Controllers

Product Lineup

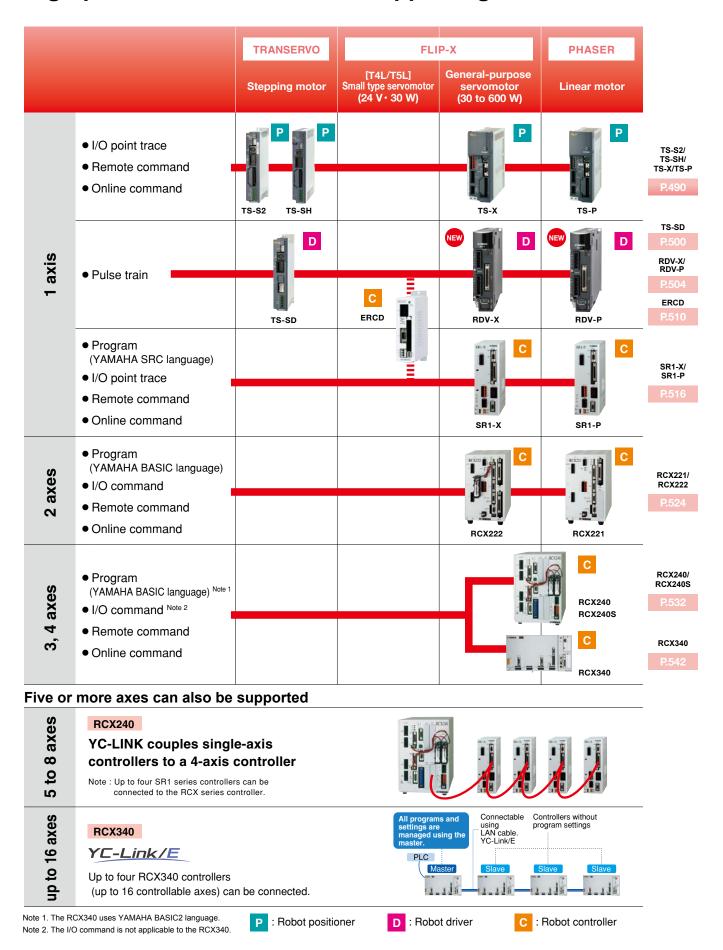
CONTROLLERS

An optimal controller can be selected from various command input formats.

As servo parameters and deceleration patterns suitable for robots are pre-registered, robots can be operated quickly without complex settings.



High performance controllers supporting YAMAHA robots



POINT 1

Selectable from various control methods

Program input

A variety of operation settings, calculations, and conditional branching is possible

The single-axis robot controllers use the YAMAHA SRC language Note which is simple yet contains all required functions, such as I/O outputs and conditional branching, etc. The multi-axis controller RCX series uses the YAMAHA BASIC language capable of more sophisticated programming and includes all types of arithmetic operations, flexible variable settings, and various conditional branching, etc. Both are easy to use robot language conforming to the BASIC. These languages support various needs from simple operations to expert user's sophisticated work.

Note. The 2-axis controller DRCX also uses YAMAHA SRC language.

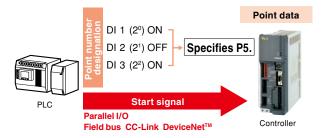
Cinale avia valent	VAMALIA CDO	MOVA 1, 100	Moves to point number 1 at 100 %-speed.	
Single-axis robot controller	robot YAMAHA SRC language <example></example>	DO 1,1	Turns on general-purpose output number 1.	
controller		WAIT 2 , 1	Waits until general-purpose input number 2 turns on.	

	IF DO(10)=1 THEN *END	Jumps to *END if general-purpose input number 10 turns on. Otherwise, moves to the next line.	
Multi-axis robot YAMAHA BASIC		MOVE P, P2, STOPON DI(1) =1	Moves to point number 2. Stops when general-purpose input number 1 turns on during movement.
controller		WAIT ARM	Waits until the robot arm operation ends.
language (Example)	P3=WHERE	Writes the current position into point number 3.	
	*END:	Defines the label named "END".	
		HOLD	Pauses the program.

I/O point trace

Program-less means easy

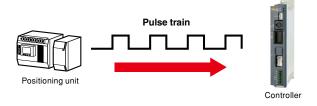
The host unit specifies a point number in binary format and the robot moves to the specified point when the start signal is input. The controller can operate only by teaching the point data without programs.



Pulse train

Acceleration/deceleration curves can be created freely

The robot is controlled using pulse trains sent from the positioning unit. The controller does not need to have programs or point data. This pulse train is convenient when the control is centralized to the host unit.



Remote command

Ideal for unified data management

The word function of the CC-Link or DeviceNet[™] is used to issue various commands or data to the robot. The expandability of the word function from simple operation instructions to point data writing is fully utilized to freely use the robot controller functions from the host unit.

Note. This function is enabled when selecting an option network board.



Online command

Execute everything from a PC

The PC can issue various commands or data to the controller or receive the data or status through the RS-232C or Ethernet Note. All executable operations from the teaching pendant can be executed from the PC.

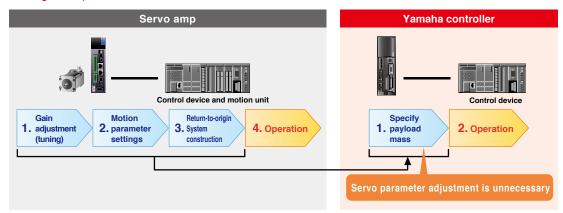
Note. Ethernet is enabled when selecting an option network board. (For the RCX340, Ethernet is provided as standard function.)



Easy optimal setup

Complicated parameter settings are unnecessary

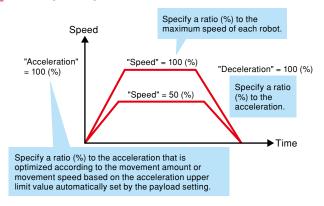
Robot controllers are specially designed for YAMAHA robots. Optimal values for servo parameters required for robot operation, such as gain are already registered beforehand. Start operating immediately without any need for complicated settings or tuning, even if you don't have knowledge or experience about control.



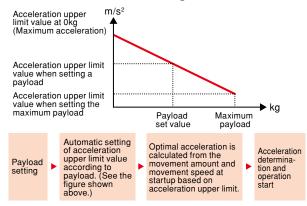
Easy acceleration/deceleration settings

The acceleration/deceleration is an important factor that affects the service life of the machine. If too high acceleration is set, this may cause the service life of the machine to shorten. If the acceleration is too low, the motor power cannot be used effectively, causing the tact time to lower. The acceleration/deceleration setting of YAMAHA robot controller is determined finely by load weight. Setting only payload parameters will automatically set optimal acceleration/deceleration by taking the service life of the machine and motor capability into consideration. Detailed robot knowledge from YAMAHA is what makes this possible. (Note: For the pulse train input, the customer may need to set the acceleration/deceleration.)

Concept of speed and acceleration



Acceleration calculation algorithm



Zone control (= Optimal acceleration/deceleration automatic setting) function

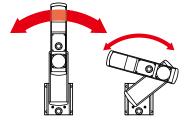
The SCARA robot also incorporates a zone control function that always operates the robot at its maximum performance level by considering changes in inertia due to the arm posture. Therefore, the robot does not exceed the tolerance value of the motor peak torque or speed reducer allowable peak torque only by entering the initial payload to bring out the full power of the motor and keep the high acceleration/deceleration.

For X-axis of YK500XG

The torque in the arm folded state is 5 or more times different from that in the arm extended state.



This may greatly affect the service life, vibration during operation, and controllability.



If the motor torque exceeds the peak value

- \rightarrow This may adversely affect the controllability and mechanical vibration, etc.
- If the torque exceeds the tolerable peak torque value of the speed reducer
 - → This may cause early breakage or shorten the service life extremely.

POINT 3

Multi-function and expandability

- Multi-axis controllers support up to 30,000 points (10,000 points for the RCX2 series, 1,000 points for the single-axis controller (255 points for the TS series)). Up to 100 programs can be created on each controller.
- Various field networks, CC-Link, DeviceNetTM, PROFIBUS, and EtherNet/IPTM are supported.

 Note. Some models do not support all networks.
- The TS series, RD series, SR1 series, and RCX series use a dual-power supply system with separate control power supply and power supply.
- As the controllers conform to the CE marking that is safety standards in EU (Europe), they can be used safely even overseas.

 The TS series (except for TS-S), SR1 series, and RCX series conform to up to safety category 4.

For details about functions of each controller, refer to controller details pages from P.479.

		Number of	Number of	Applicable network					Compliance	
Name Type	Type	points	programs	CC-Link	DeviceNet™	Ethernet	EtherNet/IP™	PROFIBUS	PROFINET	with CE
TS-S2/TS-SH	1 axis robot	255	-	0	0	-	0	-	0	0
TS-X/TS-P	positioner	255	-	0	0	-	0	-	0	0
TS-SD	1 axis robot	-	-	-	-	-	-	-	-	0
RDV-X/RDV-P	driver	-	-	-	-	-	-	-	-	0
ERCD	1 axis robot controller	1,000	100	-	-	-	-	-	-	-
SR1-X/SR1-P		1,000	100	0	0	0	-	0	-	0
RCX221/RCX222	1 to 2 axes controller	10,000	100	0	0	0	-	0	-	0
RCX240	1 to 4 axes controller	10,000	100	0	0	0	0	0	-	0
RCX340		30,000	100	0	0	0	0	0	0	0

RDV-X/RDV-P

P.504

FLIP-X

PHASER

[Robot driver]





Operation method	Pulse train
Input power	Main power Single-phase/3-phase AC 200 V to 230 V Control power Single-phase AC 200 V to 230 V
Origin search method	Incremental

Dedicated pulse train control

The dedicated pulse train control has achieved a compact body and a low price.

Position setting time reduced by 40%

The response frequency is enhanced about two times in comparison with former models. The position setting time of uniaxial robots is reduced by about 40%. Note 1

Large cost reduction possible

It is easy to assemble them in automated machinery. You can save much labor in designing, parts selection, setting and more. A large cost reduction is possible.

Contributing to saving space for the whole control board

The compact design has reduced the width up to a maximum of 38% in comparison with former models. In addition, the improvement of radiation efficiency makes it possible to arrange the devices with less space in between. Multiple units can be installed side by side in a neat arrangement.

Easy replacement

The parameter settings and fastening-hole pitches are the same as those of former models. It is easy to replace the software and the hardware as well.

- Command input: Line driver (2 Mpps)
- Command output: ABZ-phase output (with a divider function)

Real-time operation status monitoring

You can have analog outputs for speed, amperage, and more information to know the operation status in real time. RDV-Manager, the dedicated support software, is also available for a graphical view of the status.

Main power: Single and three phases supported (200V)

The full-specification operation is available with a single-phase power supply.

Note 1. With a 400W servomotor, 20mm ball screw lead, and portability of 40kg.

TS-S2/TS-SH/TS-SD POINT

Usable for all TRANSERVO series models



Note 1. The STH type vertical specifications and RF type sensor specifications do not support the TS-SD Note 2. SG07 is only applicable to TS-SH.

TS-SD

TRANSERVO

[Robot driver]



Operation method	Pulse train
Input power	Main power DC 24 V +/- 10 % Control power DC 24 V +/- 10 %
Origin search method	Incremental

Pulse train input driver dedicated to "TRANSERVO"

A robot driver dedicated to the pulse train input for "TRANSERVO".

Torque decrease in high-speed area is suppressed

As a vector control method is used, the torque decrease in highspeed area is small and high-speed operation even with high payload can be performed. This greatly contributes to shortening of the tact time.

Excellent silence

High-pitched operation sounds unique to the stepping motor are suppressed to achieve silent operation sounds similar to the AC servo.

Easy operation with support software TS-Manager

In the same manner as the robot positioner TS series, the operation can be performed with the TS-Manager (Ver.1.3.0 or later) having various convenient functions, such as robot parameter setting, backup, and real-time trace (The handy terminal "HT1" cannot use this TS Manager).

Applicable to a wide variety of pulse train command inputs

This robot driver can be made applicable to the open collector method or line driver method using the parameter setting and signal wiring. In the open collector method, a wide voltage range from 5 V to 24 V is supported. So, the robot driver can be matched to the specifications of the host unit to be used.

TS-Manager: Real-time trace function

The current position, speed, load factor, current value, and voltage value, etc. can be traced at real-time. Additionally, as trigger conditions are set, the data when the conditions are satisfied can be automatically acquired. Furthermore, as a range is specified from the monitor results, the maximum value, minimum value, and average value can be calculated. So, this is useful for the analysis if a trouble occurs.

Real-time traceable items (up to four items)

- Voltage type
- Command speed
- Current speed
- · Command position · Current current value
- · Current position Internal temperature Motor load factor
- Command current value
- Input pulse count Note 1 Movement pulse count Note
- Input/output I/O state
- Word input/output state Note

Note, 1: TS-SD only Note, 2: TS controller only

Daisy chain function

As multiple TS series controllers and drivers are connected in a daisy chain, the data of a desired unit can be edited from the personal computer (up to 16



TS-S2/TS-SH

TRANSERVO

TS-X/TS-P P.490 FLIP-X

[Robot positioner]



Operation method	Point trace Remote command Online command	
Number of points	255 points	
Input power	Main power DC 24 V +/- 10 % Control power DC 24 V +/- 10 %	
Origin search method	TS-S2 Incremental TS-SH Absolute Incremental	

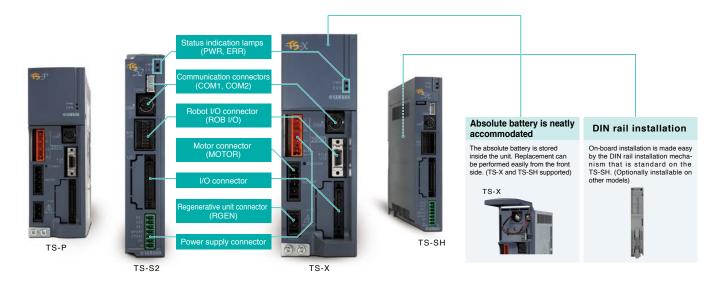


Operation method	Point trace Remote command Online command		
Number of points	255 points		
Input power	AC 100 V / AC 200 V		
Origin search method	TS-X Absolute Incremental TS-P Incremental Semi-absolute		

Design that allows a clean installation

Unified installation sizes

Height and installation pitch are unified throughout the series. Units can be installed neatly within the control board.



Selectable I/O interfaces

■ Two RS-232C ports provided

Connect support tools

Intuitive operation supports controller design and maintenance.

Daisy-chaining

Two ports can be used to daisy-chain up to 16 units.





Communication commands

Easily understood ASCII text strings can be used to perform robot operations.

Selectable 100V/200V

- The TS-X/P let you select AC100/200V as the power input. (The 20A model is 200V only.)
- · The TS-S2/SH is DC24V input.

