BETA EL
new electric vehicle from the Czech Republic

The company and the product

Škoda Elcar is a daughter company of Škoda a.s. Plzeň which is one of the biggest industrial companies in the Czech Republic. We have been involved in the electric vehicle business since 1991 and the new line Beta EL is the result of our recent development. BETA EL are utility electric vehicles, suitable for delivery services of various kinds, operating in city centres or environmentally sensitive areas like spa resorts, parks, nature reservations etc. We offer an environmental solution of light delivery transportation for post, telecommunications, municipal utilities, power distribution companies and many other applications.

Model line and vehicle structure

Trying to comply with our customers' needs as well as possible we offer four different models. The difference is based on variability of battery pack installed. The bigger the energy amount the better the range but the heavier the battery and lower the payload . We offer the following configurations:

Beta EL 126	**battery voltage**	**126 Volts**	**payload**	**420 kg**	**range**	**70 km**
Beta EL 144		**144 Volts**		**390 kg**		**85 km**
Beta EL 162		**162 Volts**		**350 kg**		**100 km**
Beta EL 180		**180 Volts**		**310 kg**		**115 km**

The vehicle is a two seated minivan made by non-tradition production technology. Absolutely corrosion-resistant light plastic body covers strong but light space frame made of steel tubes. The frame structure ensures high level of passenger safety; the front deformation zone is of unique design. Vehicle interior and chassis parts are supplied by renowned car manufacturer.

Driving the Beta EL

Beta EL is designed to be friendly, easy to use car. Driving it is very simple, the driver just pushes the accelerator and vehicle starts. When the accelerator is released, the electric motor begins to brake and returns the energy back to the battery. No clutch neither gear shifting is necessary, only the driving direction forwards/reverse must be selected. Microprocessor motor controller offers also the cruise control option, which allows to keep the vehicle running at a constant speed without touching the pedal. It helps the driver not to exceed the city speed limits and improves the energy consumption. The power of the motor allows the vehicle to compete with petrol engine cars both in speed and acceleration.

Battery

Driving energy is stored in nickel cadmium battery Saft, which is special designed for electric vehicle operation. It is high performance low maintenance water cooled battery with lifetime 1500 charging cycles. The maintenance of the battery is very simplified by reliable central water filling system. Only the connecting of filling hose to a special plug and a few minutes of waiting is needed to top up the battery.

Battery Charging

Restoring of battery energy could be made in two ways. The first one is on-board charger, which is built in the vehicle and recharges the battery using an ordinary household socket 220 Volts / 16 Amps. In this case the recharging time is 10 hours for fully discharged battery. The other way of battery recharging is energy refilling at a charging station. Then only the station connector is plugged in the vehicle fast charge socket and up to 75% of energy can be recharged within 30 minutes.

Battery Monitoring System

Battery Monitoring System is an on-board computer system which provides the driver with necessary information about battery state-of-charge, the energy consumption, etc. The most important values are indicated by analogue gauges and the others by integrated display. Additional functions of BMS are a battery data storage, a charging mode control and a reminder of regular battery maintenance.

ŠKODA ELCAR s.r.o. Ejpovice, 330 02 Dýšina u Plzně, CZECH REPUBLIC phone + 420 19 77 41 498 fax + 420 19 945651

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BETA EL 180 TECHNICAL SPECIFICATION

GENERAL CHARACTERISTIC
Light utility electric vehicle, two seated, front wheels drive.
Structure: space frame welded of steel tubes, body panels made of GRP. Rear access: tailgate.

TRACTION MOTOR	AC induction, transversally mounted
Power (rated / maximum) [kW]	20 / 40
Max. torque [Nm]	132
Rated voltage [V]	180
Max. speed [rpm]	9 000
Cooling system	liquid (water/glycol)
TRANSMISSION	single speed gear box total gear ratio 7.49
MOTOR CONTROLLER	AC inverter with regenerative braking software adjustable parameters (maximum motor current, maximum battery current) power control dependent on battery SOC
TRACTION BATTERY SYSTEM	SAFT STM nickel-cadmium batteries, low maintenance with central filling system, water cooled
Number of modules	30
Rated system voltage [V]	180
Rated capacity [Ah]	100
BATTERY MANAGEMENT SYSTEM	display built in instrument cluster, the most important information displayed by analogue gauges
Driver information	SOC - remaining capacity, discharging current, consumption, battery voltage and temperature reminds regular maintenance intervals
Stored information	number of battery cycles, total charged and discharged capacity, battery critical states
Additional functions	battery cooling system control charger control, automatic inserting of equalizing and maintenance charging cycles
ON-BOARD CHARGER	
Input	220 V / 16 A
Charging time	max . 12 hours
BOARD ELECTRIC SYSTEM	battery 12 V / 45 Ah, lead acid, maintenance free, supplied by **500 W DC/DC converter**
HEATING SYSTEM	5000 W heater, unleaded fuel, consumption 0.5 / 0.2 l/hour
SUSPENSION	
Front axle	McPherson strut with lower wishbone, offset coil springs, telescopic shock absorbers
Rear axle	rigid axle with leaf springs, telescopic shock absorbers
STEERING	rack and pinion type, safety steering column
BRAKE SYSTEM	dual diagonal circuit, power assisted (**electric vacuum pump**)
Front brake	disc brake, diameter 242 mm, floating calliper
Rear brake	drum brake, diameter 180 mm, self adjusting
WHEELS	steel 4.5 J x 13
TYRES	165 / 70 R 13
DIMENSIONS [mm]	
Overall length	3 890
Overall width	1 660
Overall height (at kerb weight)	1 700
Wheelbase	2 465
Tracks (front / rear)	1 420 / 1 380
Load compartment capacity [litres]	2 250
WEIGHTS [kg]	
Kerb weight	1 340
Gross vehicle weight	1 650
Payload	310
Max. permissible front axle load	790
Max. permissible rear axle load	870
ROAD PERFORMANCE	
Range (urban distribution cycle) [km]	115
Top speed [km/h]	100
Mains energy consumption [Wh/km]	220 - 240