Online Condition Monitoring of Rotary Screw Compressors

- Increased system availability
- Predictive maintenance
- Service programs with remote monitoring
Process assurance and availability increase in rotary screw compressors in a plastics plant

Rotary screw compressors

In rotary screw compressors, the medium is compressed by means of two rotors. Due to their cyclical operation, screw compressors are grouped between reciprocating compressors and turbo compressors. Their vibration behavior is dominated by the discharge frequency of the charge output.

VDI 3836 differentiates screw compressors into four machine groups:

- **Group 1**
  Screw compressors with plain bearings and synchromesh gears (usually for compressing process gases)

- **Group 2**
  Screw compressors with roller bearings, or roller and plain bearings, and synchromesh gears (usually oil-free compressors for generating compressed air)

- **Group 3**
  Screw compressors without synchromesh gears (usually oil-flooded screw compressors)

- **Group 4**
  Roots-type superchargers with roller bearings and synchromesh gears (usually for generating compressed air at high volumes).

High availability requirements

The availability demands placed on screw compressors are extremely high for many production processes. Failure of non-redundant machines can result in the standstill of an entire production line, with loss-of-production costs quickly reaching six-digit figures per hour.

Screw compressors are frequently used for compressing air and refrigerant. Another major field of application is process gas compression in refineries and in oil and gas production. Machine protection also plays an important role. Unrecognized unallowably high machine vibrations, bearing damage and lubrication problems can lead to catastrophic failure of compressor units.

Condition monitoring during operation helps prevent faults, enables the early detection of wear processes and lets operators take full advantage of the component service life.

VIBNODE® provides reliable and cost-effective online condition monitoring for screw compressors.
Dry screw compressors

Reliable monitoring with the VIBNODE® online monitoring system

For the following components, condition monitoring is performed using frequency-selective monitoring of the specific machine vibrations and of structure-borne sound in roller bearings. These values are tracked in combination with operating parameters such as operating pressure, speed, output and temperatures:

- Main rotor / secondary rotor with rotor mesh
- Step-up and synchromesh gears
- Roller bearings
- Compression of charge
- Drive machine with coupling / belt drive

The condition information is automatically transmitted to the higher level system of the operator or to a service partner via a network connection or via eMail.

OMNITREND® diagnosis software

- **Level 1** – Overall value monitoring
  VIBNODE tracks the trend of the characteristic vibration values along with the operating parameters. On the basis of a rise in the trend, predictions can be made on how other condition parameters will develop. An alarm is output if a limit value is exceeded.

- **Level 2** – In-depth diagnosis
  The possible causes for condition deterioration are narrowed down using in-depth diagnosis functions. This permits condition-based and cost-optimized planning of maintenance measures.
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

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