

United Electric Power System

TRANIT



Main electric switchboard of United electric power system TRANIT



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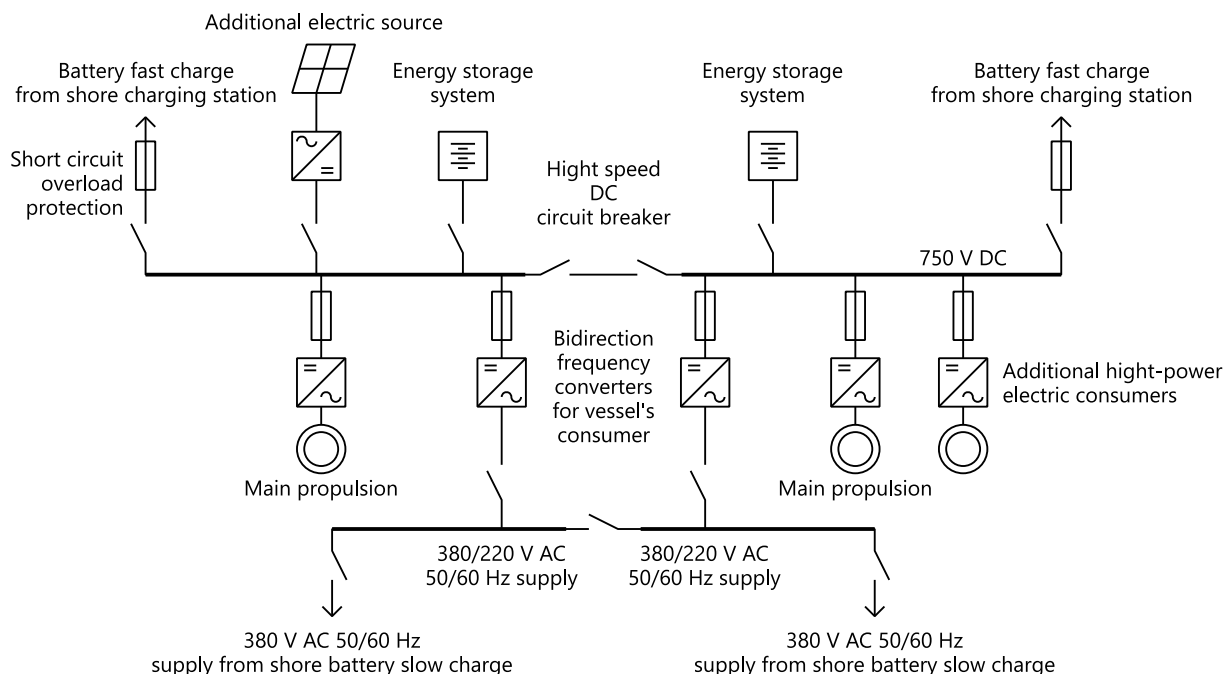


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UNITED ELECTRIC POWER SYSTEM *TRANIT*

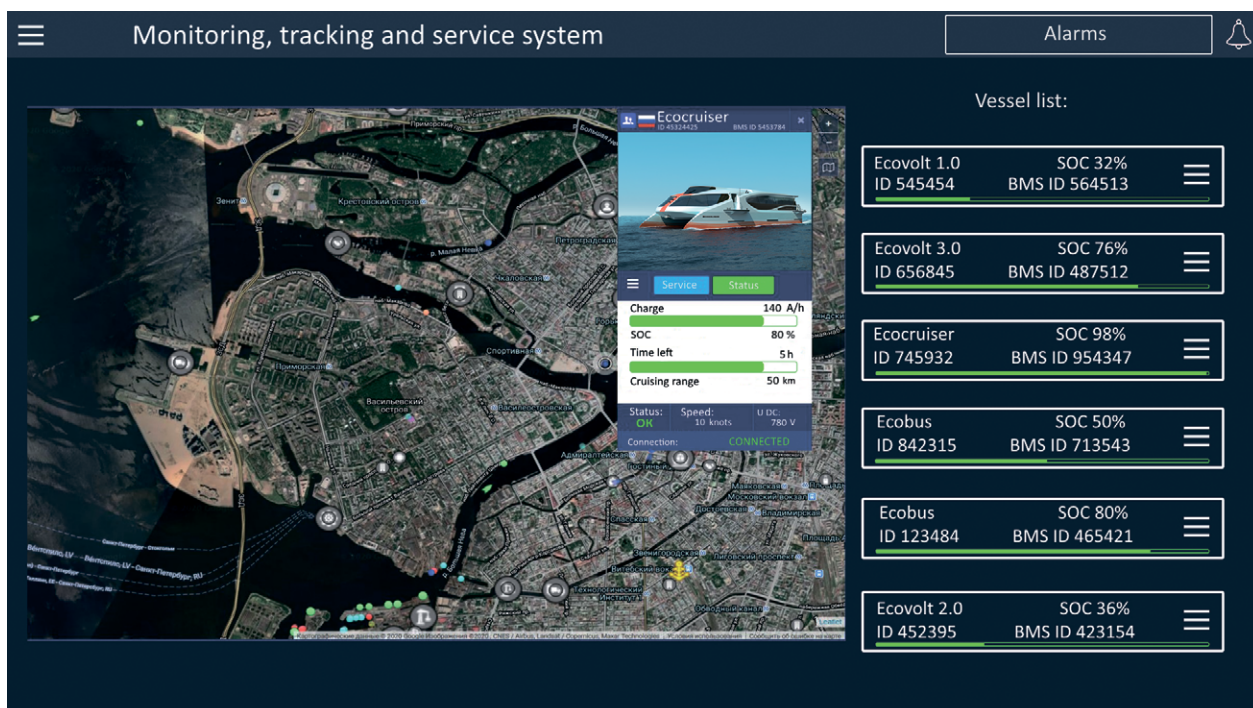
Designing fully electrical vessels for the needs of auxiliary fleet makes the most sense regarding high level of current technologies. The vessels are capable of autonomous operation during full working day. They are almost noiseless, cost-effective, environmentally friendly, and have DC grid power distribution. The main power source is Li-ion accumulator batteries.

