

HELI

# HELI AGV PRODUCTS GUIDE



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HELI Intelligent Logistics, the one-stop solution expert

## HELI INTELLIGENT



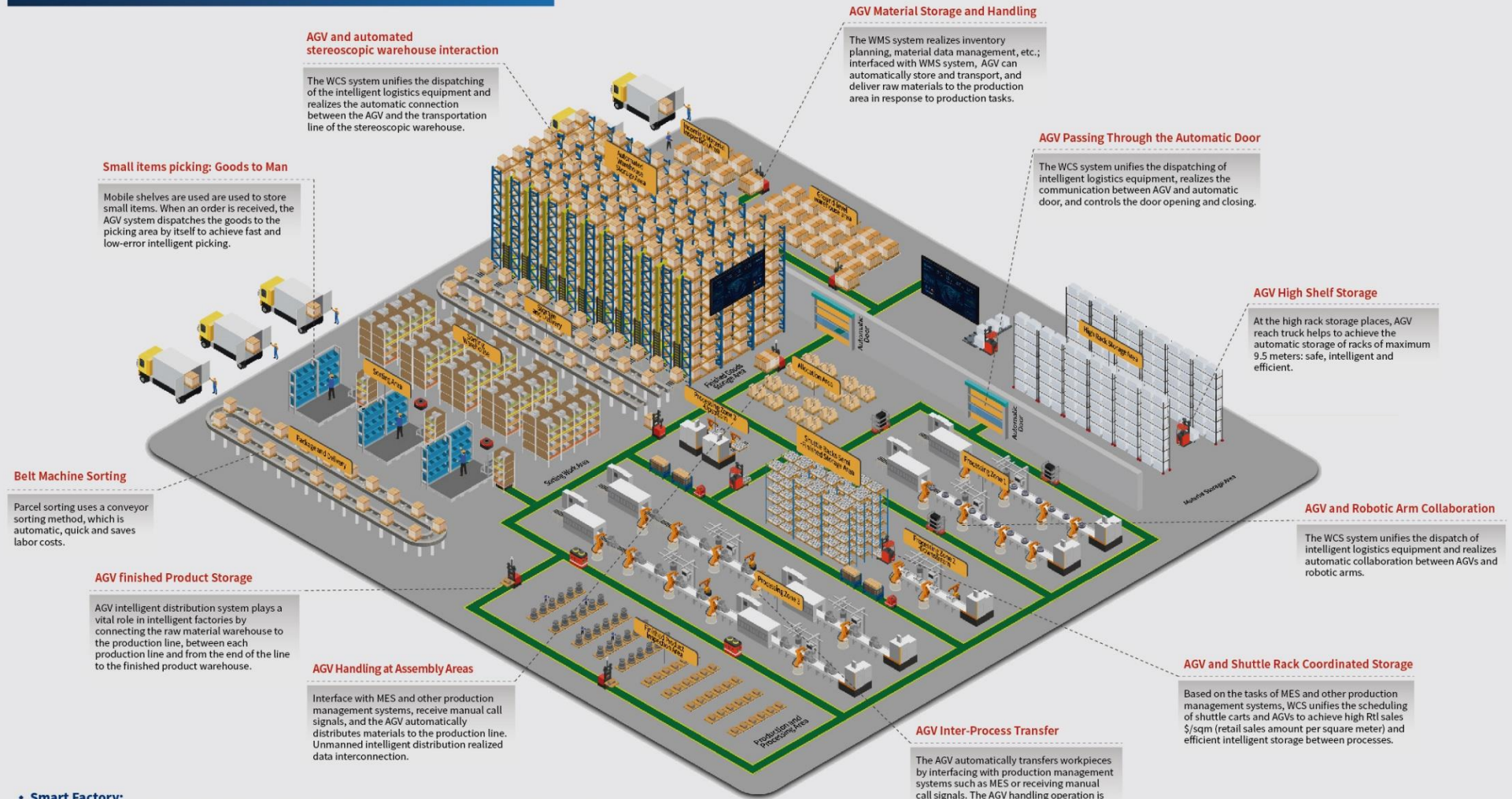
Anhui Forklift Group Corporation Ltd. (here in after referred to as Heli) is a solely state-owned company of Anhui Province. Its predecessor was a new plant of Hefei Mining Machinery Factory established in 1958. Its main business is R&D, manufacturing and sales of industrial trucks, intelligent transport equipment and the relevant core parts, having the significant advantages of large scale, completed business chain, strong comprehensive strength and high economic benefits. Since 1991, the main economic indicators have maintained leading in the national industry for 30 consecutive years. Since 2016, Heli has been ranked among the top seven in the world, representing Chinese brands to forge ahead towards higher stage.

