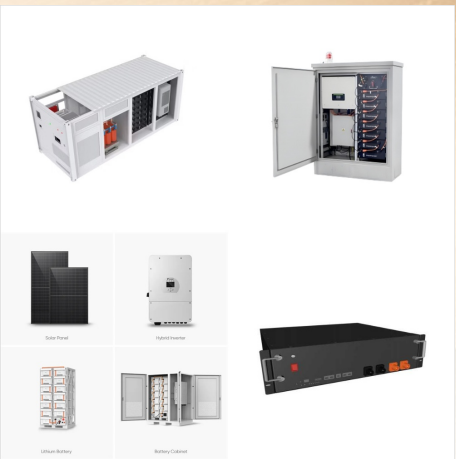
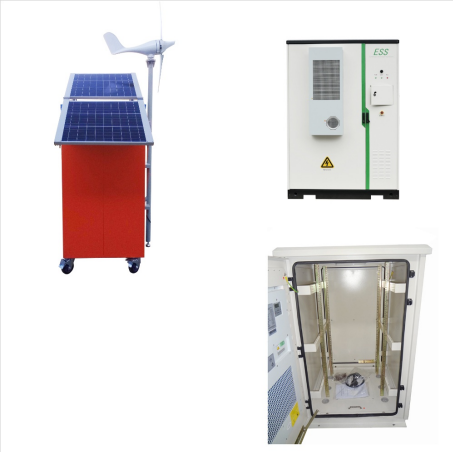
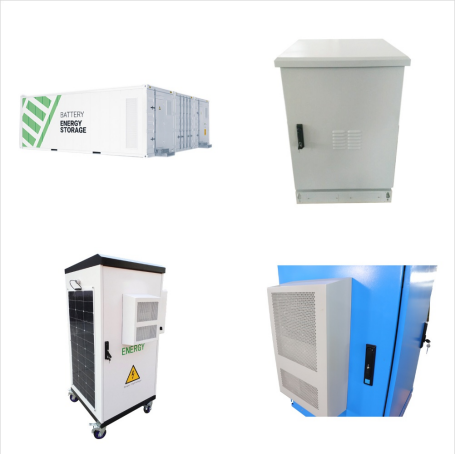


A modular approach to UUV (unmanned underwater vehicle) power source design and construction is described. A range of output power for near term UUVs from 300 W to 5 kW and a range of energy capacity from 15 to 500 kWh is considered. The different power and energy requirements are all met by use of a modular aluminum-oxygen semi-fuel cell with essentially ???

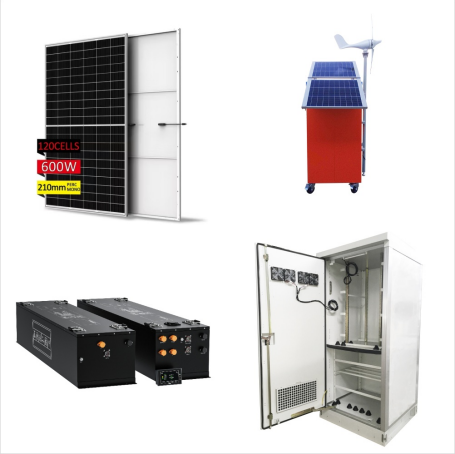


To meet the requirements of the unmanned underwater vehicles (UUVs) for the power source, a conceptual design of a 100???kWe level Nuclear Silent Thermal???Electrical Reactor (NUSTER???100) is

ALUMINIUM HYDROGEN PEROXIDE POWER SYSTEM FOR AN UNMANNED UNDERWATER VEHICLE



Hugin is an Autonomous Underwater Vehicle (AUV). It can operate autonomously at depths down to 6000 metres, without a physical connection to a boat or remote control from the surface. Hugin has advanced ???



