

English



Rainbow Robotics
Collaborative Robot

RB Series



www.rainbow-robotics.com

ROBOT FOR COEXISTENCE AND COOPERATION

Rainbow Robotics

Rainbow Robotics is a robot platforms company founded by a group of experienced researchers at the KAIST Humanoid Robot Research Center (HUBO Lab). From the world's best disaster response robots to cooperative robots (cobots) developed in-house, Rainbow Robotics invests its energy and resources in commercializing robots by securing its own technology with relentless research and development, and by providing outstanding robots at reasonable prices. Using humanoid robotics technology, Rainbow Robotics researches and develops a wide variety of robots, including cobots, autonomous mobile robots, medical robots, quadruped walking robots, and astronomical mounts, and the company is always looking for new opportunities to expand into new areas of business.

Company History

- 2021.12** CE Certification (RB3-1200E / RB3-1200EN / RB3-1200EA1 / RB3-1200EA2 / RB5-850E / RB5-850EN / RB5-850EA1 / RB5-850EA2 / RB10-1300E / RB10-1300EN / RB10-1300EA1 / RB10-1300EA2)
- 2021.09** KCs Certification (RB5-850E / RB5-850EA1 / RB5-850EA2 KCs)
- 2021.08** NICE D&B Certificate of Technical Achievement (2021.08.05 ~ 2022.08.04)
- 2021.07** Functional Safety TUV Certification (ISO 10218-1, ISO 13849-1, ISO TS 15066, IEC 61508, EN 62061, IEC 61800-5-2) CE Certification (RB5-850E / RB5-850EA1 / RB5-850EA2)
- 2021.06** CE, NRTL Motor module Certification (RBe-14-30 / RBe-17-30 / RBe-25-30 / RBe-32-20)
- 2021.04** Certificate of confirmation of companies specializing in materials, parts, and equipment (2021.04.19 ~ 2024.04.18)
- 2021.03** RB-N Series "NSF/ANSI 169" Certified
- 2021.02** Rainbow Robotics Co., Ltd. listed on KOSDAQ (277810).
- 2020.08** Delivered the LIG Nex1 internal gimbal driving assembly, and 1 other product
- 2020.07** Signed a service contract to design a satellite monitoring telescope system for the KASI
- 2020.04** Acquired the "ISO 9001:2015" Quality
- 2019.07** Launched the RB series (collaborative robot)
- 2018.02** Service contract for the operation of humanoid robot experience service during 2018 Pyeongchang Winter Olympic Games
- 2017.07** Secured KRW 10 billion in investment (venture capital)
- 2016.02** Supplied LIG Nex1 with mount drivers
- 2015.12** Exported four units of DRC-HUBO+ to the Naval Research Laboratory, USA
- 2015.09** Operated MOUNT, the electronic and optical space object monitoring system of KASI
- 2015.06** Participated in the DRC Finals competition hosted by DARPA as TEAM-KAIST (Final Winner)
- 2014.01** Acquired the "Venture Company" certification
- 2013.09** Exported two HUBO II units to Google Inc., USA
- 2011.12** Exported six HUBO II units to the MIT with support from the US National Science Foundation
- 2011.07** Mount technical service agreement signed with Korea Astronomy and Space Science Institute (KASI)
- 2011.05** Established an affiliated research institute
- 2011.02** Established Rainbow Robotics Co., Ltd. (original company name: Rainbow Co., Ltd.)



WE TOUCH THE CORE

Moving forward, Rainbow Robotics aspires to leverage its superior technological capacities to become a leader in the global robotics field.

