ADN TECH

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ESTUN CODROID

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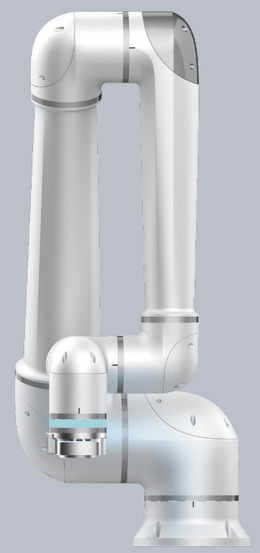
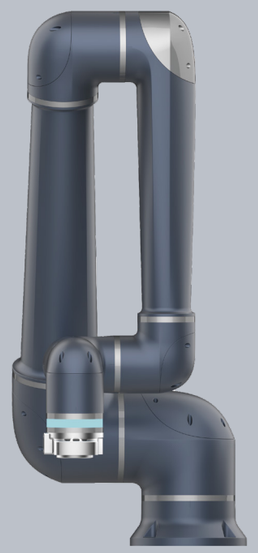




ESTUN CoDroid

Collaborative Robot Product Manual

ESTUN CODROID

COGNITIVE
COLLABORATIVE
COEXISTING

ESTUN CODROID WAS ESTABLISHED IN JULY 2022 AND ITS FOUNDERS HAVE SENIOR AND SEASONED EXPERIENCE IN BOTH AI AND ROBOT INDUSTRIES.

Taking “Operational Embodied AI” as the core technology route and relying on Estun’s abundant application scenarios and customer resources, we’re aiming to provide next generation embodied AI robots and services with Hand-Foot-Eye-Feel-Control Coordination.

By empowering robots with cognition-decision cerebrum and fell-control cerebellum, company is committed to reform the human-robot interactions and programming patterns of traditional industrial robots.

MISSION

Cocreate the Human-CoDroid Future

VISION

To be the vital promoter of embodied AI technologies and applications

ESTUN CoDroid | Collaborative Robot
Series S-Eco

Multiple safety features, innovative UI and programming, and deep integration of AI – the S-series cobot builds flexible production processes, which are smarter and safer, more efficient and reliable, for human-robot collaboration in industries.

TRUSTED SAFETY

- Emergency stop, incl. STO, SBC, conforms to EN ISO 10218-1, EN ISO 13849-1 PId.Cat.3*.
- Sensitive to collisions.
- Brakes built into all axes.

EASY AND FLEXIBLE TO USE

- Built-in torque sensor, supporting by wizard force control kit.
- Teaching precise points and paths by agile manual guidance.
- Graphical UI for easy programming that can be mastered in 1 hour by novice
- Integrated vision system, capable of running in unstructured and dynamic automation.

PERFORMANCE

- Paired with the speed of a traditional industrial robot.
- Precision upgraded to industrial robot level through accurate calibration and compensation technology.
- Identification and compensation of high precision kinematic models ensure both accurate trajectory and smooth movement.

QUALITY SYSTEM

- Comprehensive manufacturing quality management system.
- Rigorous and consistent quality control.
- Kinematic calibration before shipment to ensure absolute accuracy.
- 100+ design type tests, 20+ delivery inspections, 120 hours continuous no failure operating before shipment.

*Will be certified in Q4 2024

ESTUN CoDroid | Collaborative Robot
Series S-Pro

Torque sensors built into all axes, performance of safety and manual guidance improved completely

- More sensitive to collisions in all positions
- Compliant hand guide
- Supporting hand guide with fixed gestures

Easy programming by end display and customizable buttons, without teaching pendant.