HELI keeps innovating, takes the lead in laying out the intelligent network connection industry, carries out independent research on key technologies of intelligent network connection, and has various independently developed technical achievements. We have developed logistics management systems such as CCS (dispatch control center), WMS (warehouse management system), PMS (production management system) and MOM (Manufacturing operation system) independently in order to create complete and coordinated intelligent logistics solutions for users; the products covering forklift, transfer, traction and non-standard customized AGVs to meet the intelligent handling needs of multiple scenarios; the fleet management system products cover intelligent forklift fleet management system, remote lead-acid BMS management system, industrial vehicle rental business management system, HELI exhaust emission monitoring system platform and various intelligent vehicle terminals.

At present, HELI intelligent logistics system is successfully applied in household manufacturing, logistics and warehousing, department store and supermarket, machinery manufacturing, auto parts processing, electronic processing and other industries, and the application scenarios cover indoor and outdoor factory receiving, issuing, replenishing and warehouse storage, picking and other modes.

The work team built by HELI can provide one-stop service, including project consultation and planning, solution design, customized development, system integration and after-sales service, which can effectively guarantee the project quality and bring users a flexible, intelligent and assured intelligent logistics management upgrading experience.





**AGV and automated stereoscopic warehouse interaction**

The WCS system unifies the dispatching of the intelligent logistics equipment and realizes the automatic connection between the AGV and the transportation line of the stereoscopic warehouse.

**AGV Material Storage and Handling**

The WMS system realizes inventory planning, material data management, etc.; interfaced with WMS system, AGV can automatically store and transport, and deliver raw materials to the production area in response to production tasks.

**Small items picking: Goods to Man**

Mobile shelves are used to store small items. When an order is received, the AGV system dispatches the goods to the picking area by itself to achieve fast and low-error intelligent picking.

**AGV Passing Through the Automatic Door**

The WCS system unifies the dispatching of intelligent logistics equipment, realizes the communication between AGV and automatic door, and controls the door opening and closing.

**Belt Machine Sorting**

Parcel sorting uses a conveyor sorting method, which is automatic, quick and saves labor costs.

**AGV High Shelf Storage**

At the high rack storage places, AGV reach truck helps to achieve the automatic storage of racks of maximum 9.5 meters: safe, intelligent and efficient.

**AGV finished Product Storage**

AGV intelligent distribution system plays a vital role in intelligent factories by connecting the raw material warehouse to the production line, between each production line and from the end of the line to the finished product warehouse.

**AGV and Robotic Arm Collaboration**

The WCS system unifies the dispatch of intelligent logistics equipment and realizes automatic collaboration between AGVs and robotic arms.

**AGV Handling at Assembly Areas**

Interface with MES and other production management systems, receive manual call signals, and the AGV automatically distributes materials to the production line. Unmanned intelligent distribution realized data interconnection.

**AGV and Shuttle Rack Coordinated Storage**

Based on the tasks of MES and other production management systems, WCS unifies the scheduling of shuttle carts and AGVs to achieve high RTI sales  $\$/\text{sqm}$  (retail sales amount per square meter) and efficient intelligent storage between processes.

