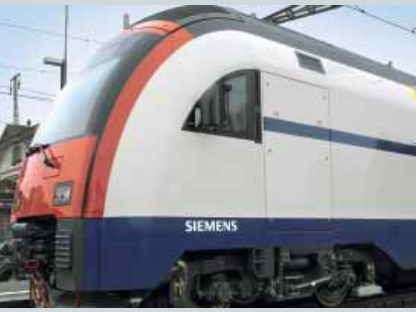
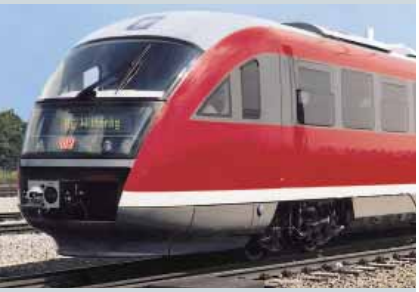


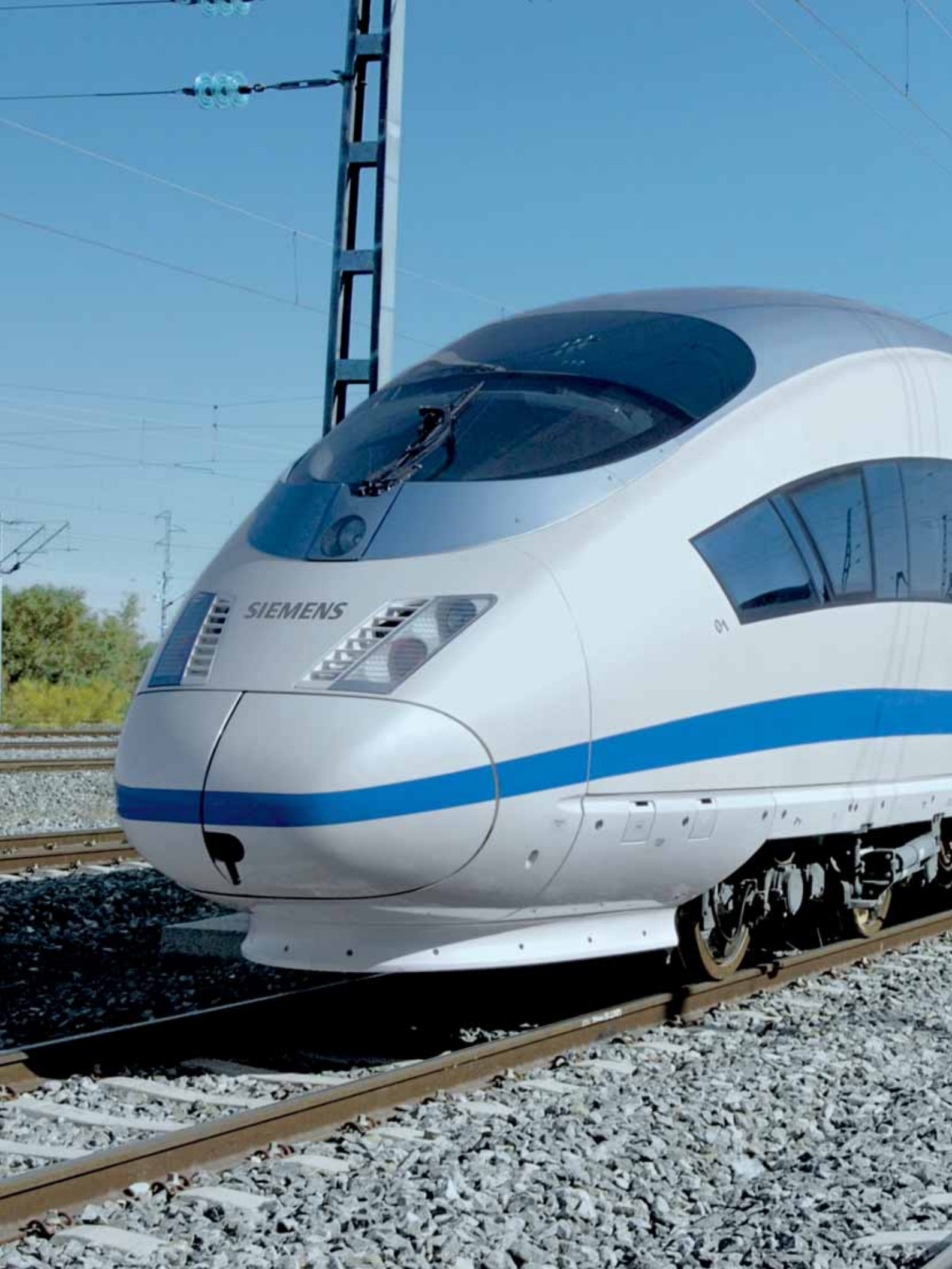


Trains

Reference List

Transportation Systems

SIEMENS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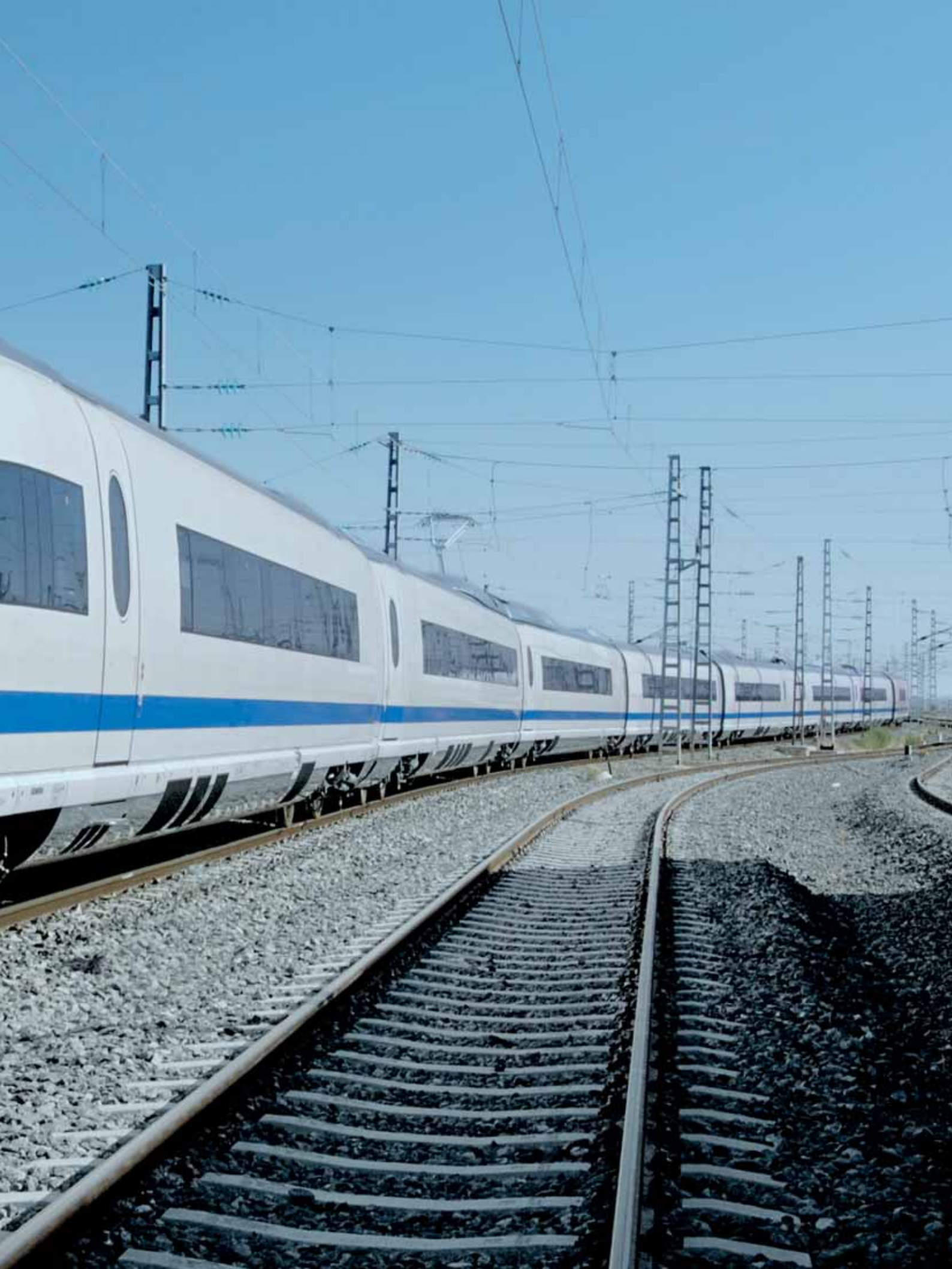


Contents

(Issue September 2006)

High Speed and Intercity Trains

Velaro

Introduction

Convenient Connections for Rail Services

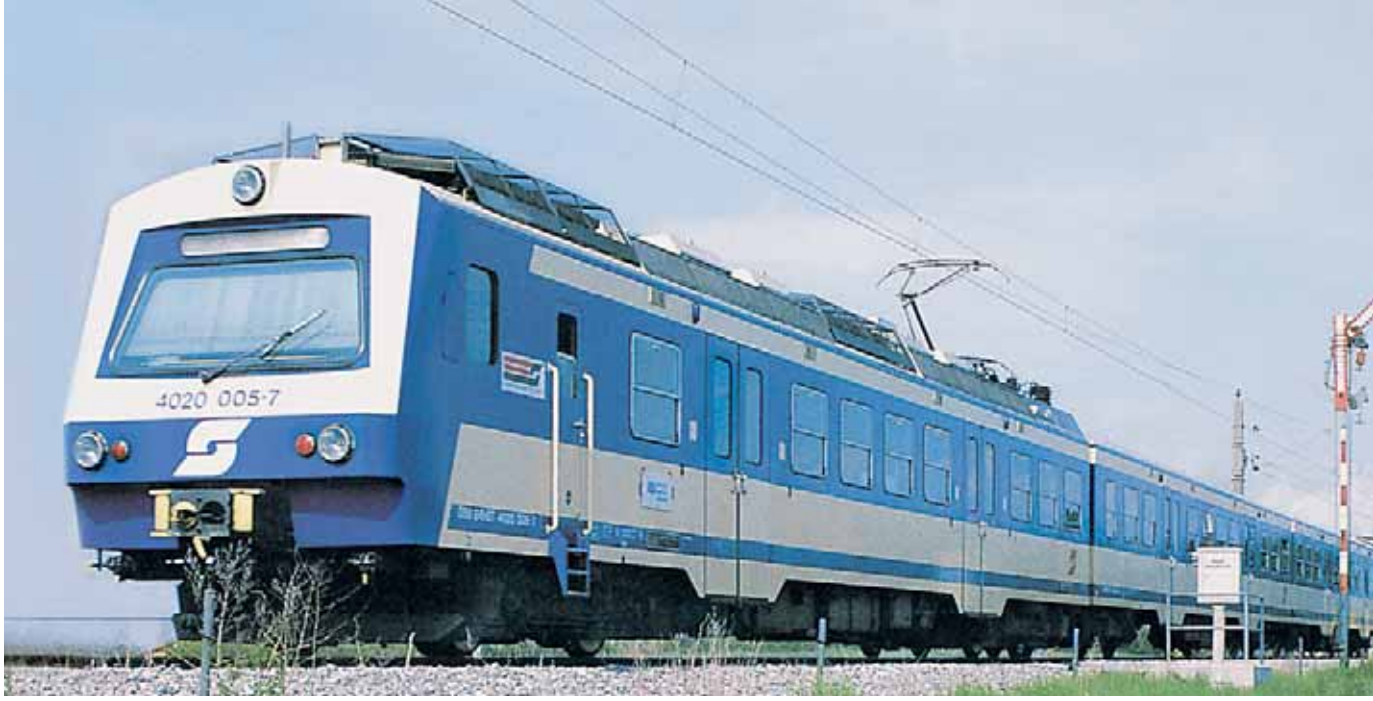
Cities and towns are now closer than they have ever been. Distances are shrinking, for individual mobility has become one of our most valued freedoms. However, the increasing number of private motor vehicles is likely to bring this mobility to a grinding halt unless all modes of transportation are sensibly interlinked to ensure mobility for everyone in the future. Railbased urban, regional and main line passenger services offer all possibilities for coordinated control of our traffic processes.

Intelligent, environment-friendly concepts are required that combine comfort, speed, safety and flexibility with state-of-the-art technology. This is the only way for rail services to become competitive again.

Multiple unit trains from Siemens Transportation Systems have always been a guarantee for smooth operation and good economy.

Although we can't make the tracks go any faster, we can certainly make the trains run on them faster. For example, with the right traction equipment – like the Velaro, the Siemens high speed platform. Or with the right tilting technology – like the ICE T. That's why we can offer you the right vehicle for every application. With the right interior furnishings, for every taste and for every route. Everything from the Desiro for private regional lines to the Siemens Velaro high speed trainset for cross-border passenger rail service. The Velaro E is the world's fastest train in operation.

As one of the world-leading suppliers of rail vehicles and railway systems, we are making our contribution to solving today's transportation problems on the regional level. By providing convenient, customer-friendly, comfortable and competitive mass transit, regional and main line services. Why not see for yourself?



4020 Electric Multiple Unit

for Austrian Federal Railways ÖBB

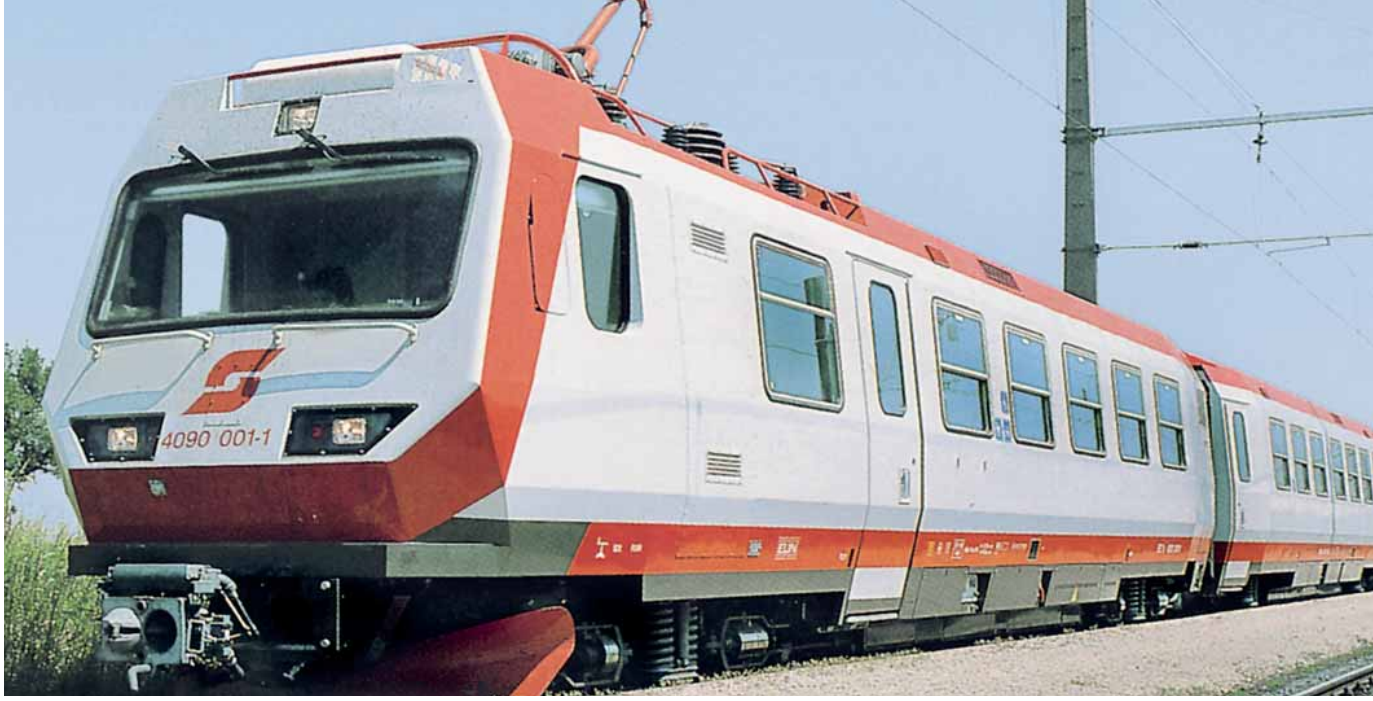
For urban traffic in several conurbations, above all Vienna, a total of 120 class 4020 electric multiple units were ordered between 1979 and 1987 in several batches.

Each train consists of a power car, a center car and a driving trailer car.

All the trains were manufactured at SGP Verkehrstechnik*), a subsidiary of Siemens.

Technical data		
Year		1979 – 1987
Number of cars		3
Power system	[kV / Hz]	AC 15 / 16,7
Maximum power at wheel	[kW]	1,785
Acceleration	[m/s²]	0.45
Maximum speed	[km/h]	120
Weight	[t]	128
Track gauge	[mm]	1,435
Number of seats		184
Numbers built		120

*) Today Siemens AG, Transportation Systems



4090 Electric Multiple Unit

for Austrian Federal Railways ÖBB

As a replacement for the loco-hauled passenger trains of the Mariazell Railway, Austrian Federal Railways made an initial purchase of two multiple units in 1994.

The four-car EMUs consist of two power cars and two center cars; the three-car trainsets consist of one power car, one center car and a driving trailer car. Two special characteristics are the track gauge of only 760 mm and the rare traction supply of 6.5 kV, 25 Hz.

The leader of the consortium that built these units was SGP Verkehrstechnik*).

Technical data		
Year		1994
Number of cars		3 and 4
Power system	[kV / Hz]	AC 6.5 / 25
Maximum power at wheel	[kW]	320 / 640
Maximum speed	[km/h]	70
Weight	[t]	87 / 123
Track gauge	[mm]	760
Number of seats		148 / 192
Numbers built		2

*) Today Siemens AG, Transportation Systems

Electric Multiple Unit CPTM São Paulo

for CPTM, Brazil

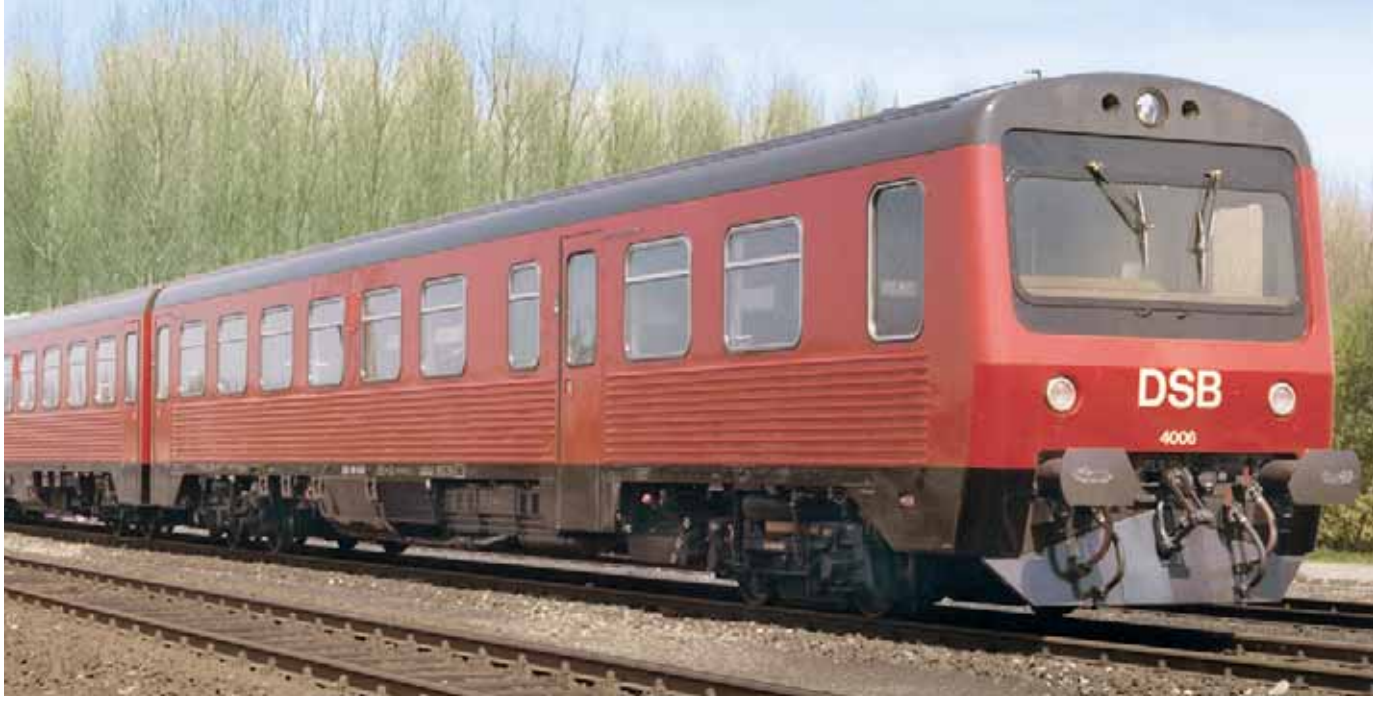
In July 1997, Companhia Paulista de Trens Metropolitanos (CPTM) placed an order for 10 air-conditioned four-car multiple units to provide suburban rail service in Greater São Paulo, Brazil. The project consortium led by Siemens AG comprises Siemens AG, Transportation Systems and Mitsui with the participation of the regional company São Paulo. This project is part of the rehabilitation program focusing on the city's existing trains and marks the first use of a Siemens rail vehicle for line service in São Paulo.

The distinguishing features of this project: high-grade steel car bodies, 4 doors on each car side, short distances between stops, special broad gauge, drive system with GTO thyristor technology, and control system using TCN equipment. Special emphasis was placed on the easy maintenance and accessibility of components as well as on enhanced operating reliability. All components essential to operation are therefore redundant and can switch over to standby components in the event of failure to ensure uninterrupted service. Standard components are used in most cases.

CPTM is increasing the appeal of its service on suburban lines with vehicles that offer a new look, air-conditioning in every compartment and an expected high degree to availability.

The design of this vehicle is based on the Desiro standards for control equipment and propulsion technology.

Technical data		
Year		2000 – 2001
Number of cars		4
Power system	[kV]	DC 3
Maximum power at wheel	[kW]	2,800
Acceleration	[m/s^2]	0.8
Maximum speed	[km/h]	90
Weight	[t]	165
Track gauge	[mm]	1,600
Number of seats		232
Number of standees		706
Numbers built		10



MR/MRD Diesel-Hydraulic Multiple Unit

for Danish State Railways DSB

The design of the MR/MRD diesel-hydraulic multiple units purchased by the Danish State Railways (DSB) in the years 1978 to 1983 is based on the pre-series vehicles of the class 628.0 for German Rail. So DSB could count on the high reliability of that service-proven design and therefore put the trains into revenue service after a very short trial period.

