

Motor catalogue

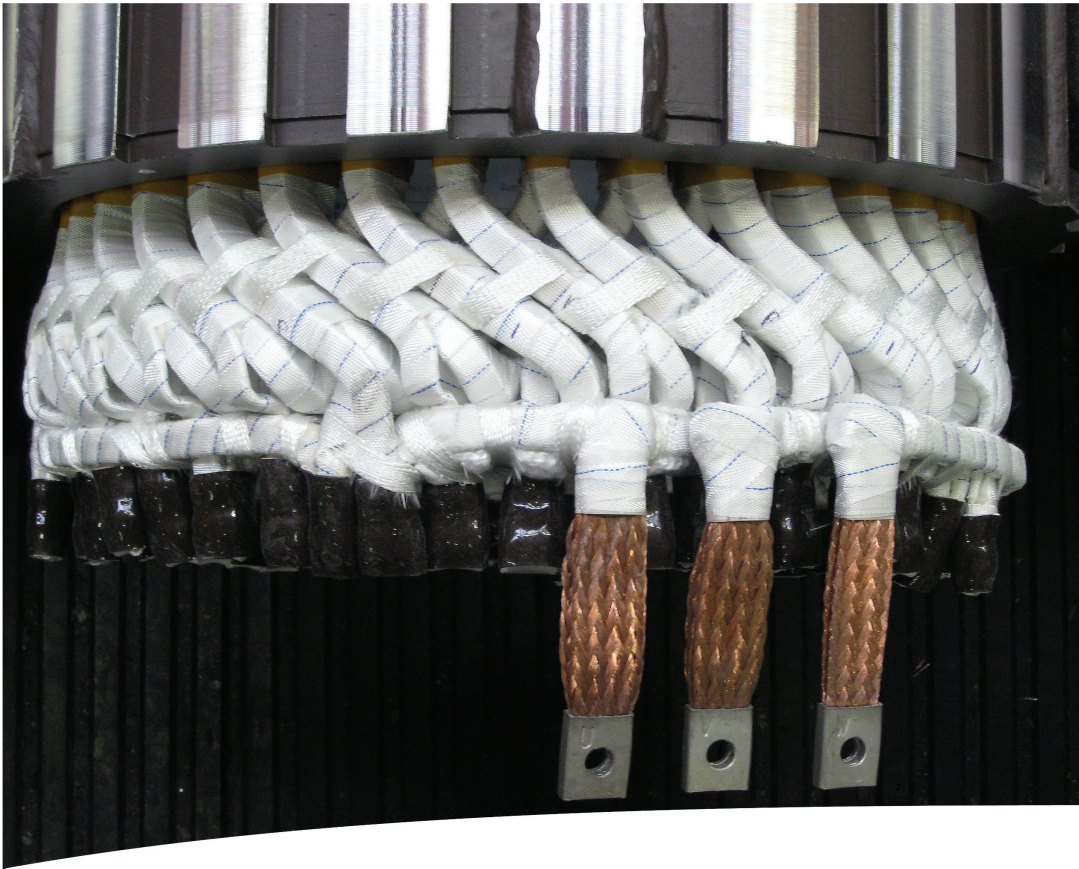
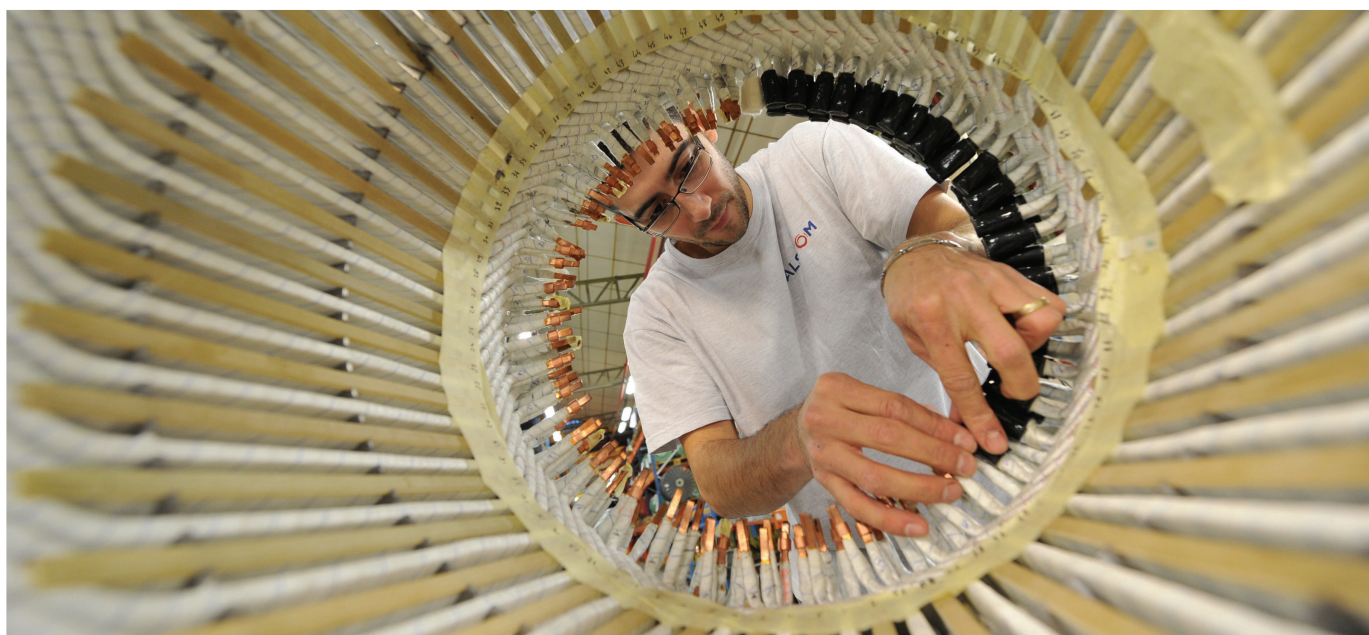


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A wide range of motors tailored to meet every need

Thanks to its extensive catalogue of motors covering all rolling stock types, Alstom provides its customers with optimised solutions adapted to their integration and operating constraints:

- asynchronous / synchronous (permanent magnet motor)
- open / closed
- self-ventilated / forced-ventilated / water-cooled
- winterised if needed

Alstom optimises motor integration in the bogie and the traction chain while adapting them to non-Alstom material.

Each year, 5,500 motors are manufactured and increase Alstom's proven motor fleet, in successful operation worldwide.

Leader in permanent magnet motor technology

Combining the widest spectrum of applications for permanent magnet motors (PMM) with the return on experience of more than 2,000 PMMs in service, Alstom is today the unrivalled leader of PMM technology in railway applications.

The PMM's main specificities are:

- to enable energy savings at train level up to 15% thanks to its increased efficiency and its lightness (up to -40% vs asynchronous motor)
- to enable innovative train architecture thanks to its compacity (up to -25%) and outstanding power-to-weight ratio (up to 1.15).

Permanent magnet motors are key to the successes of a wide range of Alstom trains from tramways to very high-speed.

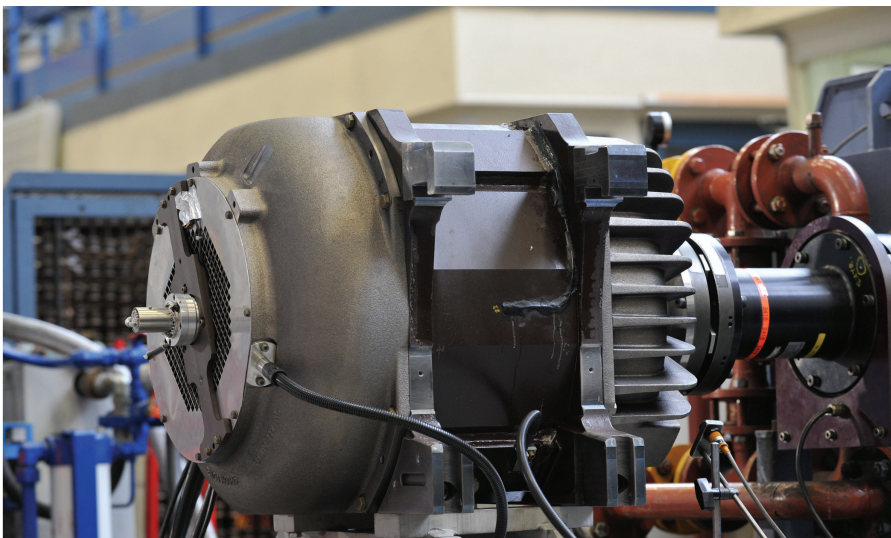
Innovative and long-lasting railway motors

Our motor engineering centre at Ornans (France) is the heart of Alstom's motor innovations: the Ornans site has been designing best-in-class motors since 1919. Its cutting-edge validation facilities guarantee that even our most innovative products are reliable: validation of the motor within its traction system, bearings fatigue test bench, fatigue test bench to validate new concepts, semi-anechoic chamber for noise performance deep validation.