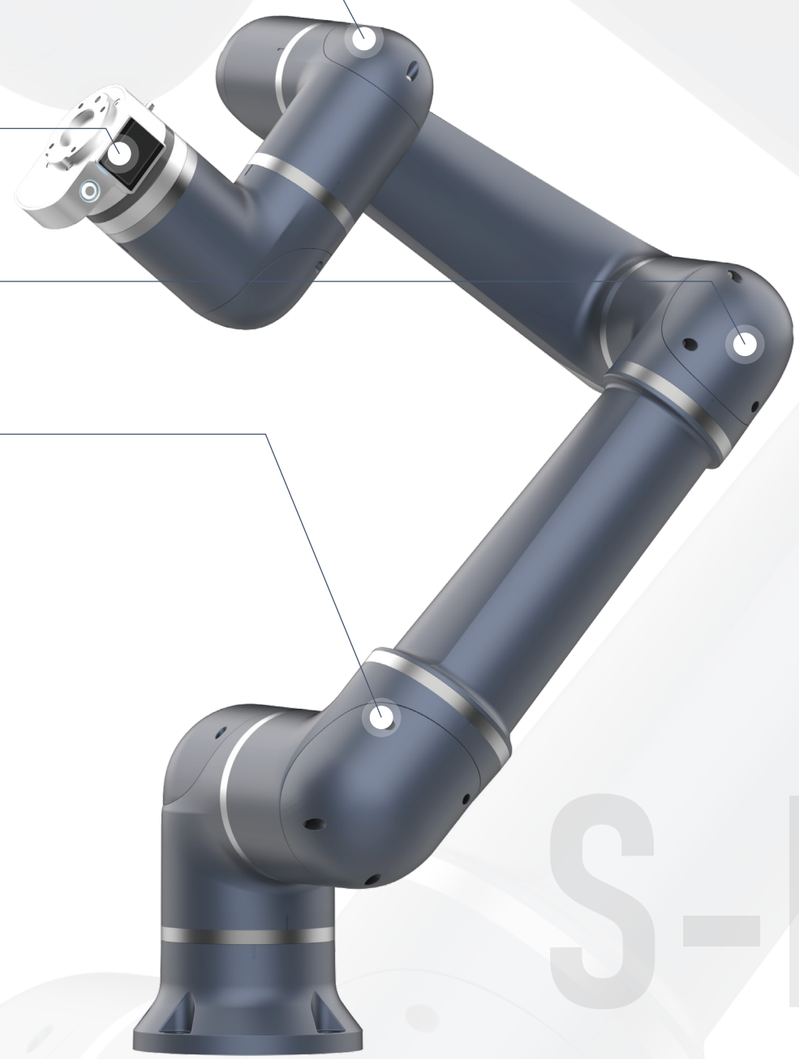
Encoder upgraded from 19-Bit ↗ 20-Bit for more accurate position detection.

Drive performance improved again

- ↗ Rigidity 50%
- ↗ Lifespan 20%

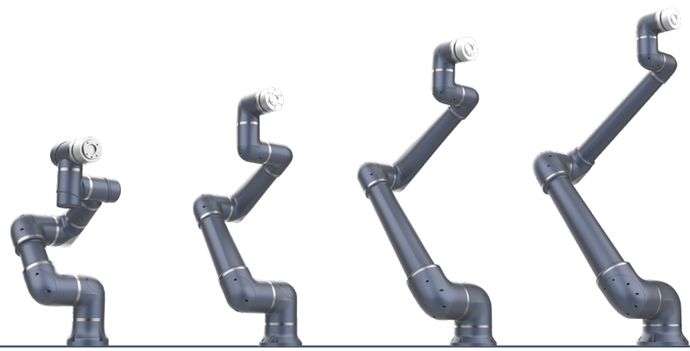
New software architecture brings the latest achievements

- Supporting extensions of force control kits
- New features added are accessible from updating



