VISIONS

AUTOMOTIVE | NO. 3

HIGHLIGHTS

VAHLE


ATTENTION

TAILOR-MADE FUTURE SOLUTIONS

READY FOR TOMORROW

Dear readers,

Welcome to the latest issue of VAHLE Visions – the exclusive insight into the latest product and application highlights. This issue focuses on applications from the automation and automotive solutions segment. True to our motto “Making your application future-proof”, we present forward-looking product and application solutions.

Modern automation solutions are characterized by dynamics and diversity. VAHLE meets these challenges with customized solutions that guarantee maximum efficiency and precision. With over a century of experience, we continuously underline our innovative strength and technical excellence.

This issue highlights the latest developments that make applications future-proof – whether through new installations, retrofits or service measures. VAHLE offers a comprehensive portfolio that enables companies to make the transition to the Smart Factory a reality. Our technologies, such as CPS® contactless power transmission, innovative control systems and preventive maintenance activities, exceed current standards and offer long-term efficiency.

On the following pages, we present solutions that ensure the future viability of plants and systems through reliable energy transmission and robust data communication. These technologies set new standards for efficiency and sustainability. With these insights into innovative technologies and solutions, we offer you a comprehensive overview of the possibilities of modern automation.

Your Vision. Our Solution.

HOW VAHLE SOLUTIONS SHAPE THE PRODUCTION OF THE FUTURE

In a rapidly changing manufacturing world, the Smart Factory is at the heart of industrial transformation. While Industry 4.0 has become part of everyday life for many companies, the Smart Factory goes a step further. It represents the use of cutting-edge technologies that take sustainability, efficiency and flexibility to new levels. The challenges of the future require systems that not only automate, but also adapt to new demands, markets and environmental conditions.

This is exactly where VAHLE comes in: Under the motto „Making your application future-proof," the company is shaping the production landscape of the future with innovative automation components and a comprehensive solution portfolio for new systems, retrofits and targeted service activities.

