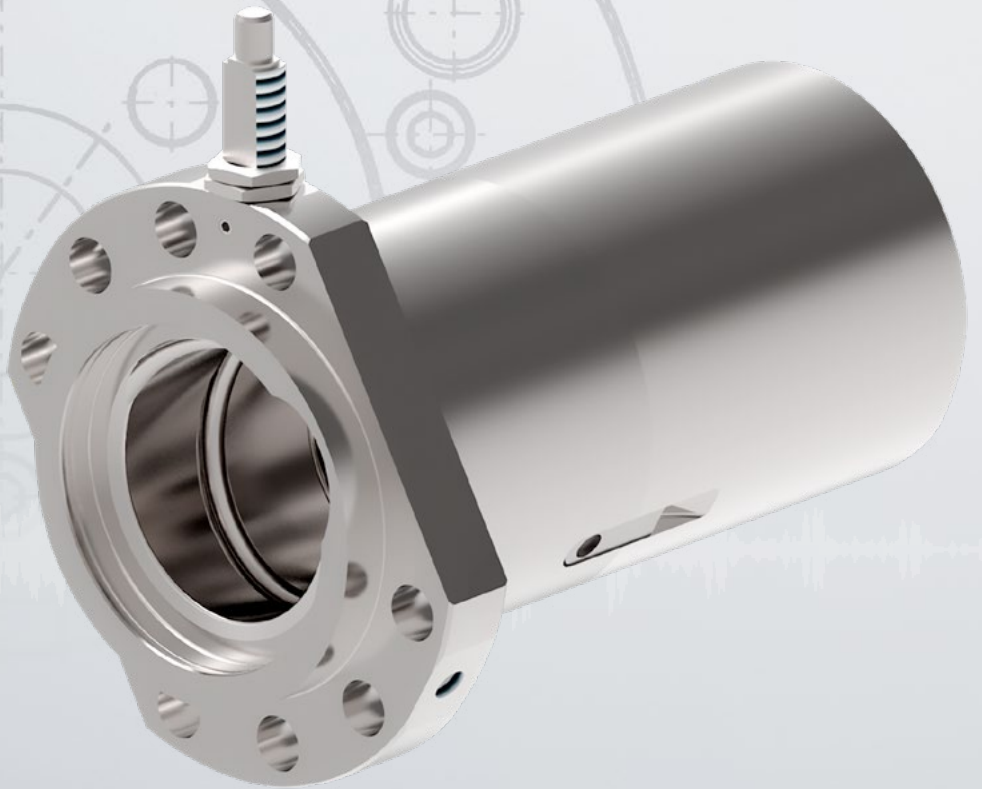


# SCHNEEBERGER



## Sensor Technology for Ball Screws

Ready for Industry 4.0

Solutions for Monitoring  
Functioning and Performance



**A.MANNESMANN**  
A member of  
SCHNEEBERGER linear technology

## Optimal Operations Monitoring for Perfect Functionality

The safest production processes are monitored operations. This also applies to ball screw drives used in machinery and plant engineering. The A.MANNESMANN sensor system is positioned on the nut flange. This provides direct monitoring results on operational behaviour in order to recognize operational status. It can also be used for documentation.

### Temperature sensors for optimal operating status

The operating temperature provides information on whether the operational behaviour is normal or abnormal. This important operational parameter for ball screws is determined directly at the nut flange, where the sensor measures the current temperature.

The temperatures established by the sensor are then compared with normal values. This makes it possible to categorise and analyse the current operational status. In case of deviations automated servicing and maintenance activities can be activated.

Long-term monitoring recognizes temperature trends. These show up and categorise situation- and time related changes early on, thus providing an important indicator regarding the service life of ball screw drives.



