

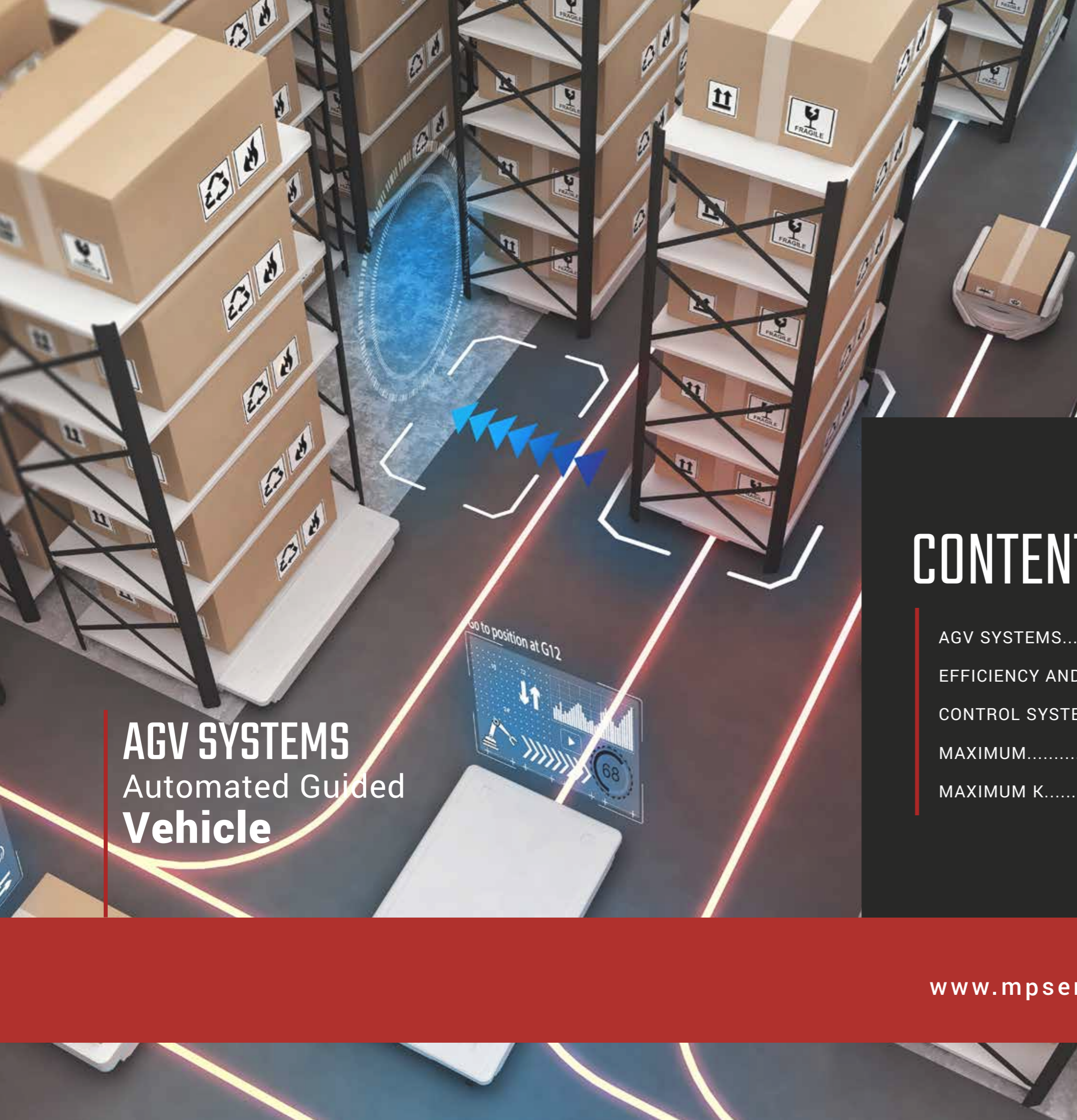


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AGV SYSTEMS

Automated Guided
Vehicle



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Automated Guided Vehicle

Vehicle

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AGV Systems |

Maximize logistics management with our advanced AGV systems

The **MAXIMUM series AGV** (Automated Guided Vehicle) systems developed by **MPS Engineering S.r.l.** are an innovative solution for the automatic transport and movement of items within manufacturing centers, warehouses, and distribution facilities.