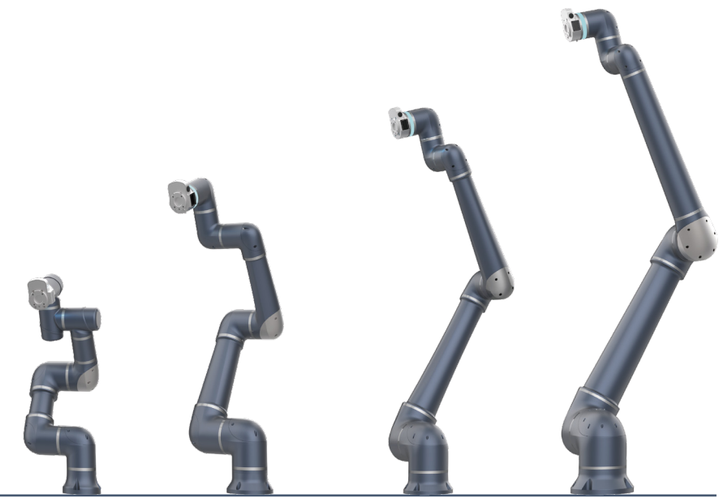
S-Pro

ESTUN CoDroid | Collaborative Robot
Specifications



S-Eco

Model	S3-60 Eco	S5-90 Eco	S10-140 Eco	S20-180 Eco
DOF	6			
Payload (kg)	3	5	10	20
Reach (mm)	575.8	919	1400	1777.5
Repeatability (mm)	±0.03	±0.03	±0.03	±0.1
Weight (kg)	14	21	37	58
Safety	Hand guide, adjustable collisiondetection			
Certification	EN ISO 13849-1 PLd Cat.3 & EN ISO 10218-1			
IP Classification	IP54			
Max. Speed at Tool End (m/s)	2	2.5	2.5	3.2
Working Range	Axis1/2/4/5/6：±360° Axis3：±160°			
Max. Speed	[3、5、10kg] Axis 1/2/3: 150 °/s [20kg] Axis1/2：110 °/s Axis3：150 °/s Axis 4/5/6: 180 °/s			
Mounting	Any orientation			
Operating Temp.	0 – 50 °C			
Operating Humidity	70% RH			
Flange Connector	ISO 9409-1-50-4-M6			
Flange Communication	2 DI, 2DO，24VDC，MODBUS RTU，RS485			



