New York City Transit – R34142 ... ONIX 800



ONIX for New York City Transit

- 680 R34142 rapid transit cars
- 952 IGBT naturally cooled drives
- ONIX 800 Range

Contract overview

In 1997, ALSTOM were chosen by NYCT and Bombardier to supply the drive systems for a new fleet of 680 metro cars, R34142's.

The trains will be equipped with ONIX 800 naturally cooled inverters. The reduction in equipment weight, size and power consumption enabled by the ONIX IGBT drive will make the vehicles among the most technologically advanced in the world.

Localization

Under "Buy America" Rules, part of the contract will be manufactured locally in ALSTOM's Hornell plant in the US.

ALSTOM qualification on R38 cars

One of the principal contract requirements was a one year revenue service test of the traction equipment. An eight car train of R-38 cars was used for the testing of both forced air cooled and naturally ventilated IGBT based propulsion system. ALSTOM achieved qualified status after 1 year of successful inservice running.

Prequalification requirements

ALSTOM had to achieve:

Compatability with existing DC car systems speed/distance and braking requirements

- Compatability with signalling system (EMC)
- 370,000 miles of revenue service running

Flawless operation

The most successful aspect of the demonstration has been the flawless operation of the naturally cooled inverter, the stability of the software for the system and the system availability. This programme resulted in ALSTOM qualifying as a supplier of propulsion equipment for the R34142 contract.

Naturally cooled inverter

The naturally cooled inverter was a specific customer requirement for the R3142 contract and considered the best option for the operating environment which can be dusty and hot.

The air cooled inverter means no fans, no noise, no dust build-up requiring practically no maintenance.

Small space envelope on underframe

There is restricted space for the equipment on the underframe due to the narrow width of the R34142 vehicle. This meant that ALSTOM had to work closely with its customer to make adjustments for the small envelope space and to ensure that the equipment would fit in the space available. This was enabled by the compact format of the ONIX Drive.



Operational specification

Operator: MTA New York City Carbuilder: Bombardier Line gauge: 1435 mm Line voltage range: 450-800 V Number of trains: 136 x 5 car units Number of cars: 680 Number of IGBT inverters: 952 Traction range: ONIX 800 Type of vehicle: Subway Train consist: 5 car train configuration A-B-B-A Power collection: 3rd rail Maximum tractive power per motor car: 512 kW A car 256 kW B car Maximum braking power per motor car: 1272 kW A car 636 kW B car

TRACTION

motors

4 x ONIX 3 phase AC

Maximum starting tractive effort: 245 kN for 14 motors Maximum design speed: 60 mph Maximum design acceleration: 2.5 mph/sec Maximum design braking: -2.2 mph/sec

HIGH VOLTAGE

Line inductor

Soft Crow-bar

Brake resistor

Circuit breakers

PROPULSION

CONTROL

- 1 ONIX IGBT inverter with rheostatic chopper Braking: regenerative and rheostatic braking
- AGATE 32 bit microprocessor - Equipment performance
- Slip/slide control

Technical characteristics

IGBT Inverter

Nominal DC input: 600 V
Peak accelerating
current, rms:1050 A rms
Cooling: heatsink cooled by
vehicle motion
Motor/inverter ratio: 2:1
Modulation frequency: 1250 Hz
varies

ONIX AC Motor

Supply voltage: 600	V
Nominal power rating: 110 k	W
Rated speed: 1750 rp	m
Maximum speed: 4314 rp	m
Cooling: Self-ventilati	on
totally enclos	ed
Motors per axle:	. 1
Class 200 insulation	

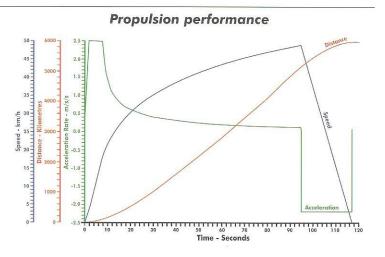
Dimensions and mass

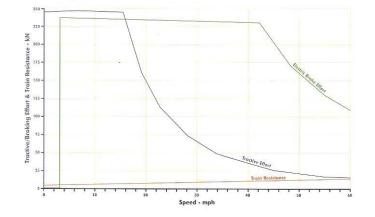
Traction Equipment Case

Length:	1680 mm
Width:	1400 mm
Depth:	740 mm
Mass:	722 ka

Motor

Rotor diameter:	263 mm
Mass:	540 kg
Height:	470 mm
Width:	420 mm
Depth:	784 mm







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