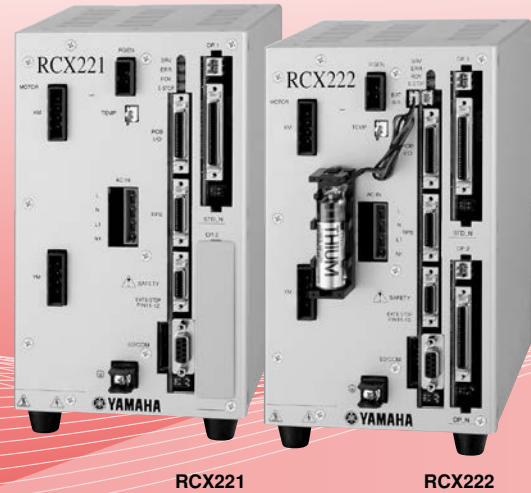# RCX221/RCX222

● **Robot controller with advanced functions**

**A 2-axis robot controller with a full range of advanced functions in a compact, space-saving size. Very easy to use.**

**Main functions ▶ P.100**

| | Programming box ▶ **RPB/RPB-E** P.700 | Support software for PC ▶ **VIP+** P.692 |

**RCX221**          **RCX222**

## ■ Basic specifications

| | Item | RCX221 | RCX221HP | RCX222 | RCX222HP |
|---|---|---|---|---|---|
| **Basic specifications** | Number of controllable axes | 2 axes maximum | | | |
| | Controllable robots | Single-axis robot FLIP-X, Linear motor single-axis robot PHASER, Cartesian robot XY-X, Pick & place robot YP-X | | Single-axis robot FLIP-X, Cartesian robot XY-X, Pick & place robot YP-X | |
| | Connected motor capacity | 2 axes total: 800W or less | 2 axes total: 900W to 1200W | 2 axes total: 800W or less | 2 axes total: 900W to 1200W |
| | Maximum power consumption | 1700VA | 2400VA | 1700VA | 2400VA |
| | Dimensions | W130 × H210 × D158mm | | | |
| | Weight | Approx. 2.9kg | Approx. 3.1kg | Approx. 2.9kg | Approx. 3.1kg |
| | Input power supply — Control power supply | Single phase AC200 to 230V +/-10% maximum (50/60Hz) | | | |
| | Input power supply — Main power supply | Single phase AC200 to 230V +/-10% maximum (50/60Hz) | | | |
| **Axis control** | Drive method | AC full-digital software servo | | | |
| | Position detection method | Resolver, Magnetic linear scale | | Multi-turn resolver with data backup function | |
| | Operating method | PTP (Point to Point), Linear interpolation, Circular interpolation, Arch motion | | | |
| | Coordinate system | Joint coordinates, Cartesian coordinates | | | |
| | Position indication units | Pulses, mm (millimeters), deg (degrees) | | | |
| | Speed setting | 1% to 100% (In units of 1%. However speed is in units of 0.01% during single-axis operation by DRIVE statement.) | | | |
| | Acceleration setting | 1.Automatic acceleration setting based on robot model type and end mass parameter 2.Setting based on acceleration and deceleration parameter (Setting by 1% unit) | | | |
| | Resolution | 1μm | | 16384 P/rev | |
| | Origin search method | Incremental / Semi-absolute | | Absolute / Incremental | |
| **Program** | Program language | YAMAHA BASIC (Conforming to JIS B8439 SLIM Language) | | | |
| | Multitasks | 8 tasks maximum | | | |
| | Sequence program | 1 program | | | |
| | Point-data input method | Manual data input (coordinate value input), Direct teaching, Teaching playback | | | |
| **Memory** | Memory capacity | 364KB (total capacity of program and points) (available program capacity during use of maximum number of points is 84KB) | | | |
| | Programs | 100 program   9,999: maximum lines per program   98KB: maximum capacity per program | | | |
| | Points | 10,000 points : maximum numbers of points | | | |
| | Memory Backup battery | Lithium metallic battery (service life 4 years at 0℃ to 40℃) | | | |
| | Internal flash memory | 512KB (ALL data only) | | | |
| | External memory backup | SD memory card | | | |

Sidebar navigation:
Articulated robots YA | Linear conveyor modules LCM | Single-axis robots GX | Motor-less single axis actuator Robonity | Compact single-axis robots TRANSERVO | Single-axis robots FLIP-X | Linear motor single-axis robots PHASER | Cartesian robots XY-X | SCARA robots YK-X | Pick & place robots YP-X | CLEAN | CONTROLLER | INFORMATION | Robot positioner | Pulse string driver | Robot controller | RCX3/YV2+ Electric gripper | Option

| Controllable robot | RCX221 ▶ XY-X **P.363** , FLIP-X **P.295** , PHASER **P.341** , YP-X **P.553** |
| | RCX222 ▶ XY-X **P.363** , FLIP-X **P.295** , YP-X **P.553** |

| CE marking | ◯ | Field networks | **CC**-*Link*  **DeviceNet**  **PROFIBUS** |

## ■ Model Overview

| Name | RCX221/RCX221HP | RCX222/RCX222HP |
|---|---|---|
| Controllable robot | Cartesian robot XY-X / Single-axis robot FLIP-X / Linear motor single-axis robot PHASER/ Pick & place robot YP-X | Cartesian robot XY-X / Single-axis robot FLIP-X / Pick & place robot YP-X |
| Power | Single phase: AC200V to 230V +/-10% maximum (50/60Hz) | |
| Operating method | Programming / Remote command / Operation using RS-232C communication | |
| Maximum number of controllable axes | 2 axes maximum | |
| Origin search method | Incremental/Semi-absolute | Absolute/Incremental |