Aluminum-hydrogen peroxide power system for an unmanned underwater vehicle continuously for 30 hours which is approximately 4 to 6 times the endurance of its existing nickel cadmium system

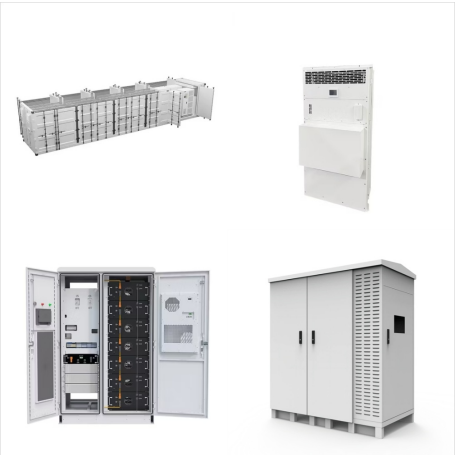
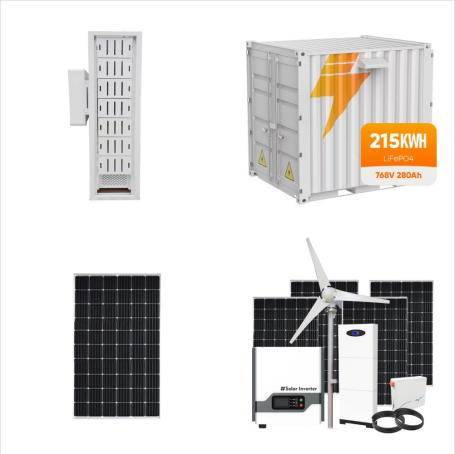
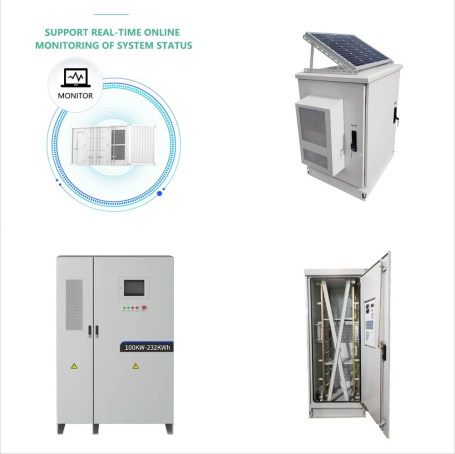


Fig. 1 gives a simple illustration of a generic hybrid fuel cell power system, which shows the main components, i.e. the fuel cell system, which consists of a fuel cell stack, fuel supply, oxidant supply, auxiliaries such as fans and pumps and for certain systems a fuel and/or oxidant processor stage; the energy storage system, which may consist of a battery, ???

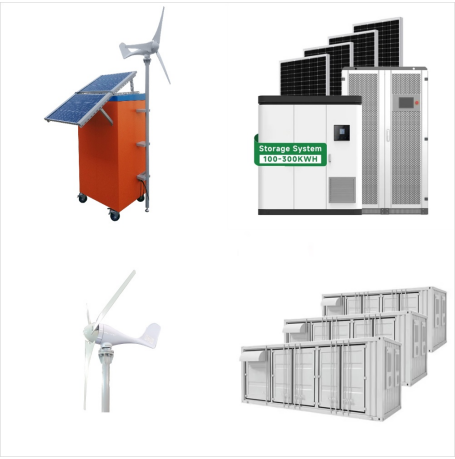
ALUMINIUM HYDROGEN PEROXIDE POWER SYSTEM FOR AN UNMANNED UNDERWATER VEHICLE



Abstract The scheme of an electric installation of an unmanned underwater vehicle based on a chemical current source of aluminum???water type with an alkaline electrolyte is considered. The mass???volume and energy characteristics of energy sources based on the aluminum???water system with an alkaline electrolyte and the characteristics of the main and ???

