ABEL®
Pump Technology

We are ABEL!

Predictive Maintenance

with the Help of AI

FüE
BSFZ
- 2022 -



Diaphragm Pumps
Solids Handling Pumps
High Pressure Pumps
Marine Pumps

www.abelpumps.com

Predictive Maintenance

What does that mean?

What Type of Maintenance are you currently doing?

Run to Failure

- unplanned downtimes
- time-consuming troubleshooting
- consequential damage possible
- long maintenance intervals possible

Preventive Maintenance

- too short maintenance intervals
- useful life of parts is not fully exploited
- high spare parts consumption
- less unplanned downtimes

NEW: Predictive Maintenance combines the advantages of previous maintenance routines:

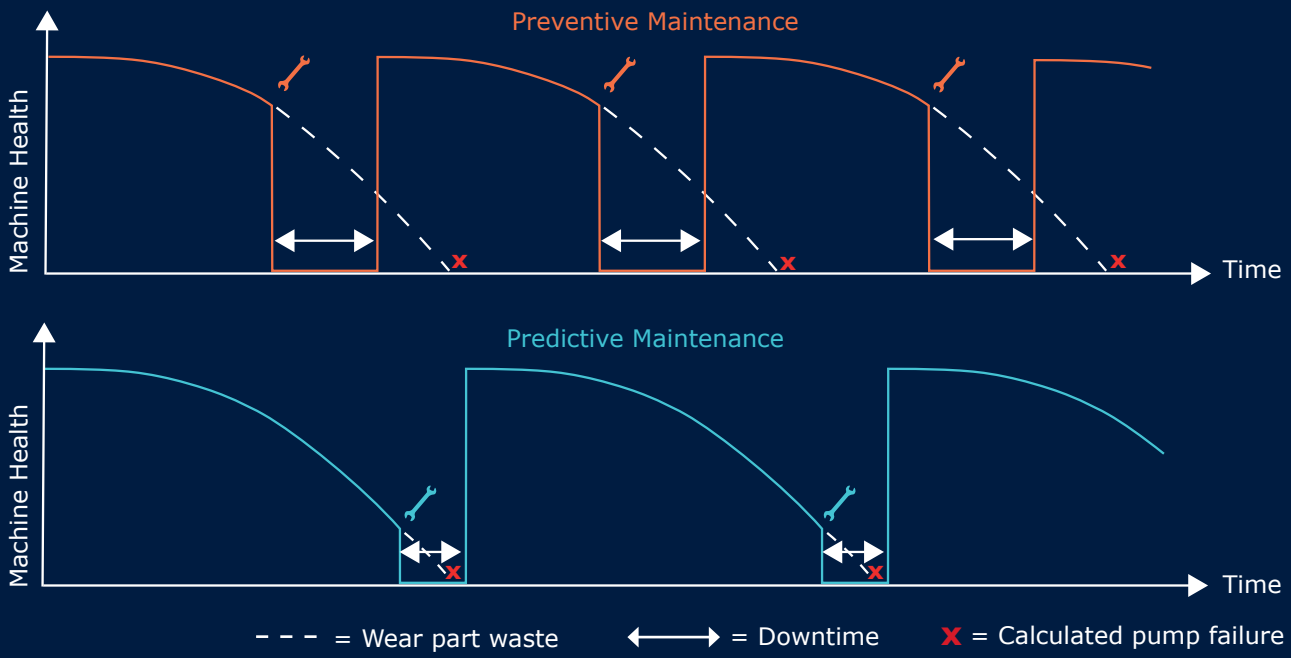
- up to 50% longer maintenance cycles
- up to 25% lower spare parts costs
- improved maintenance planning
- minimized unplanned downtimes
- early detection of critical situations
- reduced reaction times
- best possible pump performance

Reduction of operating costs - up to 25 % → **Peace of mind**

„Start your journey towards predictive maintenance."

Predictive vs. Preventive Maintenance

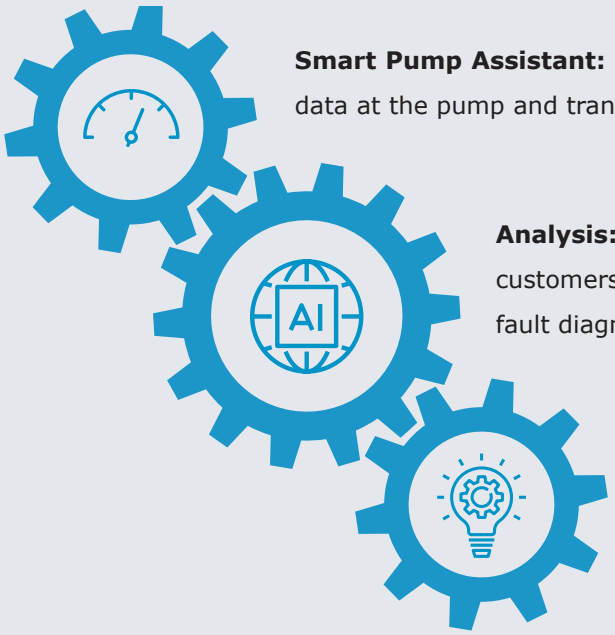
Up to three times less Downtime with Predictive Maintenance!