The use of these systems results in **significant labor cost savings**, as they do not require the presence of operators for item transport and movement. This allows human resources to be allocated to more strategic and value-added tasks.

AGV systems are autonomous and follow configurable **guide paths that can be adapted to optimize storage, retrieval, and transportation functions**. They can operate in a wide range of environments, including confined spaces, offering **maximum flexibility and adaptability** to various logistical needs.

MPS Engineering S.r.l.'s MAXIMUM AGVs represent a significant solution for **maximizing productivity and automation in logistics management**. They can be easily integrated with other management and control systems, allowing for greater efficiency and synchronization throughout the logistics process.

Our systems are capable of **optimizing workflows, reducing operational costs, and ensuring more efficient item management** within manufacturing and distribution environments.

Efficiency and Automation

The distinctive features of our AGV systems allow for:

REDUCE LABOR REQUIREMENTS

Our AGV systems automate material handling operations, reducing reliance on manual labor.

REDUCE PRODUCT DAMAGE

By replacing conventional carts with our AGV systems, the risk of damage and loss during transportation is minimized as they are designed to handle materials with care and precision.

IMPROVE SPEED AND POSITIONING ACCURACY

Our AGV systems significantly enhance material handling speed and positioning precision. This allows for workflow optimization and reduced production times.

ENHANCE SAFETY

AGV systems contribute to improved workplace safety through advanced sensors and safety algorithms, enabling safe and reliable movement. They eliminate forklift-related accidents caused by human errors.

INCREASE FLEXIBILITY

Our AGV systems offer systematic interfaces that allow integration with a variety of stands, automation, and production operations. This provides greater operational flexibility and adaptation to specific company needs.

FUNCTION AS AN AUTOMATED STORAGE AND RETRIEVAL SYSTEM (AS/RS)

AGVs can operate within existing aisle infrastructure and between multiple aisles, enabling the implementation of an efficient automated storage and retrieval system. This optimizes inventory management and enhances overall productivity.



Control system |

Efficiency and precision in trajectory control

The central role of Numerical Control (NC) in the MAXIMUM automated guided vehicle management system

The control system is entrusted to a **Numerical Control (NC)** which manages and directs the necessary trajectories to reach all programmed points, such as machining equipment and stopping stations. **The NC ensures with precision that the vehicle faithfully follows the desired trajectories.**

The **management system** performs the function of **acquiring position signals from the inertial control system and the magnetic sensor system.** In case the vehicle's carriage deviates from the planned trajectory, the management system performs necessary interpolations and provides corrections to the NC to bring the carriage back on the right track.

Communication between the AGV and the central unit occurs through an **advanced radio modem system in half-duplex mode.** This system offers a variety of data transmission applications, with transfer speeds of up to 19200 bits/s using channels ranging from 12.5, 20, or 25 kHz.

Carriage control can be performed manually using a **handheld pendant** connected to the vehicle via a connector. This allows the operator to take direct control of the carriage when necessary.

The energy required for the carriage's movement is supplied through traction battery packs. The vehicle is equipped with multiple battery packs to ensure **continuous operation for a maximum of 5 hours**, considering batteries fully charged at 100%, an operating temperature of approximately 20°C, and an average consumption of 8 kW.

The AGV is capable of autonomously connecting to the charging system during periods of non-use or upon operator command. This allows for recharging the vehicle's batteries when needed.



Cart detection system

The cart position detection system is based on solid-state gyroscope technology, which provides information about the vehicle's orientation. This system is complemented by a magnet detection system, which acts as a redundancy mode to ensure accuracy in determining the cart's position. The program manages both systems synergistically, allowing for the precise recognition of the cart's position and guiding it along the programmed trajectories. This combined approach of inertial detection and magnet detection ensures greater reliability in determining the cart's position and accurately guiding it in its operations.

Static laser sensor "rate gyro"

The gyroscope utilizes a static laser rate gyro sensor capable of measuring the pitch angle change every 10 ms. The magnet detection system consists of a magnetic antenna that detects the position of a reference magnet placed on the floor relative to the antenna's virtual center. This system enables the vehicle to accurately determine its position and accurately follow the desired trajectories.

