PROFFESIONAL ARTICLE
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The Future of Warehouse Efficiency

How Automated Storage and Retrieval Systems (ASRS) sustainably optimize processes

The intralogistics industry is currently undergoing a profound transformation. Increasing demands for speed, flexibility, and cost efficiency are driving the development of modern automated storage and retrieval systems (ASRS). Technologies such as artificial intelligence (AI), IIoT, and advanced sensor technology form the foundation for new performance standards in warehouse and production environments.

Modern providers of robotic and warehouse solutions emphasize system availability, reliability, and minimal manual intervention. Many systems today achieve over 99% uptime, enabling nearly uninterrupted material flow. A key factor is contactless charging technology, which efficiently manages the energy supply of autonomous vehicles and reduces downtime. Combined with AI-based algorithms, vehicles can react to environmental changes in real time, optimize their routes, and make autonomous decisions.

Increasing Requirements for Drive Technology

As automation advances, expectations for motor technology continue to rise. Long service life, high availability, integrated safety, and intelligent data utilization have become essential. Dunkermotoren addresses these needs with its new motor controller platform. All integrated and external control electronics are fitted as standard with a certified STO safety interface to ensure safe operation in challenging conditions.

New Safety Functions for Maximum Machine and Process Safety

Higher safety – lower integration effort – proven functionality

With the introduction of dSafe, Dunkermotoren is offering comprehensive Safe Motion functions for the first time. These include:

- SS1 – Safe Stop 1
- SLS – Safely Limited Speed
- SLP – Safe Limited Position
- SBC – Safe Brake Control
- FSoE interface (Fail Safe over EtherCAT)

These features simplify safety concepts, reduce the need for external hardware, and help implement standards-compliant applications more quickly.

Flexibly Configurable Motor Controller Platform

Maximum adaptability – simple integration – reduced system costs

The platform allows users to configure the control electronics precisely according to application requirements. Bus and Ethernet interfaces such as:

- CANopen
- PROFINET (PROFIdrive AK 1 & 4)
- EtherCAT (Distributed Clocks)
- EtherNet/IP

are integrated directly into the motor. This often eliminates the need for an external controller, saving installation space and significantly simplifying commissioning via the Drive Assistant Tool.

Additional features such as an electronic nameplate, operating hours counter, clock synchronization, and freely programmable logic increase transparency and flexibility. Improved voltage resistance also protects the electronics from high battery charging voltages - an especially important advantage in mobile robotics systems.

IIoT-Integration with nexofox

Data-driven efficiency – predictive maintenance – lower downtime costs

In combination with the digital brand nexofox, high-frequency process data can be collected directly within the customer application and transferred to the cloud via a gateway—independent of the higher-level PLC.

The analysis enables:

- Real-time insights into motor status
- Visual dashboards
- Derivation of maintenance needs
- For the first time: precise statements about motor lifetime

This forms the basis for predictive maintenance, reduces failure risks, and improves planning reliability.

Expansion of the Motor Portfolio

Higher load capacity – compact designs – robust mechanics

In parallel with electronic developments, the motor portfolio has been expanded with new hub gearboxes. The NG 250, NG 500, and NG 1000 w/o series are specifically designed for drive wheels in mobile intralogistics systems. Their robust design supports loads up to 1,000 kg without additional bearing support, saving space and simplifying mechanical integration.

Application Areas in Modern Logistics Environments

Dunkermotoren's intelligent motors are used in numerous systems, including shuttles and high-speed storage systems, AGVs and AMRs, cube robotics solutions, and sorting and picking systems.

Real-world examples highlight the versatility of the portfolio:
BG 95 dPro is used in robots for online supermarket operations, while BG 75 supports parcel sorting processes in logistics centers.

Conclusion

The combination of high-performance motor technology, integrated safety functions, IIoT capabilities, and robust mechanical design makes Dunkermotoren's solutions an essential building block for the smart warehouse of the future. Companies benefit from higher system availability, reduced operating costs, increased safety, and data-based process optimization. These solutions make a significant contribution to improving efficiency and competitiveness in modern intralogistics.

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