Robot works with workers

RB Series

Rainbow Robotics' cobot RB series is a next-generation 6-axis robotic arm. RB series features multiple products (RB5-850, RB3-1200, RB10-1300, etc) to suit the user's work environment, and all products have the CE and KCs certifications approved by the global certification body TÜV SÜD. (ISO 13849-1, Cat.3, PL-d, and ISO 10218-1, ISO/TS 15066)



RB Series Lineup

RB3-730 RB3-1200 RB5-850 RB10-1200 RB16-900
+ Built-in pneumatic option (A1, A2, A3) | + RB-N Series

Key Features



Securing high levels of performance and great price competitiveness by internalizing the production of core components

Rainbow Robotics develops and uses core components required in its cobots, such as actuators, encoders, brakes, and controllers, in-house. With these components, the RB series can deliver high driving speeds, precise controls, and braking performance without any play or instability in the braking system. Moreover, the RB series is much more reasonably priced than the competition (30% cheaper) thanks to Rainbow Robotics' extensive use of in-house developed parts.

Key components of the collaborative robots developed by Rainbow Robotics



Cobot with built-in humanoid robotics technology

Rainbow Robotics is the company that developed HUBO, a bipedal robot featuring the best robotics technology available in the market today. Using humanoid robotics technology, Rainbow Robotics has developed the RB series (Rainbow Robotics' dedicated line of cobots). Each RB series cobot is equipped with a collision detection system, a gravity compensation device, and a sophisticated motor control system.



Software to boost user's convenience

The RB series features a Linux-based, real-time robot operating system developed independently by Rainbow Robotics. The operating system, which uses a supervisory control algorithm, maintains and manages the performance of each cobot, and supports the execution of a given task within a predictable time range. This enables smooth movement (eliminates choppy robot movements), and reduces the time required for each move or action. Furthermore, if a cobot requires any additional functions or upgrades to its system operations, Rainbow Robotics can address the issue with a SW update.

RB3-730

RB3-730 is a compact, high-precision model with a payload of 3kg and a maximum range of 730mm. With joints arranged using S-pipe, RB3-730 is efficient when executing contour motions often used in welding and bonding, and can be used for IT, electronics, and bio services applications.



Specification	
Payload	3 kg
Reach	730 mm
Repeatability	± 0.05 mm
Footprint	∅ 128 mm
Materials	Aluminum, plastic, and steel
Tool connector type	M10.12-pin connector (12/24V, -2A)
Cable length (Robot arm)	5 m
Weight	11 kg
Operating environment	IP 54 / 0-50 °C
Wattage	100 W with the standard program
Noise	Less than 60dB(A)
Joint range	J1: ± 360° ± 180°/s J2: ± 360° ± 180°/s J3: ± 150° ± 180°/s J4: ± 360° ± 180°/s J5: ± 360° ± 180°/s J6: ± 360° ± 180°/s

* Specifications may change to improve performance.

RB3-1200

RB3-1200 has a payload of 3kg, and a range of up to 1200mm. It is the model that boasts the largest working radius among all existing small-load robots currently on the market. It can perform complex tasks, including welding, grinding, and CNC machine tending, and it can be used in combination with an autonomous mobile robot (AMR).



Specification	
Payload	3 kg
Reach	1200 mm
Repeatability	± 0.05 mm
Footprint	∅ 173 mm
Materials	Aluminum, plastic, and steel
Tool connector type	M10.12-pin connector (12/24V, -2A)
Cable length (Robot arm)	5 m
Weight	22.4 kg
Operating environment	IP 66 / 0-50 °C
Wattage	200 W with the standard program
Noise	Less than 65dB(A)
Joint range	J1: ± 360° ± 180°/s J2: ± 360° ± 180°/s J3: ± 165° ± 180°/s J4: ± 360° ± 180°/s J5: ± 360° ± 180°/s J6: ± 360° ± 180°/s

* Specifications may change to improve performance.

RB5-850

RB5-850 is the standard model of the RB series, with a max load capacity of 5 kg and a max work radius of 927.7 mm. It can be deployed as an all-purpose unit in manufacturing, such as production, assembly, and components fastening, and in service industries such as food and beverage systems, disinfection/sanitizer systems, and robot studios.



