

Specification for Supply, Installation and Commissioning of 125 kVA Generator

Item No.	Parameter	Required Technical Specification	Offered Technical Specification
1	General Information & Experience		
1.1	Make and Model	Please Specify	
1.2	Country of Origin	Please Specify. USA, UK, Japan, or within the European Union (EU) are preferred.	
1.3	Country of Manufacture	Please Specify. Eligible countries/regions: USA, UK, Japan, the European Union, or a substantially equivalent region "Substantially equivalent" means demonstrating equivalent standards of functionality, performance, and maintenance. The bidder shall submit three (3) end-user certificates from government institutions where similar equipment was successfully supplied and installed within the last ten (10) years.	
1.4	Equipment Condition	Brand new	
1.5	Installation Location	Animal Virus Laboratory (AVL) at Polgolla, Kandy	
1.6	Assembling Company Experience	Minimum 10 years in generating set assembly (if not assembled directly by the engine/alternator manufacturer). .	
1.7	Assembling Quality Certification	ISO 9001 and/or ISO 9002 certification. .	
1.8	Local Agent Requirements	Accredited Sri Lankan agency with a minimum 10-year proven track record of supply, installation, and after-sales service for the offered brand. .	
1.9	Support Documentation	Manufacturer authorization letter naming the specific project, plus copies of maintenance agreements for the offered brand spanning the last 5 years.	
2	Climatic & Site Design Conditions		
2.1	Maximum Ambient Temperature	40 °C .	
2.2	Average Ambient Temperature	32 °C (over 24 hours) / 35 °C (annual average) .	

2.3	Average Relative Humidity	90% .	
2.4	Plant Tropicalization	Fully tropicalized, rugged, durable design with consistent performance. .	
3	System & Performance Parameters		
3.1	Nominal Voltage	400/230 V A.C., 3-Phase & Neutral .	
3.2	System Frequency	50 Hz .	
3.3	Method of Earthing	Solid earthing, TT system .	
3.4	System Fault Level	25 kA .	
3.5	Rated Output	Not less than 125 kVA (Prime Rated) .	
3.6	Continuous Operation Target	Minimum 12 hours continuous delivery at rated output under design ambient conditions.	
3.7	Power Factor	0.8	
3.8	Overload Capacity	110% overload for 1 hour within a 12-hour operating period.	
3.9	Rated Engine Speed	1500 rpm	
3.1	Block Load Acceptance	60% block load acceptance capability with a maximum admissible speed drop of 5%.	
3.11	Waveform Distortions	Voltage waveform deviation factor $\leq 5\%$	
4	Diesel Engine Specification		
4.1	Engine Type	4-stroke, turbo-charged, working on normal auto diesel.	
4.2	Emission Compliance	EU Stage II or above (certified via test documents).	
4.3	Speed Governor Type	Electronic type, complying with Governing Class G2 (ISO 8528-5:2018) / Class A1 (B.S. 5514) with a variation limit of $\pm 1.5\%$. .	
4.4	Coupling Method	Directly flange-coupled to the alternator via a semi-flexible main drive disc coupling. .	
4.5	Mounting Layout	Skid-mounted with oil-resistant anti-vibration resilient mounts.	
4.6	Cooling Circuit	Closed cooling water circuit; radiator suitable for 40 °C tropical environments fabricated with seam-welded copper tubes and copper fins.	

