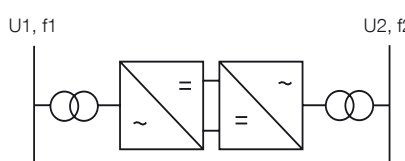
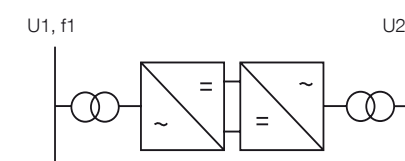
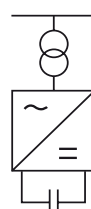
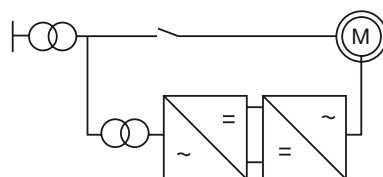


Medium Voltage Power Converter Systems

Portfolio PCS 6000 / 8000

Applications	Shore-to-Ship Power	Grid Interconnection for Rail Networks	STATCOM for Power Quality	AC Excitation for Pumped Storage Plants
Single Line				
Benefits	Connecting any ship to any port grid, improved port grid power quality: power factor control & voltage stabilization	High efficiency at partial load, active power flow control, synchronization to grid, island operation	Grid code compliance, voltage & power factor control, reactive power compensation and load balancing	Generation / pumping at partial load, optimized efficiency, reduced cavitations impact and improved grid stability
Power Range	4 - 14.5 MVA, higher by paralleling	5 - 150 MVA, higher ratings on request	6 - 32 MVA, higher ratings on request	15 - 100 MVA, higher ratings on request
In-/Output Voltages	Grid: user-defined (11 kV .. 132 kV) Ship: typical 6.6 kV .. 11 kV	Grid: user-defined (15 kV .. 400 kV) Rail: user-defined (15 kV .. 132 kV)	Grid: user-defined (10 kV .. 138 kV) Higher voltages on request	Grid: user-defined (6 kV .. 220 kV) Machine rotor voltage: up to 6 kV
In-/Output Frequencies	Input: 50 / 60 Hz Output: 60 / 50 Hz	50 Hz (3ph) .. 16.7 Hz (1ph) 60 Hz (3ph) .. 25 Hz (1ph)	Grid frequency: 50 Hz or 60 Hz Other frequencies on request	Input: 50 Hz or 60 Hz Output: 0 Hz .. 66 Hz, higher on request
References	- Terminals for cruise ships, container vessels, LNG tankers, ferries and others	- Deutsche Bahn, Germany, 15 x 19 MVA - Swiss Railways, Switzerland, 4 x 21 MVA - E.ON, Germany, 4 x 135 MVA	- INCO, Indonesia, 2 x 32 MVA - Braes of Doune, UK, 2 x 12.5 MVA - BCTC, Canada, 3 x 12 MVA	- SBB, Switzerland, 2 x 80 MVA - Avče, Slovenia, 1 x 200 MVA
Cooling	Closed loop water cooling system for zero contamination: water-air heat exchanger / water-water heat exchanger			
Technology	Voltage Source Converter (VSC) with MV IGCT semiconductors			

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