

Gateways and cloud enable digital twin

Successful project shows measurable added value with digital re cooler

In a pioneering development project, Heidinger, Cabero and ebmpapst neo are demonstrating at Kappler CNC how system reliability and efficiency can be taken to a new level with the help of a digital twin.

ebmpapst neo, the Dortmund-based digital subsidiary of fan specialist ebmpapst, is using newly developed sensors to measure vibrations on the adiabatic re cooler and analyze the air flow. The data from both measurements initially flows into an IntelliGate gateway, from where it is uploaded to the epCloud. Kappler GmbH & Co. KG, a leading international manufacturer of precision components based in Birkenfeld, was quick to embrace the project involving its re cooler.

Precision in production and on the roof

Due to the sensitive precision components in production, temperatures at Kappler CNC are accurate to plus/minus one Kelvin throughout the entire production process. One system that contributes to this precise temperature control is the jumbo re cooler system from Cabero installed by Heidinger in 2022 with 24 HyBlade axial fans with AxiTop diffusers from ebmpapst. The specialists from ebmpapst neo installed vibration meters and other sensors on all the fans. Data analysis enables conclusions to be drawn about the operating status by comparing the vibrations on the re cooler with standard values. For Cabero, this provides important information on possible optimization potential in the design of the re coolers. For Heidinger, unexpected vibrations are a signal that a service call may be imminent and should be proactively scheduled.

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The IntelliGate gateways are another component of the digitalization project. This is where all the data from the new sensors comes together and is uploaded to ebmpapst neo's epCloud. Ultimately, the collection of data such as air flow, temperature, vibration and current draw makes it possible to create a model of the Kappler system: the so-called digital twin. This model can be used to determine the current status of the system and predict potential problems – which in turn enables Heidinger to react proactively to avoid unplanned downtime and service calls. The digital twin works completely independently and is decoupled from the Kappler network. Only authorized users can analyze the data and identify optimization potential for the customer.

At Kappler CNC, the digital twin has confirmed what everyone involved expected from its real-life counterpart: the system is running extremely efficiently and smoothly. Adrian Heidinger is enthusiastic about the project: "Projects like this show the real added value that intelligent technology can offer any company, even with little effort. Thanks to the minimal time and effort required for installation, we can also use targeted data analysis to determine where there are snags and where efficiency improvements are possible, even for companies with older systems."

Contacts Trade press

Pascal Schöpf
+49 7938 81-7006
Pascal.Schoepf@de.ebmpapst.com

Corinna Schittenhelm
+49 7938 81-8125
Corinna.Schittenhelm@de.ebmpapst.com

Katrin Lindner
+49 7938 81-4224
Katrin.Lindner@de.ebmpapst.com

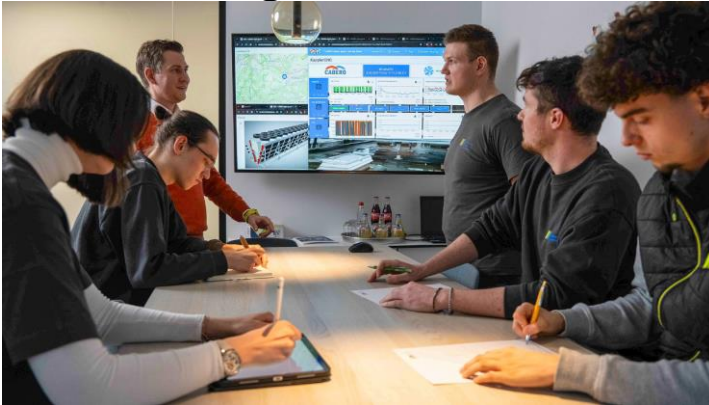
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Press office contact
ebmpapst Group
Phone +49 7938 81-7105

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Picture 1: The digital twin can be used to determine and monitor the current system status.



Picture 2: All the data from the new sensors converges at the gateways and is uploaded to the epCloud.

Picture 1 Lukas Zwiessele for ebm-papst
Picture 2 Lukas Zwiessele for ebm-papst

Characters approx. 2,900, including headings and sub-headings
Tags Digital twin, cloud, gateway, efficiency, operational reliability, data, intelligence
Link <http://www.mag.ebmpapst.com/kappler>

Contacts Trade press

Pascal Schöpf
+49 7938 81-7006
Pascal.Schoepf@de.ebmpapst.com

Corinna Schittenhelm
+49 7938 81-8125
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About ebm-papst

The ebm-papst Group, a family-run company headquartered in Mulfingen, Germany, is the world's leading manufacturer of fans and motors. Since it was founded in 1963, the technological leader has set international industry standards with its core competencies in motor technology, electronics, digitalization, and aerodynamics. ebm-papst offers sustainable, intelligent, and tailor-made solutions for virtually every requirement in ventilation and heating technology.

In the 2022/23 financial year, the Group generated turnover of EUR 2.540 billion. It employs just under 15,000 people at 30 production sites (including in Germany, China, and the U.S.) and in 50 sales offices worldwide. ebm-papst sets the benchmark in almost all sectors, such as ventilation, air conditioning and refrigeration technology, heating technology, information technology, mechanical engineering, intralogistics, and medical technology.

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Pascal Schöpf
+49 7938 81-7006
Pascal.Schoepf@de.ebmpapst.com

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+49 7938 81-8125
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Katrin.Lindner@de.ebmpapst.com

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