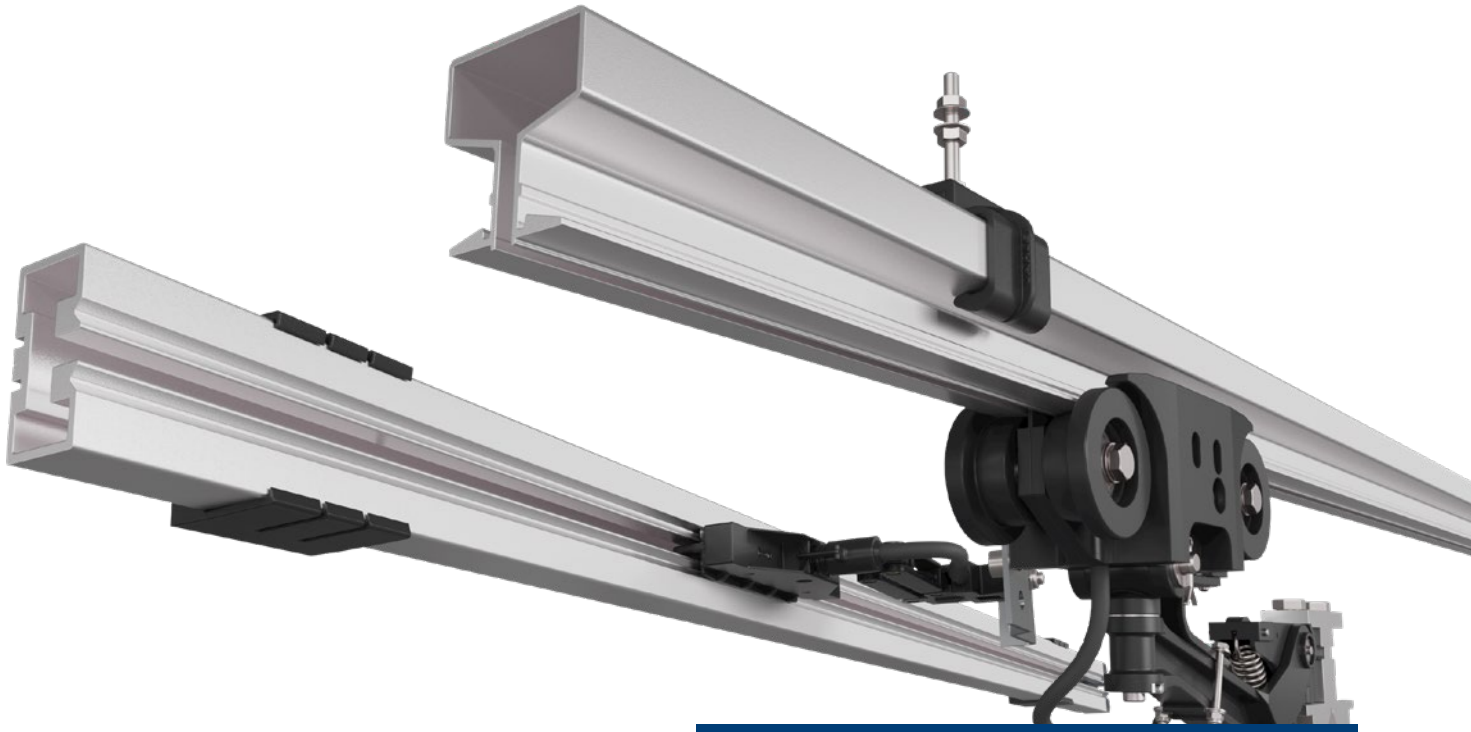
Importance of the Smart Factory

A Smart Factory combines technologies such as the Internet of Things (IoT), artificial intelligence (AI) and big data to continuously improve production processes.

It is about more than just collecting data: The real innovation lies in intelligently linking and analyzing this information. Through secure and flexible networking, it is possible to optimize current production processes and meet future challenges more effectively.

VAHLE's contribution to the Smart Factory

To pave the way for the Smart Factory, VAHLE is developing solutions that are specifically tailored to the requirements of digitally networked production. VAHLE drives innovation with a holistic approach that includes electrification, communication and control technology. With its vCOM platform, the company is a pioneer in the field of data communication.



Slotted Microwave Guide helps ensure secure process communications

A key element of a Smart Factory is the Slotted Microwave Guide, the heart of secure process communication. It guarantees interference-free data transmission and is available in different versions for both indoor (SMGM) and demanding outdoor (SMGX) environments. The shielded Slotted Microwave Guide is characterized by a high level of HF impermeability, which prevents unwanted signal leakage and the influence of external sources of interference – a factor that has been classified by TÜV.

This technology enables advanced concepts such as cybersecurity, secure boot and even machine learning in production processes. In this way, VAHLE not only meets today's production requirements, but also supports future developments in manufacturing technology. Slotted Microwave Guide technology offers the following advantages:

- ⊕ **Secure, robust and reliable data communication**
- ⊕ **High data transfer rates**
- ⊕ **No roaming between segment areas**
- ⊕ **Compact design for space-saving integration**
- ⊕ **Compatibility with all common EMS profiles**
- ⊕ **Plug-and-play for easy installation and commissioning**
- ⊕ **Co-existence with existing wireless systems**
- ⊕ **Support for PROFINET and PROFIsafe, including automatic prioritization of PROFIsafe**
- ⊕ **Field-proven compact holder for VAHLE conductor and control systems**

FUTURE OUTLOOK AND INNOVATIONS

The Innovation and Development Center of VAHLE Automation is working intensively to make the technologies future-proof and to prepare them for the requirements of the coming decades. Special attention is paid to the following areas.

Expandable communication systems
Technologies that can be easily integrated into existing wireless systems to provide future-proof communications options.

Integration into modern networks
The transition to 5G and Wi-Fi networks is at the heart of developments. This integration ensures maximum flexibility with faster and more reliable data transfer.

Flexibility and availability
The systems of the future offer maximum flexibility and high availability to further increase production efficiency and reliability.

