



PUMP MONITOR

THE COMPLETE MODULAR SOLUTION
FOR CONDITION MONITORING
OF INDUSTRIAL PUMPS



BestSens

MODULAR & CUSTOMIZABLE

PUMP MONITOR

▶ Watch our video about the Pump Monitor

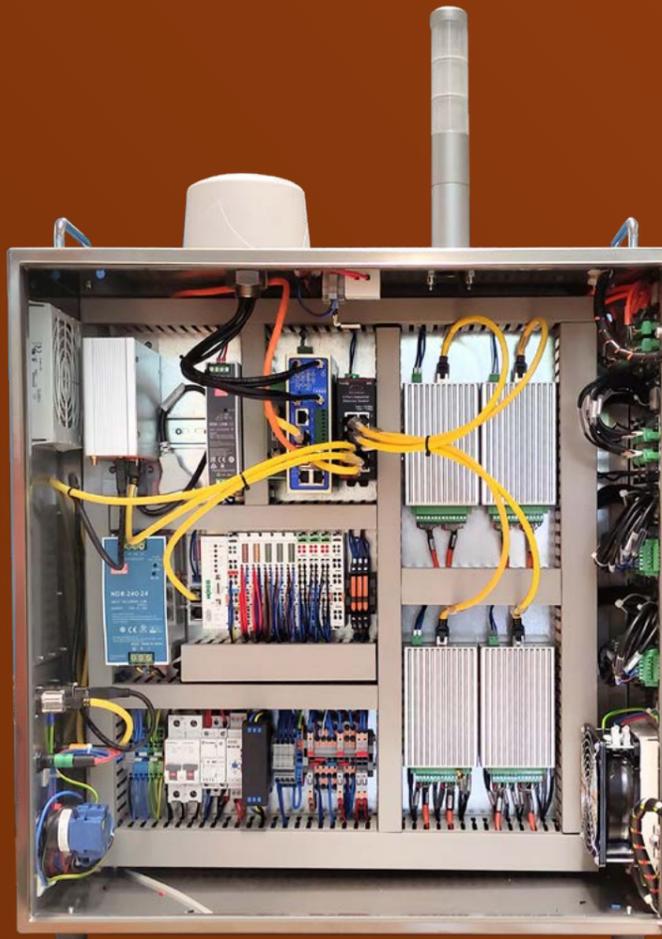
Part failures and malfunctions in industrial pumps often result in substantial damage to production plants and costly downtimes for operators.

Our industry leading condition monitoring solutions detect potential errors in pumps before they happen, enabling predictive maintenance and drastically increasing your pump's reliability.

With the Pump Monitor, BestSens AG offers its customers a complete modular solution for sensor-based condition monitoring of industrial pumps. Its modular design allows operators to configure the Pump Monitor, tailored to their specific requirements. Therefore users can choose between a wide variety of measuring modules and sensors, including our patented SAW-Technology. The evaluation and visualisation of the measured data is carried out online in the BestSens web application.

But what if these requirements change?

If necessary, the Pump Monitor's configuration can quickly and easily be adapted to changing conditions and its range of functions can be expanded by integrating additional modules and sensors.



Inside of a Pump Monitor cabinet

AT A GLANCE

YOUR BENEFITS

Learn about the value our solutions add to machines, plants and businesses

01 INCREASED RELIABILITY

Measure, detect and monitor even minor inconsistencies in the performance of your industrial pumps. Achieve the competitive edge in predictive maintenance by avoiding costly production downtimes.

02 CUTTING EDGE TECHNOLOGY

In addition to industry standard metrics such as pressure, flow, temperature and vibration, BestSens' Pump Monitor, with its patented SAW sensor technology, gives you unique and actionable insights into the condition of your mechanical seals and roller bearings. Our user friendly, web based dashboard provides an overview over all metrics measured - anywhere, anytime.