Specification	
Payload	5 kg
Reach	927.7 mm
Repeatability	± 0.05 mm
Footprint	∅ 173 mm
Materials	Aluminum, plastic, and steel
Tool connector type	M10.12-pin connector (12/24V, -2A)
Cable length (Robot arm)	5 m
Weight	22 kg
Operating environment	IP 66 / 0-50 °C
Wattage	200 W with the standard program
Noise	Less than 65dB(A)
Joint range	J1: ± 360° ± 180°/s J2: ± 360° ± 180°/s J3: ± 165° ± 180°/s J4: ± 360° ± 180°/s J5: ± 360° ± 180°/s J6: ± 360° ± 180°/s

* Specifications may change to improve performance.

RB10-1300

RB10-1300 has a payload of 10kg and a maximum range of 1,300mm, meaning it can handle the heaviest load among all robots in the RB series. It is effective for tasks involving heavier objects such as packaging, courier transportation, and pallet loading.



Specification	
Payload	10 kg
Reach	1300 mm
Repeatability	± 0.05 mm
Footprint	∅ 196 mm
Materials	Aluminum, plastic, and steel
Tool connector type	M10.12-pin connector (12/24V, -2A)
Cable length (Robot arm)	5 m
Weight	37.1 kg
Operating environment	IP 66 / 0-50 °C
Wattage	350 W with the standard program
Noise	Less than 65dB(A)
Joint range	J1: ± 360° ± 120°/s J2: ± 360° ± 120°/s J3: ± 165° ± 180°/s J4: ± 360° ± 180°/s J5: ± 360° ± 180°/s J6: ± 360° ± 180°/s

* Specifications may change to improve performance.

Robot Control Box

Robot control box is a device that controls the movement of the robot arm according to the program written by the user. Equipped with digital and analog input/output ports. Various equipments and devices can be connected and used.

Standard Control Box



Specification	
Digital input	·6 (PNP)
Digital output	·16 (PNP)
Analog input	·4 (0~10V)
Analog output	·4 (0~10V)
I/O ports	RS-232/422/485 Ethernet (TCP/IP, MODBUS TCP, Control Script) Siemens S7, OMRON Fins, Mitsubishi MC, etc ※ I/O expansion modules available
Power source	100-240V AC, 50-60 Hz
Size	454 x 240 x 416.2 mm
Weight	RB3-1200/ RB5-850 20.3 kg RB10-1300 22.2 kg
Materials	EG (electric galvanized steel sheet)

DC Control Box



Specification	
Digital input	·6 (PNP)
Digital output	·16 (PNP)
Analog input	·4 (0~10V)
Analog output	·4 (0~10V)
I/O ports	RS-232/422/485 Ethernet (TCP/IP, MODBUS TCP, Control Script) Siemens S7, OMRON Fins, Mitsubishi MC, etc ※ I/O expansion modules available
Power source	19~72V DC
Size	380 x 182 x 270 mm
Weight	11.5 kg
Materials	SUS 304
Remarks	※ Four fixing brackets provided

※ Specifications may change to improve performance.

I/O expansion module

RB Series has a total of 40 I/O ports (default configuration). If more I/O ports are required, users can add ports without using additional equipment, such as a PLC, using the I/O expansion module.



Specification	
I/O ports	Digital input 16 (PNP) Digital output 16 (PNP) Analog input 4 (0~10V) Analog output 4 (0~10V)
Power source	100-240V AC, 50-60 Hz
Size	403 x 31 x 110 mm
Weight	500 g
Materials	Aluminum

※ Specifications may change to improve performance.

RB16-900

RB16-900 has a payload of 16kg and a maximum range of 900mm, meaning it can handle the heaviest load among all cobots in the RB series. RB16-900 is effective when working with heavy loads (e.g. packaging, courier transportation, palletizing, and assembly automation).