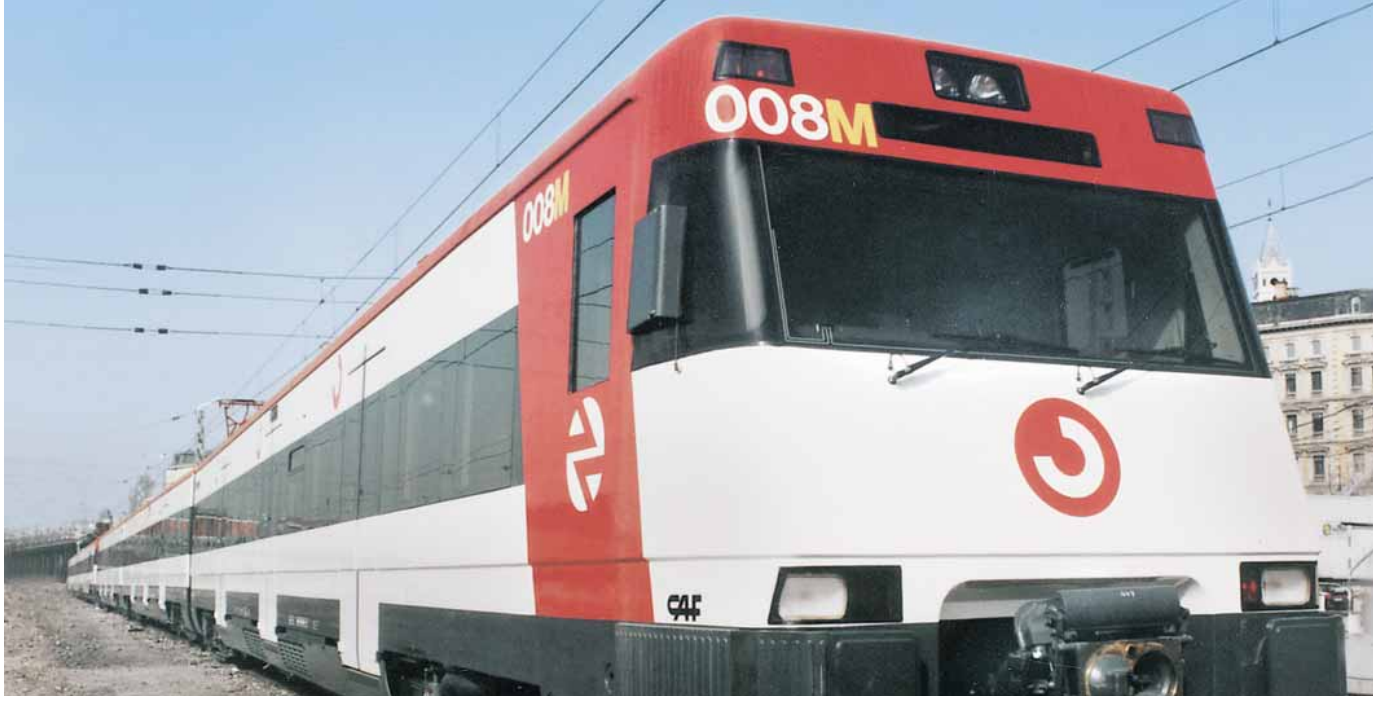
Like all DMUs from Siemens Duewag Schienenfahrzeuge GmbH*), the MR / MRD is also characterized by an appealing design, good passenger comfort and economical operation.

The introduction of these vehicles with a fixed interval timetable increased ridership by up to 250 % – proof positive that an attractive offer can persuade the public to use the train instead of the car.

Scandia-Randers built 82 vehicles under license from Siemens Duewag Schienenfahrzeuge GmbH.

Technical data		
Year		1978 – 1983
Number of cars		2 (motor car + motor car)
Diesel engine rating	[kW]	2 x 240
Maximum speed	[km/h]	130
Weight	[t]	69
Track gauge	[mm]	1,435
Number of seats		127
Numbers built		15

*) Today Siemens AG, Transportation Systems



447 Electric Multiple Unit

for Spanish National Railways RENFE

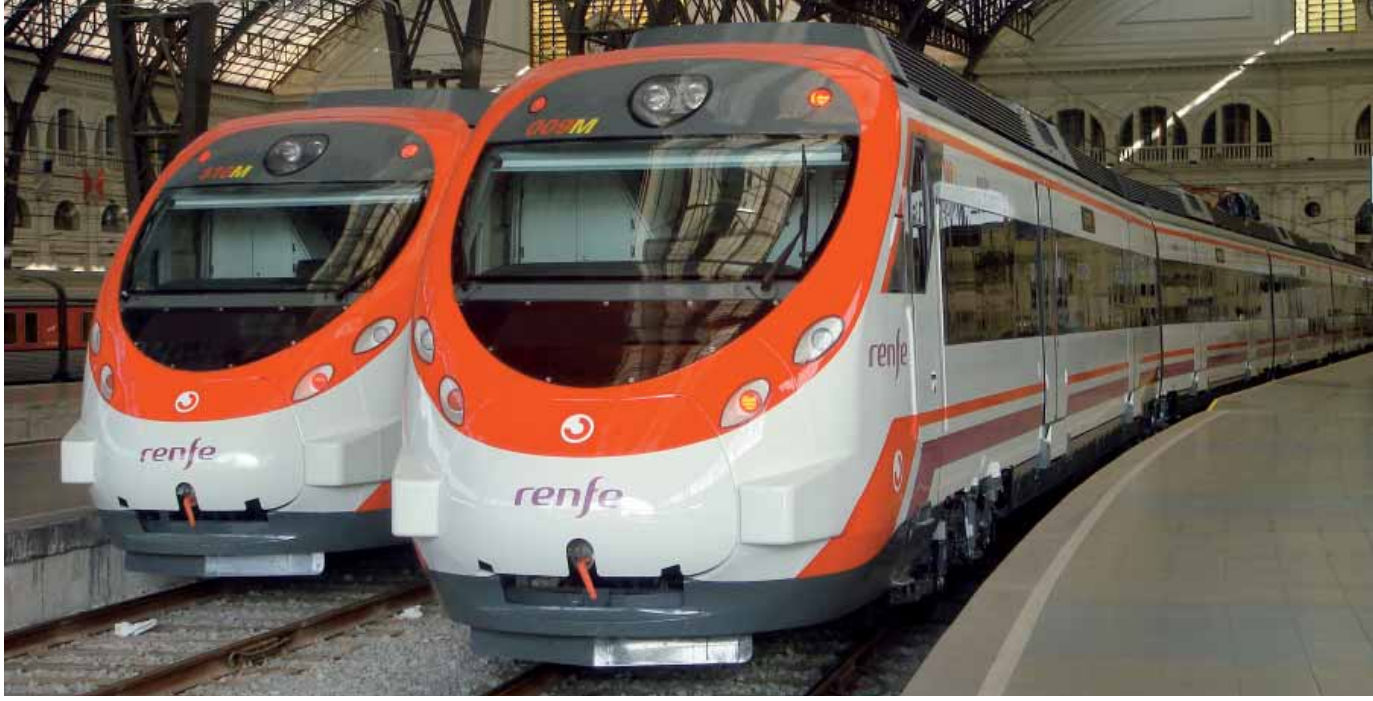
The three-car class UT / S447 electric multiple units are mainly used in the conurbations of Valencia, Barcelona, and Madrid.

Thanks to modern, three-phase AC propulsion technology from Siemens, the vehicles are characterized by high acceleration so that travel times have been reduced considerably compared to those achieved with the trains previously used. This is one reason why the ridership has increased noticeably on these lines.

A further aspect in the high acceptance for operators is the low energy consumption and the low maintenance concept of the vehicles.

So far, 183 units of this class have been equipped with Siemens traction technology.

Technical data		
Year		1992 – 2001
Number of cars		3
Power system	[kV]	DC 3
Maximum power at wheel	[kW]	2,800
Acceleration	[m/s²]	1.0
Maximum speed	[km/h]	120
Weight	[t]	157
Track gauge	[mm]	1,668
Number of seats		238
Numbers built		183



Tren CIVIA Electric Multiple Unit (UT S / 462, UT S / 463, UT S / 464, UT S / 465)

for Spanish National Railways RENFE

In the context of its infrastructure program, the Spanish Ministry of Transport plans to acquire about 250 new trains between 2003 and 2007. These trains are designed to support and renew the existing rapid transit network in the big cities of Madrid, Barcelona, Valencia, and Seville as well as in rural areas such as Asturia and Murcia.

A pre-series of 14 trains was supplied by a consortium of CAF, Siemens, Alstom and Bombardier in early 2004. The order for the second series of 43 multiple units was placed by RENFE in early 2004. CAF and Siemens were awarded another order for the third series of 40 five-car trains in February 2006. Siemens has assumed system responsibility for the traction and on-board power supply systems.

For this order, Siemens supplies the entire traction and auxiliaries comprising the high-voltage equipment, converters, motors, and gear units as well as auxiliary converter units and batteries. Our consortium partner CAF supplies the car bodies complete with interior furnishings, air conditioning, passenger information system, and control system. Siemens builds the components in its plants in Cornellá (Spain) and Uerdingen (Germany).

The mechanical part of the trains is manufactured in the CAF plants in Zaragoza and Beasain.

Technical data					
Class		Series 462	Series 463	Series 464	Series 465
Year		2003 – 2004	2004 – 2008	2003 – 2004	2006 – 2010
Number of cars		2	3	4	5
Power system	[kV]	DC 3	DC 3	DC 3	DC 3
Maximum power at wheel	[kW]	1,270	1,400	2,100	2,200
Maximum speed	[km/h]	120	120	120	120
Weight	[t]	79	106	132	157
Track gauge	[mm]	1,668	1,668	1,668	1,668
Number of seats		126	169	223	274
Numbers built		3	3 + 9	5	3 + 34 + 40

Class 332 Electric Multiple Unit

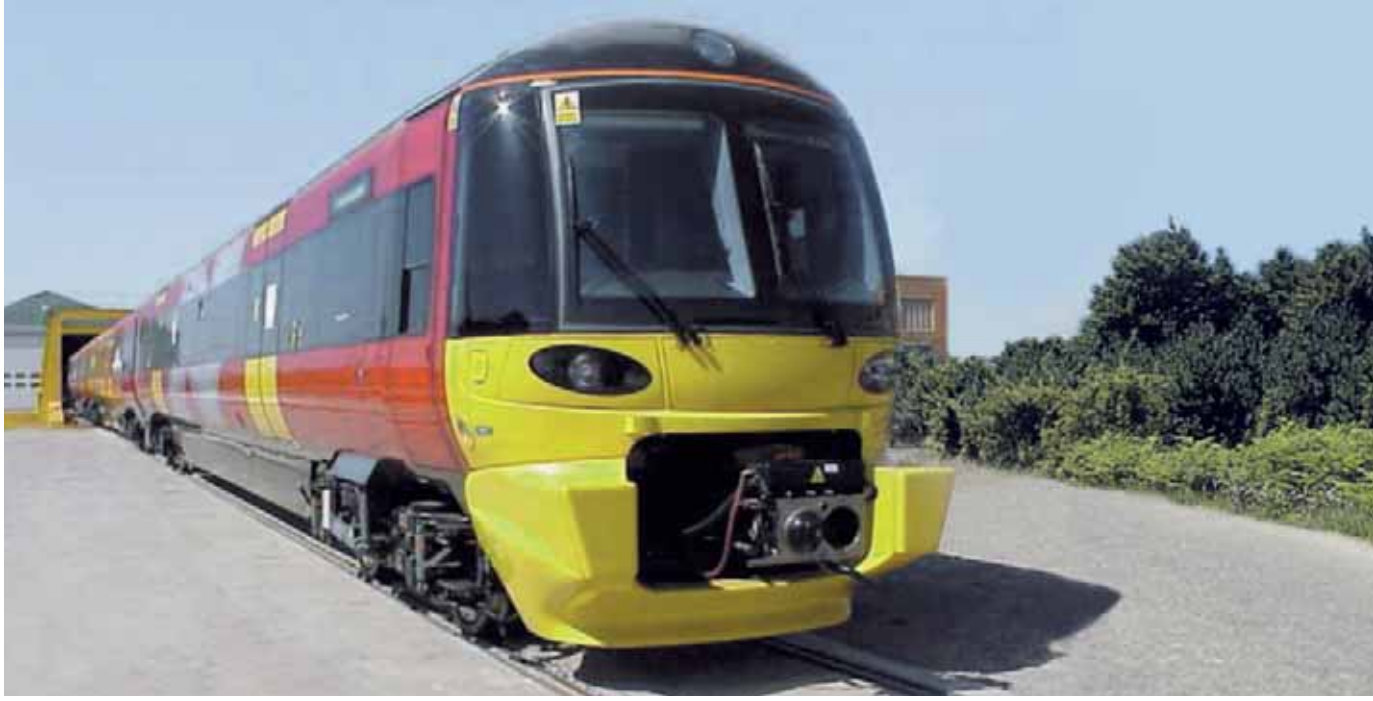
for Heathrow Express, UK

On June 1, 1998, the "Heathrow Express" took up service between Heathrow Airport and central London (Paddington). Fourteen highly modern electric multiple units transport approximately 17,000 passengers a day in shuttle operation. Compared with the 50 minutes required by the Underground, the 15-minute trip by this express service has been able to increase public acceptance of rail travel considerably. Passengers are provided with very comfortable interior furnishings with an HVAC system, telephone, screen displays and TV programs, as well as lavatory facilities.

Since June 1999, the multiple units have been refitted with a baggage compartment, which enables air passengers to check in for their flights at Paddington Station. A particular feature of this unit is its excellent service-proven reliability.

Although delivered as three-car units, these trains have been provided with a fourth car to accommodate the increased ridership.

Technical data			
Year		1997	
Number of cars		4 / 5	
Power system	[kV / Hz]	AC 25 / 50	
Maximum power at wheel	[kW]	1,400	
Acceleration	[m/s²]	1.0	
Maximum speed	[km/h]	160	
Weight	[t]	173 (4-car unit)	208 (5-car unit)
Track gauge	[mm]	1,432	
Number of seats		203 (4-car unit)	267 (5-car unit)
Numbers built		9	5



Class 333 Electric Multiple Unit

for Northern Spirit, UK

The class 333 electric multiple units entered service in the year 2001.

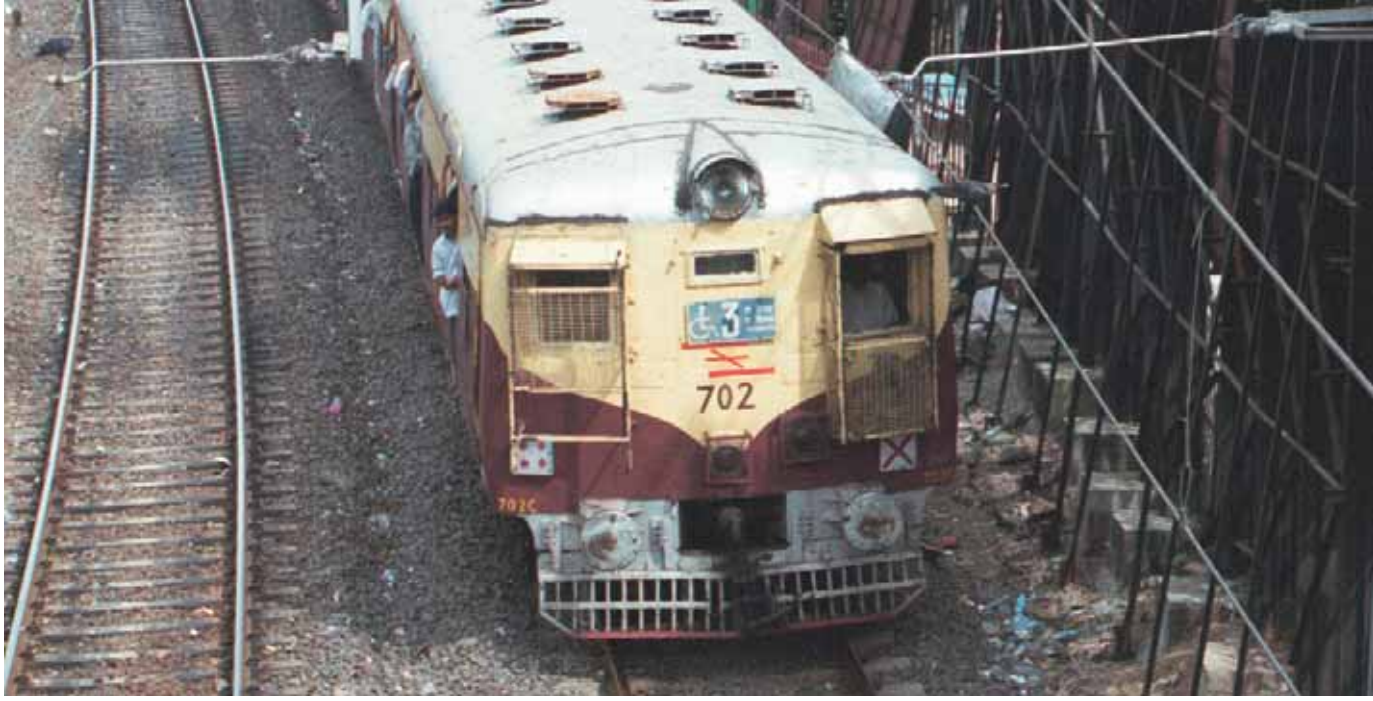
They have replaced the class 308 vehicles that serviced the Airedale Line, with the towns of Bradford, Shipley, Skipton and Leeds, as well as the Wharfedale Line linking Ilkley, Shipley, Bradford and Leeds. The operator is Northern Spirit, a company that emerged as a successor to the former Regional Railways North East.

The new electric multiple units are a modified version of the class 332 "Heathrow Express" that has been adapted to meet the needs of commuter traffic.

The use of air springs ensures extremely smooth running that provides passengers with a high standard of riding comfort. The class 333 is fully air-conditioned and characterized by a pleasantly low noise level.

Thanks to the modern, low-maintenance three-phase traction system with IGBT technology, the class 333 electric multiple units combine minimal life cycle costs with high availability.

Technical data		
Year		2000
Number of cars		3
Power system	[kV / Hz]	AC 25 / 50
Maximum power at wheel	[kW]	1,400
Acceleration	[m/s^2]	0.9
Maximum speed	[km/h]	160
Weight	[t]	145
Track gauge	[mm]	1,435
Number of seats		260
Numbers built		16



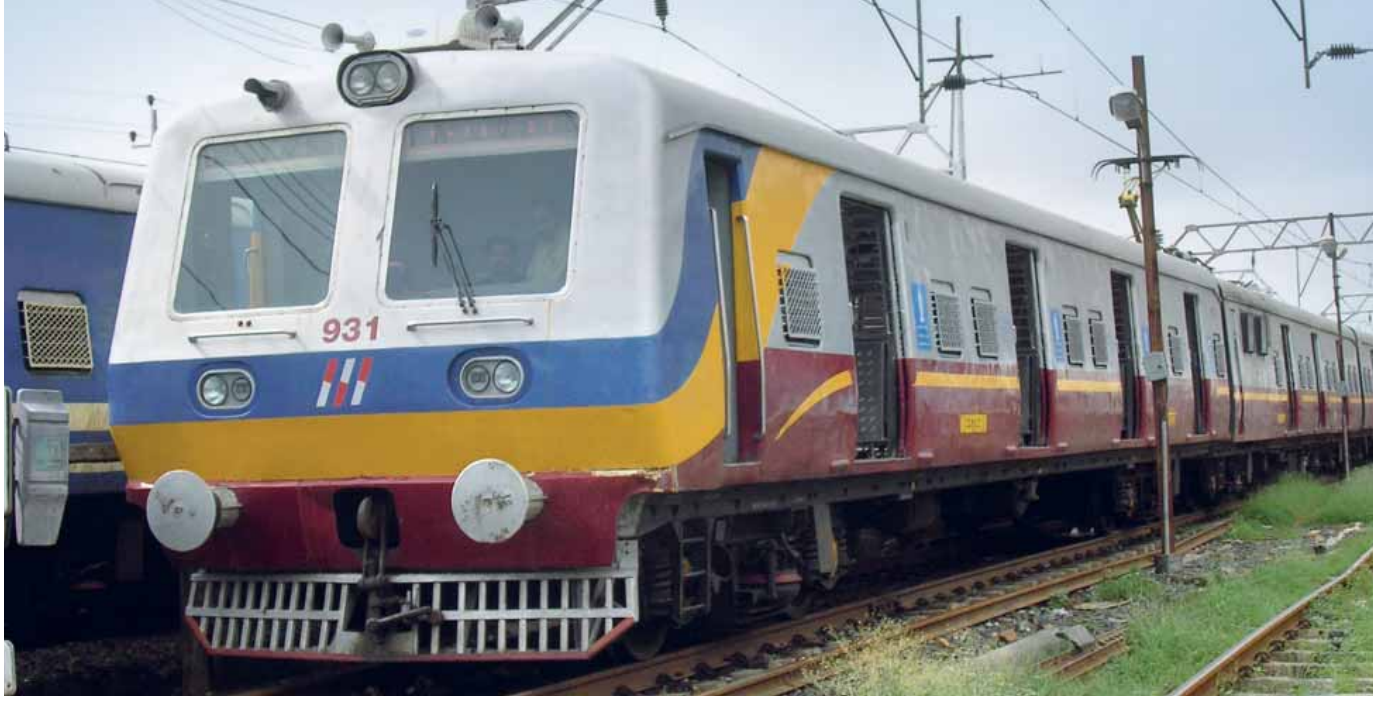
Electric Multiple Unit GP194

for Indian Railways, Mumbai

Siemens Transportation Systems supplies the complete electrical equipment, the brake control unit, the compressor, the parking brake and various other components for 170 three-car multiple units that will be used on regional routes around the West Indian city of Mumbai. This includes, among other components, the pantographs, transformers, traction and auxiliaries converters, traction motors, train control system and passenger information system. The components are designed for two power systems: the existing DC 1.5 kV as well as the AC 25 kV / 50 Hz that will replace the DC system in the Mumbai region. The components are built in the Siemens plants in Kalwa and Nashik in the state of Maharashtra.

