



PRÜFTECHNIK

Machinery Service



APPLICATION

Online Condition Monitoring of pumps

Inovative solutions for ...

- ▶ Service concepts
- ▶ Process assurance and availability
- ▶ Commissioning
- ▶ Production and quality assurance



Pumps

In almost all areas of industry, pumps are essential for conveying liquid and solid materials and for generating specific pressure conditions. These industry sectors include:

- Power generation
- Chemical industry
- Water supply, waste water management
- Steel production
- Mining
- Automotive industry
- Environmental engineering

Because the demands placed on pumps vary from application to application, pumps come in wide variety of designs.

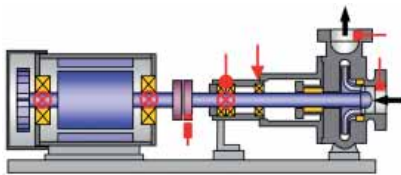
Frequently used pump types are:

- Single-stage pumps
- Multi-stage pumps
- Side channel pumps
- Submersible motor pumps
- Close-coupled pumps
- Pumps with a magnetic coupling

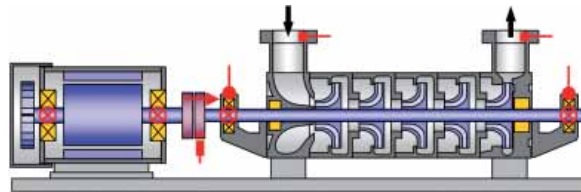
Most pumps are centrifugal pumps with a pump impeller that draws in the medium axially and expels it radially. The pressure rise in the medium results from the centrifugal forces. Semi-axial and axial impellers are used for particularly high flow rates.



FGD pump, used in flue gas desulfurization in a power plant

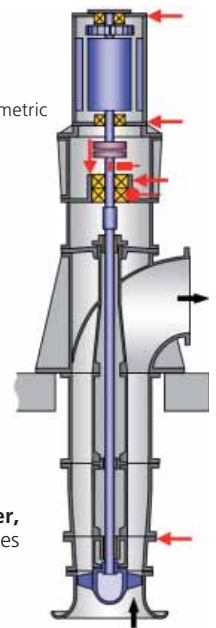


Single-stage centrifugal pump, typical design of standard chemical pumps



Multi-stage high pressure centrifugal pump, typical design of boiler feed pumps

- ⊗ Vibration
- ← RPM
- ▬ Temperature
- Pressure/volumetric
- ▬ flow rate



Vertical pump with axial impeller, used in pumping stations and sluices

Process assurance and availability

High pump availability is essential in many industrial applications. Often the failure of a non-redundant pumping system will bring an entire plant complex to a standstill.

Continuous condition monitoring helps avoid malfunctions, aids in recognizing wear processes and bearing damage early on, and promotes the optimal utilization of component service life.

VIBNODE® offers online condition monitoring for pumps that is reliable and cost-effective.



Roller bearing damage (cage damage) on the axial bearing of an axial piston pump



Wear on the pump impeller of an FGD pump due to aggressive media



Coupling wear due to faulty shaft alignment

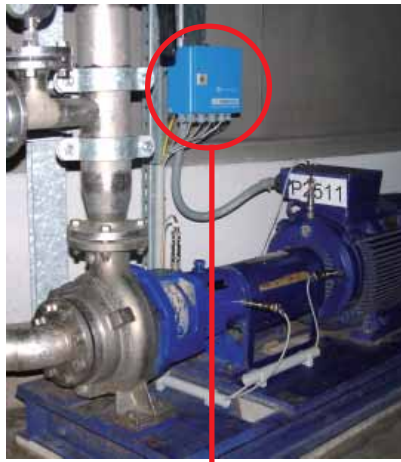
Condition Monitoring with VIBNODE®

The condition of components such as

- Pump shafts
- Pump impellers
- Roller bearings
- Drive parts

is monitored by means of the frequency-selective measurement and evaluation of specific machine vibrations, vibrations due to flow excitation, and structure-borne sound in roller bearings. The examination also involves operating parameters such as the flow rate, suction pressure, output pressure, drive power, rpm, bearing temperatures and leakage monitoring. Via a network or by eMail, the condition information is automatically transmitted to the operator's central systems and to the service partner.

