VISIONS

INTRALOGISTICS | 03.2025

HIGHLIGHTS

VAHLE

PIONEERING & FUTURE-PROOF

SOLUTIONS FOR TOMORROW'S INTRALOGISTICS

Dear Readers,

Welcome to the latest edition of the VAHLE Visions – your magazine for groundbreaking innovations and product highlights that future-proof industrial applications. In this issue, we focus on one of the most dynamic industries: intralogistics. Global trends such as digitalization, increasing cost pressure, the demand for sustainable processes, and the need for 24/7 operations are profoundly transforming this sector – but also opening up enormous potential.

VAHLE solutions not only promise, they deliver: This issue offers exciting insights into technologies specifically developed for the diverse requirements of distribution centers, automated warehouses, and production logistics. Our systems reliably deliver power and data, setting standards that will endure tomorrow.

A glimpse into the future of intralogistics: Imagine applications that are smarter, more precise, and more efficient than ever before. Sorters that work tirelessly and with maximum accuracy in continuous operation. Shuttles that effortlessly switch between levels and seamlessly connect your processes. Maintenance-free systems that set new standards for purity and reliability in the highly sensitive semiconductor industry. And this is just the beginning. eForklifts and narrow-aisle forklifts that optimally utilize even the tightest spaces, moving flexibly, autonomously, and safely. This is complemented by automated storage and retrieval systems that operate faster, more precisely, and more robustly than ever before.

But we think further: With preventive and predictive service solutions, we minimize downtime and maximize your efficiency. Our technologies and tools ensure that your intralogistics applications are always ready for use – without compromise.

VAHLE stands as an innovation driver for power and data by your side to make these visions a reality.

Your Vision. Our Solution.

EFFICIENCY & RELIABILITY FOR CONTINUOUS OPERATION

Sorter technology has established itself as a key component of modern intralogistics, especially in distribution centers and airports that require precise and efficient sorting of goods. Since the COVID pandemic, the market for sorter systems has been continuously growing. However, with this growth, the demands for quality, speed, and ”around-the-clock“ operation are also increasing.

Sorters must run continuously – 365 days a year. The demands on these systems are high: They must ensure availability of up to 99% while operating as maintenance-free as possible. Additionally, they are under constant pressure to increase efficiency while simultaneously reducing CO_2 emissions. These challenges make it necessary to carefully select the right technology.

The Two Most Popular Sorting Technologies

Tilt-Tray Sorter

Functionality
Goods are transported on movable trays that tilt at the destination station to deliver them with precision.

Challenges
Continuous operation demands robust mechanics and minimal maintenance.

Cross-Belt Sorter

Functionality
Packages are transported on belts that move sideways at the destination position to drop the cargo.

Challenges
The belt mechanisms must work with high precision and synchronization to minimize failures and wear.

Good to know

A sorter running at a speed of 3 m/s and operating 99 % of the time covers over 93,000 kilometers annually is equivalent to more than two trips around the Earth. Such performance requirements necessitate systems that are both powerful and incredibly robust. With VAHLE solutions, your application remains reliable and future-proof.

THE IDEAL SOLUTION FOR EVERY DEMAND

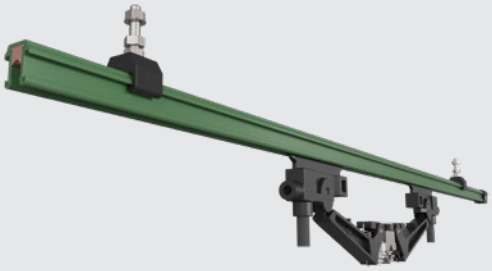
VAHLE offers optimal energy transmission solutions for almost every sorter technology. With our robust and durable systems from the conductive U20 product lines or the inductive and contactless CPS140, we ensure that your sorting systems always operate efficiently and reliably. Our systems offer an impressive availability of over 99 %, ensuring continuous operation without interruptions. The maintenance-free design of our products ensures minimal downtime and high operational reliability due to decentralized feeds. Additionally, our solutions are flexible and can be tailored to the specific requirements of your applications. By using energy-efficient systems, we contribute to the reduction of CO_2 emissions and operating costs – a sustainable contribution to the future of your facilities.