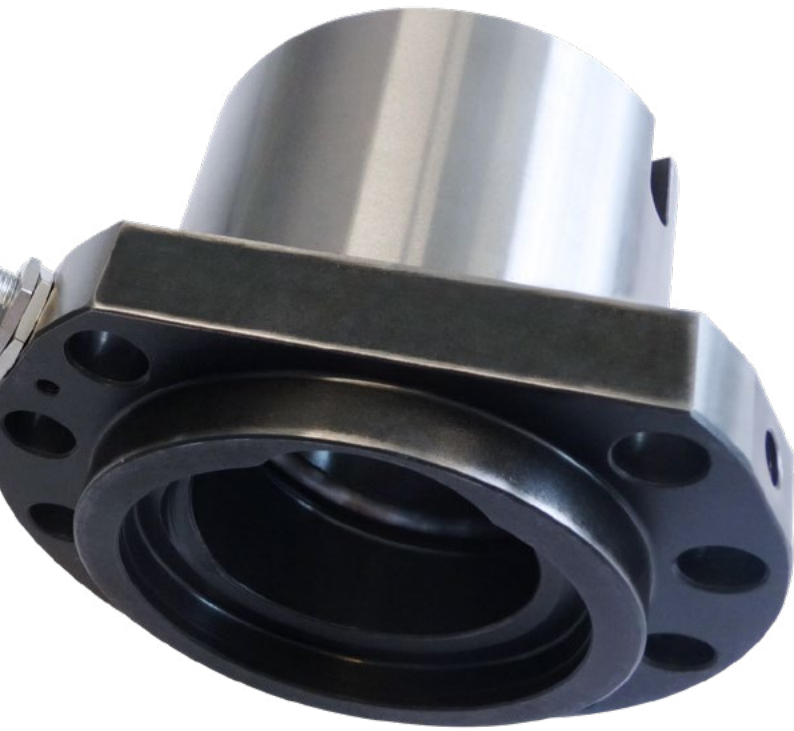
Sensor for temperature measurement on the nut flange

### Economic Advantages

- Operational reliability through performance monitoring
- Up-to-date information on the operational status
- Servicing and maintenance activation
- Avoidance of machine standstills
- Less wear and tear
- Longer service life
- Analysis and documentation
- Reliable prognoses

### Technical Advantages

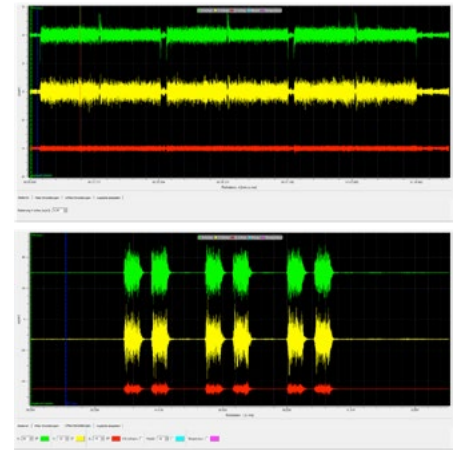
- Precise, targeted temperature monitoring
- Establishment and evaluation of vibration situation
- Analysis of vibration scenarios
- Establishment of the vibration parameters frequency, acceleration, speed, distance
- Parameter categorisation with sound diagnosis
- Measuring of running quality and performance
- Real time function monitoring



### Vibration sensors for perfect precision manufacture

The second and more complex operating parameter for ball screws is the establishment and evaluation of the vibration situation.

Due to their specific construction and their dynamic movements, all ball screws have different vibration scenarios, whose analysis provides important information about their insides. This information makes it possible to issue well-founded statements concerning the ball screw's current operational status and to make reliable prognoses regarding its future behaviour.



### Establishment of different vibration parameters

The total vibration pattern is measured at the nut flange with an accelerometer. Coordinated filters divide the total vibration into individual vibrations and establish the four important vibration parameters: frequency, acceleration, speed and distance.

By allocating the parameters to the ball screw's individual components, it is possible to make an unambiguous, reliable diagnosis. The vibration sensors allow objective establishment of the ball screw's running quality and performance.

### Practical Advantages of Sensor Technology

The operational reliability of machine tools is determined to a great measure by the all-encompassing functionality of individual machine components. Every deviation can have severe effects, which can, at worst, lead to machine standstill. That's why real time function monitoring is becoming more and more important.

The operating parameters of ball screws are an excellent basis for establishing status information. Two of these indicators are the operating temperature and the vibration situation.

Especially the vibration analysis provides detailed indicators concerning the operational status of ball screws.

By preparing the installation of a range of different sensors for ball screws, we lay the foundations for reliable measurements and sound measuring data, which in turn are the basis for your analysis and documentation strategy.

### Sensor System Requirements and Manufacture

Please contact us with your requests regarding sensor technology and analysis. Or maybe you have a vibration problem with one of your ball screws? We will gladly advise you without any obligation.

We will be happy to support you with our equipment, not only in choosing the suitable sensor technology, but also with its evaluation.



# The A.MANNESMANN Service

For all our ball screw products we offer comprehensive service and support during construction, assembly and during their complete service time:

- Constructive advice
- Parameter calculation and evaluation
- Specification of optimum lubrication
- On-site support
- Support during assembly
- Damage analysis
- Overhaul and repair
- Training

We are happy to provide you personally with detailed information. You can find an overview on our website.

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