A variety of I/O interfaces

In addition to NPN and PNP, you can choose CC-Link, DeviceNet™, EtherNet/IP™, and PROFINET field networks.

C-Link DeviceNet EtherNet/IP

Positioner interface

Functionality has been condensed into an I/O interface with 16 inputs and 16 outputs. In addition to easy positioning, this also includes functionality that enhances interoperability with the control device.

Remote commands

Numerical data can be directly manipulated by using the four-word input and four-word output areas. You can add new direct positioning commands to further unify the data at the control device.

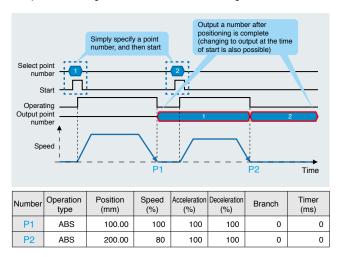
Gateway function

New types of connection are provided to reduce network costs. (CC-Link, EtherNet/IP™, and PROFINET are supported.)

Positional interface

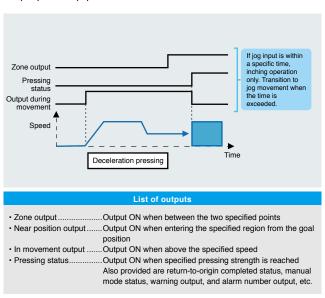
"Positioner function" for easy positioning

You can easily perform positioning operations by specifying the number of a point that is registered in the data, and entering a start command.



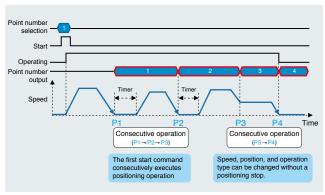
A variety of output functions

The TS controller provides a variety of status outputs that are linked with positioning operations. By selecting and using an output appropriate for the scene, this can contribute to cost-saving measures such as making the steps of the control device's program more efficient or by reducing the peripheral equipment.



Consecutive operation, linked operation

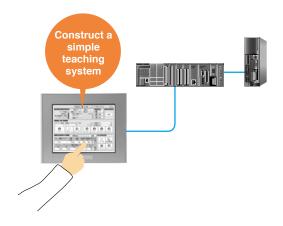
By specifying a branch destination, it is possible to execute positioning operations consecutively. Additionally, by specifying linked operation, operation with the branch destination can be executed while changing the speed without positioning stops; this allows control programming to be simplified and takt to be shortened.



Number	Operation type	Position (mm)	Speed (%)	Acceleration (%)	Deceleration (%)	Branch	Timer (ms)
P1	ABS	100.00	100	100	100	2	500
P2	ABS	200.00	80	100	100	3	800
P3	ABS linked	300.00	100	100	100	4	0
P4	ABS	350.00	30	100	100	0	0

Jog and point teaching functions are provided as standard

Jog movement and point teaching functions are provided as standard for input signals. By linking these with buttons of a touch panel etc., a simple teaching system can be constructed.



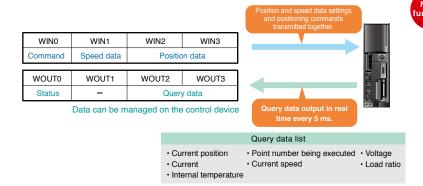
TS-S2/TS-SH/TS-X/TS-P

Remote commands

Ideal for unifying data management

Remote commands are functions by which the control device can directly handle data such as points and parameters using the word area of the field network.

Numerical data can be operated directly by using the word area. This promotes unification of data management.

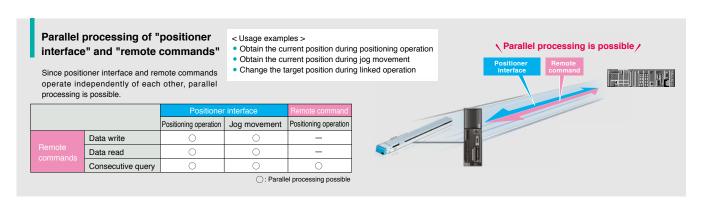


Direct positioning commands that directly specify position and speed data

As remote commands, "direct positioning commands" are provided, allowing the position and speed data to be specified directly and then positioning operations to be performed. In addition to unifying the positioning data on the control device, this allows it to be done with a single command, simplifying programming of the control device.

Consecutive queries for realtime update of various status information

Normally, remote commands only update data when responding, but if a consecutive query is issued, the data continues to be updated at a fixed interval until permission is given to stop. This is useful in various cases such as when it is desirable to obtain positioning data during operation for interoperation with peripheral devices, or to obtain current values in order to monitor the status of a robot.



"Gateway function" -- a new way to connect

New function

Decrease network cost

One controller equipped with a field network board can provide unified management of up to four I/O interfaces via a daisy-chain connection. This allows network cost to be decreased while enabling the same type of I/O control as when one board is installed for each unit. (CC-Link and EtherNet/IPTM are supported)



Daisy chain connection

No need to connect or disconnect cables during operation (up to 16 units)

From a single PC, handy terminal, or touch-panel display, it is possible to specify point data and parameters, perform operations, and monitor the status for up to 16 axes on daisy-chained controllers. For everything from design to maintenance, a connection to only the first controller is sufficient; any desired controller can be accessed simply by switching the station number, without having to connect or disconnect cables.

Communication commands

An easily handled command protocol using ASCII text strings supports a wide range of needs from data editing to operation and status monitoring. By daisy-chaining multiple devices, simple multi-axis control can be performed.



"KEYENCE PROTOCOL STUDIO Lite" serial communication settings software

By loading a TS settings file into PROTOCOL STUDIO Lite, communication settings and main communication commands can be registered automatically. Ladder-less data editing and daisy-chaining can be easily accomplished.

Contact for questions regarding PROTOCOL STUDIO Lite Keyence Corporation, www.keyence.co.jp/red/kv01/

■ Daisy-chain connections (up to 16 axes)

Communication with the KV-L21V uses a Yamaha-made communication cable (D-sub type). By using daisy-chain connections, up to 16 axes can be managed together.



Automatic device assignment for each communication command

If the communication type is specified as cyclic, the desired information to be obtained is automatically stored in data memory.



Touch operator interface "Pro-Face" GP4000 Series

Connecting GP4000 Series made by Pro-face to Robot Positioner, TS-S2, TS-SH, TS-X, TS-P enables you to use a lot of functions as well as basic operations on Touch Operator Interface.

Pro-face home page http://www.proface.com

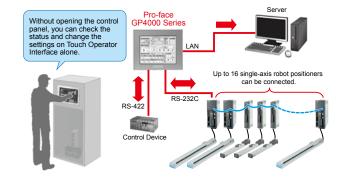
Free download of the program file from the

Can easily check a state and change settings.

- Check the status (the current position, speed etc)
- Basic operations such as Jog operation, inching operation, return to origin, error reset etc.
- Set, edit, or back up point data and parameters
- Check triggered alarms and detailed descriptions of alarm history

Supports 3 languages

Supports Japanese, English, and Chinese (simplified, traditional)



SR1-X/SR1-P

FLIP-X

PHASER

[Single-axis robot controller]





Operation method	Program Point trace Remote command Online command	
Number of points	1000 points	
Input power	AC 100 V AC 200 V	
Origin search method	SR1-X Absolute Incremental SR1-P Incremental Semi-absolute	

Various command methods

An optimal method can be selected from various command methods, such as program, point trace, remote command, and online command. The program uses the YAMAHA SRC language that is similar to the BASIC. Various operations, such as I/O output and conditional branching, etc. can be executed using simple operations.

Applicable to complete absolute position system

The SR1-X is applicable to complete absolute position system. No return-to-origin is needed. (The backup period is one year in the non-energizing state.)

I/O assignment function

As the I/O assignment is changed, the point trace operation, point teaching, and trace operation by specifying coordinate values can be selected in addition to the normal program operation. Since the JOG movement through the I/O is possible in the point teaching mode, the point teaching can be performed from the host unit without the

Current position output function

The position data is output as feedback pulse or binary data. This allows the host unit to understand the current robot position at realtime. Furthermore, functions, zone output or point zone output to output near point number are incorporated.

Torque limiting

As this function limits the maximum torque command value at desired timing, it is effective in operations such as pushing and workpiece gripping operations. Furthermore, in addition to the torque limiting by the parameter data value, the torque limiting by the analog input voltage can be performed.

ERCD

T4L/T5L

[Single-axis robot controller]



Ψ,			
-			
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ERCD			

Operation method	Program Point trace Online command Pulse train
Number of points	1000 points
Input power	DC 24 V
Origin search method	Incremental

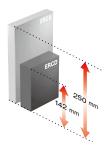
Four command formats

A desired command format can be selected from four command formats, program operation using various commands, point trace operation only by instructing a point number, online command, and pulse train input.

Compact design

Compact box size of W 44 × H 142 × D 117mm is achieved with the functions improved.

The volume ratio of the robot controller is downsized to approximately 62 % when compared to YAMAHA's conventional model ERCX. The flexibility of the installation space is improved.



Various input/output functions

As a feedback pulse output function is provided, the host control unit can easily manage the current position. Additionally, as the movement point number can be output in binary format during point trace, the operation can be checked easily. As a teaching function using the I/O is added, the flexibility and usability of the system configuration are further improved.

This output is enabled in the program or point trace operation and the number of outputs can be changed to a desired level using the division setting.

Various monitor functions

The controller status can be checked using the input/output status monitor, duty monitor, and LED status display.

Error history and alarm history

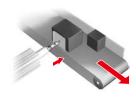
The error or alarm history that occurred in the past can be displayed and checked on the HPB or personal computer screen.

Robot number management

As the controller is initialized by the robot number of the robot to be controlled, parameters suitable for each robot model are automatically registered and no complicated servo adjustment is needed.

Torque limiting control

The torque limiting control can be performed using the program command. The axis can be stopped with the torque applied. This torque limiting control can be used for continuous positioning of workpieces with different sizes, press-fitting work, and workpiece holding operation.



Zone output function

The general-purpose output on/ off setting between desired points can be performed using the parameter setting. The positive logic/negative logic setting can be made and the axis position can be easily judged by an external unit. Up to four patterns can be set.

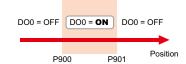


SR1-X/SR1-P/ERCD Various functions

Position data output function

Zone output

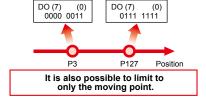
Outputs whether or not the robot position is within the specified range.



It is possible to reverse the output logic.

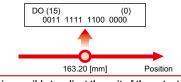
Point zone output

Outputs the point number near the robot position in binary format.



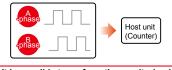
Binary output

Outputs the current robot position in 16-bit binary format. (This function is available only in the SR1.)



It is possible to adjust the unit of the output position data to be output using parameters.

Feedback pulse output Outputs the current position counter value of the robot through the A/B-phase line driver.



It is possible to perform the monitoring by host unit at real-time.
A frequency division function is built-in.

Point teaching

The JOG movement of the robot and the point reaching can be performed from the host unit.

■ Concept

• The robot is moved to the teaching position using the JOG+/JOG-command.



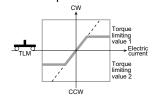
• The current position is registered into the point number specified by the PSET input.



Torque limiting function

As the torque limiting is performed during operation, the operation, such as pushing and workpiece gripping can be performed.

■ Concept



■ Features

SR₁

- Host unit manages the limiting time using the TLM input.
 Limiting status is understood using the torque limiting status output (TLON).
 Torque limit value is changed (up to 4 patterns) using the input.
 Torque can be limited using the program command.
 Torque can be limited using the analog input (0 to +10 V / 12 bit).

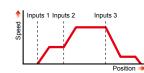
ERCD

Torque can be limited using the T program command.

Movement data change function

The movement speed or target position can be changed during movement. (This function is available only in the SR1.)

■ Concept



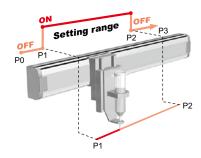
■ Features

- Host unit manages the limiting time using the movement command input.
 Movement command is ABS-PT (absolute movement command) or ABS-BN (binary specified movement command).
 Change speed can be specified in a range of 1 to 100 % (up to 4 patterns).
 Changing is disabled in the deceleration zone.

YAMAHA SRC language convenient functions

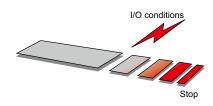
Multi-task function

This function can execute multi tasks, such as robot peripheral units in parallel at the same time. Up to four tasks can be executed. With the multi-task function combined with JMPP command, the I/O signals can be output when the robot passes through the specified point during movement.



Conditional stop function during movement

The arm can be decelerated and stopped using I/O conditions of the MOVF command while it is moving. This function is useful when searching for the target position with the sensor.



RCX2 series RCX221/222

P.524

RCX240/240S

D 520

[Multi-axis robot controller]



Operation method	Program Remote command Online command
Number of points	10000 points
Input power	AC 200 V
Origin search method	Incremental Semi-absolute



Operation method	Program Remote command Online command
Number of points	10000 points
Input power	AC 200 V
Origin search method	Absolute Incremental



Operation method	Program Remote command Online command
Number of points	10000 points
Input power	Single phase : AC200V to 230V +/-10% maximum
Origin search method	Absolute Incremental

Applicable to all YAMAHA robot models

The RCX series is applicable to all YAMAHA robot models, such as PHASER, FLIP-X, and XY-X, etc. As the single-axis robot (FLIP-X/PHASER) can be combined with the Cartesian robot freely, various applications can be supported (except for some compact single-axis robots).

Complete absolute position system

The RCX uses complete absolute specifications that need no returnto-origin when the power turns on. The completely same system can be applicable to the incremental specifications. (When the PHASER series uses the magnetic scale, it is applicable to the semi-absolute or incremental specifications.)

Extension of absolute data backup time

As the backup circuit is improved to the energy saving, the absolute position data retention period in the non-energizing state is greatly extended. The maximum one month of the conventional model is extended to approximately one year. The current position information is monitored during long vacations, equipment storage, or even during transportation, and no return-to-origin is needed when energized again. This allows quick production start.

Area check output function

This function can output the I/O signals when the robot enters a set area during operation. Up to eight check areas can be set.



Applicable to dual-drive

A dual-drive function is incorporated that controls two axes synchronously. This function is effective for heavy workpiece transfer or Y-axis long stroke of the Cartesian robot. The function can perform the operation using the high-speed and high acceleration/ deceleration of YAMAHA robots.

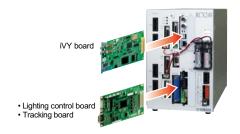
Note. The dual-drive is supported as a custom order. For detail, please consult YAMAHA

■ Example of dual-drive



Applicable to robot vision "iVY System"

The RCX series also supports the YAMAHA robot vision "iVY System" that is capable of easy setup and applicable to a wide variety of applications. As the vision board is incorporated into the controller main body, the calibration work requiring a long time and labor is then greatly simplified. As the position is corrected by the image recognition, the versatility and applicability of the equipment is widened greatly (only supported by the RCX240).