**AGV Inter-Process Transfer**

The AGV automatically transfers workpieces by interfacing with production management systems such as MES or receiving manual call signals. The AGV handling operation is designed according to the on-site requirements.

- **Smart Factory:**  
We provide one-stop intelligent logistics solutions from incoming raw materials, material preparation, material distribution, inter-process transfer and finished product storage.
- **Smart Storage:**  
We offer system solutions for many types of storage: floor stacking, high rack storage, cubic storage, and goods-to-person storage and picking operations.

# Current AGV Models

## AGV Forklift



CQD AGV Reach Truck



CDD AGV Stacker

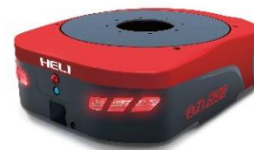


CBD AGV Pallet Truck



CTD AGV Straddle Stacker

## Load-Transfer AGV



QFD Submerged Jacking AGV



BFT AGV Back Packing Pallet Truck

## AGV Towing Tractor



QYD Outdoor Unmanned AGV Towing Tractor

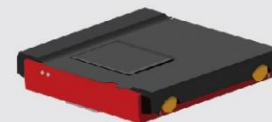


QFQ Submerged AGV Towing Tractor



WQY AGV Tail Towing Tractor

## Integral Logistics System Equipment Integration



Shuttle Carts



Robotic Arms



Pallet Stackers



Automated Stereoscopic Warehouse



Scanning Devices

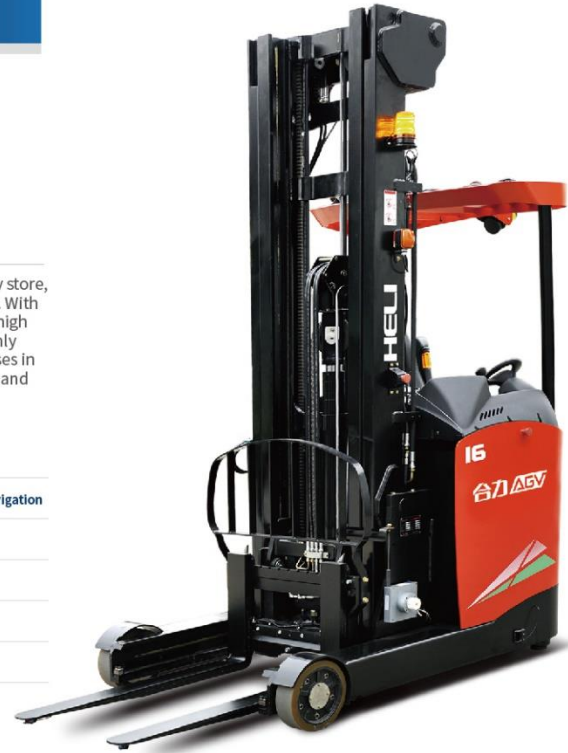
- ◆ Customized equipment and integrated logistics equipment based on scenario and application characteristics are available.

# CQD AGV Reach Truck

## Application Scenarios

HELI forklift AGVs can automatically store, stack and transfer palletized goods. With good high lifting performance and high operational accuracy, they are mainly used in scenarios such as warehouses in factories, e-commerce warehouses and warehouses in logistics centers.

	Navigation Method	Laser Navigation
	Positioning Accuracy	±5mm
	Max Speed	6km/h
	Max Load Capacity	2T
	Max Height	9.5m



### 24-Hour operation, high efficiency

It can automatically store, stack and transfer palletized goods. Travel speed up to 6km/h to meet the requirements of high-frequency storage and handling operations. High lifting performance & high operating accuracy.

### Standard Interface

It can be perfectly interfaced with users' WMS/MES/ERP and other upper systems.

### Flexible logistics, easy to expand

Flexible Logistics, Easy to Expand. The adaptive path design can be flexibly adjusted. The number of AGVs can be increased by expanding the scope of work.

### Safe & stable

Adopt multiple high level software and hardware protection to against obstacles. A reliable control system ensures high stability.



