

The new ELF 2 vehicles developed by rolling stock manufacturer PESA, with the capacity to run at speeds of up to 160 km/h, will be first delivered during 2017.

The design proposed by INGETEAM for these traction converters optimizes the availability and maintainability of the vehicles, and offers the maximum versatility to the platform of vehicles, from 2-car to 6-car configuration) to suit operator's needs.

The integration of the auxiliary converter on the traction converter has optimized space and reduced weight significantly.

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.

Likewise, diagnostic tools –INGEMASTER- have been developed to minimize maintenance costs. The converters include a regenerative braking system, in an effort to optimize energy consumption, thus reducing operating costs.

Vehicle Characteristics

** For 4-cars composition*

Type of Vehicle:	ELF2. EMUs
Supply Voltage:	3,000 Vdc
Track Gauge:	1,435 m
Maximum Speed:	160 km/h
Axle Arrangement:	Bo'2'2'2'Bo'
Traction Converters:	2
Traction Motors:	4
Maximum Power at Wheel:	2,500 kW
Traction Effort:	200 kN



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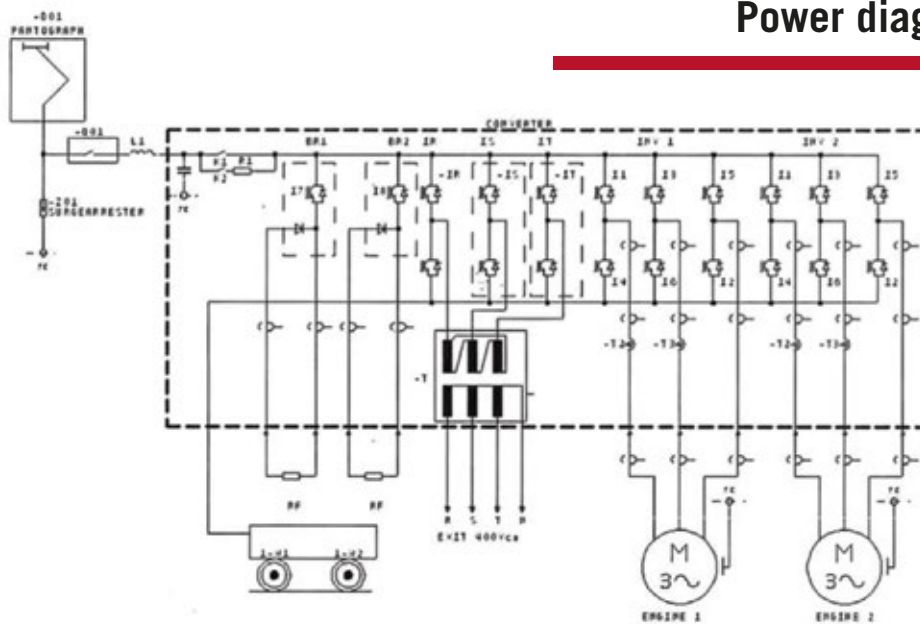
Traction Converter

Dimensions:	3312* 1784*512 mm
Weight:	925 kgs
Input Voltage:	3,000 Vdc (EN50163)
Number of inverters:	2 traction inverter + 1 auxiliary
Number of motor per inverter:	1* 450kW
Inverter Topology:	2 -level inverter
Semiconductor Technology:	6,5 kV IGBT-s
Output Variable Nom. Voltage:	0 to 2,339 Vrms
Output Frequency of inverter:	0 to 220 Hz
Output Current per inverter:	340 Arms (nominal)
Cooling system:	Liquid

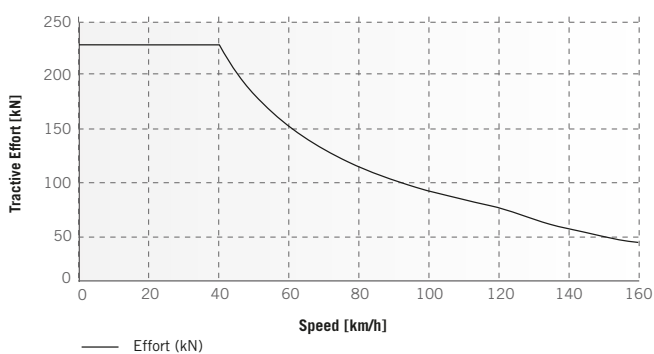
Deionised water required:	No
Temperature range:	-30°C to +40 °C
Brake method:	Regenerative to catenary
Secondary brake method:	Rheostatic

Auxiliary inverter integrated in the traction converter.
 Maximum possible power for auxiliary inverter : 250 kVA
 Different configurations available.

Power diagram



Traction effort characteristics in train speed function



Braking effort characteristic in train speed function