Double-carrier anti-collision function

When using the double-carrier, collisions between both carriers can be prevented by the control in the controller. Collision preventions by the zone judgments or external sensors are no longer needed to make the double-carrier easier to use.

■ 3D linear/circular interpolation control

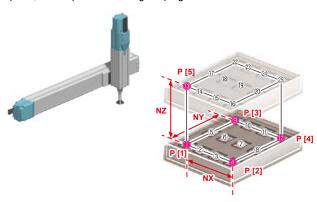
2D and 3D linear and circular interpolation controls are possible. This ensures the smooth and highly accurate operations suitable for the sealing work. (The 3D interpolation is not available in the RCX221/222.)



Palletizing function

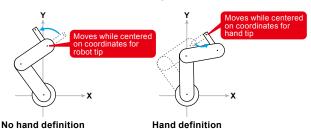
This function can easily define up to 20 kinds of pallets only by entering four corner positions on the pallet as the teaching points. When entering the teaching point in the height direction, even three-dimensional pallets are supported.

When specifying the defined pallet number and executing the movement command, the palletizing work is then performed. Various operations, one point \rightarrow pellet, pallet \rightarrow one point, and pallet \rightarrow pallet, can be performed using the programs.



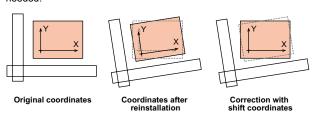
Hand definition

This function operates the robot based on coordinates of the offset tool tip when the tool is attached to the tip of the robot axis in the offset state. Particularly, this function is effective during tool rotation of SCARA robots or robots including the rotation axis.



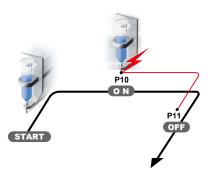
Shift coordinates

A deviation may occur in the coordinate system when re-installing or replacing the robot during maintenance work. In this case, the coordinate system can be corrected using the shift coordinate function. So, the point data can be used as it is. No re-teaching is needed.



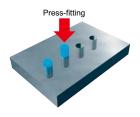
Passing point output control

The general-purpose output on/off can be controlled by specified points without stopping the axis operation during interpolation operation. The dispense can be turned on or off with the axis operated during sealing to allow smooth and stable dispensing.



Torque limiting function

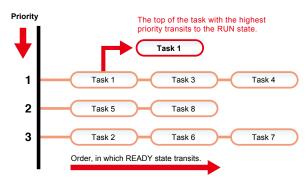
The motor torque can be limited during gripping or press-fitting.



Multi-task function

This function can execute multi tasks (up to eight tasks), such as robot peripheral units in parallel at the same time. When there are multiple tasks, the task can be changed by means of the time sharing method and a priority can be put on the task. Additionally, the priority can also be changed while the task is running. The multitask function simplifies the control configuration of the entire system to improve the operation efficiency.

■ Task scheduling



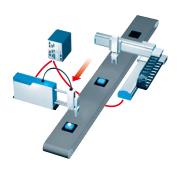
Sequence program

In addition to the normal task, a task to individually control the input/output (parallel, serial, memory, timer) can be executed.

As the sequence program can be enabled even in the manual mode, this is effective to construct a safety system linked with peripheral units

2-robot control

Two robots that are assigned to the main and sub robots can be simultaneously controlled using one controller. As this function is used together with the multi-task, advanced and smooth linking of two robots can be performed using one controller.



Applicable to auxiliary axis addition function "YC-Link system"

This YC-Link is a system that controls the single-axis robot controller SR1 from the multi-axis controller RCX series through the serial communication

By installing the YC-Link system, the RCX series can be easily linked with the SR1 series. As multiple controllers can be linked as required, up to eight axes (up to six axes for simultaneous control) can be controlled.



Powerful support software: VIP+ (plus)

This application software allows you to easily and visually operate the robot, create and edit programs, and teach points.

The user interface is greatly improved and made easier to use when compared to the conventional support software VIP.





Applicable to electric gripper "YRG series"

All grippers can be controlled using one RCX240 controller. Data exchanging with the host unit, such as PLC is not needed. The setup or startup is very easy.



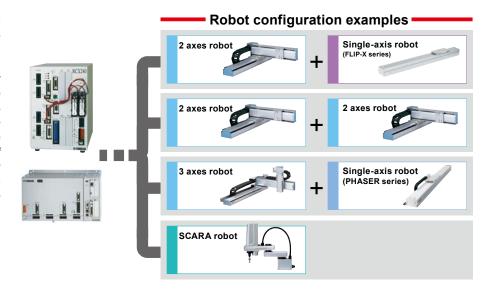
RCX240/RCX340 POINT

RCX240 and RCX340 are applicable to all single-axis, Cartesian, SCARA, and P&P robots Note

The 4-axis robot controller RCX240 and RCX340 are applicable to all robot models including single-axis, Cartesian, SCARA, and Pick & Place robots.

As the mixed control of the ball screw type FLIP-X series and linear motor type PHASER series can be performed, the robots can be combined freely according to the applications. Additionally, when preparing the robot controllers for the maintenance work of multiple robots, it is enough to prepare only one robot controller. This robot controller can be used for any model only by changing the setting

Note. Except for 24 V specification models.



[Multi-axis robot controller]



RCX340

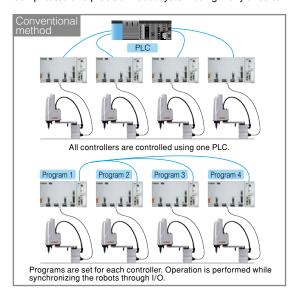
Operation method	Program Remote command Online command	
Number of points	30000 points	
Input power	Single phase : AC200V to 230V +/-10% maximum	
Origin search method	Absolute Incremental	

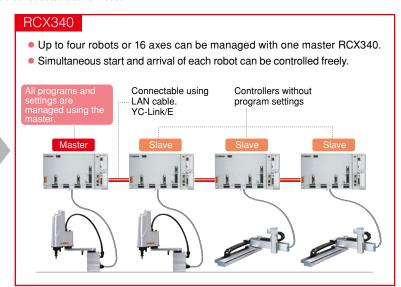
Advanced functionality allowing construction of high-level equipment

Multiple robots can be operated synchronously through the high-speed communication. Use of linking among controllers makes it possible to store programs into only one controller. Use of a newly developed algorithm achieves shortening of the positioning time and improvement of the tracking accuracy.

The control of multiple robots can be managed using one master controller

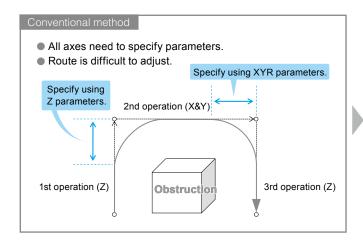
The RCX340 controller allows high-speed communication among the controllers. As the operation command can be sent to the controller of each slave from the master controller, the programs or points can be managed only using the host master controller. Additionally, as this controller supports multi tasks flexibly, data exchanging with the PLC can be simplified. Simultaneous start and simultaneous arrival of each robot can be controlled freely. Complicated and precision robot system using many axes can be constructed at a low cost.

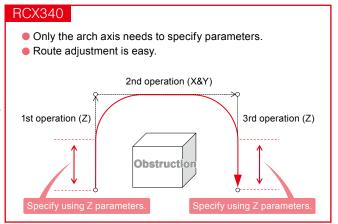




Arch motion can be specified more intuitively

As the arch motion route designation method is changed and the designation method is simplified, the arch motion can be specified more intuitively.





RCX340

Smooth movement is achieved by greatly improving motion functions

As a new servo motion engine is incorporated, various operations can be merged. Use of a newly developed algorithm achieves shortening of the positioning time and improvement of the tracking accuracy.

Expansion of CONT option function

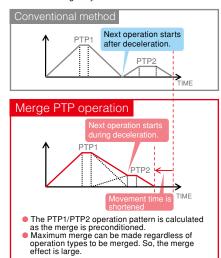
Different type operations, such as PTP, interpolation operation, and conveyor tracking, etc. are merged to improve the speed.

Example: PTP ← CP] MOVE P,P1,CONT Merge. Move C, P2,P3,CONT [Example: PTP ← Conveyor tracking] MOVE P,P1,CONT Move P,P2, CTMOVE Operation starts without stopping.

■ Improvement of operation speed Note

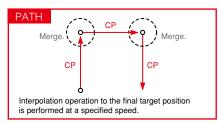
All operations can be merged as much as possible using the merge PTP.

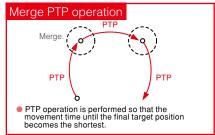
As even operations with different acceleration or deceleration time are merged at maximum level with priority put on the operation time, the movement time is shortened greatly.



■ Proper use according to application Note

When performing the continuous operation, an optimal operation can be selected according the application, like traditional PATH is used for constant-speed operation, such as sealing and merge PTP is used for operation with priority put on the movement time.





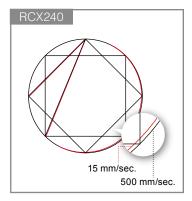
Note. It is necessary to upgrade the firmware to its latest version.

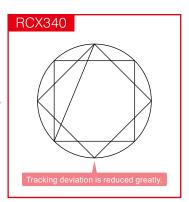
Improvement of tracking accuracy

Use of visualization with servo analyze function and high responsiveness with new servo function makes it possible to increase the follow-up ability and improve the tracking accuracy when compared to the conventional models.

15 mm/sec. 500 mm/sec.







Improved basic performance

Functions, such as robot language, multi-task, sequence function, communication, and field bus are improved and made easier to use.

Motion optimization

The optimization of the motion to meet the operation pattern is further strengthened to bring out the robot performance at its maximum level. Higher quality robot operations, such as shortening of the operation time and suppression of vibrations during stopping are achieved.

Optimal acceleration/deceleration motion

Acceleration/deceleration motion is generated that can perform the high-speed operation while suppressing vibrations.



Compact design

The outside dimensions are approximately 355 mm (W) \times 195 mm (H) \times 130 mm (D). The volume ratio is reduced to approximately 85 % and the body size is made compact when compared to the conventional 4-axis controllers so as to make the installation inside the control panel easy.





Improvement of cycle time

The speed-up of the YK-XG series is achieved.

Example: YK400XG

 Standard cycle time operation RCX340 $0.49 \text{ sec} \rightarrow 0.45 \text{ sec}$ -RCX240 800 Movement time (msec) 600 400 200 0 0 30 120 150 180 Arm rotation angle(°)

User memory capacity increase

 Number of points is greatly increased.

greatly increased.

Number of points is increased 3 times 10,000 RCX240 RCX340

Total capacity of program and point

RCX240 364KB RCX340 2.1MB

Built-in regenerative unit

As the regenerative unit (equivalent to RGU3) is built-in, no additional regenerative unit is needed when connecting to the existing robot.

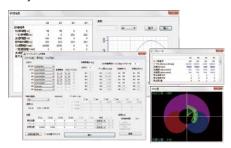
Support tool with visibility and operability improved New support software RCX-Studio Pro

The program debug function is strengthened to support the multi-task. Use of convenient operability and program input support function makes it possible to perform the quick setup.

■ YAMAHA robot becomes easier to use, faster setup, efficient maintenance

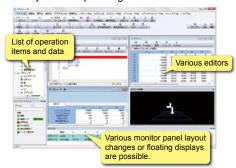
Evaluation

- Emulator function provided
- Cycle time calculator



Design

Easy-to-use operating controls

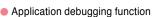


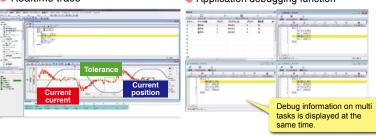
- Inter-operation with other manufacturer's line simulators
- iVY2 editor provided



After installation

Realtime trace





Maintenance

Data comparison tool



■ Programing box PBX

This programming box is applicable to three languages, "Japanese", "English", and "Chinese". Use of a color display makes it possible to improve the visibility.

Work to add or edit functions becomes easy, allowing even personnel without programming skill to operate this programming box.

A function to save the controller data into the USB memory is incorporated.



RCX340

Enhanced expandability

RS-232C and Ethernet ports are provided as standard equipment. A wide variety of high-speed and large capacity field networks, such as CC-Link, DeviceNetTM, and EtherNet/IPTM are supported as options. Connections with general-purpose servo amplifier or other company's VISION are easy. So, the RCX340 is called "connectable controller".

Up to four RCX340 controllers (up to 16 controllable axes) can be connected.

More flexible robot configuration

Centralized control of multiple robots

Easy programming

Cost reduction

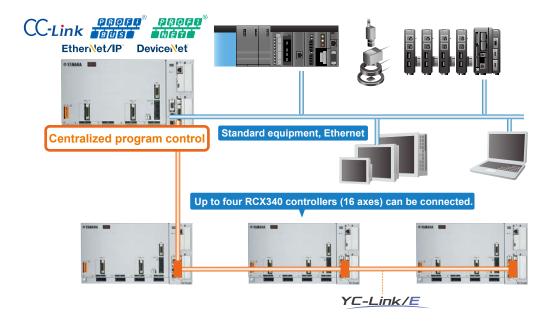
Applicable to various field buses/centralized control of robots through connections of up to four controllers

RS-232C and Ethernet ports are provided as standard equipment. Additionally, fulfilling field buses, such as CC-Link, EtherNet/IPTM, DeviceNetTM, PROFIBUS, and PROFINET Note 1 can be supported to connect and control a wide variety of devices. For 5 or more axes, use of YC-Link/E makes it possible to connect up to four RCX340 controllers so as to perform the centralized control of multiple robots. Additionally, when using YC-Link/E Note 2, multiple robots can be handled as if they are operated using one controller. This ensures very easy robot programming and management.

Therefore, this robot controller contributes to reduction of unseen costs, such as labor cost necessary for the setup work.

Note 1. Supports PROFINET Ver. 2.2

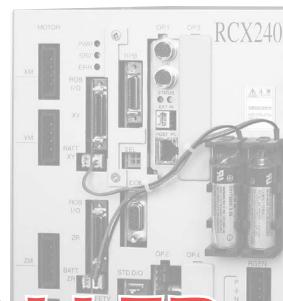
Note 2. When ordering YC-Link/E, please specify what robot is connected to what number controller.











