



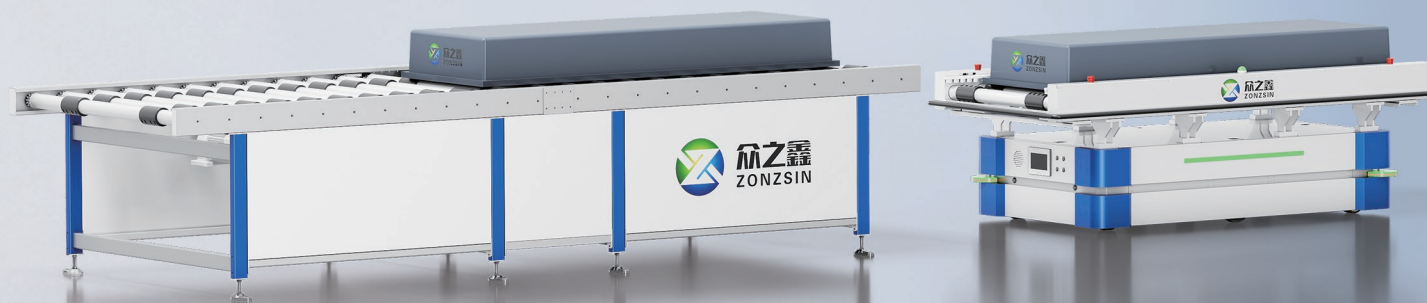
Smart PACK Lines & AGV Loading Robots

- For Reliable Energy Storage Manufacturing

Patented Technology | Your Trusted Partner

ZONZSIN

Building7, No.860 Zhongde Road, Songjiang
District, Shanghai, China
+86 134 8282 9368(Katty Liu)
+86 136 1560 5896(Emily Zheng)
katty.liu@zonzsin.com as01@zonzsin.com



Katty Liu



Emily Zheng

www.zonzsin.com

SHANGHAI ZONZSIN INTELLIGENT EQUIPMENT CO.,LTD.

Catalogue

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6PPM—MTP Battery Module PACK Assembly Line
12PPM—MTP Battery Module PACK Assembly Line
6PPM—CTP Battery Module PACK Assembly Line
12PPM—CTP Battery Module PACK Assembly Line
Fully-auto PACK Loading Robot (AGV-driven)
Fully-auto PACK Loading Equipment (Rail-fixed)
Semi-auto PACK Loading Equipment (Mecanum-wheeled)
PACK Repair Equipment (Crawler-driven)
Turnkey Solution – PACK to Container Loading Line

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Precision

Efficiency

Intelligence

Empowering Energy Storage Manufacturing Worldwide

- ✓ Patented AGV-driven loading robot
- ✓ 99.5%+ yield rate, validated by global leaders
- ✓ Turnkey solution & rapid response

About Us

Since 2019, Zonzsin has delivered high-precision, high-reliability intelligent production solutions for lithium batteries, energy storage integrators, and automotive OEMs – now trusted in Europe, the USA, Japan, South Korea and India.

| | | |
|---|--|--|
| <p>In house module PACK lines & intelligent PACK loading Patented AGV driven Battery PACK Loading Robot (2024) – reducing changeover time and maximizing container space utilization for greater line flexibility</p> <p>Our Core Capabilities</p> | <p>National High-Tech Enterprise (China) “Specialized & Sophisticated” SME ISO 9001 Multiple invention patents & software copyrights</p> <p>Technology Edge</p> | <p>Our solutions have passed rigorous validation by leading energy storage integrators in Sweden, Germany, South Korea, and the USA, etc.</p> <p>Global Reference</p> |
|---|--|--|



Milestone

- 2025-Going Global**

Partnering with leading enterprises in Europe, USA, South Korea and India, etc.
- 2024-New Product Breakout**

Invented patents | Fully-auto PACK Loading Robot (AGV-driven) breakout
- 2023-Tech Breakthrough**

CTP-tech expands markets | 'Specialized and Sophisticated enterprise' Honor
- 2022-Certification & Leap**

Relocate to new factory | ISO certification | 'National High-Tech Enterprise' Honor
- 2021-The first Milestone**

92m & 5GWh module PACK line order | Large-scale project delivery capability
- 2020-Tech Seeding**

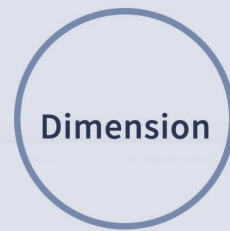
First batch of utility model authorizations
- 2019-Shanghai Launch**

Establishment in Shanghai | Focus on intelligent equipment for new energy

6PPM-MTP Line

The Optimal Entry-Level Solution

01 Dimension & Capacity:

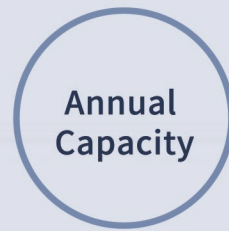


Dimension

L40000 * W8400
* H3500 (mm)



1P52S ESS PACK



Annual Capacity

0.75GWh (314Ah cells, 1 shift/day, 8 hours/shift, 300 days/year)