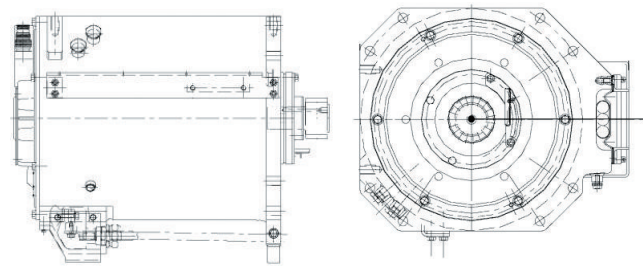
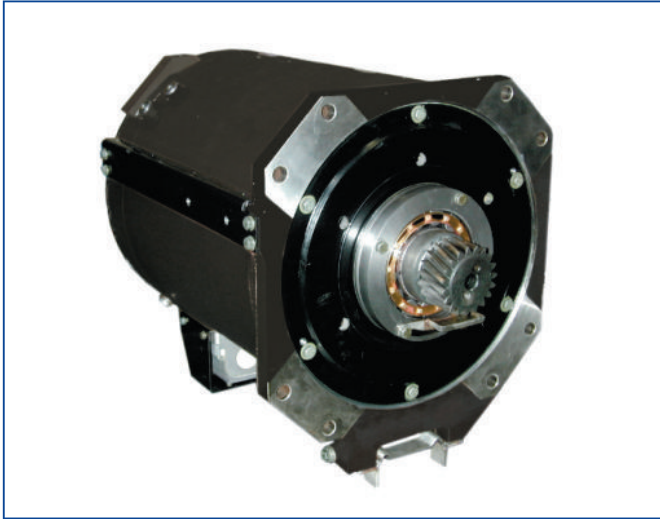
Close to our customers

Alstom supports its customer projects via a network of ISO 9001-certified manufacturing locations, while retaining a single design authority. In addition to its historical manufacturing centres in France (Ornans) and USA (Hornell, NY), Alstom has created a joint venture in China (Xian): Xayeeeco has produced nearly 5,000 motors since its creation in 2006.

Alstom accompanies its customers by offering a range of customised services for their trains and sub-systems – whether built by Alstom or not – throughout the entire lifecycle. Thanks to our catalogue of motor spare parts and our full range of maintenance and overhaul expertise, we help our customers to stay focused on their core business while minimising the lifecycle costs of their equipment.



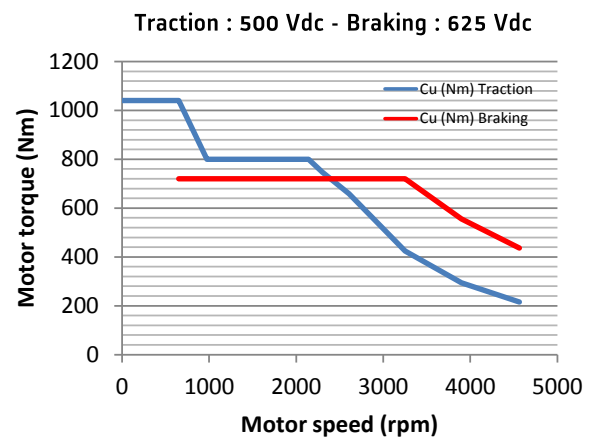
4 HGA 1433



MAIN FEATURES

- very low noise level thanks to water-cooling
- Citadis X02's motor operated all over the world on Arpège bogie in more than 6000 units

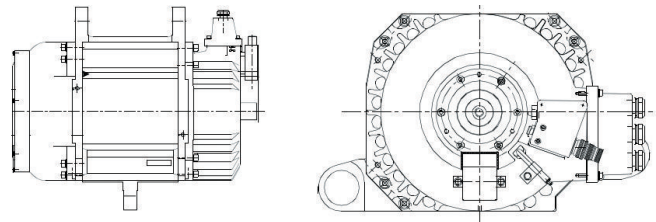
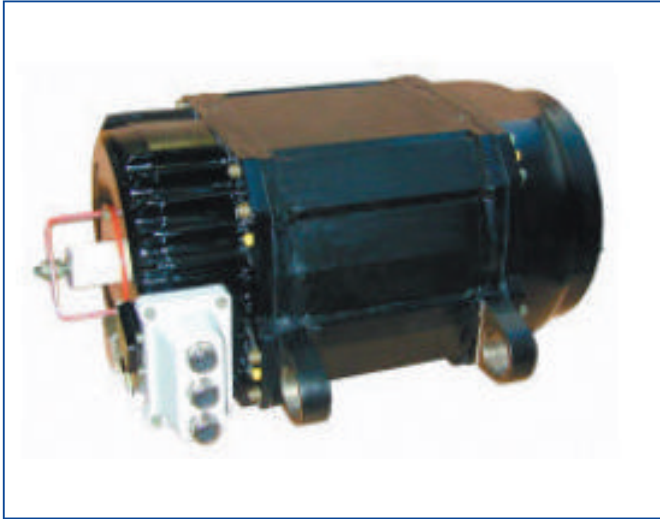
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 HGA 1433
Technology	Asynchronous
Power rating	120 kW @ 2,600 rpm
Continuous torque	440 N.m
Mechanical transmission	Pinion
Cooling system	Water-cooled
Closed/Open	Closed
Outline: width x height x length (mm)	400 x 450 x 528
Weight (kg)	335

4 LMA 1245 N

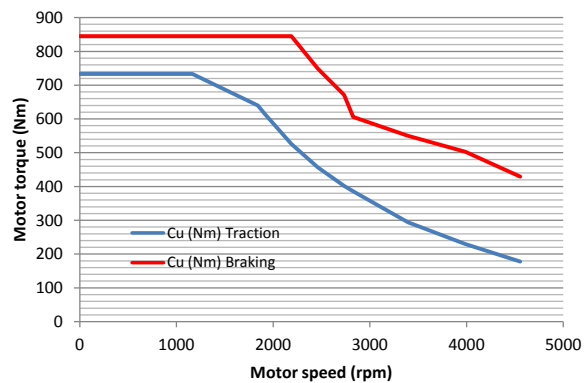


MAIN FEATURES

- operated in Melbourne (AU) on Citadis tramway

TRACTION MOTOR CHART

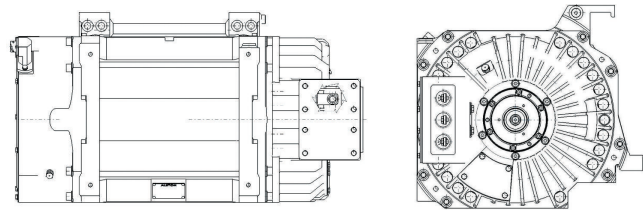
Traction : 600 Vdc - Braking : 720 Vdc



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 LMA 1245 N
Technology	Asynchronous
Power rating	105 kW @ 2,200 rpm
Continuous torque	456 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	410 x 350 x 670
Weight (kg)	380

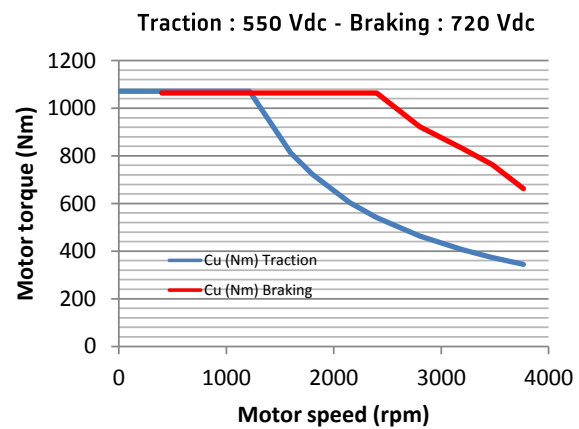
4 LMA 1452



MAIN FEATURES

- designed to be operated in low temperature conditions (-40°C/+40°C)
- fitted on TramCis with Ipomos bogie currently operated in Moscow on line 17 and sold to Saint-Petersburg (RU)

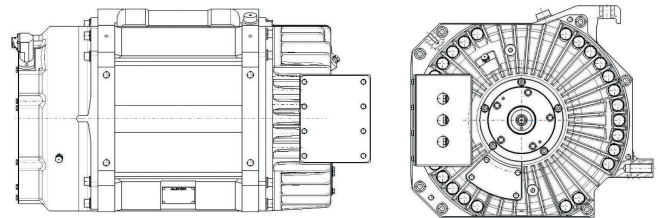
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 LMA 1452
Technology	Asynchronous
Power rating	100 kW @ 1,900 rpm
Continuous torque	503 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	382 x 431 x 720
Weight (kg)	460

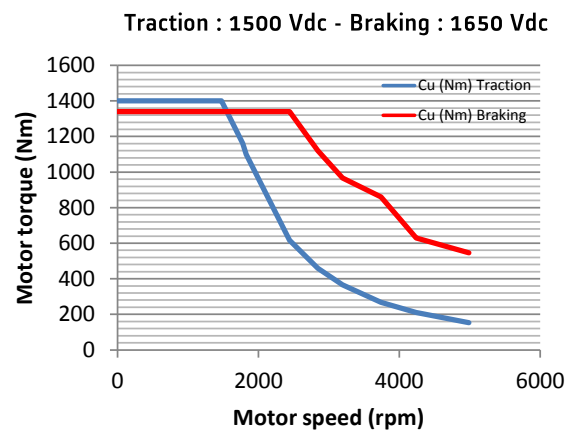
4 LMA 1648



MAIN FEATURES

- designed to be operated in low temperature conditions (-40°C/+40°C)
- will be operated on our train - train Citadis Spirit (US market) with Iponam bogie in 2018