YAMAHA ROBOT CONTROLLERS

CONTROLL

CONTENTS

Handy terminal

Programming box

CONTENTS	
CONTROLLER	
LCC140484	
POSITIONER	
TS-S2/TS-SH/TS-X/TS-P490	
DRIVER	
TS-SD 500	
RDV-X/RDV-P504	
CONTROLLER	
ERCD510	
SR1-X/SR1-P516	
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ROBOT VISION IVY SYSTEI	VI 57:
ROBOT VISION IVY SYSTEI VY System	M 57: ≣M
ROBOT VISION IVY SYSTEI	M 57: ≣M
ROBOT VISION IVY SYSTEM VY System ROBOT VISION IVY2 SYSTEM VY2 System	M 57: ≣M 57
ROBOT VISION IVY SYSTEI VY System VY2 System ELECTRIC GRIPPER	M 57; EM 57(
ROBOT VISION IVY SYSTEM ROBOT VISION IVY2 SYSTEM VY2 System ELECTRIC GRIPPER (RG Series	M 57; EM 57(
ROBOT VISION IVY SYSTEI VY System VY2 System ELECTRIC GRIPPER	M 57: EM 57: 58:
ROBOT VISION IVY SYSTEM ROBOT VISION IVY2 SYSTEM VY2 System ELECTRIC GRIPPER (RG Series Compact single cam type YRG-2005SS Single cam type	M 57; ≡ M 57; 58; 58;
ROBOT VISION IVY SYSTEM ROBOT VISION IVY2 SYSTEM VY2 System ELECTRIC GRIPPER /RG Series Compact single cam type YRG-2005SS	M 57; ≡ M 57; 58; 58;

YRG-2005W/2810W/4220W 585

•	Screw type strait style YRG-2020FS/2840FS······	586
•	Screw type "T" style YRG-2020FT/2840FT ·····	587
•	Three fingers type YRG-2004T ······	588
	YRG-2013T/2820T/4230T	589

robots
YP-X

@YAMAHA

CLEA

TROLLER INFOR

Robo

Pulse string driver

Robot controlle

> iVY/iVY Electric gripper

Option

CONTROLLER FEATURE DESCRIPTION

Single-axis

Dedicated robot controller for the LCM100

Linear conveyor module

LCC140

Linear conveyor module LCM100

P.484



Operating method	Programming/I/O point tracing/ Remote command/Operation using RS- 232C communication
Points	10,000 points
Input power	Single phase 200 to 230V AC +/-10% maximum (50/60Hz)
Origin search method	Incremental
Field networks	CC-Link, DeviceNet [™] , EtherNet/IP [™]

Single-axis robot positioner

TS-S2/TS-SH

Dedicated compact single-axis... TRANSERVO Note 1

P.490

Note 1. SG07 is only applicable to TS-SH.



Operating method	I/O point tracing/Remote command/ Operation using RS-232C communication
Points	255 points
Input power	Main power supply DC24V +/-10% Control power supply DC24V +/-10%
Origin search method	TS-S2 : Incremental TS-SH : Absolute Incremental
Field networks	CC-Link, DeviceNet [™] , EtherNet/IP [™] , PROFINET

Single-axis robot positioner

TS-X/TS-P

Single-axis robotFLIP-X Linear motor single-axis PHASER

P.490



Operating method	I/O point tracing/Remote command/ Operation using RS-232C communication
Points	255 points
Input power	AC100V/AC200V
Origin search method	TS-X : Absolute Incremental TS-P : Incremental Semi-absolute
Field networks	CC-Link, DeviceNet [™] , EtherNet/IP [™] , PROFINET

Single-axis robot driver

TS-SD

Dedicated compact single-axis...TRANSERVO

P.500



Operating method	Pulse train control
Input power	Main power supply DC24V +/-10% Control power supply DC24V +/-10%
Origin search method	Incremental
Field networks	Not supported

Single-axis robot driver

RDV-X/RDV-P

[RDV-X] Single-axis robot.....FLIP-X [RDV-P] Linear motor single-axis.....PHASER

P.504



Operating method	Pulse train control
Input power	Main power supply Single phase/3-phase 200V to 230V Control power supply Single phase 200V to 230V
Origin search method	Incremental
Field networks	Not supported

Single-axis robot controller

ERCD

Single-axis robot.....T4L/T5L Clean single-axisC4L/C5L

(P.510)



Operating method	Pulse train control/Programming/ I/O point tracing/Operation using RS- 232C communication
Points	1000 points
Input power	DC24V +/-10% maximum
Origin search method	Incremental
Field networks	Not supported

Single-axis robot controller

SR1-X/SR1-P

Single-axis robot.....FLIP-X Linear motor single-axis PHASER

(P.516)





Operating method	Programming/I/O point tracing/ Remote command/Operation using RS- 232C communication		
Points	1000 points		
Input power	AC100V/AC200V		
Origin search method	SR1-X Absolute Incremental SR1-P Incremental Semi-absolute		
Field networks	CC-Link, DeviceNet [™] , PROFIBUS		

1 to 2 axis

Multi-axis robot controller

RCX221/ RCX221HP

P.524



Operating method	Programming/Remote command/ Operation using RS-232C communication
Points	10000 points
Input power	AC200V
Origin search method	Incremental Semi-absolute
Field networks	CC-Link, DeviceNet [™] , Ethernet, PROFIBUS

Multi-axis robot controller

RCX222/ RCX222HP

Single-axis robot......FLIP-X
Cartesian robotXY-X
Pick & place.....YP-X

P.524



Operating method	Programming/Remote command/ Operation using RS-232C communicatio	
Points	10000 points	
Input power	AC200V	
Origin search method	Absolute	
Origin search method	Incremental	
Field networks	CC-Link, DeviceNet [™] , Ethernet, PROFIBUS	

1 to 4 axis

Multi-axis robot controller

RCX240/ RCX240S

P.532



Operating method	Programming/Remote command/ Operation using RS-232C communication			
Points	10000 points			
Input power	Single phase 200 to 230V AC +/-10% maximum (50/60Hz)			
Origin search method	Absolute Incremental			
Field networks	CC-Link, DeviceNet [™] , EtherNet/IP [™] , Ethernet, PROFIBUS			

Multi-axis robot controller

RCX340

P.542



Programming/Remote command/		
Programming/Remote command/ Operation using RS-232C communication		
30000 points		
Single phase 200 to 230V AC +/-10% maximum (50/60Hz)		
Absolute Incremental		
CC-Link, DeviceNet [™] , EtherNet/IP [™] , Ethernet, PROFIBUS, PROFINET		

CONTROLLER SPECIFICATION SHEET

Categor	-у		Robot controller		Robot p	ositioner	Robot driver				
Name			LCC140	TS-S2	TS-SH	TS-X	TS-P	TS-SD RDV-X RDV-			
External view		(- <u> </u>									
Operatir	ng method		Programming/ I/O point tracing/ Remote command/ Operation using RS-232C communication		/O point tracing/Feration using RS-			Р	ulse train contro	ı	
	LCM100		•	_	_	_	_	_	_	_	
	TRANSE	RVO	_	Note 2	•	_	_	•	_	_	
oqo	ELID Y	T4L/T5L/C4L/C5L	_	_	_	_	_	_	_	_	
Applicable robot	FLIP-X	FLIP-X other than above	_	_	_	•	_	_	•	_	
icab	PHASER		_	-	_	_	•	_	_	•	
ppli	XY-X		_	_	_	_	_	_	_	_	
∢	YK-X		_	_	_	_	_	_	_	_	
	YP-X		_	_	_	_	_	_	_	_	
Main power supply		Single phase 200 to 230V AC +/-10% maximum	DC24V +/-10% maximum OC24V +/-10% maximum OC24V +/-10% maximum OC24V +/-10% maximum OC24V +/-10% maximum (50/60Hz) OC24V +/-10% maximum (50/60Hz) OC24V +/-10% maximum (50/60Hz)			DC24V +/-10% maximum	Single phas 200 to +10% t (50/60H	230V o -15%			
dul	Control p	ower supply	(50/60Hz)	DC24V +/-10	DC24V +/-10% maximum (205 / 210 / 220 driver) Single phase 200 to 230V AC +/-10% maximum (50/60Hz)		DC24V +/-10% maximum	Single 200 to 2 +10% t (50/60H:	30V AC o -15%		
Number	of controll	able axes	Single-axis		Singl	e-axis			Single-axis		
Origin s	earch meth	od	Incremental	Incremental	Absolute/ Incremental	Absolute/ Incremental	Incremental/ Semi-absolute		Incremental		
Maximu	m number o	of programs	100		(program n	ot required)		_	_	_	
Maximur	m number of	steps per program	999 steps		(program n	ot required)		_	_	_	
Points			10,000 points		255	points		_	-	_	
Multitas	ks		4	-	_	_	_	_	_	_	
1/0	points	Dedicated I/O	8 points/4 points	16 points/16 points	16 points/16 points	16 points/16 points	16 points/16 points	_	_		
1/0	ponits	General I/O	16 points/16 points	_	_	_	_	_	_	_	
		CC-Link	•	•	•	•	•	_	_	_	
		Device let	•	•	•	•	•	_	_	_	
Field ne	twork	Ether 'et/IP	•	•	•	•	•	_	_	_	
support		Ethernet	_	_	_	_	_	_	_	_	
			_	_	_	_	_	_	_	_	
		PROFIT	_	•	•	•	•	_	_	_	
CE mark	king		_	•	•	•	•	•	•	•	
Program	nming box		HPB / HPB-D (with enable switch)		HT1 / HT1-D (wi	th enable switch)	_	_		
Support	t software fo	or PC	POPCOM ⁺		TS-Ma	anager		TS-Manager	RDV-M	anager	
Detailed	l info page		P.484		P.4	190		P.500	P.S	04	

Note 1. ZUA Specifications provide only Zuov.
Note 2. Exclude SG07
Note 3. Exclude YK400XR
Note 4. Maximum number of general-purpose I/O points when a total of two option boards OP.1 and OP.2 (one each) are installed.
Note 5. Maximum number of general-purpose I/O points when option OP.DIO boards (4 boards) are installed.

ERCD	SR1-X	SR1-P	RCX221 RCX221HP	RCX222 RCX222HP	RCX240 RCX240S	RCX340
2000 de 1			RC221		SCANAL SC	
Pulse train control/ Programming/ I/O point tracing/ Operation using RS-232C communication	Programming/l/ Remote of Operation using RS-	O point tracing/ command/ 232C communication		Programming/R Operation using RS-	emote command/ 232C communication	
_	_	_	_	_	_	_
_	_	_	_	_	_	_
•	_	_	_	_	_	_
_	•	_	•	•	•	•
_	_	•	•	_	•	•
_	_	_	•	•	•	•
_	_	_	_	_	Note 3	•
_	_	_	_	•	•	•
DC24V +/-10% maximum	+/-10% maximum (5	115V/200 to 230V AC 0/60Hz)	Sir	igle phase 200 to 230V AC	C +/-10% maximum (50/60	Hz)
+/-10% maximum	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5	230V AC 0/60Hz)			4 axes maximum	Max. number of robots 4
	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to	230V AC 0/60Hz)	2 axes maximum Incremental/ Semi-absolute	gle phase 200 to 230V AC 2 axes maximum Absolute/ Incremental	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/	Max. number of robots 4 Max. number of controllable axes 10 Absolute/ Incremental/
+/-10% maximum Single-axis Incremental	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental	0/60Hz) 230V AC 0/60Hz) e-axis Incremental/ Semi-absolute	2 axes maximum Incremental/ Semi-absolute	2 axes maximum Absolute/ Incremental	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute	Max. number of robots 4 Max. number of controllable axes 1 Absolute/ Incremental/ Semi-absolute
+/-10% maximum Single-axis Incremental	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental	0/60Hz) 230V AC 0/60Hz) e-axis Incremental/ Semi-absolute	2 axes maximum Incremental/ Semi-absolute 100	2 axes maximum Absolute/ Incremental	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100	Max. number of robots 4 Max. number of controllable axes 1 Absolute/ Incremental/ Semi-absolute 100
+/-10% maximum Single-axis Incremental 100 1024 steps	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental	230V AC 0/60Hz) e-axis Incremental/ Semi-absolute 00 steps	2 axes maximum Incremental/ Semi-absolute 100 9999 steps	2 axes maximum Absolute/ Incremental 100 9999 steps	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps	Max. number of robots 4 Max. number of controllable axes 1 Absolute/ Incremental/ Semi-absolute 100 9999 steps
+/-10% maximum Single-axis Incremental	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental	0/60Hz) 230V AC 0/60Hz) e-axis Incremental/ Semi-absolute	2 axes maximum Incremental/ Semi-absolute 100	2 axes maximum Absolute/ Incremental	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100	Max. number of robots 4 Max. number of controllable axes 1 Absolute/ Incremental/ Semi-absolute 100
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental	0/60Hz) 230V AC 0/60Hz) e-axis Incremental/ Semi-absolute 00 steps points	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points 8	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8	Max. number of robots 4 Max. number of controllable axes 1 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points 4	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental	230V AC 0/60Hz) e-axis Incremental/ Semi-absolute 00 steps points 4 /4 points	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8 10 points/12 points	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/11 points	Max. number of robots 4 Max. number of controllable axes 16 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points 16 8 points/9 points
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points 4 8 points/3 points	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental 10 3000 1000	230V AC 0/60Hz) e-axis Incremental/ Semi-absolute 00 steps points 4 /4 points	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/12 points	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8 10 points/12 points	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8	Max. number of robots 4 Max. number of controllable axes 16 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points 16 8 points/9 points
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points 4 8 points/3 points	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental 10 3000 1000 8 points.	230V AC 0/60Hz) e-axis Incremental/ Semi-absolute 00 steps points 4 /4 points	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8 10 points/12 points	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/11 points	Max. number of robots 4 Max. number of robots 4 Max. number of controllable axes 1 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points 16 8 points/9 points 96 points/64 points (Max.) Note
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points 4 8 points/3 points 6 points/6 points —	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental 10 3000 1000 8 points 16 points	230V AC 0/60Hz) e-axis Incremental/ Semi-absolute 00 steps points 4 /4 points /16 points	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/11 points 112 points/72 points (Max.) Note 5	Max. number of robots 4 Max. number of controllable axes 1 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points 16 8 points/9 points 96 points/64 points (Max.) Note
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points 4 8 points/3 points 6 points/6 points —	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental 10 3000 1000 8 points 16 points	230V AC 0/60Hz) e-axis Incremental/ Semi-absolute 00 steps points 4 /4 points /16 points	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/11 points 112 points/72 points (Max.) Note 5	Max. number of robots 4 Max. number of controllable axes 14 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points 16 8 points/9 points 96 points/64 points (Max.) Note
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points 4 8 points/3 points 6 points/6 points — — —	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental 10 3000 1000 8 points 16 points	230V AC 0/60Hz) e-axis Incremental/ Semi-absolute 00 steps points 4 /4 points /16 points	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/11 points 112 points/72 points (Max.) Note 5	Max. number of robots 4 Max. number of robots 4 Max. number of controllable axes 18 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points 16 8 points/9 points 96 points/64 points (Max.) Note
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points 4 8 points/3 points 6 points/6 points — — —	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental 10 3000 1000 8 points 16 points	230V AC 0/60Hz) e-axis Incremental/ Semi-absolute 00 steps points 4 /4 points /16 points — — —	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/11 points 112 points/72 points (Max.) Note 5	Max. number of robots 4 Max. number of controllable axes 14 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points 16 8 points/9 points 96 points/64 points (Max.) Note
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points 4 8 points/3 points 6 points/6 points — — —	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental 10 3000 1000 8 points 16 points	230V AC 0/60Hz) e-axis Incremental/ Semi-absolute 00 steps points 4 /4 points /16 points — — —	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/11 points 112 points/72 points (Max.) Note 5	Max. number of robots 4 Max. number of controllable axes 16 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points 16 8 points/9 points 96 points/64 points (Max.) Note
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points 4 8 points/3 points 6 points/6 points — — — — — — — — — — — — — — — — — —	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Phase 200 to +/-10% maximum (5 Single Absolute/ Incremental	230V AC 0/60Hz 230V AC 0/60Hz 230V AC 0/60Hz 230V AC 0/60Hz 230V AC 230V AC	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/11 points 112 points/72 points (Max.) Note 5	Max. number of robots 4 Max. number of controllable axes 16 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points 16 8 points/9 points 96 points/64 points (Max.) Note
+/-10% maximum Single-axis Incremental 100 1024 steps 1000 points 4 8 points/3 points 6 points/6 points — — — — — — — — — — — — — — — — — —	Single phase 100 to +/-10% maximum (5 20 driver Single phase 200 to +/-10% maximum (5 Single Absolute/ Incremental 10 3000 1000 8 points 16 points — — — —	230V AC 0/60Hz 230V AC 0/60Hz 230V AC 0/60Hz 230V AC 0/60Hz 230V AC 230V AC	2 axes maximum Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	2 axes maximum Absolute/ Incremental 100 9999 steps 10000 points 8 10 points/12 points 40 points/24 points(Max.) Note 4	4 axes maximum Max. number of controllable axes 8 Absolute/ Incremental/ Semi-absolute 100 9999 steps 10000 points 8 10 points/11 points 112 points/72 points (Max.) Note 5	Max. number of robots 4 Max. number of controllable axes 16 Absolute/ Incremental/ Semi-absolute 100 9999 steps 30000 points 16 8 points/9 points 96 points/64 points (Max.) Note

