YAMAHA
Revs Your Heart

RCX320

2-axis comprehensive controller

RCX320

Then newest addition to RCX3 series

| Easier operation | Enhanced Expandability | Improved Performance |

YAMAHA

YAMAHA MOTOR CO., LTD.

For reliable production run

Real-Time output function for preventive maintenance information.

Easier operation

Enhanced Expandability

Improved Performance

Real-Time output function for Preventive Maintenance.

Industrial Ethernet option Real-Time output function Note 1

When the industrial Ethernet option (Ethernet/IP, EtherCAT, or Profinet) is selected, the information necessary for the predictive maintenance such as error status, current position, current value, motor load factor, operation hours, and others can be output in real-time to contribute to achievement of the "non-stop production line".

Note 1: The 4-axis controller "RCX340" also supports this function.

IoT

PROFI BUS
PROFI NET Note 2
CC-Link
EtherCAT® Note 2
EtherNet/IP Note 2
DeviceNet

Note 2: The real-time output function is supported.

Real-time output function

Error status	Controller temperature	Motor load factor
Current value	Current position	In-position
Operation hours	Speed	I O

Real-time output

Predictive maintenance information

RCX340

Centralized program control

Industrial Ethernet option

Up to four RCX320 and RCX340 controllers (16 axes)

RCX340

RCX340   RCX340   RCX320

YC-Link/E

Easy and user-friendly operation system

Economical solution for 6 axes robot setup.

By connecting RCX340 4-axis controller through YC Link/E, total of 6 robots can be operated.

PBX with USB port for backup

Simple and easy operation for adding function or editing work.
Storing backup data is a simple task.

The CPU processing capacity is increased approx. three times.

The CPU processing capacity is approximately three times faster than that of the conventional model RCX221/222. The control performance such as operation tracking or internal process time is improved greatly.

Convenient LED Display for Error Status.

The operation status is displayed on the "7-segment LED display" located on the front panel of the controller. If an error occurs, the relevant error message is displayed. The error status can visibly recognized without connecting the programming box.
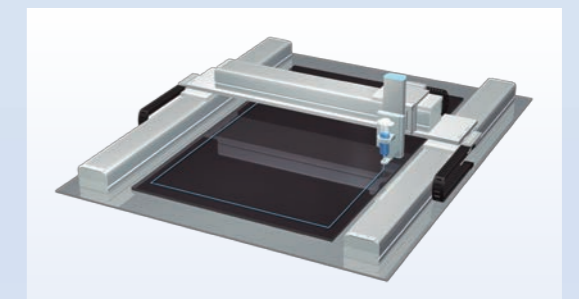
ON
OFF
SRV|ORG|E-STOP

▲7-segment LED display

RCX320 supports all 2-axis robots from small to large.

RCX320 is designed to operate Yamaha's all 2-axis robot systems with AC servo motor or linear motor. Controls two Flip/Phaser axes or all XY 2-axis systems.

Ideal for dual synchronized robot systems.

The dual robot that performs the synchronous drive between two axes can be easily controlled by one RCX320 controller.

Up to 320 kg can be controlled by one RCX320 controller.