03 DATA DRIVEN SOLUTIONS

Make smart, data driven decisions on pump adjustments, part durability, repair times and maintenance schedules. BestSens' Pump Monitor analyzes not only the past and present performance of your industrial pumps to provide you with more insight and understanding of your machines condition. Furthermore it uses the accumulated data to generate accurate predictions. This aids you in operating your pump in the future and the strategical planning of maintenance schedules.

04 SAVE TIME AND MONEY

Production downtimes in process plants can quickly become a major expense. Understanding the relationship between operating machinery, component wear and defects helps reduce downtimes and consequential damages to expensive machinery, saving your company funds..

05 CUSTOMIZABLE TO YOUR NEEDS

Our modular design makes it easy to customize the BestSens' Pump Monitor to your needs. Choose from an array of different sensing and monitoring solutions or combine them if needed. Our prefabricated modules don't solve your problem? Let us know about your requirements regarding the pump to be monitored, the scope of the desired monitoring, interfaces to the installation site and specifications. We will tailor an individual solution to your needs!



MAXIMUM PROTECTION

PUMP

- Temperature
- Pressure
- Flow
- Vibration

- Mechanical seal monitoring
- Axial thrust monitoring



API PLAN

- Temperature
- Pressure
- Flow

BEST CONNECTIVITY

- Service connection via TCP / IP
- Connection to control room via Modbus/TCP
- Cloud connection via OPCUA and MQTT

VISUALIZATION

- service personnel gets alarms and warnings with recommended actions directly on the machine

CUSTOM CABINETS

- scope of solutions adapted to your requirements

BestSens Pump Monitor

Example for an implementation for monitoring two API 610 pumps in a refinery

PATENTED TECHNOLOGIES

SMART SEAL

WE MAKE SEALS SMART

According to operators, damaged mechanical seals are the most common cause of pump failures. Seal failure means substantial damage to a plant: the production process is halted and broken seal parts may damage pump components, for example the impeller. Moreover, removing leaked pumping media is a costly special task.

Industry standard for shaft sealing

Mechanical seals are the industry standard for sealing rotating shafts. The reason for this is that mechanical seals seal very well under normal operating conditions with little wear.

Mechanical seals for different applications

Depending on the application, mechanical seals are used in different material combinations and as single or double mechanical seals.

Why it is important to monitor the mechanical seal

According to the ReMAIN study, more than 60% of unplanned pump downtimes at BASF in Ludwigshafen are due to mechanical seal damage. Therefore monitoring the mechanical seal is the most effective solution for operating plants economically and safely.

Why BestSens technology is best suited for mechanical seal monitoring

BestSens technology is the only field-proven solution for mechanical seal monitoring that gives you direct insight into what is happening in the seal gap. The patented BestSens ultrasonic measurement provides you with valuable information for planning the next maintenance interval. Together with our partner, METAX Kupplungs-und-Dichtungstechnik GmbH, we can supply you with a sensorized mechanical seal for almost any application.



Watch our video about smart seal

PATENTED TECHNOLOGIES

AXIAL THRUST

WE MAKE BEARINGS SMART

The running time of centrifugal pumps depends decisively on the load on the bearings. With the BestSens AG measuring method, the axial forces can be recorded during operation, service intervals can be extended and operating conditions can be optimized for running time.

How axial thrust is generated in pumps

The axial thrust is the resulting axial force acting at the pump rotor. Mainly the axial thrust is generated by the pressure difference at the pump impeller.