Point trace
 Remote commands
 Pulse train
 Controller sues a wide range of commands and data to the robot via CC-Link or DeviceNet™ word functions. Host device can freely use robot controller functions as needed.
 Controller sues a wide range of commands and data to the robot via CC-Link or DeviceNet™ word functions. Host device can freely use robot controller functions as needed.
 Controller operates robot by pulse train from positioner unit. Controller needs no programs or point data. Pulse train operation is convenient to allow the host device to concentrate on robot control.
 PC can send various commands and data directly to the robot controller via RS232C or Ethernet and receive status information and data.

LCC140

Robot controller

Dedicated controller for LCM100

This is a dedicated controller for the LCM100 linear conveyor module. In addition to controlling movement, positioning, and input/output signals, it can also perform operations related to slider insertion and ejection.

Single-axis

LCC140



LCC140

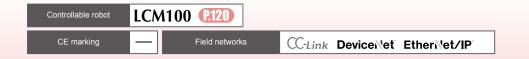
Main functions ▶ P.13



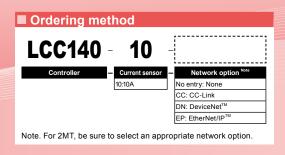


■ Basic specifications

	Item	LCC140				
Controllable ro	bot	Linear conveyor module LCM series				
Power supply capacity		1200 VA				
External dimer	nsions	W:402.5 × H:229 × D:106.5 mm				
Weight		1.8 kg				
Control power	supply input	Single-phase 200 to 230 V AC +/-10% (50/60 Hz)				
Main power su	pply input	Single-phase 200 to 230 V AC +/-10% (50/60 Hz)				
Control method	t	AC fully digital software servo				
Position detect	ion method	Magnetic linear scale				
Emergency sto	p input	Normal close contact input				
Output signal		Contact output: MPRDY				
Communicatio	n	RS-232C 2ch (HPB/COM, RFID)				
Program		Max. 999 steps/single program, Max. 10000 steps/all programs, Max. 100 programs				
Points		10000 points				
System backup)	Lithium battery				
Multitasking		Max. 4 tasks				
Usage tempera	ature	0 to 40 °C				
Storage tempe	rature	-10 to 65 °C				
Usage humidit	у	35 to 85%RH (no dewing)				
Noise resistan	ce	IEC61000-4-4 level 3				
	CC-Link compatible version	Ver. 1.10				
	Remote station type	Remove device station				
	Number of occupied stations	Fixed to 2 stations				
	Station number	1 to 63 (Set from HPB)				
	Communication speed	10M/5M/2.5M/625K/156Kbps (Set using HPB or POPCOM+.)				
CC-Link unit	Shortest length between stations	0.2 m or more				
	Total length	100m/10Mbps, 160m/5Mbps, 4000m/2.5Mbps, 900m/625Kbps, 1200m/156Kbps				
	Monitor LED	None				
	CC-Link I/O points	General-purpose input 32 points General-purpose output 32 points Dedicated input 16 points Dedicated output 16 points Input register 8 words Output register 8 words				

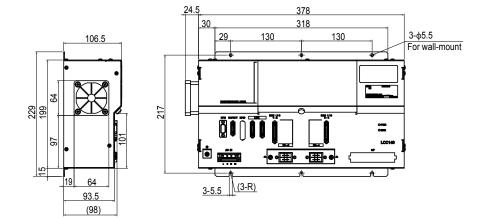


■ Model Overview	
Name	LCC140
Controllable robot	Linear conveyor module LCM100
Power	Single-phase AC200 to 230V +/-10% or less (50/60Hz)
Operating method	Programming/I/O point tracing/Remote command/ Operation using RS-232C communication

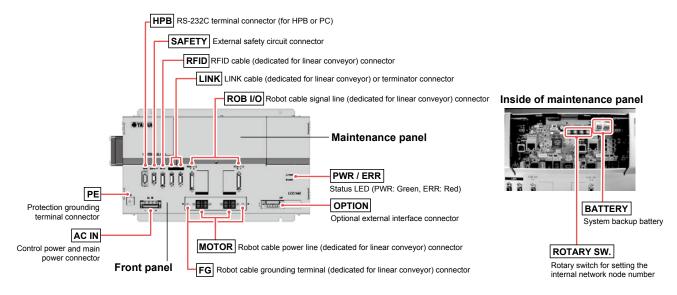


	Item		LCC140		
	DeviceNet™ Conformance test C Device profile/Device type number C Vendor name/Vendor ID Y		Volume 1 Release2.0, Volume 2 Release2.0		
			Compliant with CT24		
			Generic Device (keyable) / 2B Hex		
			YAMAHA MOTOR CO.,LTD. / 636		
	Product code		21		
	Product revision		1.0		
	EDS file name		Yamaha LCC1(DEV).eds 0 to 63 (Set using HPB or POPCOM+.)		
	MAC ID setting Communication speed settir	na	500K/250K/125Kbps (Set using HPB or POPCON	1 +\	
	Communication speed setting	ig	Predefined Master/Slave Connection Set: Group 2		
DeviceNet™	Communication data		Dynamic connection support (UCMM): None	2 only conven	
unit			Support for divided transmission of explicit messa	ige: Yes	
		Total length	100m/500Kbps, 250m/250Kbps, 500m/125Kbps		
	Network length	Branch length			
		Total branch length	39m or less/500Kbps, 78m or less/250Kbps, 156r	m or less/125Kbps	
	Monitor LED		None		
			General-purpose input 32 points	Input: 24byte	
	North an of Davids North 1/O		General-purpose output 32 points	Output: 24byte	
	Number of DeviceNet™ I/O of occupied channels	points/number	Dedicated input 16 points Dedicated output 16 points		
	or occupied charmers		Input register 8 words		
			Output register 8 words		
			LCC140: Ver. 64.07 or higher		
	Applicable software version		HPB/HPB-D: Ver. 24.06 or higher		
			POPCOM+: Ver. 2.1.0 or higher		
	Applicable EtherNet/IP™ sp	ecifications	Volume 1: Common Industrial protocol(CIP™) Edition 3.14 Volume 2: EtherNet/IP™ Adaptation of CIP Edition 1.15		
	EtherNet/IP™ Conformance	test	Compliant with CT11		
	Device profile/Device type nu	ımber	Generic Device (keyable) / 2B Hex		
	Vendor name/Vendor ID		YAMAHA MOTOR CO.,LTD. / 636		
	Product code		23		
	Product revision		1.1		
EtherNet/IP™	EDS file name		Yamaha_LCC1(EIP2).eds		
unit	Communication speed		10Mbps / 100Mbps		
	Connector specifications		RJ-45 connector (8-pole modular connector), 2 ports		
	Applicable cable specification	ns	STP cable (double shield) with CAT 5e or higher		
	Maximum cable length		100m		
	Monitor LED		Module Status(MS), Network Status(NS), Link/Ac		
	Number of EtherNet/IP™ I/C of occupied channels	points/number	General-purpose input 32 points General-purpose output 32 points Dedicated input 16 points Dedicated output 16 points Input register 8 words Output register 8 words	Input: 24byte Output: 24byte	

Dimensions

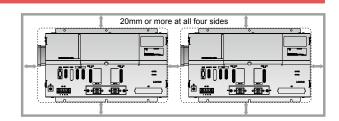


■ Part names



■ Installation conditions

- Reserve a space for the controller in the vicinity of the module.
- · Install the controller perpendicularly to the wall.
- Reserve enough margins around the controller (20 mm or more on each side) and ensure sufficient ventilation. (See fig. at right.)
- Environmental temperature: 0 to 40°C
- Environmental humidity: 35 to 85%RH (no condensation)



■ Reference for power supply capacity and heat generation quantity

The power capacity and heat generation quantity required for the linear conveyor may vary depending on the module type or operation duty. Prepare the power supply and investigate the control panel size, controller layout, and cooling method while referring to the table below.

Reference values for actual operation (per LCC140 controller)

Module type	Number of	Power supply capacity			Heat generation quantity (during operation)
would type	motors	Control power supply	During waiting	During slider operation	During slider operation
LCM100-4M	4	35VA	60VA	350VA	20W
LCM100-3M	3	35VA	54VA	271VA	16W
LCM100-2MT	2	35VA	48VA	193VA	11W

The power capacity and heat generation quantity values stated in the table show the maximum values of LCC140 and they do not exceed these values. Since the operation duty of each motor of the linear conveyor is low due to operating characteristics, the power capacity required for actual operation becomes about 1/4 to 1/3 of the maximum capacity value.

Maximum capacity values (per LCC140 controller)

Model	Power supply capacity	Heat generated
LCM100	1200VA	70W

LCC140 TS-X

Option parts

LCC140

Options

Power connector + wiring connection lever

One set of parts per LCC140 is required.



		[13-P]
		SR1-X
Model	KAS-M5382-00	SR1-P
	'	RCX221
		RCX222
		RCX240/S
		RCX340

HPB dummy connector

When performing the operation with the programming box HPB removed, connect this dummy connector to the HPB connector. One connector per LCC140 is required.



		LCC140
Model	KDK-M5163-00	SR1-X
	·	SR1-P

SAFETY connector

One connector per LCC140 is required.





Not wired (plug + shell kit)

Wired Note

Not wired KDK-M5370-10 Model Wired Note KDK-M5370-00

Note. The wired connector is that the wiring for the emergency stop cancel was performed inside the connector. Select this model when performing the operation check or debugging with single linear conveyor.

(LCC140)

LINK cable

([Number of modules] - 1) cables per line are required.



	1m	KDK-M5361-10	
Model	3m	KDK-M5361-30	LCC140
	5m	KDK-M5361-50	

Terminator connector

When connecting modules, two connectors per line are required.



Model	KDK-M5361-00	LCC140

Dust cover (for LINK connector)

This dust cover is attached to the insertion port, into which the the LINK cable terminator connector is not inserted.

When using only one module without connections, two dust covers are required.



Model	KDK-M658K-00 (for MDR20 pin)

Note. The dust cover is essential for the 2MT

LCC140

Programming box HPB/HPB-D

All operations, such as robot manual operation, program input or edit, teaching, and parameter setting can be performed with this programming box.



	HPB	HPB-D
Model	KBB-M5110-01	KBB-M5110-21
Enable switch	_	3-position
CE marking	Not supported	Applicable

_	LCC140
1	ERCD
-	SR1-X
	SR1-P

LCC140

ERCD

SR1-X

SR1-P

Support software for PC (2554) POPCOM+

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



Model	KBG-M4966-00	
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POPCOM+ environment

OS	Microsoft Windows XP / Vista (32bit / 64Bit) / 7 (32bit / 64Bit) / 8,8.1 (32bit/64bit)
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	50MB of available space required on installation drive.
Disk operation	RS-232C
Applicable controllers	SRCX/ERCX/DRCX/TRCX/SRCP/SRCD/ERCD/SR1/LCC140 Note 1

Note 1, LCC140 is applicable to Ver. 2.1.1 or later.

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.

Continues on next page

LCC140

Options

Data cables Communication cable for POPCOM+. Select from USB cable or D-sub cable.





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

Note. This USB cable supports Windows 2000/XP or

Note. Data cable jointly used for POPCOM+, VIP+, RCX-Studio Pro.

Note. USB driver for communication cable can also be downloaded from our website.

(LCC140)
(ERCD)
(SR1-X)
(SR1-P)
(RCX221)

RCX222 RCX240/S RCX340

RFID (manufactured by BALLUFF GmbH) Reader/writer cable



Model KDK-M6300-00

Note. Whether or not the RFID system can be used may vary depending on the destination place (country).
Before selecting a RFID system, please contact

YAMAHA.

RFID (manufactured by OMRON) Antenna amplifier controller cable



Model KDK-M6300-A0

Note. Whether or not the RFID system can be used may vary depending on the destination place (country).
Before selecting a RFID system, please contact

YAMAHA.

Dust cover (for RFID) This cover is attached to the insertion port if RFID is not used. (Included as standard)



KDK-M658K-10 (for MDR26 pin)

Note. Whether or not the RFID system can be used may vary depending on the destination place (country).

Before selecting a RFID system, please contact

YAMAHA.

Maintenance parts





Model		KDJ-M4751-30 (3m×1 pc.)
	KDJ-M4751-50 (5m×1 pc.)	
	KDJ-M4755-30 (Flexible cable 3m×1 pc.)	
	(Flexible cable 3m×1 pc.)	
	KDJ-M4755-50 (Flexible cable 5m×1 pc.)	
	(Flexible cable 5m×1 pc.)	

