

## Schedule of Technical Data for Diesel Generator

S.N	Item	Unit	Requirement	Bidder's Response
1	Gen-Set Model	-----	Specify	
2	Gen-Set Manufacturer	-----	Specify	
3	Country of Origin	-----	Specify	
4	Standard	-----	Specify	
5	Date of Manufacturing	-----	Specify	
6	Prime Power (PRP) at 1500 R.P.M.	kW	Specify	
7	Continuous Power (COP) at 1500 R.P.M.	kW	Specify	
8	Standby Power (ESP) at 1500 R.P.M.	kW	Specify	
9	Gen-Set Type	-----	Canopy	
<b>► Acoustic Enclosure (Canopy Requirements)</b>				
1	Type :	Weather and sound proof		
2	Noise Level at one meter with acoustic enclosure	db.	$\leq 70 \text{ db}$	
3	Number of canopy doors	-----	Specify	
4	Make and Material	-----	Specify	
5	Size	-----	Specify	
6	Details of Acoustic Enclosure	-----	Specify	
<b>► D.G Dimensions</b>				
1	D.G Dimension without Canopy (L*W*H)	Cm	Specify	
2	D.G Dimension with Canopy (L*W*H)	Cm	Specify	
3	Weight of D.G without Canopy	Kg	Specify	
4	Weight of D.G with Canopy	Kg	Specify	
<b>► Gen-Set Documents</b>				
1	Pictures for Gen-Set	-----	Must be attach	
2	Gen-Set Diagram for Dimensions	-----	Must be attach	
3	Document of Acoustic Enclosure (Canopy)	-----	Must be attach	
4	Attach any necessary Documents	-----	Must be attach	

## Schedule of Technical Data for Diesel Engine

S.N	Item	Unit	Requirement	Bidder's Response
1	Engine Model	-----	Specify	
2	Engine Manufacturer	-----	Specify	
3	Country of Engine	-----	Specify	
4	Standard	-----	Specify	
5	Date of Manufacturing	-----	Specify	
<b>3.1 Type</b>				
1	Engine Type	-----	Diesel Engine	
2	Engine Arrangement	-----	In Line	
3	Number of cylinder	-----	Multi-cylinder	
4	Number of Stroke	-----	4-Stroke	
5	Injection Type	-----	Direct injection	
6	Aspiration Method	-----	Naturally (NA)	
7	Starting Method	-----	Electric	
8	Rotation CCW	-----	CCW	
<b>3.2 Rating: Rating and De-rating Factors</b>				
1	Engine Rated Speed	RPM	1500	
2	Net Standby Power(ESP)	kW	Specify	
3	Prime Power (PRP) at rated Speed kw elec.	kW	Specify	
4	Continuous duty rating of the Diesel Engine at site conditions (2200 A.S.L and 30°C)	kW	12	
5	Maximum engine rating with 10% overload at site conditions (2200 A.S.L and 30°C)	kW	Specify	
6	Engine de-rating tables and curve for altitude	-----	Must be attach	
7	Engine de-rating tables and curve for Temp.	-----	Must be attach	
8	Engine de-rating tables and curve for humidity	-----	Must be attach	
<b>3.3 Cooling System</b>				
1	Cooling Type	-----	Water Cooling	
2	Material of Radiator (Details)	-----	Specify	
3	Radiator Fan (Details)	-----	Specify	
4	Total Coolant Capacity	<b>Ltr.</b>	Specify	
5	Thermostat	-----	Available	
6	Self-Contained Pipe	-----	Available	
<b>► Water Pump</b>				
1	Model	-----	Specify	
2	Make / Brand	-----	Specify	
3	Country of origin	-----	Specify	

