

Autonomous mobile robots from KNAPP – Warehouse flexibility thanks to strong drive solutions

The Open Shuttles, autonomous mobile robots (AMR), from KNAPP enable automation of internal transport without adjustments to the existing infrastructure. The Dunkermotoren drive solutions and gearboxes Framo Morat installed in the AMRs ensure the safe transport of even bulky and heavy loads.

How long are you willing to wait for your ordered goods?

According to a Statista publication from December 2021, most B2C customers from a total of twelve European countries included to the statistics expect their goods ordered online within three to five days. In the Netherlands, app. One third of the customers expect their goods to arrive after just one to two days.¹ But also in B2B commerce, speed, flexibility and transparency are getting increasingly important.

To meet these requirements, logistics processes within an organization must be designed to be as efficient as possible. But what is efficient today may already be outdated tomorrow. Workflows must be adapted to the fast pace of demands and requirements - and the associated logistics processes must keep pace.

A solution to these challenges is offered by the Austrian company KNAPP. Open Shuttles are autonomous mobile transport robots that take over internal transport tasks without adjustments to the existing infrastructure. Thanks to innovative fleet control software, tasks are efficiently distributed to the entire fleet of AMRs.

¹ <https://de.statista.com/statistik/daten/studie/652489/umfrage/annehmbare-lieferdauer-bei-online-bestellungen-in-europa/> - abgerufen am 22.11.2022

Travel drive

The AMRs of the Open Shuttle series are the flexible alternative to classic tote conveyor technology and transport totes, cartons and trays up to 800 x 600 mm and a maximum payload of 100 kg. Thanks to automatic lifting and width adjustment, the Open Shuttles can accommodate trays of different heights and widths. They are used to connect different storage areas with each other and also supply decentralized workstations.

In addition to plenty of intelligence provided by software and sensor technology, the travel drive is an important heart of the AMR. With its more than 70 years of experience in drive technology, Dunkermotoren, a brand of AMETEK, was able to provide the right solution.

The autonomous mobile robot is driven by two brushless DC motors of the BG 75 series. The attached controller ensures smooth acceleration and deceleration of the robot. A brake from the Dunkermotoren modular system, which is also integrated into the overall drive, ensures an immediate stop of the AMR in case of an imminent collision with other vehicles or people, which are reliably detected thanks to the integrated laser scanner.

The required power for the drive is provided by the hub gearbox from Framo Morat GmbH & Co. KG from Eisenbach, Germany. Together, the two companies - Dunkermotoren and Framo Morat - have already been able to realize many AGV/ AMR projects. Since 2021, they have been presenting a portfolio on the market specially designed for the strict safety and space requirements of AGV solutions. The complete system of motor and gearbox is maintenance-free over the entire service life. If the tread should unexpectedly become damaged or the requirements for the wheel change due to changed ground conditions, it can be replaced and serviced easily and directly on the vehicle.

With an acceleration torque of up to 42 Nm, the hub gearbox ensures the Open Shuttle to move even heavy loads without any problems. The emergency stop torque of 63 Nm ensures an immediate stop in case of an imminent collision. Thanks to the complete drive solution from Dunkermotoren and Framo Morath, the Open Shuttle is always moving safely and reliably.



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The special feature of the drive solution is the extremely compact design of the overall drive. The gearbox is integrated into the wheel hub and thus disappears into the drive without increasing its length.

Lift and steer drive

The autonomous mobile robot (AMR), Open Shuttle Fork is the model of choice when it comes to transporting entire pallets, racks or large special load carriers and has a payload of up to 1,300 kg. The integrated automatic lift enables the load to be picked up directly from the ground and allows the load to be placed at heights of up to 1.2 meters. In the Open Shuttle Fork, drive solutions from Dunkermotoren are used for both, the lifting and steering movements, giving the AMR omnidirectional mobility. Thanks to integrated CANopen electronics, the shuttle's higher-level control system can easily address and control the drives.

The lift of the up to 1,300 kg, is managed by the most powerful motor available in the Dunkermotoren product portfolio. A brushless DC motor of the BG 95 series with matching planetary gearbox handles even heavy loads without problems. The attached E 600 brake then holds the load in any desired position. If necessary, the brake is also used for an emergency stop at full lift. As soon as a certain safety level is reached, the engine is immediately switched off and the brake guarantees the stop.

To always keep the right course, two additional Dunkermotoren drives are installed in the Open Shuttle Fork as a steering unit. The intelligent BLDC motors of the BG 66 series with planetary gearboxes are particularly compact and, thus, perfectly suited for use in flat vehicles. Again, the integrated electronics provide the required intelligence. Thanks to the CANopen interface, the motor receives commands from the higher-level controller of the AMR and can implement even minimal course adjustments of several millimeters.



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KNAPP's Open Shuttles can be integrated very easily into existing structures and during ongoing operation. To cover seasonal peaks, additional robots can be easily integrated into the fleet and removed again afterwards. Thanks to robust and maintenance-free drive solutions from Dunkermotoren and Framo Morat, the Open Shuttles are reliable, durable, and meet all requirements for small installation space and common interfaces.

Are you also planning to implement a driverless transport application? Our sales team will be happy to advise you!

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