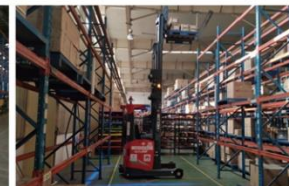
In/out storage access



Production distribution And transportation



Collaboration with Automation equipment



[video1](#)

[video2](#)

[video3](#)

# CDD AGV Stacker

## Application Scenarios

CDD AGV Stacker can automate the storage, stacking, and transfer of palletized goods. Small and flexible, it is commonly used for intelligent handling in WIP warehouses, between production lines, and from warehouse to production line.

	<b>Navigation Method</b>	Laser Navigation
	<b>Positioning Accuracy</b>	±5mm
	<b>Max Speed</b>	5km/h
	<b>Max Load Capacity</b>	2T
	<b>Max Height</b>	5.5m



### Flexible and efficient

Automatically assign handling tasks based on manual line-side calls or order task responses.

With small truck body and a travel speed of 5km/h, it meets the requirements for efficient handling over long distances.

### Entire collaboration to create highly flexible intelligent logistics

It connects multiple production links and communicates with automated equipment such as automatic doors, elevators, stereoscopic warehouse, RGVs, robotic arms, production lines, and material identification systems to achieve unified scheduling.

### Safe & stable

Adopt multiple high level software and hardware protection to against obstacles.

A reliable control system ensures high stability.

### Lifting & handling, it is suitable for multiple scenarios

5.5m of handling heights, multi-scene adaptation, from line side bin to production line.

Efficiency increased without the need for transit.

### Standard interface

It can be perfectly interfaced with users' WMS/MES/ERP and other upper systems.



# CBD AGV Pallet Truck

## Application Scenarios

HELI CBD AGV pallet truck can transfer palletized goods automatically. The truck is small and flexible, and the max handling capacity is 3 tons. It is often used for intelligent material distribution and inter-process transfer between intelligent production lines.

	<b>Navigation Method</b>	Laser Navigation
	<b>Positioning Accuracy</b>	±5mm
	<b>Max Speed</b>	5km/h
	<b>Max Load Capacity</b>	3T
	<b>Max Height</b>	205mm



### Flexible and efficient

Automatically assign handling tasks based on manual line-side calls or order task responses.

With small truck body and a travel speed of 5km/h, it meets the requirements for efficient handling over long distances.

### Good performance in heavy load handling.

Max. load 3 tons, flexible transfer of heavy load.

### Entire collaboration to create highly flexible intelligent logistics

It connects multiple production links and communicates with automated equipment such as automatic doors, elevators, stereoscopic warehouse, RGVs, robotic arms, production lines, and material identification systems to achieve unified scheduling.

### Standard interface

It can be perfectly interfaced with users' WMS/MES/ERP and other upper systems.

### Safe & stable

Adopt multiple high level software and hardware protection to against obstacles.

A reliable control system ensures high stability.

 Assembly area pick up

 Production distribution and transportation

 Collaboration with automation equipment



# CTD AGV Straddle Stacker

## Application Scenarios

This model is an upgraded stacker-type forklift AGV to overcome the difficulty of heavy load handling, which is commonly used in the WIP warehouse of heavy goods, between production lines and the intelligent handling from warehouse to production line. It can be widely used in printing, electrical manufacturing, machinery manufacturing, metal smelting, mineral energy, food, chemical and other industries.

	<b>Navigation Method</b>	Laser Navigation
	<b>Positioning Accuracy</b>	±5mm
	<b>Max Speed</b>	6km/h
	<b>Max Load Capacity</b>	4T
	<b>Max Height</b>	5m



### Flexible and Efficient

Automatically assign handling tasks based on manual line-side calls or order task responses.

### Entire Collaboration to Create Highly Flexible Intelligent Logistics

It connects multiple production links and communicates with automated equipment such as automatic doors, elevators, stereoscopic warehouse, RGVs, robotic arms, production lines, and material identification systems to achieve unified scheduling.