The systems, which are adjusted to the local climatic and environmental conditions, will reduce the energy consumption by up to 30 per cent while also reducing the maintenance and service costs. The use of IGBT converters improves the ride comfort because it ensures jerk-free acceleration and braking.

Technical data				
Year			2005 – 2007	
Number of cars		9	12	15
Power system	[kV / Hz]		AC 25 / 50 + DC 1,5	
Maximum power at wheel	[kW]	3,300	4,400	5,500
Maximum speed	[km/h]	100	100	100
Weight	[t]	630	840	1050
Track gauge	[mm]	1,676	1,676	1,676
Number of seats		900	1,200	1,500
Numbers built			170 (3-car base units)	



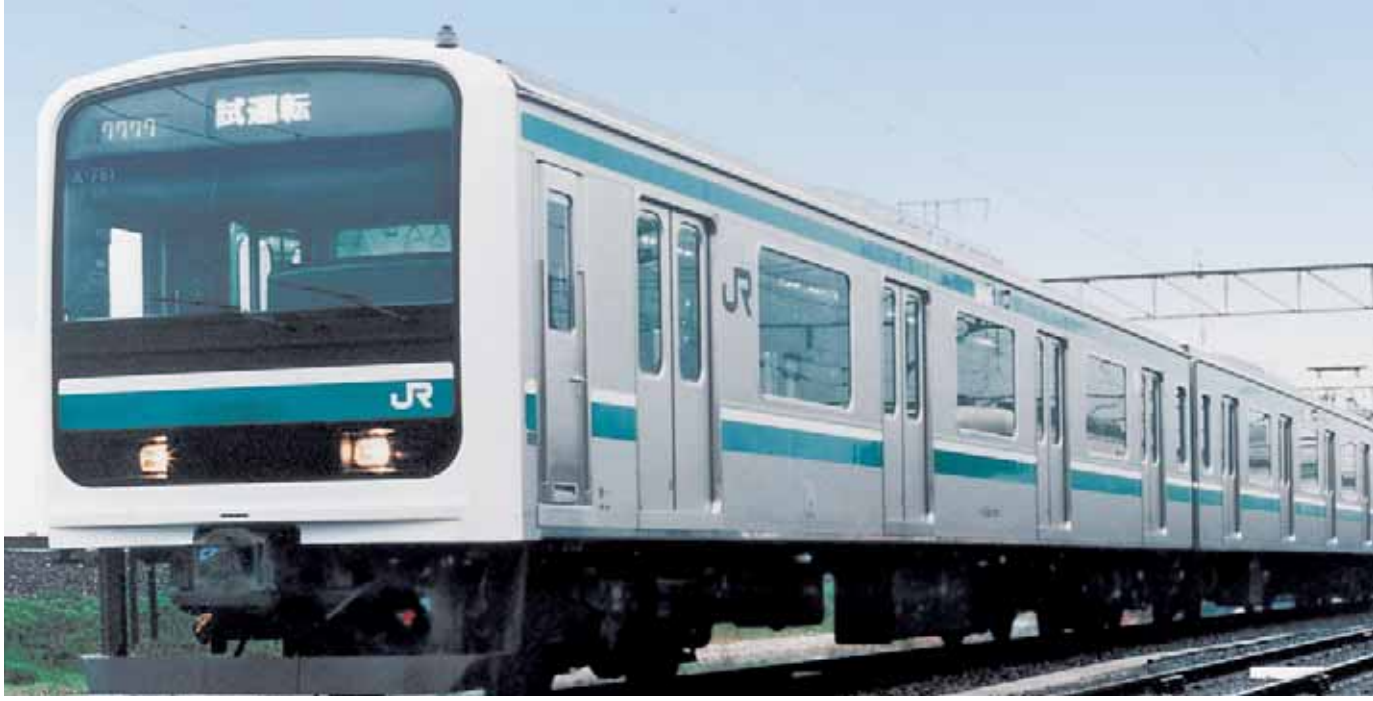
Electric Multiple Unit MRVC

for Mumbai Railways Vikas Corporation, India

For new multiple units to be used on regional routes around the West Indian city of Mumbai, Siemens Transportation Systems is supplying the complete electrical equipment for 303 three-car basic units that can be coupled to form 9- to 18-car-long trains. The Siemens scope of supply includes the complete high-voltage equipment, the main transformer, the traction and auxiliary converter units, the traction motors with transmissions, plus the train, traction, and brake control units, the passenger information system, the ventilation system, and the lighting system. The traction components are designed for two power systems: the existing 1.5 kV DC as well as the 25 kV AC / 50 Hz that will replace the DC system in the Mumbai region. Most of the components are being built in the Siemens plants in Kalwa and Nashik in the state of Maharashtra.

The systems, which are adjusted to the local climatic and environmental conditions, will reduce the energy consumption by up to 30 percent while also reducing the maintenance and service costs. The passengers will benefit from improved riding comfort made possible by the use of IGBT converters that ensure jerk-free acceleration and braking and by a ventilation system for the passenger compartments.

Technical data					
Year		2006 – 2010			
Number of cars		9	12	15	18
Power system	[kV/Hz]	AC 25 / 50 + DC 1,5			
Maximum power at wheel	[kW]	3,300	4,400	5,500	6,600
Maximum speed	[km/h]	100	100	100	100
Laden weight	[t]	630	840	1,050	1,260
Track gauge	[mm]	1,676	1,676	1,676	1,676
Number of seats		900	1.200	1,500	1,800
Numbers built		303 (3-car base units)			



E 501 Electric Multiple Unit

for Japan Railways JR East

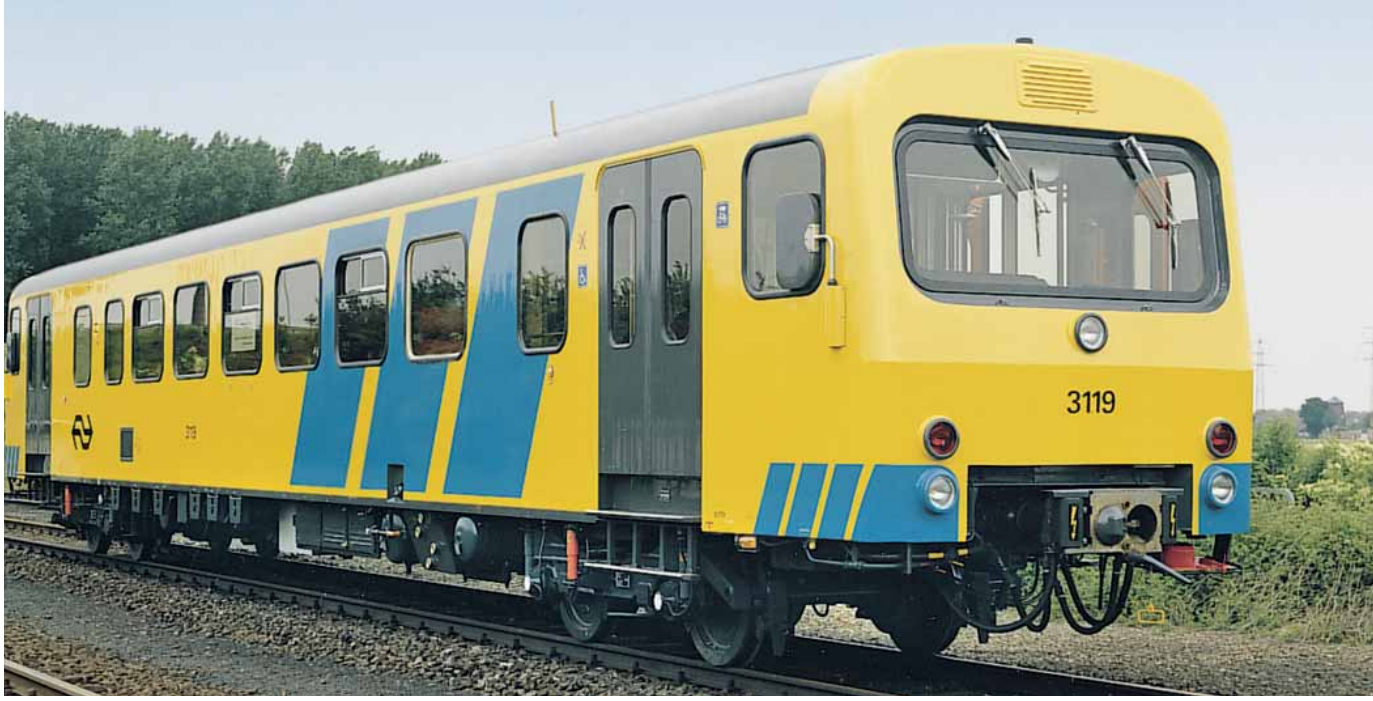
These EMUs are used in commuter services between Ueno Junction in Tokyo and the suburban center of Tsuchiura, a distance of approximately 65 km. They were put into service to meet increased capacity requirements.

The new generation of multiple units is characterized by a considerable weight reduction with improved passenger comfort. As requested by the operator, the entire technology and the maintenance schedule are designed for a service life of 15 years in order to reduce costs.

The vehicles were manufactured by Kawasaki and Tokyu Car Corporation. Siemens was responsible for the entire main circuit and supplies the key components of the traction equipment.

With regenerative feedback of the braking energy into the line, Siemens technology is helping to deal with this aspect of environmental protection in Japan, too.

Technical data		
Year		1994 – 1997
Number of cars		15
Power system	[kV / Hz]	AC 20 / 50; DC 1,5
Maximum power at wheel	[kW]	5,400
Acceleration	[m/s^2]	0.57
Maximum speed	[km/h]	120
Weight	[t]	420
Track gauge	[mm]	1,067
Passenger capacity; seated / standing		4,690
Numbers built		4



DH1 and DH2 Diesel-Hydraulic Railcar

for Netherlands State Railways NS

The DH1 and DH2 railcars run under the name “Wadloper” on secondary lines of Netherlands Railways in the Groningen and Leeuwarden regions.

They are characterized by high economy. Great reliability and ease of maintenance are further advantages that are especially appreciated by NS.

High seating comfort and ride quality as well as ergonomic design of the driver’s cab meet the demands of the passengers and operating personnel alike.

Technical data			
Class		DH1	DH2
Year		1983	1981 – 1983
Number of cars		1 (motor car)	2 (motor car + motor car)
Diesel engine rating	[kW]	212	2 x 212
Maximum speed	[km/h]	100	100
Weight	[t]	37	70
Track gauge	[mm]	1,435	1,435
Number of seats		63	150
Numbers built		19	31

DM ’90 Diesel-Hydraulic Multiple Unit

for Netherlands State Railways NS

To replace old DMU stock from the 1950s and 60s, Netherlands State Railways ordered the new DM ‘90 diesel-hydraulic multiple unit. With a combination of innovation, especially in the control technology and service-proven components adopted from the SM 90 EMUs, we created a modern vehicle that meets the demands of both the operator and the passenger.

Running gear with riding comfort worthy of an Intercity vehicle, wide seats thanks to full use of the vehicle structure gauge, as well as excellent soundproofing and thermal insulation are setting a new standard in inter-urban transportation.

The DM ’90 features a multipurpose compartment for transporting such cumbersome objects as bicycles or baby carriages and permits the installation of vending machines.

Ease of maintenance in conjunction with an intelligent diagnostics system is just one of the benefits of the DM ‘90 that rail operators find most rewarding

Technical data		
Year		1996 – 1998
Number of cars		2 (motor car + motor car)
Diesel engine rating	[kW]	2 x 320
Maximum speed	[km/h]	140
Weight	[t]	94
Track gauge	[mm]	1,435
Number of seats		151
Numbers built		53

Sprinter Lighttrain Electric Multiple Unit

for Netherlands State Railways (NS)

On July 20, 2005, Netherlands State Railways (NS) awarded the consortium of Bombardier Transportation and Siemens Transportation Systems a contract for the delivery of 18 four-car and 17 six-car electric multiple units.

The EMUs are intended for the extension of regional and urban service in the conurbations in the western part of the Netherlands and will gradually replace the existing vehicles.

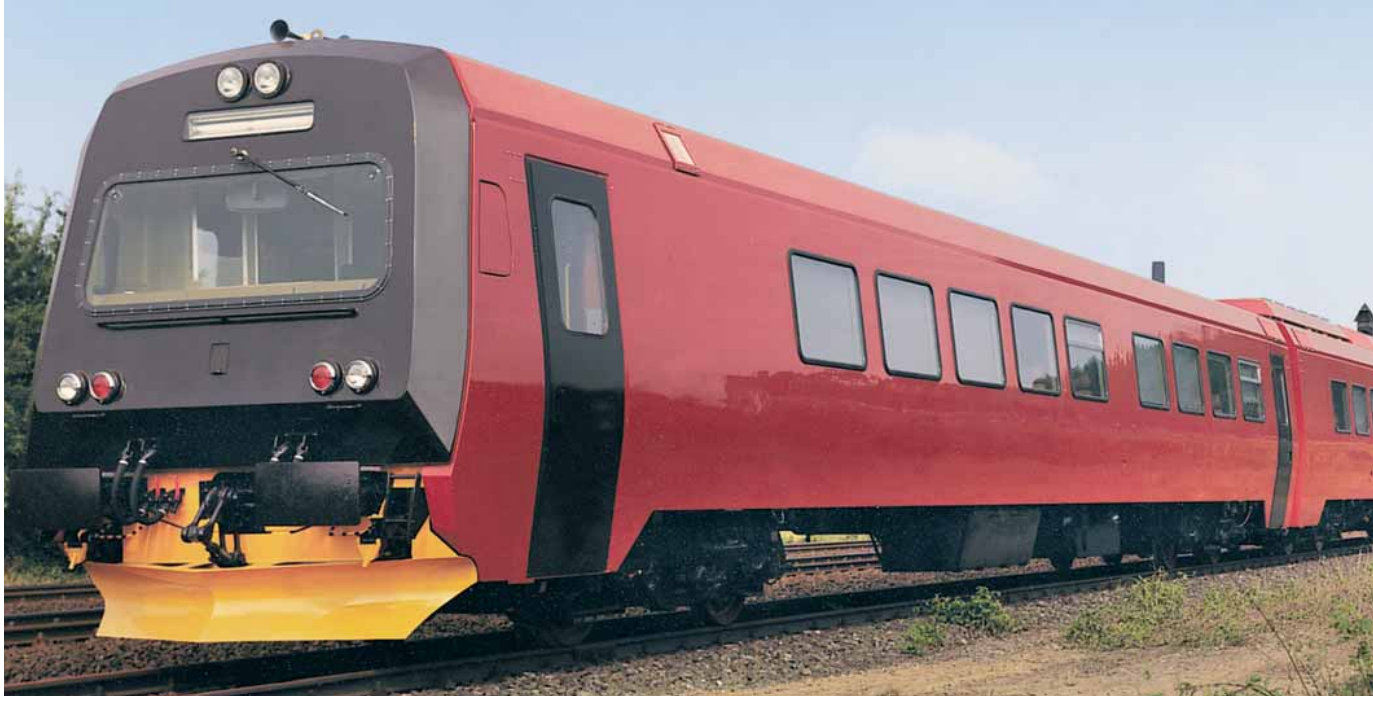
The development of these multiple units is based on the proven class 425 EMUs of German Rail (DB) and is adapted to the requirements of NS and the Dutch railway network.

Passengers' expectations for a modern regional / urban train are satisfied by an attractive design, high riding comfort and a nice panoramic view through large-pane windows. Wide doors and spacious entrance areas allow for fast and easy boarding and exiting.

The compliance with the crash scenario 3 of the Dutch railway legislation RKS means that the current and highest safety standards in the field of passive vehicle safety are being met for passengers and operating staff.

Siemens is responsible for the development of the following components:
- Bodyshell
- Bogies
- Traction converters (IGBT, water-cooled)
- Traction motors (water-cooled) with transmissions
- Traction cooling system

Technical data			
Year		2007 – 2009	2007 – 2009
Number of cars		4	6
Power system	[kV]	DC 1.5	DC 1.5
Maximum power at wheel	[kW]	1,500	2,000
Maximum speed	[km/h]	160	160
Weight	[t]	129	176
Track gauge	[mm]	1,435	1,435
Number of seats		222	332
Number of standees		68	108
Numbers built		18	17



BM/BS 92 Diesel-Electric Multiple Unit

for Norwegian State Railways NSB

To replace multiple units up to 40 years old, Norwegian State Railways (NSB) ordered 15 BM 92 diesel multiple units from Siemens Duewag Schienenfahrzeuge GmbH*). They are being used in the sparsely populated areas of Norway on low-density lines.

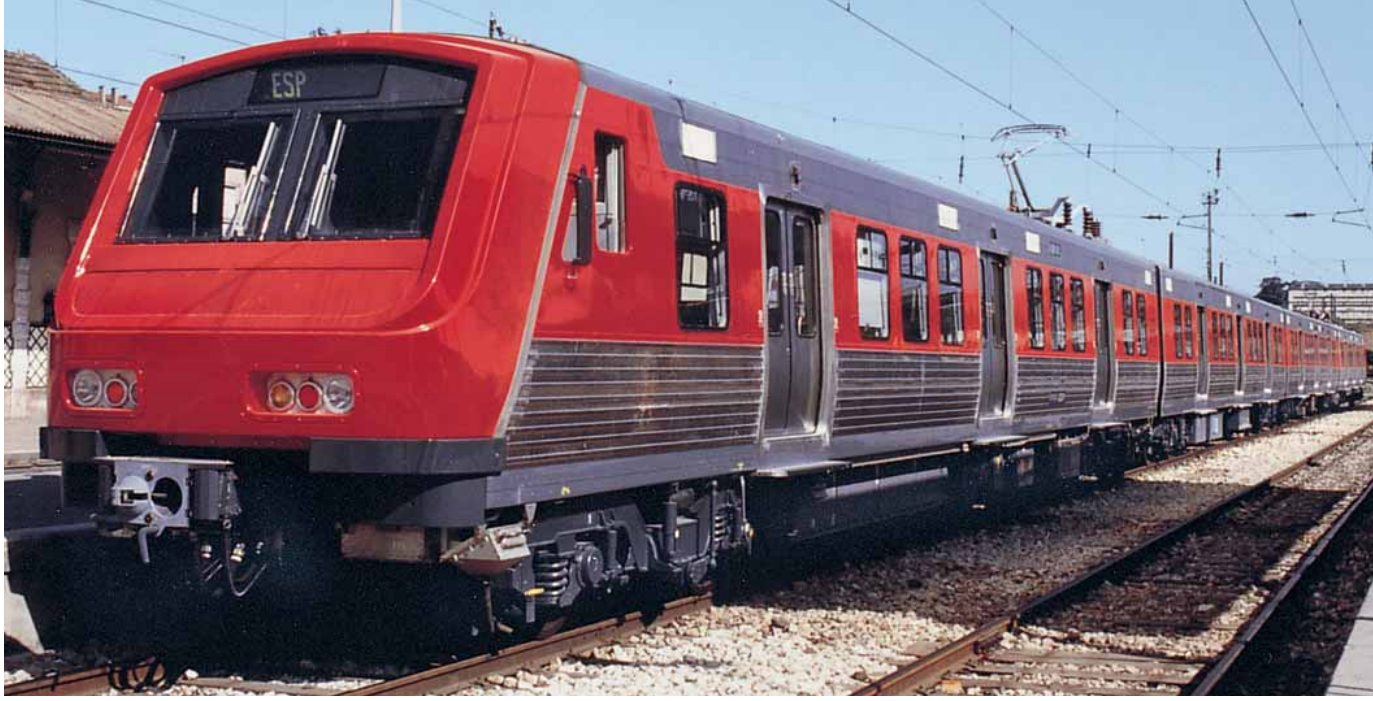
Modern three-phase power transmission ensures optimum utilization of the friction coefficients and the engine output.

The extreme climatic conditions with winter temperatures down to – 45 °C challenge the reliability of the traction system, the heating and thermal insulation of the interior – a challenge which the BM 92 fully meets. The air springs, attractive interior design and comfortable interior furnishings provide great ride quality, too.

Capitalizing on the great strides in traction technology and bodyshell design, the BM 92s were the most modern DMUs in the world at the time of delivery.

Technical data		
Year		1984 – 1985
Number of cars		2 (motor car + driving trailer)
Diesel engine rating	[kW]	2 x 357
Maximum speed	[km/h]	140
Weight	[t]	97
Track gauge	[mm]	1,435
Number of seats		146
Numbers built		15

*) Today Siemens AG, Transportation Systems



2300 / 2400 Electric Multiple Unit

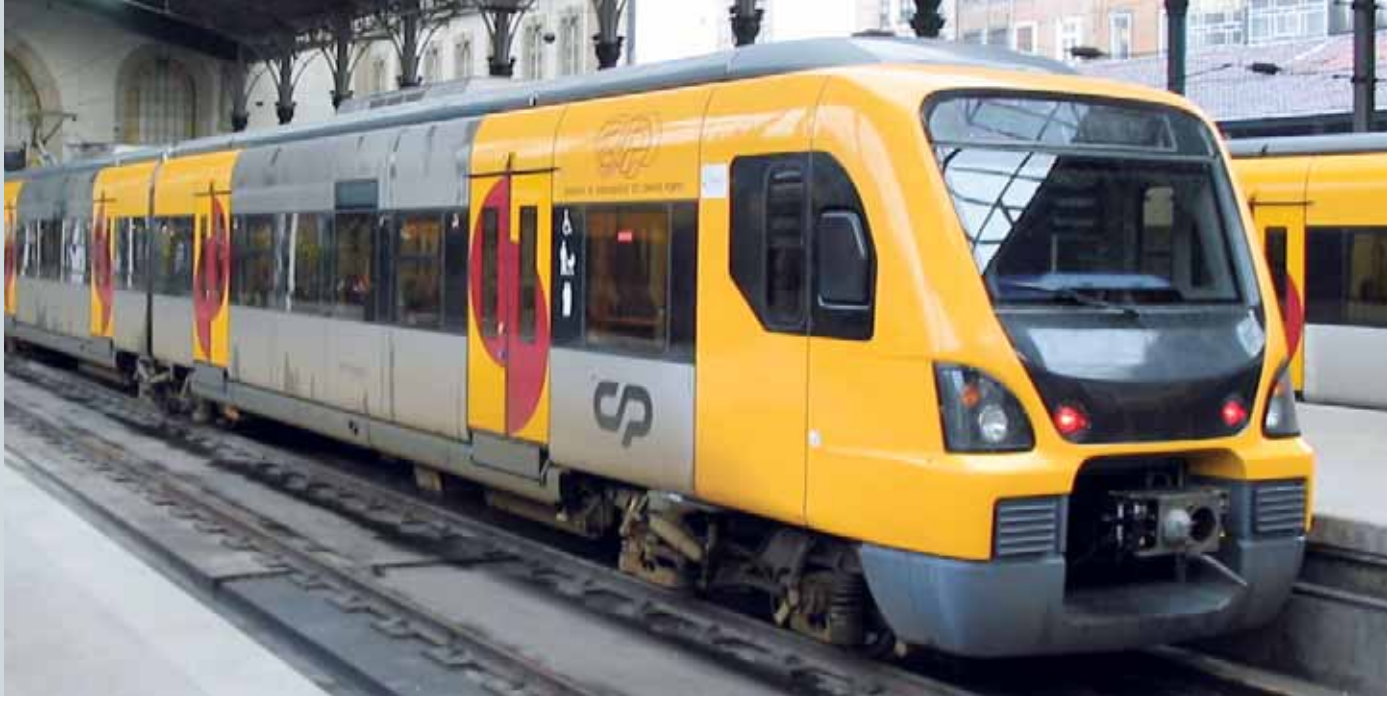
for Portuguese State Railways CP

To modernize Portuguese State Railways' fleet, the Bombardier- Siemens consortium supplied a total of 56 electric multiple units of classes 2300 and 2400. The vehicles operate on a 27-km-long suburban line between Lisbon and Sintra. On this line with challenging topographical and operating conditions – 22 km with up to 18 ‰ grades – the vehicles carry more than a quarter of a million passengers a day.