LCC140

Lithium battery for system backup



Model KDK-M4252-00 (LCC140)

Replacement filter for LCC140 (5 pcs. in package)



Model KDK-M427G-00 (LCC140)

MEMO

TS-S2/TS-SH/TS-X/TS-P

CE compliance

TS series are positioner type controllers that only performs point trace. No program is needed. Operation is simple. After setting point data, specify the point number and enter a START signal from host controller such as a PLC. Positioning or pushing operation then begins.

Main functions ▶ **P.58**







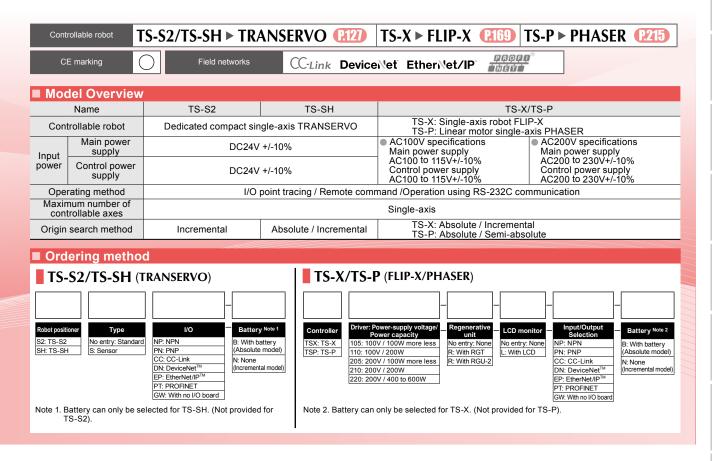
■ Basic specifications

TS-S2/TS-SH

	Item	Model	TS-S2	TS-SH					
SI	Number of con	trollable axes	Single-axis						
specifications	Controllable ro	bots	TRANSERVO series						
lica	Current consu	mption	2.5A (Rating) 4.5A (Max.)	3.5A (Rating) 6.5A (Max.)					
eci	Dimensions		W30 × H162 × D82mm	W30 × H162 × D123mm					
	Weight		Approx. 0.2kg	Approx. 0.3kg					
Basic	Input power	Control power supply	DC24V +/-10%						
ä	supply	Motor power supply	DC24V +/-10%						
	Control method	d	Closed loop vector control method						
2	Operating met	hod	I/O point tracing (Positioning operation by specifying po	int number) / Remote command					
contro	Operation type	es	Positioning, merge-positioning, push, and jog operation	s					
Axis c	Position detect	tion method	Resolver	Resolver with multi-turn absolute function					
Š	Resolution		20480 pulses/rev. or 4096 pulses/rev. depending on the	robot					
	Origin search	method	Incremental	Absolute / Incremental					
"	Points		255 points						
Points	Point type sett	ing	(1) Standard setting: Set speed and acceleration in percent of the respective maximum settings. (2) Custom setting: Set speed and acceleration in SI units.						
	Point teaching	method	Manual data input (coordinates input), Teaching, Direct teaching						
Ħ	I/O interface		Selectable from the following: NPN, PNP, CC-Link, DeviceNet [™] , EtherNet/IP [™] , PROFINET						
External input/output	Input		Servo ON (SERVO), reset (RESET), start (START), interlock (/LOCK) origin search (ORG), manual mode (MANUAL), jog motion - (JOG-), jog motion + (JOG+), Point number selection (PIN0 to PIN7)						
nal in	Output		Servo status (SRV-S), alarm (/ALM), operation end (END), operation in-progress (BUSY), control outputs (OUT0 to 3), Point number output 0 to 7 (POUT0 to POUT7)						
xte	External comm	nunications	RS-232C 1CH						
	Safety circuit		Emergency stop input, emergency stop contact output (1 system: When the HT1 is used.)						
Options	Handy termina	ıl	HT1, HT1-D (with enable switch)						
	Support softwa	are for PC	TS-Manager						
ons			0°C to 40°C, 35% to 85%RH (non-condensing)						
icati	Storage tempe	erature/ Storage humidity	-10°C to 65°C, 10% to 85%RH (non-condensing)						
pecif	Atmosphere		Indoor location not exposed to direct sunlight. No corrosive , flammable gases, oil mist, or dust particles						
als	Anti-vibration		All XYZ directions 10 to 57Hz unidirectional amplitude (
General specifications	Protective fund	ctions	Position detection error, temperature error, overload, overvoltage, low voltage, excessive position deviation, overcurrent, motor current error, motor cable faulty wiring, Excitation power failure error Note 1						

Note 1. The excitation power failure error is a protection function that is available only in TS-SH.





TS-X/TS-P

		Model			TS-X / TS-P							
	Item		100V A	C input		200V AC input						
	Driver model		TS-X105 / TS-P105	TS-X110 / TS-P110	TS-X205 / TS-P205	TS-X210 / TS-P210	TS-X220 / TS-P220					
Suc	Number of cor	trollable axes	Single-axis									
atic	Controllable ro	bots	TS-X: Single-axis robot FLIP-X series TS-P: Linear motor single-axis robot PHASER series									
oific	Power capacit	y	400VA	600VA	400VA	600VA	1400VA					
Basic specifications	Dimensions		W58 × H162 × D131m	W58 × H162 × D131mm W70 × H162 × D								
Sic	Weight		Approx. 0.9kg				Approx. 1.1kg					
Bas	Input power	Control power supply	Single phase AC100 to	115V +/-10% 50/60Hz	Single phase AC200	to 230V +/-10% 50/60	Hz					
	supply	Motor power supply	Single phase AC100 to	115V +/-10% 50/60Hz	Single phase AC200	to 230V +/-10% 50/60	Hz					
	Control metho	d	Closed loop vector co	ntrol method								
5	Operating met	hod	I/O point tracing (Posi	tioning operation by sp	ecifying point number	r) / Remote command						
Axis control	Operation type		0. 0.1	sitioning, push, and jo	· .							
is:	Position detec	tion method	TS-X: Resolver with n	nulti-rotation absolute f	unction TS-P: Magn	etic type linear scale						
Ã	Resolution		TS-X: 16384 pulses/rev. or 20480 pulses/rev. depending on the robot TS-P: 1µm									
	Origin search	method	TS-X: Absolute / Incremental TS-P: Incremental / Semi-absolute									
ß	Number of poi	nts	255 points									
Points	Point type sett	ing	(1) Standard setting: Set speed and acceleration in percent of the respective maximum settings. (2) Custom setting: Set speed and acceleration in SI units.									
	Point teaching	method	Manual data input (coordinates input) , Teaching, Direct teaching									
=	I/O interface		Selectable from the following: NPN, PNP, CC-Link, DeviceNet [™] , EtherNet/IP [™] , PROFINET									
xternal input/output	Input		Servo ON (SERVO), reset (RESET), start (START), interlock (/LOCK) origin search (ORG), manual mode (MANUAL), jog motion - (JOG-), jog motion + (JOG+), Point number selection (PIN0 to PIN7)									
l inpu	Output		Servo status (SRV-S), alarm (/ALM), operation end (END), operation in-progress (BUSY), control outputs (OUT0 to 3), Point number output 0 to 7 (POUT0 to POUT7)									
E	External comn	nunications	RS-232C 1CH									
xte	Power supply	for brake	DC24V +/-10% 300mA (prepared by the customer)									
ш	Safety circuit		Emergency stop input, main power input ready output, emergency stop contact output (1 system: When the HT1 is used.)									
Options	Handy termina		HT1, HT1-D (with enable switch)									
	Support softwa	are for PC	TS-Manager									
specifications	<u> </u>		0°C to 40°C, 35% to 85%RH (non-condensing)									
cati		erature / Storage humidity	-10°C to 65°C, 10% to 85%RH (non-condensing)									
Scifi	Atmosphere		Indoor location not exposed to direct sunlight. No corrosive , flammable gases, oil mist, or dust particles									
spe	Anti-vibration			to 57Hz unidirectional	<u>'</u>							
General	Protective fund	ctions		or, power module error, ercurrent, motor curren		verload, overvoltage, lo	ow voltage, excessive					
Ge	Protective stru	cture	IP20									

TS-S2/TS-SH/TS-X/TS-P

■ TS-X / TS-P specification selection table

Some specifications are automatically determined by the robot model.

TS-X

			T4LH/ C4LH			Т9	Т9Н	F8/ C8	F8L/ C8L	F8LH/ C8LH	F10/ C10	F10H	F14/ C14	F14H/ C14H	GF14XL	F17/ C17	F17L/ C17L	GF17XL	F20/ C20	F20N	N15/ N15D	N18/ N18D	B10	B14	B14H	R5	R10	R20
D		105	•	•	•	•		•	•	•	•		•										•	•	•	•	•	
Power supply		110					•					•		•	•													•
voltage /	TS-X	205	•	•	•	•		•	•	•	•		•										•	•	•	•	•	
Current		210					•					•		•	•													•
sensor		220														•	•	•	•	•	•	•						
Regenera-	No entry	(None)				(1)	(2)				(1)	(2)	(1)	(2)	•	(3)		(6)	(3)	(4)					(5)			
	R (RG					(1)	(2)				(1)	(2)	(1)	(2)		(3)	•	(6)	(3)	(4)	•	•			(5)			

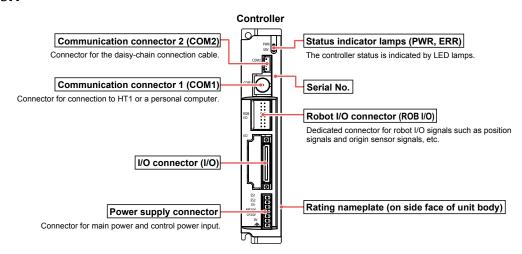
- (1) Regenerative unit is needed if using in a perpendicular position and movement stroke is 700mm or more.
 (2) Regenerative unit is needed if using in a perpendicular position.
 (3) Regenerative unit is needed if using in a perpendicular position, using at maximum speeds exceeding 1000mm per second, or if using high leads (40).
 (4) Regenerative unit is needed if using at maximum speeds exceeding 1000mm per second.
 (5) Regenerative unit is needed if using at maximum speeds exceeding 1250mm per second.
 (6) Regenerative unit is needed if using at maximum speeds exceeding 750mm per second.

TS-P

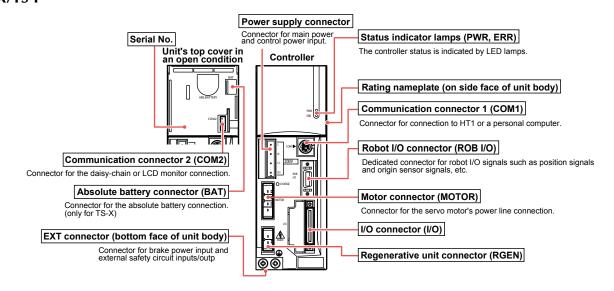
			MR12/12D	MF7/7D	MF15/15D	MF20/20D	MF30/30D	MF75/75D
_		105	•					
Power		110		•	•	•		
supply voltage /	TS-P	205	•					
Current		210		•	•	•		
sensor		220					•	•
_	No entry	(None)	•	•	•			
tive unit	R (RGT)					•	•	
	R (RGU-2							•

■ Part names

TS-S2/TS-SH



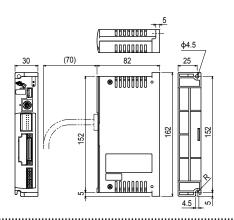
TS-X/TS-P



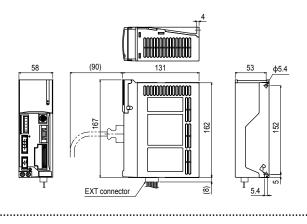
Option

■ Dimensions

TS-S2

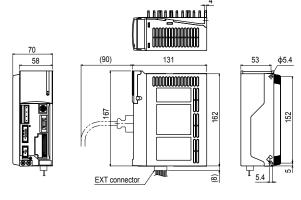


TS-X/TS-P (105/110/205/210)



TS-X/TS-P (220)

TS-SH



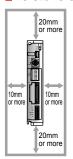
■ Installation conditions

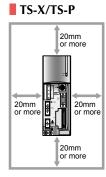
- Install the TS-S2/TS-SH/TS-X/TS-P inside the control panel.
- Install the TS-S2/TS-SH/TS-X/TS-P on a vertical wall.
- Install the TS-S2/TS-SH/TS-X/TS-P in a well ventilated location, with space on all sides of the TS-S2/TS-SH/TS-X/TS-P (See fig. at right.).

• Ambient temperature : 0 to 40°C

• Ambient humidity : 35 to 85% RH (no condensation)







■ Cautions on TS-S2 / TS-SH

For the RF type sensor specifications, the controllers "TS-S2" and "TS-SH" become "TS-S2S" and "TS-SHS", respectively.

TS-S2 / TS-SH (Standard specifications)

"BK" label is affixed to the front of the controller.

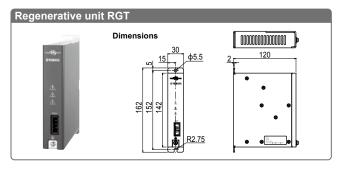


TS-S2S / TS-SHS (Sensor specifications)

"SENSOR" label is affixed to the front of the controller. (Be aware that "TS-S2S" is affixed to the front of the controller.)



■ Regenerative unit RGT/RGU-2



Basic specifications

Item	RGT
Model	KCA-M4107-0A
Dimensions	W30 × H142 × D118mm (Not including installation stay)
Weight	470g
Regenerative voltage	Approx. 380V or more
Regenerative stop voltage	Approx. 360V or less
Accessory	Cable for connection with controller (300mm)

Note. Always leave an empty space (gap of about 20mm) between this unit and the adiacent controller.

Also, always use the dedicated cable when connecting the controller.

Data structure

Point data

Parameter data

Data

Regenerative unit RGU-2 40 16 157 Dimensions 1 250 265 290

Basic specifications

Item	RGU-2 TS-P
Model	KCA-M4107-2A (Including accessory)
Dimensions	W40 × H250 × D157mm
Weight	0.9kg
Regenerative voltage	Approx. 380V or more
Regenerative stop voltage	Approx. 360V or less
Accessory	Cable for connection with controller (300mm)

Note. Always leave an empty space (gap of about 20mm) between this unit and the adjacent controller. Also, always use the dedicated cable when connecting the controller.

■ Data overview

Point data and parameter data settings must be specified in order to operate a robot from a TS series controller.

1

2

3

4 Accel.

5 Decel.

6 Push

P1 to P255

7

8

9

10 Jump

11 Flag

12 Timer

K1 to K20

RUN parameter

K21 to K39

I/O parameter

K80 to K99

Option parameter

K40 to K79, K100 to ...

