

**Detailed Technical Specifications of Fully Electrical Battery Operated Bus (BEB) for 9 m category  
(to be provided by Bus manufacturer based on the Manufacturer's Standard Production)**

S.N	Criteria	Required specifications (for the items that includes but not limited to followings)	Detailed information related to corresponding specifications to be provided by manufacturer	Remarks (Not applicable/ Customized specification other than standard to be provided in this column)
(1)	(2)	(3)	(4)	(5)
1	General	Bus type		
		Drive (RHD / LHD)		
		Make/ Brand name		
		Standard Model (Model code)		
		Country of origin		
		Design built/ Customized design		
		Operating condition: (Altitude/ Climate/Temperature etc.)		
2	Vehicle dimensions/ parameters	Overall length (m)		
		Overall Width (m)		
		Overall height (m)		
		Wheel base (m)		
		Turning Radius (m)		
		Minimum Ground clearance (at GVW load) (mm)		
		Approach angle (degree)		
		Departure angle (degree)		
		Gross Vehicle Weight (GVW) (kgs)		
		Payload (kgs)		
3	Floor Height above ground	Standard (mm)		
		Optional (If any) (mm)		
4	Acceleration time	(0 - 30 km) (second)		
	Energy consumption	at rated load (kWh/km)		
	Performance at GVW	Maximum Speed: (km/hr.)		
		Maximum Gradeability: (%)		

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(1)	(2)	(3)	(4)	(5)
5	Drive Motor (Electric Propulsion system)	Type		
		Maximum power (kW)		
		Rated power (kW)		
		Rated torque (N-m)		
		Maximum torque (N-m)		
		Efficiency (%)		
		Noise level (db)		
6	Battery	Protection level (IP ..)		
		Type		
		Capacity (kWh)		
		Energy density (Wh/kg)		
		Power density (W/kg)		
		Cycle life		
7	Charging System (Specification applicable to BEB)	Driving range at rated load (km) (in single charge)		
		Normal charger (specifications)		
		Opportunity charger (specifications)		
8	Controlling/ Real-time Monitoring	Fast Charger (Specifications)		
		Battery management system		
		Fault warnings		
		Safety features		
9	Suspension system	Protection level (IP ..)		
		Front		
		Rear		
10	Brake system	Shock Absorbers		
		Service Brake (ABS/EBS)		
		Parking Brake		
		Regenerative braking		

11	Transmission system (Drive-motor to Wheels)	Power train Direct/ Automatic		
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(1)	(2)	(3)	(4)	(5)
12	Steering (Power assisted)	Steering system		
13	Wheels/ Tyres	Type Size		
14	Chassis and Frame	Chassis type		
15	Bus Body	Factory built (by BEB manufacturer)		
		Built by others (other than BEB manufacturer)		
		Structure/ Frame (Material/ Specifications)		
		Roof paneling (Material/ Specifications)		
		Front/ Rear face (Material Specifications)		
		Ceiling height (mm)		
		Exterior paneling (material/ specification)		
		Paint (material/ specification)		
		Internal finishing (material/ specification)		
		Internal Flooring (material/ specification)		
		Grabrails (specification)		
		Door size (Width x Height) (mm)		
		Number of doors		
		Door opening mechanism		
		Emergency exit doors		
Door step height (mm)				
16	Seating	Seat (material/ specification)		
		Seat layout (dimensions)		
		Gangway width (mm)		
		Total Seating Capacity (Sitting + standee)		
		Priority seat for specially able people		

17	Air conditioner (Cooling + Heating)	Standard (type capacity)		
		Optional (type/ capacity)		
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(1)	(2)	(3)	(4)	(5)
18	Essential/ Safety Accessories items	Tools kit		
		Reverse monitor		
		Fire extinguisher		
		CCTV camera		
		GPS tracking system		
		Passenger Information System (PIS)		
		Smart Ticketing System		
		Wi-Fi		
		First-aid kit		
19	Warranty	for Battery (years)		
		for Electrical/ Mechanical/ Other items (years)		
20	Training facility	For mechanics		
		For operators		
21	Availability of Manuals/ Books	Operation instruction		
		Parts book		
		Maintenance book		
22	After Sales Service	Workshop facility in Nepal		
		Parts availability		
23	Proven performance	Date of commercially lunch/ operation		
		Vehicle performance certification		
		Drag/Rolling/ Total Resistance Chart		
		Energy consumption by Bus (at GVW) (kWh/kg)		
		Vehicle performance chart (Power -Torque - Speed)		
		Special features (if any)		

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(1)	(2)	(3)	(4)	(5)
24	Production capacity	Annual production capacity		
		Total no.of units sold in international market (in last 5 years)		
		Total no.of units sold in national market (in last 5 years)		
		Delivery time		
25	Financial	Annual turnover (Last 3 year's Average)		
		Profit After Tax (Last 3 year's Average)		
26	Estimated Cost per unit (For 9 m category BEB with all standard items and accessories as complete set) with Air-conditioning system	EXW (...) or FOB (..... ) (US\$)		
		CIF (.....) (US\$)		
		CIP (Kathmandu, Nepal) (US\$)		
27	Estimated Cost per unit BEB (For 9 m category BEB with all standard items and accessories as complete set ) Without Airconditioning	EXW (...) or FOB (..... ) (US\$)		
		CIF (.....) (US\$)		
		CIP (Kathmandu, Nepal) (US\$)		
28	Estimated Average Annual Maintenance Cost for fleet of 20 units of Bus for first 5 years	Percentage(%) of Bus cost as per manufacturer's experience in the country of origin (US\$/ year)		
		If this maintenance service to be provided as per contract by manufacturer/ supplier in Nepal (US\$/year)		