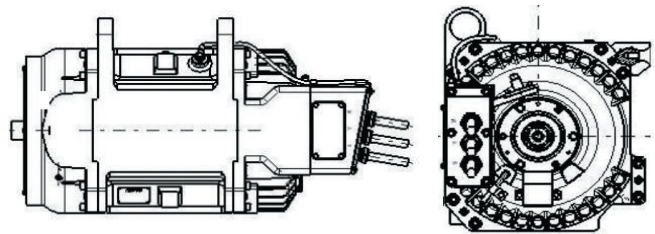
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 LMA 1648
Technology	Asynchronous
Power rating	130 kW @ 2,257 rpm
Continuous torque	550 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	390 x 431 x 720
Weight (kg)	530

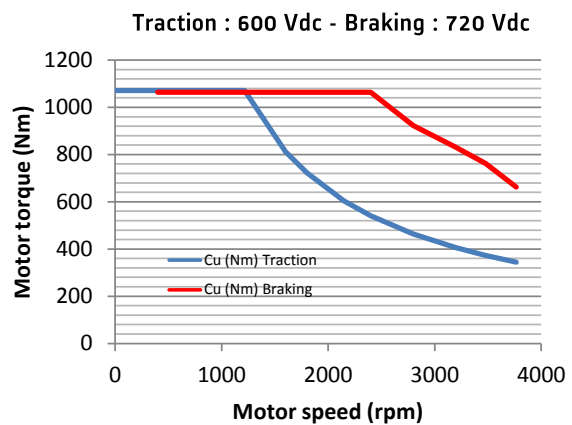
4 LMA 1446 C



MAIN FEATURES

- designed to fit into Corège bogie (trackside drive architecture)
- operated in Rotterdam (NL) since 2004

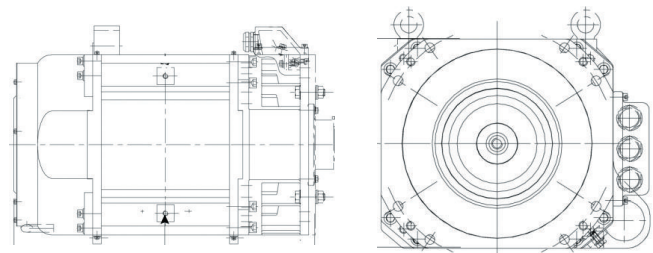
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 LMA 1446 C
Technology	Asynchronous
Power rating	100 kW @ 1,900 rpm
Continuous torque	503 N.m
Mechanical transmission	Coupling with double endshaft output
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	360 x 420 x 643
Weight (kg)	420

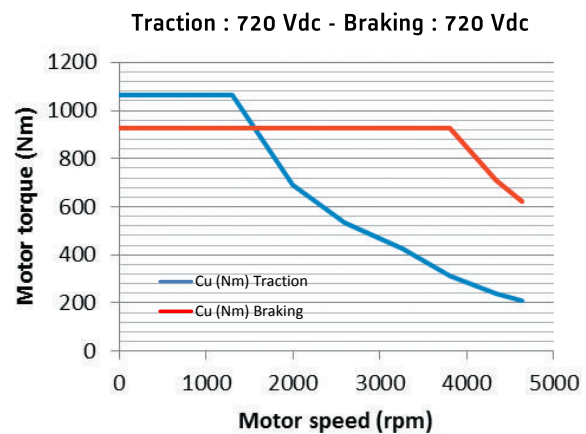
4 LGA 1450



MAIN FEATURES

- nearly 300 units operated under RegioCitadis tram-train on RandstadRail (NL) and Kassel (DE) since 2005

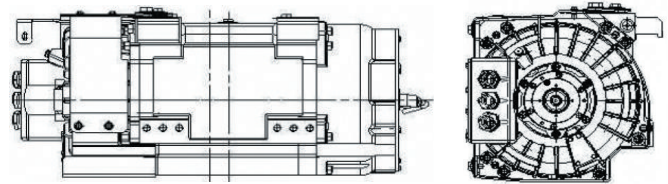
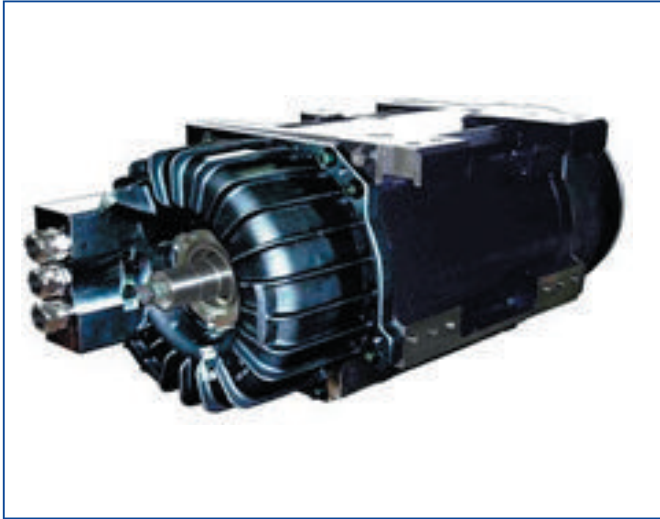
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 LGA 1450
Technology	Asynchronous
Power rating	150 kW @ 2,500 rpm
Continuous torque	573 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	420 x 380 x 690
Weight (kg)	435

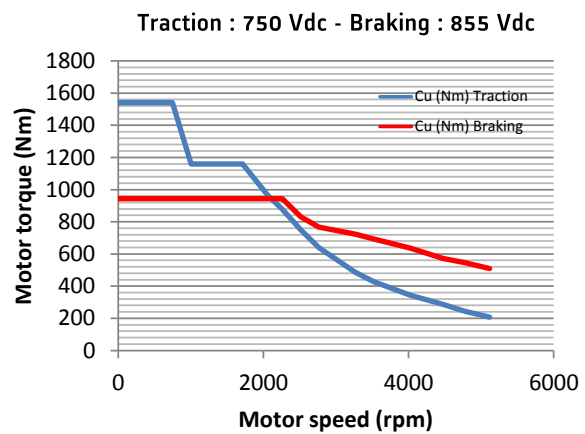
6 LMS 1052



MAIN FEATURES

- power density increased by 80% compared to asynchronous motor
- 25% more compact than asynchronous motor
- enables energy savings
- 400 motors operated on Ixège bogie on Istanbul and Aubagne Citadis tramways, as well as on Lyon and Nantes Citadis Dualis tram-trains, with speed ranging from 70 to 100 kph

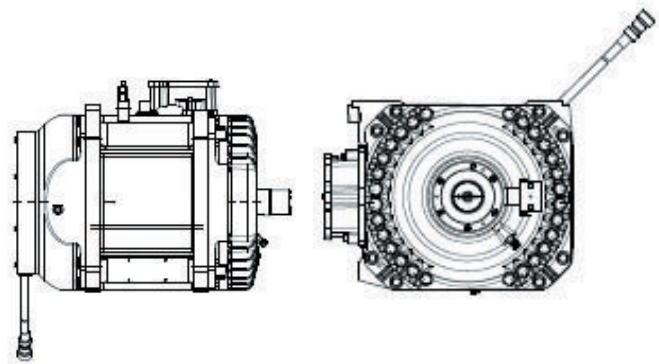
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	6 LMS 1052
Technology	PMM
Power rating	150 kW @ 2,600 rpm
Continuous torque	550 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	350 x 350 x 720
Weight (kg)	330

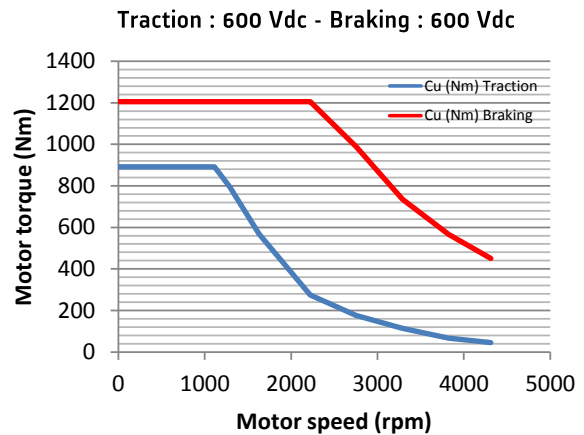
4 LCA 1640



MAIN FEATURES

- small motor particularly suitable for 100% motorized metro
- more than 4500 motors produced and operated since 2003 by New York City Transit Authority (US) and by RATP

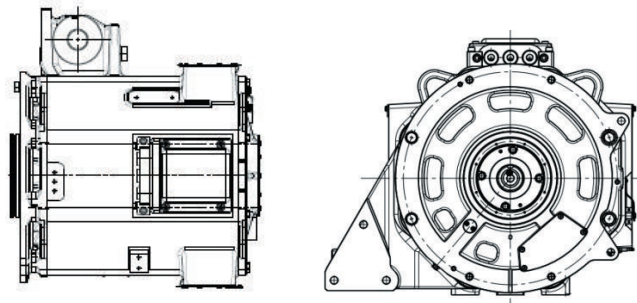
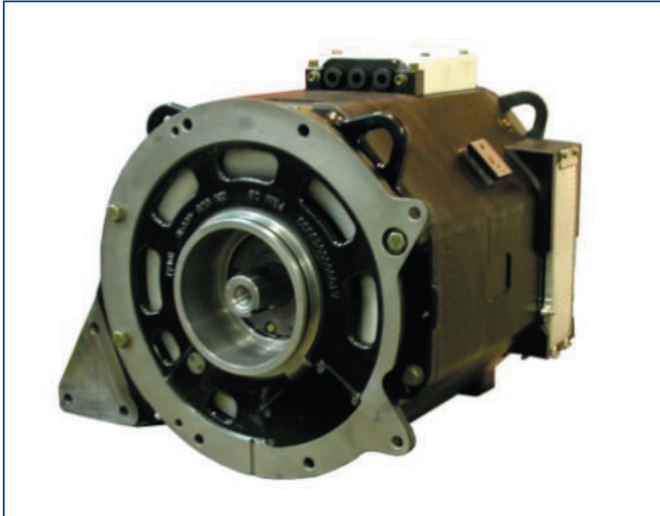
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 LCA 1640
Technology	Asynchronous
Power rating	110 kW @ 1,750 rpm
Continuous torque	600 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	430 x 567 x 740
Weight (kg)	480