If two sliders of Phaser dual system are connected and synchronized, its total payload capacity will become 320 kg (MF75D system).
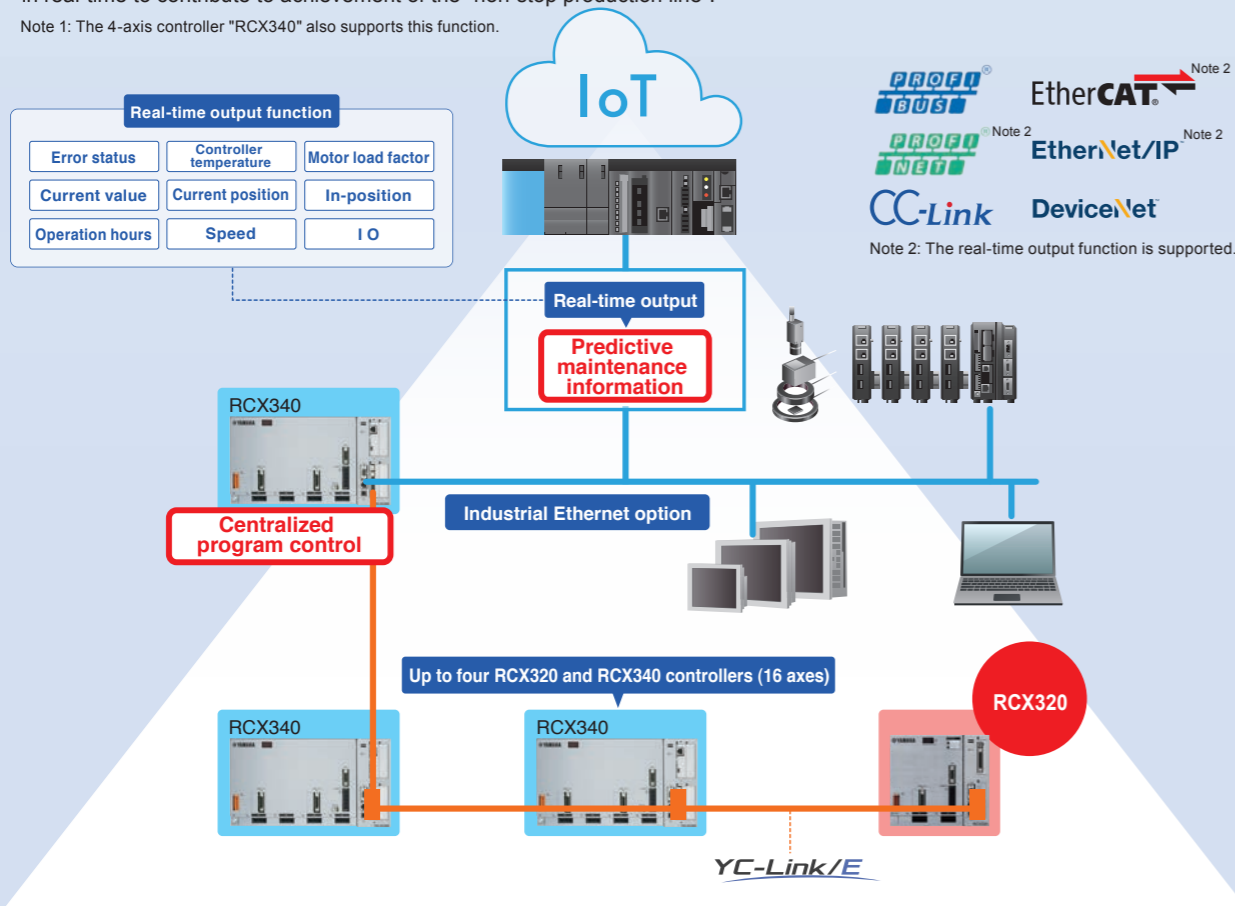
320kg

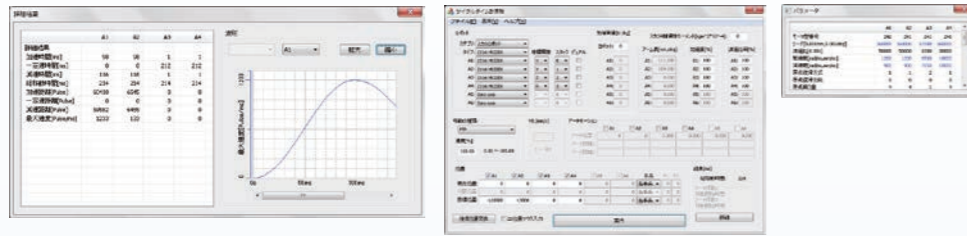## ✅ PC Programming Software "RCX-Studio Pro" (Common to the RCX340)

Both RCX340 and RCX320 run with RCX-Studio Pro. With an emulator function, writing programs or debugging can be done without connecting a controller.
Cycle time calculator between two points simplified a selection of the most suitable robot system. After startup, real-time trace and multi-tasking debug information is displayed simultaneously for monitoring status.