How to balance axial thrust and the right bearing design

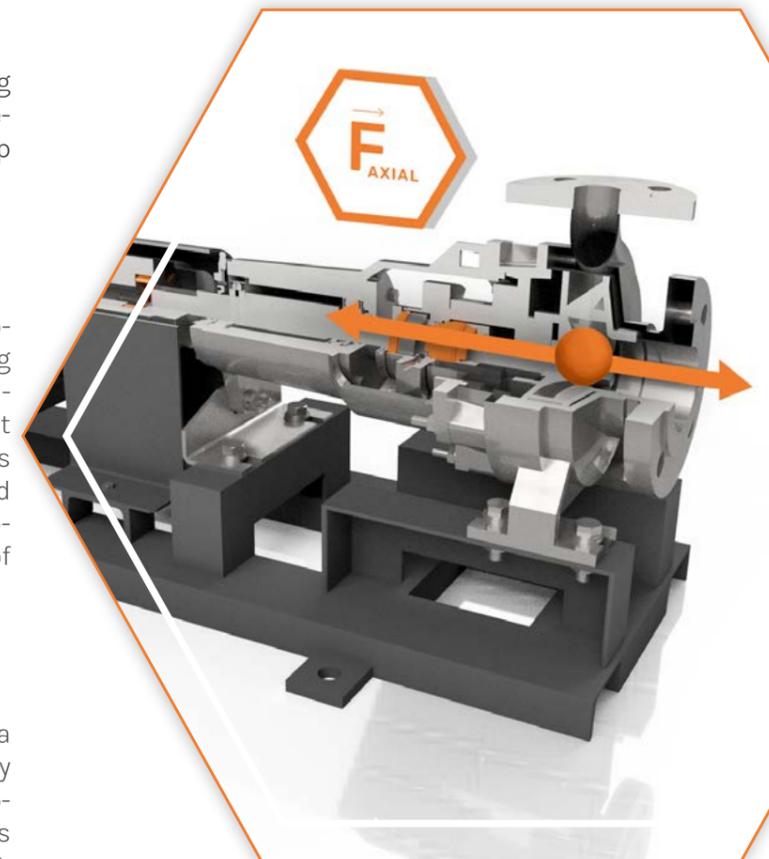
Axial thrust can be reduced by using a back-to-back design for multistage pumps, balancing holes, back vanes or a balance disc. The resulting axial thrust can be absorbed by axial thrust bearings. For small pumps, normal roller bearings are used as fixed bearings. For bigger pumps and multistage pumps the axial thrust is mainly absorbed by a preloaded X- or O-arrangement of two contact angle bearings.

Why axial thrust measurement is so important

The resulting axial thrust is a quality feature of a pump design and should be controlled especially for multistage pumps during the factory acceptance test. The resulting axial thrust determines the service life of the fixed bearing arrangement. Changes in axial thrust during operation provide information about the operating point and wear of the pump's hydraulic parts.

Why measure axial thrust with BestSens technology

You can determine the axial thrust with the original bearing setup. Easy installation of ultrasonic sensors through compression fittings in the bearing housing. Ready solution including the calibration of your bearing setup with the BestSens axial thrust calibration module. The axial thrust measurement works both for centrifugal pumps and positive displacement pumps which use deep groove ball bearings or contact angle bearings as fixed bearings.



Watch our video about axial thrust

TAILORED TO YOUR NEEDS

INQUIRY FORM

Customize your pump monitor: combine your desired modules, parts and software options

	name	function
<input type="checkbox"/>	cabinet (stainless steel)	protection of electronics
<input type="checkbox"/>	indicator light	e.g. indication of alarms /warnings
<input type="checkbox"/>	Protection Level for sensors and cabinets	protection against environmental conditions (e.g. ATEX)

	name	function
<input type="checkbox"/>	modbus TCP (ethernet)	communication with controller (PLCs)
<input type="checkbox"/>	modbus RTU	e.g. communication with control center
<input type="checkbox"/>	ethernet TCP/IP	e.g. service interface
<input type="checkbox"/>	wifi	e.g. access via mobile device
<input type="checkbox"/>	cellular interface / LTE	remote access
<input type="checkbox"/>	relais	e.g. shutdown signal (if trigger levels are crossed)
<input type="checkbox"/>	touch-panel 10"	on site visualization
<input type="checkbox"/>	web-application in customer CD	individual interface design
<input type="checkbox"/>	cloud connection via MQTT	linking of measurement data from the field to a database

