



VALVE CONTROLLERS

SAFETY-RELATED VALVE CONTROLLERS

Nutherm International, Inc. supplies safety-related valve controllers designed to meet the qualification, performance and reliability needs of the nuclear power industry. These controllers are built, tested and qualified under our NUPIC audited Appendix B Quality Assurance Program. Recently, Nutherm qualified a replacement valve controller for a US based utility. This controller is described below.

THEORY OF OPERATION

This Nutherm valve controller supplies power to a motor/pump to move a valve actuator based on the command input and the position of the valve. This controller consists of a transformer, inductor, pulse width modulated servo amplifier (PWMSA), signal converter and cooling fan all located in a control panel designed to minimize the effects of seismic forces. The transformer converts 480Vac three phase to 85Vac three phase and 120Vac control. The 85Vac power source for the PWMSA is converted to a modulated DC output for motor/pump power. An analog 4 to 20mA command input signal is compared to the feedback valve position signal provided by a linear variable differential transformer (LVDT) located on the valve and the resultant error determines if valve position change is required. As the command input position and valve position approach each other, speed of the motor/pump, monitored through motor-tachometer feedback, is reduced. When the valve command position and the valve position match, the motor/pump stops.

REPLACEMENT CONTROLLERS

Nutherm uses various options to supply replacement valve controllers. We either select a controller similar in form, fit and function to the original unit modified to meet the customer needs, or refurbish an existing unit to extend its operational life by replacing critical parts. If neither of these options exist, Nutherm can reverse engineer the existing design by analyzing all electrical and mechanical aspects. To further understand the unit, Nutherm works with the original equipment manufacturer to obtain critical information concerning the valve controller. Before completing the design, Nutherm meets with the customer to determine what deficiencies existed in the current design. Deficiencies such as overheating, difficult access, or parts that lacked adequate design margin are addressed. After the reverse engineered design is complete, Nutherm manufactures and tests the unit to verify functionality. As with any safety-related item Nutherm supplies, the qualification requirements of the customer are addressed in the final documentation and product.

TRAINING

Nutherm can provide factory and on-site training. Training sessions consisting of PowerPoint presentations, training manuals and handouts can be tailored to the site's needs. Site specific calibration procedures, troubleshooting guides and installation, operation and maintenance manuals are also available upon request.

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