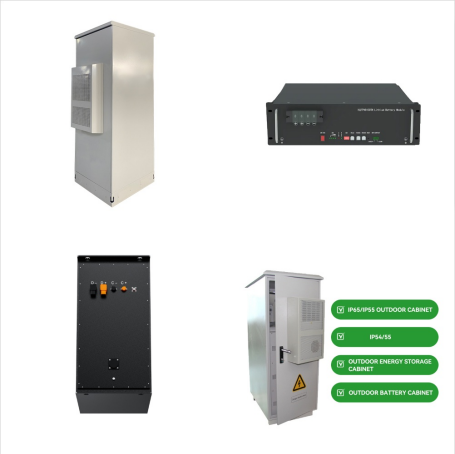


One system under development is a novel aluminum/hydrogen-peroxide pressure-compensated semi-fuel cell system that will deliver 80 kWh at 300 W for a deep-sea autonomous underwater vehicle (AUV

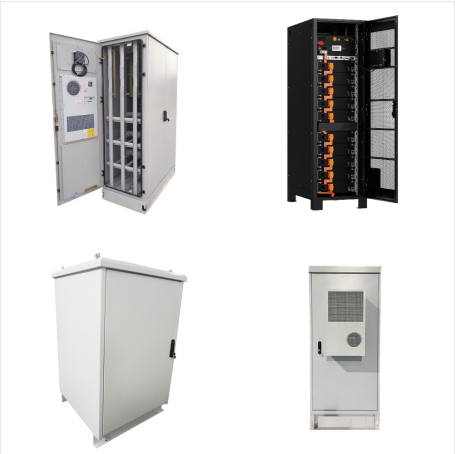


An unmanned underwater vehicle (UUV) or autonomous underwater vehicle (AUV) is a marine robot [1] used for a wide range of oceanographic and military tasks including underwater surveys, inspection

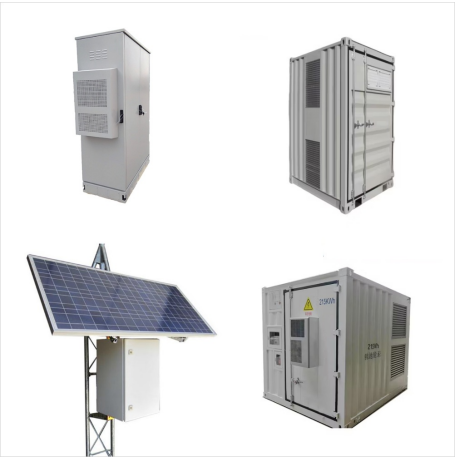
ALUMINIUM HYDROGEN PEROXIDE POWER SYSTEM FOR AN UNMANNED UNDERWATER VEHICLE



Alupower Canada Limited and the Department of National Defence with CRAD funding and DGMEM engineering support are designing and constructing a fuel cell power system (FCPS) to power small unmanned vehicles (UUVs). The ARCS 1, a DND/DREP owned experimental unmanned submersible, has been chosen as the trial vessel. The FCPS will provide sufficient ???



Fuel cells (FC) are expected to improve the endurance of unmanned undersea vehicles (UUVs). Hydrogen-oxygen fuel cells are commonly utilized undersea, which suffer from high cost and technical



The state of the art is represented by the HUGIN AUV[2]. This vehicle is powered by a Alkaline Aluminium/Hydrogen peroxide semi-fuel cell. This paper will present an alternative power generation system based on a Proton Exchange Membrane (PEM) fuel cell fed by pure hydrogen and oxygen produced by a replaceable chemical storage for AUV.