### Safe & stable

Adopt multiple high level software and hardware protection to against obstacles.

A reliable control system ensures high stability.

### Good Performance in Heavy Load Handling

The maximum load capacity is 4T, the maximum lifting height is 5m, and the heavy load can be transferred flexibly.

### Standard Interface

It can be perfectly interfaced with users' WMS/MES/ERP and other upper systems.



Warehouse transfer



Production distribution and transportation



Collaboration with automation equipment

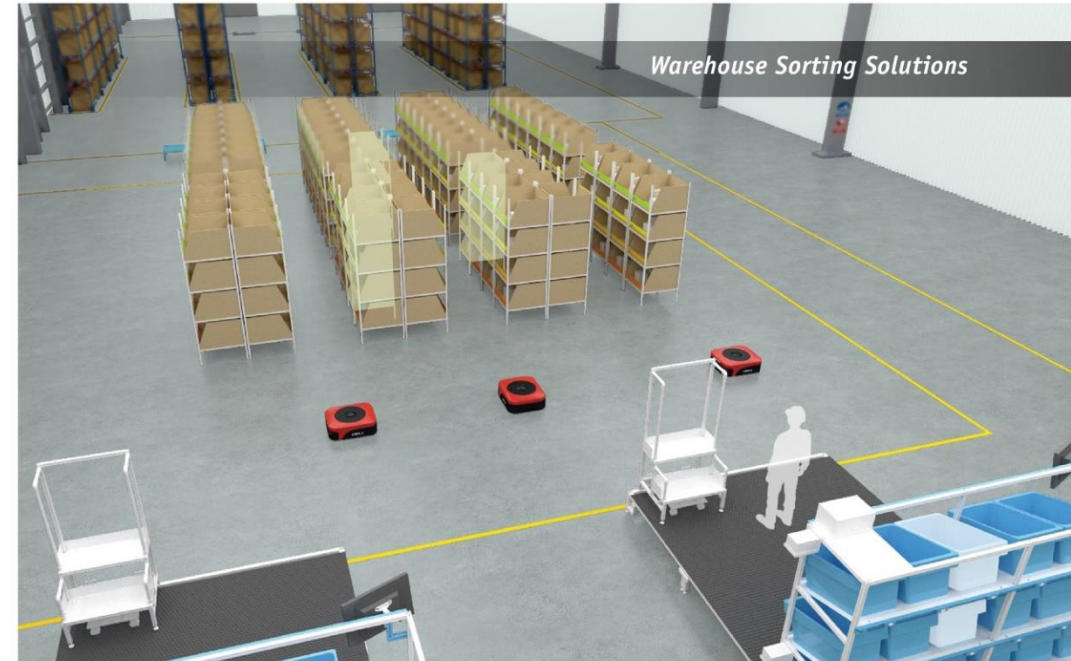


# QFD Submerged Jacking AGV

## Application Scenarios

Adopt QR code navigation. When receiving task, AGV travels to the bottom of the shelf or pallet, and the lifting platform rises to hold the goods, realizing the cargo-to-person handling. Manually picking operations are performed at the workstations based on the display prompting goods information, and after completion, AGV carry the shelves to the warehouse. The powerful dispatching system and warehouse management system can support operation scenarios featuring large-scale, multi-SKU, rapid response, and fragmented picking.

	Navigation Method	QR Code
	Positioning Accuracy	±10mm
	Max Speed	6km/h
	Max Load Capacity	1.2T
	Lifting Stroke	60m



### Powerful scheduling system

Accurate and efficient navigation. Multi-vehicle and multi-scene scheduling management, intelligent traffic management, and real-time path planning bring efficient picking.

### Accuracy rate is over 99.97%

Reduce manual intervention, the extensive use of lighting, color and error management with real-time and traceability warehouse management system helps to reduce order errors and improves service levels.

### Dynamic storage based on the ai inside of warehouse

Based on the picking frequency of goods in the warehouse, the intelligent classification of goods and the optimization of the shelf layout position of popular and lagging goods bring efficiency improvement and inventory structure optimization.