## ■ Ordering method

### ▌ RCX221/RCX221HP

RCX221 - [ ] - [ ] - [ ] - [ ] - [ ]

| Controller Note 1 | Usable for CE | Regenerative unit Note2 | Input/Output Selection 1 | Input/Output Selection 2 |
|---|---|---|---|---|
| RCX221<br>RCX221HP | No entry: Standard<br>E: CE marking | No entry: None<br>R: RG2 | N: NPN<br>P: PNP<br>CC: CC-Link<br>DN: DeviceNet™<br>PB: PROFIBUS<br>YC: YC-Link Note3 | No entry: None<br>N1: OP.DIO24/16 (NPN)<br>P1: OP.DIO24/16 (PNP) |

Note 1. Driver selection and regenerative unit selection depends on the robot type.
See Specification selection table on following page.
Note 2. The regenerative unit (option) is required when operating a model designated by YAMAHA or a load with a large inertia.
Note 3. Available only for the master.

### ▌ RCX222/RCX222HP

RCX222 - [ ] - [ ] - [ ] - [ ] - [ ]

| Controller Note1 | Usable for CE | Regenerative unit Note2 | Input/Output Selection 1 | Input/Output Selection 2 |
|---|---|---|---|---|
| RCX222<br>RCX222HP | No entry: Standard<br>E: CE marking | No entry: None<br>R: RG2 | N: NPN<br>P: PNP<br>CC: CC-Link<br>DN: DeviceNet™<br>PB: PROFIBUS<br>YC: YC-Link Note3 | No entry: None<br>N1: OP.DIO24/16 (NPN)<br>P1: OP.DIO24/17 (PNP) |

Note 1. Driver selection and regenerative unit selection depends on the robot type.
See Specification selection table on following page.
Note 2. The regenerative unit (option) is required when operating a model designated by YAMAHA or a load with a large inertia.
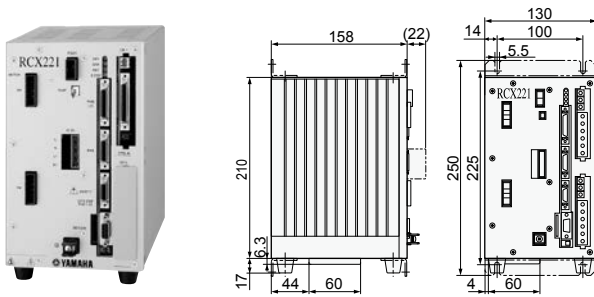Note 3. Available only for the master.

| | Item | | RCX221 | RCX221HP | RCX222 | RCX222HP |
|---|---|---|---|---|---|---|
| External input/output | STD.DIO | I/O input | Dedicated input 10 points, General input 16 points | | | |
| | | I/O output | Dedicated Output12 points, General output 8 points | | | |
| | SAFETY | | Emergency stop input (Relay contact), Service mode input (NPN/PNP specification is set according to STD. DIO setting) | | | |
| | Brake output | | Relay contact | | | |
| | Origin sensor input | | Connectable to DC 24V normally-closed contact sensor | | | |
| | External communications | | RS232C: 1CH D-SUB9 (female) RS422 : 1CH (RPB) | | | |
| | Options | Slots | 2 (inc.STD.DIO) | | | |
| | | Type | STD.DIO (NPN/PNP):<br>Dedicated input 10 points, Dedicated output 12 points, General input 16 points, General output 8 points | | | |
| | | | Optional input/output (NPN/PNP): General input 24 points / General output 16 points | | | |
| | | | CC-Link:<br>Dedicated input 16 points, Dedicated output 16 points, General input 96 points, General output 96 points (4 nodes occupied) | | | |
| | | | DeviceNet™:<br>Dedicated input 16 points, Dedicated output 16 points, General input 96 points, General output 96 points | | | |
| | | | PROFIBUS:<br>Dedicated input 16 points, Dedicated output16 points, General input 96 points, General output 96 points | | | |
| Options | Programming box | | RPB, RPB-E (with enable switch) | | | |
| | Support software for PC | | VIP⁺ / VIP | | | |
| General specifications | Operating temperature | | 0°C to 40°C | | | |
| | Storage temperature | | -10°C to 65°C | | | |
| | Operating humidity | | 35% to 85%RH (non-condensing) | | | |
| | Absolute backup battery | | – | | Lithium metallic battery  3.6V 5400mAH (2700nAH × 2) | |
| | Absolute data backup period | | – | | 1 year (in state with no power applied) | |
| | Noise immunity | | IEC61000-4-4 Level3 | | | |
| | Protecting structure | | IP10 | | | |

