

Let It Become A Pleasure Moving Forward With Heavy Load !

Shanghai Haipeng Unmanned Vehicle Technology Co.,Ltd



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## Heavy-load AGV

Active Suspension And Adapative  
Pavement Multi-drive Omnidirectional  
Heavy-load AGV



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HAIPENG-UMV

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## ● HAIPENG GROUP

Jiangsu Haipeng Group is a diversified group company that integrates three areas of business: special vehicle manufacturing, automobile sales, and pharmaceutical chain sales. The group currently has over 2,500 employees and its annual sales volume is 5 billion. In the field of special vehicle manufacturing, the company has always insisted on technological research and development as its core competitiveness, establishing its own scientific research center. Its products are widely used in metallurgy, port, logistics, offshore engineering, petroleum, shipping, military and other fields. While deeply cultivating the special vehicle market, the products have been exported to Australia, Southeast Asia, Europe and America for a long time.

In recent years, with the development of the market, Haipeng has begun to invest a significant amount of manpower and resources in the research and development of unmanned vehicles, and has established a subsidiary in Shanghai (HAIPENG-UMV) accordingly.



In the last few years, HAIPENG-UMV has emerged in unmanned vehicle field and has got a certain performance. HAIPENG-UMV will continue to develop new products, overcome industry technical challenges, and provide the market with high-quality and stable heavy load unmanned vehicles.

## ● HAIPENG SPECIAL VEHICLE



- established in 2005, registered capital: 150 million, fixed assets: 80 million
- main products: hydraulic flatbed/ self-propelled module/holding tank vehicles and car carriers
- 21205 square meters welding workshop
- 3000 square meters military workshop
- 2494 square meters assembly workshop
- 5564 square meters electrophoretic coating workshop
- 2728 square meters warehouse
- 5000 square meters test ground
- 2 full-equipped welding production lines
- One of the largest electrophoretic spray coating lines in East China
- 180 metalworking equipments

## ● HONOR QUALIFICATION

- National High-tech Enterprise
- ISO Quality Management System Certification
- World Manufacturer Identification Code Certificate
- Jiangsu Province Fluid Power Drive and Control Engineering Technology Research Center
- Jiangsu Province Enterprise Technology Center
- Equipment Manufacturing Qualification Certificate
- National Military Standard Quality Management System Certification
- Weapon Equipment Scientific Research and Production Unit Confidentiality Qualification Certification

## ● HAIPENG-UMV

Shanghai Haipeng Un-Manned Vehicles Technology Co., Ltd (HAIPENG-UMV) is a subsidiary of Jiangsu Haipeng Special Vehicle Co., Ltd invested by Haipeng Group. We are committed to the R&D and manufacturing of heavy load AGVs and unmanned vehicles. We can also provide customers with unmanned logistics solutions for heavy cargos.

The core products and services are as follows:

- Adaptive pavement multi-drive omnidirectional heavy load AGV (maximum load: 600 tons)
- Multi-drive omnidirectional and intelligent wire-controlled chassis (speed: 40 km/h, maximum load :120 tons)
- Port IGV and steel coil IGV (level 4 intelligent driving, 40/65/120 tons optional heavy load)
- Unmanned hot metal cars / slag pot carriers and unmanned driving modifications of hot metal cars, slag pot carriers, dump trucks.
- Comprehensive unmanned logistics solution for steel plants.