United electric power system, *TRANIT* series is one of the most promising trends among up-to-date e-transport. Breakthrough solutions in the area of converter equipment and electrochemistry enable to reach advanced functionality and reliability providing efficient local power distribution.



Electrical diagram of United electric power system *TRANIT* series

The System's common DC grid has simple, but flexible and multipurpose structure. It combines various electricity sources and users in the most efficient way applying semiconductor frequency converters with invertible function (i.e. bidirectional converters), therefore ensuring full control over power energy within the System. The bidirectional converters make the product rival in the market due to a number of features such as energy recuperation during braking main propulsion and ensure slow charge of energy storage systems with a frequency converter of shipboard consumers. This enables an electrical vessel to charge from the onshore grid 3x380 V (in slow charge mode up to 100 kW). Special charge stations ensure fast charge, reaching charge power up to 2 MW.



Screen of monitoring, tracking and service system (MTSS)

Satisfaction of customer needs is combined on the diagram above with no overload and limitations of trip current lower than short circuit currents provided by fast response time of semiconductor elements.

Modular design and mass production of system elements ensure time-saving and cost-effective manufacturing, and allows for producing the System with the range of motor nominal power: 130, 200, 400 kW. The System may be customized on request: the customer may include powerful equipment (a thruster, technical pump, etc.) or design the System based on one motor (e.g., for a small vessel).

United control system ensures centralized control and monitoring of all parameters leading to optimal operation mode for both users and power sources. System of monitoring, tracking and service provides for remote access to monitoring and supervision exponentially optimizing control over the vessel parameters.

Main features:

- **No diesel generators:** green operation, low noise, and operating costs (electric power costs less than fuel).
- **Increased efficiency:** low energy losses; power factor is always equal to 1, no reactive current.
- **Small weight and dimensions:** reduced weight of conductors (incl. no skin-effect and reactive current); no transformers; centralized cooling system.
- **High reliability:** utmost quality of user power while powered from FC, reduced transient time, high response time of DC circuit breakers and transistors, high-speed control system of propulsion and power systems.

The set of electrical equipment of the system Tranit is also supplemented by the energy storage system *Prometheus*.

Prometheus Systems are intended to ensure uninterruptible power supply to systems of megawatt class, electrical power supply of vessels with fully electric or hybrid propulsion systems, to store redundant electricity for solar and wind farms, to provide extra electricity power to grids in the peak hours and smooth out extra loads of power generating units.

Energy Storage Systems are manufactured in compliance with operating requirements for industrial sites and sea transport, providing excellent safety of energy storage modules.

All the main System components are the company's proprietary development, produced on our own manufacturing site. Our full-cycle production starts with research and ends up with an ideal unit implementation into a customer task, warranty and post-warranty professional service.

During all life time of ESS we provide online 24/7 monitoring to detect and fix the problem within the shortest time including both warranty and post-warranty periods.

Possible applications:

- Sea and river transport
- Manufacturing industry
 - Industrial UPS (stationary and mobile)
 - Energy storage for power plants (to smooth out peaks and store excess energy)
- Telecoms and Data centers
 - UPS of basic mobile communication stations
 - UPS for data storage and processing centers
 - UPS for PBX
- Fast charge high power stations both off-grid and grid-connected for all kinds of EVs
- Home storage systems (modules 6-10 kW)

Battery Cabinets

- Battery cabinets of modular architecture have high power density (kW/m²), reduced battery space and weight
- Outstanding, reliable and user-friendly scalability of the System
- Easy-to-install System
- Quick "hot" unit replacement
- Built-in fire-extinguishing and venting system
- Scalable monitoring to ensure control on each level (System/module/cell)
- Built-in cooling (air/fluid)
- Robust and watertight aluminum alloy housing
- Vibration and impact-resistant
- Salt fog resistant
- Low heat generation
- Bottom-part cable gland
- Optional integration with solar and wind generators
- Unilateral maintenance
- Battery Management System (BMS) provides:
 - Charge and voltage control for each cell
 - Overload protection and cell balancing
 - Defining State of charge (SOC)
 - Defining State of Health (SOH)
 - Predetermined temperature mode for each battery
 - Operation data logging
 - Black box to record and store the whole history of each cell charge/discharge cycles
 - Light and sound alarm of System Status
- Cell type – LFP
- Air cooling

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Energy storage unit