

Seat Cushion Mold System

Case History

Opportunity

In a previous case history, we showed how scrap was reduced in the manufacture of vinyl covers used on tractor seats. With the success of that project, we were given the opportunity to control the temperature of molds used to make the foam cushions used in these seats.

Problem

The molds (more than 250 of them) are made with two different materials. Some are aluminum while others are fiberglass. The molds are a clam shell design which are pre-heated to 130 to 140°F. The top and bottom of the molds are temperature controlled at two different temperatures. The current solution uses a mix of low cost electronic controllers and bi-metal thermostats to control heat-up.

The heating elements are Watlow silicone strip heaters. After the mold is heated, a two-part foam is injected into the mold. After the foam has hardened, the mold is opened and the foam seat is pulled out. The former system produced a defective product scrap rate of 15% to 20%.

Solution

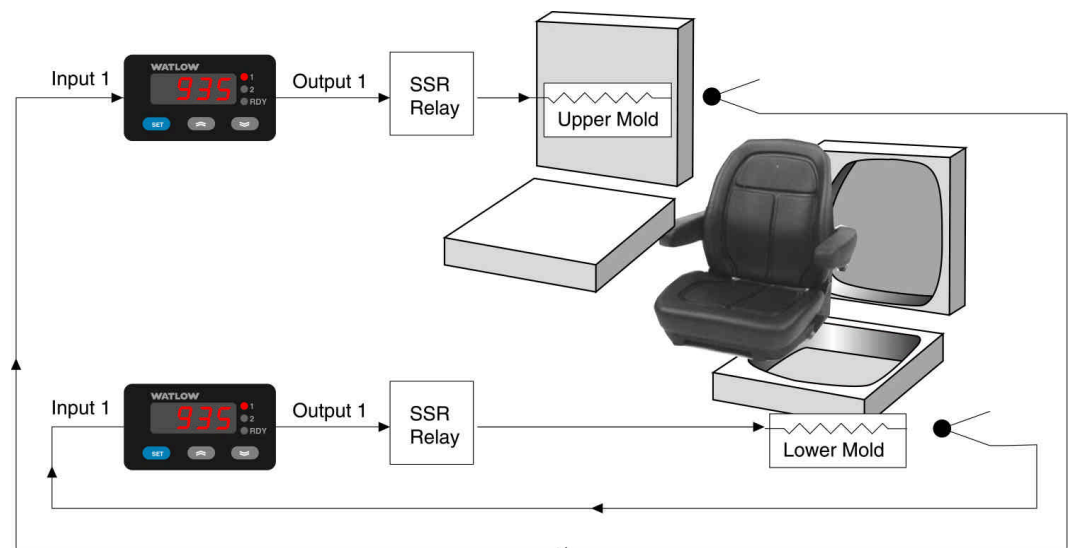
Working with engineering and maintenance, we designed a small control box containing two each of; 935A-1CC0-000R, thermocouples, and 25 ampere solid state relays. The control box was designed so that each box could be removed for repairs and cleaning without rewiring.

Static electricity proved to be a problem in the system as controllers would fail prematurely. Static electricity forms when the foam is injected into the mold. This static reaches a level of discharge when the mold is opened and the operator pulls the foam from the mold. It took six months of static discharge before the controllers would fail.

We replaced the thermocouples with grounded probes and installed anti-static floor mats for the operators to stand on. The probes were connected to the frame on which the mold rested on. The defective product scrap rate dropped to 1% to 2%.

Watlow Products Utilized

- Series 935
- Thermocouples
- Solid State Relays



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