Design and research on a variable ballast system for deep-sea manned submersibles(PDF)

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Title: Design and research on a variable ballast system for deep-sea manned submersibles

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摘要: Variable ballast systems are necessary for manned submersibles to adjust their buoyancy. In this paper,the design of a variable ballast system for a manned submersible is described. The variable ballast system uses a super high pressure hydraulic seawater system. A super high pressure seawater pump and a deep-sea brushless DC motor are used to pump seawater into or from the variable ballast tank,increasing or decreasing the weight of the manned submersible. A magnetostrictive linear displacement transducer can detect the seawater level in the variable ballast tank. Some seawater valves are used to control pumping direction and control on-off states. The design and testing procedure for the valves is described. Finally,the future development of variable ballast systems and seawater hydraulic systems is projected.

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