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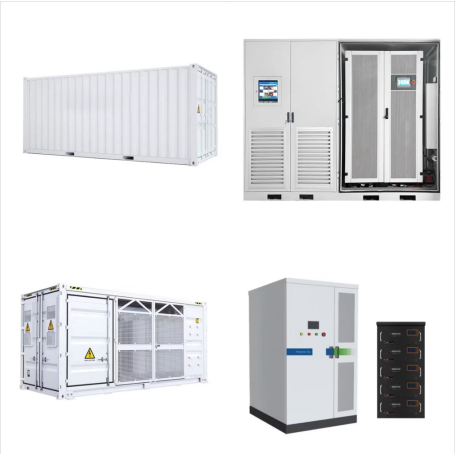
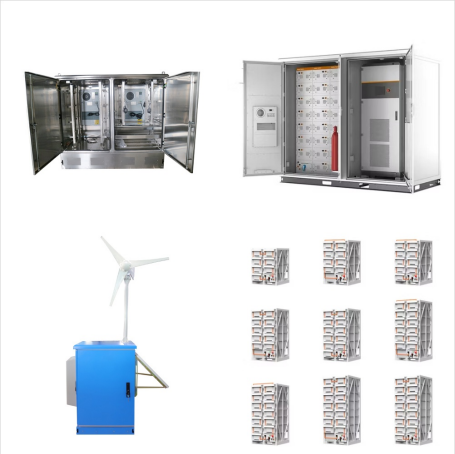
This paper provides a technology assessment for an unmanned underwater vehicle (UUV) fuel cell energy/power system (FCEPS), including design methodology and design concepts. The design concepts are based on the polymer electrolyte membrane fuel cell (FC) operating on hydrogen and oxygen. The technology assessment method presented is a ???



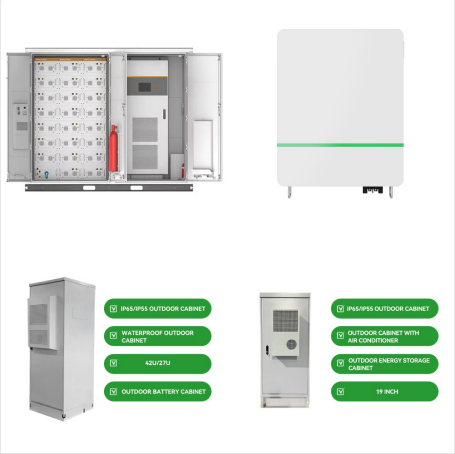
The initial draft of the "aluminium-hydrogen peroxide" battery which the two researches jotted down at an airport in the United States was patented and industrialised and was in use in Hugin all the way until 2008. However, by the early 2000s, the battery technology had caught up with FFI's patents.

Amongst metal???H 2 O 2 batteries, H 2 O 2 was first applied to aluminum???hydrogen peroxide (Al???H 2 O 2) batteries in 1969. 22 Al???H 2 O 2 cells were successfully used by the US and Navy as a power source for UUV HUGIN-II and HUGIN-3000. 23-26 However, the severe self-discharge of this type of battery limits its wide application.

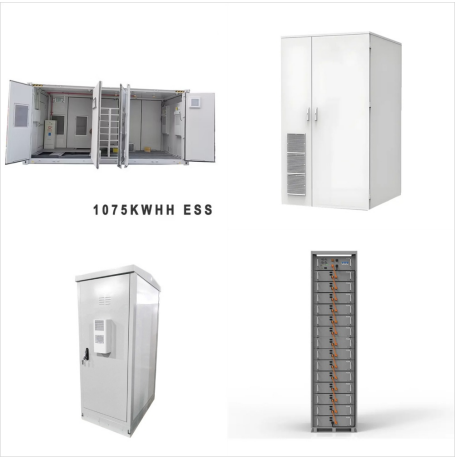
ALUMINIUM HYDROGEN PEROXIDE POWER SYSTEM FOR AN UNMANNED UNDERWATER VEHICLE



DOI: 10.1016/J.JPOWSOUR.2004.03.023 Corpus ID: 110996572; CLIPPER: a long-range, autonomous underwater vehicle using magnesium fuel and oxygen from the sea @article{Hasvold2004CLIPPERAL, title={CLIPPER: a long-range, autonomous underwater vehicle using magnesium fuel and oxygen from the sea}, author={{O}istein Hasvold and ???