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S.N	Item	Unit	Requirement	Bidder's Response
<b>3.4 Lubrication System</b>				
1	Total Oil Capacity	Ltr.	Specify	
2	Oil Pre-heating	-----	Specify	
3	Oil draining Pipe with Cap	-----	Specify	
<b>► Oil Pump</b>				
1	Model	-----	Specify	
2	Make / Brand	-----	Specify	
3	Country of origin	-----	Specify	
<b>3.5 Engine Starting System</b>				
1	Type of Starting System	-----	Electric	
2	Voltage of Starting System	V	12VDC	
<b>► Starter Motor</b>				
1	Model	-----	Specify	
2	Make / Brand	-----	Specify	
3	Country of origin	-----	Specify	
4	Rated Power kW/A	-----	Specify	
<b>► Starter Battery</b>				
1	Type of Battery	Dry –free maintenance		
2	Nominal Battery Voltage	V	12-Volts	
3	Capacity of Battery	AH	Specify	
4	Cold Cranking Current: CCA	A	Specify	
5	Model	-----	Specify	
6	Make / Brand	-----	Specify	
7	Country of origin	-----	Specify	
<b>► Alternator For Battery charging (Dynamo Charger)</b>				
1	Model	-----	Specify	
2	Make / Brand	-----	Specify	
3	Country of origin	-----	Specify	
4	Output Voltage	V	12VDC	
5	Rated Current	A	≥ 30A	
<b>3.6 Fuel system</b>				
<b>► Fuel Injection Pump</b>				
1	Model / Type	-----	Specify	
2	Make / Brand	-----	Specify	
3	Country of origin	-----	Specify	

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<b>► Fuel Lift Pump</b>				
1	Model / Type	-----	Specify	
2	Make / Brand	-----	Specify	
3	Country of origin	-----	Specify	
<b>► Replaceable Filter</b>				
<b>► Separate Preliminary Filter</b>				
<b>► Fuel Solenoid Valve</b>				
1	Rated Operating Voltage	V	12VDC	
2	Type	-----	Energize to run	
3	Model	-----	Specify	
4	Make / Brand	-----	Specify	
5	Country of origin	-----	Specify	
<b>► Fuel Consumption (Lt/hr)</b>				
1	At 100% Load PRP	Lt/hr	Specify	
2	At 75% Load PRP	Lt/hr	Specify	
3	At 50% Load PRP	Lt/hr	Specify	
<b>3.7 Governing System</b>				
1	Governor Type	-----	Mechanical	
2	Speed Drop& Steady State	-----	<4%	
3	Model	-----	Specify	
4	Make / Brand	-----	Specify	
5	Country of origin	-----	Specify	
<b>3.8 Intake Air System</b>				
1	Air Firer	-----	Dry Type, Replaceable	
2	Air intake Manifold	-----	Specify	
<b>3.9 Exhaust System and Silencer</b>				
1	Type	-----	Residential Type	
2	Material Type	-----	Flexible Stainless Steel	
3	Volume Exhaust Gas flow	m <sup>3</sup> /h	Specify	
4	Silencer	-----	Available	
<b>3.10 Coupling Arrangement</b>				
1	Flexible Coupling	-----	Heavy and duty	
2	Flywheel	-----	Suitable for single bearing alternator	
3	Housing Flywheel	-----		
4	Anti-Vibration Pads	-----	Available	

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S.N	Item	Unit	Requirement	Bidder's Response
<b>3.11</b>	<b>Sensors and Engine Protection</b>			
▶	<b>Engine Temperature Sensor</b>			
1	Type	-----	VDO or Equivalent	
2	Model	-----	Specify	
3	Make/Brand	-----	Specify	
4	Country of Origin	-----	Specify	
▶	<b>Oil Pressure Sensor</b>			
1	Type	-----	VDO or Equivalent	
2	Model	-----	Specify	
3	Make/Brand	-----	Specify	
4	Country of Origin	-----	Specify	
▶	<b>Engine Protection</b>			
1	High Temperature Protection	-----	SD	
2	Low Oil Pressure	-----	W+SD	
3	Low Water Level	-----	W	
4	Coolant Temperature Protection	-----	W+SD	
<b>Warning :W” , SD “Shutdown”</b>				
<b>3.12</b>	<b>Engine Document</b>			
1	De-Rating Factor For Engine	-----	Must be attach	
2	All Document of Engine	-----	Must be attach	

