

# Wireless charging



For short to medium distance sailing routes, a purely electrical operated propulsion system using batteries as the energy source is an efficient and environmentally friendly solution. The batteries are charged when in one or more of the ports of call. The charging time is usually short compared to the transit time. It is important, therefore, that the charging system can begin operating rapidly.

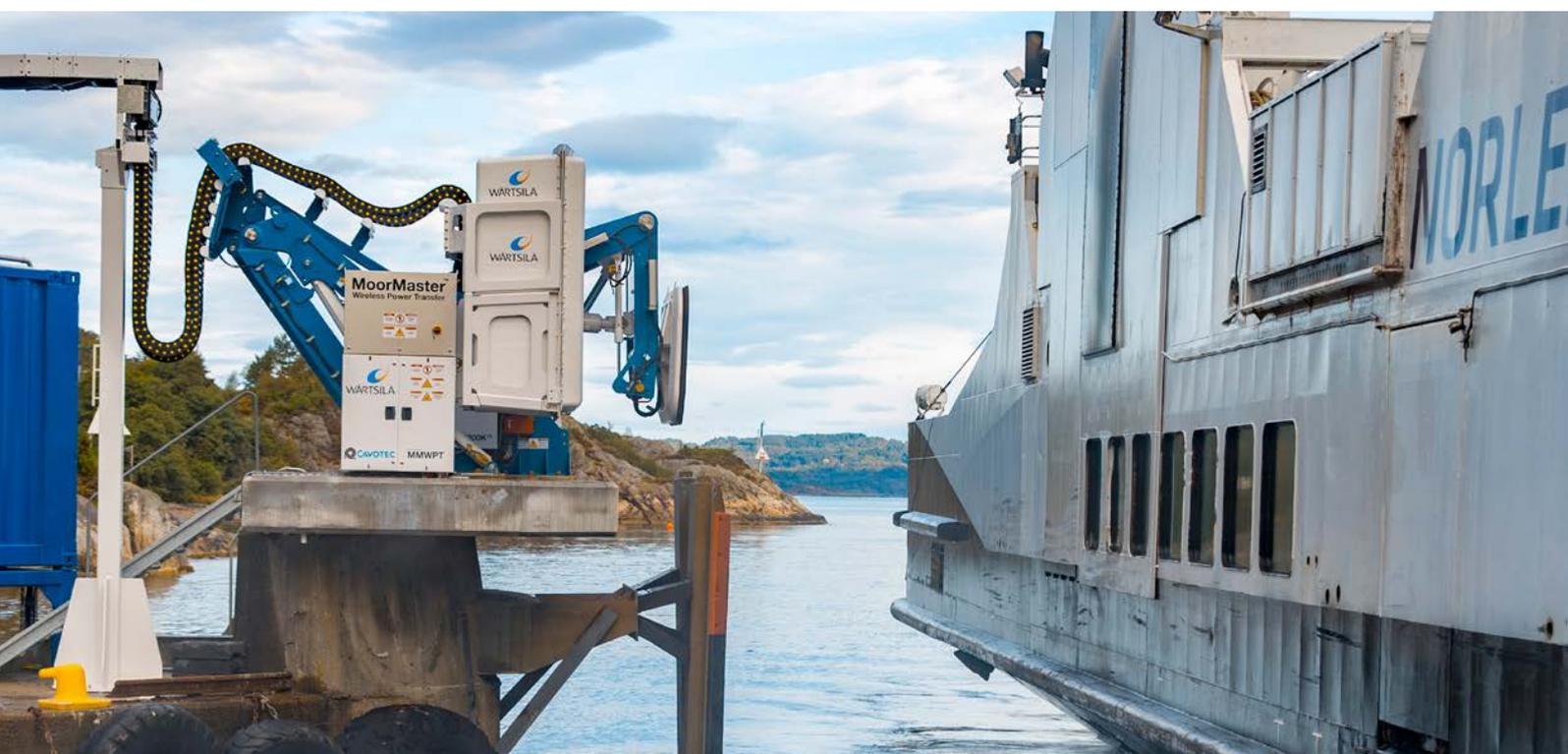
Two different charging options are available – wireless and plug-in. The Wireless charger ensures a rapid start to the charging procedure. It is connected to the DC-bus, which allows a single charger to charge both batteries, if required. A plug-in solution is available for applications that do not require as much flexibility.

## Charger concepts

Wärtsilä has developed several concepts for charging from the shore, the most innovative solution being Wireless charging. With this concept, a frequency converter is used to transform the 50/60 Hz 3-phase system into AC voltage with an output of several kHz. This voltage feeds a sending

coil unit located on the shore-side, while the receiving coil unit is mounted onboard the ship. The high frequency voltage is then converted to DC-voltage onboard. This system can transfer more than 2 MW of energy between the coils within a distance range of between 150 and 500 mm.

Another charger concept provided by Wärtsilä is one based on the use of three-phase connectors. Optional transformers can be installed onboard the vessel to provide galvanic insulation and voltage adaption. Voltage adaption can be used to increase the rate of power transfer for a plug-in connector. The three-phase voltage is converted to DC-voltage onboard.





### Key benefits

The Wärtsilä Wireless charging system offers the following benefits:

- **Increased charging time.** Because the time required to connect the ship to a plug-in charger is eliminated, charging can start when the onboard coil is 500 mm away from the on-shore coil. This allows more kWhs to be transferred to the battery during mooring. The system can also be integrated with an automatic mooring solution supplied by Cavotec.
- **Reduced maintenance.** No connecting and disconnecting of the plug is needed. Since there are no cables involved, related issues such as wear, creepage, and safety, are avoided and maintenance costs are reduced. This is the preferred solution when many charging sequences per day are required.
- **Safety.** Galvanic insulation is automatically provided by the inductive charger. Because the operation is wireless, there is no risk of connection and disconnection damage. The charging connection and disconnection procedures are automatic.

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