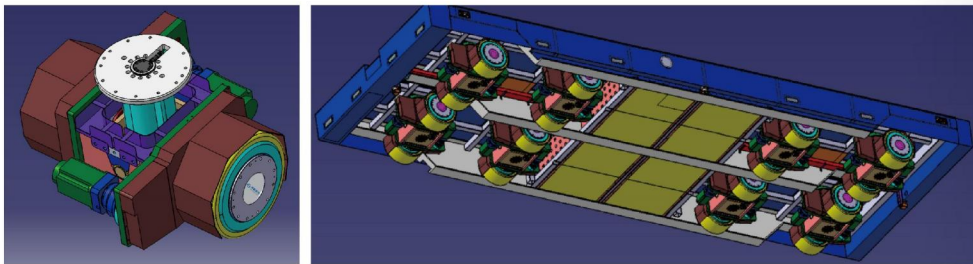


## Overview of Haipeng Multi-drive Omnidirectional Heavy Load AGV

### ■ Characteristics and Advantages:

#### ○ Omnidirectional walking

Haipeng utilizes multi-drive synchronous control technology, allowing the transport vehicle to have six, ten, or more wheel modules, with each wheel being independently driven. Each module can rotate around its own central axis, enabling the transport vehicle to travel in any direction and operate in smaller spaces, including a full 360-degree rotation on the spot.



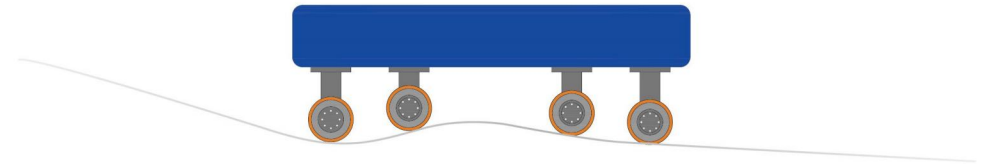
#### ○ Self-adaptive pavement

Haipeng's adaptive road surface technology is accomplished through a hydraulic suspension system. Each driven axle is equipped with a hydraulic cylinder, and through the balanced control of multi-axle hydraulic power, it achieves an even distribution of the vehicle's load across each driven unit. Additionally, each hydraulic axle can automatically adjust its height according to the unevenness of the road surface, and it can also perform a coordinated overall lift of multiple axles as needed by the vehicle, in order to achieve the purpose of lifting the load.

The vehicle intelligently carries the load and evenly distributes the payload across all axles through an electro-hydraulic control system, thus allowing the vehicle to adaptively move extremely heavy loads on uneven road surfaces.

As the load weight increases, the hydraulic suspension system can distribute the load across all wheels, enabling the heavy-load transport vehicle to travel on relatively weak road surfaces without causing the damage to the road that traditional wheel systems would.

Haipeng's adaptive suspension system completely isolates the moving vehicle from the irregularities of the factory floor, essentially simulating precise ground track motion. Large structures can move effortlessly and accurately in any direction without resistance to reversing direction, a function that traditional rail, wheel, roller, or caster components cannot achieve.



### ■ Characteristics and Advantages:

#### ○ Coordinated multi-vehicle operation

Haipeng's multi-vehicle collaboration working technology enables the coordinated operation of two, three, or four transport vehicles under a single ultra-long and/or very wide load, ushering in a new era for the assembly operations of heavy equipment.

When the product (physical dimensions or weight) exceeds the size that a single transport vehicle can carry, multiple vehicles can be electronically linked to create a larger 'virtual' vehicle. This larger vehicle operates as a single entity, controlled by a single operator using wireless remote control. It possesses all the functionalities of a single vehicle, but on a larger scale.

Haipeng's multi-vehicle collaborative working technology allows multiple transport vehicles to combine under a single large load and work in coordination as needed based on the length and/or width of the load.

#### ○ Real-time load monitoring

Haipeng's heavy-load AGV utilizes real-time center of gravity monitoring technology to determine the optimal load position and balance point. By calculating the exact location virtually, it assists the equipment in achieving perfect lifting.

#### ○ Wireless remote control, long-distance control and fault diagnosis

Control is conducted through a human-machine interface or a handheld wireless remote controller, which allows for the regulation of the vehicle's forward and reverse speed, turning angles, driving modes, as well as the control of raising and lowering the load. The vehicle is equipped with a high-resolution monitor that provides the operator with graphical feedback on the current status of the transport vehicle, including:

- current position of the module
- the actual weight of each module
- the total load of the transport vehicle
- calculating the center of gravity of the load

The vehicle can communicate with the command center in real-time via 5G, allowing for remote walking and motion control as well as remote fault diagnostics.