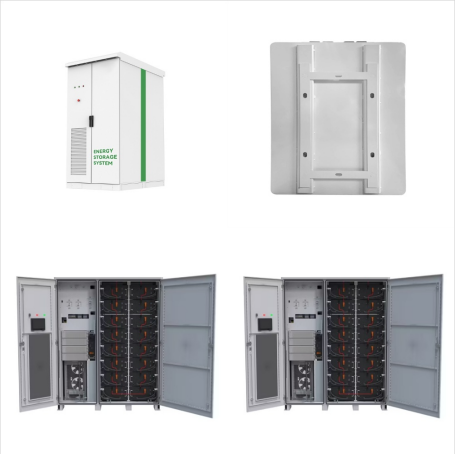


The present paper proposes a study for the integration of a hybrid power system composed by rechargeable batteries and fuel cells with chemical gas storages for an Autonomous Underwater Vehicle

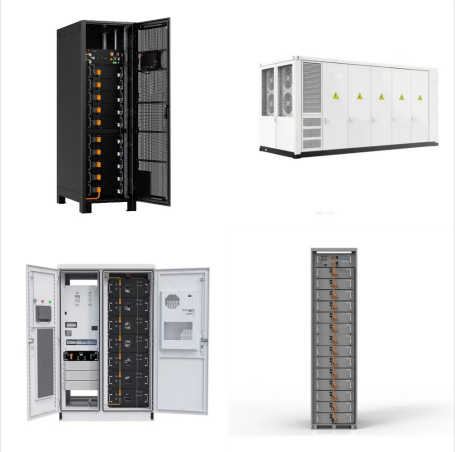


a large displacement unmanned underwater vehicle (LDUUV) [21]. One of these contracts resulted in a successful demon-stration in an AUV in 2015, and General Atomics completed a 46-day demonstration of their Aluminium Power System in 2018 [22]. The latter system uses hydrogen generated by the reaction between aluminium and water while oxygen is

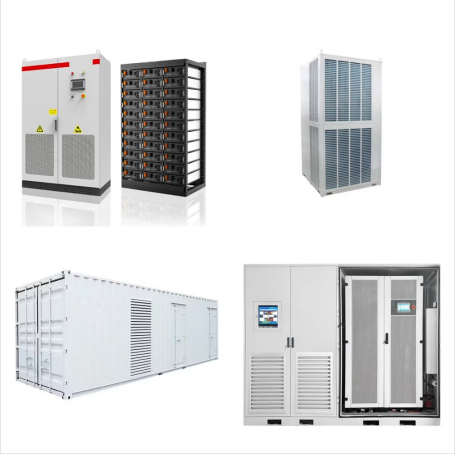
ALUMINIUM HYDROGEN PEROXIDE POWER SYSTEM FOR AN UNMANNED UNDERWATER VEHICLE



The Li/SF 6 combustion reaction can provide power for unmanned underwater vehicle (UUV) due to the advantages of high heat release and no gaseous combustion products. Exploring the combustion and heat transfer characteristics of Li/SF 6 can greatly improve the performance of the UUV combustor. In this paper, based on the operation requirements of ???

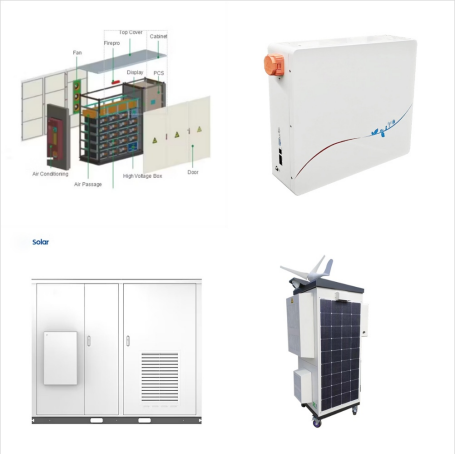


Recently, An et al. [76] developed an alkaline-acid direct ethanol fuel cell with hydrogen peroxide as an oxidant, resulting in a peak power density of 130 and 160 mW cm -2 at 60 and 80?C