Side tabs: Articulated robots YA / Linear conveyor modules LCM / Single-axis robots GX / Motor-less single axis actuator Robonity / Compact single-axis robots TRANSERVO / Single-axis robots FLIP-X / Linear motor single-axis robots PHASER / Cartesian robots XY-X / SCARA robots YK-X / Pick & place robots YP-X / CLEAN / CONTROLLER / INFORMATION / Robot positioner / Pulse string driver / Robot controller / RCX/iVY2+ Electric gripper / Option
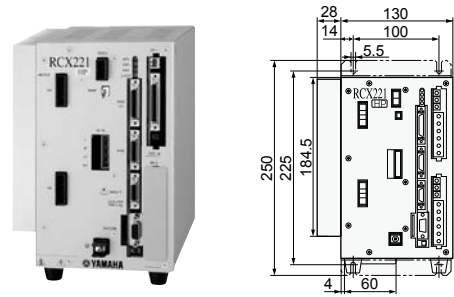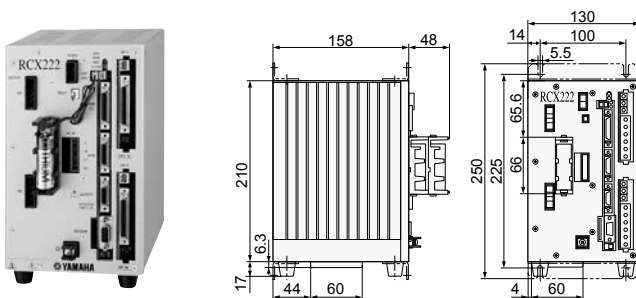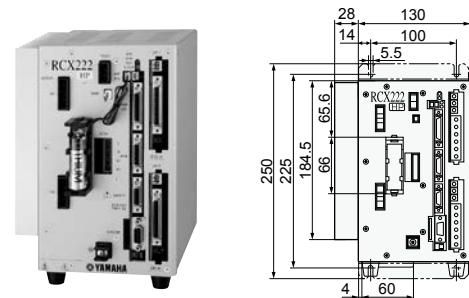
# RCX221/RCX222
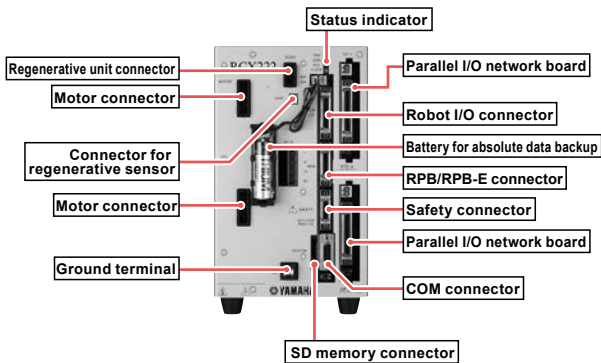
## ■ Dimensions

### ■ RCX221
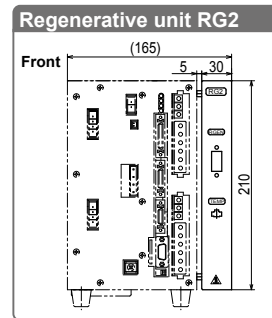


### ■ RCX221HP



### ■ RCX222



### ■ RCX222HP



## ■ Part names



- Status indicator
- Regenerative unit connector
- Motor connector
- Connector for regenerative sensor
- Motor connector
- Ground terminal
- Parallel I/O network board
- Robot I/O connector
- Battery for absolute data backup
- RPB/RPB-E connector
- Safety connector
- Parallel I/O network board
- COM connector
- SD memory connector

Note. Photograph shows RCX222. The component names on the RCX221 are the same but it does not come with an absolute backup battery.

## ■ Regenerative unit RG2

### Regenerative unit RG2



Front (165)  5  30  210

Note. Depth (D) is 158mm. Installs on the right side of the RCX221 (HP), RCX222 (HP). Cannot be installed as a separate unit.

### ● Basic specifications

| Item | RG2 |
|---|---|
| Model | KAS-M4130-00 (including cable supplied with unit) |
| Dimensions | W35 × H210 × D158mm |
| Weight | 0.8kg |
| Regenerative voltage | Approx. 380V or more |
| Regenerative stop voltage | Approx. 360V or less |
| Accessory | Cable for connection with controller (300mm) |

Note. Installs on the right side of the RCX221 (HP), RCX222 (HP).Cannot be installed as a separate unit.

## ■ Specification selection table

The robot type automatically determines the normal specifications or HP specifications.