Scalable hardware solutions
Powerful hardware that scales and adapts to future standards for long-term investment protection.

These technologies are key components of the „future-proof" approach, which aims to transform industrial production sustainably through innovation. VAHLE Automation's development projects consistently follow this path.

TECHNOLOGIES FOR THE FUTURE OF MANUFACTURING

Innovative technologies and advanced systems are critical to the success of new manufacturing facilities. Especially in modern material handling, inductive power transmission is central to the power supply of transport applications.

THE SMOOTH FUTURE

INDUCTIVE ENERGY TRANSMISSION

Inductive energy transmission is one of the most advanced technologies in the VAHLE portfolio and offers decisive advantages for the user. In environments where cleanliness and minimal particle contamination are of the utmost importance – such as food production, the semiconductor industry and other clean room applications – users benefit from inductive energy transmission. A recent example of the successful application of our technologies is our project at Westvlees in Belgium. There, one of the most modern overhead conveyor systems has been installed, completely equipped with VAHLE systems. This includes the control system, the inductive energy transmission and the data communication.

The inductive CPS® power supply eliminates frictional wear, thus preventing contamination that could affect production quality – a critical advantage, especially in the white range of food production. It is also virtually maintenance free.

Modular supply
VAHLE Pickup Units and VBX Feeders are designed for maximum modularity. The segmented feeders can be scaled in 10 kW increments up to 30 kW, with no limit on total system power.

Flexible track installation
VAHLE CPS stranded conductors allow maximum flexibility in track installation. From movable turnouts to coaxial supply lines, they guarantee maximum efficiency.

Powerful pickups
With 4 kW per unit, the E400 pickups are VAHLE‘s most powerful compact pickups. In combination with the RE400 560V control electronics, a stable power supply and a perfect interaction between vDRIVE control and power supply are guaranteed.

MODULAR SOLUTIONS

ADVANCED COMMUNICATION AND CONTROL ELEMENTS

In addition to energy transmission, our vDRIVE communication and control solutions play a central role in today's manufacturing processes. These systems provide precise monitoring and control to ensure process reliability and efficiency. Integrated real-time data analysis and seamless communication between components contribute to an optimal process flow.

Modular in design, these systems can be combined with a variety of data communication systems to provide the following benefits:

Flexibility and efficiency
vDRIVE control solutions provide a scalable platform for motion axes, sensors and safety functions. They have numerous digital interfaces for standard sensors and use standardized components to minimize maintenance. This enables short delivery times and high functional transparency, complemented by an open system architecture for maximum performance without additional head control.

Next generation communication power
Combining vDRIVE motion control with vCOM communication unleashes the full power of the system. This combination ensures precise control at high data rates that meet the demands of Smart Factory and Industry 4.0. In addition to standard data communication via half-wave and rail bus, the advanced SMGM Slotted Microwave Guide System is also available.

Functional safety
In automated environments such as intralogistics and automotive manufacturing, flexibility and safety are critical. Our TÜV-certified VCS-SMG-SAFE application control enables reliable implementation of safety functions (such as safe shutdown, safe position and safe speed) and protects both personnel and production from disruptions. Preconfigured applications and fail-safe configuration simplify the integration of these safety solutions.

VCS1
Control system

- Modular design
- Features specific to Electric Monorail Systems, especially lightweight EMS
- Predefined I/O interfaces
- Standard pulse code modulation versions available
- 23% reduced material consumption*

*Compared to previous generation

VCSX
Modular controls

- Modular construction system
- Standard designs for quick implementation
- Power range from 0.75 to 7.50 kW (expandable to 22 kW)
- Configuration via PLC function block – no head control required
- Plug-and-play module connections

VCS-SMG-SAFE
Safe application control

- TÜV-certified safety control up to Performance Level E (PLe) / SIL3
- PROFINET / PROFIsafe communication profile from stationary to mobile – fully transparent throughput
- Preconfigured technology applications for easy implementation

OVERHEAD HOIST TRANSPORT SYSTEM SOLUTIONS

CERTIFIED EFFICIENCY FOR OHT SYSTEMS

One of the latest and most important applications in the field of materials handling is the Overhead Hoist Transport (OHT) system, which is mainly used in the chip and semiconductor industry. VAHLE is one of the few suppliers with the necessary certifications and application know-how for this high-performance technology. With VAHLE solutions for new systems – from inductive energy transmission via classic conductor bars to control and communication systems – production environments can be designed for the future.