Specification	
Payload	16 kg
Reach	900 mm
Repeatability	± 0.05 mm
Footprint	Ø 196 mm
Materials	Aluminum, plastic, and steel
Tool connector type	M10 12-pin connector (12/24V, -2A)
Cable length (Robot arm)	5 m
Weight	32 kg
Operating environment	IP 66 / 0-53 °C
Wattage	350 W with the standard program
Noise	Less than 65dB(A)
Joint range	J1 : ± 360° ± 180°/s J2 : ± 360° ± 180°/s J3 : ± 165° ± 180°/s J4 : ± 360° ± 180°/s J5 : ± 360° ± 180°/s J6 : ± 360° ± 180°/s

※ Specifications may change to improve performance.

Built-in pneumatic option (A1, A2, A3)

Rainbow Robotics also offers a built-in pneumatic line, which makes its cobots much easier to use (eliminates the need to arrange and organize cables). The built-in pneumatic option is compatible with all RB series products. Depending on the pneumatic and signal lines, the user can select either A1, A2, or A3.



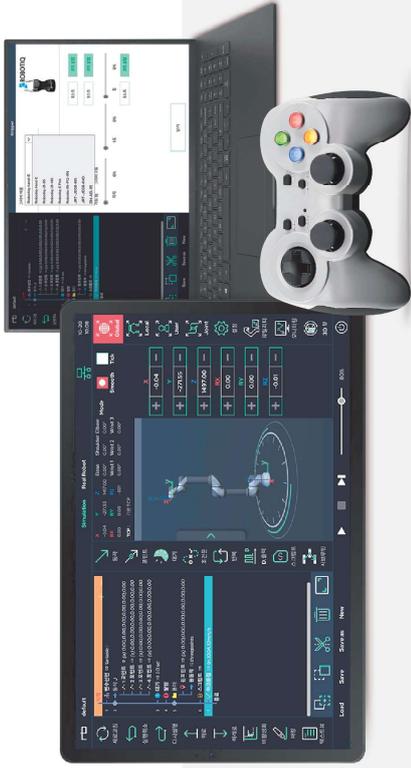
Model Name	Pneumatics lines	Signal lines
RB5-850A1	4 EA(4Ø tube)	N
RB5-850A2	5 EA(4Ø tube)	12 Pin(AWG28)
RB3-1200A1	4 EA(4Ø tube)	N
RB3-1200A2	5 EA(4Ø tube)	12 Pin(AWG28)
RB10-1300A1	1 EA(8Ø tube)	N
RB10-1300A2	1 EA(8Ø tube)	12 Pin(AWG28)
RB10-1300A3	4 EA(4Ø tube)	N

※ Specifications may change to improve performance.

※ In addition, when applying the option, it is necessary to check the driving range and operating environment.

Teaching Pendant

Rainbow Robotics' cobots are easy to program using the Rainbow Robotics Teaching Pendant. Moreover, the icon-based GUI allows users to configure the interface to suit their required conditions. The user-friendly GUI also makes maintenance easier, improves security, and enables intuitive programming. The Teaching Pendant is compatible with Android OS-based smartphones, tablet PCs, and Windows OS-based devices.



◆ Main Features

User's convenience

Rainbow Robotics' Teaching Pendant is a lightweight, highly responsive product, and it can be connected via wired or wireless options. Also, a single Teaching Pendant can control multiple robots.

Jog-based interface

When writing a program, a robot often has to be repositioned or relocated. RB series cobots have a jog dial next to the programming window. Users can use the jog dial to move the robot and add the desired commands.

Program tree viewing & processing

Users can access the program summary through the program tree, and functions such as zoom/scroll can help view the content with greater accuracy.

Program configuration

Users can confirm and load previously created programs through the sub-program and template functions. Here, the loaded program is automatically grouped so that the user can check the full overview.

Digital output

Users can control the entire port by selecting either ON or OFF. Furthermore, various options such as a bit combination output and pulse output are available for digital output.

