DWFRITZ
PRECISION AUTOMATION

Solution Sheet

Percutaneous Aortic Valve Test System

Challenge

A leading medical device manufacturer needed a self-contained test chamber capable of verifying the performance capabilities of four sizes of aortic heart valves.

Solution

The tool tests the current valve under both forward-flow effective orifice area (EOA) and reverse flow conditions. The system employs a magnetically coupled centrifugal pump using closed-loop control to circulate either saline or a 0.25% glutaraldehyde solution at precisely controlled rates up to 20 L/min for forward flow testing. Ultrasonic flow meters measure valve performance for both effective orifice area (EOA) and reverse flow for leakage testing.

An inline, thermostatically-controlled heater maintains solution temperatures within the system of 37°C ±2°C, while an on-board filtration system removes particulate matter larger than 0.2 µm. Solenoid driven pinch valves controls fluid flow routing.

An endoscope provides live images of the current process, pausing between each phase for the operator to view and digitally confirm a live image of the current valve under inspection. All test results are written to disk under time-date stamps and, on test completion, an on-board printer generates an adhesive pass/fail label based on valve performance during testing, which the operator can attach to the valve package.

Result

The system performs automated inspections on **100 units per 8-hour shift** with a high-flow accuracy of ±0.047 L/min, low-flow accuracy of ±0.008 L/min, and differential pressure accuracy of 0.025mmHg. Inspections include effective orifice area and reverse flow leakage, as well as leaflet integrity during and after valve closure.

About DWFritz Automation

Established in 1973, DWFritz Automation designs, builds, and supports engineer-to-order automation systems and high-speed, non-contact metrology and inspection platforms, as well as providing world-class build-to-print manufacturing capabilities to clients.

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