### Safe and reliable operation

Adopt high performance and high security battery, advanced radar avoidance and safety touch edge protection technology; built-in fire extinguisher device.

Goods and parts picking

Production distribution and transportation

Collaboration with automation equipment



# QYD Outdoor Unmanned AGV Towing Tractor

## Application Scenarios

HELI outdoor unmanned traction AGV can automatically plan the route of transportation tasks according to the site working conditions and automatically complete the transportation tasks. It is ideal for hauling cargo in scenarios such as national defense, railway, port, postal service, manufacturing, medicine, tobacco, logistics, etc.



	Navigation Method	Multi-sensor incorporation
	Positioning Accuracy	±10mm
	Max Speed	25km/h
	Max Towing Capacity	25T



### Unmanned operation

Using 3DSLAM technology to automatically create 3D high precision maps of the environment; based on multi-sensor incorporation to achieve high precision positioning of the vehicle in indoor and outdoor environments, while sensing obstacles in the environment in real time.

### Flexibility

No fixed driving path is required, only the AGV driving area is set. In the movable area, the driverless tractor can complete multi-vehicle cooperation, real-time automatic path planning and automatic obstacle avoidance.

### Environmental friendly

600Ah high-capacity lithium battery; low noise, no pollution, high traction force, stable and reliable performance; easy maintenance; four-wheel drive (dual-chamber double circuit brake); portable traction pin operating mechanism.

### Easy switching

Unmanned and manual driving can be switched at any time, and the operation is flexible.

### Standard interface

It can be perfectly interfaced with users' WMS/MES/ERP and other upper systems.



Industrial park



Port terminal



Logistics park



# AGV Trolleys

## QFQ Submerged AGV Towing Tractor

### Operation method

The submerged traction type AGV is submerged to the bottom of the material car, and the lifting platform rises or sinks to realize the material car hook-up handling or offloading.



	Navigation method	Magnetic navigation/ QR code
	Positioning Accuracy	±10mm
	Max Speed	2.7km/h
	Traction capacity can be customized	

## WQY AGV Tail Towing Tractor

### Operation method

The tail is hooked up to the material cart, which can haul more than one cart at a time to meet the requirement of material supply and multi-piece goods transfer in the workshop.



	Navigation method	Magnetic navigation/ QR code
	Positioning Accuracy	±10mm
	Max Speed	2.7km/h
	Traction capacity can be customized	

## BFT AGV Back Packing Pallet Truck

### Operation method

Point-to-point shifting and handling, backpack loaders can be designed according to demand, and they can rotate in place and walk freely in narrow paths for flexible operation.



	Navigation method	Magnetic navigation/ QR code
	Positioning Accuracy	±10mm
	Max Speed	2.7km/h
	Backpacking capacity can be customized	

## Production Handling Solutions

### Cost optimization

Payback period of 1-2 years

### Safe and reliable

Reliable safety protection mechanism, slow down and stop in advance when encountering obstacles, and avoid the cross in advance to ensure operational safety.

### Optimized management

Automatically assign handling tasks based on manual line-side calls or order task responses.

### Standard interface

It can be perfectly interfaced with users' WMS/MES/ERP and other upper systems.

### Flexible customization

We offer standardized products or customized designs according to customer requirements.

[video1](#)

In/out storage Access

Production distribution and Transportation

Collaboration With automation Equipment



[video2](#)