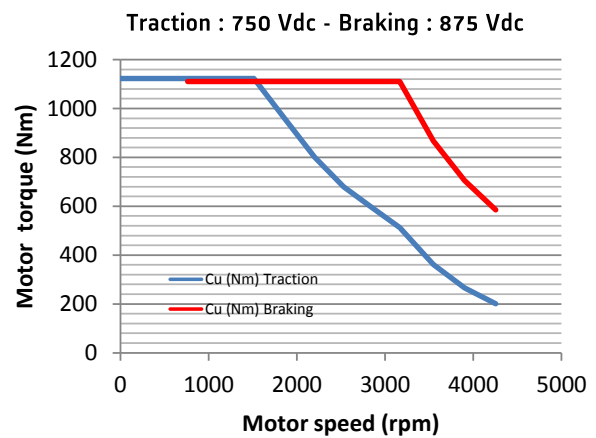
4 EXA 1828 A



MAIN FEATURES

- 1500 motors produced and operated on metro since 2003 in Caracas (VE) and Sao Paulo (BR)

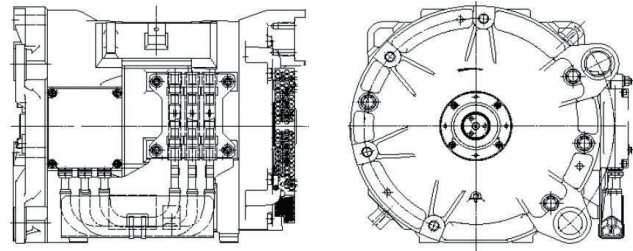
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 EXA 1828 A
Technology	Asynchronous
Power rating	180 kW @ 2,411 rpm
Continuous torque	713 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	550 x 565 x 682
Weight (kg)	740

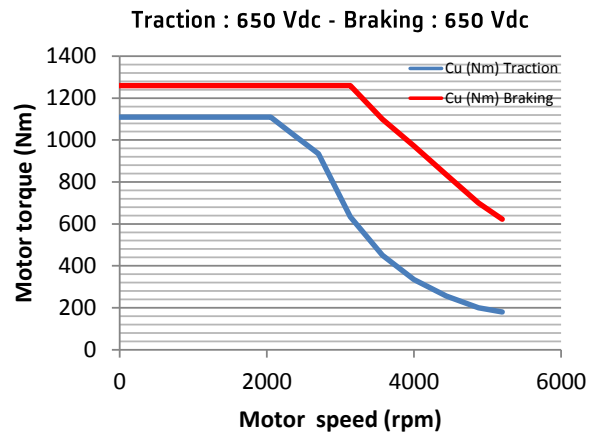
4 EXA 2122



MAIN FEATURES

- 2000 motors operated on metro by WMATA (US)

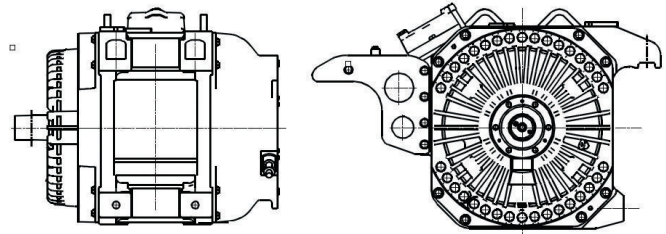
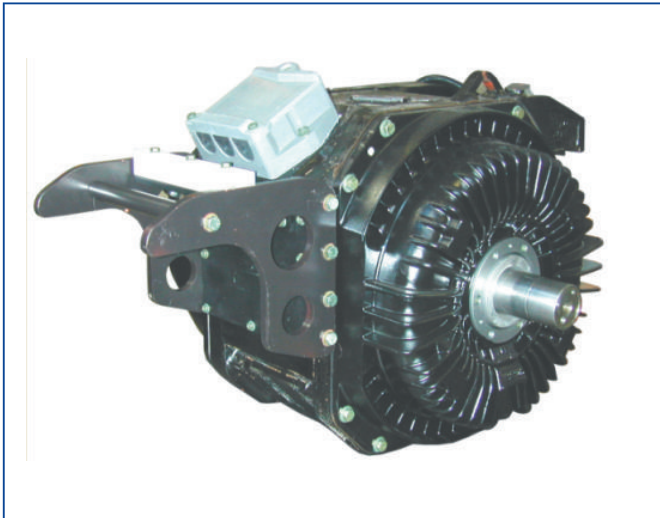
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 EXA 2122
Technology	Asynchronous
Power rating	165 kW @ 2,810 rpm
Continuous torque	561 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	560 x 536 x 647
Weight (kg)	595

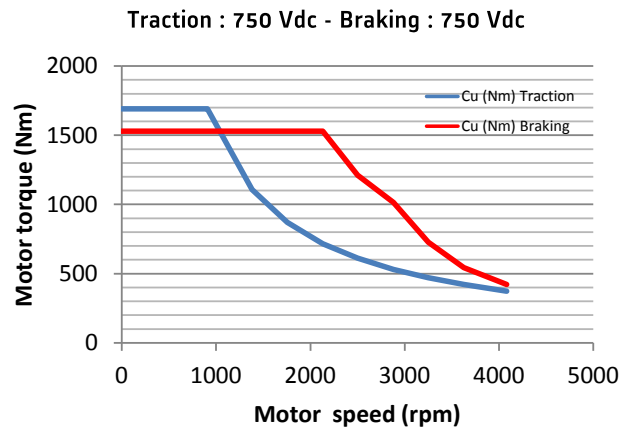
4 LCA 2138



MAIN FEATURES

- 4 LCA 2138 is part of a metro motor family with power rating ranging from 150 Kw to 275 Kw
- exists in open or closed version
- compatible with 750 V DC, 1500 V DC and 3000 V DC power supply
- 10 000 units operated worldwide on Metropolis

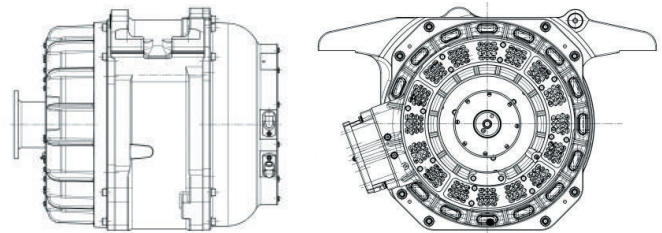
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 LCA 2138
Technology	Asynchronous
Power rating	185 kW @ 200 rpm
Continuous torque	882 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	500 x 550 x 670
Weight (kg)	700

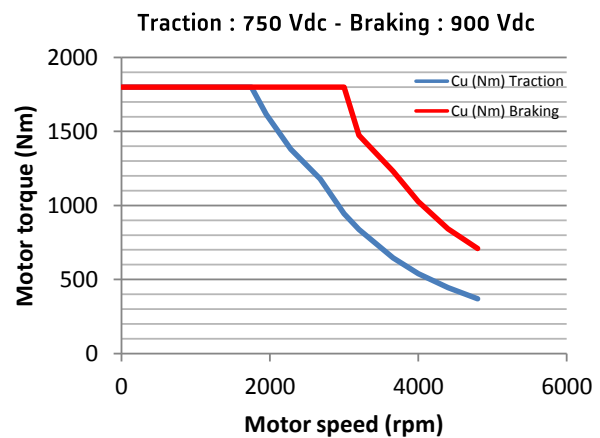
4 ECA 2120



MAIN FEATURES

- operation to be started in 2015 on metro in Lille (FR)

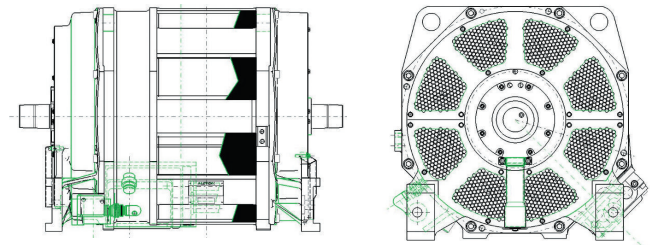
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 ECA 2120
Technology	Asynchronous
Power rating	200 kW @ 2,400 rpm
Continuous torque	796 N.m
Mechanical transmission	Cardanshaft
Cooling system	Self-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	550 x 553 x 608
Weight (kg)	555