4.7	Exhaust & Silencer Insulation	Industrial-type silencer with stainless steel flexible tubing. Fully insulated with eco-friendly lagging and clad with ≥ 1 mm thick removable Aluminum sheeting.	
4.8	Servicing Feature	Factory-fitted rotary-type manual lube oil drain pump.	
4.9	Engine Protections	Low oil pressure, High lubricant oil temperature, High water/coolant temperature, and Over speed.	
5	Alternator Specification		
5.1	Alternator Type	Brushless, 3-phase, 4-wire star connected, A.C. exciter with rotating diodes.	
5.2	Excitation System	Permanent Magnet Generator (PMG) or auxiliary winding excitation.	
5.3	Inherent Voltage Regulation	Within $\pm 1\%$ of normal voltage from no-load to 110% full load (across 1.0 to 0.8 PF).	
5.4	Windings Insulation	Class H for both rotor and stator windings.	
5.5	Enclosure Protection Class	IP 23	
5.6	Motor Starting Capability	Short-time overload capacity up to 300% for a maximum of 10 seconds.	
5.7	Condensation Protection	Extra winding insulation (insulating varnish) and anti-condensation heaters powered via a 230V single-phase A.C. source.	
5.8	Alternator Protections	Over current, Over voltage, Over frequency, Earth fault, and Reverse power protection.	
6	Control Panel & Cubicle		
6.1	Construction Standard	Sheet steel, vermin and dustproof floor/set-mounted cubicle with lockable hinged front doors conforming to IP 23.	
6.2	Main Circuit Breaker	MCCB with adjustable thermal overload, adjustable shunt tripping, and UVT (under-voltage trip) facilities.	
6.3	Origin of Key Control Parts	Control panel, MCCB, trickle charger, and control module must originate in USA, UK, Japan, or within the EU. (Preferred)	

6.4	Adjustable Control Timers	Mains failure start delay, Load transfer (Mains to Gen), Load transfer (Gen to Mains), and Cool-down/shut-down delay.	
6.5	Integrated Power Analyzer Meters	Engine RPM, Frequency, Hour run recorder, Amperage, Line & Phase Voltages, kW, kWhrs, Power factor, Lube oil pressure, and Water temperature.	
6.6	Alarm Reset and System Signals	Audio-visual resetting type indicators for shutdowns/trips (low oil, high temp, overspeed, overcurrent, fail to start, mains/gen status). Audio alarm must automatically shut off after 3 minutes.	
6.7	Emergency Controls	Emergency stop button with a transparent cover (pressed-locked and turned-released type).	
7	Battery & Charging System		
7.1	Battery Construction	Heavy-duty lead-acid type with integrated minimum/maximum electrolyte level indicators and protective connector covers.	
7.2	Static Battery Charger	Boost & Trickle charger powered by single-phase 230V A.C. when the generator is shut down.	
7.3	Charger Safeguards	AC/DC transient protections, fused AC input and DC output protection; must not discharge batteries upon AC input failure.	
7.4	Charging Capacity Requirements	Fully recharge completely discharged batteries in less than 12 hours without tripping AC devices under any DC load conditions.	
8	Acoustic Soundproofing Canopy		
8.1	Canopy Sheeting Material	Base-frame mounted sound-attenuating zinc-coated steel sheeting, minimum thickness of 16 SWG.	
8.2	Internal Lining & Access	Lined with sound-absorbing materials retained by perforated steel sheets. Side-opening doors with lockable recessed handles.	
8.3	Enclosure Air Handling	Acoustic intake louvers at the generator end and acoustic discharge louvers at the engine end.	

8.4	Max Sound Level (Outside Room)	Day time: ≤ 63 dB(A); Night time: ≤ 50 dB(A) (Central Environmental Authority standards).	
8.5	Max Sound Level (At 1m distance)	Day time: ≤ 75 dB(A) ± 3 dB(A).	
9	Automatic Transfer Switch (ATS) Panel		
9.1	ATS Construction Type	Adjustable motorized MCCB type with Form 3b internal separation and electrostatically applied powder coat finish.	
9.2	Enclosure Protection Class	Rigid, metal cubicle type, totally enclosed, dust and vermin protected to IP 54 minimum.	
9.3	Maintenance Manual Bypass	Integrated 160A manual changeover switch acting as an alternative system bypass.	
9.4	Surge Protective Device (SPD)	Type 1+2 MOV type, DIN rail mounted with visual health status indicator.	
9.5	SPD Electrical Capacities	Nominal 400V, Impulse current ≥ 50 kA, Max discharge current ≥ 80 kA, Let-through voltage ≤ 1.3 kV. Connecting lead length ≤ 300 mm.	
9.6	Main System Control Components	Phase failure relay (detecting all three phases of main supply), selector switch for auto/off/manual operation, power analyzer, and status lights.	
10	Power Cables & Cable Management		
10.1	Cable Size Specification	4×70 mm ² 1-Core Cu/XLPE/PVC (sized for 125 kVA layout).	
10.2	Rated Cable Specifications	600/1000V, unarmored single-core copper conductor to BS 5467 or IEC 60502 with ratings permanently embossed on the outer sheath.	
10.3	Cable Supplier Quality	Cable manufacturer must possess a valid ISO 9001:2000 quality assurance certification.	
10.4	Cable Trays & Routing	All routing laid inside perforated Hot-Dip Galvanized (HDG) cable trays with protective lids.	
10.5	Cable Installation Standard	Strictly comply with BS 7671 (IEE Wiring Regulations).	
11	Earthing System		
11.1	Governing Standards	Installed in strict alignment with BS 7671:2018 (17th Edition), IEC 60364-5-54, and BS 7430 standards.	