Each EMU is designed as a four-car unit consisting of two power cars and two trailer cars. The multiple unit has a symmetrical design, i. e. each half unit consisting of a power and a trailer car forms an electrically autonomous unit.

The class 2400 multiple units are additionally equipped with an air-conditioning system. In 1999, CP ordered the class 2300 units to be retrofitted with an air-conditioning system as well.

Technical data			
Class		2300	2400
Year		1992 – 1996	1997 – 1999
Number of cars		4	4
Power system	[kV / Hz]	AC 25 / 50	AC 25 / 50
Maximum power at wheel	[kW]	3,100	3,100
Acceleration	[m/s^2]	1.1	1.1
Maximum speed	[km/h]	120	120
Weight	[t]	180	186
Track gauge	[mm]	1,668	1,668
Number of seats		348	348
Number of standees		416	416
Numbers built		42	14



3400 Electric Multiple Unit

for Portuguese State Railways CP

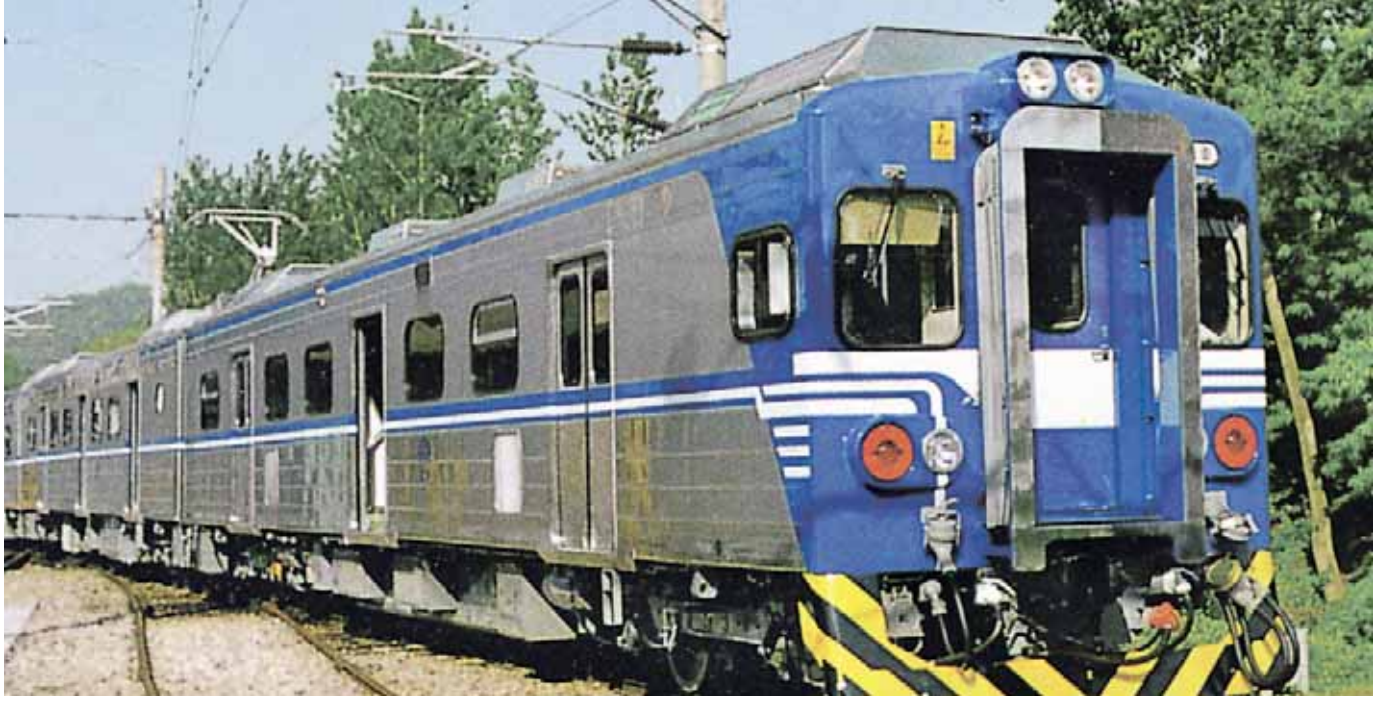
A Siemens-led consortium of companies comprising Siemens and Bombardier supplied 34 electric multiple units to the Portuguese State Railways (CP) for use in the Greater Porto and Lisbon areas.

This supply contract marks the beginning of a new generation of suburban trains to operate in Portugal under the type classification UME 3400.

Based on the Desiro family of multiple units by Siemens and the ITINO series from Bombardier, these EMUs are especially noted for their economical operation, low power consumption, and a high degree of passenger comfort including a state-of-the-art passenger information system. Besides that, the train is provided with an innovative system for the transmission of diagnostics data as well as of control signals to permit remote control of energy meters and HVAC equipment by means of GSM communication. Each of the 34 trains consists of a permanently coupled four-car unit using Jacobs bogies. They operate in the Greater Porto area and represent an innovative modernization of the city's fleet of regional trains. This delivery updates and modernizes Porto's fleet for regional traffic.

The Siemens scope of supply and services included the entire traction and auxiliary systems, the complete control equipment, HVAC, passenger information and entertainment systems, as well as automatic couplers. Bombardier supplied the car bodies and running gear complete with air brake system and also performed the final assembly work in Lisbon under Siemens supervision.

Technical data		
Year		2002 – 2004
Number of cars		4
Power system	[kV / Hz]	AC 25 / 50
Maximum power at wheel	[kW]	1,700
Acceleration	[m/s²]	1.0
Maximum speed	[km/h]	140
Weight	[t]	115
Track gauge	[mm]	1,668
Number of seats		250
Numbers built		34



500 Electric Multiple Unit

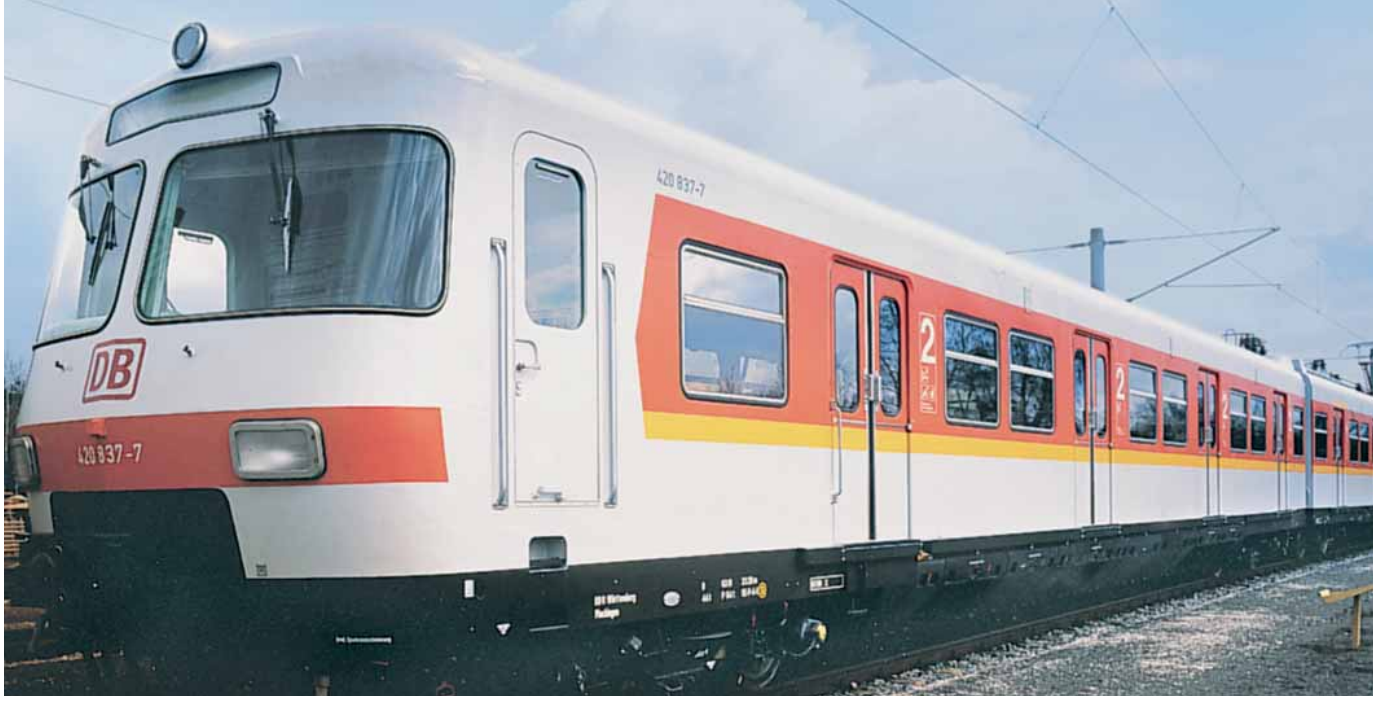
for the Taiwan Railway Administration TRA

In September 1993, the Taiwan Railway Administration (TRA) placed an order for the supply of 86 electric multiple units with a consortium comprising Daewoo Heavy Industries, the South Korean coach-maker and Siemens Transportation Systems. The first vehicles were supplied in June 1995.

The new class 500 EMUs are being used on the heavily frequented West Main Line to deal with the growing passenger traffic.

The 500 unit is a milestone in the history of Taiwanese railway operation because it marks the first vehicle to feature asynchronous technology.

Technical data		
Year		1995 – 1997
Number of cars		4
Power system	[kV / Hz]	AC 25 / 60
Maximum power at wheel	[kW]	2,530
Acceleration	[m/s^2]	0.8
Maximum speed	[km/h]	110
Weight	[t]	165
Track gauge	[mm]	1,067
Passenger capacity; seated / standing		240 / 480
Numbers built		86



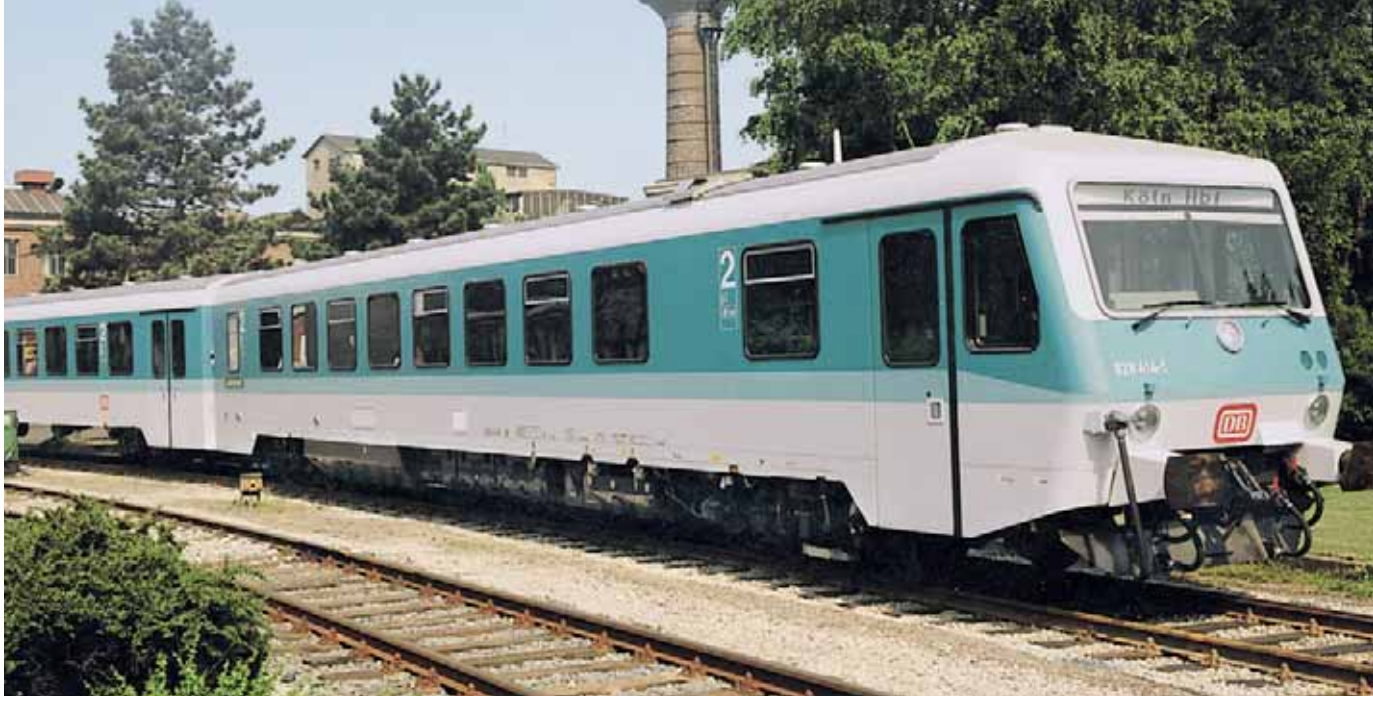
420 Electric Multiple Unit

for German Rail DB AG

For the 1972 Olympic Games in Munich, the former German Federal Railway required powerful multiple units for LRT service. Based on the rapid transit – S-Bahn – systems of Hamburg and Berlin and the experience with existing AC power vehicles, this three-car class 420 multiple unit was developed in the year 1969.

With every axle driven, this train proved so successful that by the beginning of 1997 German Rail had put almost 500 units into service. They are used in the Munich, Stuttgart and Frankfurt conurbations and for temporary service in the Ruhr district, too.

Technical data		
Year		1969 – 1996
Number of cars		3
Power system	[kV / Hz]	AC 15 / 16,7
Maximum power at wheel	[kW]	3,000
Acceleration	[m/s²]	1.0
Maximum speed	[km/h]	120
Weight	[t]	138
Track gauge	[mm]	1,435
Number of seats		194
Numbers built		497



628.4 / 928.4 Diesel-Hydraulic Multiple Unit

for German Rail DB AG

The third in the series of class 628 diesel-hydraulic multiple units, the 628.4, marks the temporary culmination of a 20-year success story. No fewer than 473 multiple units of this class developed by Siemens Duewag Schienenfahrzeuge GmbH*) (SDS) have been supplied to German Rail and to various private railways.

The 628.4 sets standards in passenger comfort with modern running gear and air springs, as well as exemplary thermal insulation and soundproofing.

Today, the class 628 multiple unit can be found working on virtually all of DB AG's secondary passenger rail lines. It has replaced heavy, cost-intensive loco-hauled trains. With a top speed of 120 km/h, it is also working in fast train service on some main lines.

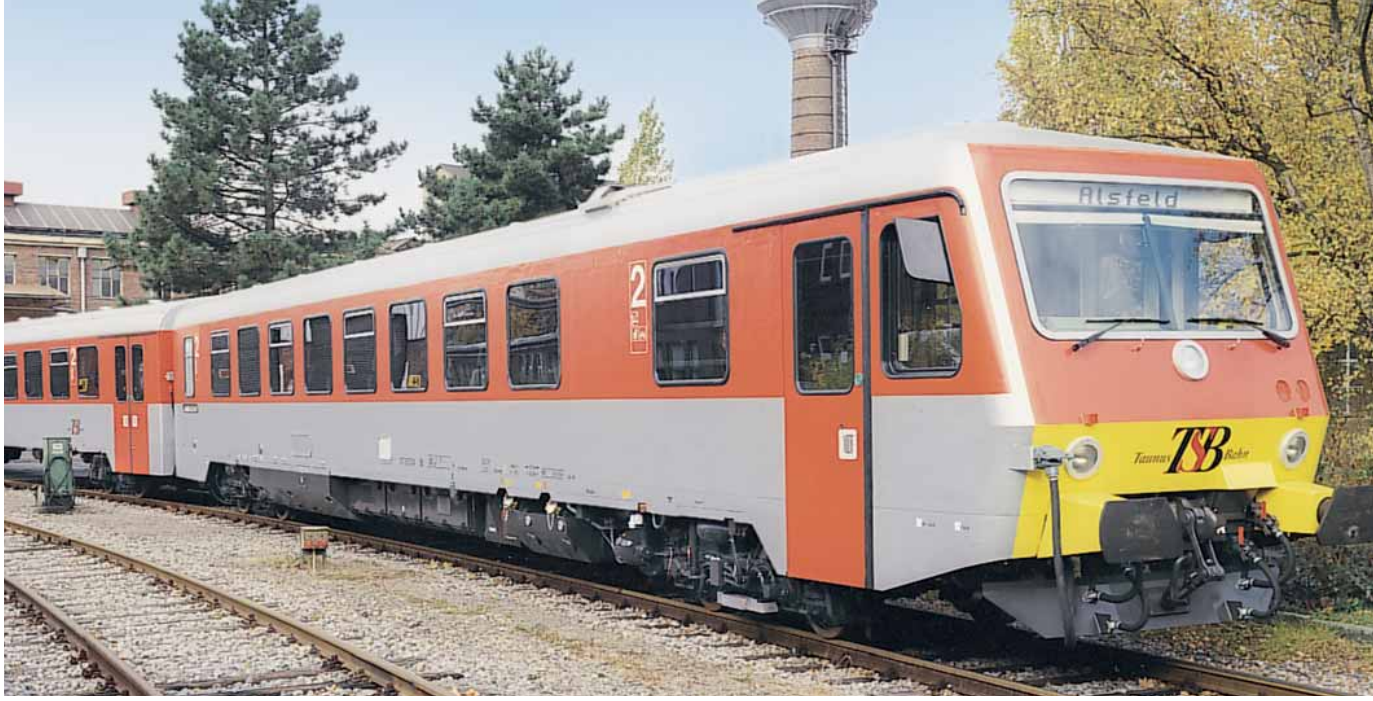
Developed by SDS, a total of 306 third-series trains have been built by SDS, Linke-Hofmann-Busch and AEG Schienenfahrzeuge.

References

- German Federal Railways/ German Rail (297)
- Westerwaldbahn, Germany (1)
- Hessische Landesbahn, Germany (1)
- Romanian State Railways (SNCFR) (2)
- Elbe-Weser-Verkehrsbetriebe (5)

Technical data		
Year		1992 – 1995
Number of cars		2 (motor car + driving trailer)
Diesel engine rating	[kW]	485
Maximum speed	[km/h]	120
Weight	[t]	70
Track gauge	[mm]	1,435
Number of seats		146
Numbers built		306

*) Today Siemens AG, Transportation Systems



628.9 / 629.0 Diesel-Hydraulic Multiple Unit

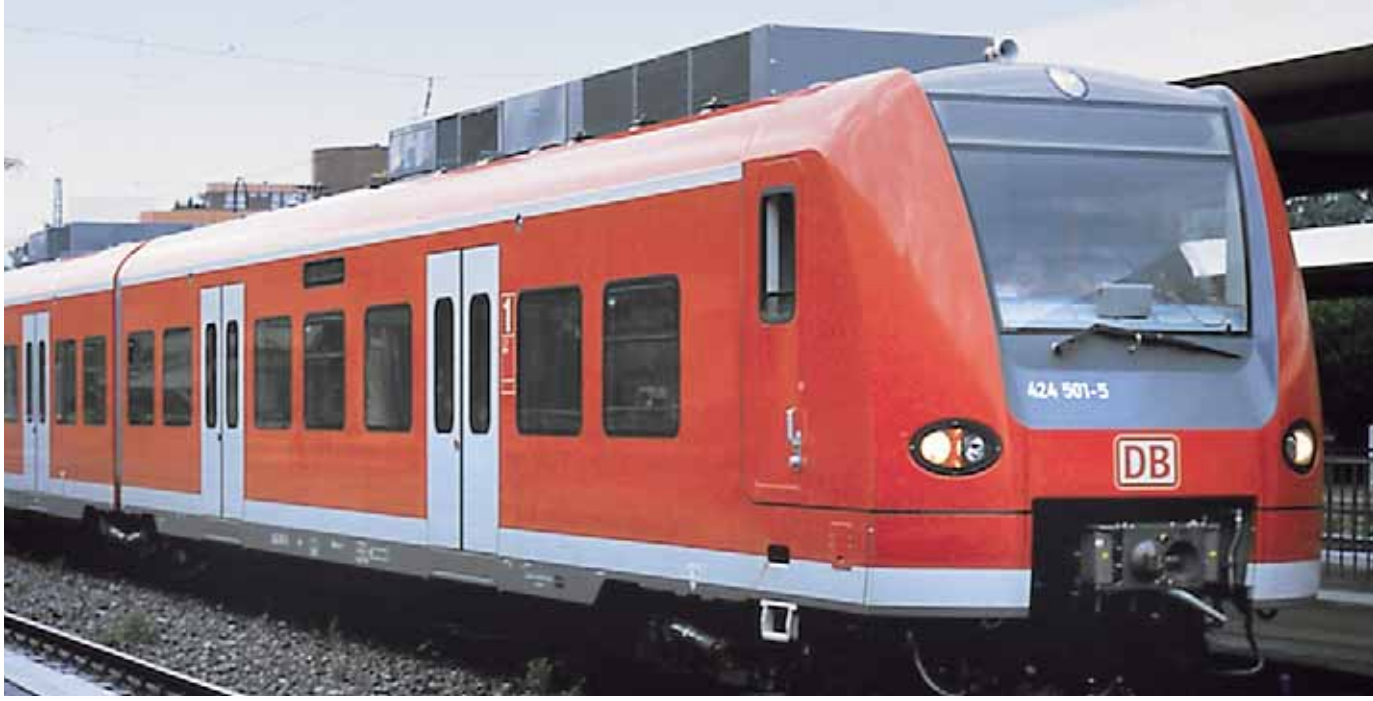
for German Rail DB AG

To increase the tractive effort on lines with frequent up grades, seven 628.9 / 629.0 multiple units with the double power car configuration were supplied to DB AG and to the regional rail authority Hessische Landesbahn. In principle, the 629.0 is a power car with the interior furnishings of the 928.4 driving trailer car.