HELI



Model		CQD-AGV	CDD-AGV	CBD-AGV	CTD-AGV	QYD-AGV	QFD-AGV	QFQD-AGV	QFQS-AGV	WQY-AGV	BFT-AGV
		AGV Reach Truck	AGV Stacker	AGV Pallet Truck	AGV Straddle Stacker	Outdoor Unmanned AGV Towing Tractor	Submerged Jacking AGV	Submerged AGV Towing Tractor(One-way)	Submerged AGV Towing Tractor(Two-way)	AGV Tail Towing Tractor	GV Back Packing Pallet Truck
General parameters	Load (customizable)	1600	1600	3000	4000	25000	800	500	500	500	500
	Overall length (including safety scanner)(mm)	1994 (without forks)	2195	2034	2520 (without forks)	3230	910	1370	1580	925	850
	Overall width(mm)	1270	856	958	1270	1425	690	415	415	410	520
	Overall height (mm)	2528	2538	2045	2496	1980	280	280	280	930	485
	Self-weight(kg)	3100	1010	650	2780	3670	200	180	200	200	180
	Operating height max(mm)	9500	5500	205	5000	/	340	/	/	/	/
	Min. turning radius(mm)	1840	1730	1865	2321	3160	/	1000	1200	1000	/
	Rotational ability	/	/	/	/	/	360°	/	/	/	90°、180°
Drive type	Servo wheel	Servo wheel	Servo wheel	Servo wheel	Servo wheel	Differential speed	Differential speed/ servo wheel	Differential speed/ servo wheel	Differential speed/ servo wheel	Differential speed/ servo wheel	
Navigation	Method of navigation	Laser navigation	Laser navigation	Laser navigation	Laser navigation	Multi-sensor fusion	QR code navigation	QR code / magnetic navigation	QR code / magnetic navigation	QR code / magnetic navigation	QR code / magnetic navigation
	Positioning accuracy(mm)	±5	±5	±5	±5	±10	±10	±10	±10	±10	±10
Driving speed	Unladen km/h	6	5	5	6	25	6	2.7	2.7	2.7	2.7
	Full load km/h	6	5	5	6	12	6	1.8	1.8	1.8	1.8
Battery (lithium)	Type	Lithium (Lead-acid optional)	Lithium (Lead-acid optional)	Lithium (Lead-acid optional)	Lithium (Lead-acid optional)	Lithium (Lead-acid optional)	Lithium (Lead-acid optional)	Lithium (Lead-acid optional)	Lithium (Lead-acid optional)	Lithium (Lead-acid optional)	Lithium (Lead-acid optional)
	Rated voltage(V)/ capacity(Ah) (optional)	48/320	24/200	24/320	48/500	80/600	48/36	24/60	24/60	24/60	24/60
	Designed service life	>9000h	>9000h	>9000h	>9000h	>9000h	≥5年	>9000h	>9000h	>9000h	>9000h
Trafficability	Climbing capacity°	<3	<3	<3	<3	<14	<3	<3	<3	<3	<3
	Capacity to cross the ditch mm	≤8	≤5	≤5	≤5	≤80	≤5	≤5	≤5	≤5	≤5
	Capacity to get over the hump (mm)	≤5	≤5	≤5	≤5	≤80	≤5	≤5	≤5	≤5	≤5
Operating environment	Temperature°	- 5-40	- 5-40	- 5-40	- 5-40	- 5-40	0-50	0-50	0-50	0-50	0-50
	Humidity%	≤90	≤90	≤90	≤90	≤90	40-95	40-80	40-80	40-80	40-80
	Noise level(dB)	<75	<75	<75	<75	<75	<65	<60	<60	<60	<60

# Customer Cases

- At present, HELI intelligent logistics system is successfully applied in household manufacturing, logistics and warehousing, department store and supermarket, machinery manufacturing, auto parts processing, electronic processing and other industries, and the application scenes cover indoor and outdoor factory receiving, issuing, replenishing and warehouse storage, picking and other modes. In the project construction HELI adheres to the spirit of professionalism and concentration, successfully overcoming many technical problems, highly recognized by users and the industry, setting a benchmark for modern intelligent logistics industry.

