

BERLIN-WARSAW EXPRESS

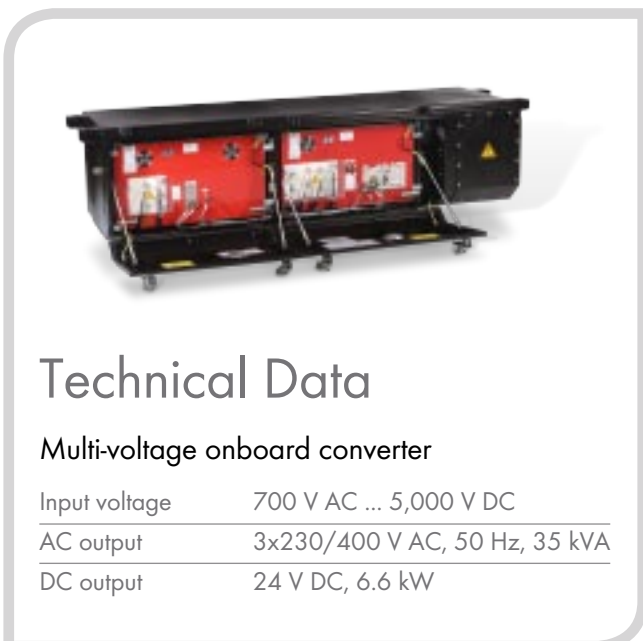
RELAXED AND RAPID TRIP TO POLAND

The name „Berlin-Warsaw Express“ stands for the close cooperation between Deutsche Bahn (German Railway) and the Polish state railway on the Berlin - Poznan - Warsaw line. The trains run three times a day from Berlin via Frankfurt (Oder), to Poznan to Warsaw.

Poland is close and far at the same time: only 600 kilometers in the „Berlin-Warsaw Express“ lie between the the two capital cities. And yet until now the neighbors in the east have been far away for most Germans. This only started to change on May 1, 2004: since Poland's entry into the European Union, the interest of the Germans has suddenly

grown, while the Poles have always oriented themselves towards Western Europe. Large numbers of Poles commute to Germany every week, in order to earn their money there. The typical commuter journey with the Berlin-Warsaw-Express takes around six hours from capital to capital. Many commuters experience the journey as relaxation and perceive it as a gentle change from one life to another. The main thing lying between departure and arrival is ... time. Plenty of time to immerse oneself in a Polish newspaper or meet with friends for a coffee in the train restaurant. The Boardbistro caters for small and large appetites by serving the passengers drinks and typical Polish dishes such as „Schabowy“ (Schnitzel).





Technical Data

Multi-voltage onboard converter

Input voltage	700 V AC ... 5,000 V DC
AC output	3x230/400 V AC, 50 Hz, 35 kVA
DC output	24 V DC, 6.6 kW

Boardbistro with MEE-NTLD

In order to serve meals fresh from the oven and beer on tap, the six Deutsche Bahn Boardbistros have been equipped with a new MEE-NT multi-voltage energy supply system from SMA. The system has an output of 75 kW and is mounted in two underfloor containers. It consists of a high-voltage converter, a battery charger and a three-phase AC inverter to supply the electric consumers in the Boardbistro kitchen. The three-phase AC inverter for the air conditioning unit is situated in a separate container, which is also mounted under the car and also contains SMA technology.

Cooling system with emergency operation

The three-phase AC inverter module for the kitchen consumers has been designed for normal and emergency operation, which ensures reliable supply of the Galley cooling system. In normal operation the three-phase AC inverter is supplied by the intermediate circuit of the energy supply system with +/-400 V DC. In the event that no train line voltage is available, the inverter automatically switches to emergency operation and is supplied by the Boardbistro battery. To ensure continued supply of the Boardbistro cooling system during emergency operation, a transformer is connected downstream of the inverter for voltage adjustment and galvanic isolation. Anyone who now intends making the train journey from Berlin to Warsaw should definitely visit the many theaters and cinemas, and the dozens of museums and galleries.

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Bottom left:

The Berlin-Warsaw Express
before departure
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Above:

The Berlin-Warsaw Express
with SMA energy supply
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