MAXIMUM

The New Frontier of Industrial Automation

MPS Engineering's range of Automated Guided Vehicles (AGV and AMR) is expanding further with the addition of the brand-new **MAXIMUM** series.

This new model is currently under construction at MPS Engineering and features **innovative magnetic induction power technology**.

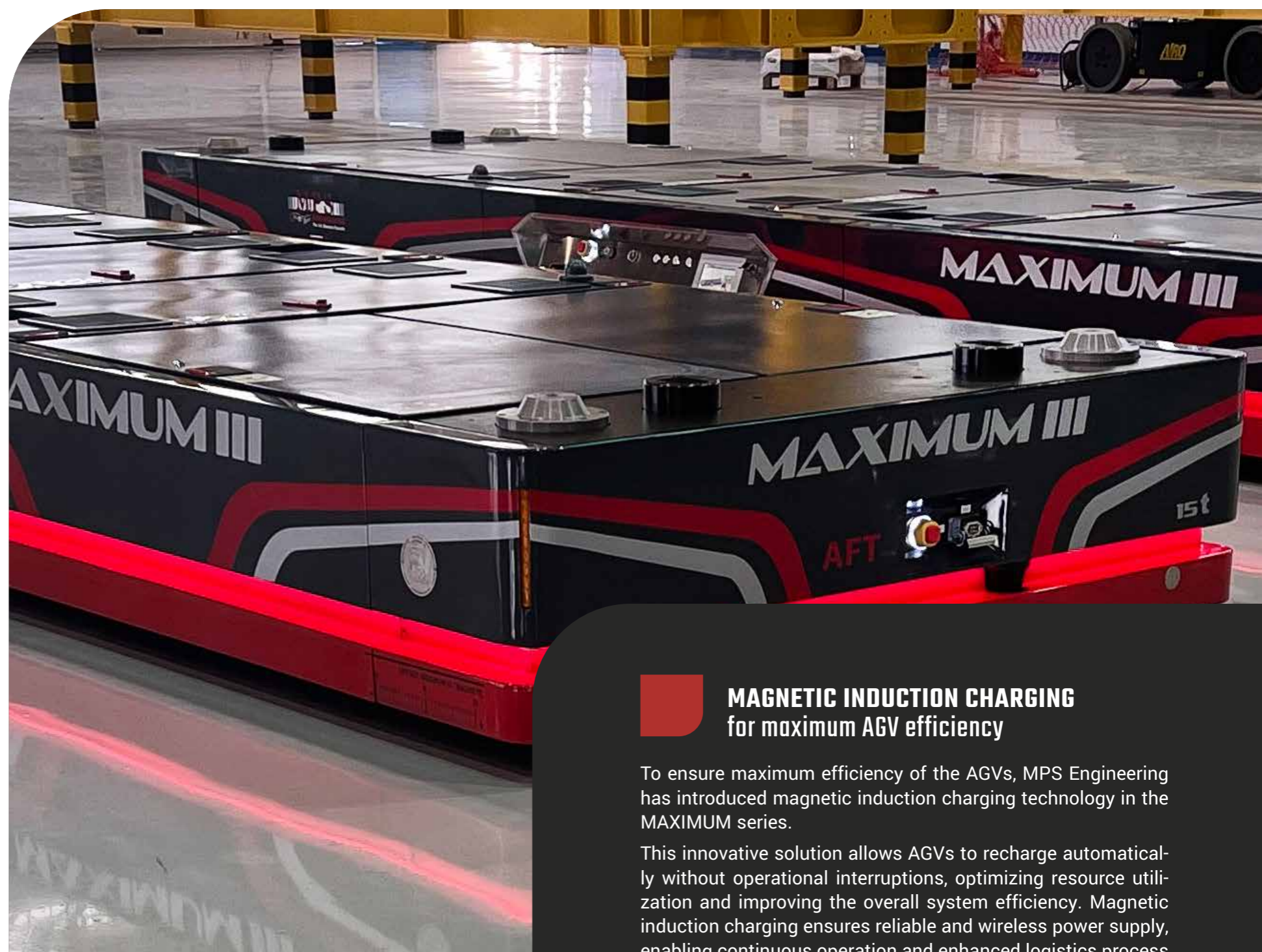
Magnetic induction power technology represents a significant advancement in industrial automation. This system allows for efficient charging of AGV and AMR vehicles without the need for physical connections or direct contacts, thanks to the use of magnetic fields. This ensures **greater operational flexibility and reduces downtime associated with charging**.

