

INGETEAM has developed and supplied the electrical equipment for high speed power heads. The maximum speed of the train is 250km/h and the supply voltage is 25 kVac, 50 Hz.

The trains came into service on Uzbekistan railway lines (gauge: 1.520mm) in 2011.

Ingeteam's supply includes the complete electrical engineering and supply of the traction system; auxiliary battery charger and control cabinets; High voltage cell and electronic control system.

The traction converter contains: Active Front End (AFE) rectifiers, two traction converters that feed two traction motors each and three auxiliary converters. Two of these auxiliary traction converters supply the auxiliary power necessary for the power head with a total power of 150kVA each and the third is the supply of 250kVA for the passenger cars. The compact design of this converter and the incorporation of the passenger car auxiliary converter allows to add approximately up to 20 seats more in the two end cars.

The control system is based on the electronic control system developed in-house, with decentralised I/Os and MVB, WTB Communications modules, according to IEC 61375-1 TCN standards.

## Vehicle Characteristics

Client:	TALGO
Type of Vehicle:	Power Heads
Catenary Voltage:	25 kVac (+25% -30%)
Traction Distribution:	Push-Pull
Track Gauge:	1,500 mm
Maximum Speed:	250 km/h
Nominal Power:	2,400 kW / 3,150 HP
Maximum Effort:	200 kN
Traction Converters:	2
Nr. Motors:	4, Asynchronous



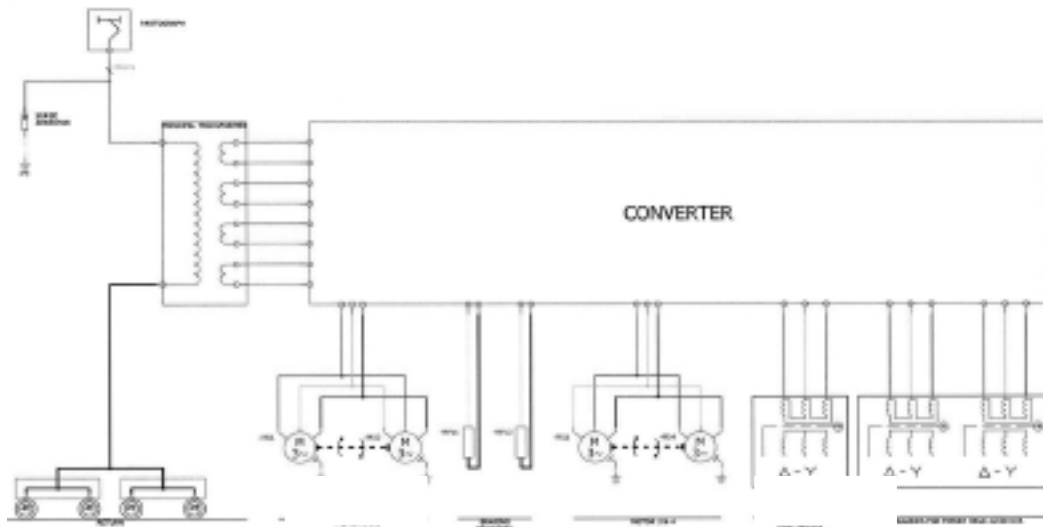
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## Traction Converter

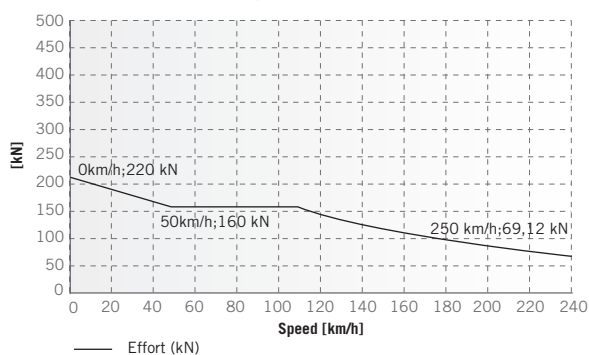
Input catenary voltage :	25 kVac 50 Hz (+ 25% / -30%)
Nr. of inverters:	2 independent inverters
Nr. of motor per inverter:	2
Inverter topology:	2-level inverter
Continuous power/motor:	632 KW
Max. power / inverter:	1,400 KW
Semiconductor topology:	6.5 kV IGBTs
Output voltage of inverter:	0 to 2,807 Vrms
Output frequency of inverter:	0 to 154.6 Hz
Output current per inverter:	0 to 300 Arms/phase
Cooling system:	water
Temp. range:	-25°C to 50°C
Electric braking:	regenerative to catenary
Secondary electric braking:	rheostatic



## Power diagram



Maximum traction effort characteristic in train speed function



Maximum braking effort characteristic in train speed function