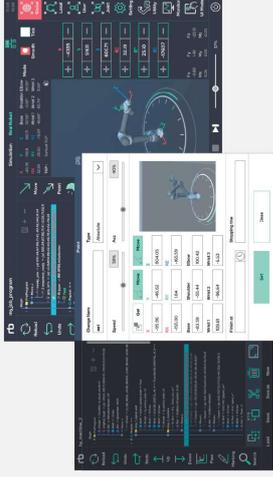
Real-time monitoring

The Teaching Pendant has debugging and monitoring functions to check the value of each selected variable. While the program is running, users can check the selected variable via a pop-up, and check variables in real-time using the monitoring function.

UI

Easy to Handle

The operation and movement of the robot is easy with its simple and intuitive UI. Using a touch screen and/or joystick, operate the robot intuitively and quickly.

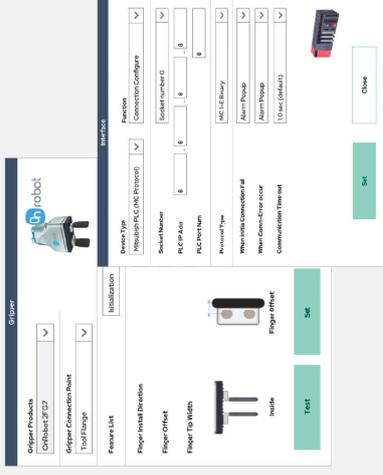


Various Accessories

Our robots support various gripper and sensors such as Robotiq/OnRobot (simply plug-and-play). The robot and various accessories can be used without having to install a separate program.

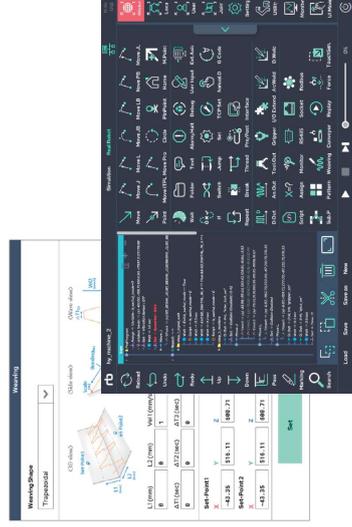
Connectivity

Our robots can communicate with various PLC / Sensor / Welder / HMI using its built-in communication function. They can exchange data with various devices without any additional programming.



Various Functions

The Rainbow Robotics program offers a variety of built-in functions. Users can quickly access available functions by inputting a few setting values.



Accessory

RB series robots support "Plug&Play" so that users can easily use various grippers, sensors, PLCs, welding machines, and HMI. The RB series accelerates development, and it works under a wide variety of working conditions.



Robotiq Hand-E



Robotiq 2F-55/140



Robotiq E-Pick



Robotiq RH2-12RN



OnRobot 2FG7



OnRobot RG2/RG



JRT-JEGB 485/4140



DH-AG-95



Schunk Co-act



Schunk EGP



OMRON PLC



Analog Welding Equipments OTC Deiften, Megmeet, etc



HIWIN SEG-24-TM



HIWIN SEG-04-TM



Robotiq FT Sensor



Robotiq FT Sensor



Pickit 3D



Setech NutRunner



MITSUBISHI PLC Series



LS ELECTRIC PLC Series



Welding Equipments ESAB / Kemppi / Kolarc



HMI



Siemens PLC



SCHMALZ



World's first NSF-certified robot RB-N Series



RB-N series has been certified by the National Sanitation Foundation (NSF) for safe and hygienic use in the food and beverages market, and is designed to be used as stand-alone units without the need to add any jackets or additional devices to the robot.

RB-N series features three models - RB5-850N, RB3-1200N, and RB10-1300N - that can be applied in various food and beverage applications, such as fryers using high-temperature oil and espresso machines using high-pressure steam.

※ The specifications of RB-N series robots are the same as the RB series robots.

NSF Certificate and scope of application



Various F&B industry applications

- Unmanned cafe platforms (coffee, ade, milk tea, cocktails)
- Soft ice cream robots
- Waffle-making robots
- Chicken-cooking robots
- Kitchen utensils-washing robots, etc.