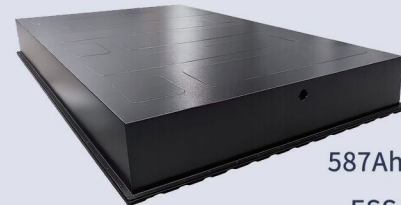


1P104S ESS PACK



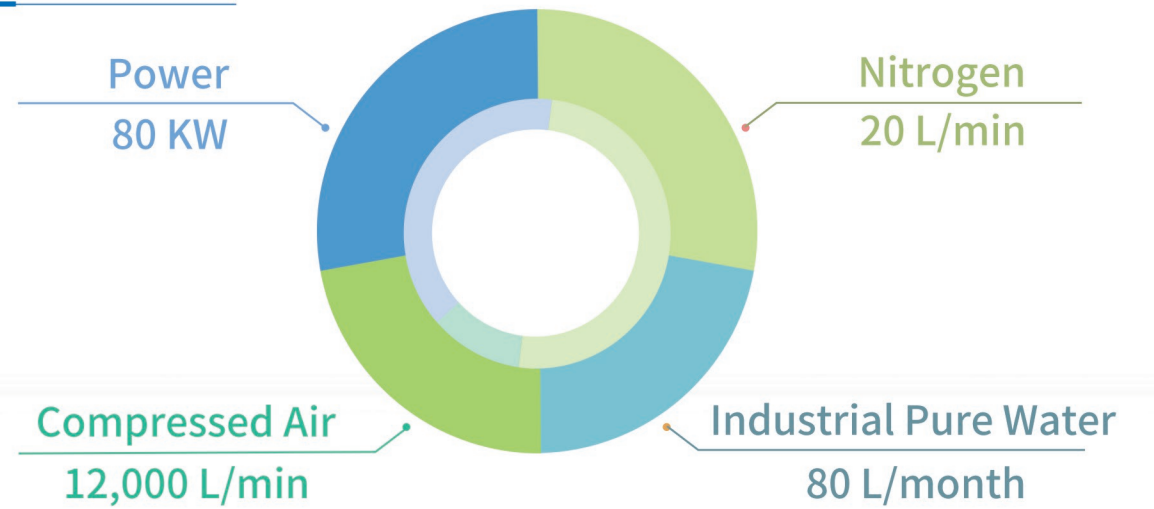
Maximum Annual Capacity

1.8GWh (314Ah cells, 2 shifts/day, 10 hours/shift, 300 days/year)



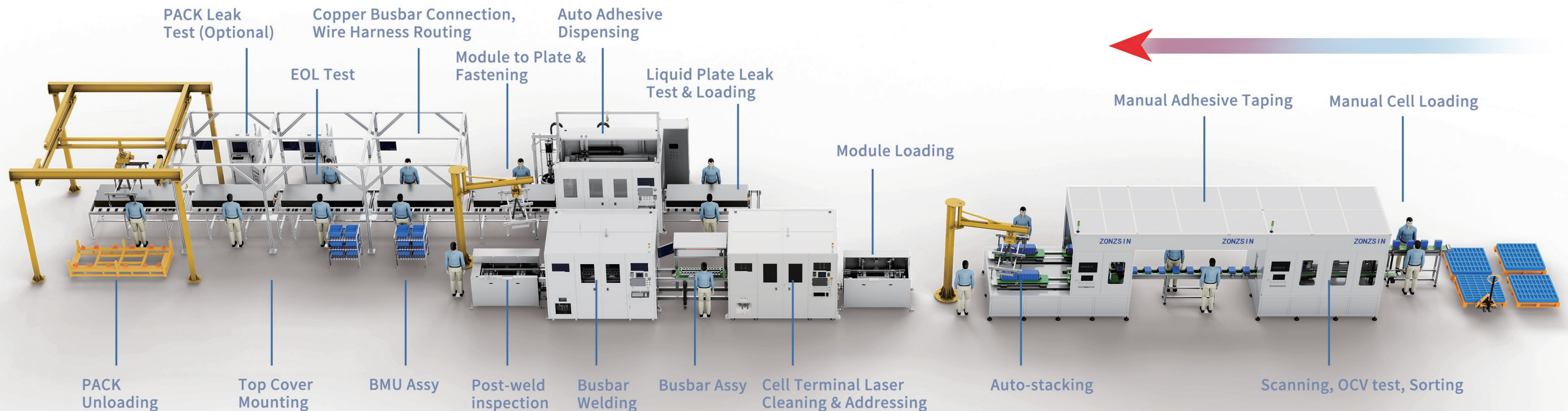
587Ah Cells
ESS PACK

02 Utility Requirements:



03 Key Technology Parameters:

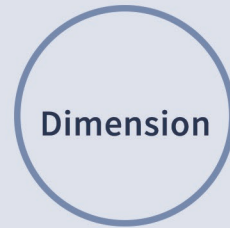
- High Yield Rate $\geq 99.5\%$, ensuring output and profit.
- Pole Positioning & Cleaning Accuracy Repeated positioning accuracy 0.1 mm.
- Busbar Laser Welding & Positioning Accuracy ---- Focus shift $\leq 1.5\text{mm}$, Welding seam offset $\leq \pm 0.2\text{mm}$.
- Busbar Laser Welding Parameters Penetration: 0.5~2 mm, Welding width: 1~3 mm.
Welding shear force $\geq 3500\text{N}$.