## OMV 10 Series of Ultra-thin Multi-drive Omnidirectional Heavy Load AGV



### Features and Advantages:

- Omnidirectional walking
- Hydraulic active suspension
- Self-adaptive pavement
- Coordinated multi-vehicle operation
- Real-time load monitoring
- Ultra-thin vehicle
- Wireless remote control, long-distance control and fault diagnosis

### Application Area:



### Technical Parameter:

Model	OMV10-4	OMV10-6	OMV10-8
Load	40t	60t	80t
Weight	5t	6t	7t
Engine type	optional lithium battery、lead-acid battery、diesel generator、alternating current (AC)		
Driving form	Dual DC Servo Motor Differential Drive		
Suspension type	hydraulic active suspension		
Lifting method	hydraulic lifting		
Length	5000mm	6000mm	7000mm
Width	2400mm	2400mm	2400mm
Height	420mm	420mm	420mm
No. of driving units	4	6	8
No. of wheels	8	12	16
Wheel materials	steel wheel with polyurethane coating		
Wheel diameter	φ300mm	φ300mm	φ300mm
Speed of empty load	30m/min	30m/min	30m/min
Speed of full load	25m/min	25m/min	25m/min
Full load climbing speed	15m/min	15m/min	15m/min
Driving mode	orward, backward, turning,lateral,diagonal movement, spinning in place, multi-vehicle coordination		
Climbing ability	full load ≤4%, empty load≤10%		
Lifting speed	10mm/s		
Lifting stroke	100mm		
Driving positioning accuracy	3mm		
Lifting positioning accuracy	0.5mm		
Protection rating	IP54 (IP65 optional)		
Storage Temperature	-40°C~80°C		
Operating Temperature	-10°C~60°C (-40°C~60°C optional)		
Relative humidity	0~100%		
Salt fog resistance	4x 2h salt fog (5 % NaCl) 40 °C/93 % RF 72 h under constant temperature conditions (optional)		
Anti-explosion	Ex optional		
Control method	remote operation/automatic navigation/ receive commands from the host computer for control/remote control		
Safety protection	rubber bumper strip/proximity edge sensor to prevent collisions/laser radar anti-collision		
Navigation method	magnetic strip / ribbon / QR code / inertial / laser SLAM / INS+GNSS navigation		
Location mode	RFID / QR code /visual positioning		

## OMV 15 Series of Adaptive Pavement and Multi-drive Omnidirectional Heavy Load AGV



### Features and Advantages:

- Omnidirectional walking
- Hydraulic active suspension
- Self-adaptive pavement
- Coordinated multi-vehicle operation
- Real-time load monitoring
- Wireless remote control, long-distance control and fault diagnosis

### Application Area:



### Technical Parameter:

Model	OMV15-4	OMV15-6	OMV15-8
Load	60t	80t	120t
Weight	7t	8t	9t
Engine type	optional lithium battery、lead-acid battery、diesel generator、alternating current (AC)		
Driving form	Dual DC Servo Motor Differential Drive		
Suspension type	hydraulic active suspension		
Lifting method	hydraulic lifting		
Length	5000mm	6000mm	8000mm
Width	2400mm	2400mm	2400mm
Height	670mm	670mm	670mm
No. of driving units	4	6	8
No. of wheels	8	12	16
Wheel materials	steel wheel with polyurethane coating		
Wheel diameter	φ400mm	φ400mm	φ400mm
Speed of empty load	30m/min	30m/min	30m/min
Speed of full load	25m/min	25m/min	25m/min
Full load climbing speed	15m/min	15m/min	15m/min
Driving mode	forward, backward, turning, sidling, diagonal movement, spinning in place, multi-vehicle coordination		
Climbing ability	full load ≤4%, empty load ≤10%		
Lifting speed	10mm/s		
Lifting stroke	150mm		
Driving positioning accuracy	3mm		
Lifting positioning accuracy	0.5mm		
Protection rating	IP54 (IP65 optional)		
Storage Temperature	-40°C~80°C		
Operating Temperature	-10°C~60°C (-40°C~60°C optional)		
Relative humidity	0~100%		
Salt fog resistance	4x 2h salt fog (5 % NaCl) 40 °C/93 % RF 72 h under constant temperature conditions (optional)		
Anti-explosion	Ex optional		
Control method	remote operation/automatic navigation/ receive commands from the host computer for control/remote control		
Safety protection	rubber bumper strip/proximity edge sensor to prevent collisions/laser radar anti-collision		
Navigation method	magnetic strip / ribbon / QR code / inertial / laser SLAM / INS+GNSS navigation		
Location mode	RFID / QR code /visual positioning		



