

PCS 6000 Rail

Static frequency converter for grid connections

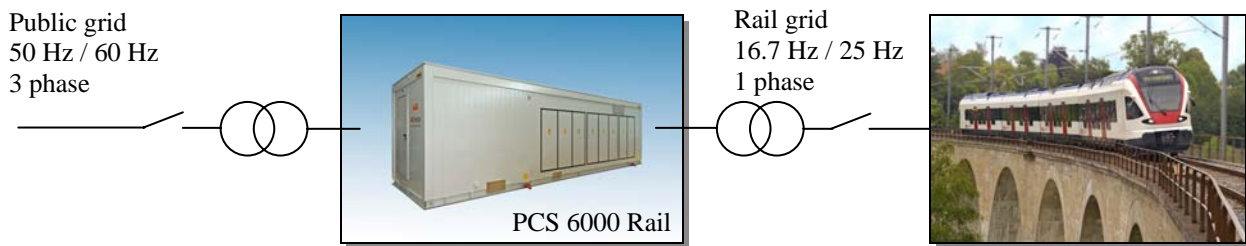


PCS 6000 Rail: 10 - 120 MVA / unit



Introduction and Main Technical Features

Railway power grids have different characteristics than public power grids. In the past separate power plants were built for the two grids. More and more this changes to have large 50 respectively 60 Hz plants and frequency converters to feed the railway grid. ABB is a pioneer and world market leader in this business with the established PCS 6000 Rail.



Customer's challenge

Railway power supplies are single phase systems. In several countries these grids are operated at 16.7 or 25 Hz for historic reasons while public grids run at 50 respectively 60 Hz. Instead of having two separate power plants for the two grids, a grid interconnection provides significant technical as well as commercial advantages.

Solution

The PCS 6000 Rail is a MV static frequency converter allowing to connect 3 phase public grids to single phase railway power grids running at 16.7 or 25 Hz. The sophisticated design based on the broad experience in the field provides a wide range of benefits. For example the bi-directional power transfer allows feeding power back to the public grid while trains descend from mountains generating power.



Figure 1: Power electronic part



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Benefits

- ✓ Bi-directional power transfer
- ✓ Black start island mode capability
- ✓ Reactive power compensation
- ✓ Low losses over entire power range
- ✓ Low maintenance costs (no rotating parts)

Reliability runs in the family

The PCS 6000 Rail design is part of ABB's family of PCS 6000 products which are used for a wide range of applications. It uses the same power technology as the ACS 6000 range of MV Drives. The standardization of these power electronic modules delivers substantial advantages in terms of cost and quality. With many PCS 6000 sold worldwide this converter has a proven track record and high reliability.

MV converter

ACS and PCS 6000 converter units are based on three-level IGCT phase modules. The IGCT (Integrated Gate Commutated Thyristor) is the state-of-the-art semiconductor element for this power range. The converter units are connected by a medium voltage DC link (intermediate circuit). The converter modules are water cooled with a virtually maintenance free closed loop water system equipped with redundant circulating pumps.

Key facts

Application:	Railway power supply
Type:	PCS 6000 Rail
Installation:	Indoor or outdoor
Nominal output power:	10 - 120 MVA / unit
Nominal input frequency:	50 / 60 Hz
Nominal in- and output voltage:	15 - 110 kV
Nominal output frequency:	16.7 / 25 Hz
Ambient temperatures:	-25 ... 40 °C