12PPM-MTP Line

The High-Volume Workhorse

01 Dimension & Capacity:



Dimension

L49000*W10000
*H4200 (mm)



Annual Capacity

1.48 GWh (314Ah cells, 1 shift/day, 8 hours/shift, 300 days/year)



Maximum Annual Capacity

3.7 GWh (314Ah cells, 2 shifts/day, 10 hours/shift, 300 days/year)



1P52S ESS PACK



1P104S ESS PACK

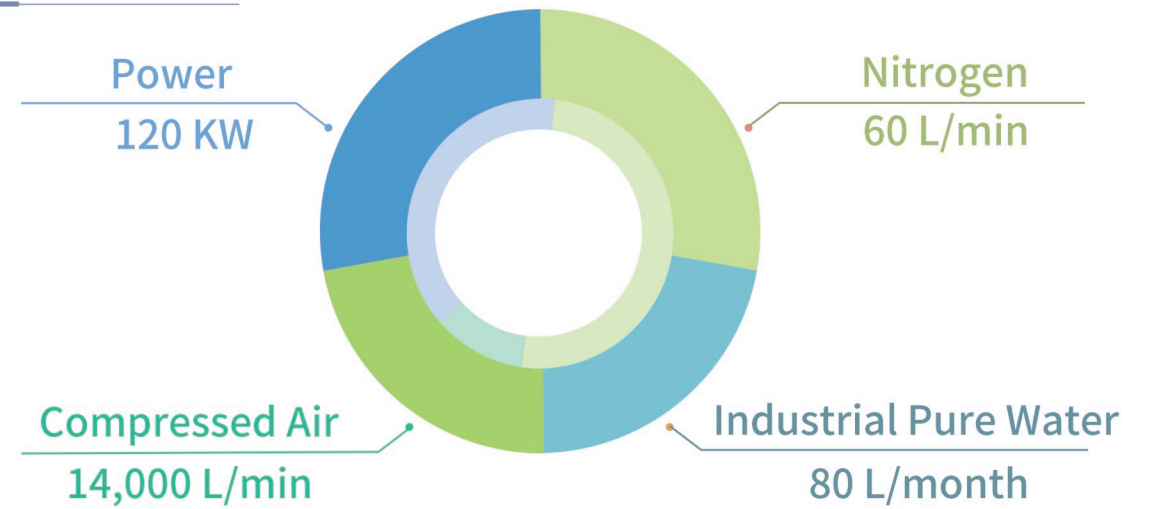


EV PACK



587Ah Cells
ESS PACK

02 Utility Requirements:



03 Key Technology Parameters:

- High Yield Rate $\geq 99.5\%$, controlling waste at high volume.
- Pole Positioning & Cleaning Accuracy Repeated positioning accuracy 0.1 mm.
- Busbar Laser Welding & Positioning Accuracy ---- Focus shift $\leq 1.5\text{mm}$, Welding seam offset $\leq \pm 0.2\text{mm}$.
- Busbar Laser Welding Parameters Penetration: 0.5~2 mm, Welding width: 1~3 mm.
Welding shear force $\geq 3500\text{N}$.

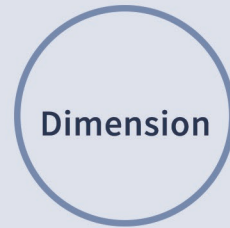


Ideal For: 280Ah / 314Ah / 587Ah | 1P52S/1P104S | ESS PACK / EV PACK

6PPM-CTP Line

The Advanced Technology Pathfinder

01 Dimension & Capacity:



Dimension

L61000*W10000
*H3500 (mm)