Inductive energy transmission from VAHLE offers numerous advantages, including minimized maintenance and increased operational safety, which extends the life of the systems and reduces maintenance costs. VAHLE's CPS140 system is the most energy efficient compared to other linear, non-contact energy transmission systems. Particularly in sensitive production areas such as the food and semiconductor industries, this technology ensures that contamination and particle pollution are avoided.

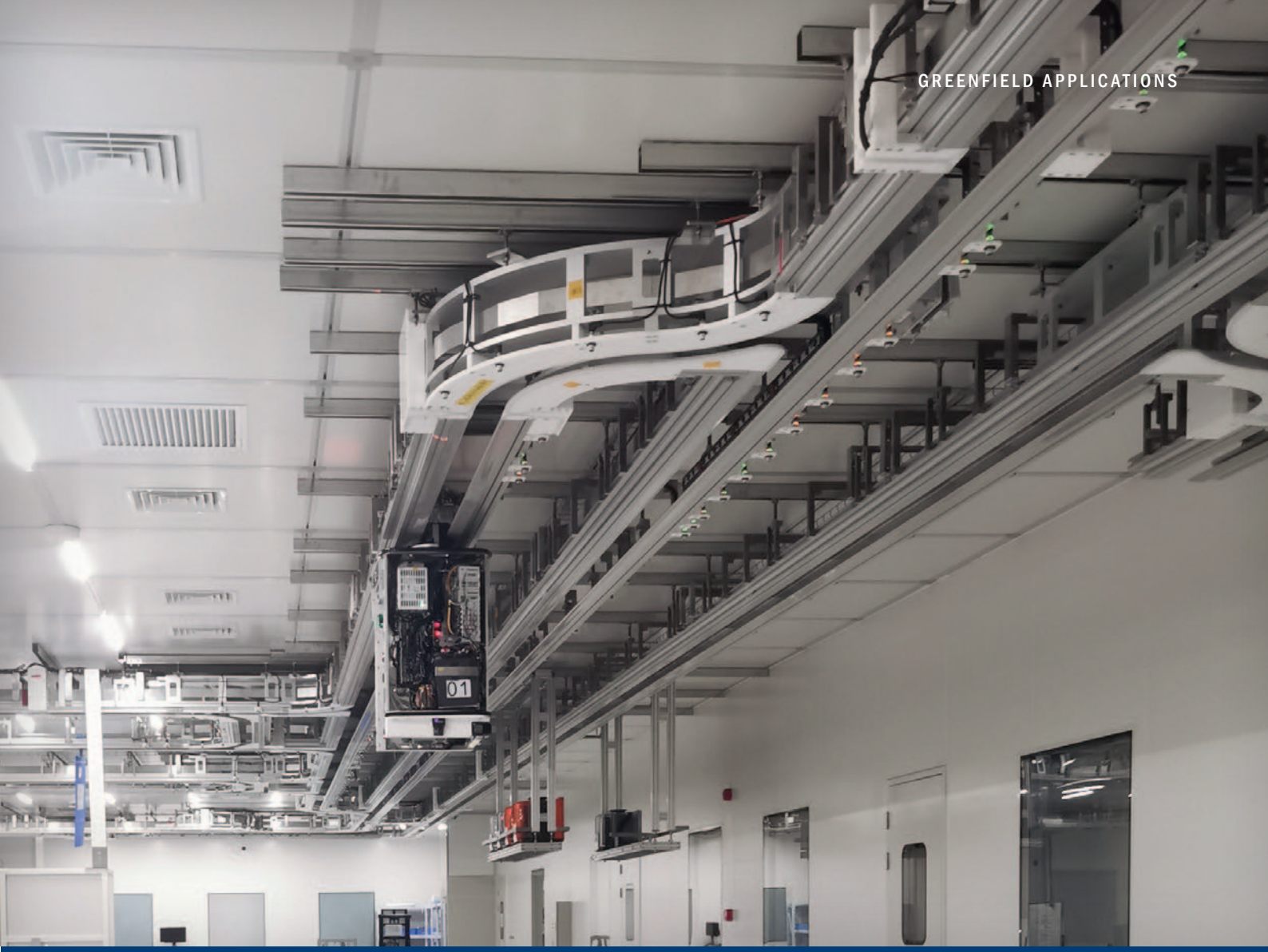
Our inductive CPS140 technology successfully meets the stringent requirements of **Semiconductor Equipment and Material International (SEMI)** and has been certified according to both **SEMI S2** and **SEMI S22**. These certifications underscore the suitability of the VAHLE CPS140 solution for use in OHT systems, where process reliability and product quality are of paramount importance.

