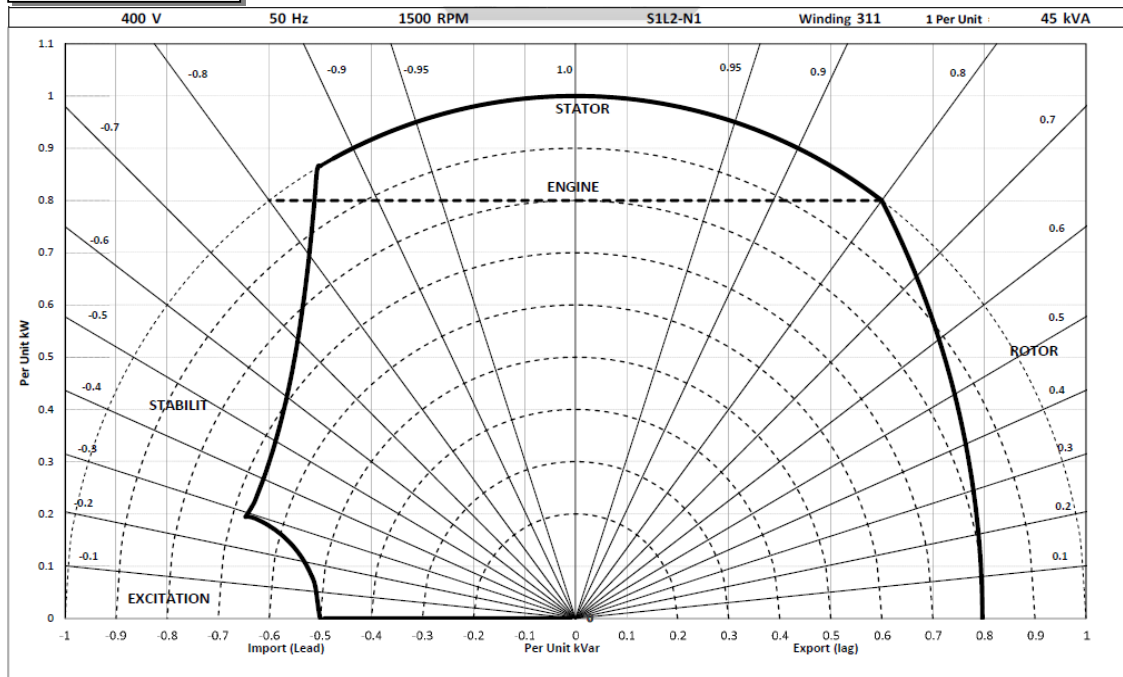
Series Delta = Curve current value X 1.732

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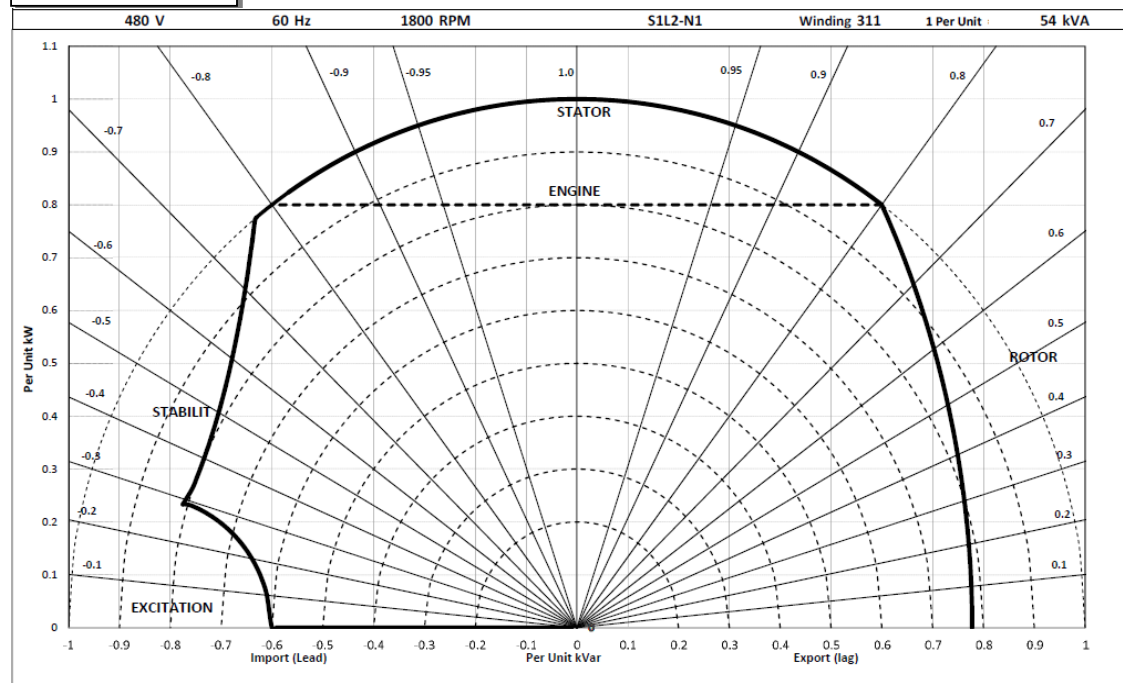
S1L2-N Winding 311 / 711

