

**ZIKO ROBOTICS**

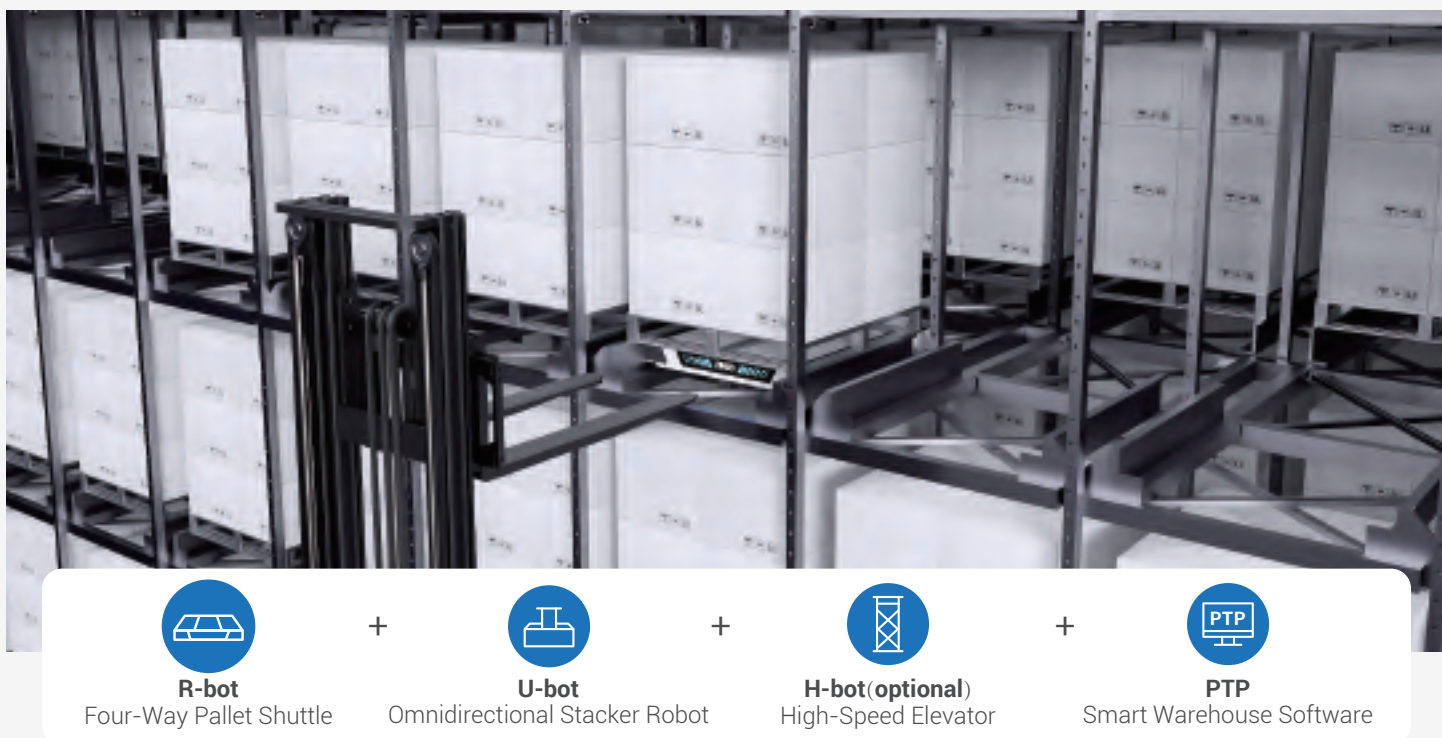


# **U-BOT + R-BOT** **DENSE STORAGE PICKING SYSTEM**

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Leader of Pallet-to-Person Robotics

U-bot and R-bot are combined in a "forward-buffering and backward-storage" operation. U-bot replaces multiple equipment functions such as elevators/conveyor lines/AGVs, and improves picking efficiency and accuracy significantly compared to a separate four-way shuttle warehouse, which is the best choice for customers who seek to maximize storage density and picking efficiency.



## U-bot Omnidirectional Stacker Robot

The U-bot Omnidirectional Stacker Robot is a smart storage robot independently developed by Zikoo Smart. This "pallet-to-person" storage and picking system offers a multitude of benefits including the ability to maneuver around narrow aisles, precise positioning, flexible deployment, and adaptable functionality.

	U4500	U6000	U8000
Dimensions	2198*1784*2100mm	2198*1820*2685mm	2198*1820*3465mm
Rated load	1000kg	1000kg	1000kg
Weight	3000kg	3300kg	3500kg
Lifting height	4500mm	6000mm	8000mm
Forward distance	1110mm	1110mm	1110mm
Applicable pallet sizes	1000-1200*800-1200mm	1000-1200*800-1200mm	1000-1200*800-1200mm
Maximum speed	1.5m/s	1.5m/s	1.5m/s
Minimum turning radius	1370mm	1370mm	1380mm
Minimum aisle width	2100mm	2140mm	2140mm
Navigation	Dual-laser and SLAM hybrid navigation	Dual-laser and SLAM hybrid navigation	Dual-laser and SLAM hybrid navigation
Operational positioning accuracy	±10mm	±10mm	±10mm
Ascending speed	0.25m/s	0.25m/s	0.25m/s
Descending speed	0.2m/s	0.2m/s	0.2m/s
Maximum forward speed	0.3m/s	0.2m/s	0.2m/s
Battery	48V/210Ah lithium-iron phosphate battery	48V/210Ah lithium-iron phosphate battery	48V/210Ah lithium-iron phosphate battery
Duration time	6~8h	6~8h	6~8h
Charging time	2~3h	2~3h	2~3h
Applicable temperature	-10~45°C	-10~45°C	-10~45°C