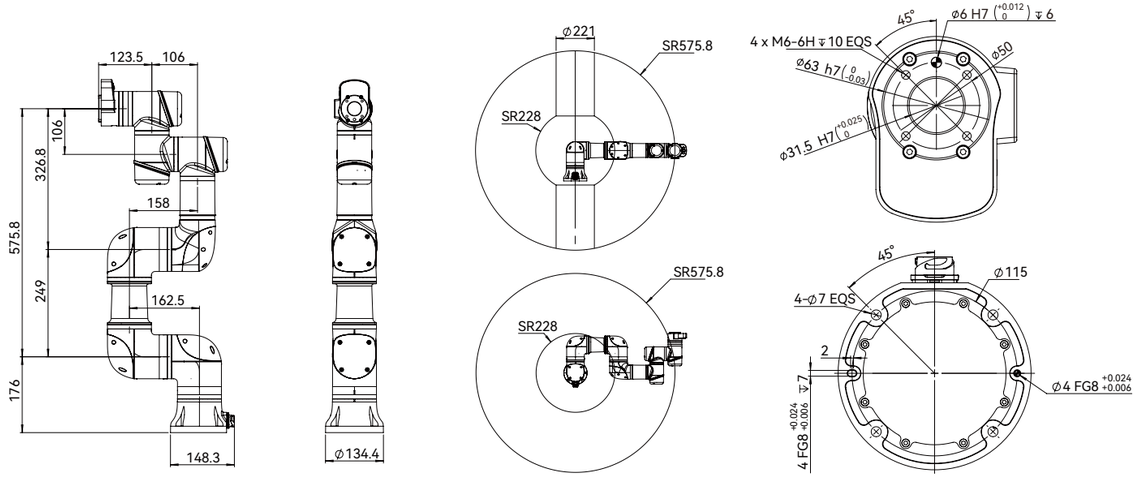
S-Pro

Model	S3-60 Pro	S5-90 Pro	S10-140 Pro	S20-180 Pro
DOF	6			
Payload (kg)	3	5	10	20
Reach (mm)	575.8	919	1400	1777.5
Repeatability (mm)	±0.03	±0.03	±0.03	±0.1
Weight (kg)	14	21	37	58
Torque Sensor Accuracy - Composition Error (F.S)	<2%			
Torque Sensor Accuracy - Repeatability Error (F.S)	<0.1%			
Safety	Hand guide, adjustable collisiondetection			
Certification	EN ISO 13849-1 PLd Cat.3 & EN ISO 10218-1			
IP Classification	IP54			
Max. Speed at Tool End (m/s)	2	2.5	2.5	3.2
Working Range	Axis1/2/4/5/6：±360° Axis3：±160°			
Max. Speed	[3、5、10kg] Axis1/2/3：150 °/s [20kg] Axis1/2：110 °/s Axis3：150 °/s Axis4/5/6：180 °/s			
Mounting	Any orientation			
Operating Temp.	0 – 50 °C			
Operating Humidity	70% RH			
Flange Connector	ISO 9409-1-50-4-M6			
Flange Communication	2 DI, 2DO，24VDC，MODBUS RTU，RS485			

