

**HONSBERG**

Member of GHM GROUP

# Dry-run protection for pumps

## The all-rounder with a bonus



OMNIPLUS-F



### BENEFITS:

- o Two measured variables in one device
- o No moving parts
- o Wear-free and low-maintenance
- o Easy installation
- o Small dimensions

Pumps are a system component in most processes in which liquid media is transported. So far, so obvious. The technical principles of pumps are diverse. They also include those that prevent dry-running only temporarily or not at all. In particular, rotary pumps that continue operating without a medium to be pumped can be severely damaged or even destroyed. In addition to dry-running, overheating is another potential danger for a rotary pump that must be counteracted with measures for pump protection.

### The Challenge

Dry-running means operation of a pump without medium to be conveyed or only partially available medium to be conveyed – e.g. when air bubbles develop in the pump housing. Then, the cooling and lubrication of the pump is no longer guaranteed, which can lead to substantial overheating of the bearings with the resulting consequences: improper heating of the remaining medium to be conveyed, abrasion of the seals, bearing damage, unabated vibrations due to the lack of medium to be conveyed and other events that can ultimately lead to the complete destruction of the pump.

Dry-running normally occurs when air or steam bubbles that have entered the pump can no longer escape. The cause for this can also be closed valves on the intake side if the negative pressure causes the formation of gas bubbles. In addition to dry-running, overheating of the pump is also a serious problem. In this context, medium to be conveyed is available in the pump, but cannot be transported, e.g. because

a valve on the pressure side is closed. As a consequence, the medium is then circulated in the pump and heats up due to the friction that occurs. This heating can be strong enough that the pump can sustain serious damage.

Therefore, pumps in industrial processes should have a safety mechanism that prevents dry-running and overheating with a precautionary shut-down of the system so that the described damages cannot occur.

For this purpose, the safety mechanism must be capable of detecting the presence of the medium to be conveyed as well as whether it is flowing with adequate speed and in a sufficient amount.



### Our solution

Our OMNIPLUS-F calorimetric flow monitor is ideal for these situations. It is capable of measuring the speed of the medium to be conveyed at the tip of the probe. If an adjustable limit value is undercut, a signal to shut down the system can be issued. If no medium to be conveyed is present, it is evaluated as if the medium to be conveyed would stand still and thus a shut-down likewise occurs. The probe tip does not have any moving parts and thus is not subject to any wear at all, which makes the sensor very reliable and low-maintenance.

The analogue output of the flow speed makes it possible to recognise a continued reduction of the amount of the medium to be conveyed at an early stage, before a critical limit is undercut, and thus the cause can be remedied or the maintenance of the system can be planned in good time. In addition to the flow speed, the temperature of the medium to be conveyed is also detected and evaluated. Especially if the measuring device is installed on the pressure side of the pump, unexpected heating of the medium to be conveyed can be interpreted as an indicator of damage. The cause can be dry-running or, for example, bearing damage based on another cause.

The OMNIPLUS-F is thus capable of detecting different potential causes of damage with a single sensor. With its compact design, the OMNIPLUS-F can be used in practically any system. The intuitive configuration via multi-function ring enables easy adjustments and adaptation. The easy-to-read display also provides a clear and comprehensible overview over all parameters. Alternatively, configuration and transmission of the measurements can take place via the digital IO-Link interface.