S.N  (1)	Criteria  (2)	Required specifications (for the items that includes but not limited to followings)  (3)	Detailed information related to corresponding specifications to be provided by manufacturer  (4)	Remarks (Not applicable/ Customized specification other than standard to be provided in this column)  (5)
29	Estimated Average Operational Cost for fleet of 20 units of Bus for first 5 years	Operation cost (including energy manpower and management) as per manufacturer's experience in the country of origin (US\$ per 100 km per bus)		
		If the operation service to be provided as per contract by manufacturer/ supplier in Nepal (US\$ per 100 km per bus)		

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### Manufacturer's Information for Fully Electrical Battery Operated Bus (BEB)

S.N (1)	Criteria (2)	Questionnaire (Related to basic qualifications requirement) (3)	Answers/ information corresponding to each row to be provided in this column (by manufacturer) (4)	Remarks (Further details/ or other specific information (if any) to be provided in this column) (5)
1	Registered Manufacturer	Year of Registration as BEB Manufacturer ( year)		
		Listed as BEB Manufacturer in stock market since (year)		
		Manufacturing factory Location and Production capacity ( <i>Location address and production units per year</i> )		
2	Manufacturing/ Supply Experiences (For BEB )	Manufacturer's experience of producing Bues (BEB) since .... (total years)		
		Supplied units (same/ similar model) in own country (within last 3 years)		
		Supplied units (same/ similar model) in international market (within last 3 years) ( <i>total physical quantity</i> )		
3	Manufacturing/ Supply Experiences (For Internal Combustion Bus (ICEB))	Manufacturer's experience of producing Bues (ICEB) since .... (total years)		
		Supplied units (same/ similar model) ICEB in own country (within last 5 years) (total physical quantity)		
		Supplied units (same/ similar model) ICEB in international market (within last 5 years) (total physical quantity)		

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(1)	(2)	(3)	(4)	(5)
4	Availability of Standard Technical documents published by manufacturer (For offered model BEB)	General Operation manual		
		General Maintenance manual		
		Spare parts catalogs		
		Comprehensive workshop manual		
		Detailed technical specification		
		Technical catalogs/ Brochures		
5	After Sales Service	Local agent/ experience and facility		
		Deployments of maintenance team for 5 years (if required) ?		
		Spare parts availability for atleast 10 years?		

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## Quality assurance and Performance Test Certifications of Fully Electrical Battery Operated Bus (BEB)

S.N (1)	Criteria (2)	Required quality assurances, test / compliance certifications (That includes but not limited to followings): (3)	Detailed information related to corresponding test certification/ quality standard to be provided by manufacturer (4)	Remarks (Not applicable/ Other related test/ certification (if any) to be provided in this column) (5)
1	Compliance Certifications	Motor Vehicle Rules for BEB (as per manufacturing country's standard)		
		Motor Vehicle Rules for BEB (International standard)		
2	Tests/ Standard Certifications (Applicable to BEB)	Rollover test certification		
		Rainwater/ Sower test certification		
		Collision test certification		
		Electric shock resistance certification		
		Steering system test certification		
		Braking system test certification		
		Suspension system test certification		
		Bus body building standard certification		
		Bus body structure (Strength/ quality assurance test)		
		Bus Roof paneling (Strength/ quality assurance test)		
		Bus Side Paneling (Strength/ quality assurance test)		
	Bus body structure (Strength/ quality assurance test)			

S.N (1)	Criteria (2)	Required quality assurances, test / compliance certifications (That includes but not limited to followings:) (3)	Detailed information related to corresponding test certification/ quality standard to be provided by manufacturer (4)	Remarks (Not applicable/ Other related test/ certification (if any) to be provided in this column) (5)
3	Battery/ Battery Related Parameters (Quality assurance/ Performance Test Certifications)	Battery Performance Test		
		Battery Capacity (AH)		
		Specific Energy (Wh/kg)		
		Specific Power (W/kg)		
		Driving Range (at 20% SoC)		
		Cycle life (at 80% DoD)		
		Packing design/ Compartment		
		Safety features		
		Protection level		
4	Electric Motor (Performance and Quality assurance)	Motor Performance test		
		Power-speed characteristics		
		Torque speed characteristics		
		Noise level (db)		
		Efficiency (%)		
		Protection level (IP ..)		
5	Charger (AC / DC)	Performance Test data/ chart		
		Charging Volt/ Power relation		
		Charging time (Hours)		
6	Test and treatment	Anti rust treatment certification		
		Shock resistance test certification		
7	Design Drawings/ Dimensions	Drawing showing seating layout/ dimensions		
		Drawing showing overall dimensions, Doors, Windows, Floor height, Ground clearance, approach angle, departure angle and Battery compartment etc.		