DOBOT

CRA Series

New Generation High Performance
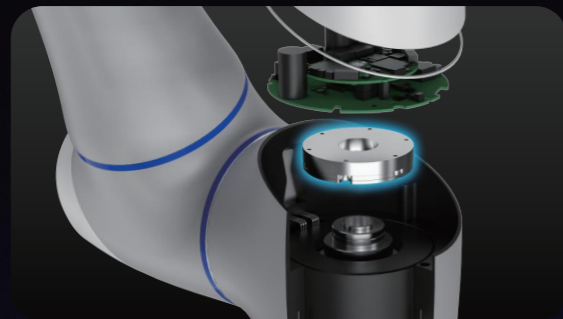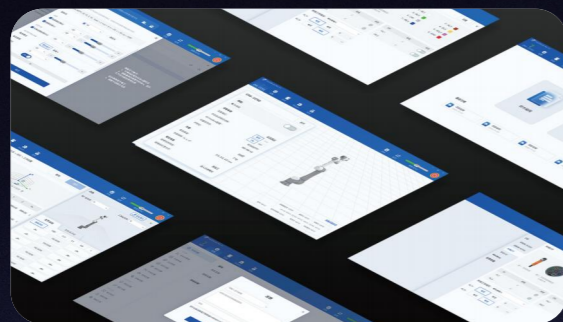Collaborative Robots

D20230520

New Generation Collaborative Robots
Fully Enhanced Performance

DOBOT
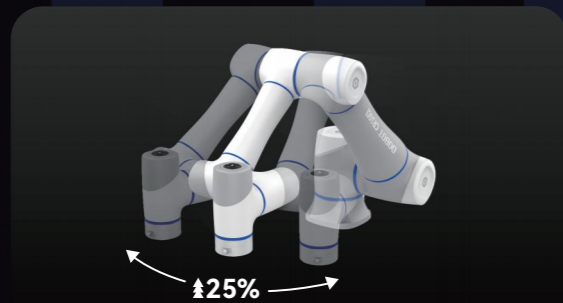
Cycle Time Improved by 25%

25%

Automatic Brake at Power Outage

Simplistic UI Design

24-way PNP/NPN
General Purpose I/O Ports

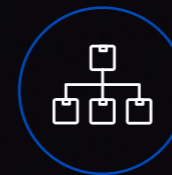IP54 Dust & Water Resistance

Dual CPU for Better Safety

DOBOT

Contents

Why Cobots

DOBOT

Why Collaborative Robots?

Quick Deployment

Compact, lightweight and supports upright and inverted installation.

Simple Operation

Simple coding allows quick adjustments to be made easily, satisfying the needs for small batch and flexible production.

Safe Collaboration

Multiple protection features including machine halt before collision and at power outage to work safely with workers without the need for safety fences.

Cost Reduction

Plug-and-play ecosystem accessories and solutions can greatly lower the cost for automation transformation.
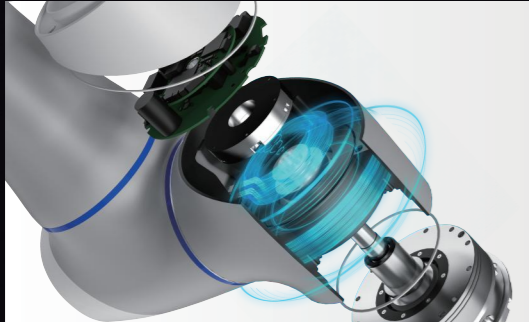
Improved Efficiency

Workers collaborating with high performance cobots can more than double their productivity.
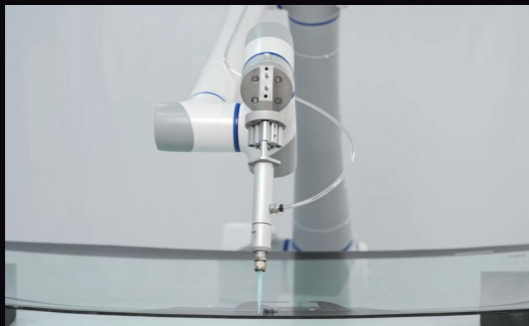
Consistent Quality

Cobots are highly reliable and perform repetitive tasks at high accuracy to deliver consistent production quality.

Key Features

Fast & Efficient

- High performance harmonic drive reducers with high load capacity.
- Highly integrated motor, drive reducer and encoder.
- Modular design allows quick disassembly for easy maintenance.

Accurate & Reliable

- By using the micron-level anti-vibration technology, the robot can stop quickly and stably under high speed operation.
- Optimized DH parameters compensation allows for spot on positioning accuracy.
- TrueMotion function ensures trajectory accuracy during complex curved operations.

Safe for Collaboration

- Dual CPUs monitor the status of robot's position, speed and safety I/O and more.
- Collision detection, SafeSkin and virtual boundaries provide multiple layers of safety.
- The CRA series has 22 safety features built-in and is ISO13849 and TS15066 certified.
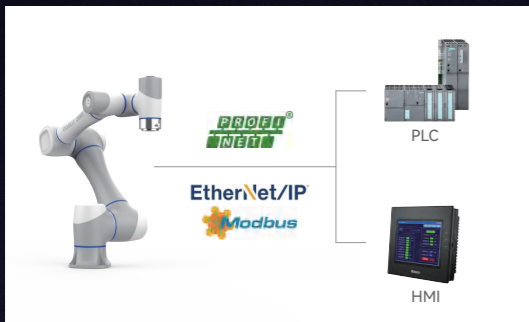
Expandable

- Integrated EtherCAT for reliable real-time microsecond response.
- Supports Modbus, Ethernet/IP and Profinet communication.
- Connects seamlessly with industrial automation systems including the PC, PLC, HMI and more.