The components are extensively the same as those of the class 628.4. The vehicles are manufactured by Siemens Duewag Schienenfahrzeuge GmbH*) and AEG Schienenfahrzeuge.

Technical data		
Year		1995
Number of cars		2 (motor car + motor car)
Diesel engine rating	[kW]	2 x 485
Maximum speed	[km/h]	140
Weight	[t]	92
Track gauge	[mm]	1,435
Number of seats		143
Numbers built		7

*) Today Siemens AG, Transportation Systems



424-426 Electric Multiple Unit

for German Rail DB AG

The class 424-426 electric multiple units are being supplied by a consortium including Bombardier and Siemens Transportation Systems.

The EMUs are intended for regional and urban services on track belonging to DB AG. They can be coupled together.

The full-width gangways between the cars provide an unobstructed view through the interior. Together with call stations to the driver and an extensive information system, this increases passenger safety and comfort.

These units are being built in batches by the consortium partners. Siemens is responsible for the following components:

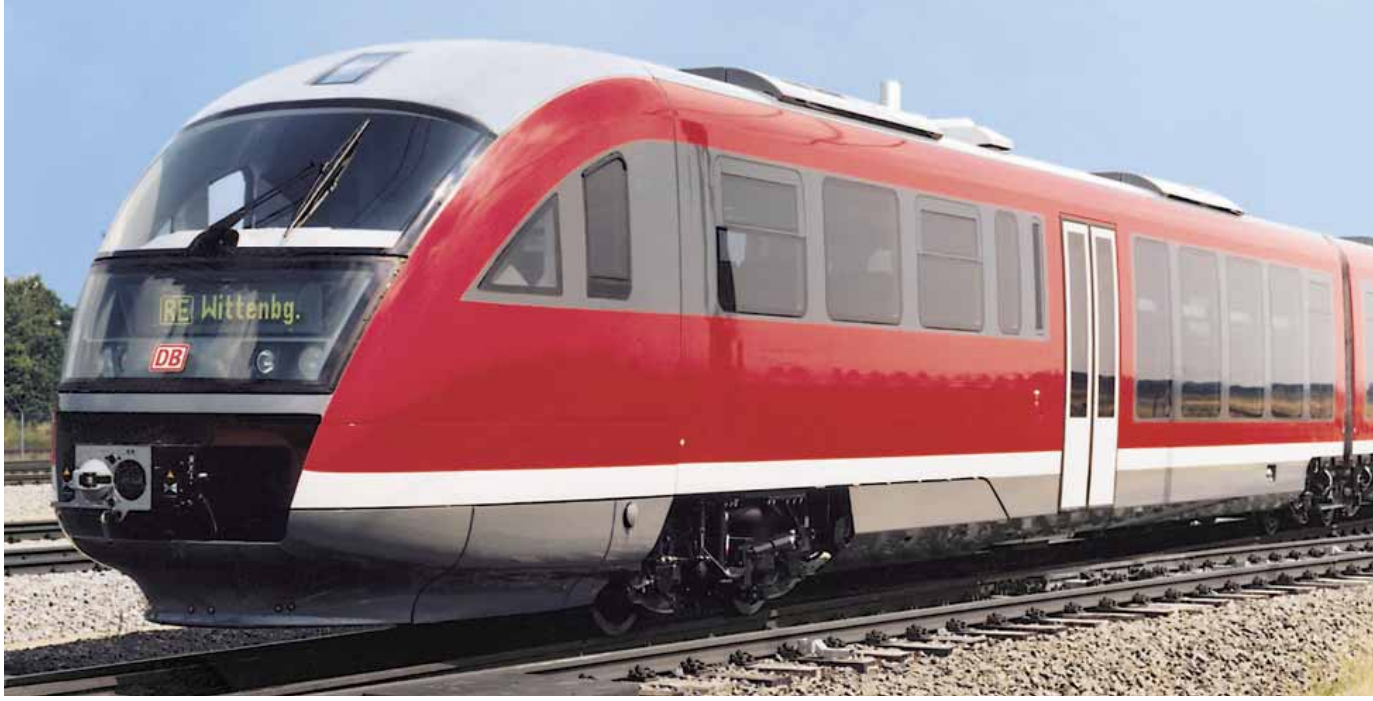
- Main transformer
- Traction converter (GTO, water-cooled)
- Traction motors (water-cooled) with transmissions
- Traction cooling system

To increase the usable space in the passenger compartments, all traction equipment is arranged under floor. Owing to the low floor height, the main transformer and traction converters have an extremely low-profile design.

The traction system features regenerative feedback of the braking energy and use of the heat dissipated from the traction components to heat the passenger compartments.

Technical data				
Class		ET 424 / 425*)	ET 426*)	ET 425.x
Year		from 1998	from 1998	2002 – 2008
Number of cars		4	2	4
Power system	[kV / Hz]	AC 15 / 16.7	AC 15 / 16.7	AC 15 / 16.7
Maximum power at wheel	[kW]	2,350	1,175	2,350
Acceleration	[m/s^2]	1.0	0.9	1.0
Maximum speed	[km/h]	140 / 160 cont. ATC	160 cont. ATC	140 with INDUSI 160 cont. ATC**)
Weight	[t]	108	61	108
Track gauge	[mm]	1,435	1,435	1,435
Number of seats		206 / 192	112	204
Platform height	[mm]	760 550	760 550	760 550
Numbers built		196	43	93

*) 360 mm with step **) 20 ET 425,3 cont. ATC



Desiro Classic Diesel-Mechanical Multiple Unit

for German Rail DB AG

With the class 642, German Rail (DB AG) has ordered modern and eco-friendly diesel multiple units for its regional rail needs.

The main comfort features of the train are:

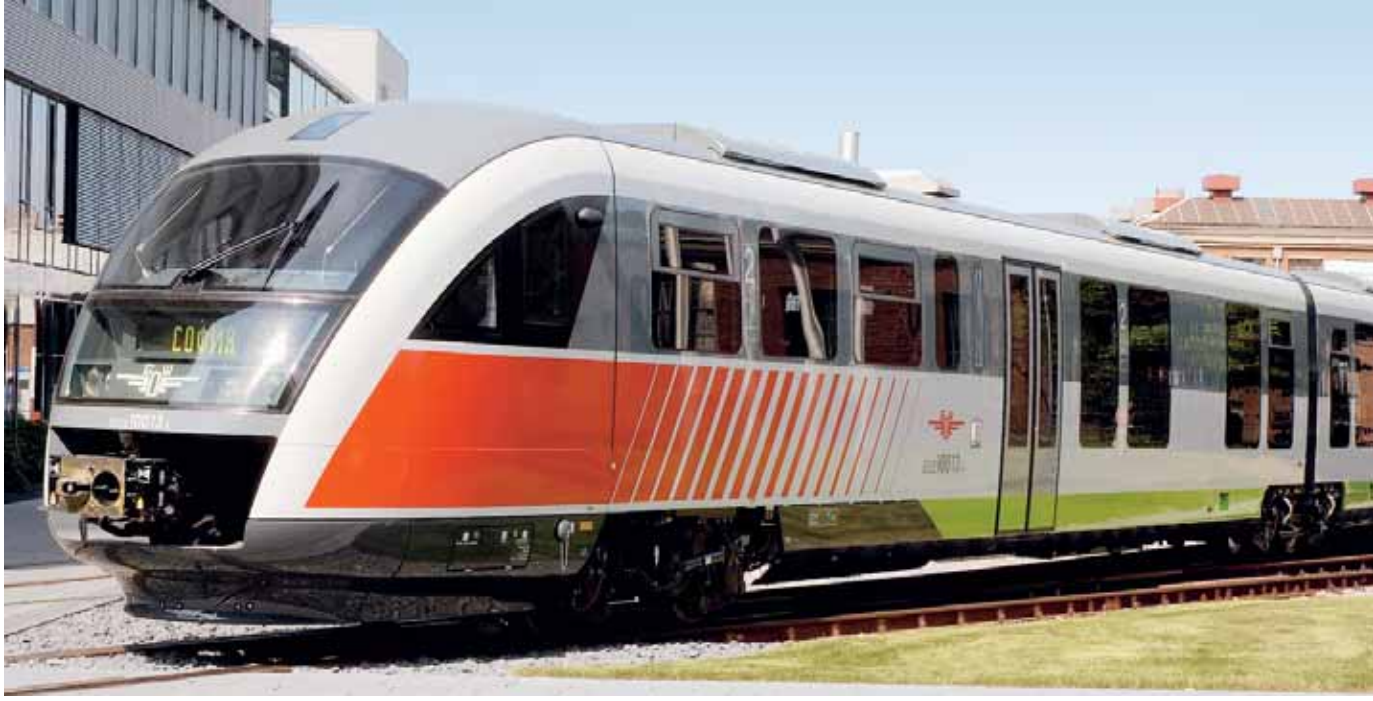
- 60 % low-floor with a floor height of only 575 mm
- Bright and spacious interior, large-pane window bands, unobstructed view through the entire train
- Toilet system suitable for handicapped passengers
- Boarding aids for wheelchair users
- Ventilation system
- Bogies with air springs for maximum passenger comfort

The use of production components from city bus technology in the class 642 ensures low investment and service costs, thus permitting attractive and economical operation on secondary lines and in conurbations.

References

- German Rail (233)
- Kahlgrund-Verkehrsgesellschaft mbH (1)

Technical data		
Year		2000 – 2003
Number of cars		2 (motor car + motor car)
Diesel engine rating	[kW]	2 x 275
Maximum speed	[km/h]	120
Weight	[t]	ca. 68
Track gauge	[mm]	1,435
Number of seats		123
Numbers built		234



Desiro Classic Diesel-Mechanical Multiple Unit

The Desiro Classic gives our customers all the benefits of a modern, environment-friendly diesel-mechanical multiple unit for regional rail service.

The main comfort features of the train are:

- Comfortable interior through high-quality materials as well as a combination of direct and indirect lighting
- 6 % low-floor section with a floor height of only 575 mm
- Bright and spacious interior, continuous band of large-pane windows, unobstructed view over the entire train interior
- Toilet system suitable for handicapped passengers
- Boarding aids for wheelchair users
- Air-cooling system
- Bogies with air springs for maximum passenger comfort.
- In addition, a number of special furnishings such as ticket vending machine and / or beverage machines, CCTV surveillance, etc. are optional

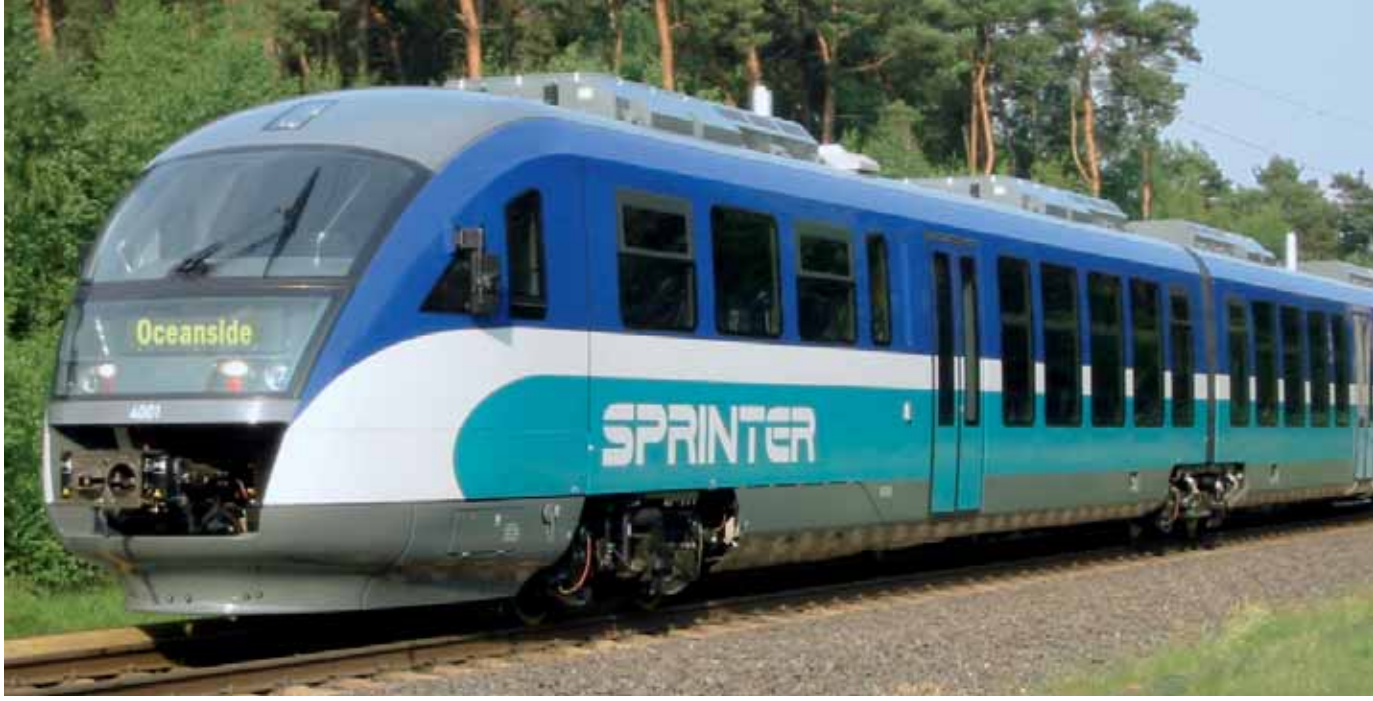
Thanks to the use of mass-produced components adopted from the motor vehicle sector, the Desiro Classic guarantees low investment and operating costs which, in addition to the possibility of flexible deployment in multiple-running or multi-section train formations, permit attractive and profitable operation on secondary lines and in conurbations.

The result:
Desiro Classic is a train that can satisfy passenger wishes and meet operator requirements to a maximum degree, as proven by the extensive list of reference applications.

References:

- HHGB Hornbaekbahnen (1)
- Nordwestbahn from Angel Trains (6)
- MAV Hungarian State Railway (23)
- SNTFC Romanian State Railway (120)
- Danish State Railways from Angel Trains (12)
- Connex from Angel Trains (12)
- Vogtlandbahn (24)
- Greek State Railways (8)
- Austrian Federal Railways (60)
- Hessische Landesbahn HLB (6)
- Bulgarian State Railways BDŽ (25)
- Nordjyske Jernbaner, Denmark (7)
- Siemens' ETCS experimental vehicle (1)

Technical data		
Year		2000 – 2008
Number of cars		2 (motor car + motor car)
Diesel engine rating	[kW]	2 x 275 or 2 x 315 from 2006: 2 x 335, Stage 3A
Maximum speed	[km/h]	120
Weight	[t]	approx. 68
Track gauge	[mm]	1,435
Number of seats		123
Numbers built		305



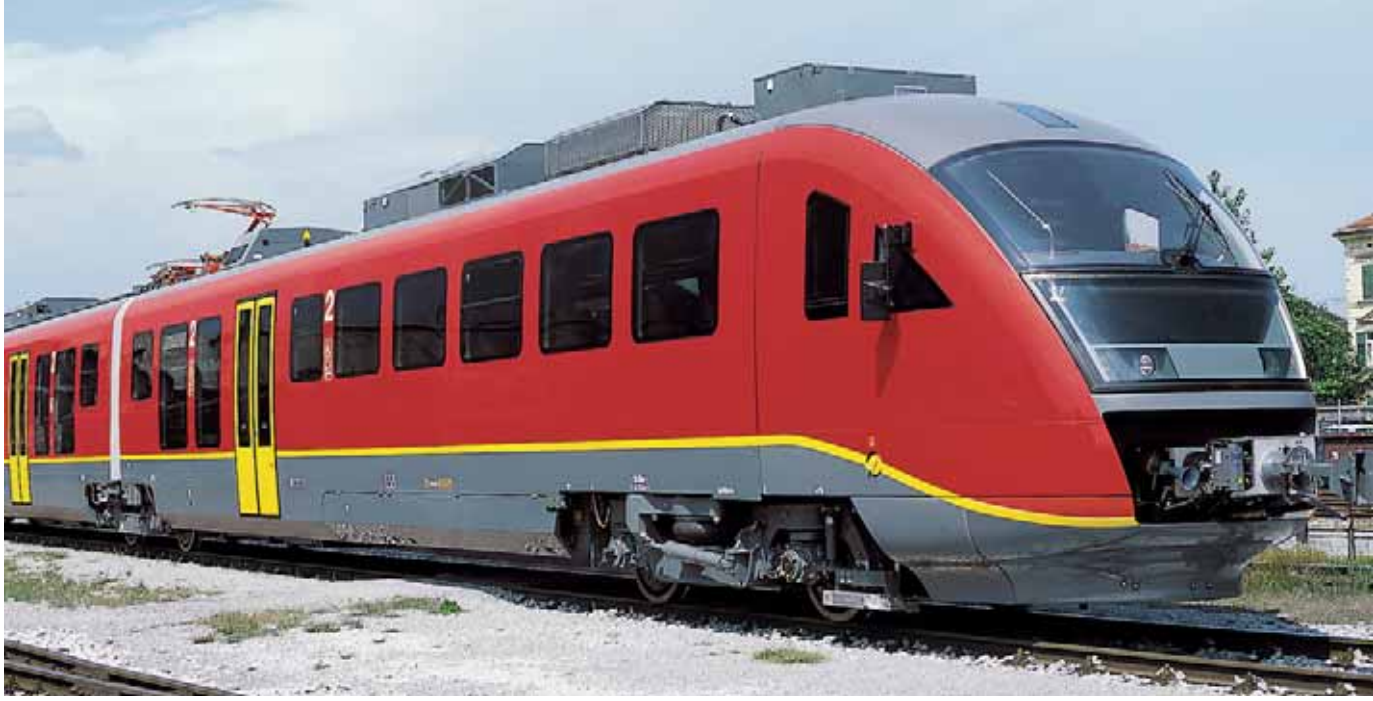
Desiro Classic Diesel-Mechanical Multiple Unit

for NCTD, California

Siemens received an order from the transit agency North County Transit District (NCTD) for 12 two-car multiple units to connect the Californian cities of Oceanside, Vista, San Marcos and Escondido.

The Desiro Classic trains ordered by NCTD are largely identical with the same type of vehicles being used in Europe, e. g. by German Rail as the type VT 642. A major difference is the elimination of the 1st class section and the toilet module, thus raising the total capacity to 128 seated and 90 standing passengers. An additional feature is the more powerful air-conditioning that has been to account for the higher ambient temperatures.

Technical data		
Year		2006
Number of cars		2
Diesel engine rating	[kW]	2 x 315
Maximum speed	[km/h]	89
Weight	[t]	ca. 70
Track gauge	[mm]	1,435
Number of seats		128
Numbers built		12



Desiro EMG 312 Electric Multiple Unit

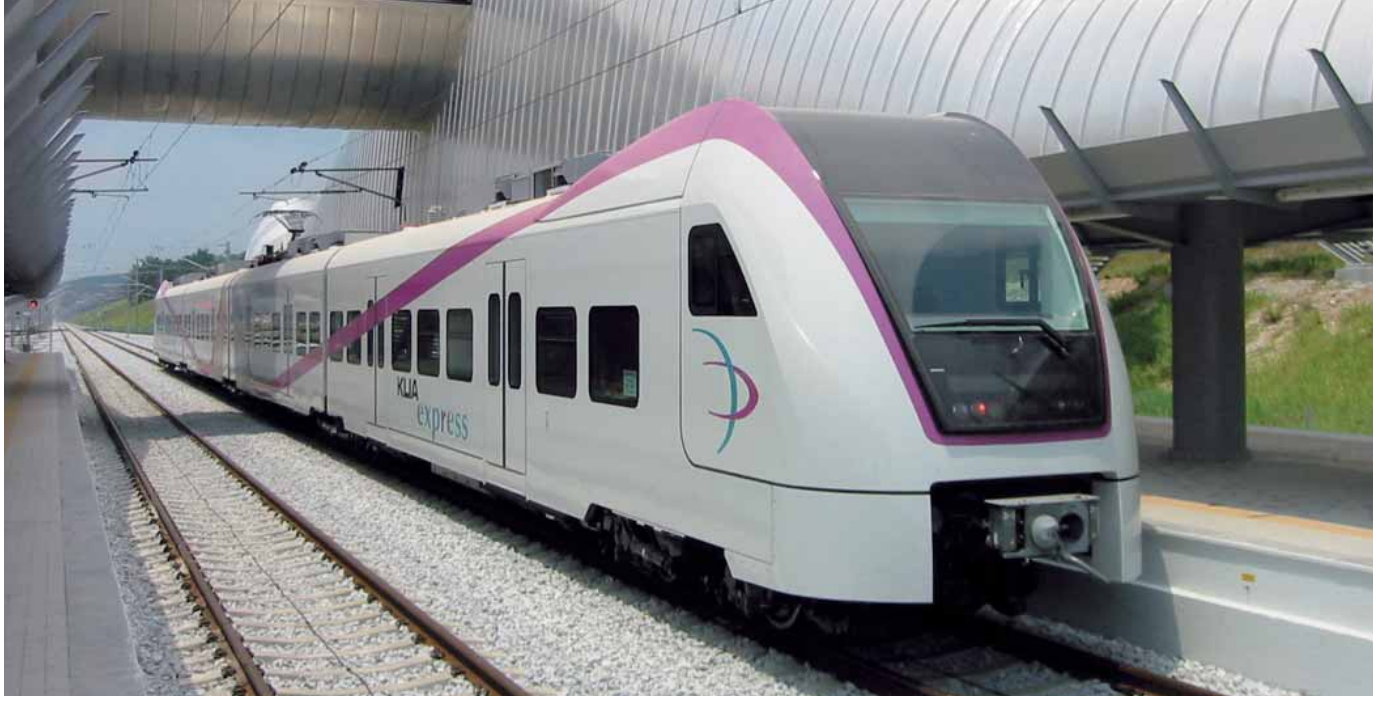
for Slovenian Railway SZ

The class 312 electric railcars for Slovenian Railway (SZ) represent the single- and double-articulated versions of the Desiro family of regional rail vehicles. They were built by Siemens AG, Transportation Systems and TVT (Slovenia) on behalf of the general contractor Siemens Austria.