### ■ RCX221/RCX221HP

| | | PHASER | | | | | |
|---|---|---|---|---|---|---|---|
| | | MF7D | MF15D | MF20D | MF30D | MF50D | MF75D |
| RCX221 | | ● | ● | ● | | | |
| RCX221HP | | | | | ● | ● | ● |
| Regenerative unit | No entry (None) | ● | ● | | | | |
| | R (RG2) | | | ● | ● | ● | ● |

● : Applicable

### ■ RCX222/RCX222HP

| | | FLIP-X | | XY-X | | | | | | | | | | | | | YP-X | | Clean |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Arm type, Gantry type, Moving arm type, Pole type | | | | | | | XZ type | | | | | | | | |
| | | N15D | N18D | PXYx | FXYx | FXYBx | SXYx | SXYBx | NXY | MXYx | HXYx | HXYLx | SXYx (ZF) | SXYx (ZFL20) | SXYBx (ZF) | SXYBx (ZFL20) | MXYx | HXYx | YP220BX | YP320X | SXYxC |
| | | | | | | | | | | | | | 2 axes | | | | | | | 2 axes |
| RCX222 | | | | ● | ● | ● | ● | ● | ● | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| RCX222HP | | ● | ● | | | | | | | ● | ● | | | | | | | | | |
| Regenerative unit | No entry (None) | | | ● | ● | ● | ○ | | | ● | | | ● | | | | | ● | ● | ● | ● |
| | R (RG2) | ● | ● | | | | ○ | ● | ● | ● | ● | | | ● | | | ● | ● | | |

● : Applicable     ○ : Select per conditions

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## Power capacity

Required power supply capacity varies according to the robot type and number of axes. Prepare a power supply using the following table as a general guide.

● **When connected to 2 axes (Cartesian robot or multi-axis robot)**

| Axial current sensor value | | Power capacity (VA) |
|---|---|---|
| X axis | Y axis | |
| 05 | 05 | 500 |
| 10 | 05 | 700 |
| 10 | 10 | 900 |
| 20 | 05 | 1500 |
| 20 | 10 | 1700 |
| 20 | 20 | 2000 |
| | | 2400 (HP) |

Note. Even if axial current sensor values for each axis are interchanged no problem will occur.

**Motor capacity vs. current sensor table**

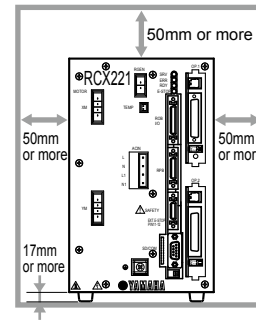| Connected motor capacity | Current sensor |
|---|---|
| 100W or less | 05 |
| 200W | 10 |
| 400W or more | 20 |

Note. Motor output of the B14H is 200W but the current sensor is 05.

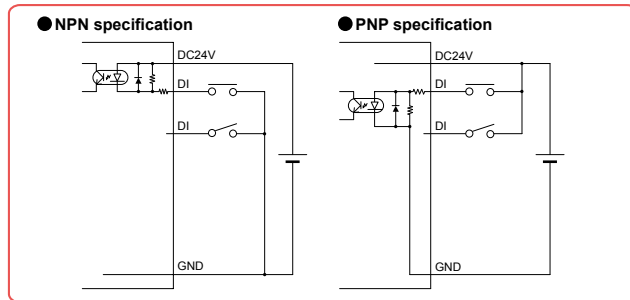### Conditions where regenerative unit is needed on multi robots

● Motor capacity exceeds a total of 450W.
● Motor capacity for perpendicular axis exceeds a total of 240W.
● The following conditions apply when perpendicular axis capacity is 240W or less.
  • perpendicular axis is 200W.
  • perpendicular axis is 100W and stroke is 700mm or more.
  • there are 2 perpendicular axes at 100W, and includes leads of 5mm.
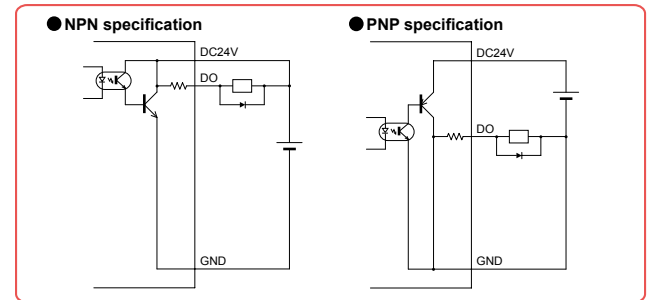● B14H which maximum speed exceeds 1250mm per second.

