

# Articulated battery bus with IMC500

SOLINGEN, GERMANY



## General

Public transport companies that operate diesel-powered buses partly under overhead wires can electrify their bus fleets by operating electric buses equipped with KIEPE's IMC technology.

SWS, the public transport company in Solingen, has decided to realise this innovative solution: They exchange the diesel buses of line 695 to IMC electric buses. The existing overhead wires will function as a approximately 2 km long IMC road, used as a charging infrastructure. The batteries of the buses will be recharged in accordance with the In Motion Charging (IMC) concept when they drive under the overhead wire.

The new electric buses, which are called BOB (Battery Overhead wire Buses) in Solingen, are equipped with liquid-cooled lithium-titanate-oxide (LTO) traction batteries. Thanks to these batteries and the only 2 x 2.1 km long "IMC charging road" the BOBs can perform regular nonstop passenger service on the 18 km long circulation. Out of town nearly 80% of the route is without overhead wire.

As the system concept, which consists of an electric drive, a battery with a battery charger, and the integration into the existing infrastructure are of vital importance, Kiepe Electric has taken on a leading role in the project.

## Scope of delivery

KIEPE delivers the entire electrical traction equipment, the on-board power supply system, the traction batteries and the automatic current collector system.

## Project characteristics

- Diesel buses are replaced by electric buses with IMC
- IMC500 = Up to 500 kW of energy transfer from the infrastructure into the vehicle
- 77 % wireless of the 18.1 km long circulation
- 2 x 2.1 km long IMC road per circulation (corresponds to 23 % with overhead contact line)
- Articulated battery bus with a discharge power of 300 kW (for acceleration, heating etc.)

## Vehicle data

<b>Design / model</b>	Articulated low-floor trolleybus of the type "Trollino 18.75" (Solaris / KIEPE)
<b>Vehicle size</b>	18,75 m x 2,55 m x 3,5 m (length x width x height)
<b>Weight of vehicle</b>	20.31 t tare; 28 t gross; 7.69 t payload
<b>Passenger capacity</b>	approx. 112 (46 seating)
<b>Electric motor</b>	2 x 160 kW asynchronous motors on the 2nd and 3rd axles (4 powered wheels)
<b>Motor control</b>	Air-cooled IGBT inverter
<b>Energy of battery</b>	Lithium-titanate-oxide (LTO); 48 kWh usable energy / 60 kWh installed energy; 200 kW continuous power / 300 kW peak power
<b>Charging concept</b>	IMC® (in motion charging) up to 240 kW and opportunity charging (standing)
<b>Vehicle power input</b>	Up to 500 kW in motion (IMC500); over 200 kW standing
<b>Current collector system</b>	Automatic lifting and lowering
<b>On-board power supply</b>	16 kW DC 24 V / 35 kW AC 500 V
<b>Heating/air conditioning</b>	40 kW / 25 kW
<b>Maximum range in battery mode</b>	40 km (emergency operation without heating/ventilation)