1P52S ESS PACK



Annual Capacity

0.75 GWh (314Ah cells, 1 shift/day, 8 hours/shift, 300 days/year)



1P104S ESS PACK



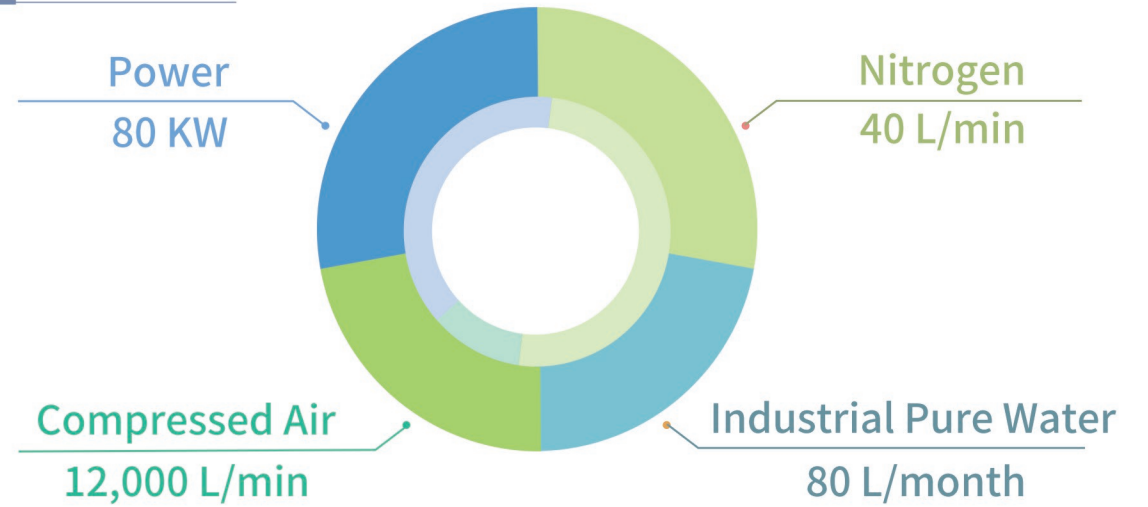
Maximum Annual Capacity

1.8 GWh (314Ah cells, 2 shifts/day, 10 hours/shift, 300 days/year)



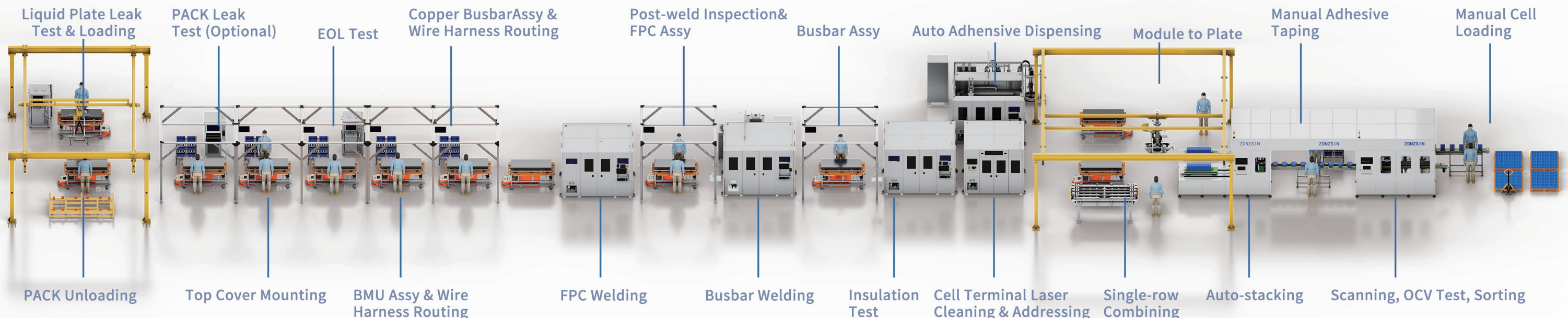
587Ah Cells
ESS PACK

02 Utility Requirements:



03 Key Technology Parameters:

- High Yield Rate $\geq 99.5\%$, ensuring output and profit.
- Pole Positioning & Cleaning Accuracy Repeated positioning accuracy 0.1 mm.
- Busbar Laser Welding & Positioning Accuracy Focus shift $\leq 1.5\text{mm}$, Welding seam offset $\leq \pm 0.2\text{mm}$.
- Busbar Laser Welding Parameters Penetration: 0.5~2 mm, Welding width: 1~3 mm.
Welding shear force $\geq 3500\text{N}$.
- FPC Laser Welding Positioning Accuracy Focus shift $\leq 1\text{ mm}$, Welding seam offset $\leq \pm 0.1\text{mm}$.
- FPC Laser Welding Parameter: Penetration 0.1~0.3 mm, Welding shear force $\geq 120\text{N}$.

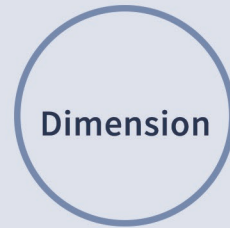


Ideal For: 280Ah / 314Ah / 587Ah | 1P52S/1P104S | ESS PACK / EV PACK

12PPM-CTP Line

The Peak Performance Leader

01 Dimension & Capacity:



Dimension

L67000*W10000
*H4200 (mm)