11.2	Grounding Media	Cu/PVC insulated cables or high-conductivity copper tapes.	
11.3	Connection to Outer Ground	Extended outside the facility and anchored to a copper-plated rod or GI tube via a secure conductor clip.	
11.4	Inspection Pit Construction	Minimum dimensions of 300 mm×300 mm×300 mm featuring a clean, removable inspection hatch/cover.	
11.5	Ground Isolation Metrics	Dedicated isolated networks for neutral lines of generators and body grounding paths (synchronizing panel, cable trays, fuel system).	
11.6	Maximum System Ground Resistance	≤ 30 ohms.	
12	Testing & Commissioning		
12.1	Pre-bid Factory Acceptance Test	Submission of a prior FAT report for the exact same generator model along with the bid document (mandatory for responsiveness).	
12.2	Factory Acceptance Test (FAT) Steps	Performance run spanning load bands: 0% (5 min), 25% (15 min), 50% (15 min), 75% (15 min), 100% (30 min), 110% (10 min). Quick start and 60% single-step load acceptance testing.	
12.3	Site Testing Requirements	Functional alarm/protection verification, starting profile checks, site resistive load bank test up to 110% (15 min) at 20-min intervals, and a 65% instantaneous load-step check.	
12.4	Calibration Standards	All factory and site measurement testing devices must be calibrated within 6 months of testing dates.	
13	Warranty & Comprehensive Services		
13.1	Warranty Baseline Period	2 Years or 2000 operating hours from successful on-site commissioning (whichever comes first).	
13.2	Maintenance Inspections	2-year comprehensive maintenance scheme following manufacturer guidelines. Minimum of 2 detailed inspections per annum completely free of charge during the warranty cycle.	

13.3	Parts Replacement Quality	All replacement parts and servicing consumables (oil, air, fuel, and fuel-water separator filters) must be genuine OEM items produced by the engine manufacturer.	
13.4	Miscellaneous Fire Safety Supply	1 unit of 3 kg Carbon Dioxide (CO2) and 1 unit of minimum 9-liter Foam type fire extinguishers supplied and installed.	
13.5	Dedicated Maintenance Hand Tools	A complete professional set of tools required to execute routine maintenance work supplied as part of the generator scope.	
14	Applicable Standards		
14.1	Complete Generator Plant	2006/42/EC, 2014/35/EU, 2014/30/EU, 2000/14/EC, 2005/88/EC, LVD, EN 12100, EN 13857, EN 60204, ISO 8528.	
14.2	Industrial Diesel Engine	B.S. 5514, BS 5000 Part III, ISO 3046/1.	
14.3	Synchronous Alternator Unit	B.S. 5000, IEC 60034, BS 4999 (IEC 34-1).	
14.4	Control Layouts & Panels / ATS	IP 23, BS 5586 (IEC 439) / ATS: BS 5486 (IEC 60439).	

Note:

- All offers must comply with given specifications or have a higher configuration.
- The supplier must fill the compliance sheet with the correct information.
- Approval for payment will be given upon completing the supply, installation & commissioning of machines successfully.