## Installation conditions

• Install the RCX221/RCX222 inside the control panel.
• Install the RCX221/RCX222 on a flat, level surface.
• Install the RCX221/RCX222 in a well ventilated location, with space on all sides of the RCX221/RCX222 (See fig. at right.).
• Do not block the heat-sink on the side panel.
• Do not block the fan on the bottom of the controller.
• Ambient temperature  : 0 to 40°C
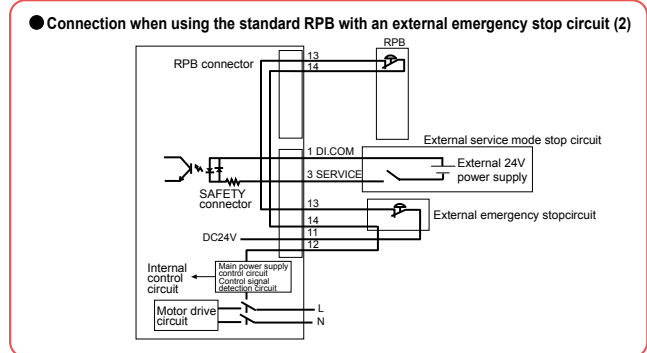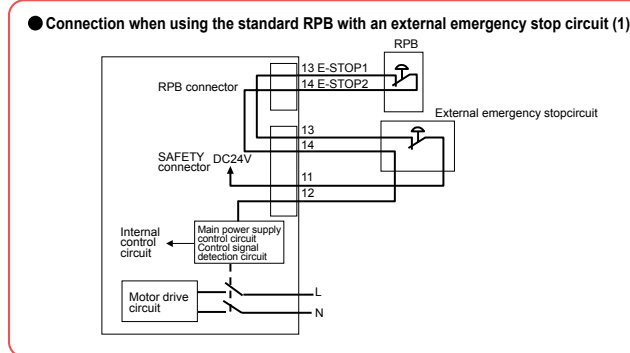• Ambient humidity  : 35 to 85% RH (no condensation)

50mm or more
50mm or more
50mm or more
17mm or more

*Provide the same space dimensions for RCX222.

## Example of input signal connection

● **NPN specification**
DC24V
DI
DI
GND

● **PNP specification**
DC24V
DI
DI
GND

## Example of output signal connection

● **NPN specification**
DC24V
DO
GND

● **PNP specification**
DC24V
DO
GND

## Emergency input signal connections

● **Connection when using the standard RPB with an external emergency stop circuit (1)**

RPB
13 E-STOP1
14 E-STOP2
RPB connector
13
14
External emergency stopcircuit
SAFETY connector  DC24V
11
12
Internal control circuit
Main power supply control circuit Control signal detection circuit
Motor drive circuit
L
N

● **Connection when using the standard RPB with an external emergency stop circuit (2)**

RPB connector
13
14
RPB
1 DI.COM
External service mode stop circuit
3 SERVICE
External 24V power supply
SAFETY connector
13
14
External emergency stopcircuit
11
12
DC24V
Internal control circuit
Main power supply control circuit Control signal detection circuit
Motor drive circuit
L
N

## SAFETY connector signals

| Terminal number | I/O No. | Name |
|---|---|---|
| 1 | DI.COM | Dedicated input common |
| 2 | INTERLOCK | Interlock signal |
| 3 | SERVICE | SERVICE mode input |
| 4 | DO.COM | Dedicated output common |
| 5 | MPRDY | Main power supply ready |
| 6 | SERVO OUT | Servo-on state output |
| 7 | NC | No connection |
| 8 | KEY1 | RPB key switch contact |
| 9 | KEY2 | RPB key switch contact |
| 10 | 24VGND | EMG 24V, GND |

| Terminal number | I/O No. | Name |
|---|---|---|
| 11 | EMG24V | Power supply for emergency stop input |
| 12 | EMGRDY | Emergency stop ready signal |
| 13 | EMGIN1 | Emergency stop input 1 |
| 14 | EMGIN2 | Emergency stop input 2 |
| 15 | EMGIN3 | Emergency stop input 3 |
| 16 | EMGIN4 | Emergency stop input 4 |
| 17 | LCKIN1 | Enable switch input 1 |
| 18 | LCKIN2 | Enable switch input 2 |
| 19 | LCKIN3 | Enable switch input 3 |
| 20 | LCKIN4 | Enable switch input 4 |

Articulated robots YA
Linear conveyor modules LCM
Single-axis robots GX
Motor-less single axis actuator Robonity
Compact single-axis robots TRANSERVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & place robots YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCX/iVY2+ Electric gripper
Option