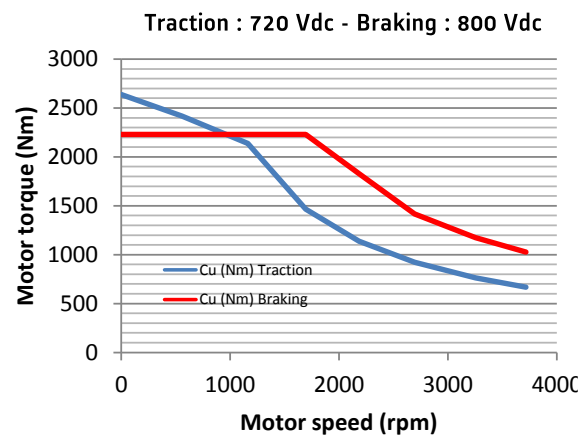
4 ELA 2848 C



MAIN FEATURES

- operated in 700 units Paris (FR) and Santiago (CL) on metro single-motor rubber-tyre bogie

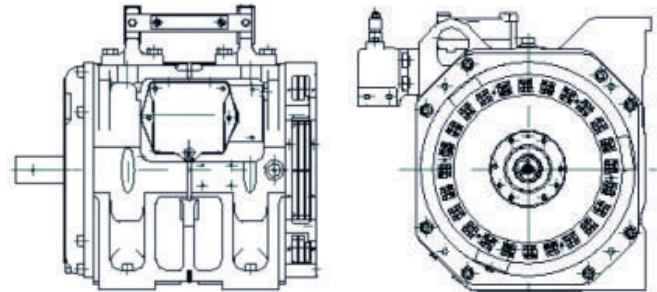
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 ELA 2848 C
Technology	Asynchronous
Power rating	300 kW @ 2,300 rpm
Continuous torque	1,245 N.m
Mechanical transmission	Coupling with double endshaft output
Cooling system	Self-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	650 x 650 x 760
Weight (kg)	1100

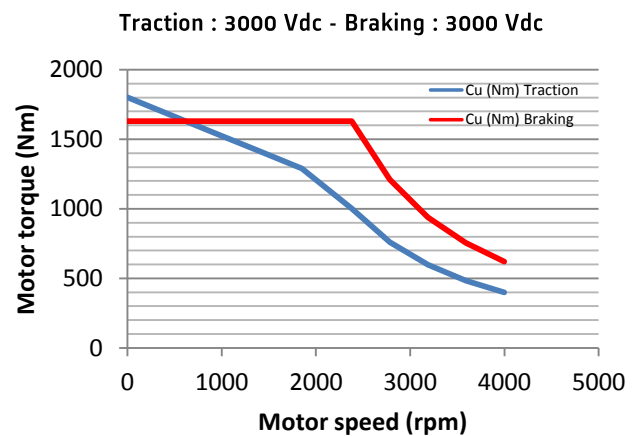
4 ECA 1836 A



MAIN FEATURES

- exists in both 3000 V DC and 1500 V DC power supply
- nearly 1000 motors operated on suburban train X'Trapolis in Chile and Australia

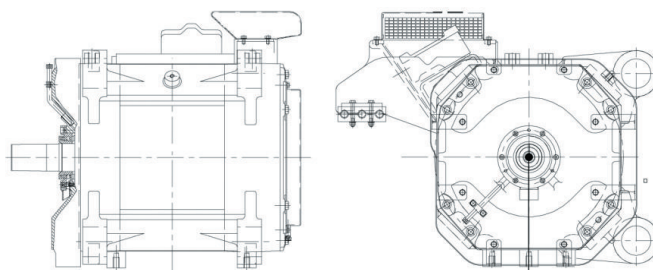
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 ECA 1836 A
Technology	Asynchronous
Power rating	180 kW @ 2,000 rpm
Continuous torque	860 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	507 x 520 x 577
Weight (kg)	740

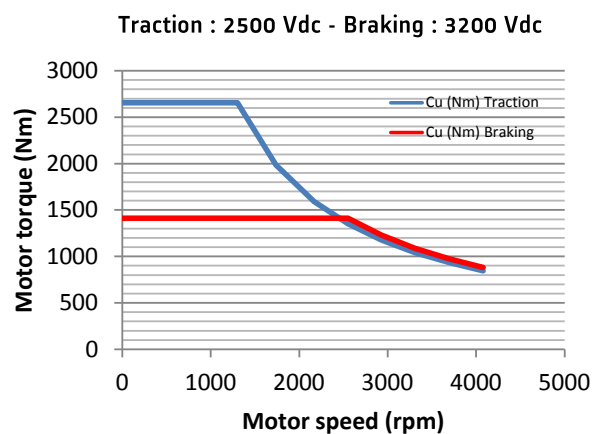
4 EXA 2146 C



MAIN FEATURES

- 500 units operated by Complessi per Trasporto Regionale (IT)

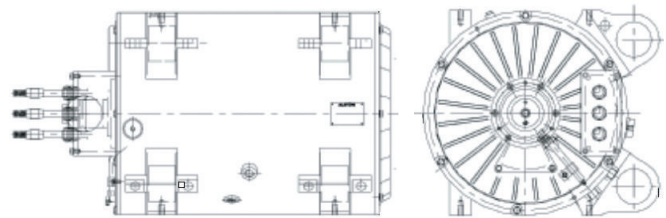
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 EXA 2146 C
Technology	Asynchronous
Power rating	250 kW @ 1,963 rpm
Continuous torque	1,216 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	555 x 535 x 670
Weight (kg)	795

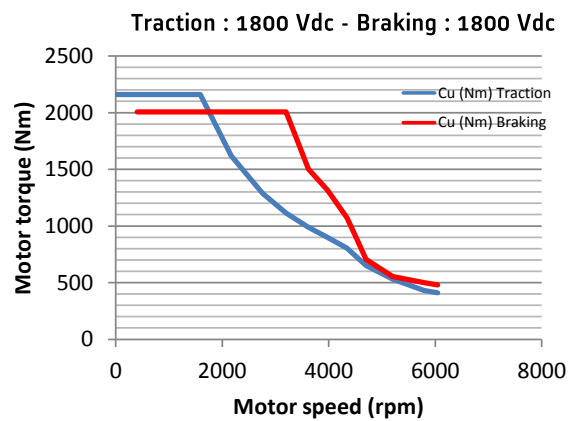
6 HCA 1755 Y



MAIN FEATURES

- designed to withstand rigorous Scandinavian winters, operating at -35°C and garaged at -40°C.
- very low noise level and high power density thanks to water-cooling
- operated on EMUs Coradia Continental and Nordic since 2006

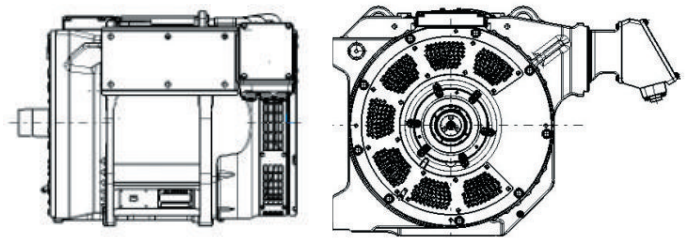
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	6 HCA 1755 Y
Technology	Asynchronous
Power rating	250 kW @ 3,000 rpm
Continuous torque	797 N.m
Mechanical transmission	Coupling
Cooling system	Water-cooled
Closed/Open	Closed
Outline: width x height x length (mm)	460 x 460 x 640
Weight (kg)	600

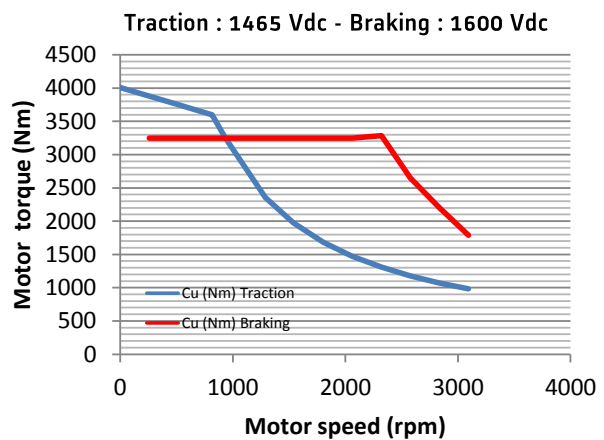
4 ECA 2846



MAIN FEATURES

- 1300 units operated on double-deck suburban trains by RATP in Paris (FR)

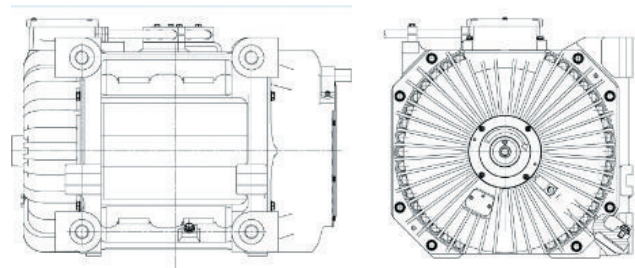
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 ECA 2846
Technology	Asynchronous
Power rating	350 kW @ 1,650 rpm
Continuous torque	2,025 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	668 x 610 x 802
Weight (kg)	1225

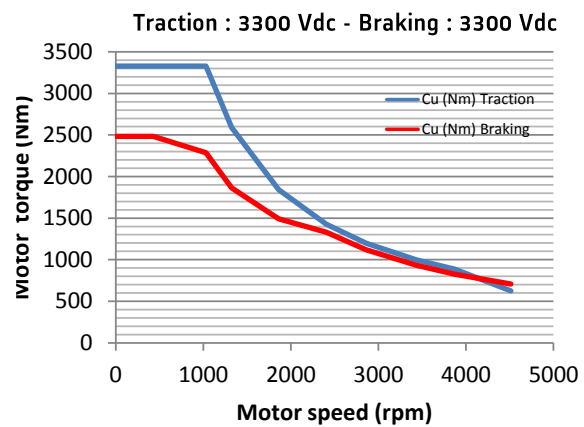
6 LCA 2560



MAIN FEATURES

- 890 units operated by RENFE (SP)