Servo parameter

Zone (-)

Zone (+)

Near width

RUN type

Position

Speed

Point data

The point data used in positioning operations includes items such as the "RUN type", "Position", and "Speed", etc. Up to 255 points (P1 to P255) can be registered. There are two point data setting types: "Standard setting" type that automatically defines optimal positioning simply by specifying the payload and "Custom setting" type that allows setting the speed (mm/s) and acceleration (m/s²) in SI units. Select the desired setting type according to the application.

Parameter data

Parameter data is divided into the following categories: "RUN parameters", "I/O parameters", "option parameters", and "servo parameters".

Sets the point data to be used in positioning. Select the desired setting type ("standard setting" or "custom setting") according to the application.

Standard settingOptimum positioning is provided simply by

(2) Custom setting

specifying the payload.

Speed and acceleration can be set in SI units.

and return to-origin operations.

Specifies parameter settings related to positioning

Specifies parameter settings related to terminal assignments and I/O function selection.

Specifies parameter settings related to options such as CC-Link, etc.

Specifies parameter settings specified to the connected

These parameters are specified during initial processing.

Point data

Point data item list

1 011	i onit data itom not									
	P1 to P255									
	Item	Description								
1	RUN type	Specifies the positioning operation pattern.								
2	Position	Specifies the positioning target position or movement amount.								
3	Speed	Specifies the positioning speed.								
4	Accel.	Specifies the positioning acceleration.								
5	Decel.	Specifies the positioning deceleration (as a percentage of the acceleration).								
6	Push	Specifies the electrical current limit value for "Push" operations.								
7	Zone (-)	Charifica the "personal zone" output ronge								
8	Zone (+)	Specifies the "personal zone" output range.								
9	Near width	Specifies the "near width" zone (distance tolerance relative to target position).								
10	Jump	Specifies the next movement destination, or the next merge operation merge destination point No. following positioning completion.								
11	Flag	Specifies other information related to the positioning operation.								
12	Timer	Specifies the waiting time (delay) after positioning								

completion.

"Standard setting" and "custom setting"

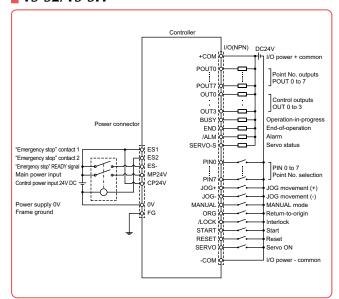
There are 2 setting types for point data ("standard setting" or "custom setting"). Select the desired setting type according to the application.

The maximum number of setting points for both setting types is 255 points (P1 to P255).

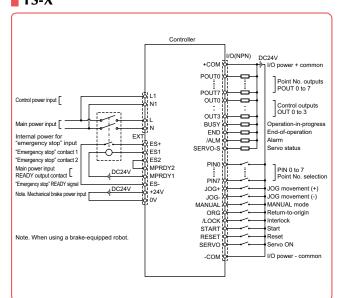
Setting Type	Description
Standard setting	Optimum positioning is provided simply by speci- fying the payload. This setting type is well-suited to assembly and transport applications.
Custom setting	Allows changing the speed and acceleration in SI units so the desired positioning operation can be set. This setting type is suited for machining and inspection systems.

■ NPN type input / output wiring diagram

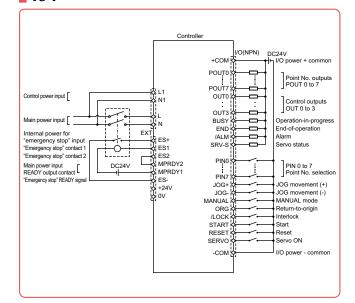
TS-S2/TS-SH



TS-X

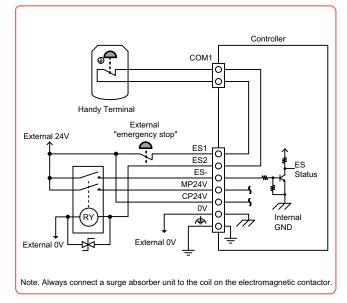


TS-P

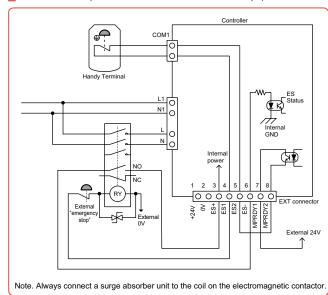


■ Emergency stop circuit example

TS-S2/TS-SH (power connector and host unit connection example)



TS-X/TS-P (EXT connector and host unit connection example)



Installing an external safety circuit will satisfy safety category class 4 standards. See P.613 for more information.

■ I/O Specifications

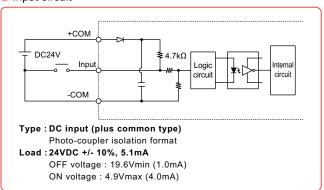
Item	Description
NPN	Input 16 points, 24VDC +/-10%, 5.1mA/point, positive common Output 16 points, 24VDC +/-10%, 50mA/point, sink type
	Input 16 points, 24VDC +/-10%, 5.5mA/point, minus common Output 16 points, 24VDC +/-10%, 50mA/point, source type
CC-Link	CC-Link Ver.1.10 compatible, Remote station device (1 node)
DeviceNet™	DeviceNet [™] Slave 1 node
EtherNet/IP™	EtherNet/IP [™] adapter (2 ports)
PROFINET	PROFINET Slave 1 node

■ I/O signals (NPN / PNP)

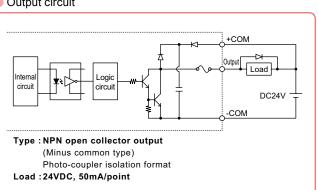
No.	Signal Name		Description	No.	Signal Name		Description	
A1	+COM	I/O p	power input, positive common	B1	POUT0			
A2	+COIVI	(24V	(24VDC +/-10%)		POUT1			
А3	NC	No	annation	В3	POUT2			
A4	NC	INO C	No connection		POUT3			
A5	PIN0			B5	POUT4		Point No. outputs	
A6	PIN1			В6	POUT5			
A7	PIN2			В7	POUT6			
A8	PIN3			В8	POUT7	uts		
A9	PIN4		Point No. select	В9	OUT0	Outputs	OUT0 to OUT3 assignments include: • Zone output	
A10	PIN5			B10	OUT1		Personal zone outputMANUAL mode status	
A11	PIN6			B11	OUT2		Return-to-origin end statusNEAR output	
A12	PIN7	Inputs		B12	OUT3		Movement-in-progressPush statusWarning output	
A13	JOG+	트	JOG movement (+ direction)	B13	BUSY		Operation-in-progress	
A14	JOG-		JOG movement (- direction)	B14	END		Operation-end	
A15	MANUAL		MANUAL mode	B15	/ALM		Alarm	
A16	ORG		Return-to-origin	B16	SRV-S		Servo status	
A17	/LOCK		Interlock	B17	NC	No.		
A18	START		Start	B18	NC	NO C	onnection	
A19	RESET		Reset	B19	COM	1/0 -	cover input possible common (0) ()	
A20	SERVO		Servo ON	B20	- COM I/O power input, negative common (0V)			

■ NPN type I/O circuit details

Input circuit

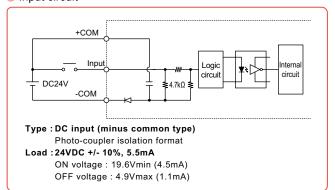


Output circuit

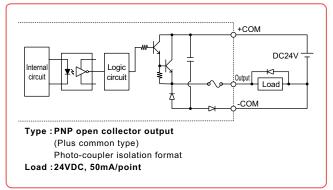


■ PNP type I/O circuit details

Input circuit



Output circuit



LCC140 TS-X

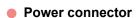
TS-X

TS-SH

Accessories and part options

TS-S2/TS-SH/TS-X/TS-P

Standard accessories

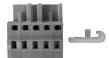




		TS-S2
Model	KCC-M4421-00	TS-SH
		TS-SD

Power connector (AC100V specifications)

Included when 100V model is purchased



	 	TS-X
Model	KCA-M5382-00	TC_D
		13-1

Power connector (AC200V specifications)

Included when 200V model is purchased





		TS-P_
		SR1-X
Model	KAS-M5382-00	SR1-P
	•	RCX221
		RCX222
		RCX240/S

EXT connector

For braking power and safety circuit connections.



	140A M5070 00	— (тs-х
Model	KCA-M5370-00	TC D
		— (13-Р

Dummy connector



		13-32
	WOA ME400 00	— (ТS-SH
Model	KCA-M5163-00	TS-X
		TC D

I/O cables (2m/20-core×2)



		TS-S2
		TS-SH
Model	KCA-M4421-20	
	_	<u></u>
		TS-P

Absolute battery

Absolute battery basic specifications				
Item	For TS-X	For TS-SH		
Battery type	Lithium metallic battery			
Battery capacity	3.6V / 1,650mAh 3.6V / 2,750mAh			
Data holding time	About 1 year (in state with no power applied)			
Dimensions	ф18 × L50mm	φ17 × L53mm		
Weight	24g	22g		







Model	KCA-M53G0-10 (For TS-X)
Model	KCA-M53G0-01 (For TS-SH)

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.

CC-Link connector (CC-Link specifications)

Included when CC-Link model is purchased





Madal	Connector Note.	KCA-M4872-00 KCA-M4873-00	
Model	Jump socket	KCA-M4873-00	
Note. This is a single connector type. (Insert type con			

	Connector Note. KCA-M4872-00		TS-S2
۱.		KCA-M4873-00	TS-SH
This is a single connector type. (Insert two con-		TS-X	
nectors into a branching socket.)			TS-P

See next page for optional parts

■ Options

Handy terminal HT1/HT1-D





		HT1	HT1-D
Model	3.5m	KCA-M5110-0J	KCA-M5110-1J
wodei	10m	KCA-M5110-6J	KCA-M5110-7J
Enable switch		_	3-position
CE marking		Not supported	Applicable

TS-S2)
TS-SH	D
TS-X)
TS-P)
	TS-SH TS-X

Support software **TS-Manager**



		_ ?
Model	KCA-M4966-0J (Japanese)	_ (
	KCA-M4966-0E (English)	_ (
		_ ;

TS-S2 rs-sh TS-X TS-P TS-SD

TS-Manager environment

os	Microsoft Windows 2000 / XP / Vista (32bit/64bit) / 7 (32bit/64bit)
CPU	Exceeding the environment recommended by the OS being used
Memory	Exceeding the environment recommended by the OS being used
Hard disk	Vacant capacity of more than 20MB in the installation destination drive
Communication port	Serial (RS-232C), USB
Applicable controllers	TS-S2 / TS-SH / TS-X / TS-P / TS-SD
- ' '	

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.

Data cables

Communication cable for TS-Manager. Select from USB cable or D-sub cable.



Madal	USB type (5m) D-Sub type (5m)	KCA-M538F-A0
wodei	D-Sub type (5m)	KCA-M538F-01

Note. USB driver for communication cable can also be downloaded from our website.

TS-S2 TS-SH TS-X TS-P TS-SD

> TS-S2 TS-SH

> > TS-X

TS-P

Daisy chain and gateway connection cable



Model	KCA-M532L-00 (300mm)
Model	KCA-M532L-00 (300n

TS-SD

CC-Link termination connector (CC-Link specifications)



13-32		
TS-SH		
13-311	KCA-M4874-00	Model
TS-X	11071-1014-00	WIOGCI
_==	,	
TS-P		



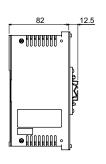
	Madal	For TS-X	KCA-M5119-00	TS-X
Model	Model	For TS-P	KCA-M5119-10	TS-P

DIN rail mounting bracket (This bracket is provided in TS-SH as standard equipment.)



For TS-S2

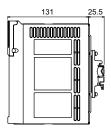
KCC-M499A-00



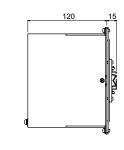


Model

TS-S2



(TS-X	
(TS-P	



For TS-X / TS-P	TS-X	Madal	For TS-X / TS-P with RGT
KCA-M499A-00	TS-P	wodei	KCA-M499A-10

MEMO

TS-SD

CE complianceOnly for pulse train controlDedicated for TRANSERVO

The TS-SD is a high-performance robot driver specifically designed for the TRANSERVO series that supports pulse train command input.

Main functions ▶ **P.57**



■ Basic specifications			
Item	Model	TS-SD	

	Item	Model	TS-SD
SL	Number of c	controllable axes	Single-axis
Ę	Controllable	robots	TRANSERVO series Note
ig	Current con:	sumption	3A (Rating) 4.5A (Max.)
eci	Dimensions		W30 × H162 × D82mm
Basic specifications	Weight		Approx. 0.2kg
sic	Input power	Control power supply	DC24V +/-10%
B	supply	Main power supply	DC24V +/-10%
_	Operating m	nethod	Pulse train control
Axis control	Control met	hod	Closed loop vector control method
္ပ	Position det	ection method	Resolver
XiS	Resolution		20480 P/rev, 4096 P/rev
⋖	Origin searc	ch method	Incremental
'n			Line driver method : 500 kpps or less
External input/output	Pulse train command input		Open collector method : 100 kpps or less (DC5 to 24V +/-10%)
inp	Input		Servo ON (SERVO), reset (RESET) origin search (ORG)
ternal	Output		Servo status (SRV-S), alarm (/ALM), positioning completion (IN-POS), return-to-origin end status (ORG-S)
	External cor	mmunications	RS-232C 1CH
Options	Support soft	tware for PC	TS-Manager
	Operating to	emperature	0°C to 40°C
	Storage tem	perature	-10°C to 65°C
ons	Operating h	umidity	35% to 85%RH (non-condensing)
äţ	Storage hun	nidity	10% to 85%RH (non-condensing)
specifications	Atmosphere	•	Indoor location not exposed to direct sunlight. No corrosive , flammable gases, oil mist, or dust particles
Seneral	Anti-vibratio	n	All XYZ directions 10 to 57Hz unidirectional amplitude 0.075mm 57 to 150Hz 9.8m/s ²
	Protective functions		Position detection error, overheat, overload, overvoltage, low voltage, position deviation, control power voltage drop, overcurrent, motor current error, CPU error, motor line disconnection, command speed over, pulse frequency over

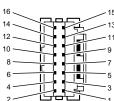
Note. Except for RF type sensor specifications and STH type vertical specifications.