## Schedule of Technical Data for Alternator

S.N	Item	Unit	Requirement	Bidder's Response
1	Alternator Model	-----	Specify	
2	Alternator Manufacturer	-----	Specify	
3	Country of Engine	-----	Specify	
4	Standard	-----	Specify	
5	Date of Manufacturing	-----	Specify	
<b>4.1 Type</b>				
1	Self-Excited	-----	Specify	
2	Self-Regulated	-----	Specify	
3	Screen Protected	-----	Specify	
4	Rated Power Factor	-----	0.8 Lag	
5	Rated Voltage	<b>V</b>	230/400	
6	Rated Frequency	<b>Hz</b>	50	
7	Number of Phases	-----	3 Phase	
8	Number of Wires	-----	4 Wire +PE	
9	Winding Connection	-----	( Y)Star	
<b>4.2 Ratings</b>			Specify	
1	Full Load output in KVA	-----	Specify	
2	Full Load output in kW at 0.8 Pf	-----	Specify	
3	Rated at Site Conditions (2200 A.S.L, 30°C)	-----	Specify	
4	Overload Capacity at max. Ambient Temp.	-----	Specify	
5	De-rating tables and Curves	-----	Must be attach	
<b>► Efficiency at 0.8 Power Factor</b>		-----	Specify	
1	At 100% Load	-----	Preferable 87%	
2	At 75 % Load	-----	Specify	
3	At 50% Load	-----	Specify	
<b>4.3 Construction</b>				
1	Design	-----	Welded Steel	
2	Degree of Protection	-----	IP23	
3	Insulation Level	-----	H Class	
4	Bearing	-----	Single Bearing	
5	Ventilation	-----	Self-Ventilated	
6	Frame (Details)	-----	Must be attach	

## Schedule of Technical Data for Alternator

S.N	Item	Unit	Requirement	Bidder's Response
<b>4.4</b>	<b>Excitation System</b>			
1	Exciter Type	-----	Brushless	
2	With PMG/ Self Excited	-----	Specify	
<b>4.5</b>	<b>AVR</b>			
1	Type	-----	3 Phase -Electronic	
2	Voltage Regulation	-----	$< \pm 1\%$	
3	Voltage Variation	-----	+5% for PF(0.8-1)	
4	Model	-----	Specify	
5	Make/ Brand	-----	Specify	
6	Country of Origin	-----	Specify	
7	Protection against Low Speed	-----	Specify	
8	Protection against Over- Voltage	-----	Specify	
9	Protection against Over Excitation	-----	Specify	
<b>4.6</b>	<b>Documents</b>			
1	Complete Details, Catalogue , Diagrams For Alternator	-----	Must be attach	
2	Attach Tables of De-rating Factors For Alternator	-----	Must be attach	
3	Attach a Complete Details of A.V.R	-----	Must be attach	

## Schedule of Technical Data for Generator Control Panel

S.N	Item	Unit	Requirement	Bidder's Response
<b>5.1</b>	<b>Panel</b>			
1	Panel Model	-----	Specify	
2	Manufacturer	-----	Specify	
3	Country of Origin	-----	Specify	
4	Panel Dimensions(L*W*H)	-----	Specify	
<b>5.2</b>	<b>Gen-Set Controller(Electronic Card) Control and display unit</b>			
1	Type	-----	Auto start	
2	Controller Model	-----	Specify	
3	Manufacturer	-----	Specify	
4	Country of Origin	-----	Specify	
	Controller Dimensions (L*W*H)	-----	Specify	
<b>I</b>	<b>Controller Operation Modes</b>			
1	Auto Operation Mode	-----	Specify	
2	Manual Operation Mode	-----	Specify	
3	Test Operation Mode	-----	Specify	
4	Off Mode	-----	Specify	
<b>II</b>	Digital Display Of Controller		<b>LCD</b>	
<b>III</b>	<b>Digital instruments (Metering and monitoring)</b>			
<b>►</b>	<b>For Engine</b>			
1	R.P.M “Speed Value	<b>Rpm</b>	Specify	
2	Battery DC Voltage	<b>V</b>	Specify	
3	Battery Charging DC Ampere	<b>A</b>	Specify	
4	Oil Pressure Value (bar/Pascal)	<b>Bar</b>	Specify	
5	Coolant Temperature Value	<b>°C</b>	Specify	
6	Running hours	<b>Hr</b>	Specify	
7	Number of Cranking Attempt	-----	Specify	
<b>►</b>	<b>For Alternator</b>			
1	AC Voltage Values (Line- Line)	<b>V</b>	Specify	
2	AC Voltage Values (Line- Neutral)	<b>V</b>	Specify	
3	AC Current Per Phase Values	<b>A</b>	Specify	
4	Frequency Value	<b>Hz</b>	Specify	
5	kVA, kVAR, kW/ Phase and total, kWh	-----	Specify	
6	Power Factor (P.F)	-----	Specify	



