



ENGEL e-floMo improves the process stability and business opportunities

The Situation

The trends towards watertight process control has come to temperature control within the machine tool industry. With ENGEL floMo a manifold system with temperature monitoring was invented. With ENGEL e-floMo, ENGEL takes it to the next level for process control. The temperature control system does not only monitor the conditions of each cooling zone, but it furthermore keeps the parameters constant during the whole period when produced.

The conditioning within the mold has a huge influence on the productivity and quality of the parts produced, which has not received the deserved attention until now. The ENGEL floMo innovation in 2010 turned the market and its thinking processes around. The combination of plastic injection molding with advanced electronic process control was earlier a purely manual process. The newly developed ENGEL e-floMo with active valves enables fully automated control and volume regulation of the flow.

Topic:

Grundfos Direct Sensors™ helping to control & monitor ENGEL injection moulding machines, via the Engel e-FloMo.

Location:

Schwertberg, Austria

Company:

ENGEL AUSTRIA GmbH

The solution

Automatic compensation of volume flow variations...

The pressure and hence flow of water thru the production can vary - for instance, when a filter blocks or simply when running at different loads with multiple tools running at the same time. It has for long been acknowledge that such influence goes unnoticed, or worst case means that the parts are produced to scrap.

ENGEL flomo operated with a manual valve can prevent this with its monitoring functions. The ENGEL e-flomo not only monitors, but also adjusts dynamically and automatically to maintain the pre-set optimal conditions inside the cooling side of the tool. If the flow drops, the valve will open up to compensate, until the pre-set optimal conditions are reached.

... and keeping the temperature under control

To keep the cooling temperature constant is up to the temperature control unit. The uncertainty of the temperature conditions however occurs from the unit and to the mold, which with the ENGEL e-flomo is solved with incoming control of the water temperature, monitoring and maintenance of the water temperature during the whole production period. Control of return temperature, differential temperature between main and return and several other process parameters is integrated in the ENGEL e-flomo into the process control.

The Outcome

For all three necessary measurements in the system, Engel uses Grundfos Direct Sensors™. The main advantage of the sensors is that they are 2in1 sensors. This means that the VFS is a vortex flow and temperature sensor, able to measure up to 120 °C; while the RPS is a relative pressure and temperature sensor, with the same temperature measurement range. By feeding back the flow and pressure as well as temperatures and the delta T between the VFS and RPS, into the system, ENGEL is able to control and monitor the entire manifold cooling process, as described below:

ENGEL e-flomo is developed for operation up to 120 °C. Control valves in the main and return lines enable a simple and fast opening and closing of each zone. Both the ENGEL flomo and e-flomo are not affected by the water becoming dirty, which increases the life of the units against corrosion and facilitates a high up-time.

The new manifold system is the ENGEL e-flomo with electric regulating valves. It enables a full automatic control of the volume flow, which is maintained and kept constant during periods of fluctuating pressure for the complete period of production.