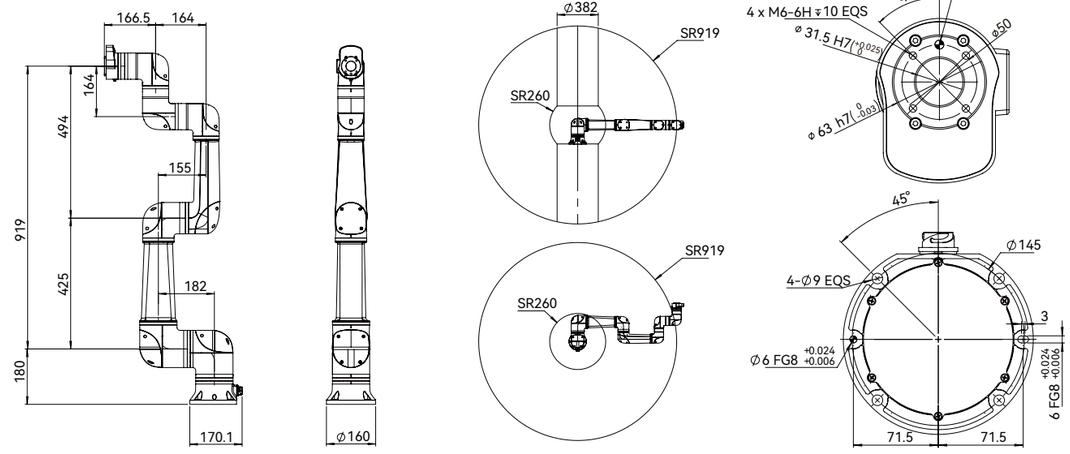
ESTUN CoDroid | Collaborative Robot

Series-Technical Drawings

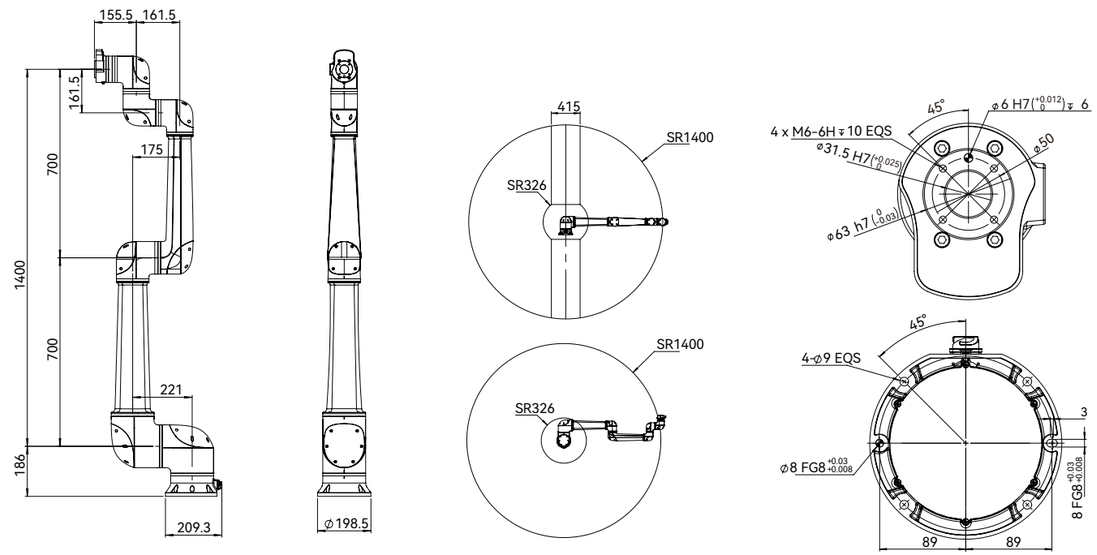
3kg Arm



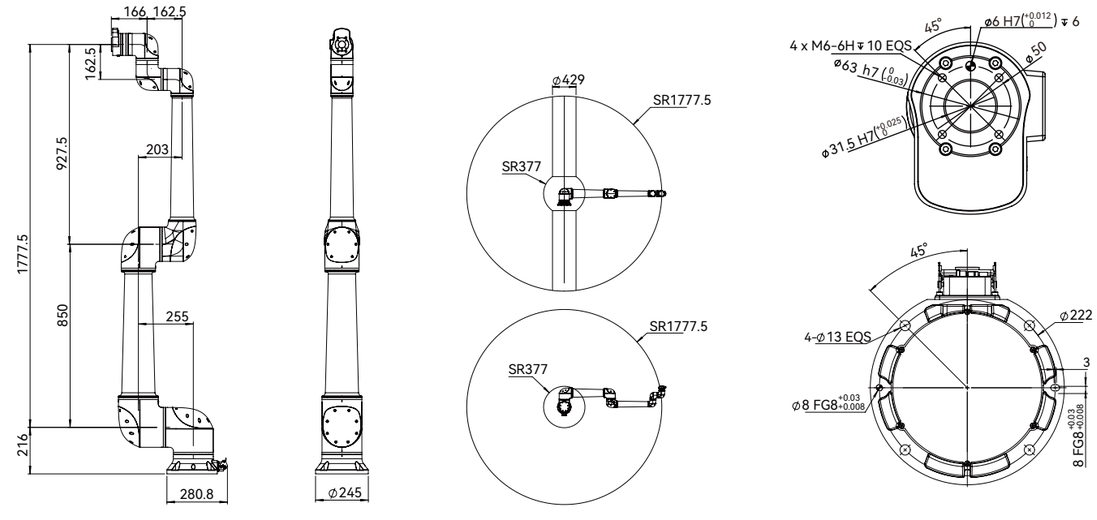
5kg Arm



10kg Arm



20kg Arm



ESTUN CoDroid | Collaborative Robot
Series-Control Cabinet

COCB-E03/05/10/20

Demonstrator	PC/laptop/tablet/smart phone/teach pendant
Safety device	1 hand-held enable channel, 1 hand-held E-stop channel
Hand guide	Cartesian space/axis space; Teaching method: point/continuous path
High dynamic force control	Cartesian space/axis space impedance control
IP classification	IP20
I/O ports	16DI(PNP), 16D0(PNP), 4AI, 4AO, five E-stop inputs
I/O power supply	24VDC, 2A
Communication	MODBUS RTU, MODBUS TCP, CAN, RS485 EtherNET, EtherCAT, Profinet slave (optional), EthernetIP slave (optional)
Power supply	AC: 100- 240 V 47 - 63 Hz/DC: 48 V
Box dimensions	402*270*149mm (10kg and below) 420*290*200mm (20kg)
Weight	13kg
Material	SPCC
External control interface	Underlying force/position control interface; Robot model library and API
Cable length	Robot-Controller 3m Controller power cable 3m Manipulator handle 6m