Annual Capacity

1.48 GWh (314Ah cells, 1 shift/day, 8 hours/shift, 300 days/year)



Maximum Annual Capacity

3.7 GWh (314Ah cells, 2 shifts/day, 10 hours/shift, 300 days/year)



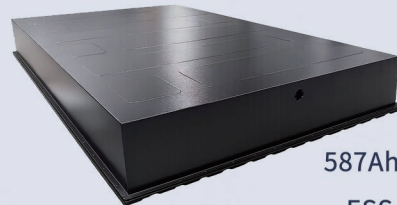
1P52S ESS PACK



1P104S ESS PACK

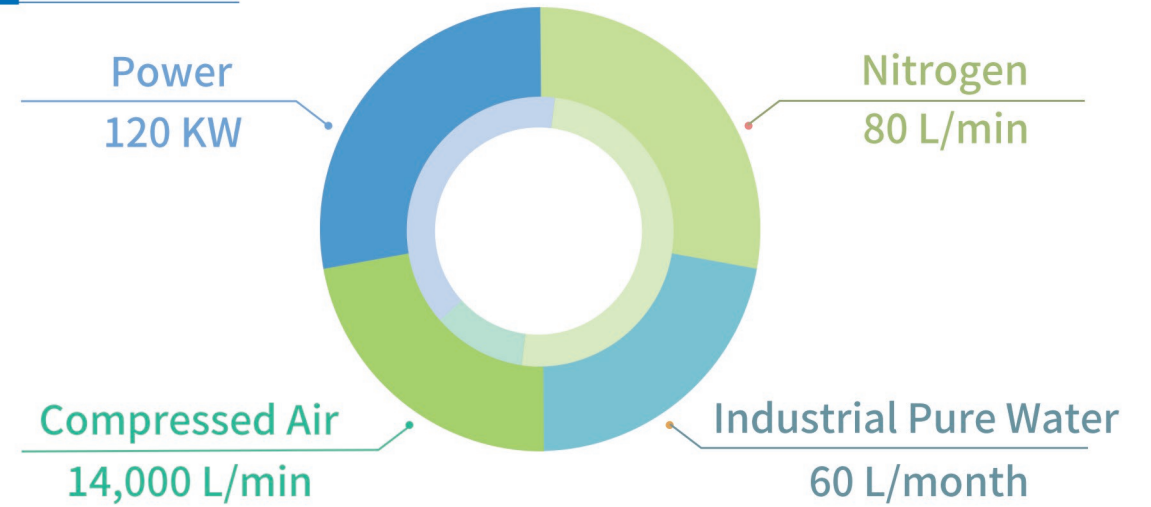


EV PACK



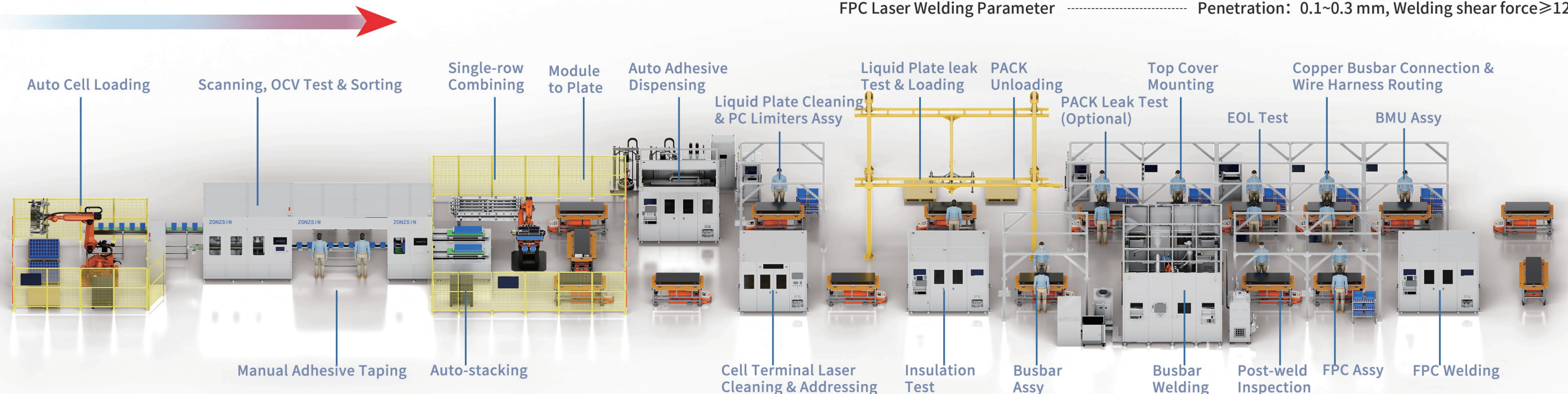
587Ah Cells
ESS PACK

02 Utility Requirements:



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- High Yield Rate $\geq 99.5\%$, ensuring output and profit.
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- FPC Laser Welding Parameter Penetration: 0.1~0.3 mm, Welding shear force $\geq 120\text{N}$.



Ideal For: 280Ah / 314Ah / 587Ah | 1P52S/1P104S | ESS PACK /EV PACK

Fully-auto PACK Loading Robot (AGV-driven)



Equipment Overview

A fully-auto PACK Loading Robot built for hundred-megawatt ES projects. Integrates high-precision vision, adaptive control, and digital management for fully automated PACK loading. From the moment the PACK leaves the production line, it automatically completes loading, posture adjustment, precise alignment, and smooth container & cabinet insertion — pushing the efficiency and space utilization of large-scale integration to the extreme.