# RCX221/RCX222

## ■ Standard I/O [connector name: STD. DIO] signal table

| Terminal number | Signal name | Name RCX221 | Name RCX222 |
|---|---|---|---|
| 1 | DI01 | Servo ON | |
| 2 | DI10 | Sequence program control | |
| 3 | DI03 | Step run | |
| 4 | CHK1 | Check input 1 | |
| 5 | DI05 | I/O command run | |
| 6 | DI06 | Spare [Note 1] | |
| 7 | DI07 | Spare [Note 1] | |
| 8 | DI20 | General input 20 | |
| 9 | DI21 | General input 21 | |
| 10 | DI22 | General input 22 | |
| 11 | DI23 | General input 23 | |
| 12 | DI24 | General input 24 | |
| 13 | DI25 | General input 25 | |
| 14 | DI26 | General input 26 | |
| 15 | DI27 | General input 27 | |
| 16 | DO00 | EMG monitor (emergency stop monitor) | |
| 17 | DO01 | CPU OK | |
| 18 | DO10 | AUTO mode | |
| 19 | DO11 | Return-to-origin complete | |
| 20 | DO12 | Sequence program in progress | |
| 21 | DO13 | Auto operation in progress | |
| 22 | DO14 | Program reset output | |
| 23 | DO15 | Battery alarm output [Note 2] | |
| 24 | DO16 | END | |
| 25 | DO17 | BUSY | |
| 26 | DI12 | Auto operation start | |
| 27 | DI13 | AUTO mode switching | |
| 28 | DI14 | ABS reset (Not in use normally) | Return-to-origin [Note 3] |
| 29 | DI15 | Program reset | |
| 30 | DI16 | MANUAL mode | |
| 31 | DI17 | Return-to-origin (In use normally) | ABS reset [Note 4] |
| 32 | DI30 | General input 30 | |
| 33 | DI31 | General input 31 | |
| 34 | DI32 | General input 32 | |
| 35 | DI33 | General input 33 | |
| 36 | DI34 | General input 34 | |
| 37 | DI35 | General input 35 | |
| 38 | DI36 | General input 36 | |
| 39 | DI37 | General input 37 | |
| 40 | CHK2 | Check input 2 | |
| 41 | DO02 | Servo-on state | |
| 42 | DO03 | Alarm | |
| 43 | DO20 | General output 20 | |
| 44 | DO21 | General output 21 | |
| 45 | DO22 | General output 22 | |
| 46 | DO23 | General output 23 | |
| 47 | DO24 | General output 24 | |
| 48 | DO25 | General output 25 | |
| 49 | DO26 | General output 26 | |
| 50 | DO27 | General output 27 | |

Note 1. Use of DI06, DI07 is prohibited.
Note 2. DO15 is a memory backup battery voltage drop alarm output.
Note 3. Set origin return for axes using incremental specifications and axes using semi-absolute specifications.
Note 4. Set origin return on axes using absolute specifications.

Area check output can be assigned to DO20 to DO157.
(Area check output assignment differs depending on the controller software version. See the user's manual for details.)

## ■ Option I/O [connector name: OP. DIO] signal table

| Terminal number | Signal name | Name |
|---|---|---|
| 1 | – | Spare |
| 2 | DI40 | General input |
| 3 | – | Spare |
| 4 | DI41 | General input |
| 5 | – | Spare |
| 6 | – | Spare |
| 7 | – | Spare |
| 8 | DI50 | General input |
| 9 | DI51 | General input |
| 10 | DI52 | General input |
| 11 | DI53 | General input |
| 12 | DI54 | General input |
| 13 | DI55 | General input |
| 14 | DI56 | General input |
| 15 | DI57 | General input |
| 16 | – | Spare |
| 17 | – | Spare |
| 18 | DO30 | General output |
| 19 | DO31 | General output |
| 20 | DO32 | General output |
| 21 | DO33 | General output |
| 22 | DO34 | General output |
| 23 | DO35 | General output |
| 24 | DO36 | General output |
| 25 | DO37 | General output |
| 26 | DI42 | General input |
| 27 | DI43 | General input |
| 28 | DI44 | General input |
| 29 | DI45 | General input |
| 30 | DI46 | General input |
| 31 | DI47 | General input |
| 32 | DI60 | General input |
| 33 | DI61 | General input |
| 34 | DI62 | General input |
| 35 | DI63 | General input |
| 36 | DI64 | General input |
| 37 | DI65 | General input |
| 38 | DI66 | General input |
| 39 | DI67 | General input |
| 40 | – | Spare |
| 41 | – | Spare |
| 42 | – | Spare |
| 43 | DO40 | General output |
| 44 | DO41 | General output |
| 45 | DO42 | General output |
| 46 | DO43 | General output |
| 47 | DO44 | General output |
| 48 | DO45 | General output |
| 49 | DO46 | General output |
| 50 | DO47 | General output |

## ■ Robot Language Table

### ● General commands

| Language | Function |
|---|---|
| DECLARE | Declares that a label or sub-procedure is in an external program. |
| DEF FN | Defines a function that is available to the user. |
| DIM | Declares the name of an array variable and the number of elements. |
| EXIT FOR | Terminates a FOR statement to NEXT statement loop. |
| FOR to NEXT | Controls repetitive operations |
| GOSUB to RETURN | Jumps to a subroutine with the label specified by a GOSUB statement and executes the subroutine. |
| GOTO | Unconditionally jumps to the line specified by a label. |
| HALT | Stops a program and resets it. |
| HOLD | Pauses a program. |
| IF | Allows control flow to branch according to conditions. |
| LET | Executes a specified assignment statement. |
| ON to GOSU | Jumps to a subroutine with each label specified by a GOSUB statement according to conditions and executes the subroutine. |
| ON to GOTO | Jumps to each line specified by a label according to conditions. |
| REM | All characters that follow REM or an apostrophe (') are viewed as comments. |
| SELECT CASE to END SELECT | Allows control flow to branch according to conditions. |
| SWI | Switches the currently executed program to a specified program, and executes from the first line after compiling. |
| WHILE to WEND | Controls repetitive operations. |
| Label statement | Defines "labels" in program lines. |

