

KUKA



Mobile Robots





_Mobile platforms and mobile robotics

Mobile solutions for agile production.

If you want to get
things moving, you
have to stay in motion.

Mobility is an important driver of Industry 4.0. KUKA develops mobility concepts for the next stage in the evolution of more flexible industrial production. In the cyber-physical world of Industry 4.0, established structures are becoming a thing of the past. Static production facilities and assembly lines are obsolete. KUKA develops intelligent, mobile units that work together perfectly and find their destination autonomously.



KMP 600-S diffDrive



KMP 1500P



KMP 3000P




omniMove



KMR iiwa



KMR iisy

 **KMP 600-S diffDrive.**
Mobile freedom thanks to AGVs:
material transport in dynamic environments.

The KUKA Mobile Platform KMP 600-S diffDrive opens up new avenues and more flexibility for production intralogistics. The KMP 600-S diffDrive provides support as an automated guided vehicle (AGV) with a payload of up to 600 kilograms. In

addition, it allows maximum freedom of movement for employees, as it does not require any protective fencing. The laser scanners at the front and rear provide maximum safety and allow high speeds in all directions when cycle times require it.



What advantages do the AGVs offer for in-house logistics? AGVs bring required goods and raw materials fully automatically to the right place at the right time. They take on physically demanding transportation tasks and are able to share passageways with human operators and conventional industrial trucks thanks to their comprehensive safety technology. Through the use of camera-based 3D object detection, they integrate seamlessly into existing production environments.

The KMP 600-S diffDrive can also be expanded with 3D object detection. This allows the AGV to autonomously detect obstacles that are between 30 millimeters and 2.10 meters above the ground. At the same time, the KMP 600-S diffDrive is ideally equipped for the tough everyday environment of industrial production: thanks to its IP 54 design, it is protected against splashes of water and dust, for example.

High safety standard

- Laser scanners at the front and rear
- 3D obstacle detection available
- Four emergency stops
- Eight safety zones at both the front and rear of the vehicle

Extremely fast

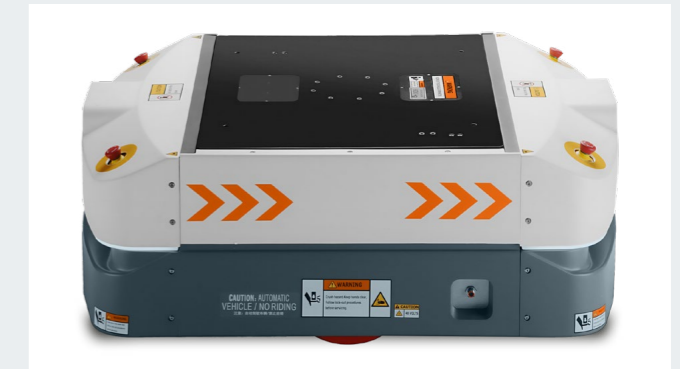
- The AGV travels up to 2 meters per second
- Full speed in all directions
- Integrated lift of up to 60 millimeters in under 3 seconds

Protection class IP 54

- Optimally equipped for the daily work of industrial production
- Protection against foreign objects such as (metal) dust
- Protected against water spray from any direction

Intelligent navigation

- Fleet manager software for the entire KUKA AGV portfolio
- Navigation via laser scanner and a pre-generated environment map
- Identifies the fastest route – even in complex environments



Automated guided vehicles from KUKA: Fast commissioning, simple maintenance. Applications can be programmed via JAVA. In order for KUKA's intelligent, autonomous vehicles to optimally support in-house material flows, they must first be taught. The KMP 600-S diffDrive is commissioned quickly and easily via a wireless controller. Maintenance is just as easy as start-up: No tools are required to access AGV components, such as rollers, laser scanners and service interfaces – for inspection, firmware updates, calibration, and repairs.

Eight security zones. There are eight safety zones in front of and behind the KMP 600-S diffDrive, which customers can customize to suit the application situation. The size of the protective field changes dynamically depending on the speed and direction of travel.