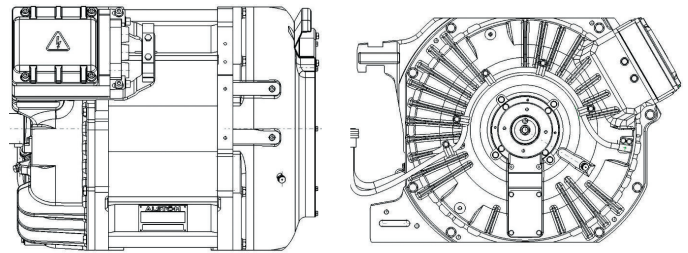
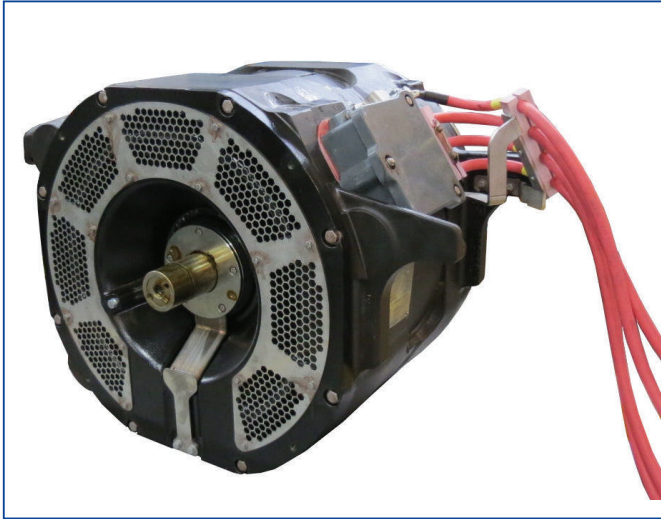
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	6 LCA 2560
Technology	Asynchronous
Power rating	320 kW @ 2,200 rpm
Continuous torque	1,390 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	588 x 530 x 820
Weight (kg)	970

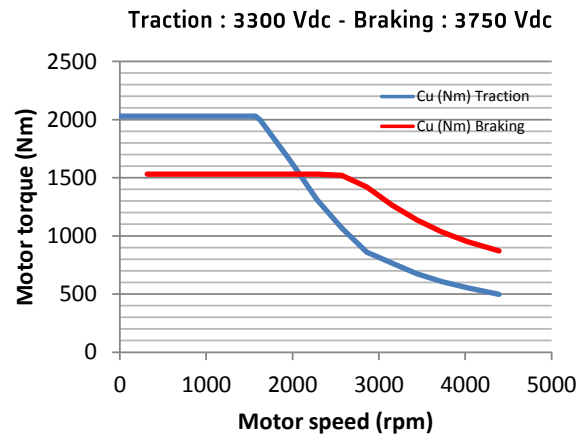
6 ECA 3022 A



MAIN FEATURES

- new motor developed to fit into a metric gauge bogie.
- 9600 motors to be produced and operated under X'Trapolis Mega by Passenger Rail Agency of South Africa

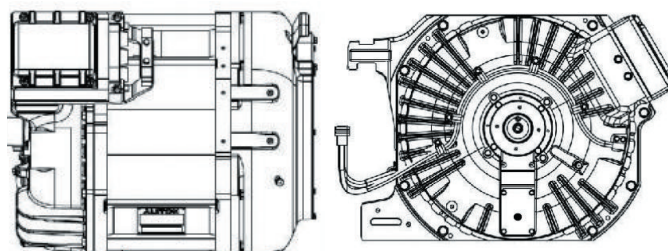
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	6 ECA 3022 A
Technology	Asynchronous
Power rating	320 kW @ 2,400 rpm
Continuous torque	1,273 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	640 x 630 x 585
Weight (kg)	800

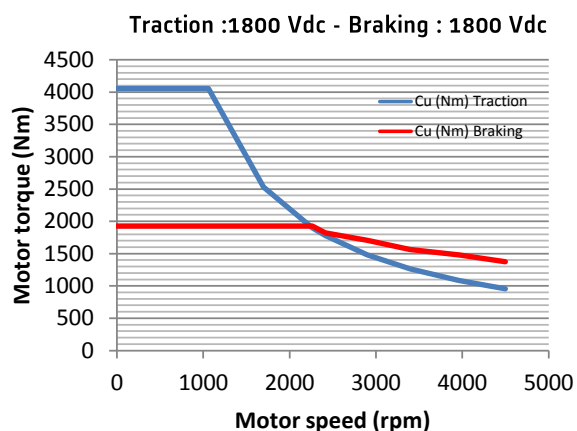
12 LCS 2939 C



MAIN FEATURES

- power density 30% higher than asynchronous equivalent which enables to reduce motorization rate
- enables energy savings
- contributes to train noise – 10 dbA below TSI
- operated by SNCF under Coradia Polyvalent since 2014

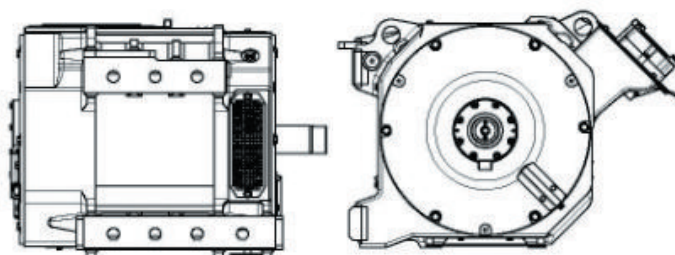
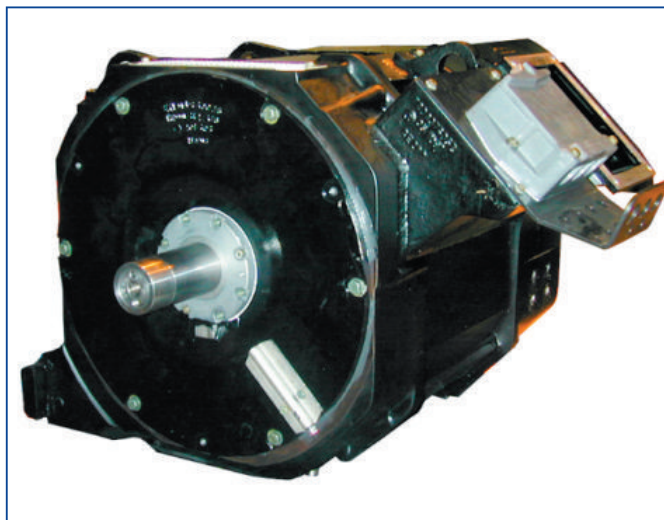
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	12 LCS 2939 C
Technology	Synchronous
Power rating	450 kW @ 2,525 rpm
Continuous torque	1,701 Nm
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	600 x 550 x 680
Weight (kg)	685

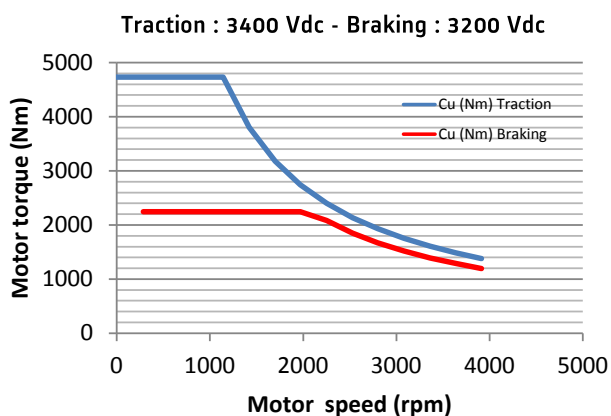
4 FXA 2854 A



MAIN FEATURES

- designed to be operated in low temperature conditions (-40°C)
- low noise level thanks to optimised forced-ventilation
- 1500 motors operated by SJ (SW), SNCF (FR) and FNM (IT) on single-deck and double-deck EMUs

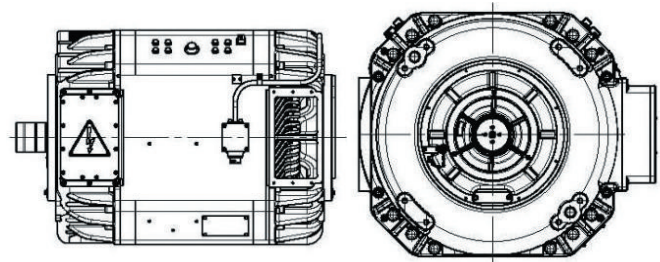
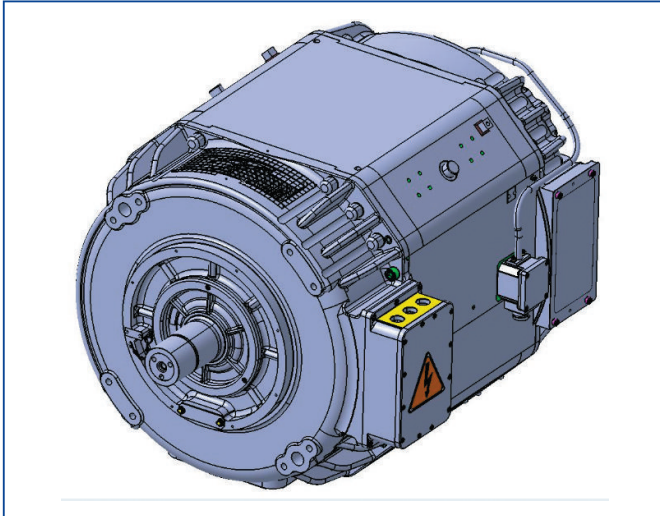
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 FXA 2854 A
Technology	Asynchronous
Power rating	450 kW @ 1,966 rpm
Continuous torque	2,185 N.m
Mechanical transmission	Coupling
Cooling system	Forced-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	640 x 686 x 752
Weight (kg)	1260