The advanced control and communication systems from VAHLE enable seamless integration and real-time monitoring of production processes for maximum reliability. With certified solutions for high-performance systems such as OHT, your plants are optimally prepared for future requirements.

VAHLE CPS140 technologies in the OHT sector

Highest performance
The U150 pickup offers maximum performance in minimum space, making it ideal for high performance applications such as OHT.

Modular voltage levels
The RE150's modular design makes it easy to provide the appropriate system voltages (24-80 V, 280 V, 560 VDC).



SEMI CERTIFIED
S2 | S22

Certified excellence for maximum safety

Efficient and secure technology
VAHLE's CPS140 technology meets the stringent requirements of **Semiconductor Equipment and Material International (SEMI)** and is certified to both **SEMI S2** and **SEMI S22**. These certifications guarantee maximum safety, efficiency and reliability in operation, especially in sensitive production environments.

RETROFIT – OPTIMIZATION OF EXISTING SYSTEMS

In the dynamic world of automation, the demands on production systems are constantly changing. Many machines and processes have operated reliably for years, but even the best energy and data transmission solutions eventually reach the end of their lifecycles. This does not necessarily mean that the equipment has to be scrapped. This is where retrofitting comes in: By upgrading existing systems, you can bring them up to date without having to completely rebuild them. Retrofitting is a strategic approach to increasing efficiency, flexibility and safety while extending the life of existing equipment and optimizing total cost of ownership.

Meaning and definition of retrofit
Retrofitting is the process of upgrading existing equipment with modern technology to improve its performance and lifespan. This process allows companies to take advantage of the latest innovations without having to invest in completely new applications.

Retrofitting increases productivity, reduces costs and improves competitiveness by adding new functionality and safety features to older systems.

Good reasons to optimize existing applications

Cost savings
The capital cost of a retrofit is significantly less than the cost of a complete new purchase.

Reduced operating costs
The increased efficiency of retrofitted equipment significantly reduces operating costs.

Ease of maintenance
Retrofits make equipment easier to maintain and ensure a supply of spare parts.

Remote maintenance
Newer technology enables remote maintenance, making maintenance processes more efficient.

Improve productivity and quality
Productivity and quality of production are increased through modern technology.

Avoid new approval processes
Retrofit projects do not require new approvals, simplifying the process.

Customized solutions
Components and equipment can be customized to meet customer needs.

Safety standards
Retrofitting ensures that existing equipment meets the latest safety standards.

UPGRADE FOR MAXIMUM EFFICIENCY

KEY FACTORS FOR CONTROL RETROFIT SOLUTIONS

Plants that have been in operation for more than 15 years often have higher failure and downtime rates. Timely modernization is necessary to minimize this wear and tear. Retrofit solutions offer the opportunity to overcome production overcapacity and extend the life of existing systems while efficiently addressing wear-related challenges.

As manufacturing plants transition to electric vehicles (EVs), the demands for speed and durability increase, requiring improved control system performance. Modern control systems often integrate safety functions through programmable electronic systems. Retrofits must ensure that these systems comply with current machine guidelines and that complex functions are maintained.