The **MAXIMUM III** series has been designed with specific customer needs and operational challenges in mind. It offers **higher load capacity, increased autonomy, and improved energy efficiency**.

Additionally, it features **advanced navigation and safety capabilities**, enabling smarter and safer material handling operations within industrial environments.

AGV MAXIMUM I-II-III KEY FEATURES

Description	Unità	Dati
Length	mm	min 5.500
Width	mm	min 1.900
Height	mm	min 600
Capacity	t.	10 200
Structure Material	S355JR Steel	
Perimeter Cover Material	Fiberglass/Metal	
Surface Finish	Sandblasting and Painting	
Energization System	Lithium Batteries Floor Inductive	
Continuous Operation Battery Group Autonomy	min	300
Positioning Precision	mm	+/- 10
Navigation System	Gyroscope /Magnetic Antenna /Laser Scanner /Magnetic Strip /Induction	
Handling System	Omnidirectional	
Operation System	Single or Tandem Configuration	
Maximum Sound Pressure	dB(A)	70
Maximum Empty Translation Speed	m/min	30
Maximum Full Load Translation Speed	m/min	30
Maximum Lifting Stroke	mm	300
Maximum Expected Surmountable Slope	m/min	5
System Availability within 12 months from start-up	%	97
Operating Temperature	°C	+5 + 35 °C
Availability	d/h	7/7 - 24/24



MAGNETIC INDUCTION CHARGING for maximum AGV efficiency

To ensure maximum efficiency of the AGVs, MPS Engineering has introduced magnetic induction charging technology in the MAXIMUM series.

This innovative solution allows AGVs to recharge automatically without operational interruptions, optimizing resource utilization and improving the overall system efficiency. Magnetic induction charging ensures reliable and wireless power supply, enabling continuous operation and enhanced logistics process optimization.

MAXIMUM K |

MGV stands for Manually Guided Vehicle, which is used for heavy-duty transportation on asphalt