PLC

EtherNet/IP

Modbus

HMI

DOBOT CR10A
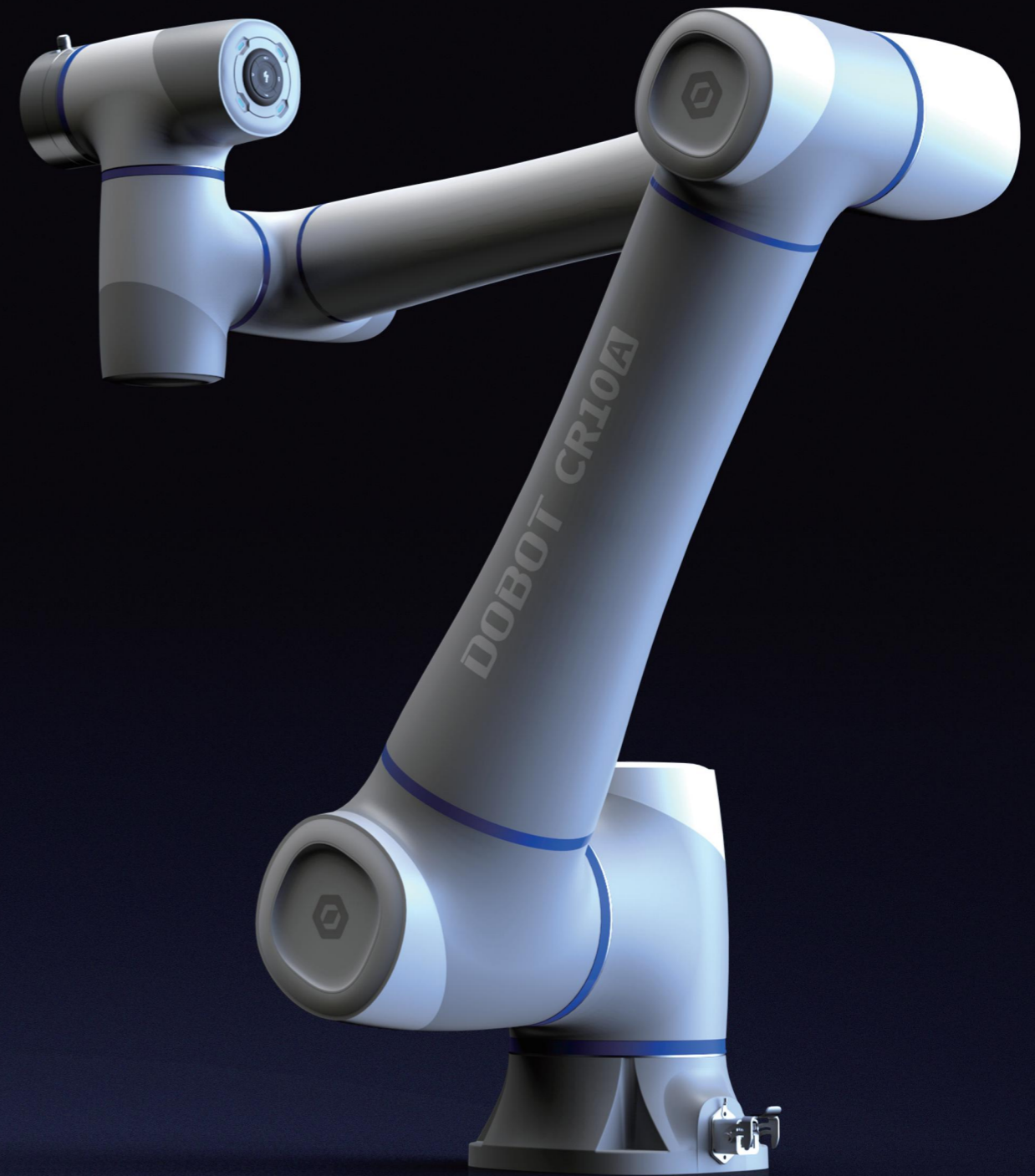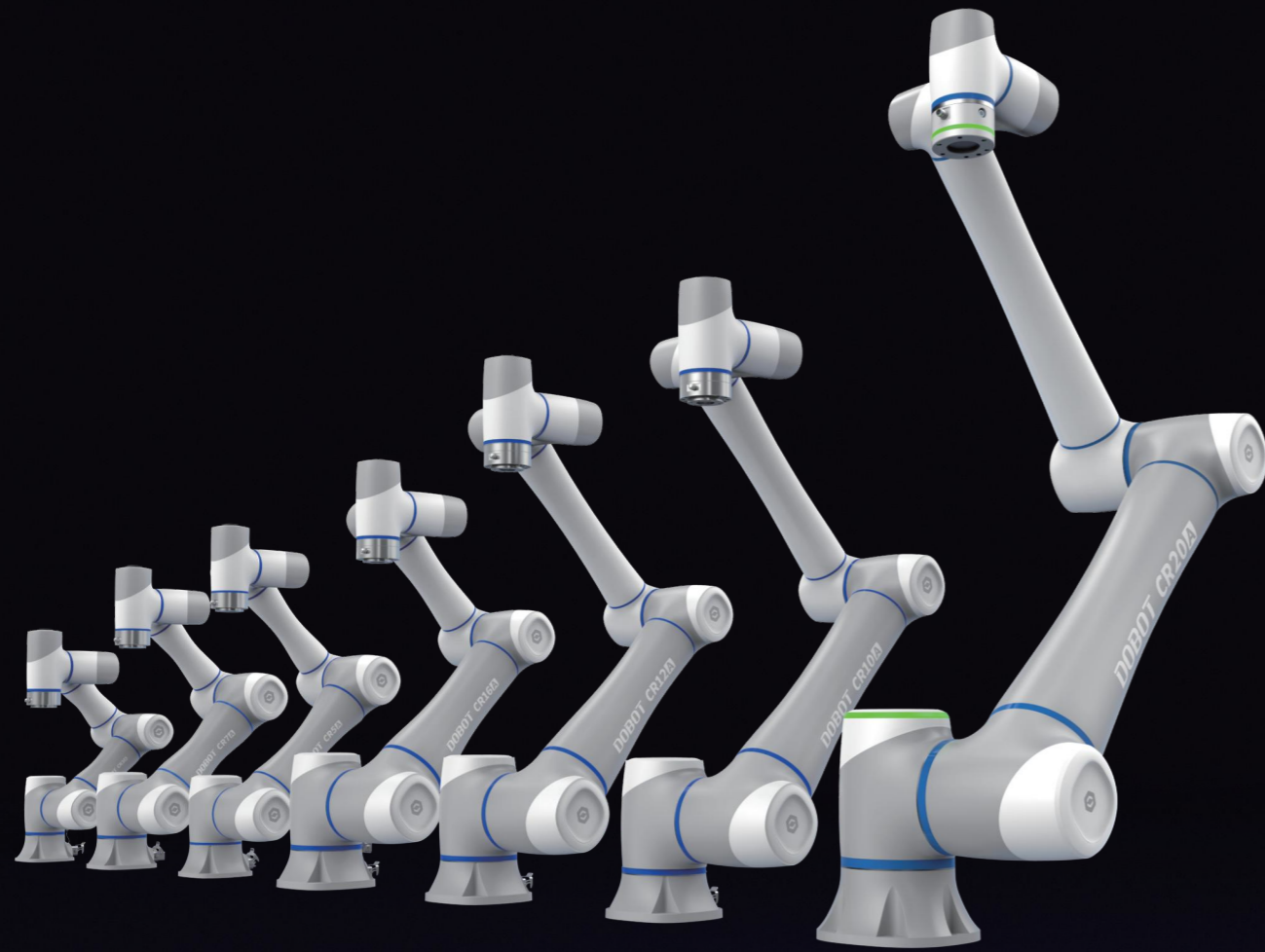
CRA Series