RCX-Studio Pro

■ Robot operations like initial setup and maintenance tasks are easier than ever.

Model Selection Stage   Reduces evaluation time before design stage.

● **Emulator function** ➤ The software can be debugged in the offline mode.
● **Cycle time calculator** ➤ Easy selection of the most suitable robot system.

Design Stage   Reduced design workload

● **Easy-to-use operating controls**

List of operation items and data
Various editors
For rearranging multiple monitor panel layout and floating displays.

● **iVY2 editor provided**

The component type can be registered without changing the software when the robot vision is used.
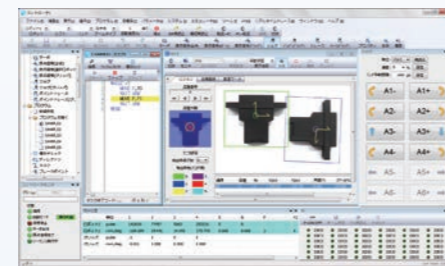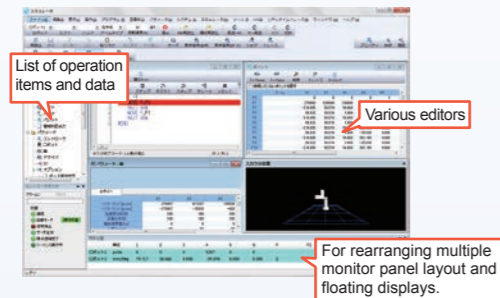
Startup and Operation Stage   Visualized information for easy monitoring.

● **Realtime trace**

The internal information of the controller is output continuously.

Tolerance
Current current
Current position

● **Application debugging function**

The debugging statuses of multiple tasks can be displayed simultaneously.

Debug information on multi tasks is displayed simultaneously.
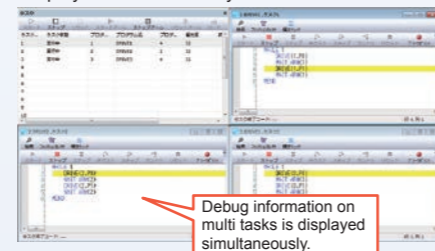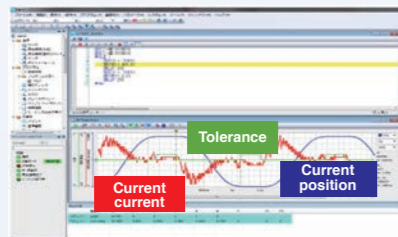
Maintenance   The maintenance and service time is reduced greatly.

● **Data comparison tool**

The specified two data is compared to visually display the difference. Comparison of all or by program ".all" files or comparison with online data can be selected.

Select and compare two data items
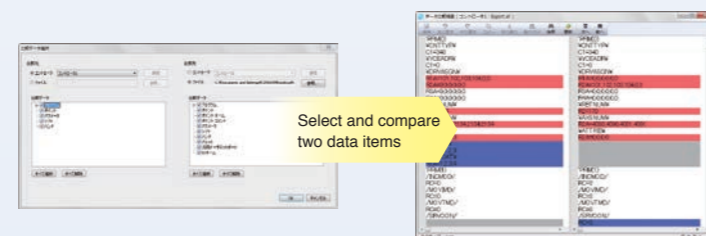
More enhanced expandability

✅ Enhanced field network support and option function

Six types of internal field networks such as EtherNet/IP, EtherCAT, CC-Link, DeviceNet, PROFINET, and PROFIBUS are supported. The RS-232C and Ethernet ports are installed as the standard ports and the option functions such as the gripper and vision system are also supported, allowing you to construct a system suitable for the needs.