# R-bot Four-Way Pallet Shuttle

The R-bot Four-Way Shuttle is a smart storage robot that is independently developed by Zikoo and designed for dense storage systems of pallets. It boasts four-way flexible driving, smart autonomous handling, multi-shuttle collaborative operation, and other benefits. It is flexibly adaptable to dense storage scenarios for pallets in various industries.



		Standard Model R1500N	Cold Chain Model R1500C	New Energy Model R1500E
Weight	Kg	320	360	350
Rated load	Kg	1000	1500	1500
Navigation	-	RFID + photoelectric sensor	RFID + photoelectric sensor	RFID + photoelectric sensor
Positioning accuracy	mm	±2	±2	±2
Applicable temperature	°C	-10~45	-25~0	-5~45
Type of batteries	-	Lithium-iron phosphate battery	Lithium-iron phosphate battery	Lithium-iron phosphate battery
Battery capacity	Ah	46	38	48
Duration time at full charge	h	8~10	6~8	8~10
Fully charging time	h	1.5	2.5	2.5
Body dimensions	mm	L1000*W972*H125	L1192*W972*H125	L1192*W972*H125
Applicable pallet sizes	mm	1100~1600*800~1200	1200~1600*1000~1200	1200~1600*1000~1200
Maximum speed	m/s	2	2	2
Acceleration	m/s <sup>2</sup>	2	2	2
Reversing time	s	2.5	2.5	3.5
Lifting time	s	2.5	2.5	3.5

## In Action

### Receiving Process

#### STEP 1

The palletized materials are sent to the inbound point by forklift, and the manual PDA performs the inbound task and requests the WMS system for inbound storage

#### STEP 2

U-BOT accepts the operation instruction and carries the material from the inbound point and places it in the designated position on the four-way shuttle rack

#### STEP 3

The four-way shuttle vehicle travels from the standby point to the front cache point of the warehouse and elevates and transports the materials to the designated position, and the high-level materials need to be carried by the four-way shuttle to reach the high-level warehouse through the elevator

#### STEP 4

After completing the inbound action, the four-way shuttle feeds back to the upper level information system, and the backend system updates the inventory information in real time.

### Dispatch Process

#### STEP 1

According to the order or warehouse plan, WMS sends out the warehouse task instruction, and WCS system schedules the four-way shuttle

#### STEP 2

Four-way shuttles carry materials to the outbound point at the end of the four-way shuttle racks and wait for outbound delivery, high-level goods can be prepared in advance through the elevator to the ground floor area

#### STEP 3

U-BOT carries the materials from the 4-way shuttle rack and places them at the picking point, waiting for manual/automatic picking action

#### STEP 4

After the picking is completed, the trailing pallet is returned to the warehouse for storage and the WMS system updates the information about the storage level in the storage area.

# The Advantages of U-Bot + R-Bot Dense storage picking system

The U-bot + R-bot Ultra-High-Efficiency and Ultra-High-Density Storage and Picking System uses the U-bot Omnidirectional Stacker Robot and R-bot Four-Way Shuttle to enable forward-buffering and backward-storage operations. The U-bot takes on the roles of elevators, conveyors, and AGVs/AMRs, thereby realizing a "sowing and harvesting" process of dense storage and efficient pallet-to-person picking with a single vehicle. In the meantime, when integrated with PTP Smart Warehouse Software, it achieves a "dual control" over efficiency and density, significantly enhancing picking accuracy. Therefore, it is a highly efficient, highly dense, innovative storage and picking solution.



## Ultra High Storage Density

Dense storage with "distribution wall" picking positions for optimum space utilization

High space utilization with no fixed aisles



## Ultra-high Operating Efficiency

No-unpacking put-away, fast picking, to suit more customers' needs

The rack "distribution wall" is designed with multiple single-depth positions for efficient storage and picking

R-bot inside the warehouse, U-bot outside the warehouse, efficient coordination and intelligent scheduling of multiple devices



## Ultra-High ROI

2-3 year ROI

Easier to deploy and faster to delivery than a separate four-way shuttle warehouse

Compared to a separate four-way shuttle warehouse, there is no conveyor lifting equipment and costs are significantly reduced



## Flexible Deployment

Replacement of conveyor lifting in front of the warehouse, more flexible operation in front of the warehouse

Flexibility to increase or decrease the number of U-bot, R-bot according to order requirements

Global planning, phased implementation, flexible expansion

## Scenarios

≤30m

N.H. of warehouse

Medium

No. of SKUs

High

Storage Density

Relatively High

In/Out Storage Efficiency

High

Picking efficiency

## Industries



Food



E-commerce



Cold Chain



Energy



3PL



Retail



Pharmaceuticals



Apparel

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