Highly Adaptive & Flexible Productivity

The CRA series is a new generation of high-performance collaborative robots developed by Dobot. It has improved safety, stability, and scalability thanks to the brand new controller and system software and is much easier to operate. It satisfies the performance required by industrial clients, including speed, accuracy and reliability, allowing more efficient human-machine collaboration in industrial scenarios.
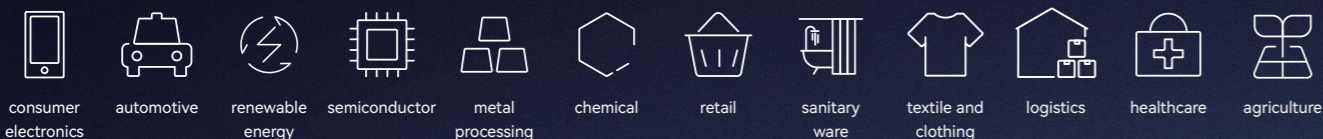
consumer electronics automotive renewable energy semiconductor metal processing chemical retail sanitary ware textile and clothing logistics healthcare agriculture

Easy Operation

Intuitive graphical user interface with in-built automation simulation. Control robots with PC, tablets, smartphones, teaching pendant and more. Graphical and script programming are available to accommodate users of diverse background.

Multiple Layers of Protection for Collaboration

The robot has 5 levels of adjustable collision detection settings to meet the safety requirements of different application scenarios. Built-in virtual boundaries to setup operating space. Supports robot halt and deceleration to ensure the safety of nearby workers. With 10-way safety I/O ports, it can meet the needs of most safety control requirements with external devices.
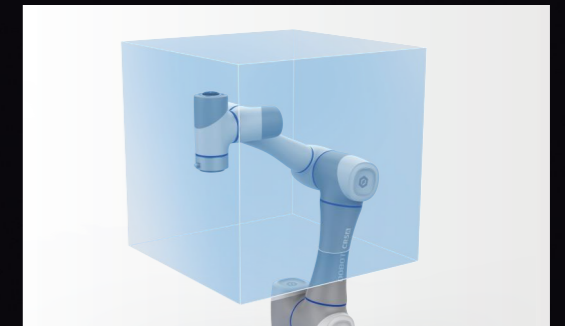
2.5D Vision for Accurate Positioning

Self-developed 2.5D vision positioning feature means that even slanted objects can be picked up accurately. Graphical programming allows users to build solutions quickly. Supports 2D vision feature expansion such as positioning, measurement, detection, and identification.