## OMV 20 Series of Adaptive Pavement and Multi-drive Omnidirectional Heavy Load AGV



### Features and Advantages:

- Omnidirectional walking
- Hydraulic active suspension
- Self-adaptive pavement
- Coordinated multi-vehicle operation
- Real-time load monitoring
- Wireless remote control, long-distance control and fault diagnosis

### Application Area:



### Technical Parameter:

Model	OMV20-10	OMV20-16	OMV20-24
Load	200t	300t	500t
Weight	16t	24t	32t
Engine type	optional lithium battery、lead-acid battery、diesel generator、alternating current (AC)		
Driving form	Dual DC Servo Motor Differential Drive		
Suspension type	hydraulic active suspension		
Lifting method	hydraulic lifting		
Length	9000mm	13500mm	18000mm
Width	3000mm	3000mm	3000mm
Height	660mm	660mm	660mm
No. of driving units	10	16	24
No. of wheels	20	32	48
Wheel materials	steel wheel with polyurethane coating		
Wheel diameter	φ450mm	φ450mm	φ450mm
Speed of empty load	30m/min	30m/min	30m/min
Speed of full load	25m/min	25m/min	25m/min
Full load climbing speed	10m/min	10m/min	10m/min
Driving mode	forward, backward, turning, sidling, diagonal movement, spinning in place, multi-vehicle coordination		
Climbing ability	full load ≤5%, empty load ≤10%		
Lifting speed	10mm/s		
Lifting stroke	150mm		
Driving positioning accuracy	3mm		
Lifting positioning accuracy	0.5mm		
Protection rating	IP54 (IP65 optional)		
Storage Temperature	-40°C~80°C		
Operating Temperature	-10°C~60°C (-40°C~60°C optional)		
Relative humidity	0~100%		
Salt fog resistance	4x 2h salt fog (5 % NaCl) 40 °C/93 % RF 72 h under constant temperature conditions (optional)		
Anti-exposure	Ex optional		
Control method	remote operation/automatic navigation/ receive commands from the host computer for control/remote control		
Safety protection	rubber bumper strip/proximity edge sensor to prevent collisions/laser radar anti-collision		
Navigation method	magnetic strip / ribbon / QR code / inertial / laser SLAM / INS+GNSS navigation		
Location mode	RFID / QR code /visual positioning		

## OMV 25 Series of Ultra-thin Multi-drive Omnidirectional Heavy Load AGV



### Features and Advantages:

- Omnidirectional walking
- Hydraulic active suspension
- Self-adaptive pavement
- Coordinated multi-vehicle operation
- Real-time load monitoring
- Ultra-thin vehicle
- Wireless remote control, long-distance control and fault diagnosis