Predictive Maintenance

How does it work?

Our Predictive Maintenance Philosophy



Smart Pump Assistant: A sophisticated hardware concept captures all essential data at the pump and transfers them to the cloud.

Analysis: Our AI tool analyzes the pump health to provide customers with reliable information for process optimization and fault diagnosis.

Empowerment: Together with the customer, we work out a customized predictive maintenance strategy and remain in very close contact.

„Predictve maintenance as a philosophy to be enabled for and with customer."

Phases of implementing Predictive Maintenance

Phase 1	Phase 2	Phase 3
SPA Commissioning & Train AI model	Optimizing Process	Predictive Maintenance

- Achieve the best efficiency in operation & maintenance
- Effect the development - Each new step is based on the your needs!

Smart Pump Assistant (SPA)

24/7 Automatic Error Detection with Help of AI

We detect the most common errors!

Wear-based failures:

- Suction valve wear
- Discharge valve wear
- Piston wear

Event-based failures:

- Sedimentation in the downstream pipeline
- Wrong pulsation dampener setting
- Too high discharge pressure
- Suction valve blockage
- Discharge valve blockage
- Hydraulic control functionality
- Loosen diaphragm rod





„We are able to predict wear based failures up to several weeks in advance."

Smart Messaging System

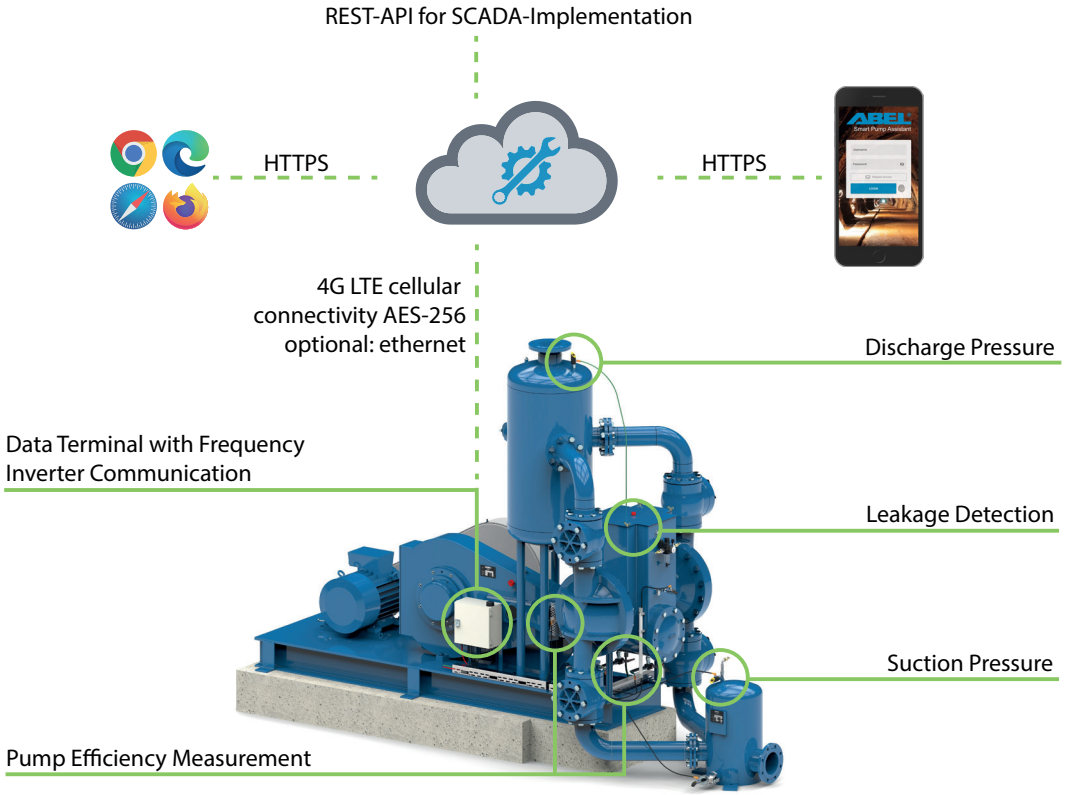
- **Notification when certain thresholds are exceeded**
- **Notification in case of errors with detailed error information**
- **Monthly Pump Performance Report**
- **Notifications can be sent via email, SMS & app**



Smart Pump Assistant

Hardware Concept

24/7 Pump Monitoring	Coverage
Data access via browser or app	✓
24/7 real-time alerts	✓
Historical trends	✓
Data export to multiple formats	✓
Runtimer	✓
Stroke Counter	✓
Stroke Frequency (RPM)	✓
Suction Pressure	✓
Discharge Pressure	✓
Oil Pressure	only HMQ
Oil Temperature	only HMQ
Flow Rate (calculated)	only CM & HM
Flow Counter (calculated)	only CM & HM
Diaphragm Leakage Detection	✓
Pump Efficiency Measurement	✓



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The pumping solution for your industry:

- Mining
- Water and Wastewater
- Ceramics
- Chemical
- Oil and Gas
- Energy Industry
- Corrugated Board
- Paint and Varnish
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