EtherNet/IP   EtherCAT   CC-Link   DeviceNet   PROFINET   PROFIBUS
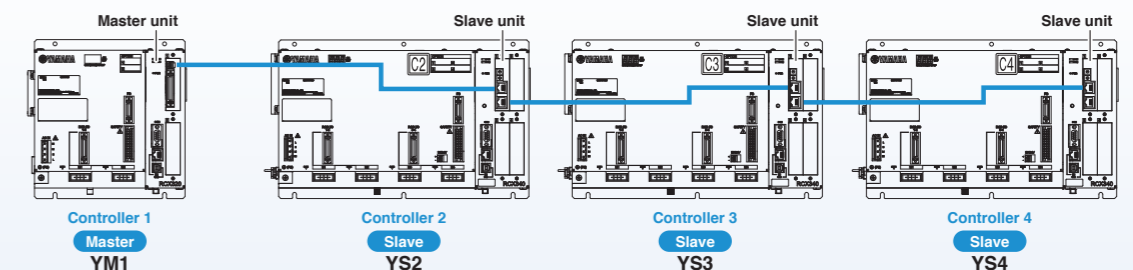
✅ Synchronized control of multi-axis robots

Use of the inter-controller communication "YC-Link/E" makes it possible to control multiple robots such as Cartesian robots and SCARA robots synchronously.
The YC-Link/E can be executed by the program of only the master controller. This contributes to great reduction of the system startup time.
The "RCX320" and "RCX340" controllers support both the master and slave specifications, allowing you to construct a system flexibly.
Note. Up to four "RCX320" and "RCX340" controllers can be connected by the inter-controller communication "YC-Link/E".
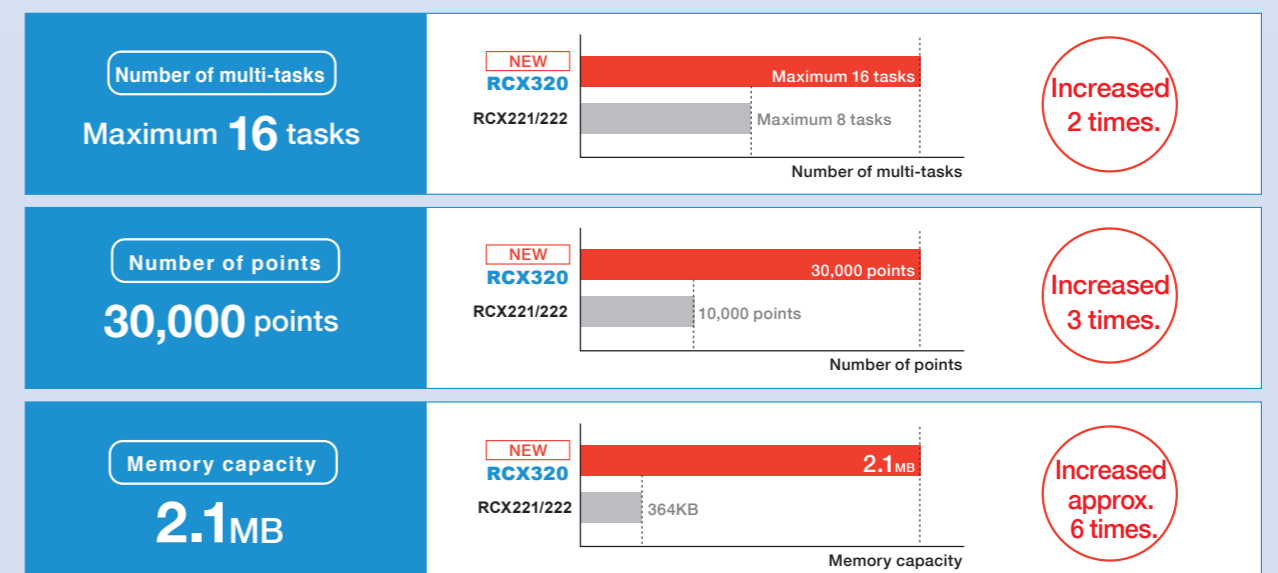
Example of YC-Link/E connections