### Application Area:

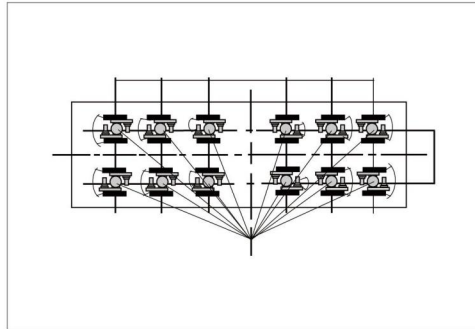


### Technical Parameter:

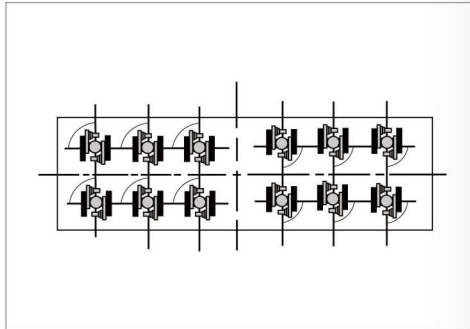
Model	OMV25-8	OMV25-12	OMV25-20
Load	200t	300t	500t
Weight	16t	24t	32t
Engine type	optional lithium battery、lead-acid battery、diesel generator、alternating current (AC)		
Driving form	Dual DC Servo Motor Differential Drive		
Suspension type	hydraulic active suspension		
Lifting method	hydraulic lifting		
Length	8000mm	9000mm	9000mm
Width	2300mm	2400mm	3300mm
Height	420mm	420mm	420mm
No. of driving units	8	12	20
No. of wheels	16	24	40
Wheel materials	steel wheel with polyurethane coating		
Wheel diameter	Φ300mm	Φ300mm	Φ300mm
Speed of empty load	30m/min	30m/min	30m/min
Speed of full load	25m/min	25m/min	25m/min
Full load climbing speed	10m/min	10m/min	10m/min
Driving mode	forward, backward, turning, lateral, diagonal movement, spinning in place, multi-vehicle coordination		
Load Monitoring	function of weight measurement, center of gravity position detection, overweight alarm and unbalance alarm		
Lifting speed	10mm/s		
Climbing ability	full load ≤4%, empty load ≤10%		
Over-obstacle capacity	Can overcome ground undulations of ±10mm.		
Lifting stroke	100mm		
Driving positioning accuracy	3mm		
Lifting positioning accuracy	0.5mm		
Protection rating	IP54 (IP65 optional)		
Storage Temperature	-40°C~80°C		
Operating Temperature	-10°C~60°C (-40°C~60°C optional)		
Relative humidity	0~100%		
Salt fog resistance	4x 2h salt fog (5 % NaCl) 40 °C/93 % RF 72 h under constant temperature conditions ( optional)		
Anti-exposion	Ex optional		
Control method	remote operation/automatic navigation/ receive commands from the host computer for control/remote control		
Safety protection	rubber bumper strip/proximity edge sensor to prevent collisions/laser radar anti-collision		
Navigation method	magnetic strip / ribbon / QR code / inertial / laser SLAM / INS+GNSS navigation		
Location mode	RFID / QR code /visual positioning		