### ● Robot operation

| Language | Function |
|---|---|
| ABSRST | Performs return-to-origin along robot absolute motor axes. |
| DRIVE | Performs an absolute movement of each axis in the main group. |
| DRIVEI | Performs a relative movement of each axis in the main group. |
| MOVE | Performs an absolute movement of the main robot axes. |
| MOVEI | Performs a relative movement of the main robot axes. |
| ORIGIN | Performs return-to-origin on an incremental mode axis or absolute search on a semi-absolute mode axis. |
| PMOVE | Performs a pallet movement of the main robot axes. |
| SERVO | Controls the servo ON/OFF of the specified axes in the main group or all axes (in main group and sub group). |

### ● I/O control

| Language | Function |
|---|---|
| DELAY | Waits for the specified length of time (ms). |
| DO | Outputs the specified value to the DO ports. |
| LO | Outputs the specified value to the LO port to prohibit axis movement or permit axis movement. |
| MO | Outputs the specified value to the MO ports. |
| OUT | Turns ON the bits of the specified output ports and the command statement ends. |
| RESET | Turns OFF the bits of the specified output ports. |
| SET | Turns ON the bits of the specified output ports |
| SO | Outputs the specified value to the SO port. |
| TO | Outputs the specified value to the TO port. |
| WAIT | 1. Waits until the condition in DI/DO conditional expression are met.<br>2. Waits until positioning on the robot axes is complete (within the tolerance range). |

### ● Coordinate control

| Language | Function |
|---|---|
| CHANGE | Switches the hand of the main robot. |
| HAND | Defines the hand of the main robot. |
| RIGHTY / LEFTY | Selects whether the main robot will be "right-handed" or "left-handed" when moving to a point specified on a Cartesian coordinate system. |
| SHIFT | Sets the shift coordinates for the main robot by using the shift data specified by a shift variable. |

### ● Condition change

| Language | Function |
|---|---|
| ACCEL | Changes the acceleration coefficient parameter of the main group. |
| ARCH | Changes the arch position parameter of the main group. |
| ASPEED | Changes the automatic movement speed of the main group. |
| AXWGHT | Changes the axis tip weight parameter of the main group. |
| DECEL | Changes the deceleration rate parameter of the main group. |
| ORGORD | Sets the axis sequence parameter to perform return-to-origin and absolute search in the main group. |
| OUTPOS | Changes the OUT position parameter of the main group. |
| PDEF | Defines the pallet used to execute a pallet movement command. |
| SPEED | Changes the program speed for the main group. |
| TOLE | Changes the tolerance parameter of the main group. |
| WEIGHT | Changes the tip weight parameter of the main robot. |

### ● Communication control

| Language | Function |
|---|---|
| ONLINE / OFFLINE | Changes communication mode and initialize the communication port. |
| SEND | Sends the read file data into a write file. |

### ● Screen control

| Language | Function |
|---|---|
| PRINT | Displays the value of specified variable on the MPB/RPB screen. |

### ● Key control

| Language | Function |
|---|---|
| INPUT | Assigns a value to the variable specified from the MPB/RPB. |

### ● Procedure

| Language | Function |
|---|---|
| CALL | Calls up sub-procedures defined by the SUB and END SUB statements. |
| EXIT SUB | Terminates the sub-procedure defined by the SUB and END SUB statements. |
| SHARED | Does not permit variables declared with a program written outside a subprocedure (SUB to END SUB) to be passed on as dummy arguments, but allows them to be referred to with a sub-procedure. |
| SUB to END SUB | Defines a sub-procedure. |

### ● Task control

| Language | Function |
|---|---|
| CHGPRI | Changes the priority of the specified task. |
| CUT | Terminates a task currently being executed or temporarily stopped. |
| EXIT TASK | Terminates its own task currently being executed. |
| RESTART | Restarts a task that is temporarily stopped. |
| START | Sets the task number and priority of the specified task and starts that task. |
| SUSPEND | Temporarily stops another task being executed. |

### ● Error control

| Language | Function |
|---|---|
| ON ERROR GOTO | If an error occurs during program execution, this command allows the program to jump to the error processing routine specified by the label without stopping the program, or stops the program and displays the error message. |
| RESUME | Resumes the program execution after recovery from an error. This command is used in the error processing routine. |
| ERL | Gives the line number where an error occurred. |
| ERR | Gives the error code number when an error occurred. |

### ● PATH control

| Language | Function |
|---|---|
| PATH | Sets the PATH motion on the main robot axis. |
| PATH END | Terminates the path setting for PATH motion. |
| PATH SET | Starts the path setting for PATH motion. |
| PATH START | Starts the PATH motion. |