	pcs.	classification	sensor position	measurand	unit	signal type	measuring range
<input type="checkbox"/>		pumped medium	suction side	pressure	bar	4 - 20 mA	0 - 16
<input type="checkbox"/>		pumped medium	pressure side	pressure	bar	4 - 20 mA	0 - 16
<input type="checkbox"/>		pumped medium	suction side	temperature	°C	Ω (PT100/1000)	0 - 120
<input type="checkbox"/>		pumped medium	pressure side	temperature	°C	Ω (PT100/1000)	0 - 120
<input type="checkbox"/>		Seal condition	seal	temperature ultrasonic	°C indicator light	Ω (PT100/1000) analog	-40 - 150
<input type="checkbox"/>		bearing condition mechanical stress pump	motor or bearing housing	vibration acceleration 3-axis (x,y,z)	mm/s²	IEPE	z.B. +- 500mV/g (+16g)
<input type="checkbox"/>		bearing condition mechanical stress pump	motor or bearing housing	vibration accelartion 1-axis	mm/s²	IEPE	z.B. +- 500mV/g (+16g)

classification	sensor position	measurand	unit	signal type
expansion options	e.g. API-Plan	temperature	°C	Ω (PT100/1000)
expansion options	e.g. API-Plan tank	pressure	bar	4 - 20 mA
expansion options	e.g. API-Plan	fill level	litre	4 - 20 mA
expansion options	e.g. API-Plan	flow rate	litre	4 - 20 mA

INQUIRE

Who are we talking to?

Where are you from?

What's your company?

How can we contact you?

What do you want to tell us?

- send copy to my mail address
- subscribe me to the BestSens Newsletter
- I agree to the use of my data for marketing purposes

send



The BestSens AG headquarter in Niederfüllbach, Germany

The BestSens AG

Your partner for pump reliability

Excellent partner with continuity and sustainability

For 10 years, the board members and company founders of BestSens, Sebastian Stich, Wolfgang Diller and Lars Meisenbach have been your reliable contact. With innovative strength, customer orientation, perseverance and the highest motivation, BestSens' core team grows organically to guarantee you the best possible solutions, insights and support. Among other things, the award of the Bavarian Ministry of Economic Affairs as digital champion shows the pioneering role of BestSens AG and reflects the market success of the solutions. The management and our work are characterised by the combination of ten years of experience and the drive and vision of our dynamic team.

Technology leader in the field of machine monitoring

BestSens solutions are at the cutting edge of technology, especially for the monitoring of mechanical seals and roller bearings in machines such as pumps. A large number of patents reflect the technological leadership. The core technology of many solutions are sensors and systems with which you can precisely examine the condition and operating conditions of components such as mechanical seals and roller bearings by means of surface acoustic waves (SAW: Surface Acoustic Waves). This not only tells you when a component needs to be replaced, but also allows you to investigate the damage mechanism.

Combining market and customer understanding

We want you to understand, that we want to understand you. We really do! Every day we strive to fully understand your tasks and needs in depth in order to provide you with suitable solutions. To this end, we have put together an interdisciplinary team of computer scientists, electrical engineers, physicists and industrial mechanics who can understand your CAD drawings as well as your automation setup, and work with you to find long-term solutions to your problems at hand. We actively and regularly participate in all relevant trade fairs and events, such as ACHEMA, the Praktiker Conference in Graz. Since 2021, we have been actively involved in the technical diagnostics working group of PCK refinery in Schwedt a.O.

Proven partner in an excellent company network

Complex solutions require cooperation between specialists. Since the company was founded, BestSens AG has built up strong and reliable partners in the fields of sealing technology, roller bearings, pump manufacturers, rotating equipment service, software solutions and certification bodies. We experience time and again that this interdisciplinary cooperation enriches all parties.

Made in Germany

To meet your highest quality demands, BestSens AG develops and produces all solutions at both locations, the headquarter in Niederfüllbach near Coburg and the development office in Nuremberg, Germany.

 [Watch our video
about BestSens](#)



Sebastian Stich
M. Eng., Dipl.-Ing. (FH)
CEO
my favorite topic:
axial thrust measurement



Lars Meisenbach
Dipl.-Ing. (FH)
CSO
my favorite topic:
solutions for pump system monitoring



Wolfgang Diller
M. Eng., Dipl.-Ing. (FH)
CTO
my favorite topic:
monitoring of mechanical seals

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