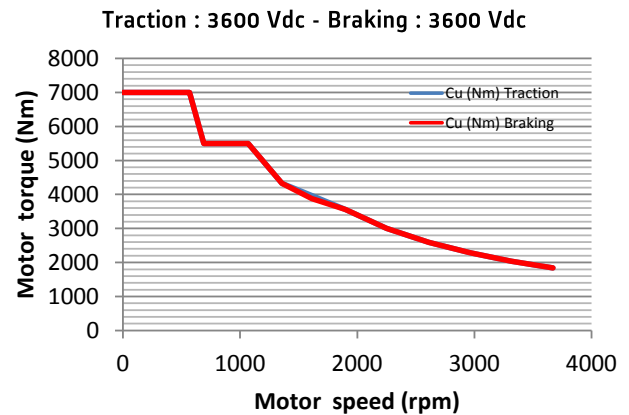
6 FJA 3257 A



MAIN FEATURES

- motor located under carbody
- exists in self-ventilated version
- more than 700 motors operated on High Speed application by RENFE (SP), Trenitalia (IT), SBB (CH), MOR (CN) and PKP (PL) on Pendolino

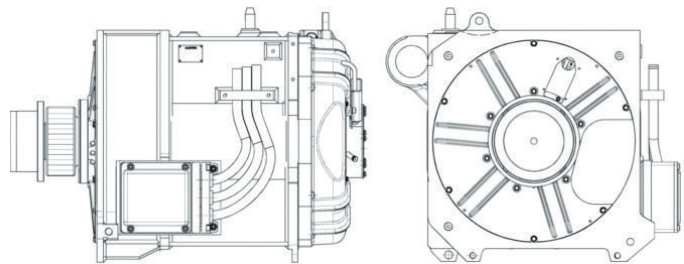
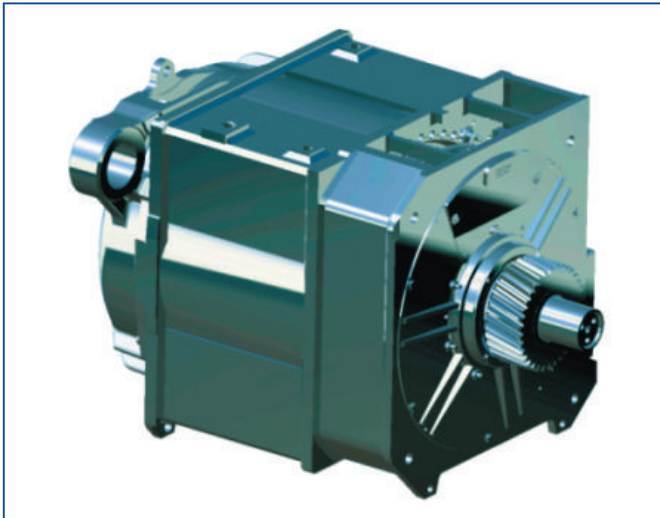
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	6 FJA 3257 A
Technology	Asynchronous
Power rating	708 kW @ 2,200 rpm
Continuous torque	3,073 N.m
Mechanical transmission	Cardanshaft
Cooling system	Forced-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	680 x 680 x 890
Weight (kg)	1613

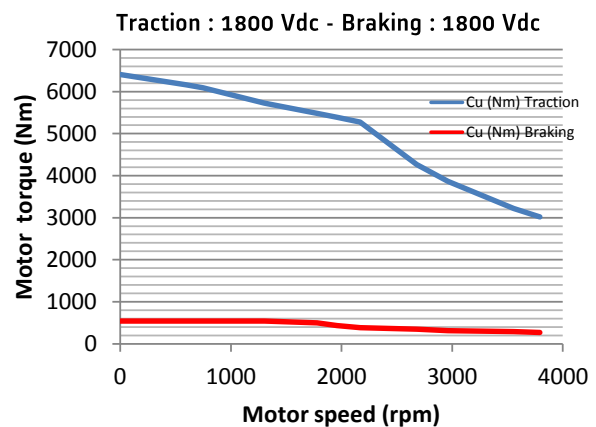
6 FHA 3657



MAIN FEATURES

- motor located under carbody
- suitable for concentrated traction in Very High Speed application
- 1100 units operated on Euroduplex by SNCF (FR)

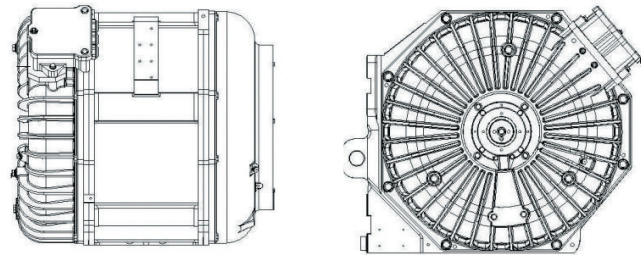
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	6 FHA 3657
Technology	Asynchronous
Power rating	1,200 kW @ 2,963 rpm
Continuous torque	3,865 N.m
Mechanical transmission	Pinion
Cooling system	Forced-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	660 x 650 x 860
Weight (kg)	1350

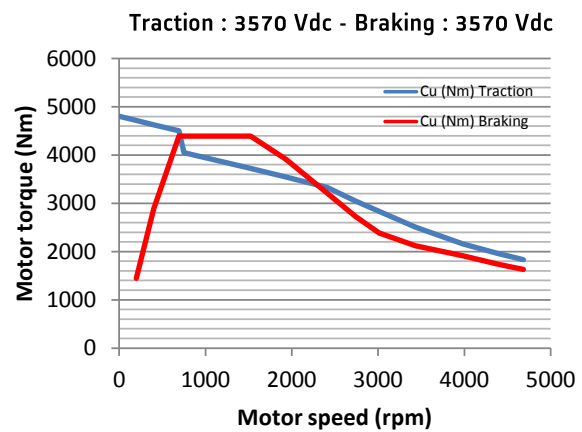
12 LCS 3550 C



MAIN FEATURES

- light motor thanks to outstanding power density above 1.1 Kw/Kg
- enables distributed traction in Very High Speed application with reduced number of motorized axles
- 250 units operated on AGV by NTV (IT)
- hit 2007 World Speed record at 574.8 kph

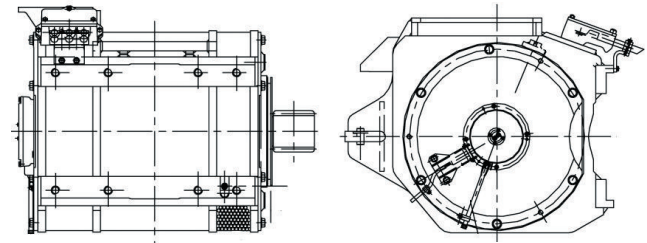
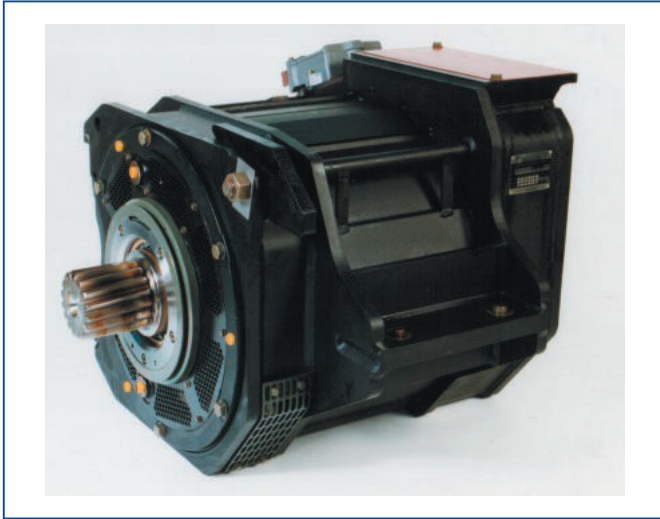
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	12 LCS 3550 C
Technology	Synchronous
Power rating	900 kW @ 3,500 rpm
Continuous torque	2,456 N.m
Mechanical transmission	Coupling
Cooling system	Self-ventilated
Closed/Open	Closed
Outline: width x height x length (mm)	650 x 650 x 735
Weight (kg)	785