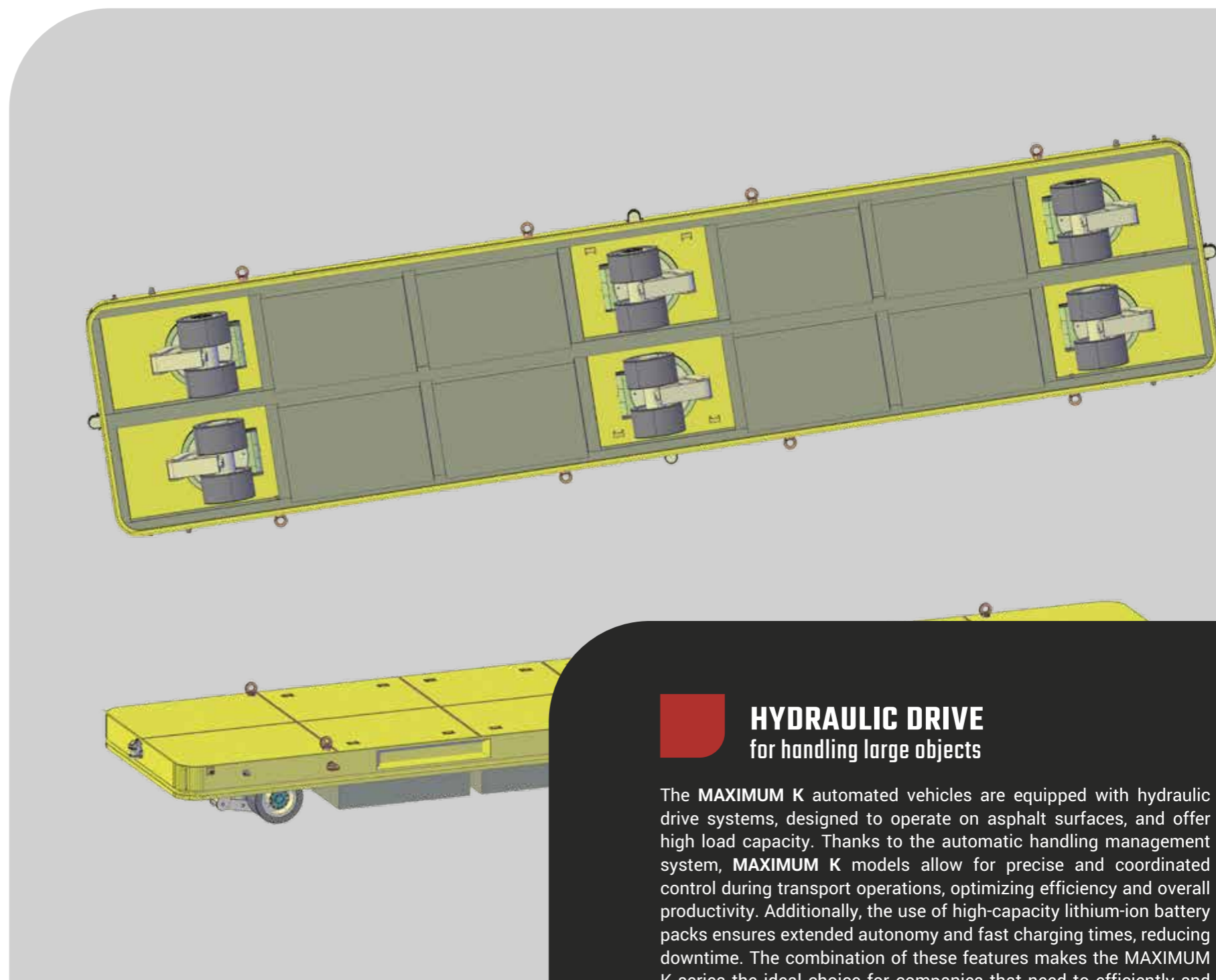
The new series of MAXIMUM K vehicles, currently in development, includes a range of Manually Guided Vehicles (MGV) equipped with hydraulic drive. MAXIMUM K vehicles are designed to operate specifically on asphalt surfaces and offer significantly high load capacity. These vehicles are ideal for transporting large-sized materials due to their robustness and superior performance. What makes MAXIMUM K models particularly innovative is their ability to operate in synchronization with an automatic materials handling system. This system enables precise and coordinated control of transport operations, facilitating the efficient movement of large objects and improving overall productivity.

Another strong point of MAXIMUM K vehicles is their power system. They are equipped with high-capacity lithium-ion battery packs, ensuring extended autonomy and quick charging times. This allows for continuous use and reduces downtime associated with battery charging.

The combination of hydraulic drive, high load capacity, automatic materials handling, and advanced power supply makes the MAXIMUM K series an ideal choice for companies that need to transport and handle large objects efficiently and safely.

MAXIMUM K | MGV- Manually Guided Vehicle CARATTERISTICHE PRINCIPALI

Description	Unità	Dati
Length	mm	min 5.500
Width	mm	min 1.500
Height	mm	min 800
Capacity	t.	10 800
Structure Material	Steel S355JR	
Perimeter Casing Material	Metal	
Surface Finish	Sandblasting and Painting	
Power Supply System	Diesel/Lithium Batteries	
Continuous Operation Battery Group Autonomy	min	300
Control System	Remote Control	
Handling System	Omnidirectional Self-leveling	
Operating System	Single or Coupled in Tandem	
Maximum Sound Pressure	dB(A)	78
Maximum Empty Travel Speed	m/min	30
Maximum Loaded Travel Speed	m/min	30
Maximum Lifting Stroke	mm	800
Maximum Expected Gradeability	m/min	150-300
System Availability within 12 Months from Start-up	%	97
Availability	d/h	7/7 - 24/24



HYDRAULIC DRIVE for handling large objects

The MAXIMUM K automated vehicles are equipped with hydraulic drive systems, designed to operate on asphalt surfaces, and offer high load capacity. Thanks to the automatic handling management system, MAXIMUM K models allow for precise and coordinated control during transport operations, optimizing efficiency and overall productivity. Additionally, the use of high-capacity lithium-ion battery packs ensures extended autonomy and fast charging times, reducing downtime. The combination of these features makes the MAXIMUM K series the ideal choice for companies that need to efficiently and safely transport and handle large objects.



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