Typical Alternator Operating Charts

400V/50Hz



480V/60Hz



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S1L2-N Winding 311 / 711

RATINGS AT 0.8 POWER FACTOR

Class - Temp Rise		Standby - 163/27°C				Standby - 150/40°C				Cont. H - 125/40°C				Cont. F - 105/40°C			
50 Hz	Series Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	Parallel Star (V)	190	200	208	220	190	200	208	220	190	200	208	220	190	200	208	220
	Series Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
	kVA	45.3	49.5	49.5	N/A	44.0	48.0	48.0	N/A	41.2	45.0	45.0	N/A	37.5	41.0	41.0	N/A
	kW	36.2	39.6	39.6	N/A	35.2	38.4	38.4	N/A	33.0	36.0	36.0	N/A	30.0	32.8	32.8	N/A
	Efficiency (%)	87.9	87.3	87.5	N/A	88.2	87.8	87.9	N/A	88.9	88.6	88.7	N/A	89.7	89.4	89.5	N/A
	kW Input	41.3	45.3	45.2	N/A	39.9	43.7	43.7	N/A	37.1	40.6	40.6	N/A	33.5	36.7	36.7	N/A

60 Hz	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	52.3	55.4	N/A	59.4	50.8	53.9	N/A	57.6	47.2	50.4	N/A	54.0	43.2	45.8	N/A	49.1
	kW	41.8	44.3	N/A	47.5	40.6	43.1	N/A	46.1	37.8	40.3	N/A	43.2	34.6	36.6	N/A	39.3
	Efficiency (%)	89.6	89.5	N/A	89.3	89.9	89.8	N/A	89.7	90.5	90.4	N/A	90.3	91.1	91.0	N/A	90.9
	kW Input	46.7	49.5	N/A	53.2	45.2	48.0	N/A	51.4	41.7	44.6	N/A	47.8	37.9	40.3	N/A	43.2

De-Rates

All values tabulated above are subject to the following reductions:

- 3% for every 500 meters by which the operating altitude exceeds 1000 meters above mean sea level
- 3% for every 5°C by which the operational ambient temperature exceeds 40°C
- For any other operating conditions impacting the cooling circuit please refer to applications

Note: Requirement for operating in an ambient exceeding 60°C and altitude exceeding 4000 meters must be referred to applications.

Dimensional and Torsional Drawing

For dimensional and torsional information please refer to the alternator General Arrangement and rotor drawings available on our website (<http://stamford-avk.com/>)

Note: Continuous development of our products means that the information contained in our data sheets can change without notice, and specifications should always be confirmed with Cummins Generator Technologies prior to purchase.