Electromagnetic Brake Ensures the Safety of Workers and Products

Brakes are auto-engaged 18 ms upon power outage, preventing robotic arms to fall more than 1 mm. No displacement in the case of sudden stops, power on and off.
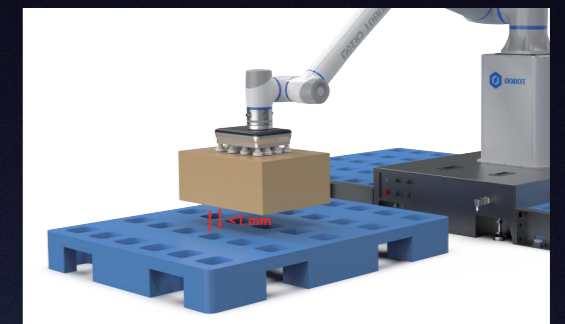
CRA Series Specifications

Model	CR3A	CR5A	CR7A	CR10A	CR12A	CR16A	CR20A
Weight	16.5 kg	25 kg	24.5 kg	40 kg	39.5 kg	40 kg	70 kg
Payload	3 kg	5 kg	7 kg	10 kg	12 kg	16 kg	20 kg
Working Radius	620 mm	900 mm	800 mm	1300 mm	1200 mm	1000 mm	1700 mm
Maximum Speed of TCP	2 m/s	2 m/s	2 m/s	2 m/s	2 m/s	2 m/s	2 m/s
Range of Motion — J1/J2	± 360°	± 360°	± 360°	± 360°	± 360°	± 360°	± 360°
Range of Motion — J3	± 155°	± 160°	± 160°	± 160°	± 160°	± 160°	± 165°
Range of Motion — J4/J5/J6	± 360°	± 360°	± 360°	± 360°	± 360°	± 360°	± 360°
Maximum Joint Speed — J1/J2	180°/s	180°/s	180°/s	150°/s	150°/s	150°/s	120°/s
Maximum Joint Speed — J3	223°/s	180°/s	180°/s	180°/s	180°/s	180°/s	150°/s
Maximum Joint Speed — J4/J5/J6	223°/s	223°/s	223°/s	223°/s	223°/s	223°/s	180°/s
End-Effector I/O Interface — DI/DO/AI	2	2	2	2	2	2	4
End-Effector I/O Interface — RS485	Supported						
Repeatability	± 0.02 mm	± 0.02 mm	± 0.02 mm	± 0.03 mm	± 0.03 mm	± 0.03 mm	± 0.1 mm
IP Rating	IP54						
Noise	70dB(A)						
Temperature Range	0℃ ~ 50℃						
Power Consumption	120W	150W	150W	350W	350W	350W	500W
Installation Method	Any						
Cable length from main body to control box	5 m						6 m
Materials	Aluminum alloy、ABS plastic						

CRA Series Control Box Specifications

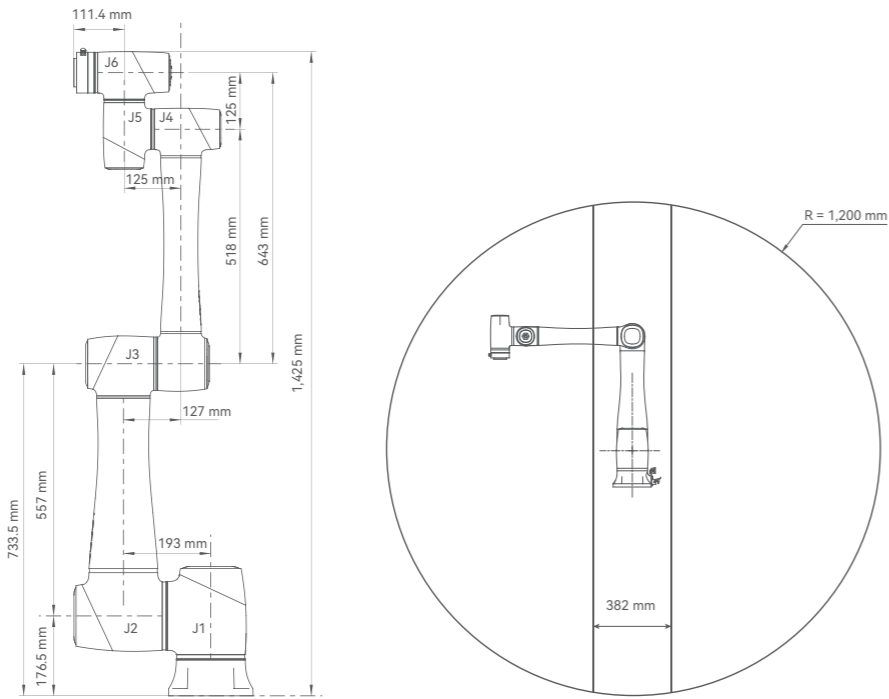| Product Name		CC262	CC263
Control Box Dimensions		345 mm x 345 mm x 145 mm	400 mm x 400 mm x 175 mm
Weight	AC Version	9.5 kg	15 kg
Weight	DC Version	8.5 kg	/
Input Power	AC Version	100 ~ 240V, 47 ~ 63Hz	
Input Power	DC Version	30 ~ 60V	/
I/O Power		24V, Max 3A, Maximum 0.5A for one way	
I/O Ports	DI/DO	24 Way（NPN/PNP)	
I/O Ports	AI/AO	2 Way, 0 ~ 10V, 4 ~ 20mA	
Remote On/Off		Supported	
Communication	WAN	2, for TCP/IP, Modbus TCP, Ethernet/IP communication	
Communication	USB	2, for document import and export	
Communication	485 Port	1, for RS485, Modbus RTU communication	
Communication	Encoder	1, for ABZ incremental encoder	
Environments	Temperature	0 ~ 50℃	
Environments	Humidity	≤ 95%, Non-condensing	
IP Rating		IP20（IP54 available upon choice)	
Cooling Method		Fan cooling	
Teaching Method		PC, App (Android/ iOS), teaching pendant	
Compatible Models		CR3A ~ CR16A	CR20A