PAD Teach Pendant optional

Teach Pendant	Pad
Weight	550g
Display Size	12.7 inch

End Effectors

Various end effectors can be quickly switched to match multiple industry applications


Handling

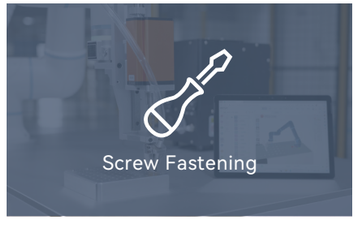

Screw fastening

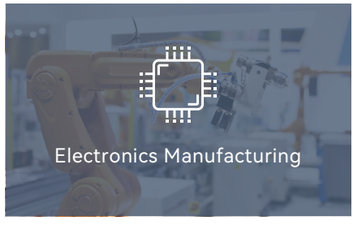

Polishing

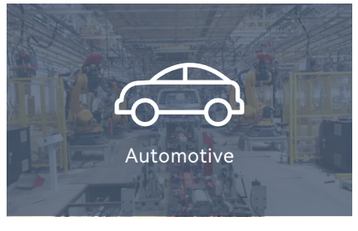

Welding


Spraying

Application Scenarios







M ESTUN CoDroid | Collaborative Robot Series-Mobile Manipulator

Featured with advanced laser SLAM and navigation technology, visual sensing technology, and motion control, M-series provide a Hands-Feet-Eyes integrated control by combining cobot and AMR. It is intelligent to recognize environment and perform precise route planning to ensure that the operation process is accurate and consistent, which can also avoid obstacle and people independently.

FUNCTIONAL SAFETY HUMAN-ROBOT SHARED SPACE

- Autonomous obstacle avoidance
- Multiple functional safety
- Human-Robot collaboration

CLOUD+ EDGE INTERGRATION ENHANCED MANAGEMENT EFFICIENCY

- Real-time feedback of robot data
- Edge data consolidation
- Cloud data visualization

PRECISE AND EFFICIENT INTEGRATED HANDS, FEET, AND EYES

- Hands (Arm): Agile operations, smooth interaction, easy programming
- Feet (AMR): Rapid mapping, autonomous navigation, obstacle avoidance
- Eyes (2D/3D Vision): Open integration, intelligent recognition, dynamic sensing

FLEXIBILITY INTELLIGENT ENVIRONMENT SENSING

- Modular tooling for rapid deployment
- Plug-and-play end effectors
- L-shaped design for more space
- Various communication interfaces, adaptable for extended applications

Specification

Model	M5-B	M10-B	M5-L	M10-L
DOF	6	6	6	6
Payload (kg)	5	10	5	10
Reach (mm)	919	1400	919	1400
Weight (kg)	21	37	21	37
Navigation Mode	Laser SLAM navigation, reflector navigation			
Drive Mode	Differential drive of double wheel			
L*W*H (mm)	1056*692*750			
Ground Clearance (mm)	30			
Turning Diameter (mm)	1200			
Weight (kg)	200			
Mobile Platform Payload kg)	217	233	212	228
Min. Passage Width (mm)	700			
Position Accuracy (mm)	±5			
Angle Accuracy (°)	±0.5			
Obstacle Clearance Height (mm)	10			
Gap Width (mm)	30			
Speed (m/s)	<1.5			
Gradeability (°)	5			
Battery (V/Ah)	50			
Running Time (h)	≤8			
Charging Time (10-80%)(h)	≤1.5			
Charging Mode	Manual charging / quick battery replacement			
Wi-Fi	Yes			
Laser Reflector Navigation	Yes			
DO	16			
DI	16			
AO	4			
AI	4			
E-stop Interface	4 outputs			
Ethernet	4 RJ45 Ethernet ports			
Laser Sensor	1 or 2			
Teach Pendant	pad/pc			
E-stop Button	Yes			
Speaker	Yes			
Status Light	Yes			
Bumper Strip	Yes			