Master unit   Slave unit   Slave unit   Slave unit

Controller 1	Controller 2	Controller 3	Controller 4
Master	Slave	Slave	Slave
YM1	YS2	YS3	YS4

• The "RCX320" and "RCX340" controllers support both the master and slave specifications.
• Up to four "RCX320" and "RCX340" controllers can be connected.
• The network board is inserted into only the master controller (YM1).

Improvement of basic performance

The basic performance is greatly improved when compared to the conventional "RCX221/222" controllers.

Number of multi-tasks

Maximum **16** tasks

NEW RCX320 — Maximum 16 tasks
RCX221/222 — Maximum 8 tasks
Number of multi-tasks

Increased 2 times.

Number of points

30,000 points

NEW RCX320 — 30,000 points
RCX221/222 — 10,000 points
Number of points

Increased 3 times.

Memory capacity

2.1MB

NEW RCX320 — 2.1MB
RCX221/222 — 364KB
Memory capacity

Increased approx. 6 times.

| Item		Description
Basic specifications	Applicable robots	YAMAHA single-axis robots, linear single-axis robots, P&P robots
	Connected motor capacity	1200W or less (in total for 2 axes)
	Power capacity	2400VA
	Dimensions	W213 × H195 × D130mm (main unit only)
	Weight	3.6kg (main unit only)
	Input power supply — Control power supply	Single-phase 200 to 230V AC +/-10% 50/60Hz
	Input power supply — Main power supply	Single-phase 200 to 230V AC +/-10% 50/60Hz
Axis control	No. of controllable axes	Max. 2 axes Up to four units of the RCX320 and RCX340 can be connected using the inter-controller communication "YC-Link/E".
	Drive method	AC full digital servo
	Position detection method	Resolver or magnetic linear scale
	Control method	PTP motion (point to point), ARCH motion, linear interpolation, circular interpolation
	Coordinate systems	Joint coordinates, Cartesian coordinates
	Position display units	Pulses, mm (1/1000 steps), degree (1/1000 steps)
	Speed setting	0.01 to 100% (below 1% can be changed by programming)
	Acceleration/deceleration setting	Optimized by robot model and tip weight parameter Setting by acceleration coefficient and deceleration rate parameters (1% steps) * Can be changed by programming. Zone control (For SCARA robots only, optimized according to arm posture)
Programming	Program language	YAMAHA BASIC II conforming to JIS B8439 (SLIM language)
	Multi-task	Max. 16 tasks
	Sequence program	1 program
	Memory capacity	2.1MB (Total of program and point data) (Available capacity for program when the maximum number of points is used: 300KB)
	Program	100 programs (maximum number of programs) 9999 lines (maximum number of lines per program)
	Point	30000 points (maximum number of points)
	Point teaching method	MDI (coordinate data input), direct teaching, teaching playback, offline teaching (data input from external unit)
	System backup (Internal memory backup)	Lithium battery (service life about 4 years at 0 to 40°C)
	Internal flash memory	512 KB
External I/O	SAFETY — Input	Emergency stop ready input, 2 systems Auto mode input, 2 systems (Enabled only when the global specifications are used.)