	KMP 600S-2 diffDrive
Dimensions (L x W x H)	1,000 x 750 x 353
Weight	246 kg
Rated payload	600 kg
Maximum speed straight ahead	2 m/s
Maximum acceleration	1.25 m/s
Maximum braking acceleration	1.5 m/s
Battery capacity	at least 8 hours
Charging time	2 hours
Interfaces	48 VDC, 24 VDC, EtherCAT, I/O, STO
Integrated lifting device	up to 60 mm
Pose accuracy	±10 mm

KMP 1500P. The smart AMR platform maximizes efficiency in production halls and warehouses.

The autonomous mobile platform, is designed to enhance intralogistics, material supply for production lines and process linkage applications. With its cutting-edge slam navigation, precision positioning, advanced load identification, 3D cameras, and innovative charging technology, this AMR offers a package of high-performance features, safety, and flexibility in automated transport and material handling.

The autonomous mobile robot (AMR) is a game-changing solution to optimize intralogistics operation. The KMP 1500P lifts all types of load carriers and could be easily implemented into existing industrial projects to deliver exceptional solutions, whether it is optimizing warehouse processes, streamlining assembly lines, or enhancing material handling in complex industrial environments.

The AMR platform can identify the load due to its technology and QR code readers, which improves material traceability and operational efficiency. In addition, the 3D cameras provide an additional layer of safety, detecting obstacles in three-dimensional space, and ensuring the well-being of the AMR, the load and equipment.

The KMP 1500P offers easy programming that allows workflows to be quickly adapted and optimized, reducing the time and resources required for implementation, and resulting in increased operational efficiency and flexibility.

The driverless transport system is the perfect solution for automating material supply. Small and medium-sized companies also benefit from lower operating costs and a high degree of flexibility when using mobile robotics.

Demands on mobile robotics in the age of Logistics 4.0

The autonomous mobile platform KMP 1500P provides a safe and autonomous transport solution for heavy loads in factories and logistics centers. With its flexible movement, the KMP 1500P can navigate complex and dynamic environments, adapt to changing requirements and optimize material flow. This provides agility and versatility in operations, ultimately helping businesses to respond quickly to evolving market demands and achieve higher productivity.



Versatile use of driverless robotics in intralogistics

The AMR automatically delivers the required goods and raw materials to the right place at the right time. The Autonomous Mobile Robot (AMR), with its differential drive technology, is optimally equipped for tasks in production and in-plant logistics. A wide range of applications can be supported.

- **Material supply to stations and lines.** Enables efficient just in time material supply from the warehouse or supermarket to stations, assembly and pre-assembly lines.
- **Process linkage/chaining.** Autonomous transport of components and workpieces from station to station by the KMP 1500P increases the flexibility in the production and makes unflexible conveyers obsolete.
- **Commissioning.** Flexible picking processes, goods-to-person, autonomous piece picking or flexible sorting.
- **Warehousing and point-to-point transports.** Reliable stock management and inventory control thanks to the KMP 1500P and its capable fleetmanager KUKA.AMR Fleet.

Configuring instead of programming – the KUKA.AMR Fleet navigation system

The No-Code-Platform with AI functionality is easy and intuitive to use. The navigation system KUKA.AMR Fleet makes it possible to configure settings by cursor in the browser instead of programming them. This allows new or modified routes to be planned quickly and efficiently. Additional comfort and AI functions as automatic rack recognition increase the efficiency during integration.

The software also enables comprehensive fleet management of the entire AMR system. It fully regulates all fleet traffic and is able to automatically reschedule in the event of obstacles.

Smart traffic management for optimized material flow: different AMRs and AMRs on one digital platform.