CR3A

CR7A

CR5A

CR10A
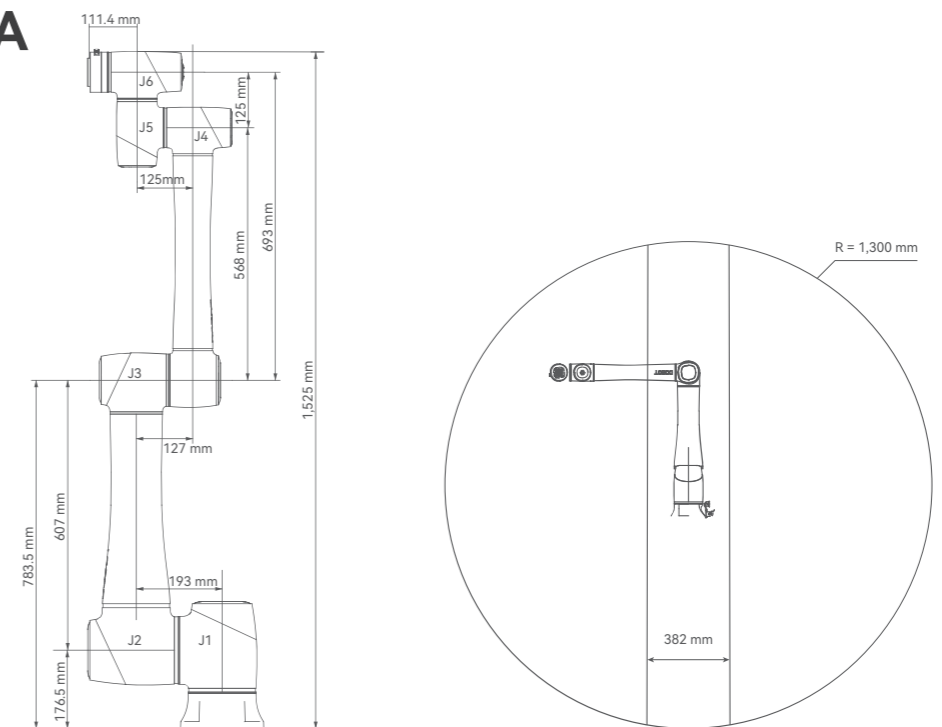
Device Dimensions

CR12A

- 111.4 mm
- J6
- J5 J4
- 125 mm
- 125 mm
- 518 mm
- 643 mm
- 1,425 mm
- J3
- 127 mm
- 733.5 mm
- 557 mm
- 193 mm
- J2 J1
- 176.5 mm
- R = 1,200 mm
- 382 mm

CR20A

- 130.5 mm
- 128.8 mm
- 128.8 mm
- 746 mm
- 1,992 mm
- 173.7 mm
- 825.2 mm
- 230 mm
- 220.5 mm
- R = 1,700 mm
- 352 mm

CR16A

- 111.4 mm
- J6
- J5 J4
- 125 mm
- 125 mm
- 363 mm
- 488 mm
- J3
- 127 mm
- 1,223 mm
- 688.5 mm
- 512 mm
- 193 mm
- J2 J1
- 176.5 mm
- R = 1,000 mm
- 382 mm

Control Box

- 145 mm
- 373 mm
- 376 mm
- 345 mm
- 155 mm
- 345 mm

15 cm Proactive Protection Range

The CRAS series senses obstacles that come within 15 cm, and performs emergency stop or automatic evasion to avoid damages caused by collisions.

Pre-collision Detection

15 cm

Safer

10 ms Instant Response Time

Within 0.01 second after sensing obstacles, it automatically activates reaction procedures predetermined by the users, whether it is to stop or evade. The result is a highly responsive and safe interaction.

More responsive

10 ms Response time

360° Safety Protection

The SafeSkin is industry's first wearable accessory made of silicon. It is soft on contact to reduce collision impact. With excellent anti-interference characteristics, the SafeSkin's performance is not affected by intermediate materials such as clothes and plastic gloves. It is wrapped around the robotic arm to offer all-round safety protection.