DSE7310/20 MKII

AUTO START & AUTO MAINS FAILURE CONTROL MODULES



KEY FEATURES

- Configurable power-up mode
- MPU fail delay
- Enhanced graphical user interface
- Drag & drop advanced PLC editor
- MSC ID within PLC GenComm override
- 4-Line back-lit LCD text display
- Multiple Display Languages
- Five key menu navigation
- LCD alarm indication
- Heated display option available
- Customisable power-up text and images
- DSENet expansion compatibility
- Data logging facility
- Internal PLC editor
- Protections disable feature
- Fully configurable via PC using USB, RS232 & RS485 communication
- Front panel configuration with PIN protection
- Power save mode
- 3 phase generator sensing and protection
- 3 phase mains (utility) sensing and protection (DSE7320 MKII only)
- Automatic load transfer control (DSE7320 MKII only)
- Generator current and power monitoring (kW, kvar, kVA, pf)
- Mains current and power monitoring (kW, kvar, kVA, pf) (DSE7320 MKII only)
- kW and kvar overload and reverse power alarms
- Over current protection
- Unbalanced load protection
- Independent earth fault protection
- Breaker control via fascia buttons
- Fuel and start outputs configurable when using CAN
- 6 configurable DC outputs
- 2 configurable volt-free relay outputs
- 6 configurable analogue/digital inputs
- Support for 0 V to 10 V & 4 mA to 20 mA sensors
- 8 configurable digital inputs
- Configurable 5 stage dummy load and load shedding outputs
- CAN, MPU and alternator frequency speed sensing in one variant
- Real time clock
- Manual and automatic fuel pump control
- Engine pre-heat and post-heat functions
- Engine run-time scheduler
- Engine idle control for starting & stopping
- Fuel usage monitor and low fuel level alarms
- Simultaneous use of RS232 and RS485 communication ports
- True dual mutual standby using RS232 or RS485 for accurate engine hours balancing.
- MODBUS RTU support with configurable MODBUS pages.
- Advanced SMS messaging (additional external modem required)
- Start & stop capability via SMS messaging
- 3 configurable maintenance alarms
- Compatible with a wide range of CAN engines, including tier 4 engine support
- Uses DSE Configuration Suite PC Software for simplified configuration
- Licence-free PC software
- IP65 rating (with supplied gasket) offers increased resistance to water ingress
- Modules can be integrated into building management systems (BMS) using MODBUS RTU

KEY BENEFITS

- Automatically transfers between mains (utility) and generator (DSE7320 MKII only) for convenience.
- Hours counter provides accurate information for monitoring and maintenance periods
- User-friendly set-up and button layout for ease of use
- Multiple parameters are monitored & displayed simultaneously for full visibility
- The module can be configured to suit a wide range of applications for user flexibility
- PLC editor allows user configurable functions to meet user specific application requirements.

SPECIFICATIONS

DC SUPPLY

CONTINUOUS VOLTAGE RATING

8 V to 35 V Continuous
5 V for up to 1 minute

CRANKING DROPOUTS

Able to survive 0 V for 100 mS, providing supply was at least 10 V before dropout and supply recovers to 5 V. This is achieved without the need for internal batteries. LEDs and backlight will not be maintained during cranking.

MAXIMUM OPERATING CURRENT

510 mA at 12 V, 240 mA at 24 V

MAXIMUM STANDBY CURRENT

330 mA at 12 V, 160 mA at 24 V

CHARGE FAIL/EXCITATION RANGE

0 V to 35 V

GENERATOR & MAINS (UTILITY)

VOLTAGE RANGE

15 V to 415 V AC (Ph to N)
26 V to 719 V AC (Ph to Ph)

FREQUENCY RANGE

3.5 Hz to 75 Hz

MAGNETIC PICKUP

VOLTAGE RANGE

+/- 0.5 V to 70 V

FREQUENCY RANGE

10,000 Hz (max)

INPUTS

DIGITAL INPUTS A TO H

Negative switching

ANALOGUE INPUTS A & F

Configurable as:
Negative switching digital input
0 V to 10 V sensor
4 mA to 20 mA sensor
Resistive sensor