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S.N	Item	Unit	Requirement	Bidder's Response
<b>IV Indicator , Alarms Lights and Protection</b>				
<b>► For Engine</b>				
1	Fail To Start	-----	LED	
2	Gen-Set Normal Running	-----	LED	
3	High Coolant Temperature	-----	W+SD	
4	Low Oil Pressure	-----	W+SD	
5	Low Coolant Level	-----	W	
6	Battery Charge Fail	-----	W	
7	Over/Under Speed	-----	W+SD	
8	Dynamo Charge Fail	-----	W	
9	High / Low Battery Volts	-----	W	
10	Emergency Stop	-----	SD	
<b>► For Alternator</b>				
1	Over Frequency	-----	W+SD	
2	Under Frequency	-----	W+SD	
3	Over Voltage	-----	W+SD	
4	Under Voltage	-----	W+SD	
5	Over Load and S.C	-----	Trip+ SD	
6	Missing Protection	-----	Specify	
7	Phase Sequence	-----	Specify	
<b>V Controller Configuration</b>				
1	Configured by using front Panel	-----	Specify	
2	By PC through USB Connections	-----	Specify	
3	Allowable to Configurable Timers	-----	Specify	
<b>VI Alarm Retransmission</b>				
1	Gen-Set Running (Free Contact)	-----	Specify	
2	Gen-Set Failure (Free Contact)	-----	Specify	
<b>5.3 Automatic Battery Charger</b>				
1	Type	-----	Specify	
2	Input AC Voltage	V	230V	
3	Output DC voltage	V	12VDC	
4	Charge Current	A	5A	
5	Model	-----	Specify	
6	Make	-----	Specify	
7	Country of Origin	-----	Specify	

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S.N	Item	Unit	Requirement	Bidder's Response
<b>5.4 Protections Devices</b>				
<b>► Gen-Set Output Circuit Breaker</b>				
1	Type	-----	MCCB	
2	Number of Poles	-----	4 Poles	
3	Rated Current	A	25	
4	Breaking Capacity Current	KA	10kA	
5	Model	-----	Specify	
6	Make	-----	Specify	
7	Country of Origin	-----	Specify	
8	Level of Protection	-----	At least IP22	
<b>► Surge Protection Devices</b>				
1	SPD Level	-----	Level 1 or 2	
2	Model	-----	Specify	
3	Make	-----	Specify	
4	Country of Origin	-----	Specify	
<b>► Suitable MCBs to Protect all DC/AC Circuit</b>				
<b>5.5 Terminals</b>				
<b>► Power Terminals</b>				
1	4 Terminals for output (C.S.A =16mm <sup>2</sup> )	-----	Specify	
<b>► Control and alarm terminals</b>				
1	terminal for remote start/stop Gen-Set	-----	Specify	
2	Alarm terminal (+B) For Gen-Set Running	-----	Specify	
3	Alarm Terminal (+B) for Generator Failure	-----	Specify	
4	Auxiliary Terminals (L-N) AC For Heater	-----	Specify	
5	Suitable terminals for Gen-Set's battery(+/-)	-----	Specify	
6	Suitable terminals for automatic battery charger (L-N) AC	-----	Specify	
<b>5.5 Documents</b>				
1	Single Line Diagram for Panel and Controller	-----	Must be attach	
2	Catalogue of Control Module	-----	Must be attach	
3	Operation Manual and fault funding manual for Controller	-----	Must be attach	