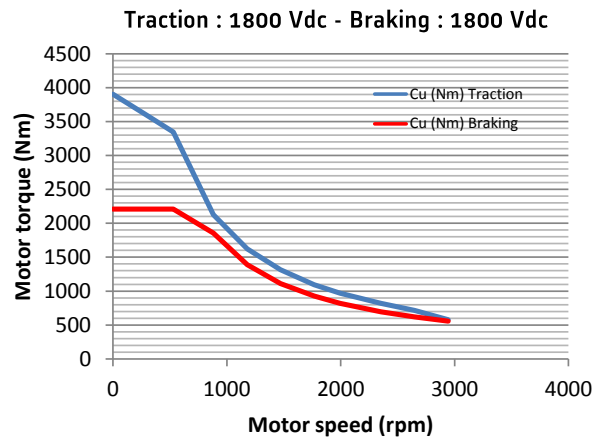
6 FRA 3055 A



MAIN FEATURES

- pinion fitted with cannon box
- 700 units operated on shunting locomotive BB460 by SNCF (FR)

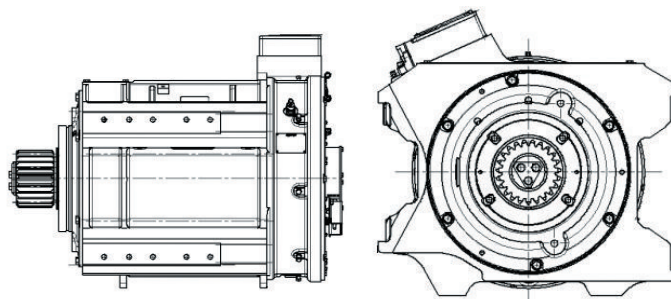
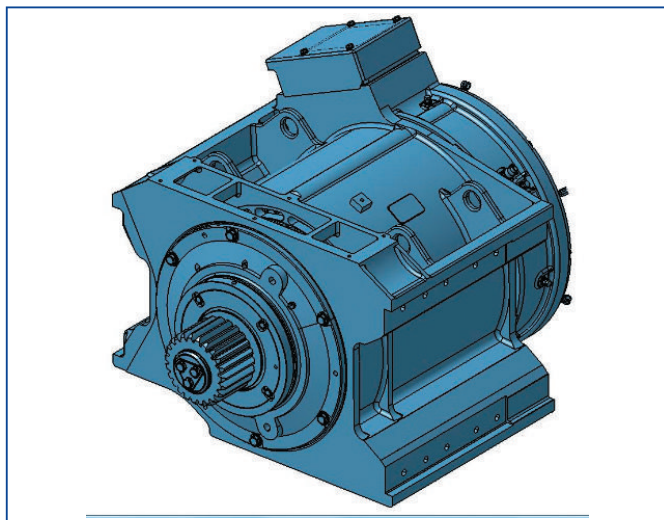
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	6 FRA 3055 A
Technology	Asynchronous
Power rating	194 kW @ 650 rpm
Continuous torque	2,850 N.m
Mechanical transmission	Pinion
Cooling system	Forced-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	695 x 665 x 797
Weight (kg)	1350

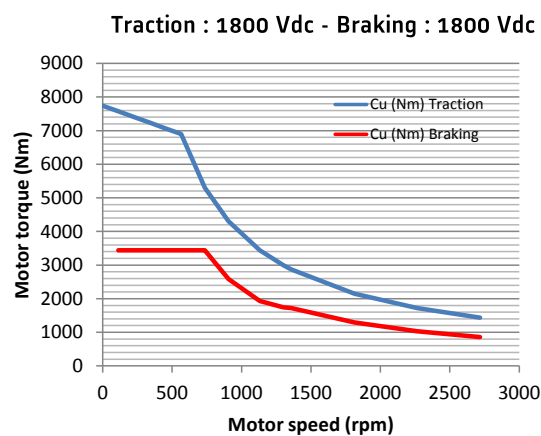
6 FRA 3266 F



MAIN FEATURES

- 830 units operated on diesel-electric BB475000 by SNCF (FR)

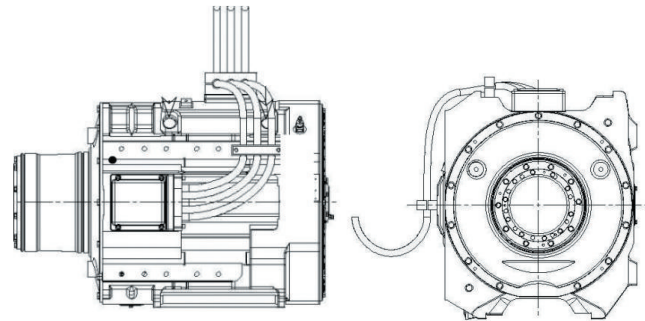
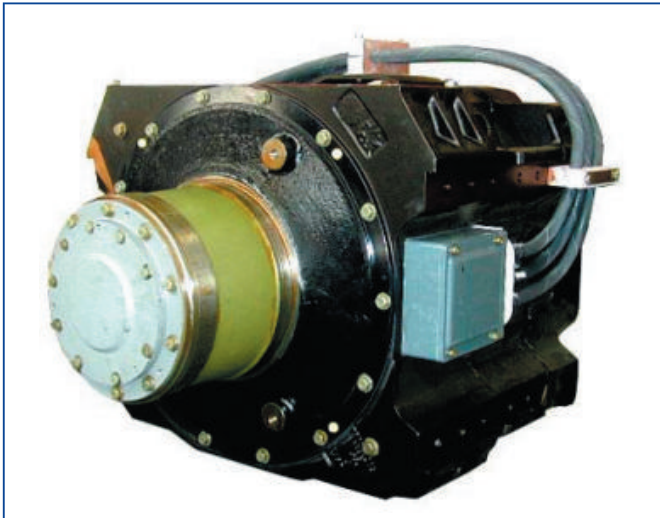
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	6 FRA 3266 F
Technology	Asynchronous
Power rating	408 kW @ 735 rpm
Continuous torque	5,300 N.m
Mechanical transmission	Pinion
Cooling system	Forced-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	950 x 902 x 1197
Weight (kg)	2050

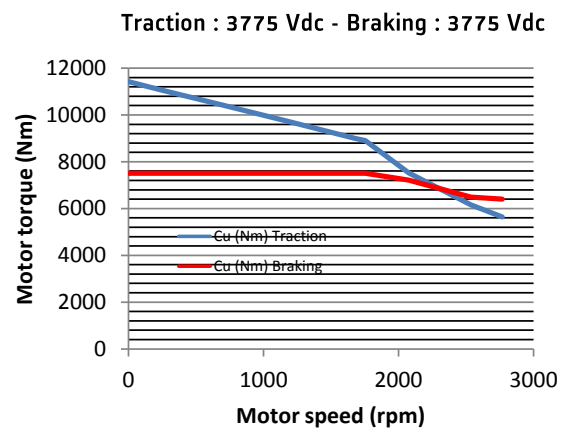
6 FRA 4567 D



MAIN FEATURES

- 6 FRA 4567 D is part of a motor family with power ranging from 395 Kw to 1600 Kw
- depending on the version, gearbox link could be made via pinion or rods
- suitable for freight application thanks to high torque (up to 10000 N.m)
- option for winterization (-50°C) and GOST
- operated in France, Iran, China, Kazakhstan and Russia

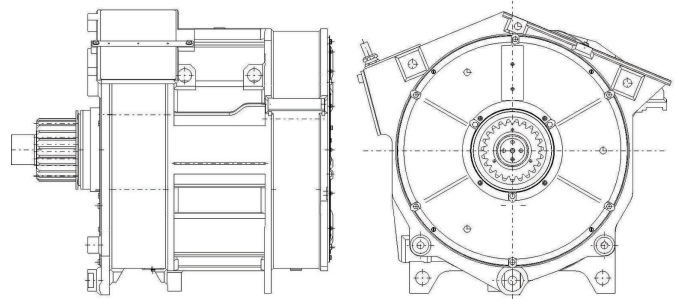
TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	6 FRA 4567 D
Technology	Asynchronous
Power rating	1,634 kW @ 1,753 rpm
Continuous torque	8,901 N.m
Mechanical transmission	Pinion
Cooling system	Forced-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	907 x 800 x 1253
Weight (kg)	2767

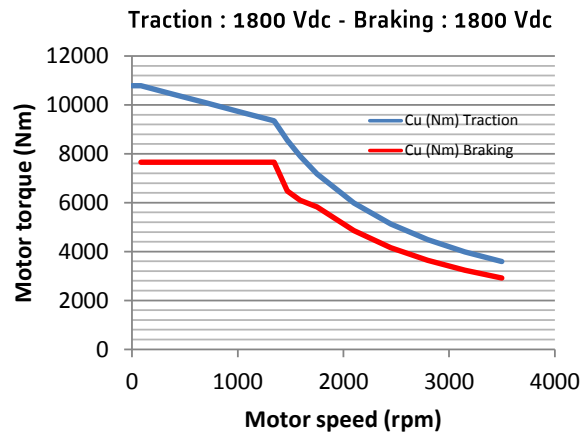
4 FXA 4553



MAIN FEATURES

- option for winterization (-50°C) and GOST
- operated on passenger locomotives application in Morocco, Kazakhstan, France, Belgium and US

TRACTION MOTOR CHART



MAIN MOTOR CHARACTERISTICS

Traction motor type designation	4 FXA 4553
Technology	Asynchronous
Power rating	1,314 kW @ 1,469 rpm
Continuous torque	8,542 N.m
Mechanical transmission	Pinion
Cooling system	Forced-ventilated
Closed/Open	Open
Outline: width x height x length (mm)	890 x 890 x 942
Weight (kg)	2350

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