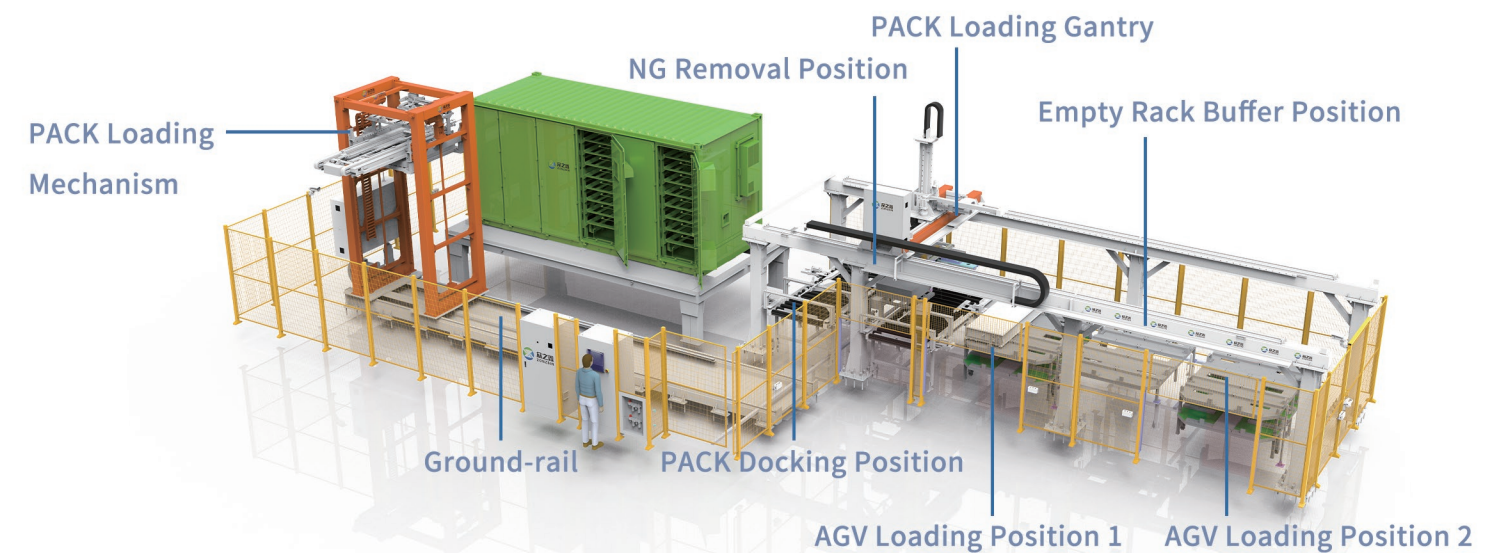
Core Highlights

- Ultra Precision:** 5-DOF control, positioning accuracy $<0.05\text{mm}$.
- 3D vision alignment:** 3D vision & adjustable mechanism average accuracy $\pm 1\text{mm}$, angle compensation accuracy $\pm 0.2^\circ$.
- AGV Positioning:** Laser & QR code positioning accuracy $\pm 10\text{mm}$, angle compensation accuracy $\pm 1^\circ$.
- Full Traceability:** Process data such as thrust, vision data, cluster position, cycle time, real-time power, and capacity are locally recorded and uploaded for data traceability and process optimization.
- Fast Charging:** 200A auto & fast charging, 1-hour full charge. One charge supports 2 containers PACK loading.
- High Efficiency:** 150s/PACK average cycle. Completes 4 containers per shift.

Typical Application

Indoor | Fully-auto | Batch production

Fully-auto PACK Loading Equipment (Rail-fixed)



Equipment Overview

Designed for the mass production of gigafactories. Fixed installation with anchor bolts for superior stability and safety. As the core of fully automated lines, it seamlessly connects with heavy-duty AGVs for fast container transfer and high-speed PACK loading.

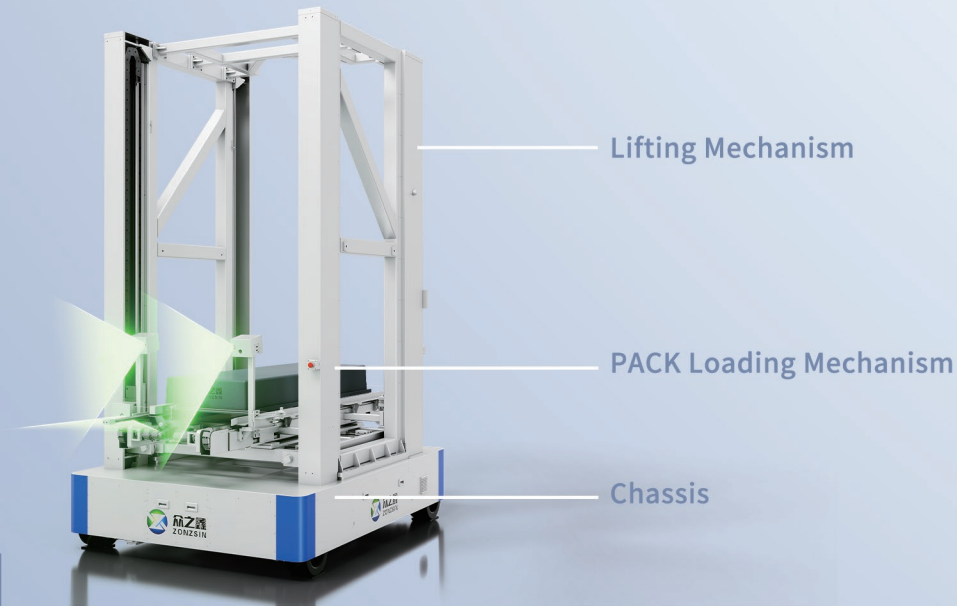
Core Highlights

- Flexible Gripper:** Changeover $<1\text{ min}$, 98% mixed-line compatibility.
- Stable Rail Mounting:** Containers can be flexibly moved by AGV or straddle carrier.
- Dual-layer Rack + 5-station Scheduling:** 2 PACKs/rack, auto AGV docking + QR code binding for precise material traceability.
- Precision Positioning:** 3D laser + AI vision positioning.
- Mechanical Buffer + Soft Sensing:** Spring buffer + 3D vision for spatial accuracy $\leq \pm 1\text{ mm}$, angle compensation accuracy $\leq \pm 0.2^\circ$.
- Digital Twin Pre-configuration:** New container model setup & debug time reduced by 70%.