At the same time, awareness of energy efficiency and sustainability is growing, increasing the demand for modern, energy-efficient systems. VAHLE offers comprehensive solutions to bring existing systems up to date through targeted modernization.

Our approach includes a wide range of products and services designed to maximize the performance and efficiency of retrofit projects. This includes the vDRIVE VCS control platform, a modern platform of key products tailored to the specific needs of retrofit projects. These solutions make it possible to bring existing systems up to date while increasing flexibility and sustainability.

Our contribution to retrofitting

Control system VCS1

- Short delivery times due to standard designs
- Integrated phase failure monitoring for increased safety
- New graphic display for improved visualization
- Backward compatible with Z-rail and DCS1 systems
- Standard Pulse Code Modulation (PCM)
- Use of standard components for improved serviceability
- Parameterization interface via USB-C
- Configuration via PLC function block for full functional transparency
- No intermediate head control required
- Up to 23 percent material savings over previous model
- Output power supply improved by 20 percent, eliminating the need for external power supplies

Modular controls VCSX

- Configuration via PLC function block for complete functional transparency
- Lean topology without intermediate head control
- Integrated rail bus module in vehicle controller for easy installation
- Standard versions enable shorter delivery times
- Easy customization for specific requirements
- Easy scalability for drive axes, sensors and safety functions
- Equipped with a wide range of digital inputs and outputs for standard sensors
- Customized housing dimensions and standardized components for easy serviceability

OLD STAYS, NEW MAKES IT BETTER

RETROFIT SERVICE AS AN EFFICIENT NEW START

After a detailed analysis of the existing applications and technologies, the system – including drive, control, mechanics and automation – is modernized on the basis of new technologies. Old components are dismantled and replaced with modern elements. Thanks to efficient processes, long production downtimes are avoided.

VAHLE offers comprehensive service: Our experienced project management and consulting ensure a smooth retrofit process. Afterwards, our technicians take over the commissioning and support you in restarting production.

Retro (Latin for „backwards“) and fit (English for „to fit“) combine the trend of the past with the advantages of the latest technology and efficiency. As a full-service company, we make sure you get the most out of your equipment.

A concrete example of the benefits of retrofitting is the conversion of an aging conveyor system in a logistics center. By integrating our vPOWER energy transmission solutions and vCOM data communication systems, the system was able to operate more efficiently. The new technologies enabled remote monitoring, which drastically reduced downtime. In addition, the use of energy-efficient components increased productivity and reduced costs. The modernization of the system met all current safety standards and did not require extensive approval procedures.

VAHLE is committed to continuous development in the retrofit sector to ensure that our solutions always meet the latest standards. Through the use of intelligent tools and innovative control systems, we are constantly expanding the possibilities of retrofitting and helping companies to secure the future of their systems.

Retrofitting is a sustainable investment that not only extends the life of your logistics systems, but also prepares them for future challenges. With the latest information and control technology, we improve processes and increase productivity, turning retrofits from a cost item into a future-proof investment.

The success of a retrofit depends on choosing the right partner and a well-thought-out migration plan. The cost of downtime can be much higher than the investment in a reliable retrofit concept. With over 111 years of know-how, VAHLE offers you the expertise to successfully implement your visions. Our motto „Your vision. Our solution.“ is reflected in our daily work – we guarantee that your systems remain efficient today and in the future.

FUTURE-PROOFING THROUGH PREVENTION AND EFFICIENCY

In an increasingly automated industry, companies are under intense cost pressure, while budgets for service and maintenance are often limited. In the automotive industry in particular, a comprehensive service offering is essential for future-proofing. Regular inspections and maintenance prevent unplanned downtime, increase efficiency and extend the lifecycle of systems. Condition monitoring and predictive maintenance enable real-time monitoring of equipment condition and allow maintenance to be planned in advance, ensuring productivity and competitiveness.