## Third party warehousing and logistics



## High Shelf Intelligent Storage

### Application Advantages

- The AGV dispatching system is interfaced with the user's WMS system to achieve automatic in/out picking of more than 4,000 cargo spaces.
- AGV dispatching systems independently assign tasks, control the traffic and manage the information in complex path and multi-site environments.
- The highest rack is 7.2m, opening up the domestic high lift forklift AGV application market
- High frequency fast-in and fast-out operation, AGV travel speed up to 6km/h.
- Meet the users needs in the unpacking and sorting operation



## Machinery Manufacturing



## Transfer of semi-finished products between production processes and intelligent storage

### Application Advantages

- AGV cooperate with automatic shuttle car, adopted shuttle shelf storage, achieved high storage efficiency and Rtl sales \$/sqm efficiency.
- HELI Self-developed WCS system unifies the dispatch of AGVs, robotic arms and automatic shuttles to achieve orderly logistics management.
- Semi-finished products are first-in, first-out, the standardized inventory management is also applicable to food, department store goods and other industries.
- Fully automated operations from production to storage, facilitating overall collaboration and unified data management in the digital factory.



# Customer Cases

## Department store retailing



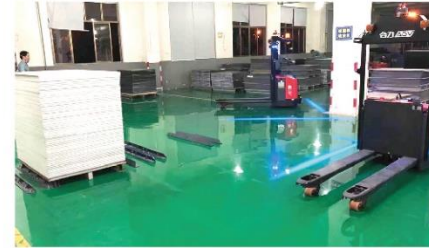
## Shopping mall warehouse unmanned storage

### Application Advantages

- The AGV dispatching system is interfaced with the user's WMS system to achieve automatic in/out picking of more than 2,000 cargo spaces.
- Information warehouse management, unmanned handling operations, easy to trace the flow of goods
- Optimize inventory and respond quickly to order demand.



## Household manufacturing industry



## Automated material handling and automatic inter-process transfer in household manufacturing workshop

### Application Advantages

- The AGV dispatching system is docked with the user's MES system to automatically receive work tasks and meet user's order-based production.
- Widely connected with user automated equipment, the AGVs collaborate with automated equipment of whole field.
- The WMS system developed by HELI meets user's requirement of virtual ground warehouse management, and the items managed are complex and vary in quantity.
- Multiple AGV vehicles of various types work together to complete multi-process handling operations such as transfer, distribution, and warehousing.
- Load capacity is 3T, can meet the user's heavy-duty handling needs.



# Customer Cases

## // Machinery Manufacturing



## // Synchronized material supply between production lines

### Application Advantages

- Low input costs to meet the material distribution of steady pace.
- It helps to standardize the order of the production workshop and improve the information management level.
- Call materials by pressing the button, good human-computer interaction operations.



## // Goods-to-Man Intelligent Sorting

### Application Advantages

- More than 1400 SKU storage, picking efficiency increased by more than 70%.
- Collaborate with production preparation plan to ensure stable production.
- Manual work is at the operating table, easy and convenient.
- Multiple error-proof management mechanisms to reduce picking errors.

## // Combined Material Supply Between Production Lines

### Application Advantages

- Basing on user's order-oriented production model, flexible logistics information technology is used to intelligently deliver combined materials on demand.
- Long distance handling for heavy objects and flexible logistics solutions, it is more suitable for current production needs and future expansion & upgrading plans.



## // Special AGV models (Customized according to user needs)

### Application Advantages

- HELI offers customization services for non-standard products

## Customer Cases



### // **Reliable after-sales service**

#### **Quick Response**

7\*24 hours online diagnosis, remote monitoring and on-site maintenance services for timely response and resolution of after-sales problems.

#### **Operations and Maintenance Training**

During the project construction and delivery period, engineers are on site for operation and maintenance to ensure the process and provide professional training to enterprise operators.

#### **Renovation and Upgrade**

Develop programs suitable for the upgrading and transformation of the enterprise according to the development needs and business changes.

## Professional Services



#### **Experiences**

The staff has many operation experiences in multiple types of project.

#### **Team**

Self-built full life-cycle service team, reliable project design and management

#### **Dedication**

Focusing on serving intelligent handling, we develop key logistics handling equipment and software systems according to the needs of production processes.