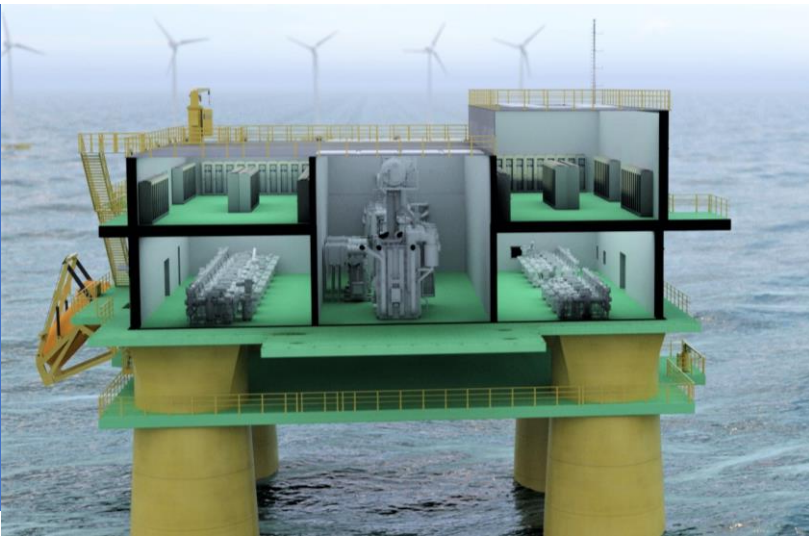


TRANSFORMERS

Transformers for floating applications

Floating offshore substations and wind turbines



Floating substations and wind turbines are a rapidly emerging solution, for deep waters. Introducing even greater challenges for the already demanding offshore segment.

With a full offshore wind transformer portfolio, now enabled for floating, we are the partner of choice, from the nacelle to the connection point.

Supporting our customers to reach their goal of a carbon neutral future.

Offshore wind generation

Since the first commercial projects in the early 1990s, offshore wind electricity generation has grown enormously.

Yet building offshore has great challenges beyond the harsh salt-water environment, and only a small fraction of the full potential has been exploited, as many offshore areas do not have a suitable seabed and beyond 60-meter depths are not feasible for bottom-fixed structures.

The floating solution

Floating substations and floating wind turbines offer a solution.

These structures can be used in deep waters, vastly increasing the available global capacity for developing offshore wind energy.

Yet floating systems come with their own challenges. Floating structures are constantly in motion, exposed to vibrations and shocks from waves up to 15 meters in height; 365 days a year, for their whole lifetime.

Enabling power transmission

Transformers and shunt reactors are key for the transmission of electricity generated in offshore windfarms and Hitachi ABB Power Grids now has a complete and qualified range of this equipment for floating applications.

Using our world leading experience – particularly on offshore oil and gas, marine and offshore wind segments – and in partnership with the forefront floating offshore developers, we bring together:

- Highest reliability and maximum availability to withstand dynamic motions, accelerations and inclinations coming from normal floating operations and from extreme-weather conditions
- Global expertise support and manufacturing footprint
- Deep understanding of grid requirements
- Optimized Total Cost of Ownership (TCO) with best balance between initial investment and operational costs for increased sustainability
- Lightweight and modular design with smaller footprint
- Specially designed:
 - Active part
 - Tank
 - Tap changers
 - Accessories
 - External components

Technical data

	Wind turbine transformer - Dry type -	Wind turbine transformer - Liquid type -	Collector step-up transformer	Shunt reactor	Earthing transformer
High voltage	≤ 36 kV	≥ 36 kV	< 300 kV	< 300 kV	33 or 66 kV
Low voltage	> 400 V	> 400 V	33 or 66 kV	N/A	> 400 V
Rated power (typical)	< 10 MVA	> 5 MVA	> 100 MVA	> 20 MVA _r	
Cooling	ANAF or AFWF	KFWF	ONAN or KNAN	ONAN or KNAN	ONAN or KNAN
Insulation	Epoxy resin and High temp class material	Ester fluid and High temp class material	Ester fluid or Mineral Oil / High temperature class material or Cellulose		
Tap-changer	De-energized	De-energized	On-Load	On-Load or None	De-energized or None
Efficiency	High efficiency options available				
Frequency	50 or 60 Hz				
Standards	IEC/IEEE or other technical standards				

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