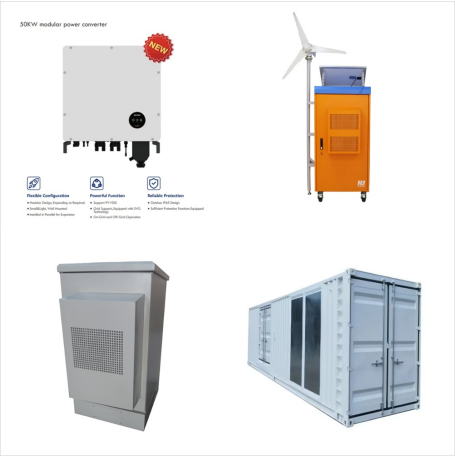


??? Spherical aluminium containers (2 large, one small) ??? Cell voltage 0.70 V ??? Faradayic efficiency 0.95 ??? Weight of Fuel Cell 20 kg ??? Power for and weight of auxiliary systems is neglected System weight System volume System energy density System energy 246 kg 300 litre 130 Wh/kg 32 kWh ??? Net positive buoyancy of 55 kg!

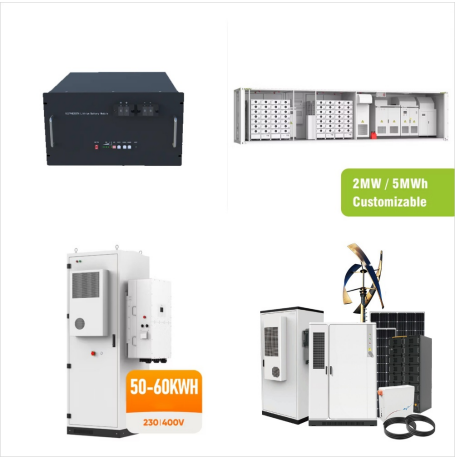
ALUMINIUM HYDROGEN PEROXIDE POWER SYSTEM FOR AN UNMANNED UNDERWATER VEHICLE



Semantic Scholar extracted view of "Aluminum???hydrogen peroxide fuel-cell studies" by David J. Brodrecht et al. The alkaline aluminium/hydrogen peroxide power source in the Hugin II unmanned underwater vehicle. ?. 1999; 85. Save. Aluminum-hydrogen peroxide power system for an unmanned underwater vehicle. G.D. Deuchars J. Hill J

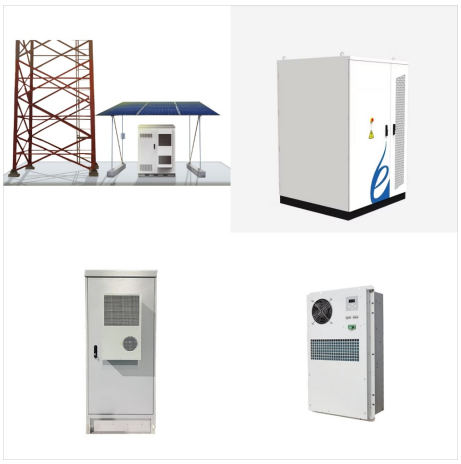


The present paper proposes a study for the integration of a hybrid power system composed by rechargeable batteries and fuel cells with chemical gas storages for Improving the subsea endurance and the power system efficiency of unmanned underwater vehicles The alkaline aluminium/hydrogen peroxide power source in the Hugin II unmanned



However, the degree to which an aluminum???seawater power system could outperform other systems has remained unknown because of uncertainties about volume and energy costs associated with the

ALUMINIUM HYDROGEN PEROXIDE POWER SYSTEM FOR AN UNMANNED UNDERWATER VEHICLE



In 1993, The Norwegian Defence Research Establishment (FFI) demonstrated AUV-Demo, an unmanned (untethered) underwater vehicle (UUV), powered by a magnesium/dissolved oxygen seawater battery (SWB). This technology showed that an underwater range of at least 1000 nautical miles at a speed of 4 knots was possible, but also that the maximum hotel load this ???