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# DEVELOPMENT OF A MODULAR POWER SUPPLY SYSTEM AND PROPULSION SYSTEM FOR A HEAVY WORK CLASS ROV

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Over the recent few years in the field of underwater robotics a tendency appeared to switch to fully electric ROVs not only of inspectional but also of working classes with power more than 100 kW. This became possible both due to the significant development of technologies and electronic components and due to the global trend towards the transition to "green" energy. This, in turn, made it possible to develop a new class of underwater robotics - resident ROV, i.e. having the possibility of permanent basing under water without the need for the use of a support vessel.

In the process of the proactive designing of the heavy working class ROV (IMCA class III, B), the first acute question that arose was choosing an adequate power supply system and propulsion thrusters as key components of the underwater vehicle. Appearance of new semiconductor devices based on silicon carbide (SiC) has led to a transition to a qualitatively new level in the field of power electronics and designing of switch-mode power supplies. An increase in the switching frequency allowed for reducing the size of the inductors and their size, which increased the capacity of the power supplies. This made it possible to create an innovative HVDC power supply system for the ROV. Simultaneously, the development of a thruster with power of 20 kW and a driver for the thruster of the corresponding power were carried out as well.

The paper justifies the choice of the parameters for the DC power supply system and analyses the key aspects in the development of modular power supplies, elements of the thrusters and the results of the prototypes testing in real sea conditions.

**Key words**: ROV, remotely operated vehicle, robotics, power supply system, underwater thruster.

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