These vehicles will be used for rail service on all electrified routes in Slovenia as well as in the Ljubljana region on the 85-km-long Koper-Postojna line and the 62-km-long Ljubljana-Zidani Most line.

This design combines high performance, comfort and low life cycle costs and is the consistent development of the successful range of vehicles designed by Siemens Transportation Systems for regional rail service. The electric railcar is designed on the basis of a modular system with defined interfaces and therefore offers additional advantages in terms of operating reliability and safety.

Technical data			
Class		312-0	312-1
Year		2000	2001
Number of cars		2	3
Power system	[kV]	DC 3	DC 3
Maximum power at wheel	[kW]	1,650	2,000
Maximum speed	[km/h]	140	140
Weight	[t]	75	95
Track gauge	[mm]	1,435	1,435
Number of seats		133	188
Numbers built		10	20



Desiro ET Electric Multiple Unit

for Kuala Lumpur's ExpressRailLink, Malaysia

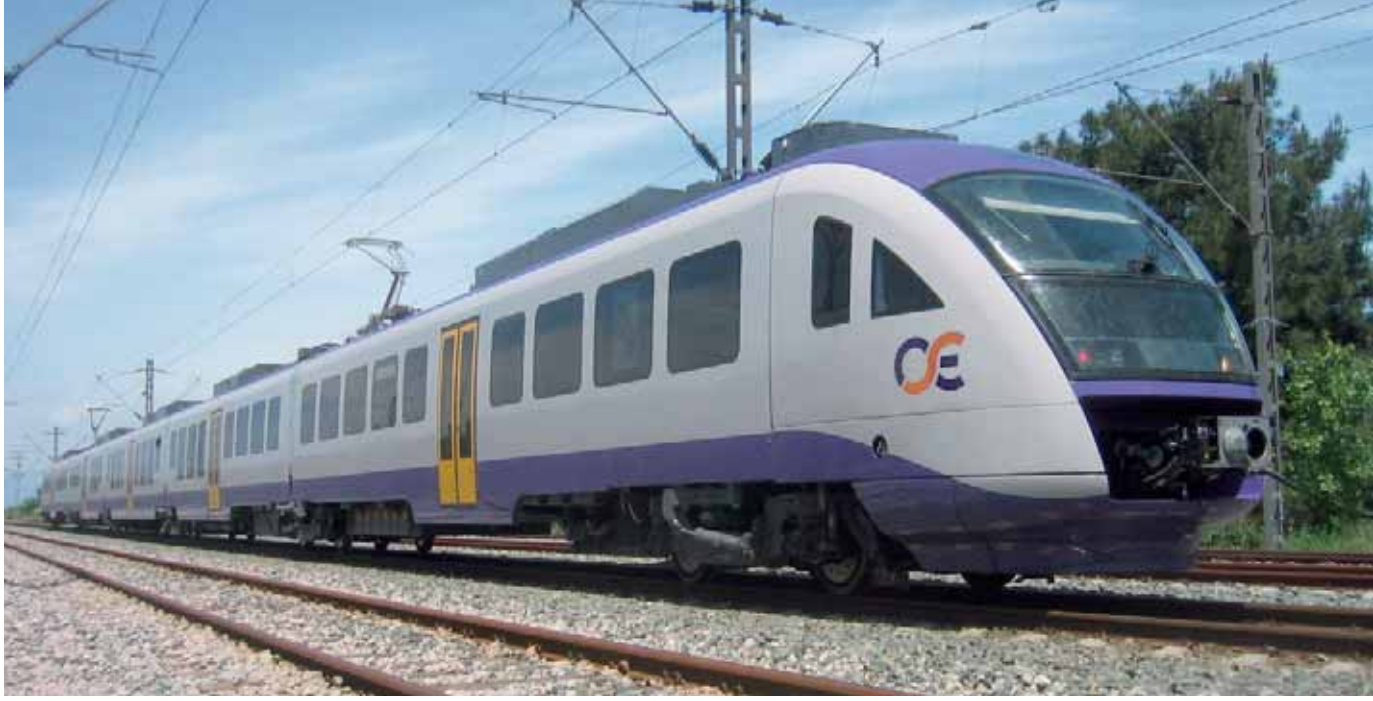
A new fast rail service – the Express-RailLink (ERL) – has been built to provide quick connections between the modern Kuala Lumpur International Airport and downtown Kuala Lumpur.

The top-quality furnished ERL trains take passengers to the airport nonstop in 30 minutes and in high comfort. Additional CRS (Commuter Rail Service) trains with more robust interior furnishings and extra space for standees are deployed to cope with day-to-day commuter traffic. These CRS trains stop at three stations along the route. Except for the interiors, both trains are identical in design to ensure rational maintenance and spare parts stocking.

Developed from a DB AG express train model, these units are distinguished by improved elegant styling as well as by modern traction and control equipment.

To accommodate the expected increase in the number of riders these trains are designed to run in multiple. A special convenience offered in ERL service enables passengers not only to check in for their entire trip but also hand in their baggage upon arriving at KLS (Kuala Lumpur Sentral = the city's main station), leaving them free to travel with only their hand luggage. These multiple units are provided with a separate baggage compartment for this purpose. Each ERL train is also equipped with toilets, suitable for handicapped persons.

Technical data		
Year		2001 – 2002
Number of cars		4
Power system	[kV / Hz]	AC 25 / 50
Maximum power at wheel	[kW]	1,800
Acceleration	[m/s^2]	1.0
Maximum speed	[km/h]	160
Weight	[t]	120
Track gauge	[mm]	1,435
Number of seats (type ERL)		156
Number of seats (type CRS)		144
Number of standees (type CRS)		396
Numbers built (ERL + CRS)		8 + 4



Desiro Electric Multiple Unit

for Greek Railways OSE

Greek Railways (OSE) ordered 20 five-car electric multiple units of the Desiro type from Siemens AG.

These EMUs are being built by a German-Greek consortium led by Siemens AG (Germany) and including Siemens AE (Greece) and Hellenic Ship Yards.

The modern EMUs are part of the successful Desiro platform from Siemens Transportation Systems that is used in Germany, the United Kingdom and numerous other countries. The maximum power of the fully air-conditioned trains is 3,000 kW, the maximum speed 160 km/h. The Desiro units will be used in Athens to connect the airport with the city as well as on the North-South link between Athens-Thessaloniki.

The Desiro for OSE offers a high quality and ride comfort. Its modular design – using service-proven and tested components – ensures high technical reliability and low life cycle costs.

Technical data		
Year		2004
Number of cars		5
Power system	[kV / Hz]	AC 25 / 50
Maximum power at wheel	[kW]	3,000
Acceleration	[m/s^2]	1.0
Maximum speed	[km/h]	160
Weight	[t]	150
Track gauge	[mm]	1,435
Number of seats		310
Numbers built		20

Desiro RABe 514 Double-Deck Electric Multiple Unit

for Swiss Federal Railways SBB

The modern electric multiple units running at 140 km/h are fully airconditioned, equipped with vacuum toilets and suitable for handicapped people. Wide doors permit fast boarding and existing even for passengers with mobility impairments. The comprehensive passenger information system helps passengers keep track with their travel status. The EMUs are characterized by their high acceleration capability for demanding rapid transit service, serving routes with relatively short distances between stops. The units combine modern design with proven technology and reliable components.

Technical data		
Year		2005 – 2008
Number of cars		4
Power system	[kV / Hz]	AC 15 / 16.7
Maximum power at wheel	[kW]	3,200
Maximum speed	[km/h]	140
Weight	[t]	218
Track gauge	[mm]	1,435
Number of seats		396
Numbers built		35 + 25

Desiro Classic Electric Multiple Unit

for Bulgarian State Railways (BDŽ)

In 2005, Bulgarian State Railways (BDŽ) placed an order for electric multiple units of the type Desiro Class of EMU comprising 15 three-car trains and 10 four-car trains.

Vehicles of the type Desiro Classic EMU have also been supplied to other European countries, including Slovenia and Greece. The multiple units for the Bulgarian State Railways BDŽ represent a further development of this proven family of vehicles from Siemens Transportation Systems.

The vehicles excel through their superior running performance and comfort at low life cycle costs.

The train's design is based on a modular platform with clearly defined interfaces and offers additional advantages in terms of technical reliability and safety.

Technische Daten			
Class		3-car unit	4-car unit
First delivery		from 2007	from 2008
Number of cars / unit		3	4
Power system	[kV / Hz]	AC 25 / 50	AC 25 / 50
Maximum power at wheel	[kW]	1,300	1,300
Maximum speed	[km/h]	140	140
Weight	[t]	ca. 101	ca. 123
Track gauge	[mm]	1,435	1,435
Number of seats		190	254
Numbers built		15	10

Desiro UK Class 360 Multiple Unit

for ONE Great Eastern

National Express is one of the major successful bus and rail service providers in Great Britain. One of its business units is ONE Great Eastern that operates a network of railway lines starting at London's Liverpool Street station and which has recorded dramatic increases in ridership in the past few years. As a result, an order was placed via Angel Trains Ltd. – the world's largest leasing company for passenger trains – with Siemens for 21 Desiro type four-car multiple units that are to replace the old rolling stock. To meet infrastructure requirements these trains are designed to operate on the 25 kV AC line voltage system.

The class 360 is a four-car multiple unit that offers 280 seats, including 16 in first class. The power supply is 25 kV / 50 Hz. The vehicles are being used between the Liverpool Street, Ipswich and Clacton terminals. These 21 multiple units have been in service since 2003 and have accumulated a running performance of over three million kilometers. The maximum traction power is 1,550 kW at a weight of 170 t. There is one universal WC module per train. Maximum speed is 160 km/h.

Technical data		
Year		2002
Number of cars		4
Power system	[kV / Hz]	AC 25 / 50
Maximum power at wheel	[kW]	1,550
Acceleration	[m/s²]	0.98
Maximum speed	[km/h]	160
Weight	[t]	174
Track gauge	[mm]	1,435
Number of seats		280
Numbers built		21

Desiro UK Class 444 Multiple Unit

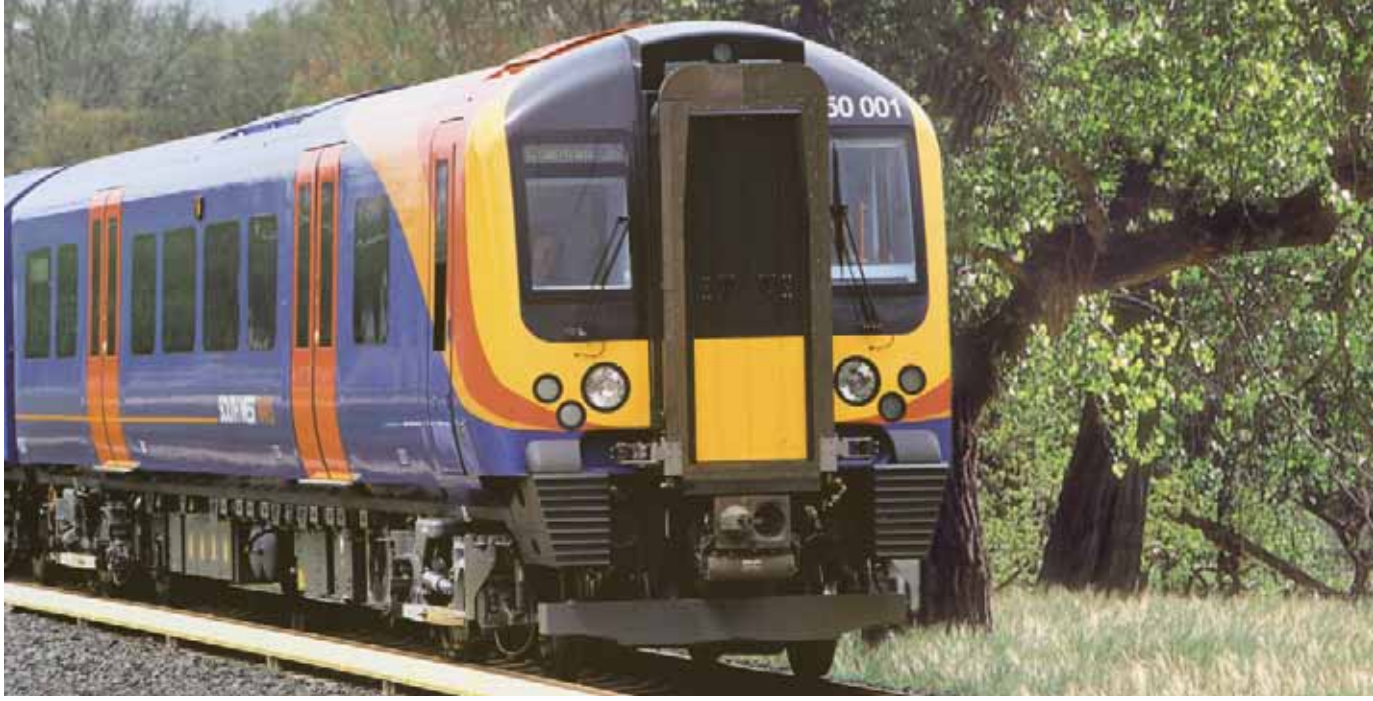
for South West Trains

Stagecoach, one of the largest bus and train operators in the United Kingdom, have the franchise to operate South West Trains – the busiest commuter railway in the United Kingdom serving London's Waterloo Station from the southwest.

In early 2001, Stagecoach and Angel Trains (world's largest leasing company of passenger trains) placed a contract with Siemens for multiple unit trains to run on the South West Trains network. The contract comprises 45 x class 444 five-car multiple units each 23 meters long.

In addition Siemens have a 25-year train care contract to maintain the trains at a purpose-built depot in Northam, Southampton.

Technical data		
Year		2002
Number of cars		5
Power system	[V]	DC 750
Maximum speed	[km/h]	160
Weight	[t]	227
Track gauge	[mm]	1,435
Number of seats		334
Length of vehicle	[m]	23
Numbers built		45



Desiro UK Class 450 Multiple Unit

for South West Trains

Stagecoach, one of the largest bus and train operators in the United Kingdom, have the franchise to operate South West Trains – the busiest commuter railway in the United Kingdom serving London's Waterloo Station from the southwest.

In 2001, Stagecoach and Angel Trains (the world's largest leasing company of passenger trains) placed a contract with Siemens for 110 class 450 four-car multiple unit trains. In addition, Siemens was awarded a 25-year contract to maintain these trains at a purpose-built depot in Northam, Southampton.

In 2005, the customer ordered 17 more trains to be delivered by the end of 2006.

Technical data		
Year		2002 – 2006
Number of cars		4
Power system	[V]	DC 750
Maximum speed	[km/h]	160
Weight	[t]	176
Track gauge	[mm]	1,435
Number of seats		273
Numbers built		100 + 10 + 17

Desiro UK Class 350 / 1 Multiple Unit

for West Coast Main Line

For use in West Coast Mainline regional traffic, Angel Trains Limited purchased a total of 30 class 350/1 electric multiple units for the operator National Express Group, which will commence service in 2005.

The EMUs for National Express Groups are equipped for operation in AC 25 kV and DC 750 V systems. They have a maximum speed of 160 km/h. The four-car Desiro trains use a 2 + 2 seating arrangement in the 1st and 2nd class sections. The new trains will initially operate on the London Euston – Milton Keynes and Birmingham New Street – Liverpool Lime Street routes.

Siemens is also responsible for the maintenance and cleaning of the trains, for which a new depot is being established in Northampton.

Technical data		
Year		2004 – 2005
Number of cars		4
Power system	[kV / Hz]	AC 25 / 50 + DV 750 V
Maximum power at wheel	[kW]	1,550 AC, 1,500 DC
Maximum speed	[km/h]	160
Weight	[t]	175
Track gauge	[mm]	1,435
Number of seats		235
Numbers built		30

Desiro UK Class 360 / 2 Multiple Unit

for Heathrow Airport Limited

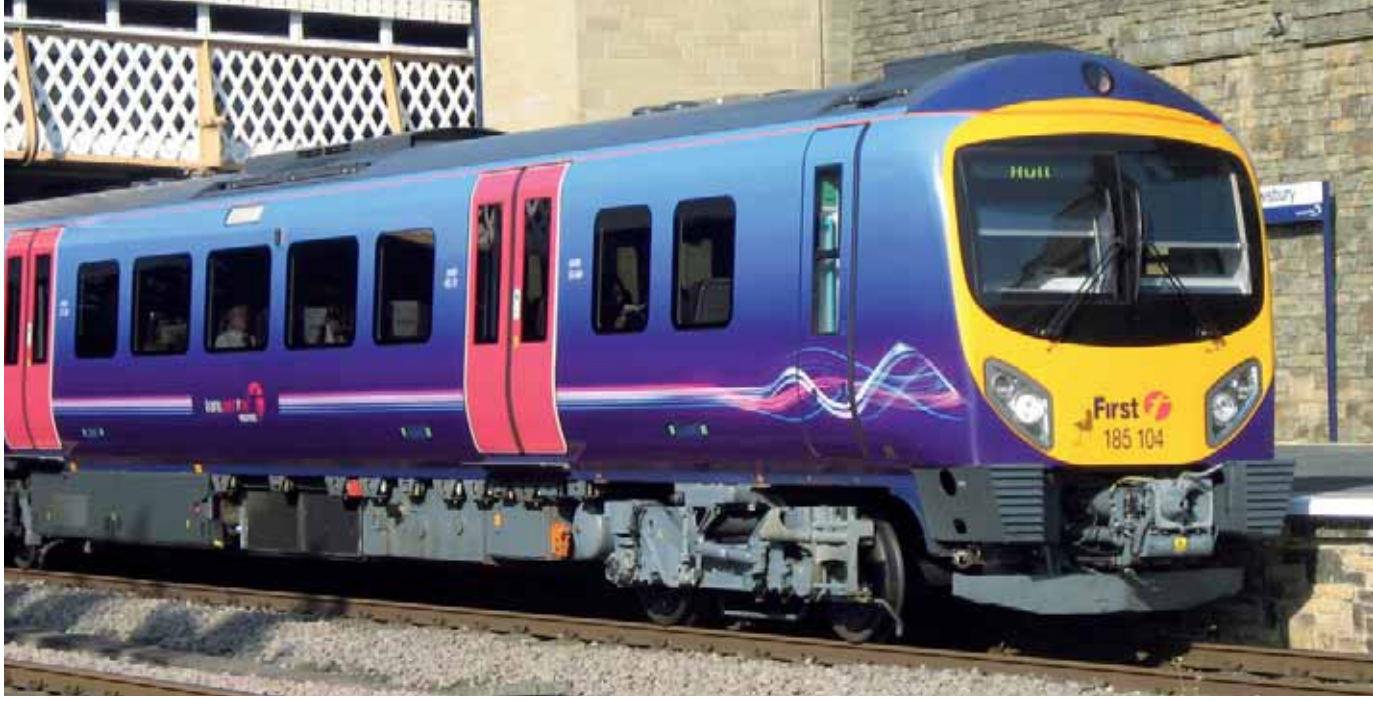
For the Heathrow Connect Service, Heathrow Airport Limited has ordered a total of 4 class 360/2 electric multiple units that are in service from 2005.

The EMUs for Heathrow Airport Limited are equipped for operation with AC 25 kV and reach a maximum speed of 160 km/h. They provide space for 280 seated and 130 standing passengers, are fully air-conditioned and use acoustic and optical passenger information systems. The passenger compartment offers additional space for luggage, meeting the requirements of airline passengers. The trains are designed to increase the transportation capacity of the Heathrow Express and service five new stops in the West London area between Ealing Broadway and Heathrow Airport.

The new multiple units are built in the Siemens TS plant in Uerdingen (Germany) and maintained in Heathrow's Old Oak Common depot.

The original order included four four-car units. These will now be converted to five-car units by December 2007, and an additional five-car multiple unit will also be delivered.

Technical data		
Year		2004 – 2007
Number of cars		4 + 1
	[kV / Hz]	AC 25 / 50
Maximum power at wheel	[kW]	1,550
Maximum speed	[km/h]	160
Weight	[t]	170
Track gauge	[mm]	1,435
Number of seats		266
Numbers built		5



Desiro UK Class 185 Diesel-Hydraulic Multiple Unit

for First Group & Keolis / TransPennine Express

For intercity traffic in Northern England, HSBC Rail (UK) Limited ordered for the operator consortium FirstGroup plc / Keolis SA a total of 51 diesel multiple units of the type Desiro UK Class 185, the first of which have been in service in the First TransPennine rail network since March 2006.

The three-car DMUs, which are about 70 m long, operate at a running speed of 160 km/h. They are equipped with powerful diesel engines that provide particularly good traction on the steep gradients of the Pennine Hills in Northern England.

In addition to a modular, maintenance-friendly design, the train provides many features that enhance the comfort of the passengers. These include, for example, the comfortable "intercity-class" seats, the air-conditioning system, the GPS-based passenger information system that keeps passengers up-to-date with important travel details depending on the current location of the train, the CCTV video surveillance system and the special area reserved for mobility-impaired passengers.

To date, all trains have been delivered precisely on schedule. And they have displayed their high level of reliability right from the beginning of scheduled passenger service.

The trains are being built in the Siemens plant in Krefeld-Uerdingen (Germany), tested at Wildenrath Test Center and will be delivered to the customer by the end of 2006.