3rd Generation SafeSkin
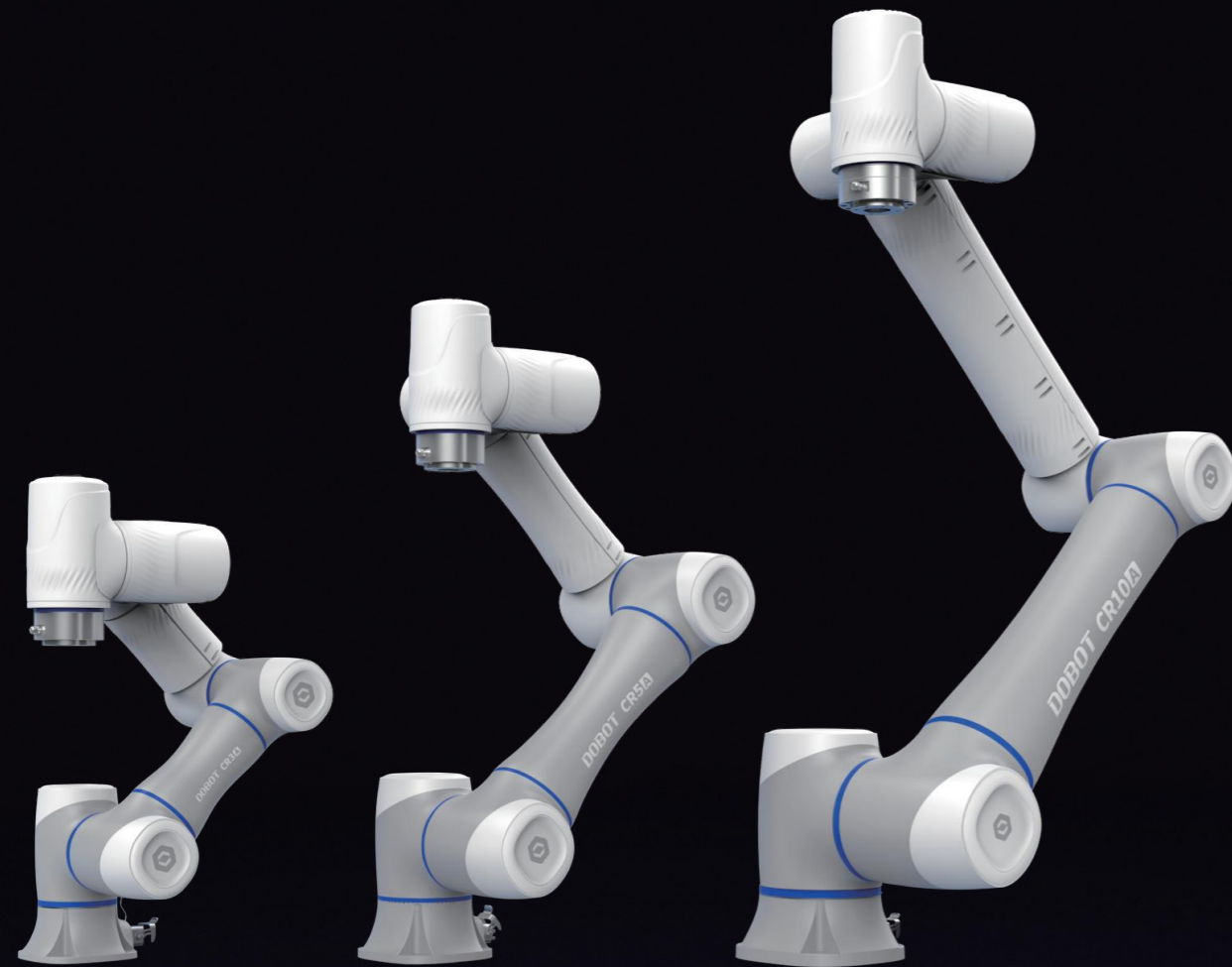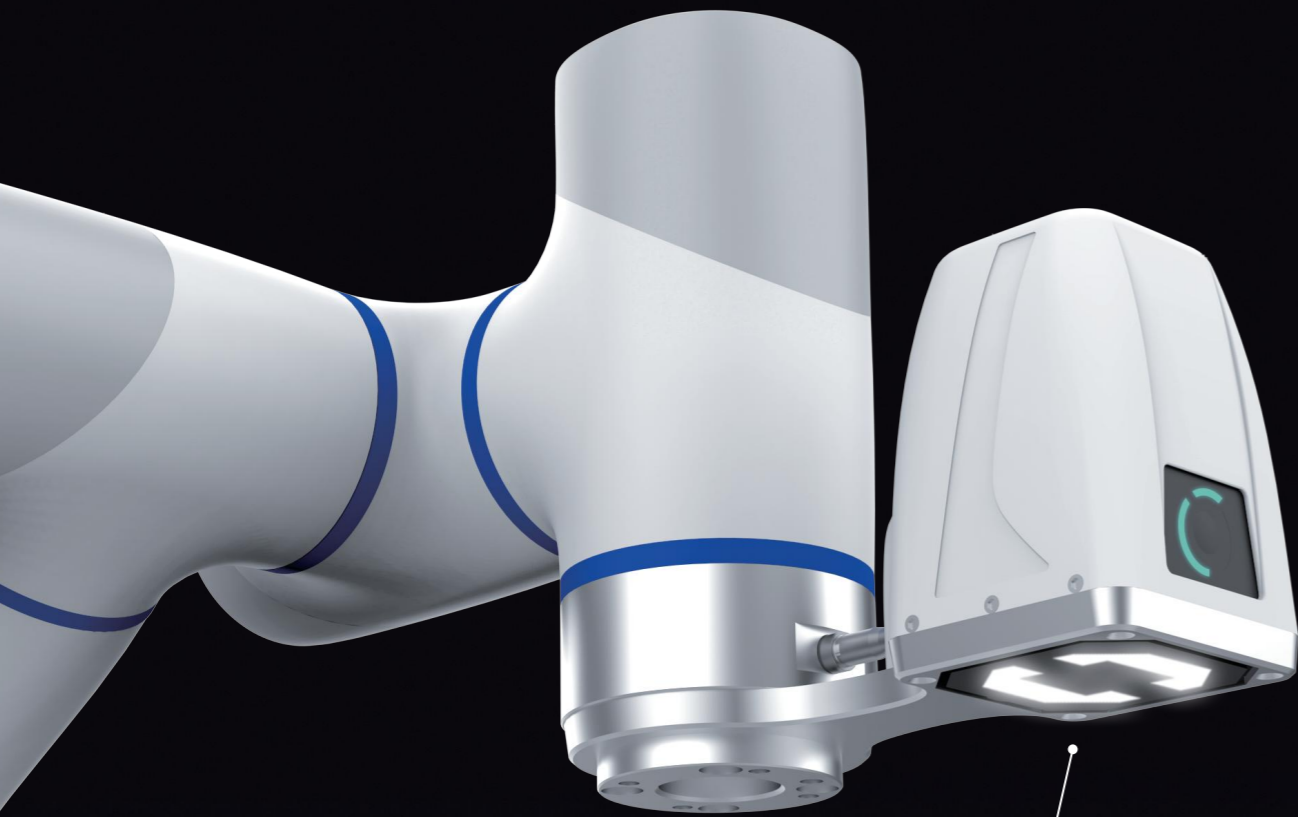
CRAS Series