ESTUN CoDroid | Collaborative Robot

Welding Solutions

SELF-DEVELOPED CORE TECHNOLOGIES, ENHANCING PROGRAMMING EFFICIENCY

- Swing welding: Providing triangular, sinusoidal, circular, and figure-eight swing patterns, allowing adjustment of swing frequency, swing amplitude, left-right dwell time, and other parameters to meet welding seam dimensions and forming requirements.
- Multi-layer, multi-pass welding: For middle thickness plate, as the relevant points of first weld seam have been taught by manual guidance, the remaining points will be calculated according to the offset parameters, which greatly shortens the programming time, and the parameters can be saved and recalled for next operation.
- Stitch welding: Suitable for single-pass fillet welding and stitch weld seams.This process only requires the relevant points of weld seam through manual guidance, and the welding parameters will choose appropriate weld length, gap length and welding sequence, which simplifies programming logic significantly.

INTELLIGENT ALGORITHMS, OPTIMIZING WELDING QUALITY

- Position search: Providing wire/laser position search to ensure the accuracy of repetitive work.
- Seam tracking: Providing arc/laser tracking to ensure great precision and consistency.
- Welding database: The core database offers professional parameters at any time.

ACCESSORY FUNCTIONS ENSURE CONSISTENT WELD QUALITY

- Fine turning: The parameters such as current, voltage, speed, swing, etc., and also the relative position of welding torch can be adjusted during welding process.
- Weld Resumption: When the program is interrupted due to external interference, it can be resumed from paused place without repeating the previous path.

ARC WELDING

Model	QINEO StarT 406
Welding output	20A/15V-400A/34V
60% duty cycle of welding current	400A
100% duty cycle of welding current	350A
Operating voltage	380V-400V/3-phase
Dimensions	1270*765*960 mm

LASER WELDING

Model	RFL-C2000H
Rated output power	2000W
Working mode	Continuous/Modulated
Modulation frequency	1-5000Hz
Fiber core diameter	50μm
Operating voltage	220±10%VAC、50/60Hz
Dimensions	1270*765*960 mm

Product Features

- **FLEXIBLE** | The welding cart can be flexibly transported, suitable for various scenarios.
- **VERSATILE** | Compatible with domestic and foreign main stream welding machine brands.
- **MULTIPLE** | MIG/MAG, Laser.
- **REAL-TIME** | Welding process parameters can be adjusted in real-time to ensure excellent welding quality.
- **SAFE** | Interlocking signals between the welding machine and the robot ensure absolute safety.
- **CONVENIENT** | Modular welding procedure calling, which can be divided into single-pass welding programs, multi-layer, multipass weld seams, and skip welding.
- **USER-FRIENDLY** | Importing professional parameters from database with one click, and the user teaches weld points only.
- **TRACEABLE** | Key parameters can be monitored and recorded to form a welding log.