Technical data		
Year		2005 – 2006
Number of cars		3
Diesel engine rating	[kW]	3 x 560
Maximum speed	[km/h]	160
Weight	[t]	163
Track gauge	[mm]	1,435
Number of seats		169
Numbers built		51

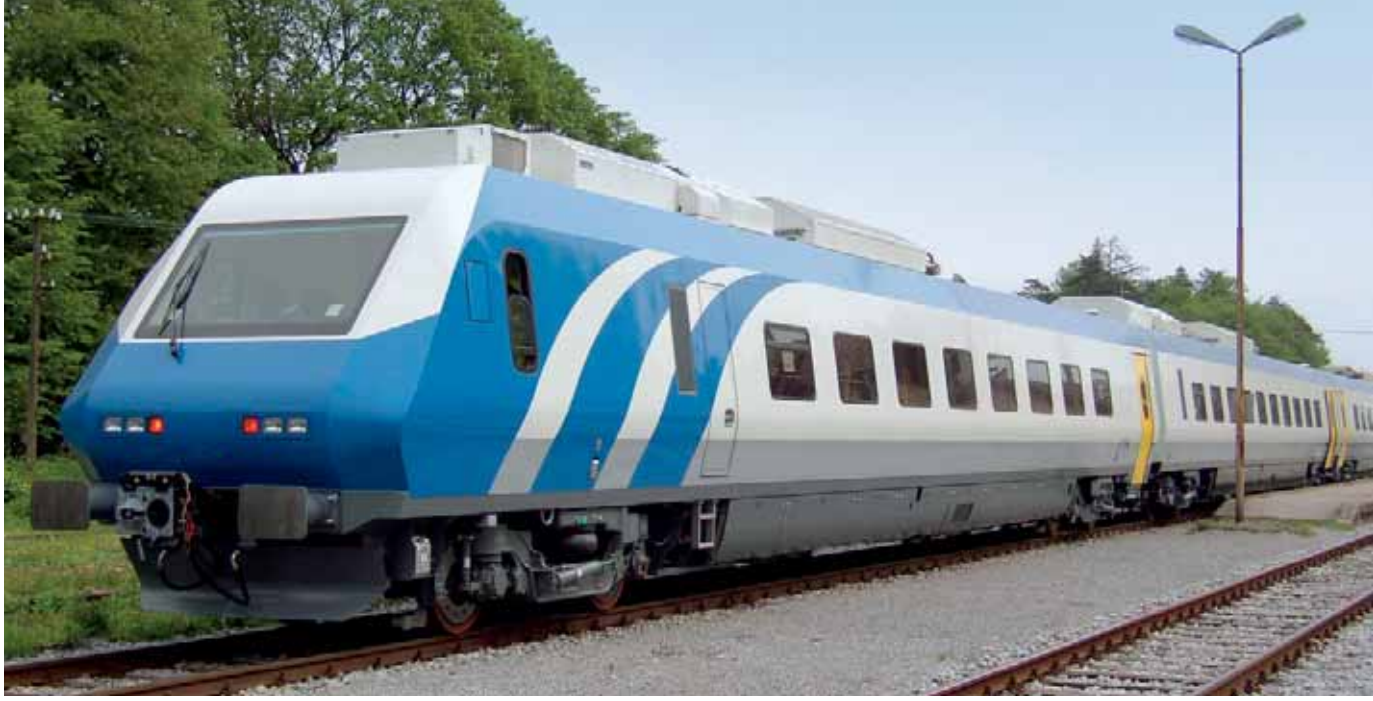
Airport Rail Link Bangkok Electric Multiple Unit

for Thai State Railways

Siemens, as a member of a consortium, received an order from Thailand's state railways to build a railway link to Bangkok's new Suvarnabhumi airport. This order further strengthens Siemens' position as a leading provider of airport links.

The four-car Express and the three-car City Line multiple units based on the proven Desiro UK platform from Siemens are supplied via a 25 kV AC / 50 Hz contact line. The Express train offers 164 standard seats, six folding seats, one wheelchair space and a universal toilet. The City Line train has 150 bench seats and standing room for 595 passengers. It is designed for a maximum speed of 160 km/h.

Technical data			
Class		City Line	Express
Year		ab 2007	ab 2007
Number of cars		3	4
Power system	[kV / Hz]	AC 25 / 50	AC 25 / 50
Maximum speed	[km/h]	160	160
Track gauge	[mm]	1.435	1.435
Number of seats		150	164 + 6
Number of standees		595	0
Numbers built		5	4



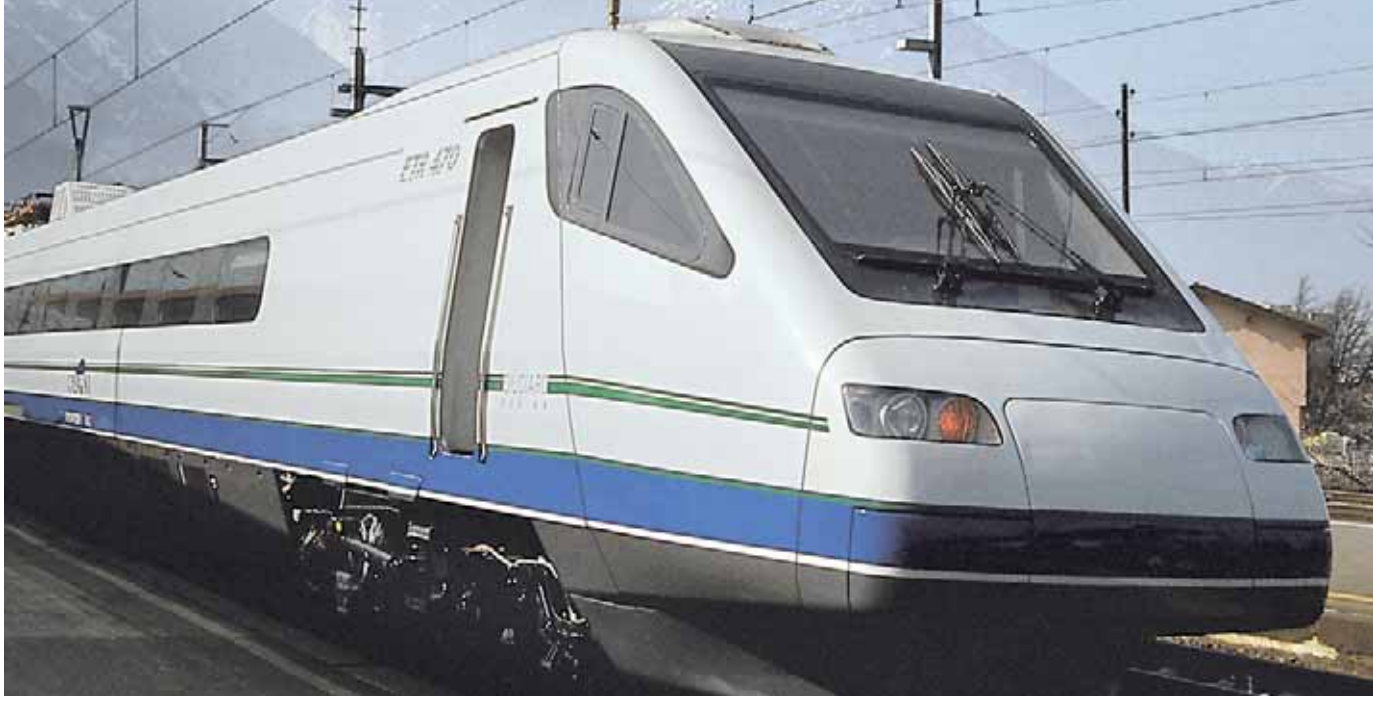
“Paradise” DH4-1 Diesel-Hydraulic Multiple Unit

for Iranian Islamic Republic Railways RAI

In 2001, RAJA passenger trains, the passenger trans-portation services branch of Iranian Islamic Republic Railways (RAI), ordered 20 diesel-hydraulic Intercity multiple units from Siemens Austria, initially for operation on the 1,000-km-long route between Tehran and Mashad. This formed the basis of the DH4-1 motor car concept, which uses proven components to ensure high reliability and availability. The steel construction motor cars are equipped with underfloor drive components and are designed for high ride comfort with full air-conditioning and high speeds (up to 160 km/h) on nonelectrified routes.

The four cars of the DH4-1 trains are semi-permanently coupled at their ends. The motor car concept allows the automatic coupling of several trains of the same length up to a total length of 12 cars. The train offers very high operating performance and high-quality interior furnishings to passengers, including audio and video entertainment, an on-board galley for catering, large legroom and adjustable seat backs, tilt tables, seat back tables, European- and oriental- style toilets, wheelchair space, a fully air-conditioned passenger space and an independent air-conditioning system for the driver’s cab.

Technical data		
Year		2004 – 2005
Number of cars		4 + 2
Diesel engine rating	[kW]	4 x 588
Maximum speed	[km/h]	160
Weight	[t]	240
Track gauge	[mm]	1,435
Number of seats		252
Numbers built		20



470 Electric Multiple Unit

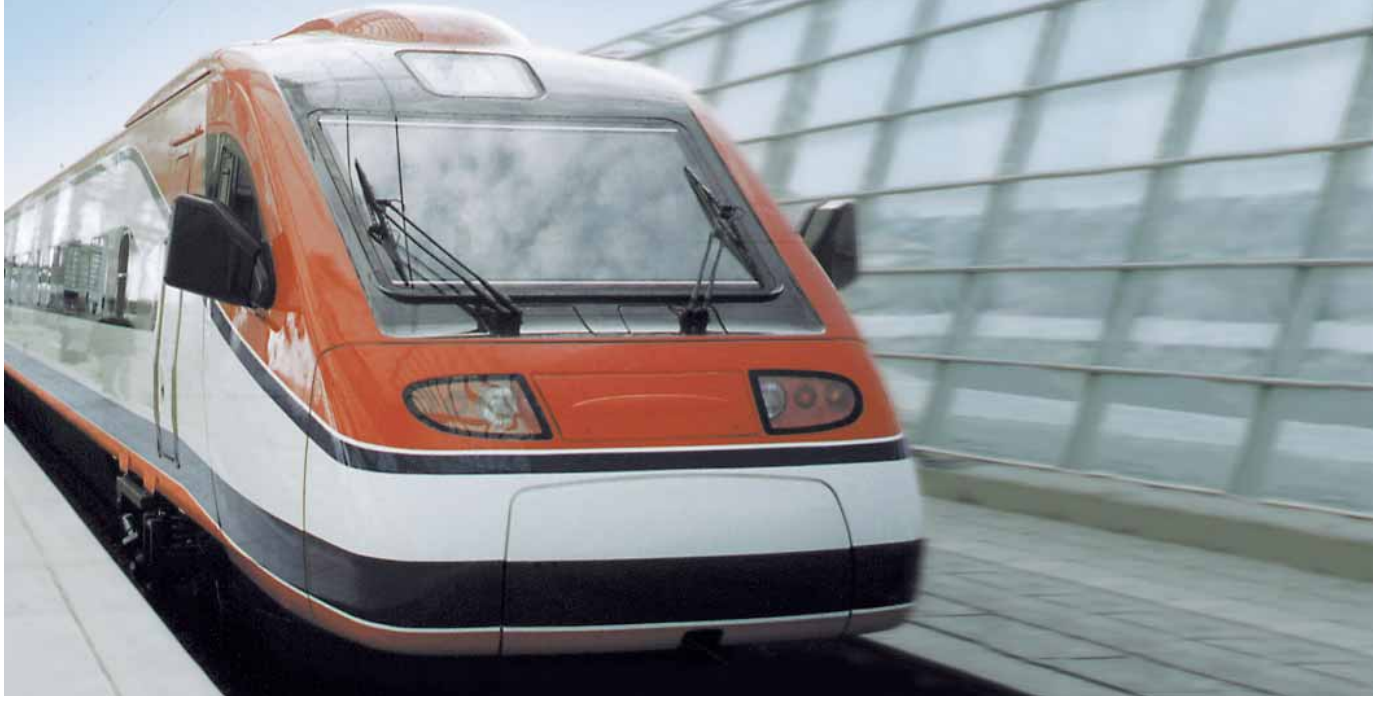
for CISALPINO AG, Italy

The CISALPINO AG – a joint venture of the Italian State Railway (FS), Swiss Federal Railways (SBB) and the Lötschbergbahn (BLS) – has ordered 9 dual-system class 470 Pendolinos with active tilt control.

This EMU marked a milestone on the way to improving the rail link over the Alps with all its curves. It services the Milan – Bern – Basel, Milan – Geneva and Milan – Zurich routes. These lines link up with the high-speed networks of the neighboring countries.

For this Fiat order, Siemens supplied the main components of the high-voltage equipment and the SIBAS®32-based traction control.

Technical data		
Year		1996
Number of cars		9
Power system	[kV / Hz]	AC 15 / 16,7 DC 3
Maximum power at wheel	[kW]	5,880
Maximum speed	[km/h]	200
Weight	[t]	498
Track gauge	[mm]	1,435
Number of seats		473 (+ 2)
Numbers built		9



CPA Class 4000 Electric Multiple Unit (Pendoluso)

for Portuguese State Railways CP

These class 4000 EMUs were the first tilting trains to be introduced in Portugal for speeds of up to 220 km/h.

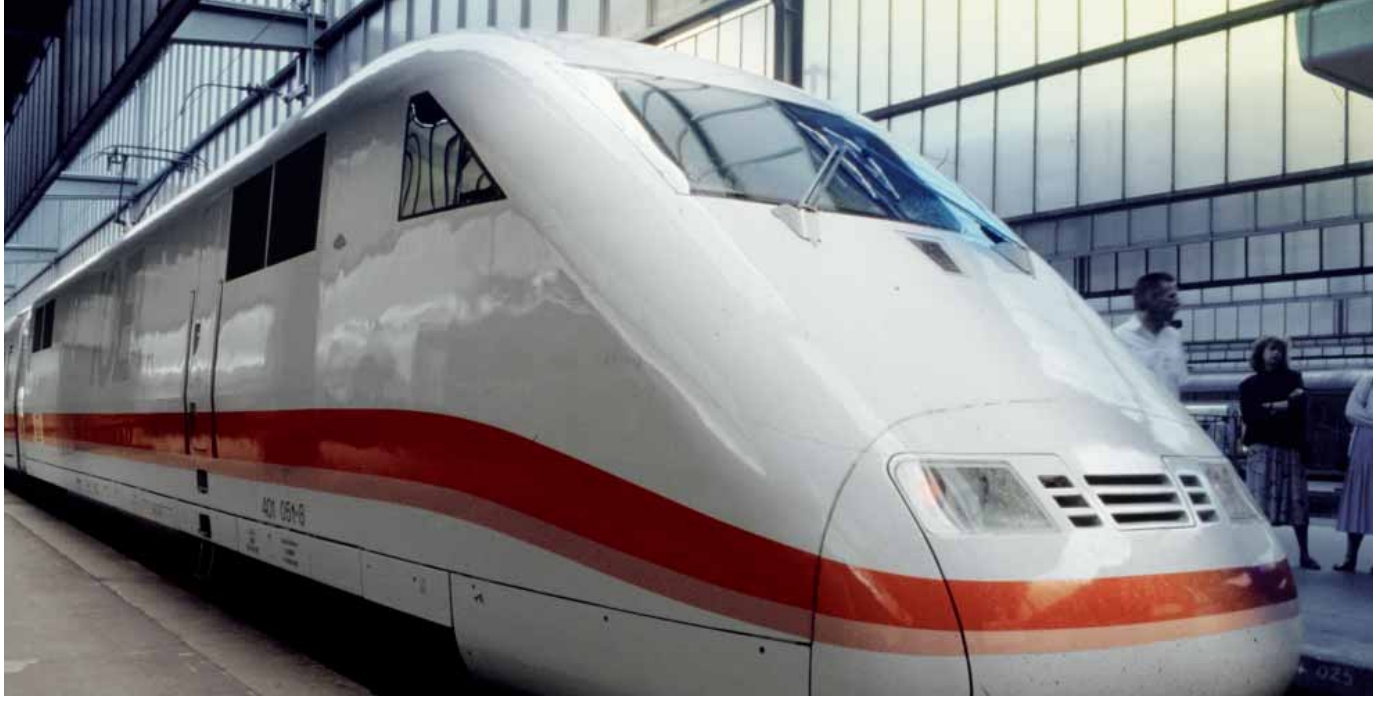
At the end of February 1996, Fiat as general contractor and Siemens as subcontractor for the electrical equipment received the order for ten trains, the first five of which were delivered starting from December 1998 to the beginning of 1999. The last five trains were delivered within 2000.

The short delivery time of 10 months between receipt of order and delivery of the first items deserves special mention.

The Pendoluso is an EMU InterCity made up of two driving motor cars, two intermediate motor cars and two intermediate trailer cars. The sixth car is a restaurant / bar. Two of the six cars are more luxuriously equipped than the others. One car is equipped with wheelchair spaces, wheelchair lift and toilet designed for use by the disabled.

The train is equipped with the Fiat hydraulic tilting system. It is fully air-conditioned and has an audio system with cassette and CD players, as well as a video system with ceiling-mounted monitors in every car. Information is provided to passengers in the form of electronic interior and exterior displays, as well as interactive information terminal. Communication to the outside from all cars is made possible through the use of mobile telephones. A fax machine is also provided for the convenience of passengers.

Technical data		
Year		1998 – 2000
Number of cars		6
Power system	[kV / Hz]	AC 25 / 50
Maximum power at wheel	[kW]	4,000
Maximum speed	[km/h]	220
Weight	[t]	325
Track gauge	[mm]	1,668
Number of seats		301
Numbers built		10

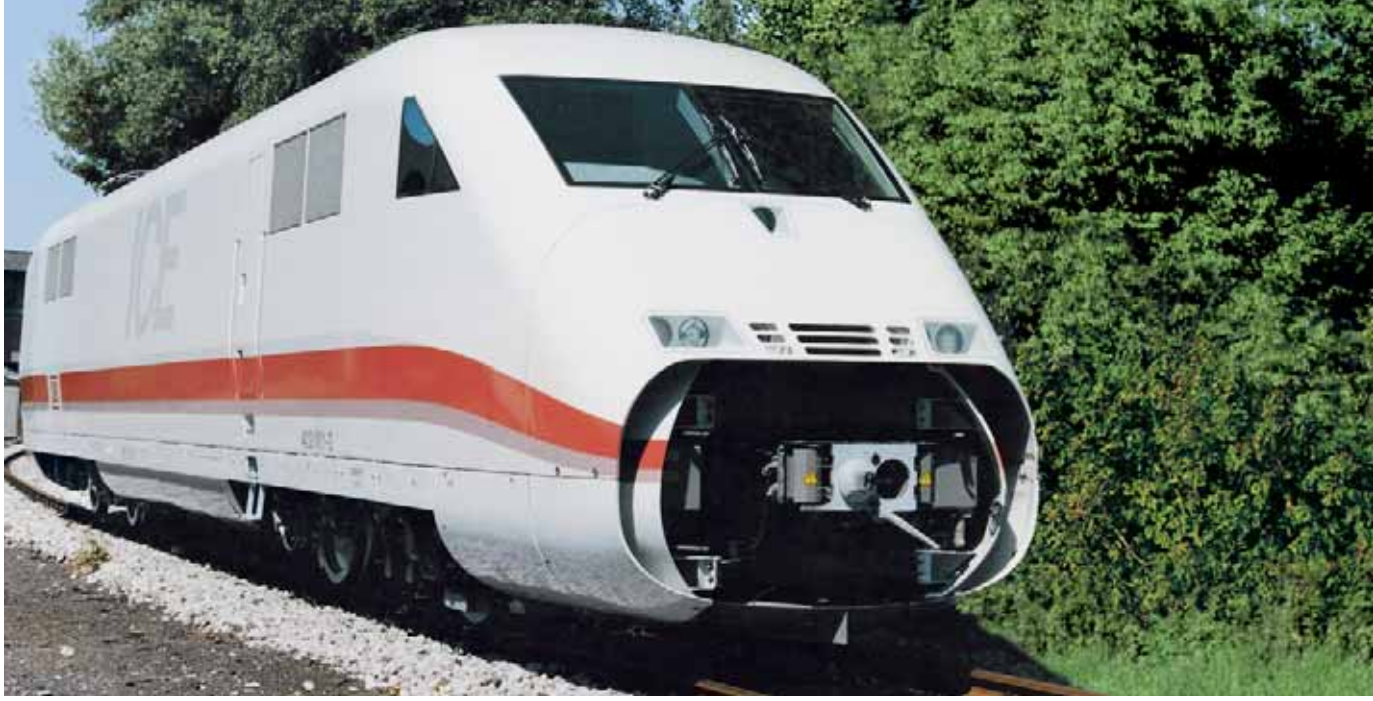


ICE 1 High Speed Trainset

for German Rail DB AG

The ICE 1 was Germany's first high-speed train. Siemens supplied components for the ICE 1 power car, including the traction motors and traction control units. In July 2005, Siemens received the order to equip 19 ICE 1 trainsets with the ETCS train control system. These trainsets will provide service on routes between Germany and Switzerland starting in December 2006.

Technical data		
Year		1990 – 1992
Power system	[kV / Hz]	AC 15 / 16,7
Maximum speed	[km/h]	280
Track gauge	[mm]	1,435
Continuous rating	[kW]	4,800
Numbers built		120



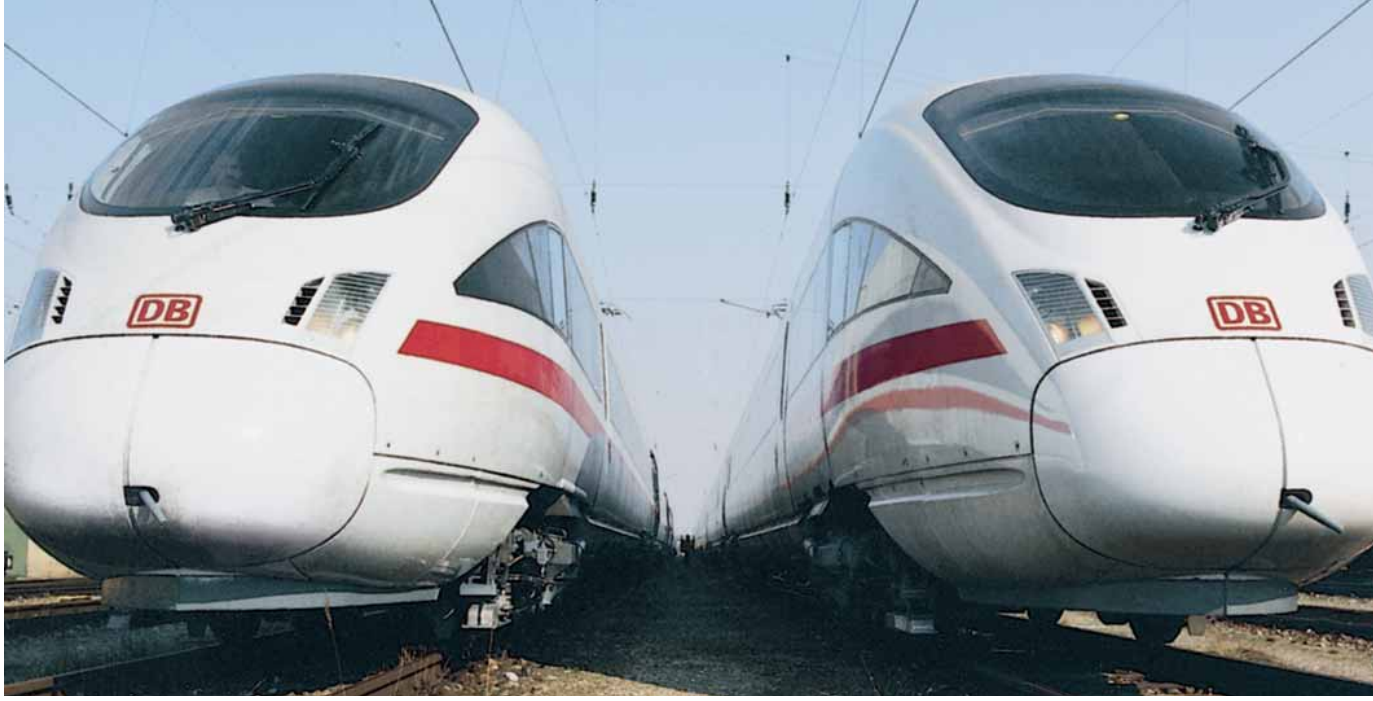
ICE 2 High Speed Trainset

for German Rail DB AG

The Siemens-led Siemens / Bombardier consortium supplied an addition to the ICE family.