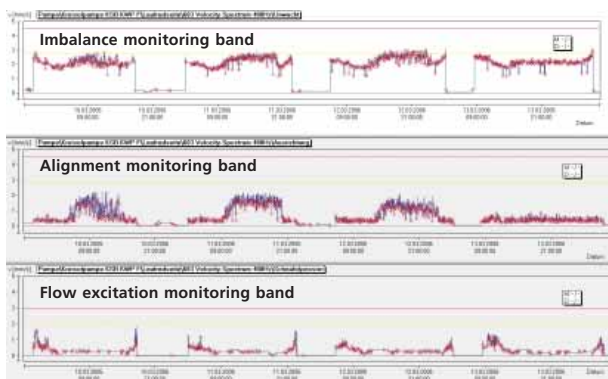
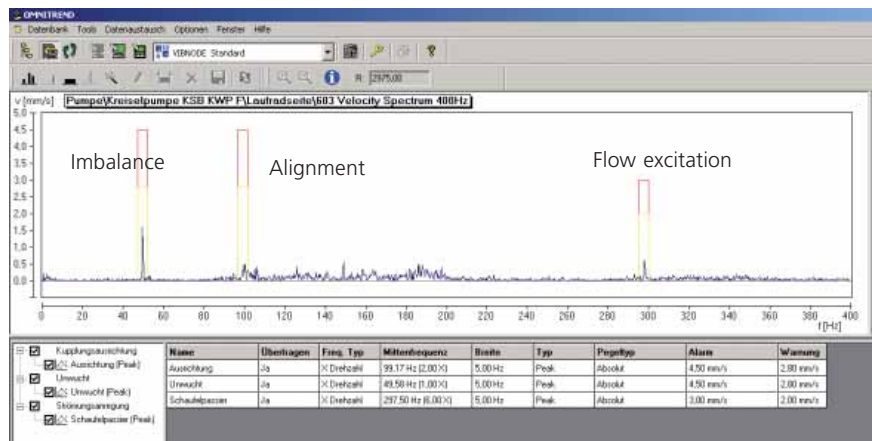
OMNITREND®, the diagnosis software, saves the condition data, presents it in straightforward diagrams and charts, and provides a convenient analysis of all stored condition information.



VIBNODE®
Condition Monitoring System

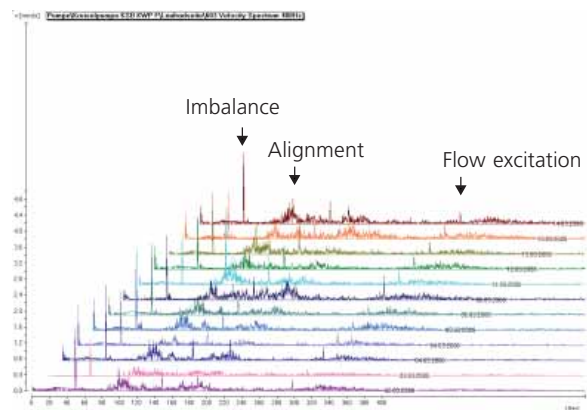


Vibration sensors in the area of the pump shaft bearing



Level 1 – Characteristic value trend

The vibration value trends are tracked in combination with the operating parameters. On this basis, predictions can be made on how the equipment condition will develop in the future, and the necessary maintenance measures can be defined.



Level 2 – In-depth diagnosis

The in-depth diagnosis functions can be used to pinpoint the causes for a deterioration in condition, making it possible to cost-effectively plan maintenance measures on the basis of the actual machine condition.



▶ Profit from the **benefits** of our
proven measurement systems –
and from the **extensive experience**
of our **worldwide PRÜFTECHNIK**
Machinery Service! ◀



Online + offline machine monitoring and diagnosis



Troubleshooting – Videoscopy, torque measurement



Measuring roller parallelism



Training, consulting and engineering



**Mobile measurements
Diagnosis + troubleshooting service**



Temporary and telediagnosis service