Typical Application

Indoor | Fully-auto | Continuous Production

Semi-auto PACK Loading Equipment (Mecanum-wheeled)



Equipment Overview

An economic "standby station" when automatic lines encounter sudden failures. Mecanum wheel omni-directional move technology enables flexible movement in tight spaces. Supports remote/manual dual modes for immediate emergency response, ensuring uninterrupted production.

Core Highlights

1. **Mecanum Wheel Driven:** Agile movement in workshop aisles with speed 400 mm/s, free steering in complex spaces.
2. **Dual Control Modes:** Remote & manual operations.
3. **C7-grade Roller Screw + Linear Guide:** Lifting stroke 1.05–3.4 m (customize), repeatability ± 0.1 mm, max load 1.5 tons.
4. **Floor Tilt Compensation:** Motorized leveling legs compensate for $\pm 3^\circ$ floor tilt, ensuring vertical stability on uneven ground.
5. **High Compatibility:** Supports 1P52S, 1P104S, 314Ah & 587Ah battery PACKs. As a standby station, fills production line gaps.

Typical Application

Indoor | Emergency Backup

PACK Repair Equipment (Crawler-driven)



Equipment Overview

Designed for complex and uneven on-site floors where traditional wheeled equipment struggles. The crawler chassis enhances ground adaptability and mobility, ensuring stable movement. In BESS energy storage projects, this unit safely and efficiently removes faulty or inspection ready PACKs from cabinets or containers and transports them to maintenance stations.

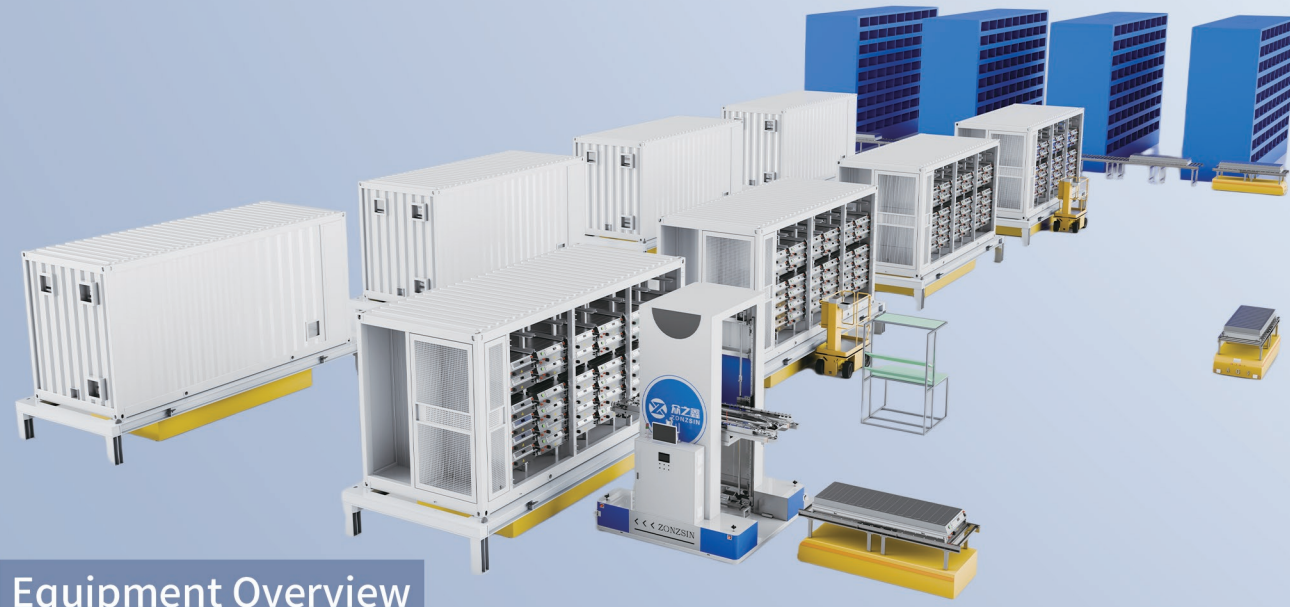
Core Highlights

1. **All terrain mobility:** Crawler chassis easily handles challenging floors for stability in harsh conditions.
2. **Leveling function:** Manual handwheel leveling for easy-using.
3. **Customizable lifting range:** Supports high load electric cylinder lifting.
4. **Precise PACK alignment:** Accurate loading into containers, combining strength with fine control.
5. **Efficient & Safe Human robot Collaboration:** Remote control allows one person operation. Over 60% efficiency increasing vs. traditional lifting methods, significantly reducing equipment downtime.