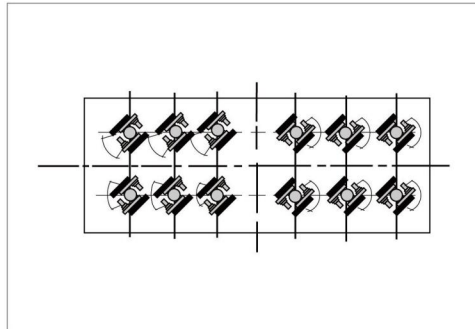
## Driving Mode



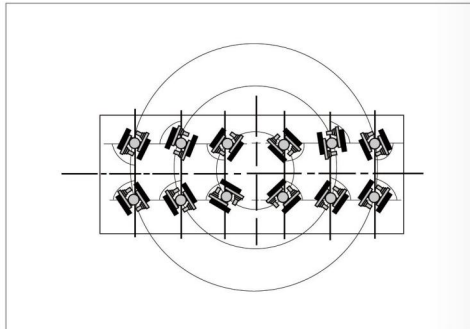
• Straight Driving Mode



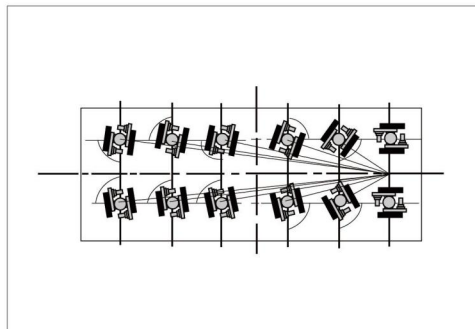
• Lateral Driving Mode



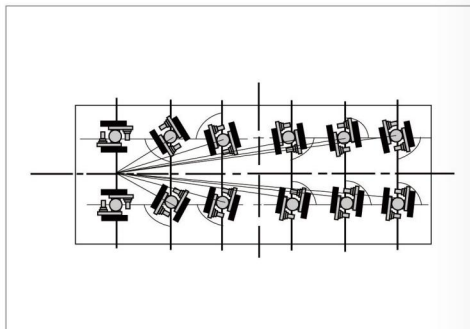
• Diagonal Driving Mode



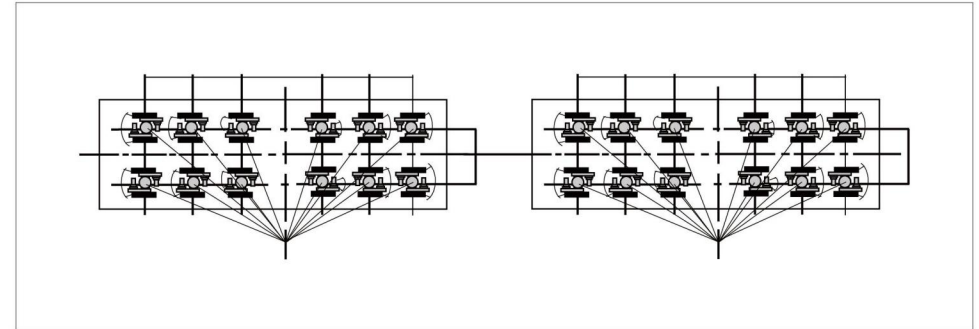
• Center Rotation Mode



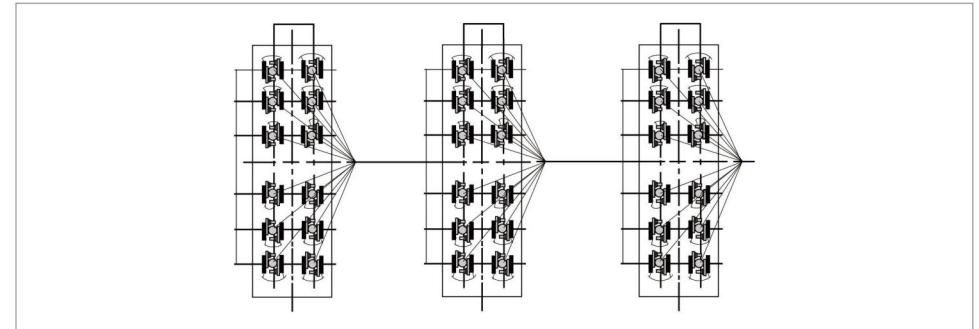
• Vehicle Front-Wheel Steering Mode



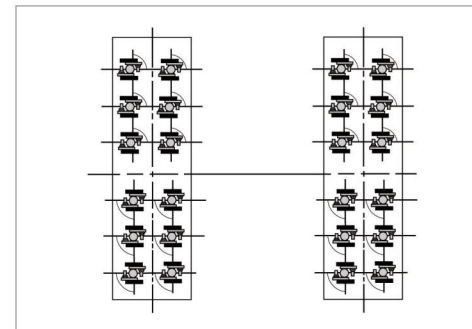
• Vehicle Rear-Wheel Steering Mode



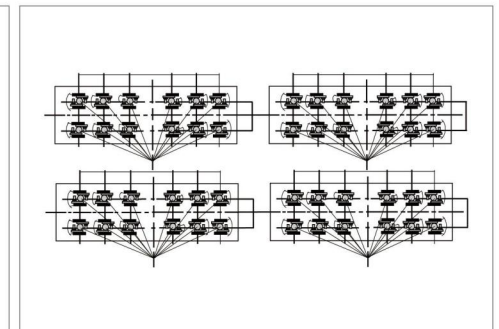
• Dual-Vehicle Synchronization Mode



• Three-Vehicle Synchronization Mode



• Dual-Vehicle Synchronization Mode



• Four-Vehicle Synchronization Mode