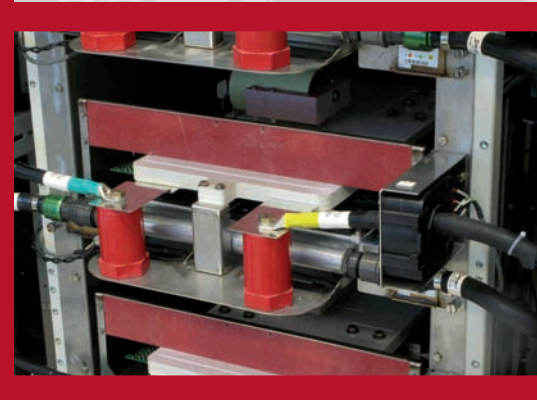


Ingeteam

ED-74 Self-propelled Electrical Units for ■■■■■■ Regional Services



The design of the converters has allowed the availability and maintainability of the vehicles to be improved and the space to be optimized

Ingeteam Traction has developed and supplied the traction system for a new family of self-propelled electrical vehicles in collaboration with the rolling stock manufacturer PESA. The first 14 units of this family of vehicles, with the capacity to circulate at speeds of up to 160 km/h, are currently providing service for the railway operator PKP Regional, in one of the most important corridors in Poland, between the cities of Warsaw and Lodz.

For this family of vehicles, Ingeteam Traction has supplied the water-cooled on-board traction converters for 3,000 Vdc catenary that make up the auxiliary converters, thus optimizing the system in terms of both costs and space.

Each of the traction converters incorporates two 500 kW traction inverters, one for each traction motor, providing redundancy for the vehicle in order to improve availability rates. The auxiliary converter for each of the converters has a power of 200 kVA.

The modular design of the converters has optimized their maintenance since it allows power modules to be exchanged in a simple manner, in a reduced period of time, without the need for heavy, special tools and without the need to empty the cooling circuit. Likewise, diagnostic tools have been developed for the purpose of minimizing maintenance costs.

The converters include a regenerative braking system, returning energy from braking to the catenary, in an effort to optimize energy consumption, thus reducing operating costs.

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Technical Data

1 Vehicle characteristics

Type of vehicle	ED-74
Supply voltage	3,000 Vdc
Number of cars	4
Traction distribution	Push-Pull
Track gauge	1,435 mm
Maximum speed	160 km/h
Axle load	< 17,500 kg
Acceleration	1 m/s ²
Traction converters	2 based in 6.5 kV IGBT-s
Traction motors	4 asynchronous motors
Continuous traction power	2,000 kW
Maximum power at wheel	2,778 kW
Traction effort	200 kN up to 50 km/h

2 Traction converter

Dimensions	2,500 x 1,100 x 2,000 mm
Weight	1,500 kg
Input voltage	3,000 Vdc (± 1,000 V)
Number of inverters	2 independent inverters
Number of motor per inverter	1
Inverter topology	2 level inverter
Semiconductor technology	6.5 kV IGBT-s
Continuous power per motor	500 kW
Maximum power per inverter	695 kW
Output voltage of inverter	0 to 2000 Vrms
Output frequency of inverter	0 to 172 Hz
Output current per inverter	0 to 280 Arms per phase
Cooling system	Water with anti-freezing
Deionised water required	No
Temperature range	-40°C to 35 °C
Brake method	Regenerative to catenary
Secondary brake method	Rheostatic

Modular concept, in order to maximize the availability and maintainability of the system.

3 Auxiliary Converter

Dimensions	Integrated in the traction converter
Input voltage	3,000 Vdc (± 1,000 V)
Output voltage	400 Vac ± 5%
Nominal power	250 kVA
Output current per phase	221 Arms
Output voltage ramp	Programmable 0 to 5 s
Total harmonic distortion (THD)	< 10%