Inductive vs. Conductor Systems: Choosing the Right System

CPS140

Inductive Systems

The faster and longer a sorter runs, the more attractive the use of an inductive system becomes. These systems require less maintenance as they do not need current collectors that require regular servicing. This is a clear advantage, especially in applications that run around the clock (such as large logistics centers or airports). Inductive systems minimize maintenance efforts and increase efficiency.



U20

Conductor Systems

For slower sorters or those without 24/7 operation, conductor systems like VAHLE‘s U20 are ideal. These systems are particularly advantageous when fewer wear parts need to be replaced on a regular basis. Conductor systems offer a cost-effective solution as they excel even in less demanding operational requirements.

THE TRUE SPRINTERS AT ALL LEVELS OF WAREHOUSE AUTOMATION

In today‘s intralogistics, shuttle systems play a key role in optimizing processes and making warehouse operations fast and efficient. In the dynamic e-commerce sector, these transport sprinters are indispensable, where speed, flexibility, and high availability are crucial. Shuttle systems move autonomously and ensure continuous operation – even in the smallest spaces.

Peak Performance under Demanding Conditions

Modern shuttle systems impress with maximum flexibility and adaptability. Thanks to innovative roaming variants, shuttles switch vertically between rack levels with shuttle lifts or horizontally between aisles via rail systems. The combination of both approaches enables a three-dimensional shuttle system that offers maximum efficiency and flexibility for demanding applications such as omni-channel distribution, same-day delivery, or pre-picked orders. Additionally, these systems are characterized by high reliability: Multi-level technologies with at least two lifts per aisle ensure accessibility and increase robustness – even in the event of a shuttle failure.

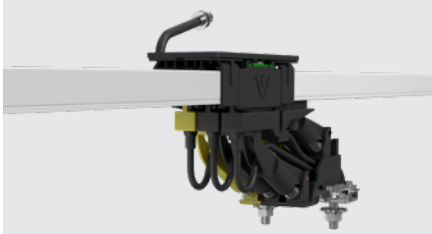
In confined warehouse environments, shuttles operate under high performance pressure. Their requirements include:

Highest Availability: Nearly uninterrupted operation is a must.

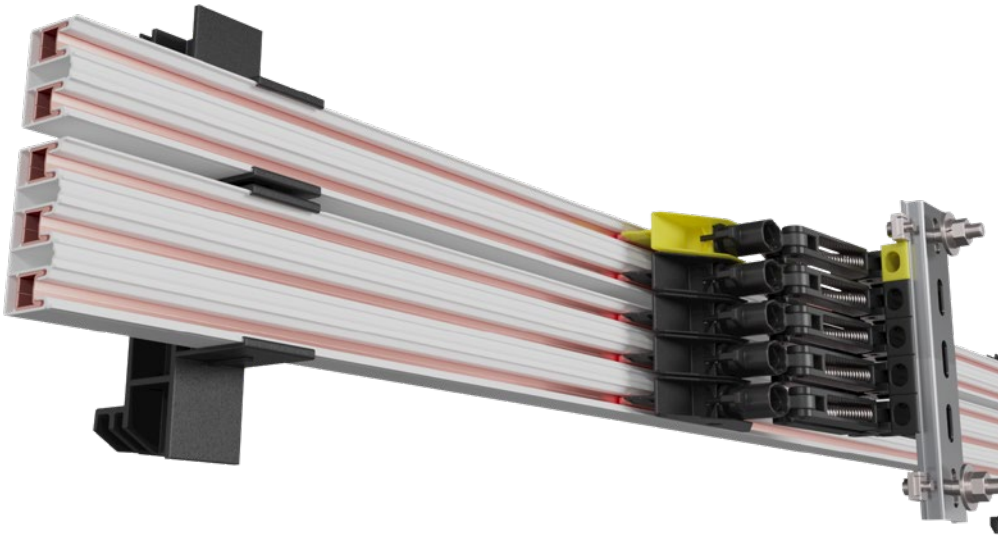
Minimal Maintenance: Low-maintenance systems are essential, especially in hard-to-reach automated warehouses.

Maximum Efficiency: Low energy losses and reliable signal transmission reduce operating costs and increase productivity.