Pre-collision Detection for Efficiency and Safety

The CRAS series is the upgraded version of the CRA series. It has the same characteristics and performance of the CR series, and is further improved by the addition of the SafeSkin for pre-collision detection to achieve better safety and collaboration efficiency. The CRAS series has 3 kg, 5 kg and 10 kg payloads to offer both safety and efficiency to end users.

4 Times Efficiency Gains

With fewer collisions and operation halts, human-machine collaboration speed can be increased to 1 m/s, four times the international standard of 0.25 m/s.

Avoid collision under medium to low-speed operation Decreases 90% of the rate of collision

DOBOT

Accurate Positioning

Self-developed 2.5D spatial compensation technology with an accuracy of ±0.5 mm to identify the height and tilt of objects to deal with complex grabbing tasks. For example, in scenarios such as uneven or inclined surfaces, have AMMR robots can carry out tasks accurately.

Quick Deployment

Compatible with DobotStudioPro robot operation software, with guided steps on operation settings and graphical programming, even users with no prior programming knowledge can complete building solutions easily.

Flexible & Expandable

Integrated algorithms to enable object sensing, measurement, text and image identification, fulfilling the majority needs of robotic vision applications.

Black & White Smart Camera

12 mm lens, **5** Megapixel HD imaging
14 LED for balanced light source

CRV500

2.5D Vision for Accurate Picking

With a built-in high performance vision system and an operating software, anyone can familiarize themselves easily. The vision kit can carry out tasks such as grabbing, assembly, transportation and even loading and unloading.

▍CRV500 Specifications

Camera	
Sensor Type	CMOS, global shutter
Pixel Size	3.2 μm × 3.2 μm
Sensor Size	1/1.7"
Resolution	2368 × 1760
Pixel Format	Mono 8
Color	Black & white
Components	
Lens Connector	M12 mount, mechanical focusing
Focal Length	12.4 mm
Light Source	14 LED: White

Dobot+ Open Ecosystem of Accessories

DOBOT

Dobot+ actively cooperates with ecosystem partners to offer various end effector and peripheral accessories to simplify the deployment process while allowing secondary development for different needs.

- Supports over 100 plug-and-play end effectors for quick automation deployment.
- Provides a one-way RS485 port to end effector and control box each, for flexible third-party accessory expansion.
- Provides standard SDK and rich demo source code for efficient project development.

2D/3D Cameras

HIKROBOT
DS-2CD4065F-(A)(P) Camera

HIKROBOT
Industrial Encoder

HIKROBOT
Industrial 2D Camera

ALSONTECH
AT-S1000-C

OMRON
QX-870 Series
Laser Barcode Scanner

COGNEX
Vision Systems

MECHMIND
Mech-Eye Industrial 3D Camera

SOLOMON
AccuPick 3D

Force Sensors

Robotiq
FT 300-S Force Torque Sensor

ATI
Multi-Axis Force
/ Torque Sensors

Onrobot
Hex 6 Axis Force Torque Sensor

Kunwei
KWR75B Multi-dimensional
Force Sensor

Link-touch
ST Six-Axis Force Sensor

XJCSENSOR XJC-3F
Adaptive 3-Axis Force Sensor

Grippers

Tendertouch
Soft grippers

ROBOTIQ
2F-85 & 2F-140v

ROBOTIQ
2F-85 & 2F-140

OnRobot
RG2 & RG6

OnRobot
3-Finger Gripper

SCHUNK
Co-act EGP Series

SCHUNK
EGH Series

DH-Robotics
PGE Series

DH-Robotics
PGC Series

Mobile Platforms

Seer
AMB Series

Youibot
Trans Mobile Robot

Standard Robots
OASIS AMRs

AGILE.X
HUNTER 2.0

Solutions

![DOBOT]

We have developed specially process package software for screwdriving, welding and palletizing. Through simple setups, automation processes can be built. This significantly reduce the amount of time and labor cost needed for project development. These process packages work with ecosystem accessories, users can choose the right accessories for their
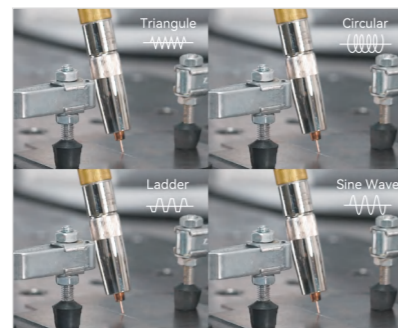
Welding Solution

Setup arc/laser welding applications quickly with the welding process package and welding machine.

Deploy in 30 Minutes

Supports Various Arc Patterns

Collision Protection Without Fence

Screwdriving Solution

Screwdriving process package and electric screwdriver allow flexible customization of various screwdriving tasks.