### ● Torque control

| Language | Function |
|---|---|
| DRIVE (with torque limit option) | Executes an absolute movement command on each axis in the main group. |
| TORQUE | Changes the maximum torque instruction for the specified main group axis. |
| TRQTIME | Sets the current limit time-out period on the specified main group axis when using a torque limit setting option in the DRIVE statement. |
| TRQTIME | Sets the current limit time-out period on the specified main group axis when using a torque limit setting option in the DRIVE statement. |

# Accessories and part options
## RCX221/RCX222

## ■ Standard accessories

● **Power connector + wiring connection lever**

| Model | KAS-M5382-00 |

LCC140 · TS-X · TS-P · SR1-X · SR1-P · RCX320 · RCX221 · RCX222 · RCX340

● **Safety connector**

| Model | KAS-M5370-00 |

RCX221 · RCX222

● **RPB terminator (dummy connector)**
Attach this to the RPB connector during operation with the programming box RPB removed.

| Model | KFR-M5163-00 |

RCX320 · RCX221 · RCX222 · RCX340

● **Standard I/O (STD.DIO) connector**

| Model | KAS-M533G-00 |

RCX221 · RCX222

● **Option I/O (OP.DIO) connector**

| Model | KAS-M533G-10 |

RCX221 · RCX222

● **L type stay (for installing front side, rear side.)**
Use to install the controller.

| Model | KAS-M410H-00 |

Note. Model No. is for a single bracket (L type stay).
(Two are required to install one controller.)

RCX221 · RCX222

● **Absolute battery**
Battery for absolute data back-up.
(Not included with the RCX221)

### ● Basic specifications

| Item | Absolute battery |
|---|---|
| Battery type | Lithium metallic battery |
| Battery capacity | 3.6V/2,700mAh |
| Data holding time | About 1 year Note1 (in state with no power applied) |
| Dimensions | φ17 × L53mm |
| Weight Note2 | 21g |

| Model | KAS-M53G0-12 |

Note 1. When using 2 batteries.
Note 2. Weight of battery itself.
Note. The absolute battery is subject to wear and requires replacement.
If trouble occurs with the memory then remaining battery life is low so replace the absolute battery. The battery replacement period depends on usage conditions. But generally you should replace the battery after about 1 year counting the total time after connecting to the controller and left without turning on the power.

SR1-X · RCX222

**Important** | **Absolute battery installation conditions** | 1 to 2 batteries are required for each 2 axes.
● 1 battery…...Data storage time of approximately 6 months (with no power applied)
● 2 batteries…Data storage time of approximately 1 year (with no power applied)
Note. Absolute battery is not required for either of the 2 axes if using incremental or semi-absolute specifications.

● **Battery case**
This is the absolute battery holder.

| Model | KBG-M5395-00 |

SR1-X · RCX222

## ■ Options

### ● Programming box RPB/RPB-E  P.700

This device can perform all operations such as manual robot operation, program entry and edit, teaching and parameter settings.

**RPB**    **RPB-E**

| | RPB | RPB-E |
|---|---|---|
| Model | KBK-M5110-10 | KBK-M5110-00 |
| Enable switch | – | 3-position |
| CE marking | Not supported | Applicable |

`RCX221`
`RCX222`

### ● Support software for PC VIP+  P.692

VIP+ is a simple to use application software that makes tasks such as robot operation, writing-editing programs, and point teaching easy to visually understand.

| VIP+ software model | KX0-M4966-00 |
|---|---|

`RCX221`
`RCX222`

#### ● Environment

| OS | Windows 2000, XP (32bit), Vista, 7, 10 (Supported version: V.2.8.4 or later) |
|---|---|
| CPU | Processor that meets or exceeds the suggested requirements for the OS being used. |
| Memory | Suggested amount of memory or more for the OS being used. |
| Hard disk | 40MB of available space required on installation drive. |
| Communication method | RS-232C |
| Applicable robot controllers | RCX22x / 240 |

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.
Note. ADOBE and ADOBE READER are registered trademarks of Adobe Systems Incorporated.

### ● Data cables

Communication cable for VIP+.
Select from USB cable or D-sub cable.

**USB**    **D-Sub**
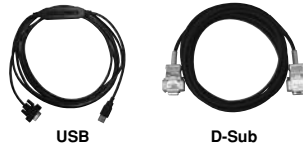
| Model | USB type (5m) | KBG-M538F-00 |
|---|---|---|
| | D-Sub type 9pin-9pin (5m) | KAS-M538F-10 |

`LCC140`
`ERCD`
`SR1-X`
`SR1-P`
`RCX320`
`RCX221`
`RCX222`
`RCX340`

Note. This USB cable supports Windows 2000/XP or later.
Note. Data cable jointly used for POPCOM+, VIP+, RCX-Studio Pro and RCX-Studio 2020.
Note. USB driver for communication cable can also be downloaded from our website.

**Side tabs:**
Articulated robots YA
Linear conveyor modules LCM
Single-axis robots GX
Motor-less single axis actuator Robonity
Compact single-axis robots TRANSERVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & place robots YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCX/iVY2+ Electric gripper
Option