Cleaning Module



Condition Monitoring Add-on



VCL: THE KEY TO YOUR EFFICIENT SHUTTLE OPERATION

The VAHLE Compact Line (VCL) is the ideal solution for shuttle systems – whether one-dimensional or multi-dimensional. It provides a reliable power source and reduces long-term operating costs through:

- **Compact Design:** Ideal for tight warehouse environments.
- **High Energy Efficiency:** Minimal losses ensure optimal power supply.
- **Durability and Reliability:** Low-maintenance operation even under extreme conditions; durable carbon brushes minimize total cost of ownership.
- **Flexibility:** Adaptable and scalable for any application.
- **High Speed and Roaming Capability:** The high-speed funnel system enables travel speeds of up to 4 m/s and uninterrupted shuttle movements – even when switching aisles and levels.

In addition to the VCL, VAHLE also offers solutions for partial power supply, tailored to specific requirements:

vPOWER SLS/SLSM: Ideal for power supply on partial routes or defined charging points.

vPOWER BLS/BLK: Ideal solution for charging points used exclusively for recharging devices.

Innovative Cleaning Solutions & Condition Monitoring

Cleaning Module for Conductor Systems
The specially developed cleaning module removes carbon dust and particles during operation. It reduces wear, increases the lifespan of the conductor systems, and improves operational safety.

Condition Monitoring Add-on
The condition monitoring module monitors carbon wear in real-time. Potential problems can be detected early and addressed specifically before unexpected failures occur. This monitoring ensures that the maximum lifespan of the carbon brushes is optimally utilized. This not only significantly reduces maintenance efforts but also sustainably lowers total operating costs.

Your Advantage: Efficiency, Reliability, & Future-Proofing

With VAHLE components, you can design your shuttle systems to be efficient, reliable, and future-proof – optimal for the requirements of modern warehouse automation. Contact us to customize your solutions:
vahle.com/request

HIGH-TECH PRODUCTION OF THE FUTURE

In semiconductor and cleanroom manufacturing, micrometers determine millions in value. Highest purity standards, maximum automation, and uninterrupted production are essential. This is where Overhead Hoist Transport (OHT) systems come into play. These game-changers in intralogistics transport materials fully automated, seamlessly, and efficiently to their destination – 24/7, without human intervention. They minimize obstacles such as machines or operators, ensure a seamless material flow, and enable unprecedented process reliability.

Precision in Motion: Cleanroom Logistics on a New Level

OHT systems are tailored to the complex requirements of modern semiconductor fabs: They connect process areas (Interbay), enable material transport between production, testing facilities, and stockers (Intrabay) – all with a level of precision that sets new standards.

Always on: 24/7 operation without interruption.

Particle-free and clean: Contactless movement without abrasion or contamination.

Highest repeatability: Millimeter-precise docking through intelligent control.

INTELLIGENT CONTROL

Smart, Connected, Forward-Thinking

Modern OHT systems are far more than a means of transport; they are the heart of a new generation of automation. OHT systems require a power supply as innovative as their movement technology – and this is where VAHLE's CPS140 kHz technology comes in.

VAHLE is one of the few providers worldwide with the necessary know-how and certifications to equip OHT systems with absolutely reliable power and data transmission. The best systems not only work efficiently – they communicate! The inductive energy transmission is system expandable. By integrating a mobile control unit, health status can be recorded and communicated in a timely manner. The result: Maximum performance, full control, and seamless integration. Highest precision and manufacturing quality – in a consistently recurring standard.