Simple Setup, Easy to Familiarize

Calibration in 2 Steps
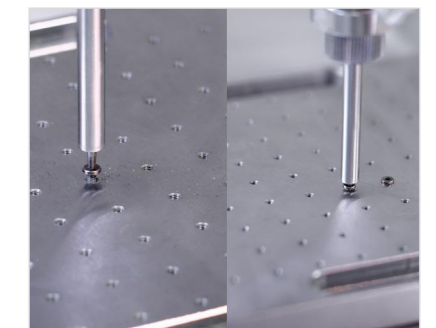
Consistent Quality & Capable Performance

Palletizing Solution

Complete task building in 2 to 4 hours with plug-and-play accessories and the palletizing process package.

Easily Create Automation Processes
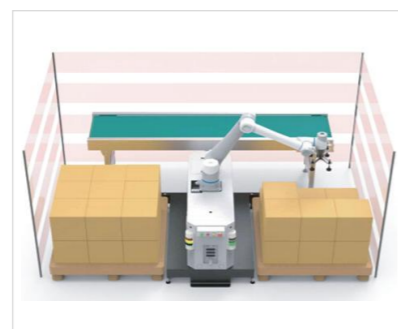
Supports External Light Curtains

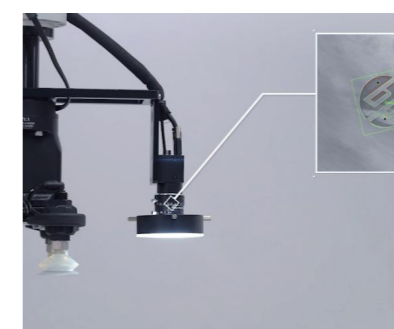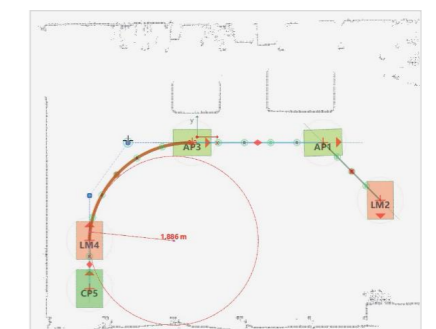Remote Tracking of Live Status

AMMR Solution

Collaborative robot and AMR work together to carry out tasks such as transportation, loading and unloading between multiple stations and inspections.

Laser SLAM Navigation

2.5D Vision

Completes Route Planning in 5 Minutes

Diverse Application Scenarios

The CRA series has 3 kg, 5 kg 10 kg, 12 kg, 16 kg and 20 kg payloads to offer both safety and efficiency to end users. Covers over 15 major industries including consumer electronics, automotive, semiconductor, food & beverage, chemical, healthcare and retail.

PCB Board Loading & Unloading
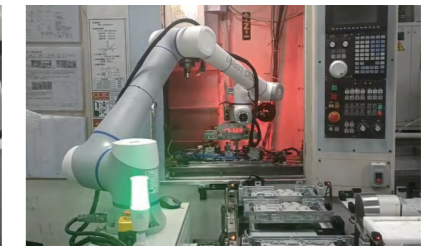
PCB Board Burn-in Transportation
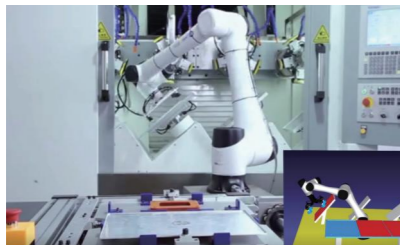
Semiconductor Plastic Packaging Loading and Unloading

Loading & Unloading CNC Machine Tools (SafeSkin)

Machine Tools Loading & Unloading

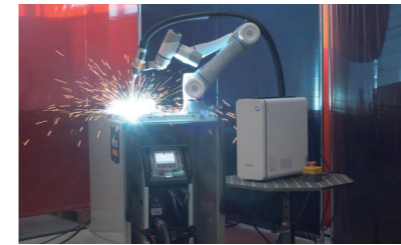Loading & Unloading by AMMR

Laptop Back Case Polishing, Loading & Unloading

Electronic Parts Inspection

Automotive Parts Assembly
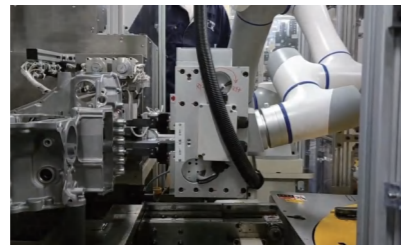
Metal Workpieces Processing

Depalletize Plastic Bottles

Loading & Unloading Plastic Caps

Automotive Oil Pipe Joint Installation

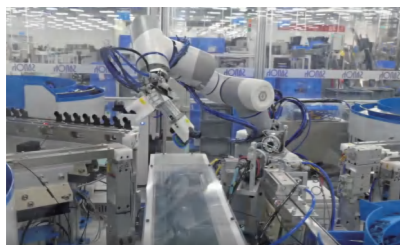Gearbox Screwdriving

Windshield Gluing

Inspection of Dangerous Chemicals

Inspection of Toilet Bowls
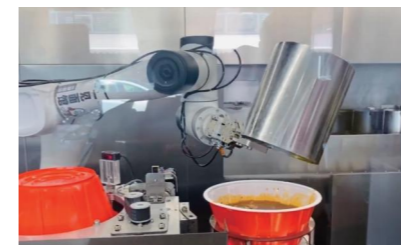
Eyeglasses Polishing

Automotive Joint Sealing Ring Installation

Energy Storage Screwdriving

Loading & Unloading New Energy Battery

Robot Noodle Store

Latte Art Coffee Stand

Laboratory Assistant