Typical Application

Outdoor (Mud & Sand) | Repair in large-scale ES

Turnkey Solution - PACK to Container Loading Line



Equipment Overview

A turnkey solution for gigawatt-scale energy storage factories. Centered around our Battery PACK to Container equipment, it connects PACK incoming, intelligent transfer, and full system testing into one automated & deeply integrated line.

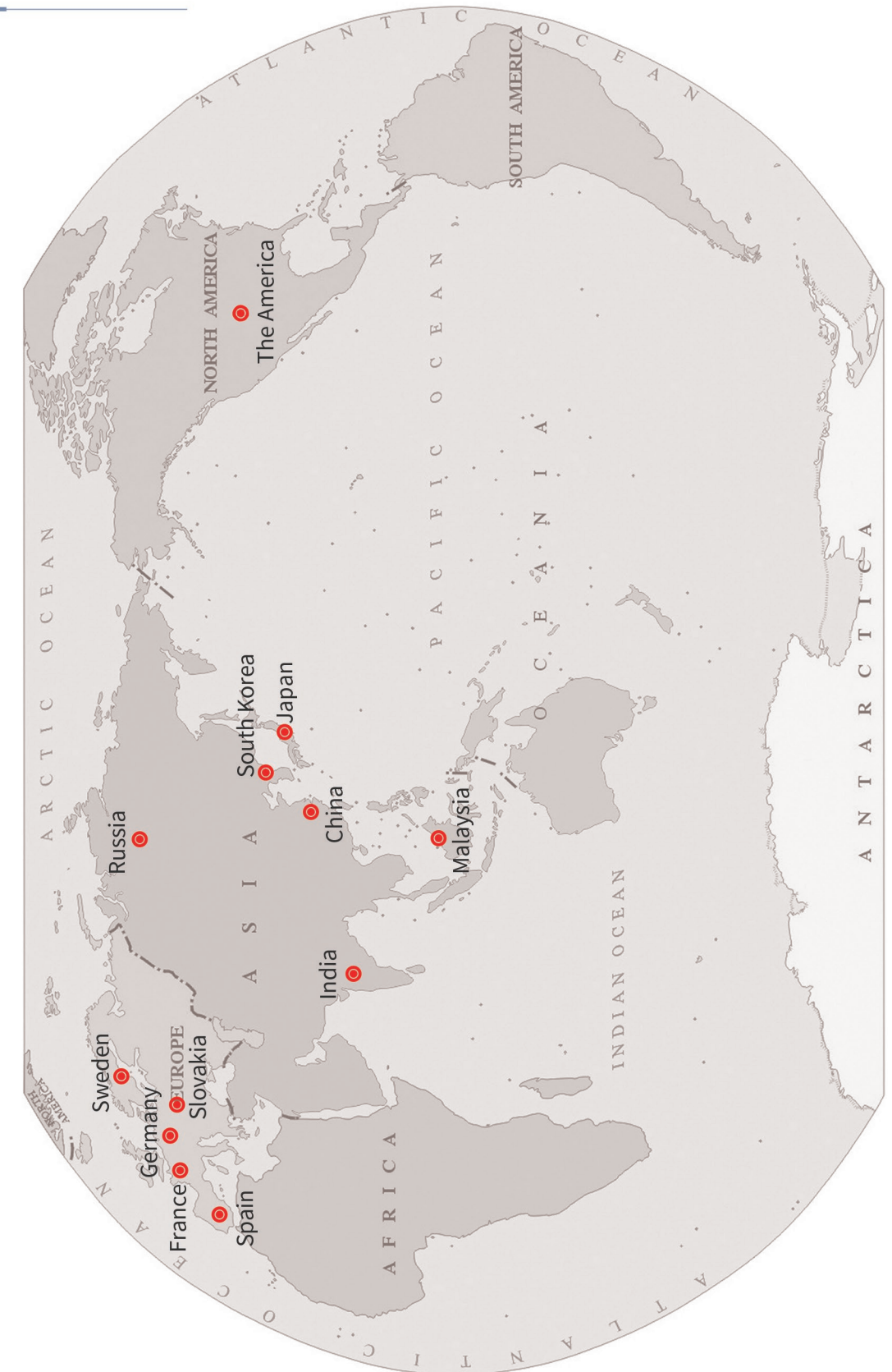
Core Highlights

- 1. End-to-End Integration:** Full automation and data connectivity from PACK incoming to final testing.
- 2. Reliable & Efficient:** Seamless equipment coordination ensures production rhythm & production stability.
- 3. Flexible & Smart:** AI vision & adaptive algorithms support fast changeover for various PACK structures.
- 4. Full Traceability:** MES system tracks data of every battery and key process parameters for later production optimization.
- 5. Turnkey Delivery:** One-stop service from planning to production – fast deployment.

Typical Application

Indoor | Batch & continuous production | Gigawatt-scale energy storage factories.

Service Map



Service Philosophy: Fast Response & Deep Support.

We don't just maintain equipment
—we boost your production efficiency.

Service Commitment: Full Lifecycle Support.

Pre-sales: Technical consultation · Solution validation
In-sales: Installation · Commissioning · On-site training
After-sales: Remote diagnostics · Preventive maintenance