The Hope Group
A DIVISION OF KLX INC.

Motion & Control Integration
Technologies | Components | Systems Solutions

General Dynamics Electric Boat Relies on The Hope Group To Design/Build Hydraulic Test Stand for the U.S. Navy

The Hope Group recently supplied General Dynamics Electric Boat with a custom hydraulic test stand designed to conduct pre-installation tests and troubleshoot special hydraulic control valves, including directional control valves, emergency control valves, electro-hydraulic servo-control valves, as well as hydraulic motors, cylinders, and filters.

The test stand controls and monitors hydraulic oil parameters including pressure, temperature, and flow to simulate test and shipboard conditions in order to analyze valve performance. According to Craig Phillips, Engineering Manager, the test stand also has the capability to perform hydrostatic tests at pressures up to 7,000 psi and can also be used to cycle test or hydrostatically test hydraulic accumulators.

Operational Features

Craig Phillips explained that the hydraulic test stand supplies filtered 2190 TEP hydraulic oil, which can be regulated between 0 and 3,000 psi, with a flow rate from 0 to 20 gpm. He stated that oil temperature can be regulated from 100 degrees to 140 degrees Fahrenheit, which is the range that is required by valve and ship systems specifications. An air-oil heat exchanger was provided to remove heat in order to maintain temperatures down to 100 degrees in 70 degree ambient temperature. The test stand also contains a built-in air-over-oil pump capable of pressures up to 10,000 psi at low volume for hydrostatic testing.

Other important operational features include the hydraulic test stand piping, which permits flexibility in piping arrangements so that it can be easily connected to or disconnected from the supply and return lines. The test stand design includes three separate oil supply lines capable of supplying oil from 0 to 3,000 psi, in addition to two separate lines capable of supplying oil at alternating pressures from 0 to 3,000 psi through four-way, three-position, solenoid-operated control valves.

Safety Features

According to Phillips, there are several important safety features incorporated into the design of the piping systems used for testing. The hydraulic test stand's high-pressure piping system is constructed of 3,000 psi minimum-service, pressure-rated components while the low-pressure return piping and components are rated for 600 psi working pressure minimum. The hydrostatic piping system is constructed of 10,000 psi minimum-service, pressure-rated components. The piping systems also incorporate relief protection to prevent over-pressurization, thereby ensuring safety.

HMI Touchscreen
The hydraulic test stand features an Allen Bradley PLC and HMI interface with proportional control valves on pump and test bench.

Heat Exchanger
The hydraulic test stand features an air cooled heat exchanger for maintaining hydraulic fluid temperature with VFD on motor for controlling temperature and noise reduction.

Hydrostatic Testing
The main hydraulic system will be capable of supplying 20 gpm of oil at 3,000 psi and a small air/oil pump for 7,000 psi hydrostatic testing.

ISO 9001 Certified
ITAR Registered

The Hope Group
A division of KLX Inc.
70 Bearfoot Road
Northborough, MA 01532

Tel: 508-393-7660
Fax: 508-393-8203

www.TheHopeGroup.com