	SAFETY — Output	Emergency stop contact output, 2 systems Enable contact output, 2 systems (Enabled only when the PBX-E is used.) Motor power ready output, 2 systems
	Brake output	Transistor output (PNP open collector)
	Origin sensor input	Connectable to 24V DC B-contact (normally closed) sensor
	External communications	RS-232C: 1CH (D-SUB 9-pin (female)) Ethernet: 1CH (In conformity with IEEE802.3u/IEEE802.3) 100Mbps/10Mbps (100BASE-TX/10BASE-T) Applicable to Auto Negotiation RS-422: 1CH (Dedicated to PBX)
General specifications	Operating temperature	0 to 40°C
	Storage temperature	-10 to 65°C
	Operating humidity	35 to 85% RH (no condensation)
	Atmosphere	Indoor location not exposed to direct sunlight. *No corrosive , flammable gases, oil mist, or dust particles
	Anti-vibration	All XYZ directions 10 to 57Hz unidirectional amplitude 0.075mm 57 to 150Hz 9.8m/s²
	Protective functions	Position detection error, power module error, temperature error, overload, overvoltage, low voltage, excessive position deviation, overcurrent, motor current error
	Noise immunity	Conforms to IEC61000-4-4 Level 3
	Protective structure	IP20
	Appliance classes	Class I
Options	Parallel I/O board — Standard specifications	Dedicated input 8 points, dedicated output 9 points General-purpose input 16 points, general-purpose output 8 points NPN/PNP specifications are selected. (maximum 1 board)
	Parallel I/O board — Expansion specifications	General-purpose input 24 points, general-purpose output 16 points NPN/PNP specifications are selected. (maximum 4 boards)
	Option board — CC-Link board Ver1.1/2.0 / DeviceNet™ board / EtherNet/IP™ board / PROFIBUS board / PROFINET board / EtherCAT board	Remote I/O Dedicated input/output: 16 points each General-purpose input/output: 96 points each Remote register Input/output: 16 words each
	Option board — YC-Link/E board (master/slave)	Communication cycle: 1 ms, control cycle: minimum 1 ms / maximum 8 ms, maximum number of robot units: four units Maximum number of control axes: total 14 axes (including two master controller axes), maximum 12 axes for slaves only
	Option board — YRG (gripper) board	Position detection method: optical rotary encoder, minimum setting distance: 0.01 mm Speed setting: 20 to 100% relative to the maximum parameter speed, number of connected gripper units: maximum two units Drive power: DC 24V +/-10%, 1.0A Max
	Option board — Tracking board	Number of connected encoders: maximum two units, supported encoders: 26LS31/26C31 equivalent line driver (RS422 compliant) Encoder power supply: DC5V (2 counter (ch) total 500 mA or less) (supplied from controller)
	iVY2 unit	Camera pixels: maximum 5 million pixels, number of registered models: 254 models, number of connected cameras: maximum two units Power supply: DC24V +/-10% 1.5A Max
	Programming box	PBX, PBX-E
	Absolute battery	3.6V 2750mAH / axis Backup retention time: About 1 year
	Support software for personal computer	RCX-Studio Pro

Dimensions

Ordering method

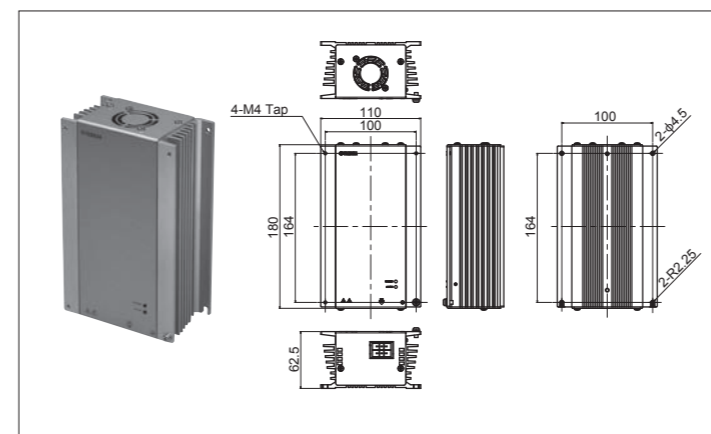**RCX320** – [ ] – [ ] – [ ] – [ ] – [ ] – [ ] – [ ]

