TRACTION T10 Roof Mounted Traction System for ELF

For these vehicles, INGETEAM supplies the roof-mounted traction converters for 3,000 Vdc catenary optimizing the system in terms of costs, space and weight.

The EMUs composed by two/three cars, have been designed for commuter and regional service where platform height is 550mm.

The auxiliary converter for each of the converters has a power of 200 kVA.

The modular design 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 converter includes a regenerative braking system, returning energy during braking to the catenary, in an effort to optimize energy consumption, thus reducing operating costs.

Vehicle Characteristics

Client:	PESA
Type of Vehicle:	ELF
Supply Voltage:	3,000 Vdc
Number of cars:	2/3 cars
Traction distribution:	Push-Pull
Track Gauge:	1,435 mm
Maximum Speed:	130 km/h
Axle Arrangement:	Bo-B-B-Bo (2 cars)
Acceleration:	$\geqslant 1$ m/ s^2
Traction Converters:	2
Traction Motors:	4
Maximum Power at Wheel:	1,961 kW
Traction Effort:	141 kN

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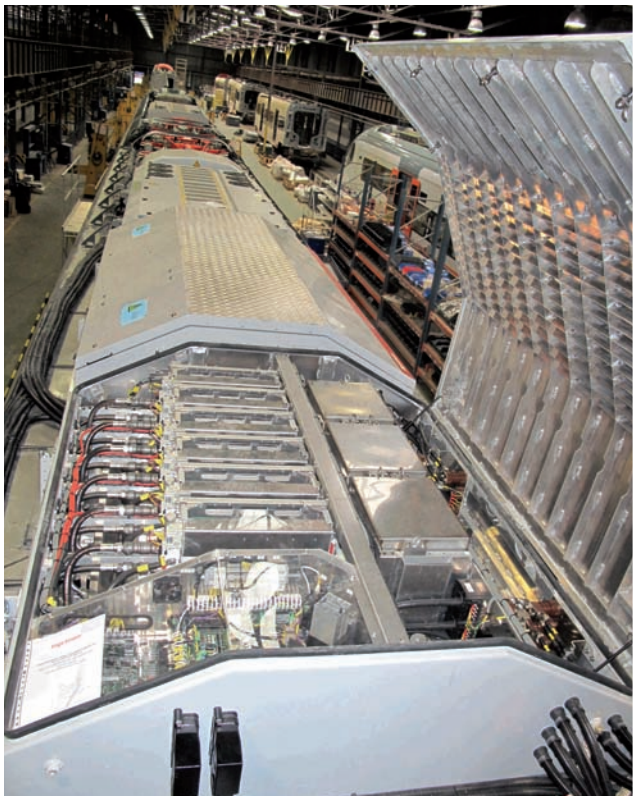
Traction Converter

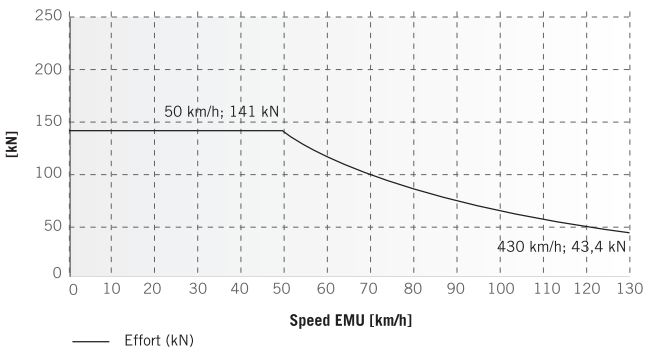
Dimensions:	1,800x570x1,900 mm
Weight:	810 Kg
Input Voltage:	3,000 Vdc (2000-4000)
Number of inverters:	2
Number of motor per inverter:	2
Continuous Power/motor:	400 kW
Max. Power/converter:	2,267 kW
Semiconductor topology:	6.5 kV IGBTs
Output Voltage of inverter:	0 to 2,807 Vrms
Output Frequency of inverter:	0 to 172 Hz
Output Current per inverter:	0 to 325 Arms per phase
Cooling system:	Liquid
Deionised water required:	No
Temperature range:	-40ºC to 50 ºC
Electric braking method:	Regerenative to catenary
Secondary braking method:	Rheostatic

Auxiliary Converter

Dimensions:	1,800x570x2,900 mm
Input Voltage:	3,000 Vdc (± 1,000 V)
Output Voltage:	400 Vac ± 5%
Nominal Power:	200 kVA
Output current per phase:	360 A
Output Voltage Ramp:	Programmable 0 to 5 s
Total Harmonic Distortion (THD):	< 10%



Maximum traction effort characteristic in train speed function



Power diagram