Recommendations for Planning and Installation of Monitoring Systems for Magnetic Drive Pumps

In the case of sealless pumps (magnetic drive Centrifugal pumps and canned motor pumps) in particular, unallowed operating conditions will quickly cause major damage, with substantial expense as consequence. The following operating conditions must be avoided under all circumstances:

**Dry-running of the bearings**

It must be ensured that the pump is always filled with liquid when in operation. Tests have demonstrated that plain bearings are irreparably damaged even when running dry for only a very short time.

**Protection methods:**

???Filling level indicator or flow-meter

???Excessively small delivery flows or closed valves in delivery line

In this case, the liquid in the pump will gradually heat up. Depending on the specific medium, this may cause evaporation of the liquid between the bearings, and dry-running of these bearings, or thermal destruction of the plastic lining. Consequently, overheating will occur immediately if the pressure-line valve is completely closed.

**Protection methods:**

???Motor load monitor, flow-meter, by-pass from pressure line (upstream the pressure valve).

???Excessively high delivery flows

If the maximum delivery flow stated in the pump’s performance characteristic curve is substantially exceeded, adequate bearing lubrication is no longer assured, due to the lack of circulation of medium in the bearings. Also axial forces increase to such an extent that the bearings can be irreparably damaged. For this reason, our pumps should never be operated at greater delivery flows than those published in our performance characteristic curve.

**Protection methods:**

???Motor Load Monitor, Flow-meter, Orifice in the Pressure Line

The following contains a description and assessment of various monitoring systems. These systems are available as accessories for our pumps.

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**Motor Load Monitor**

**Installation:**

Control panel, or spray-water proof plastic housing for all other locations.

**Function:**
The motor load monitor controls the electric power consumed by the drive motor and shuts off this motor if electric power impermissible operating conditions are detected.

**Operating conditions detected:**

- Delivery flow too small, danger of overheating
- Delivery flow excessive
  - Breaking away of magnetic coupling
  - Inadequate bearing lubrication due to lack of liquid circulation

**Assessment:**

The motor load monitor does not provide protection against starting of magnetic drive pumps without liquid. An additional filling level indicator would be necessary for this purpose.

**Flow-meter**

**Installation:**

Transducer: Suction line (directly in front of the pump)

Amplifier: On transducer, or separately, according to temperature of medium.

**Function:**
The flow-meter only allows the pump start-up if the suction line is filled. During operation, the flow-meter monitors the flow.

Operating conditions detected:

- No liquid
- Delivery flow too small
- Delivery flow excessive

Assessment:

Comprehensive top-level protection for the pump against dry-running.

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**Filling Level Indicator**

**Installation:**

Suction line, directly in front of the pump.

**Function:**

The filling level indicator monitors the liquid level in the suction line. It allows start-up of the pump only if the suction line is filled.
**Operating conditions detected:**

The filling level indicator protects the magnetic drive pump against dry-running if no liquid is present.

**Assessment:**

The filling level indicator does not protect the pump against delivery flows which are too small or too great. An additional motor load monitor would be necessary for this purpose.