Controller	No. of controllable axes	Safety standards	Regenerative unit	Controller option A (OP.A)	Controller option B (OP.B)	Vision System	Absolute battery
	2: 2 axes 1: 1 axes	N: Normal E: CE	No entry: None R: YHX-RU	No entry: Non-selection NS: STD.DIO(NPN) Note 1 Note 4 NE: EXP.DIO(NPN) Note 2 Note 4 PS: STD.DIO(PNP) Note 1 Note 4 PE: EXP.DIO(PNP) Note 2 Note 4 GR: Gripper TR: Tracking Note 5 YM1: YC-Link/E master Note 6 YS2 to 4: YC-Link/E slave Note 6 EP: EtherNet/IP™ Note 7 PB: PROFIBUS Note 7 CC: CC-Link Note 7 DN: DeviceNet™ Note 7 PT: PROFINET Note 7 ES: EtherCAT Note 7	No entry: Non-selection ---- Note 3 NE: EXP.DIO(NPN) Note 2 Note 4 ---- Note 3 PE: EXP.DIO(PNP) Note 2 Note 4 GR: Gripper TR: Tracking Note 5 YM1: YC-Link/E master Note 6 YS2 to 4: YC-Link/E slave Note 6 EP: EtherNet/IP™ Note 7 PB: PROFIBUS Note 7 CC: CC-Link Note 7 DN: DeviceNet™ Note 7 PT: PROFINET Note 7 ES: EtherCAT Note 7	No entry: Non-selection VY: iVY2 without light VL: iVY2 with light	2: 2 pcs. 1: 1 pc. 0: 0 pc.

Please select desired selection items from the upper portion of the controller option A in order.

Note 1. [STD.DIO] Parallel I/O board standard specifications
Dedicated input 8 points, dedicated output 9 points,
general-purpose input 16 points, general-purpose output 8 points
Do not mix with field bus (CC/DN/PB/EP/PT/ES).
Note 2. [EXP.DIO] Parallel I/O board expansion specifications
General-purpose input 24 points, general-purpose output 16 points
Note 3. Only one DIO STD specification board can be selected. Therefore, this board cannot be selected in OP.B to OP.D.
Note 4. Select either NPN or PNP in DIO
Note 5. Only one tracking board can be selected.
Note 6. Select only one master or slave board for YC-Link/E.
For details, refer to "YC-Link/E ordering explanation" below.
Additionally, when ordering YC-Link/E, please specify what robot is connected to what number controller.
Note 7. Select only one fieldbus in a controller (CC/DN/PB/EP/PT/ES)

● Controller option board position
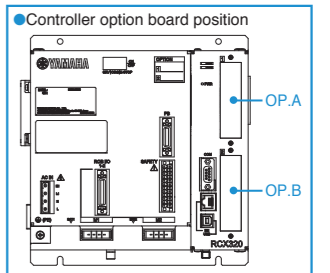
Regenerative unit YHX-RU

● Basic specifications

Item		YHX-RU
Model		KEK-M5850-0A
Dimensions		W62.5×H180×D110mm
Weight		1.45kg
Absorbable electric power		100 W (Equivalent to RGU 3) * 200 W when 2 are connected
Power Supply Input		254 to 357 V DC (Controller DCBUS Connecting)
Connector		Regenerative unit connector (for unit connection and extension)
Installation Environment	Working Temperature	0 to 40 °C
	Working Humidity	35 to 85% RH (No Condensation)
	Location of Use	Altitude 2,000 m or lower and indoor (free from corrosive gases and dust)
	Storage Temperature	-10 to 65 °C
	Vibration Withstanding	1G
Protective Construction / Rating		IP20 / Class 1

● Regenerative unit connection cable
Used when connecting a regenerative unit.

	Model	YHX-RU-50C
0.5m	Parts No.	KEK-M5363-00