⊕ **Highest Cleanroom Suitability**
Certified according to SEMI S2 and S22

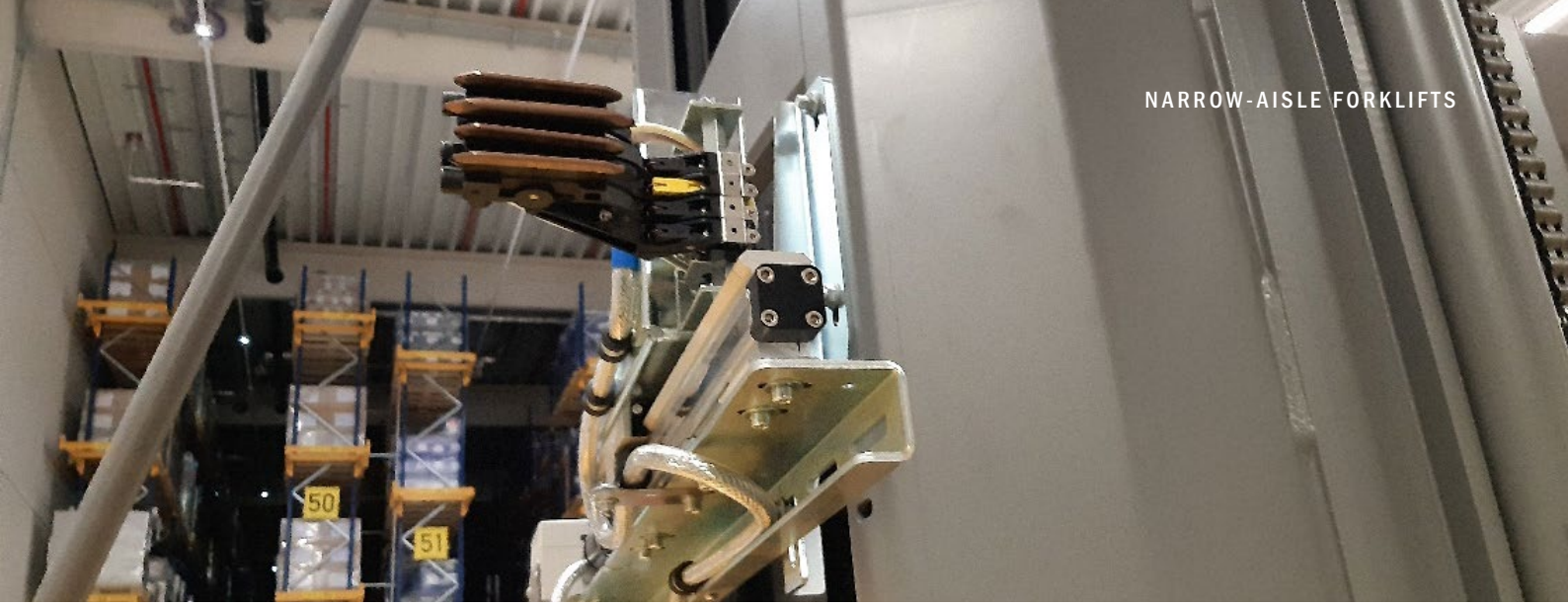
⊕ **Highest Safety Standards, no Wear & Maximum Durability**
Inductive, non-contact power transmission

⊕ **Maximum Efficiency with Minimal Losses**
Energy always exactly where it is needed

⊕ **Cost-efficient in Continuous Operation**
Highest efficiency and lowest loss performance on the market save the end customer money month after month,

⊕ **Flexibly Scalable**
Voltage levels from 24-80 VDC, 280 VDC, 560 VDC

⊕ **Compact & Powerful**
VAHLE 140 kHz technology offers the most compact components on the market – ideal for critical applications with extremely small curve radii, without loss of performance



CONTINUOUS POWER FOR DEMANDING WAREHOUSE MOVEMENTS

In modern high-bay warehouses, narrow-aisle forklifts are indispensable for optimizing storage space in the tightest areas. These compact devices operate in aisles only a few meters wide and can reach heights of up to 20 meters. Therefore, it is crucial that these forklifts work reliably under the most demanding conditions and handle efficient warehouse processes without failures.

The use of narrow-aisle forklifts in high-bay warehouses places high demands on technology, especially on the power supply.

Maximum Space Utilization
Every square meter must be used efficiently to maximize storage capacity. Forklifts must easily reach both ground level and high shelves.

Speed & Precision
Warehouse processes must run quickly and accurately to maximize turnover and avoid bottlenecks or delays.

Reliability
Unplanned failures are not an option in confined warehouse environments – forklifts must be ready for use at all times.

Energy Efficiency
In intensive operations, a continuous, cost-efficient power supply is essential to keep operating costs low.

THE SIMPLE BUT INNOVATIVE SOLUTION

Conductor Systems for Seamless Power Supply

To meet the high demands of modern warehouse environments, VAHLE offers a solution for narrow-aisle forklifts: Conductor systems that ensure continuous power supply. In the aisles, a 4-pole VKS with reverse polarity protection PE ensures smooth power transmission.

⊕ **Uninterrupted Power Supply**
The VKS conductor system ensures continuous power supply to the forklift, regardless of the rack position. Guided by a guide wire, the transmission remains stable.

⊕ **Maximum Flexibility & Precision**
Narrow-aisle forklifts can travel multiple aisles without battery changes or charging breaks. The conductor line enables seamless aisle changes, thus increasing efficiency.