ANALOGUE INPUTS B, C, D & E

Configurable as:
Negative switching digital input
Resistive sensor

OUTPUTS

OUTPUT A & B (FUEL & START)

15 A DC at supply voltage

OUTPUTS C & D

8 A AC at 250 V AC (Volt-free)

AUXILIARY OUTPUTS E, F, G, H, I & J

2 A DC at supply voltage

DIMENSIONS

OVERALL

245 mm x 184 mm x 51 mm
9.6" x 7.2" x 2.0"

PANEL CUT-OUT

220 mm x 160 mm
8.7" x 6.3"

MAXIMUM PANEL THICKNESS

8 mm
0.3"

STORAGE TEMPERATURE RANGE

-40°C to +85°C
-40 °F to +185 °F

OPERATING TEMPERATURE RANGE

-30°C to +70°C
-22 °F to +158 °F

HEATED DISPLAY VARIANT

-40 °C to +70 °C
-40 °F to +158 °F

RELATED MATERIALS

TITLE

DSE7310 MKII & DSE7320 MKII Installation Instructions
DSE7310 MKII & DSE7320 MKII Operator Manual
DSE7310 MKII & DSE7320 MKII Configuration Suite PC Manual

PART NO.

053-181
057-253
057-243

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DSE7310/20 MKII

AUTO START & AUTO MAINS FAILURE CONTROL MODULES

The DSE7310 MKII is an Auto Start Control Module and the DSE7320 MKII is an Auto Mains (Utility) Failure Control Module suitable for a wide variety of single, diesel or gas, gen-set applications.

Monitoring an extensive number of engine parameters, the modules will display warnings, shutdown and engine status information on the back-lit LCD screen, illuminated LEDs, remote PC and via SMS text alerts (with external modem).

The DSE7320 MKII will also monitor the mains (utility) supply. The modules include USB, RS232 and RS485 ports as well as dedicated DSENet® terminals for system expansion.

Both modules are compatible with electronic (CAN) and non-electronic (magnetic pick-up/alternator sensing) engines and offer an extensive number of flexible inputs, outputs and extensive engine protections so the system can be easily adapted to meet the most demanding industry requirements.

The extensive list of features includes enhanced event and performance monitoring, remote communications & PLC functionality. Dual mutual standby is now available on both the DSE7310 MKII & DSE7320 MKII using RS232 or RS485 communications. This provides for a simpler and more convenient installation with more advanced features such as true engine hours balancing.

The modules can be easily configured using the DSE Configuration Suite PC software. Selected front panel editing is also available.

ENVIRONMENTAL TESTING STANDARDS

ELECTRO-MAGNETIC COMPATIBILITY

BS EN 61000-6-2
EMC Generic Immunity Standard for the Industrial Environment
BS EN 61000-6-4
EMC Generic Emission Standard for the Industrial Environment

ELECTRICAL SAFETY

BS EN 60950
Safety of Information Technology Equipment, including Electrical Business Equipment

TEMPERATURE

BS EN 60068-2-1
Ab/Ae Cold Test -30 °C
BS EN 60068-2-2
Bb/Be Dry Heat +70 °C

VIBRATION

BS EN 60068-2-6
Ten sweeps in each of three major axes
5 Hz to 8 Hz at +/-7.5 mm,
8 Hz to 500 Hz at 2 gn

HUMIDITY

BS EN 60068-2-30
Db Damp Heat Cyclic 20/55 °C
at 95% RH 48 Hours
BS EN 60068-2-78
Cab Damp Heat Static 40 °C
at 93% RH 48 Hours

SHOCK

BS EN 60068-2-27
Three shocks in each of three major axes
15 gn in 11 ms

DEGREES OF PROTECTION PROVIDED BY ENCLOSURES

BS EN 60529
IP65 - Front of module when installed into the control panel with the supplied sealing gasket.

COMPREHENSIVE FEATURE LIST TO SUIT A WIDE VARIETY OF GEN-SET APPLICATIONS