The autonomous transport system is characterized by high flexibility, safety and scalability

Autonomous navigation	Highest safety standards	Intelligent charging management	Extras for flexible use	International certification
<ul style="list-style-type: none"> • Slam-Navigation • Camera underneath the mobile platform, reading QR-codes for high positioning accuracy ±5 mm • Easy to integrate, operate and maintain due to No-Code-Platform with AI functionality KUKA.AMR Fleet • Connection via Wi-Fi, 5G capable 	<ul style="list-style-type: none"> • Laser scanners for safe obstacle detection • 3D cameras additionally detect obstacles and people, protecting AMR, load and employees • Bumper / safety edge for extra safety • Acoustic and optical signals, as well as 4 emergency stop switches (at each corner of the platform) 	<ul style="list-style-type: none"> • Docking station for conductive charging with digital touch screen • As soon as the battery level gets low, the AMR is automatically routed to a free charging station • No installation of special power supply required due to single phase • 2 h charge for 8 h of use. 1 h charge for 20-80 % capacity • Inductive charging available in 2024 	<ul style="list-style-type: none"> • Lift with treated hole grid pattern (for pins, etc.) • Lifting height: 60 mm • High load capacity up to 1,5 t • Max. speed: 1.8 m/s without load, 1.5 m/s loaded • On-platform camera for QR load identification • Sound module for notifications, alarms, music 	<ul style="list-style-type: none"> • IP 54 protection class: protection against splash water, dust, and chips • ICE, UL, and FCC approval for the IoT devices



KMP 3000P. Working tirelessly for the perfect flow.

With the KMP 3000P platform, KUKA is introducing a real heavyweight in the area of AMR to the market. The platform can transport loads of up to three tonnes. Its omnidirectional drive guarantees maximum flexibility in the narrowest of spaces in intralogistics. Thanks to its inductive charging concept, the platform is constantly ready for operation, which allows for flexible charging in the process.



Transport capacity of up to three tonnes.

Mobile robotics is a crucial factor when it comes to optimizing intralogistical processes. The KMP 3000P builds on the success of its little sister, the KMP 1500P, and adds an extra one and a half tonnes in terms of transport capacity. With the ability to move up to three tonnes, it opens up a variety of possible applications for various sectors. Whether material supply in production, process linking without conveyor belts or classic point-to-point transport – the KMP 3000P effortlessly masters the transport of large, unwieldy and heavy components.

Functions in the smallest of spaces.

The KMP 3000P has an omnidirectional drive. This allows it to move in all directions. "This makes the platform extremely flexible. It can move diagonally and therefore handle narrow curves. This delivers considerable advantages in a cramped production environment," explains Julian Stocksclaeder, Head of AMR Business Development at KUKA. Four integrated 3D cameras and two laser scanners offer a 360° view, meaning that the platform can effortlessly detect and avoid obstacles. This not only increases efficiency, but also increases safety in various working environments.

Ready to operate, day and night, thanks to the new inductive charging principle.

The best platform is one that operates 24 hours a day, 7 days a week. Thanks to its inductive charging principle, the KMP 3000P does just that. This means that the platform can be charged wirelessly, both centrally at the station as well as non-centrally within the application area at various, freely selectable locations. It can also be charged via inductive pads, which are attached to the floor of the hall. Based on the operational plan for the KMP 3000P, breaks that arise during operation – for example while the robot is loading a machine – can be used to charge the platform during the process. This guarantees round-the-clock operation.

New drive concept reduces maintenance requirements.

The new, omnidirectional drive concept of the KMP 3000P combines the advantages of mecanum wheels from the OmniMove series with the cost-effective diffDrive: The driven casters guarantee extremely smooth running and allow for high speeds. Each of the two drive units consists of two wheels each. Since the weight is distributed over two wheels, there is a lower point load on the individual wheel, which reduces wear. In addition to replacing the entire drive unit, it is also possible, if required, to replace the covering on individual casters. The fact that the parts that are used are common standard components that are widely available contributes to the simple and cost-effective maintenance. "If something has to be replaced, parts are easy to access: A service hatch provides easy access to the inside of the platform," reports Julian Stocksclaeder.

Intuitive configuration with the KUKA.AMR Fleet software instead of tedious programming.

The KMP 3000P is controlled using the suitable software KUKA.AMR Fleet – an intelligent, AI-based and easy-to-use fleet management system. Furthermore, the VDA 5050 standard communication interface guarantees maximum compatibility between the AMR and different control systems.



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