⊕ **Reliability & Ease of Maintenance**
The robust, low-maintenance conductor line provides reliable performance even under high load. Precise components minimize downtime and ensure operation.

⊕ **Energy Efficiency through Intelligent Use**
By recovering energy during braking or lowering, energy consumption is reduced, saving costs and promoting sustainability.

INDESTRUCTIBLE HEROES OF ORDER PICKING

Intralogistics without automated storage and retrieval systems (AS/RS)? Unthinkable! Stacker cranes are the backbone of modern high-bay warehouses. They enable precise and automated storage and retrieval of goods – often up to 40 meters high and at impressive travel speeds. However, with increasing demands on throughput, storage capacity, and availability, the challenges also grow. Reliable power and data transmission as well as precise positioning are therefore essential factors for smooth operation.

Technical Challenges in High-Bay Warehouses

Space Constraints
High-bay warehouses are optimized for maximum space efficiency, but increasing product variety significantly complicates the available construction space. The infrastructure of power components, such as energy and data transmission, must be compact and powerful.

Dynamics & High Speeds
Modern stacker cranes reach travel speeds of up to 6 m/s. Frequent starts and stops create high mechanical stresses. Increasing throughput volumes also require maximum performance, while higher travel speeds necessitate greater power outputs. A flexible and robust solution is crucial here.

24/7 Operation with Minimal Downtime
Downtime – whether due to maintenance or unforeseen failures – significantly impacts supply chains and operations. Therefore, the equipment must not only be powerful but also extremely reliable and low-maintenance. This is especially true for use under extreme environmental conditions, such as in cold storage warehouses down to -30 °C.

Precise Positioning
In addition to power supply, precise positioning is crucial. Stacker cranes must operate with millimeter accuracy – even at great heights and under demanding environmental conditions.

To meet these requirements, the optimal interaction of technologies within the system is crucial to ensure the best possible performance:

Compact & Robust Power Transmission
Continuous power supply, space-saving, and extremely robust. Whether 10-pole VKS10, VKS or U25 – the solution depends on the specific requirements of the system.

Secure Data Communication
Real-time data transmission with interference-free SMGM Slotted Microwave Guide technology.

High-Precision Positioning
With the latest generation of Absolute Positioning APOSM – seamlessly integrable into existing warehouse management systems.

APOSM diagnostic box

APOSM: MAGNETIC POSITIONING FOR HIGHEST ACCURACY

With its compact design and high system reliability, APOS Magnetic Gliding sets new standards in positioning technology for stacker cranes.

⊕ **High Precision:** Absolute position value with an accuracy of 1 mm.

⊕ **Robust and Interference-Resistant:** Works even in dust, humidity, and challenging lighting conditions.

⊕ **Maximum Compatibility:** Perfectly matched to VAHLE conductor systems.

⊕ **Easy Installation:** Plug & Play without complex configuration.

Diagnosis & Full Check

The VAHLE diagnostic box, in combination with the latest positioning generation APOSM, enables a comprehensive check of the entire positioning system.

It offers detailed route analysis and real-time retrieval of important system parameters such as status, temperature, position, error bit, and system log of the read heads. This ensures optimized maintenance, accelerated error detection, and increased overall performance of the positioning system.

- **System Parameters in Real-Time:** Status, temperature, position, error bit, and system log
- **Full Configurability** of the reading heads
- **Real-Time Status Information** of the reading head
- **Maintenance Functions:** Inspection of the code band route and long-term system control
- **Flexible System Choice:** 17-bit (up to 524 m) or 19-bit (up to 2000 m)
- **Error Analysis** at Initial Commissioning

The Key to Best Performance

Stacker cranes must work faster, more efficiently, and more reliably. The setup of power and data transmission as well as positioning is crucial for smooth warehouse operation. Companies that rely on innovative solutions benefit from stable, high-performance intralogistics with minimal maintenance effort. Since 1912, VAHLE has been revolutionizing the movement of goods and ensuring reliable operation. Contact us and find out how we can optimize your intralogistics: **vahle.com/request**

VAHLE SERVICE – FOR A TROUBLE-FREE FUTURE

MAXIMUM AVAILABILITY, MINIMAL DOWNTIME

Whether sorter, shuttle, stacker crane, OHT, or narrow-aisle forklift – regular maintenance, professional cleaning, and precise inspection ensure reliable and future-proof intralogistics.

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**

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