PREDICTIVE MAINTENANCE
34 | Condition Monitoring – Enabler für Industrie 4.0

HYDAC SPECIAL EDITION

08 | LOUNGE
„Fluidtechnik – extrem vielschichtig, unglaublich spannend“

HYDAC CM-EXPERT
Maschine 2

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Intelligent sensor systems, IoT gateways, edge computing, cloud services, big data analysis, machine learning, digital twin, administration shells, greenfield, brownfield, data hub, energy management ... is that everything? These topics relating to I4.0 are spoken and written about constantly. If you’re looking for the usual Industrie 4.0 buzzword bingo, however, this isn’t the article for you.
When the German federal government set up Industrie 4.0 as a research project, it undoubtedly wasn’t fully aware of the effects it would have on the industrial landscape in Germany. Industrie 4.0 is a revolution that has been designated as such while it is still in progress. For the three previous industrial revolutions, this wasn’t the case.

WHAT IS I4.0 ACTUALLY?
The so-called fourth industrial revolution aims to link together people, production plants and products, digitise them and thus incorporate them into the value creation process. But this digitisation process is only possible with specific tools, or “enablers”. In other words, things that make something possible.

So what is it that we are trying to do? And what makes condition monitoring suitable as an “enabler” for Industrie 4.0? It’s all about data, and collecting data. Data comes in all kinds of formats and from all manner of sources.

But what is data?
According to the dictionary:

- [numerical] values resulting from observations, measurements, statistical surveys and the like, information based on observations, measurements, statistical surveys and the like, formulatable findings;
- (EDP) facts, figures, information saved electronically;
- (mathematics) numerical values or variables required for finding a solution or performing a calculation for a problem.

Now things start to make sense. All companies already have this data. It is stored in a wide variety of formats and languages. The crux of the matter is: who will evaluate the existing data? And how can all the data that is generated be “managed” and evaluated?

By poring over machine logbooks and documenting recurring events? Not really.

By structuring information available in programmable memory controls, pre-compressing it and converting it into usable information? Not usually.
SO WHAT IS TO BE DONE?

Why not make use of an “enabler” that can help a company to generate useful and practical information from the large volume of data already present in the company’s diverse range of machines?

And (online) condition monitoring, which has been highly praised for years, although taking some time to become established for certain monitoring methods, is just such an “enabler”. Too difficult, too costly, too complicated. Return on investment (ROI) hard to calculate, investments have no direct “payback”.

The data is already there. Every machine and plant owner has it. All that needs to be done is for it to be evaluated and, for example, converted into recommendations for action.

THE SOLUTION

For this purpose, HYDAC has created a plug-and-play system that links together the wide variety of data from all kinds of sources, pre-compresses the data and uses it to generate intelligent machine-and process-related information, messages and recommended actions. The company originally comes from the hydraulic component and system line of business and now supplies a wide portfolio of products and services, constantly refined thanks to in-depth application knowledge and adapted to customers’ needs.

The HYDAC condition monitoring portfolio has the perfect tools for use in greenfield and brownfield applications, from intelligent sensors with bidirectional communication (Fig. 01) and corresponding gateway, smart components with integrated algorithm (Fig. 02 to 04), stand-alone condition monitoring for oil and oscillation analysis (Fig. 05) and a machine-related dashboard for one or more machines in production to extensive process visualisation and certified energy management system (as shown in the lead picture).

A gateway (Fig. 06) can be used to effortlessly equip individual machines or sensor systems with an individual dashboard (for OEE, availability, quality etc.) so that they can later be incorporated into a higher-level monitoring and energy management system. This modularity spares the machine owner extensive investments and thus enables the owner to equip the entire machinery with scalable data analysis bit by bit.

JUST ONE SMALL STEP

Predictions for the life expectancy of components and systems, pending consumable changes and process-related errors are all communicated in real time. Data from ERP systems is linked with machine and process data to improve coordination between production jobs and machine availability and to optimise the productivity of production. With the HYDAC system, predictive maintenance is just one small step away from condition monitoring.

HYDAC experts work in partnership with customers to decide what hardware and software modules are needed, whether the user would prefer a cloud service or a local server solution and how the individual dashboard and corresponding analysis tools should look. All in the spirit of “learning together in the brownfield!”

Photos: HYDAC, Saarbrücken

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