Palletizing Solutions

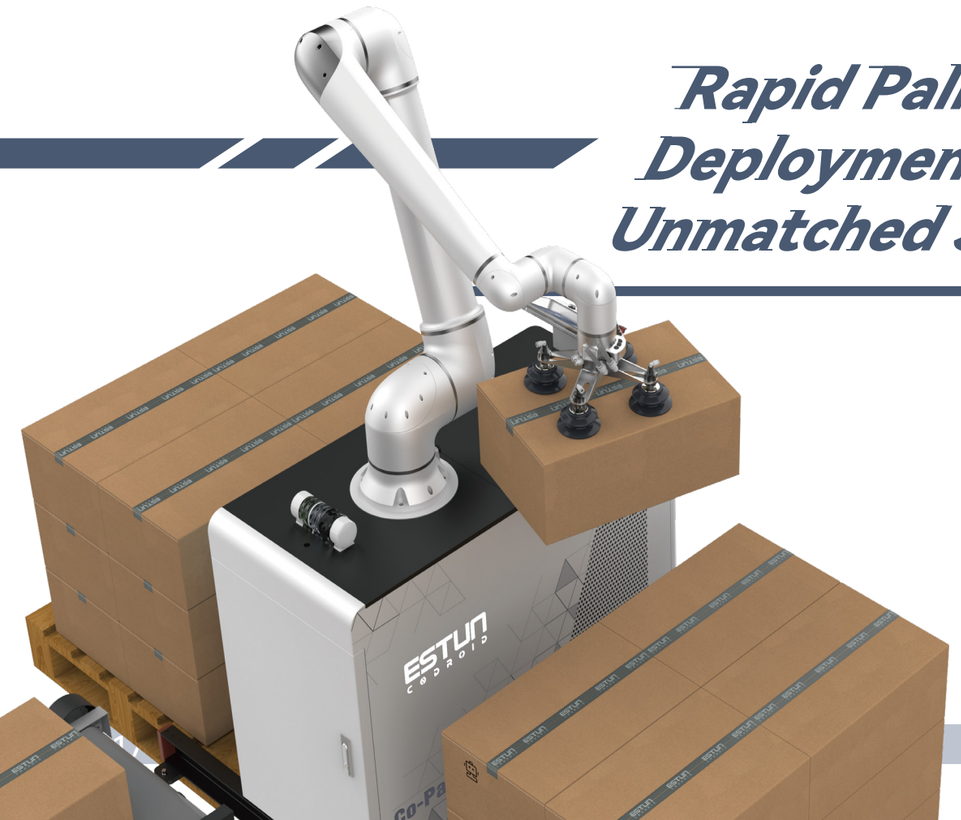
READY TO USE, RAPID DEPLOYMENT
Plug and play, requiring only power and air supply connections for setup within 30 minutes. meeting fast-paced production without professionals to configure.

TERMINAL COMPATIBILITY, UNLIMITED CONNECTION
Supporting PC, tablet, and mobile devices to connect and log in directly via the web to teach pendant interface freely.

GRAPHICAL PROCESS KIT, EASY PROGRAMMING
Professional palletizing package with graphical guidance and no-code programming. Complete palletizing program setup with drag teaching, enabling easy programming in just "3 minutes" with "zero experience".

CUSTOMIZABLE STACK PATTERNS, ENSURING STABILITY
Define stack patterns through animated interactions, achieving tighter stacking with leaning palletizing.

MORE FLEXIBILITY, EASY TO MOVE
Compatible with various sizes, weights, and materials of boxes, supporting mixed-size stacking. Easy to move among different production lines, making it ideal for various production and logistics scenarios.



Rapid Palletizing Deployment With Unmatched Speed

Specifications

Model	Co-Palletizer 20 (Fixed)	Co-Palletizer 20 (Elevating)
Payload(kg)	20	
Working Radius	1777.5	
Horizontal Distance(Pallet Size)(mm)	1200*1200	
Max. Joint Speed	Axis1/2：110 °/s Axis3：150 °/s Axis4/5/6：180 °/s	
Repeatability(mm)	±0.1	
Communication	Analog, Digital, MODBUS RTU, MODBUS TCP, CAN, RS485	
IP Classification	IP54(arm)	
Operating temp.(℃)	0 – 50	
Weight(kg)	270	300
Footprint(mm)	1530*1480	
Rated Voltage(V)	220	
Max. Power Consumption(W)	3000	
Palletizing Speed	8-12/min	
Palletizing Height(mm)	1930	2430
Compatible surfaces	Cardboard, smooth surfaces