Prevention is the key to efficiency

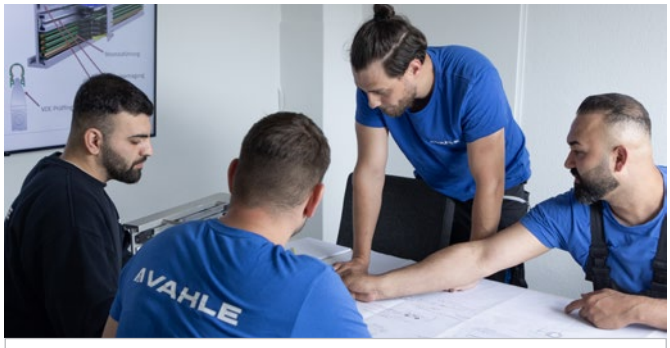
Tailor-made preventative service and maintenance solutions promote efficiency and reduce unplanned downtime in plant operations. Regular inspections, maintenance slots and routine use of cleaning tools protect conductor systems from failure. Digital solutions, such as condition monitoring, provide continuous monitoring so that weak points can be detected early and maintenance can be optimally scheduled. This proactive approach reduces the risk of unexpected failures and increases systems efficiency and availability.

Maintenance as a long-term investment in the future

Investing in regular maintenance and inspection is the key to sustainable production. Well-maintained systems last longer and operate more efficiently. Ongoing monitoring and maintenance prepares equipment for future challenges. Especially in the automotive and automation industries, flexibility and reliability are key. Tailored maintenance solutions ensure the future viability of equipment. Targeted inspections, predictive maintenance and intelligent monitoring tools maintain performance, sustainability and long-term success.

Work more efficiently with intelligent solutions

In automotive manufacturing, where precise processes are critical, downtime can be costly. System monitoring and advanced maintenance tools can reduce the risk of unplanned downtime. Our predictive maintenance tool, the Smart Collector, accurately identifies maintenance cycles and proactively intervenes before failures occur. This increases reliability and efficiency without unnecessary downtime. The Smart Collector continuously monitors the condition of electrical loads and indicates when maintenance is required. Combined with condition monitoring, it provides insight into the status of the system and ways to extend its life.



Expertise for sustainable production

With more than 111 years of experience and expertise, we offer customized service concepts tailored to the specific needs of your system. Innovative maintenance solutions ensure the long-term performance of your equipment and guarantee that it will continue to run efficiently and reliably in the future.

Contact our service team for preventive maintenance solutions:

+49 2307 704999

VAHLE SERVICE – FOR A TROUBLE-FREE FUTURE

MAXIMUM AVAILABILITY, MINIMAL DOWNTIME

Whether electric monorail system, skillet line, OHT, or e-forklift – regular maintenance, professional cleaning, and precise inspection ensure reliable and future-proof automotive industry.

With preventative and predictive service, seamless spare parts supply, and our protect programs, we keep your systems efficient, safe, and consistently powerful.

Schedule a System Check Now!
Simply scan the QR code or visit **vahle.com/globalservice**

11/24

Paul Vahle GmbH & Co. KG
Westicker Str. 52
59174 Kamen
Germany

+49 2307 7040
info@vahle.com
vahle.com

You can find your local contact at: vahle.com/contact

IMPRINT

PUBLISHER | Paul Vahle GmbH & Co. KG (left side)
REPRESENTED BY | Paul Vahle Verwaltungs GmbH (Managing and personally liable partner), this represented by Dipl.-Ing. Achim Dries (Managing Director)
REGISTRATION IN THE COMMERCIAL REGISTER | Register court: Local court Hamm, Registration number: HR B 4495
RESPONSIBLE FOR CONTENT | Dr. Andreas Jung, Paul Vahle GmbH & Co. KG (left side)
TEXT & DESIGN | Paul Vahle GmbH & Co. KG (left side)
PRINT | Druckerei Schmidt, Ley + Wiegandt GmbH + Co. KG, An der Wethmarheide 36, 44536 Lünen

SUBJECT TO ERRORS AND TECHNICAL CHANGES.