PCS 6000 Rail
Frequency converter at Timelkam, Austria

The Timelkam rail converter system transforms the 50 Hz line current into 16.7 Hz traction current and feeds this into ÖBB's 110 kV traction transmission network, thus making an essential contribution to the service reliability of the Westbahn. The rail converter system can be used for energy transfer in both directions.

System overview

The ABB 30 MW converter unit consists of pre-tested components, which can be quickly assembled into a functional system. The selected converter design also means short commissioning and maintenance times. Practical experience has shown that the guaranteed high operational availability is completely fulfilled.

Converter

The current converter is comprised of semiconductor elements, which are assembled into standard modules. These PCS 6000 modules use IGCT technology (Integrated Gate Commutated Thyristor). The reliability and high energy efficiency of IGCT technology has been proven in various other applications in addition to traction converters. The modular standardization of the IGCT current converter results in savings in engineering costs, and thus has a direct positive effect for the customer.

Transformers

The transformers are designed for outdoor installation. The 50 Hz transformer is designed as a 12 pulse circuit and is fed by the 3 AC 110 kV 50 Hz network. The 16.7 Hz transformer is a summation transformer and adds the partial voltages of the converter to the traction voltage of 2 AC 110 kV. Both transformer types are oil-filled and provided with noise protection covers as well as the usual protective and maintenance devices.

Container / DC link

The containers are designed for outdoor installation. They protect the current converter units and filter circuits from weather effects and environmental influences. The cooling unit with the pumps and monitoring instruments, as well as the control technology and control system, are housed in a separate air-conditioned container. For personal safety a locking system is integrated into the monitoring and control circuits. The use of containers eliminates the requirement for the customer to construct a building, meaning that building costs can be kept low.

Technical data

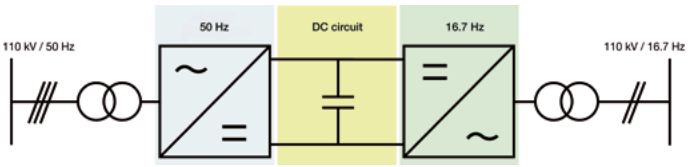
System	Frequency converter Timelkam Austria
Type	PCS 6000 Rail
Application	Traction supply, 110 kV mains power supply
Installation	Outdoor
Ambient conditions	-30°C ... +40°C
Number of units	2
Frequency	3 AC 50 Hz / 2 AC 16.7 Hz
Grid three-phase system	3 AC 110 kV
Traction voltage 16.7 Hz	2 AC 110 kV
Active power 16.7 Hz per converter	30 MW
Apparent power 16.7 Hz per converter	35.3 MVA
Cos phi 16.7 Hz	0.85
Converter cooling	Water (glycol) / air

Cooling

The cooling is autonomous and is managed by the converter control. Redundant pumps circulate the conditioned water-glycol mixture between the converter and the heat exchanger. The converter losses are emitted to the environment by this heat exchanger. This cooling design is proven and guarantees a high availability while ensuring compliance to the acoustic limit values.

Control technology / control system

All control, regulation and protection functions are provided by the proven, fully digital PEC 800 system. This control system is designed for use with quick and precise control circuits for converter systems. The integrated Microscada system guarantees reliable visualization, storage and operation of monitoring circuits, sequences and events. A higher-level command centre controls the two ABB 30 MW converters via standard interfaces.



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