The appearance, principal dimensions, exterior profile and electrical equipment of the ICE® 2 continue the tradition of the ICE series. One readily visible feature of the second generation is the fully automatic nose coupling behind the electro-pneumatically operated nose flap. With its power car class 402 solution, the ICE 2 is planned for service either as a half-train (one power car and one driving trailer car with six intermediate cars) or as a full-length trainset (two coupled halftrains). The ICE 2 can run on all DB AG tracks with 15 kV, 16.7 Hz, as well as on some tracks belonging to SBB and ÖBB.

Technical data		
Year		1995 – 1997
Number of cars		8
Power system	[kV / Hz]	AC 15 / 16,7
Maximum power at wheel	[kW]	4,800
Maximum speed	[km/h]	280
Weight	[t]	410
Track gauge	[mm]	1,435
Number of seats (incl. restaurant)		389
Numbers built		44



ICE T Electric Trainset

for German Rail DB AG

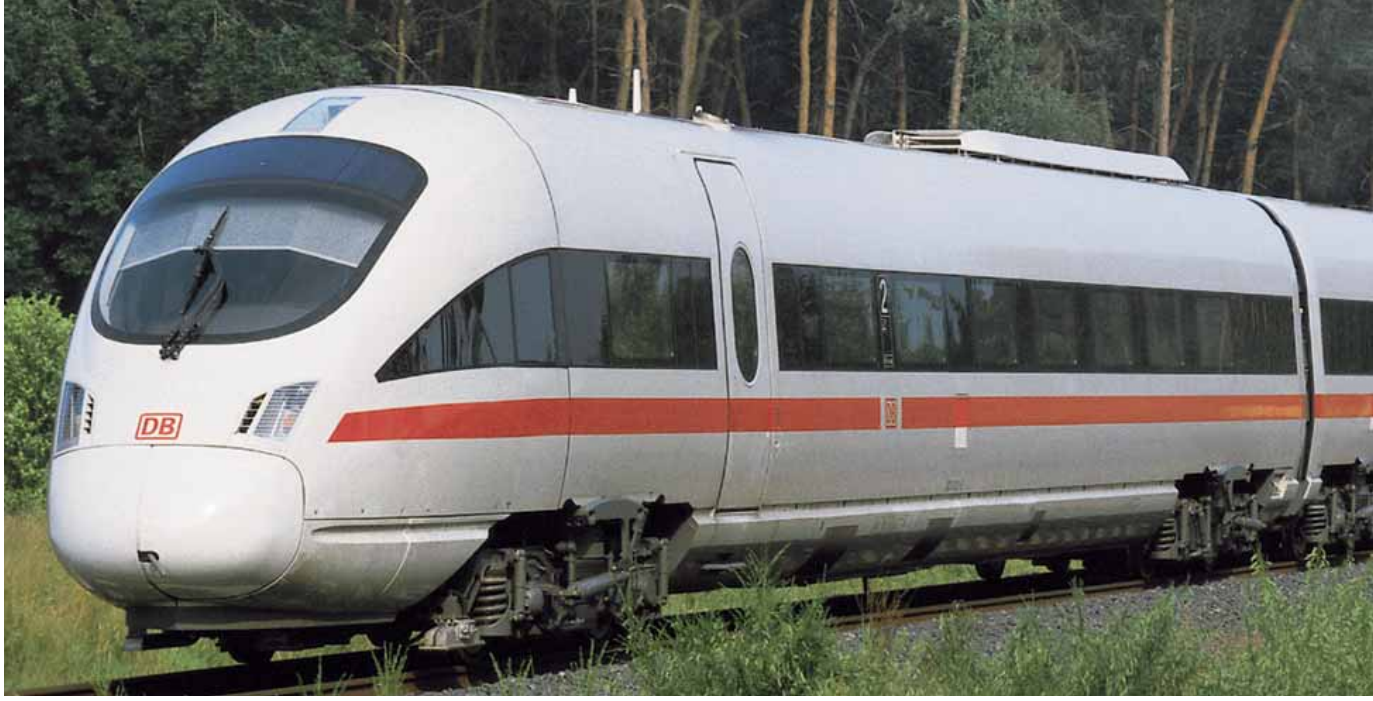
A consortium consisting of Bombardier, Alstom, and Siemens supplied 43 ICE® T vehicle incorporating titling systems to handle the electric mainline traffic (Series 1) for German Rail (DB AG). The first trainsets entered revenue service at the start of the summer timetable 1999.

The trains are designed for deployment on existing alignments, running at speeds of up to 230 km/h. They will be used on German Rail's network and in crossborder traffic with Switzerland.

Thanks to the tilting technology (up to 8° inclination in curves), the riding comfort is improved and travel time cut by 15 to 20 %.

In the spring of 2002, German Rail ordered another 28 ICE T trainsets (Series 2).

Technical data				
		Series 1 5-car unit	Series 1 7-car unit	Series 2 7-car unit
Year		1999 – 2000	1999 – 2000	2004 – 2005
Number of cars		5	7	7
Power system	[kV / Hz]	AC 15 / 16.7	AC 15 / 16.7	AC 15 / 16.7
Maximum power at wheel	[kW]	3,000	4,000	4,000
Maximum speed	[km/h]	230	230	230
Weight	[t]	273	366	366
Track gauge	[mm]	1,435	1,435	1,435
Number of seats		250	381	390
Numbers built		11	32	28



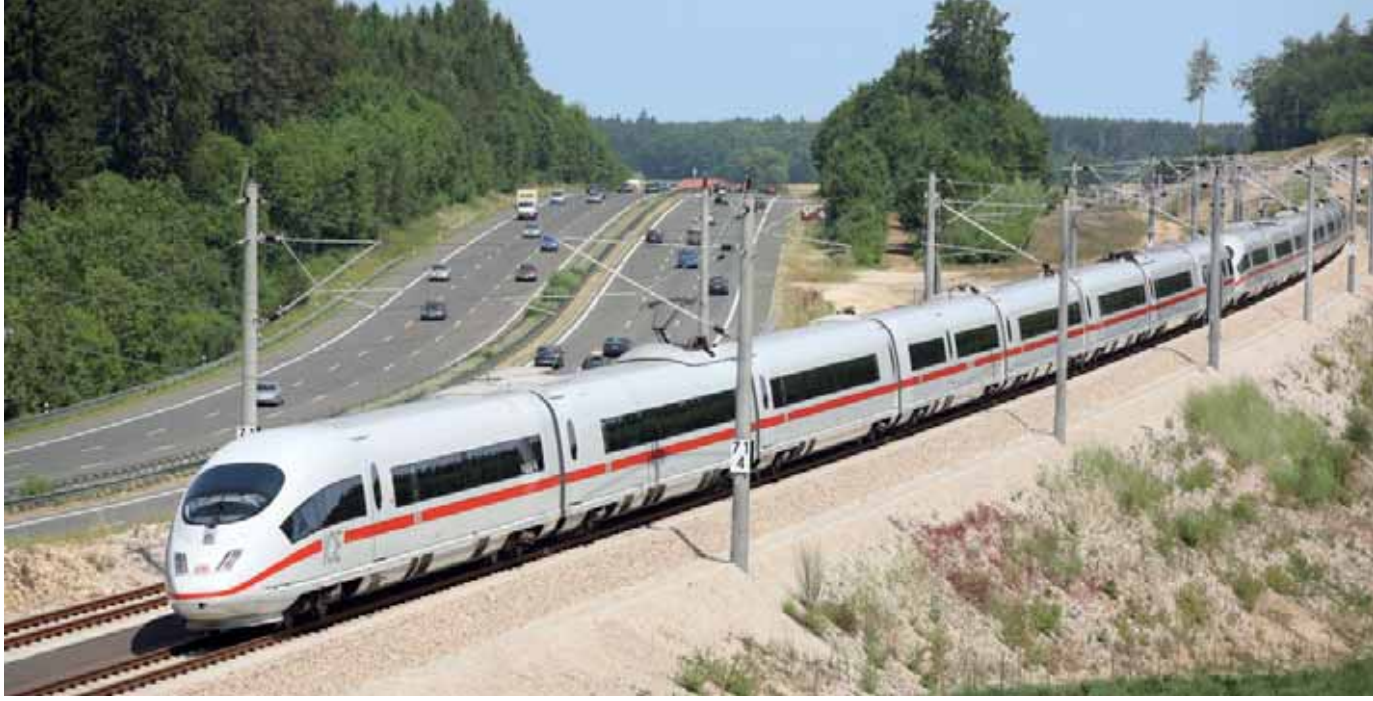
ICE TD High Speed Diesel-Electric Trainset

for German Rail DB AG

The fast diesel-electric trainset ICE TD® with active tilting was developed and built by a Siemens-led consortium comprising Siemens and Bombardier.

It is equipped with active tilt control by Siemens, permitting travel times that are attractive for the passenger without the operator having to invest heavily in the infrastructure.

Technical data		
Year		1999 – 2000
Number of cars		4
Diesel engine rating	[kW]	4 x 560
Maximum speed	[km/h]	200
Weight	[t]	200
Track gauge	[mm]	1,435
Number of seats		195
Numbers built		20



ICE 3 High Speed Trainset

for German Rail DB AG and for Netherlands State Railways NS

Under the leadership of Siemens, the ICE work group Siemens/ Bombardier supplied German Rail (DB AG) and Netherlands State Railways (NS) with the ICE® 3 trainset (Series 1). With its multiple unit configuration, the ICE 3 represents a completely new development for high-speed rail (HSR) service. All the traction equipment is arranged under floor and 50 % of all axles are driven by individual traction motors. Thanks to this distributed traction arrangement, the ICE 3 is able to attain a starting acceleration never before known in this sector. This vehicle comes with single as well as multisystem capability. The multi-system version is intended as European variant for deployment on international railway networks such as in Germany, Austria, Switzerland, Belgium, France, and the Netherlands.

To meet the demands of the catering scheme he favors, the operator can choose from a number of different ICE 3 floor plans.

Following the successful introduction of this trainset, another 13 Series 2 trains were supplied to German Rail. In December 2005, the ICE Siemens / Bombardier joint venture received the order to convert five ICE 3 trainsets into multi-system versions for revenue service in France.

Technische Daten

		Series 1 e. g. Bistro concept Single-system	Multi-system	Series 2 Single-system
Year		2000 – 2001	2000 – 2001	ab 2004
Number of cars		8	8	8
Power system	[kV / Hz]	AC 15 / 16.7	AC 25 / 50 AC 15 / 16.7 DC 3 DC 1.5	AC 15 / 16.7
Continuous power at AC at DC	[kW]	 8,000 –	 8,000 4,300	 8,000 –
Maximum speed at AC at DC	[km/h]	 330 –	 330 220	 330 –
Track gauge	[mm]	1,435	1,435	1,435
Number of seats		441	431	458
Numbers built German Rail Netherlands Railways		 37 –	 13 4	 13 –

High Speed Trainset Velaro E

for Spanish National Railways RENFE

On July 30, 2001, Siemens AG and the Spanish railway company RENFE AVE® signed the contract for the delivery of 16 high-speed trainsets, due to the opening a new line of operation between Madrid – Barcelona. The trains will be delivered in an eight-car configuration. They will provide a travel time of less than two hours and thirty minutes for the distance of about 625 km between Barcelona and Madrid. The train will be designed for a maximum speed of 350 km/h. This velocity makes these trains the fastest seriesproduction train worldwide. The new Velaro® E trains are based on the same technology already proven in revenue service on German Rail's ICE® 3 (Deutsche Bahn AG).

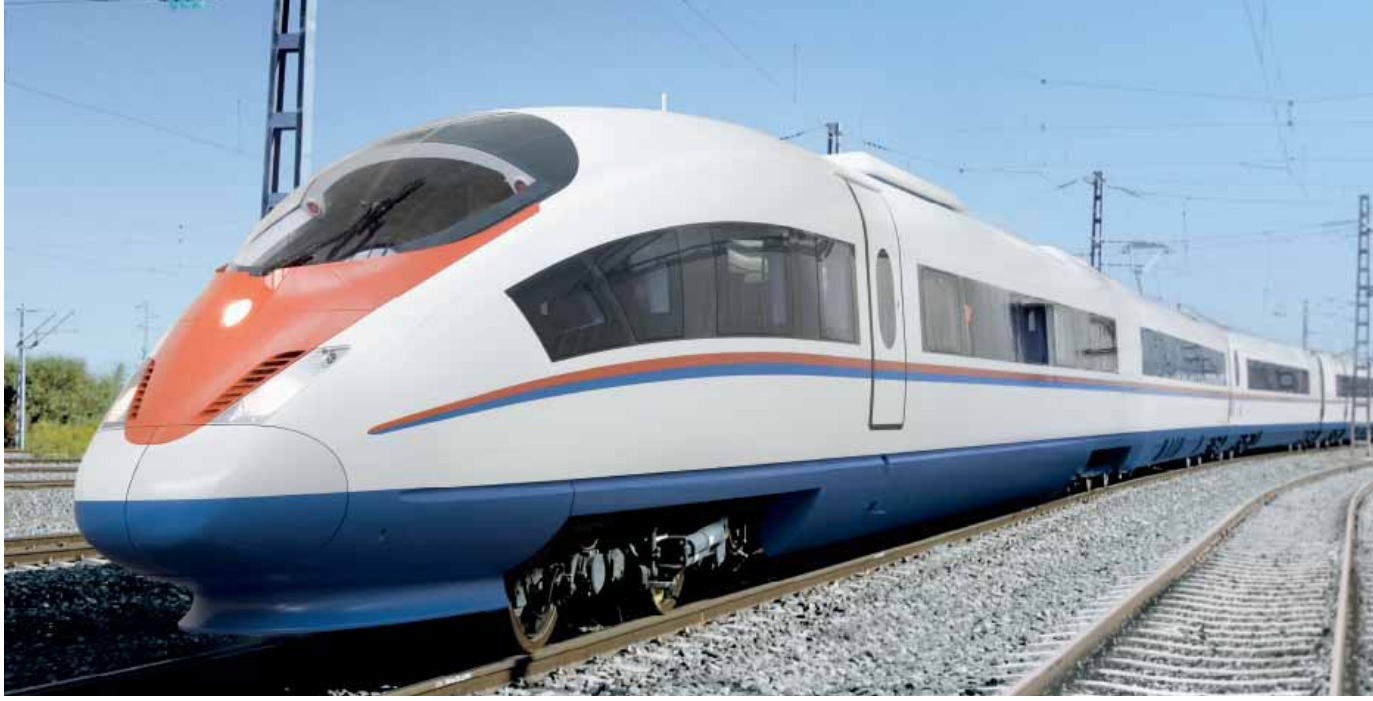
Furthermore the interior outfit is adapted to the RENFE marketing and service concept. This signifies the realization of three different passenger areas inside the train.

- the "Club-Class" with the highest comfort, 2+1seating arrangements and a separate service provision
- the "Preferente-Class", which is comparable to DB AG ICE 3's first class and
- the "Turista-Area" with 2 + 2 seating arrangements.

The Velaro E train configuration uses the same principles as the DB AG's ICE 3: all traction and auxiliary systems are distributed under floor and, consequently, generate extra passenger and service space in the train.

The high-speed trains by Siemens set new standards for fast rail service not only in Spain. The project shows again that Siemens has one of the most innovative and attractive highspeed train concepts worldwide.

Technical data		
Year		ab 2005
Number of cars		8
Power system	[kV / Hz]	AC 25 / 50
Maximum speed	[km/h]	350
Weight	[t]	439
Track gauge	[mm]	1,435
Number of seats		404
Maximum power at wheel	[kW]	8,800
Numbers built		16 + 10

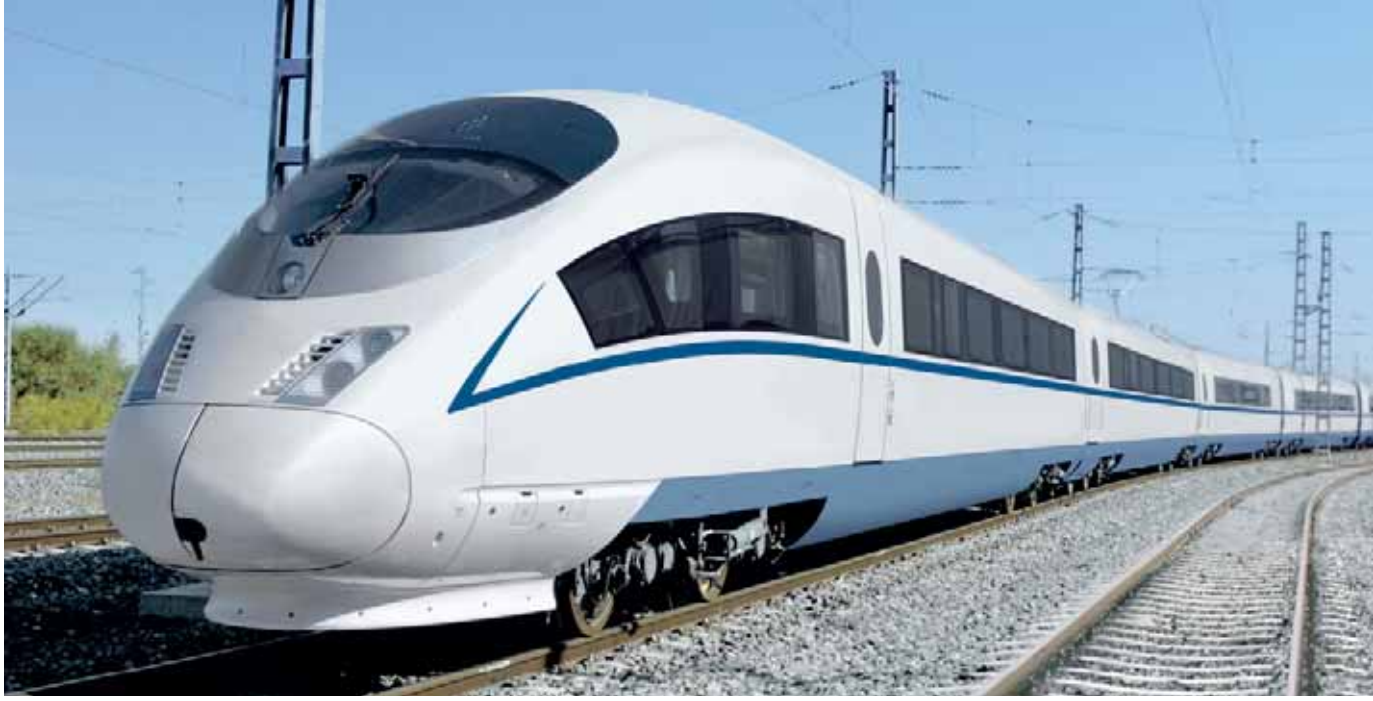


High Speed Trainset Velaro RUS

for Russian Railways RZD

In April 2005 and in May 2006, Siemens and the Russian railway operator RZD signed contracts for the development and construction of high speed trains and for their maintenance over a period of 30 years. The project includes the delivery of initially eight high speed train-sets and calls for the characteristics of all components and systems to be adapted to the specific climatic requirements and to the standards of the Russian Federation. The trainsets with distributed traction equipment are to be supplied in two variants, i.e. in single- and dual-system versions, so that they can be used throughout the entire railway network. These ten-car trainsets are intended for service on all high speed lines of the Russian Federation, starting with the Moscow – St. Petersburg line. They are based on the world's most advanced high speed technology and characterized by an attractive design. The car bodies are wider than those of the Velaro E and are made of trendsetting aluminum material.

Technical data		
Year		ab 2008
Number of cars		10
Power system	[kV / Hz]	Single-system trains: 3 kV DC Dual-system trains: 3 kV DC + 25 kV / 50 AC
Maximum speed	[km/h]	250 (upgradeable to 300)
Weight	[t]	667
Track gauge	[mm]	1,520
Width of car body	[mm]	3,265
Number of seats		604
Continuous rating	[kW]	8,000
Numbers built		8



High Speed Trainset Velaro CN

for Chinese Ministry of Railways MOR

In November 2005, Siemens AG and its partner CNR Tangshan Locomotive & Rolling Stock Works won an order from the Chinese Ministry of Railways MOR to supply 60 high speed trains.

The eight-car trainsets with a maximum service speed of 300 km/h are based on the Velaro platform and offer 2 + 3 seating in the tourist class for 600 passengers. The trains will initially be used on the Beijing – Tianjin route and later also provide service on other routes, including the Beijing – Shanghai and Guangzhou – Wuhan lines.

The trains benefit not only from the world's most advanced high speed technology, but also an attractive design. The car bodies are wider than those of the Velaro E and are made of trendsetting aluminum material.

The high expectations of the customer for local content are fulfilled by the transfer of knowledge to various Chinese partners. The first trains will be presented before the start of the 2008 Olympic Summer Games in Beijing.

Technical data		
Year		from 2007
Number of cars		8
Power system	[kV / Hz]	AC 25 / 50
Maximum speed	[km/h]	300
Weight	[t]	447
Track gauge	[mm]	1,435
Number of seats		601
Continuous rating	[kW]	8,800
Numbers built		60

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The information in this document contains general descriptions of the technical options available, which do not always have to be present in individual cases. The required features should therefore be specified in each individual case at the time of closing the contract.

www.siemens.com/transportation