NSF Mark

- Safety certification for special purpose food processing equipment and related components (NSF/ANSI -69)
- Approved as a production facility/equipment by the NSF

Innocuous cooking robot (safe for the human body)

- Uses special paint that does not emit any harmful substances
- Guarantees a level of safety that allows food to be cooked again even if it comes into direct contact with the robot
- Approved with a crash test (harmlessness of foreign substances such as paint chips generated as a result of a collision proven)

Use of highly durable fasteners / connections

- Uses special SUS fasteners/connections that don't rust
- Uses coupling rings proven for use at high temperatures and offers high strength, high stiffness, low moisture absorption, fatigue resistance, creep resistance, and great hygiene performance

Superior user's convenience

- Features a waterproof and dustproof 6-axis robot arm with an IP66 rating
- Works as a stand-alone robot unit that can eliminate the hassle of changing jackets and reduce costs



Cases of RB series applications

1 CNC machine tending

CNC machine tending is a process that repeats the task of inserting raw materials into a machining tool, then taking out the processed product. RB series not only performs simple and repetitive tasks on behalf of human workers, but also prevents the risk of industrial accidents. Furthermore, it supports IP66-rated (dust and water-resistant), meaning RB series can continue to work without any issues even if it comes in contact with cutting oil and coolant during the machining process.



STS PRECISION CO., LTD

"We have managed to boost productivity by 40~50% by introducing RB series robot to the manual CNC process. Also, we are now able to respond more actively to the demands of our customers, which have increased two to three times since the recent boom in semiconductor."



3

Mold handling

Mold handling is used when loading-unloading injection molded parts. A robot can perform dangerous tasks such as operators putting their hand into the injection molding machine to take out a newly produced component.



TP Solution

"Since a robot is always consistent in performing its task, it reduces the defect rate and boosts productivity quite substantially. Also, robots can help workers learn new skills. For example, they can learn how to control the overall process, rather than performing simple and repetitive tasks."

2 Welding solutions

As standard, RB series is equipped with the necessary functions for weaving and arc welding, which makes it capable of various welding applications, including specimen, argon, weaving, pulse, arc, and corner welding.



J-system

"Welding requires great precision and attention to detail. Naturally, you need to input a lot of robot motions and points. Unlike industrial robots, robots come with a direct teaching function, making motions and points much easier to input."



JCT

"Welding systems using robots have the advantage of being easy to install and being capable of small-lot productions compared to conventional industrial robots. Also, robots are more economical in terms of the space and cost they require since they do not require any additional devices or facilities such as fences. If you are finding it difficult to recruit an experienced and skilled welder, try using a robot welder that is easy to control, even for novice robot operators."

4

Robot cafe platform

Robot cafe platform is open 24 hours a day, 7 days a week and is unmanned from ordering to providing drinks. If you order the drink you want through the kiosk, you will receive the drink you ordered within 50 seconds, and you can check the order waiting status through the monitor.



Yellowphant Coffee

"Yellowphant Robot Cafe is an unmanned robot cafe that offers a variety of drinks, including coffee, ice cream, ade, and tea. Currently, it is operated by highway rest areas such as Deokpyeong Rest Area, Geumwong Rest Area, and Jukjeon Rest Area, as well as landmarks such as Busan Diamond Tower, Geje Cable Car, and Daegu Aquarium."

5

Fried Cooking Robot

Robert using RB series is a robot that automatically performs frying cooking tasks. It is a robot that can cook 50 baskets of fried food per hour, and not only chicken, but also fries such as french fries, cone dogs, and churros.



Robo Arete (Robert Chicken)

"Robert Chicken's entire store is equipped with cooking automation, where cooperative robots fry chicken instead of humans. It also uses safety laser scanners to ensure employee safety, and AI-based cooking optimization ensures the best taste. We are providing the best solution for many chicken operators and their headquarters, which have recently been struggling with rising labor costs and labor shortages."



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