■ I/O signal table

No.	Signal Name	Description
1	+COM	I/O power supply input (DC 24V +/- 10%)
2	OPC	Open collector power supply input
3	PULS1	Command pulse input 1
4	PULS2	Command pulse input 2
5	DIR1	Command direction input 1
6	DIR2	Command direction input 2
7	ORG	Return-to-origin
8	NC	Prohibited to use this signal.
9	RESET	Reset
10	SERVO	Servo ON
11	ORG-S	Return-to-origin end status
12	IN-POS	Positioning completion
13	/ALM	Alarm
14	SRV-S	Servo status
15	-COM	I/O power supply input (0V)
16	FG	Ground

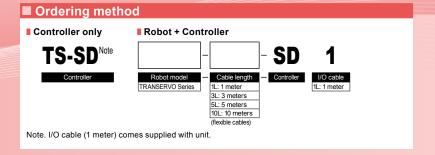
TS-SD

I/O connector

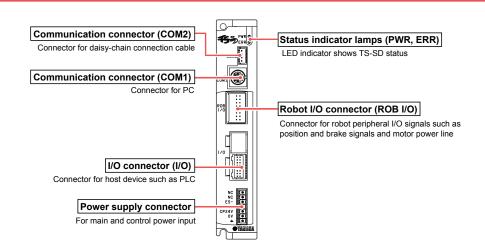




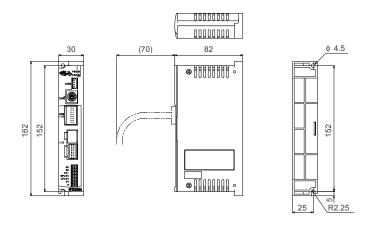
■ Model Ove	rview		
Name		TS-SD	
Controllable robot		Dedicated compact single-axis TRANSERVO	
Input nower	Main power supply	DC24V +/-10% maximum	
Input power	Control power supply	DC24V +/-10% maximum	
Operating method		Pulse train control	
Maximum number of controllable axes		Single-axis	
Origin search method		Incremental	



■ Part names



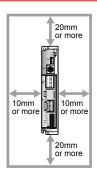
■ Dimensions



TS-SD

■ Installation conditions

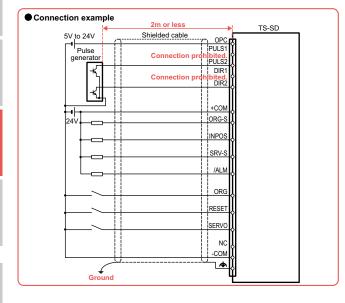
- Install the TS-SD inside the control panel.
- Install the TS-SD on a vertical wall.
- Install the TS-SD in a well ventilated location, with space on all sides of the TS-SD (See fig. at right.).
- Ambient temperature: 0 to 40°C
- Ambient humidity : 35 to 85% RH (no condensation)



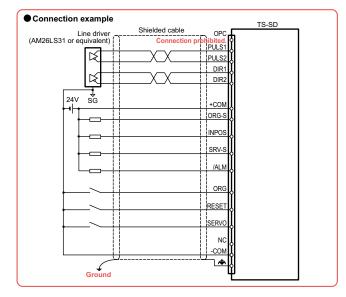
■ I/O signal list						
Туре	Signal Name	Open collector	Line driver	Description		
	OPC	Open collector power supply input	(Connection prohibited. Note 2)	Input the power supply for the open collector. (DC5 to 24V +/- 10%)		
	PULS1	(Connection prohibited. Note 1)	Command pulse input (+)	Input terminal for pulse train input commands. Select from 3		
	DIR1	(Connection prohibited. Note 1)	Command direction input (+)	command forms by changing parameters.		
	PULS2	Command pulse input	Command pulse input (-)	Phase A/Phase B input		
Inputs	DIR2	Command direction input	Command direction input (-)	Pulse/Sign input CW/CCW input		
	ORG	Return-to-origin	←	Starts return-to-origin when ON and stops it when OFF.		
	RESET	Reset	←	Alarm reset		
	SREVO	Servo ON	←	ON: servo on; OFF: servo off.		
	ORG-S	Return-to-origin end status	←	ON at return-to-origin end.		
Outputs	IN-POS	Positioning completion	←	ON when accumulated pulse in deviation counter are within specified value range.		
	/ALM	Alarm	←	ON when normal. OFF when alarm occurs.		
	SRV-S	Servo status	←	ON when servo is on.		

Note 1. When using the open collector specifications, do not connect any signal to the PULS1 and DIR1 terminals. Doing so may cause the driver to malfunction or breakdown. Note 2. When using the line driver specifications, do not connect any signal to the OPC terminal. Doing so may cause the driver to malfunction or breakdown.

■ Input / output signal connection diagram [open collector]



■ Input / output signal connection diagram [line driver]



■ Daisy chain function

Connecting two or more TS series controllers and drivers in a daisy chain allows editing data on any one unit from a PC.

- Up to 16 units connectable
- Requires daisy chain coupler cables.



Accessories and part options



Standard accessories

Power connector



		TS-S2
Model	KCC-M4421-00	TS-SH
		TS-SD

I/O cables (1m)



Model	KCC-M5362-00	TS-SD
-------	--------------	-------

■ Options

Support software TS-Manager





		KCA-M4966-0J (Japanese)
		KCA-M4966-0E (English)

	TS-S2
-	TS-SH
-	TS-X
-	TS-P
	TS-SD

TS-Manager environment

os	Microsoft Windows 2000 / XP / Vista (32bit/64bit) / 7 (32bit/64bit)
CPU	Exceeding the environment recommended by the OS being used
Memory	Exceeding the environment recommended by the OS being used
Hard disk	Vacant capacity of more than 20MB in the installation destination drive
Communication port	Serial (RS-232C), USB
Applicable controllers	TS-S2 / TS-SH / TS-X / TS-P / TS-SD

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.

Data cables

Communication cable for TS-Manager. Select from USB cable or D-sub cable.





			TS-S2
Madal	USB type (5m)	KCA-M538F-A0	TS-SH
wodei	D-Sub type (5m)	KCA-M538F-A0 KCA-M538F-01	TS-X

Note.	USB driver for communication cable can also be
	downloaded from our website.

	_
TS-S2	J
TS-SH)
TS-X	Ō
TCD	

TS-P TS-SD

Daisy chain and gateway connection cable



		TS-SH
Model	KCA-M532L-00 (300mm)	TS-X
		TS-P
		TS-SD

RDV-X/RDV-P

Only for pulse train control

These are high-performance robot drivers for the FLIP-X series and PHASER series which support pulse train command input.



Main functions ▶ P.56



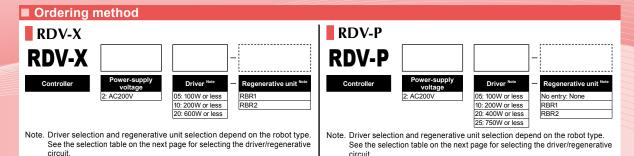
■ Basic specifications

	Item	Model		RDV-X			RD'	V-P				
Driver	model		RDV-X205	RDV-X210	RDV-X220	RDV-P205	RDV-P210	RDV-P220	RDV-P225			
Numbe	r of controllable	e axes	Single-axis									
Contro	llable robots		Single-axis robo	ot FLIP-X		Linear motor single-axis robot PHASER						
suc	Capacity of the	connected motor	200V 100W or less 200V 200W or less 200V 600W or less 20			200V 100W or less 200V 200W or less 200V 400W or less 200V 750W or le						
atic	Maximum pow	er consumption	0.3kVA	0.5kVA	0.9kVA	0.3kVA	0.5kVA	0.9kVA	1.3kVA			
cific	Dimensions		W40×H160×D14	10mm	W40×H160×D170mm	W40×H160×D1	40mm	W40×H160×D170mm	W55×H160×D170mm			
be	Weight		0.7kg		1.1kg	0.7kg 1.1kg 1.2kg						
Basic specifications	Input power	Control power supply	Single phase 20	00 to 230V +10%	, -15%, 50/60Hz	z +/-5%						
Bas	supply	Motor power supply	Single phase / 3	3-phase 200 to 2	30V +10%, -15%	6, 50/60Hz +/-5%	6					
<u> </u>	Position detect	ion method	Resolver			Magnetic linear	scale					
Axis control	Control system	1	Sine-wave PWN	/I (pulse width m	odulation)				_			
Sis C	Control mode		Position control	Position control								
₹	Maximum spee	ed Note 1	5000rpm			3.0m/s			_			
nction	Position comm	and input	Line driver signal (2M pps or less) (1) Forward pulse + reverse pulse (2) Sign pulse + Command pulse (3) 90-degree phase difference 2-phase pulse command One of (1) to (3) is selectable.									
Input/output related function	Input signal		24V DC contact point signal input (usable for sink/source) (24V DC power supply incorporated) (1) Servo ON (2) Alarm reset (3) Torque limit (4) Forward overtravel (5) Reverse overtravel (6) Origin sensor Note 3 (7) Return-to-origin (8) Pulse train input enable (9) Deviation counter clear									
ut rel	Output signal		Open collector signal output (usable for sink/source) (1) Servo ready (2) Alarm (3) Positioning completed (4) Return-to-origin complete									
d	Relay output si	gnal	Braking cancel signal (24V 375mA) -									
Input/o	Position output	i	Phase A, B signal output: Line driver signal output Phase Z signal output: Line driver signal output / open collector signal output N/8192 (N=1 to 8191), 1/N (N=1 to 64) or 2/N (N=3 to 64)									
	Monitor output		Selectable items: 2ch, 0 to +/-5V voltage output, speed detection value, torque command, etc.									
	Display		5-digit number indicator, Control power LED									
	External opera	tor	PC software "RDV-Manager" monitoring function, parameter setting function, operation tracing function, trial operation function, etc. USB2.0 is used. Windows Vista / 7 / 8 / 8.1 personal computer can be connected.									
cţi	Regenerative b	oraking circuit	Included (but wi	thout braking re	sistor)							
Internal function	Dynamic brake	Note 4	Included (Operation conditions can be set.) (No DB resistor, connection: 2-phase short circuit) Included (Operation conditions can be set.) (No DB resistor, connection: 2-phase short circuit) Included (Operation conditions can be set.) (No DB resistor, connection: 2-phase short circuit)									
	Protective fund	ction Note 2	Semi-enclosure	type (IP20)								
	Protective fund	ctions	Over-current, overload, braking resistor overload, main circuit overvoltage, memory error, etc.									

RDV-X/RDV-P



■ Model O	■ Model Overview								
	Name	RDV-X	RDV-P						
Co	ntrollable robot	Single-axis robot FLIP-X Note 1	Linear motor single-axis robot PHASER						
Innut nower	Main power supply	Single phase / 3-phase 200 to 230V +10% to -15% (50/60Hz +/-5%)							
Input power	Control power supply	Single phase 200 to 230V +10% to -15% (50/60Hz +/-5%)							
Op	erating method	Pulse train control							
Maximum nu	mber of controllable axes	Single-axis							
Origi	in search method	Incremental							



	Item		RDV-X			RDV-P					
Driver	model	RDV-X205	RDV-X210	RDV-X220	RDV-P205	RDV-P210	RDV-P220	RDV-P225			
Ö	Support software for PC	RDV-Manager									
sus	Operating temperature	0°C to +55°C									
General specifications	Storage temperature Note 5	-10°C to +70°C									
Sen	Operating humidity	20% to 90%RH (non-condensing)									
spe	Vibration Note 6	5.9m/s ² (0.6G) 10 to 55Hz									

Note 1. These data are parameters and calculation range in controlling the robot driver and do not indicate the capacity of the robot at the maximum speed.

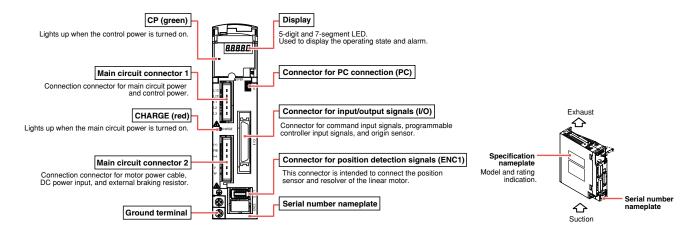
Note 2. JIS C 0920 (IEC60529) is used as the base for the protection method.

Note 3. GXL-8FB (made by SUNX) or FL7M-1P5B6-Z (made by YAMATAKE) is used for the origin sensor. The power consumption of the origin sensor is 15mA or less (at open output) and only 1 unit of the origin sensor is connected to each robot driver. (future specification)

Note 4. Use the dynamic brake for emergency stop. Note that the braking may be less effective depending on the robot model.

Note 5. The storage temperature is the temperature in the non-energized state including transportation. Note 6. The JIS C 60068-2-6:2010 (IEC 60068-2-6:2007) test method is uses as the base.

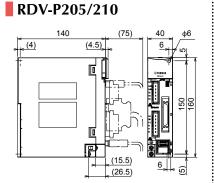
■ Part names



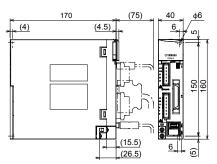
Optic

■ Dimensions

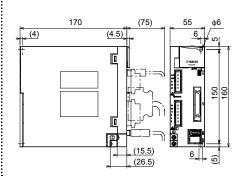
RDV-X205/210







RDV-P225



■ Driver / regenerative unit selection table

RDV-X

																FLI	P-X													
			T4LH/ C4LH	T5LH/ C5LH	T6L/ C6L	Т9	тэн	F8/ C8	F8L/ C8L	F8LH/ C8LH	F10/ C10	F10H	F14/ C14	F14H/ C14H	GF14XL	F17/ C17	F17L/ C17L	GF17XL	F20/ C20	F20N	N15	N18	N15D	N18D	B10	B14	B14H	R5	R10	R2
		05	•	•	•	•		•	•	•	•		•												•	•		•	•	
Driver selection	RDV-X	10					•							•													•			•
Selection		20										•			•	•	•	•	•	•	•	•	•	•						
Regenera-	No en (None	try e)	•	•																										
	RBR	1			•	•	•	•	•	•	•	•	•	•	•	0	0	•	0	•	•	•	•	•	•	•	•	•	•	•
	RBR	2														0	0		0											

• If placed horizontally the RBR1 is required, if placed vertically then RBR2 is required.

RDV-P

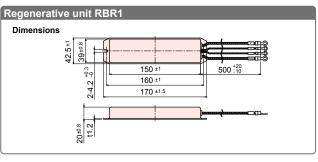
			PHASER							
			MR12/ MR12D	MF7/ MF7D	MF15/ MF15D	MF20/ MF20D	MF30/ MF30D	MF75/ MF75D		
	RDV-P	05	•							
Driver		10		•	•	•				
selection	KDV-P	20					•			
		25						•		
Regenera-	No entry (None)		•							
tive unit	RBR1			•	•	•	•			
	RBR2	2						•		

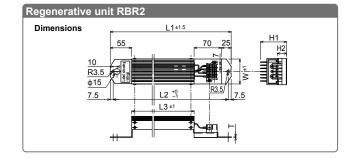
■ Regenerative unit RBR1 / RBR2 dimensions

The regenerative unit is a device that converts the braking current generated when the motor decelerates into heat.

Regenerative unit is required for specified Yamaha models and for operation with loads having large inertia.







Regenerative unit RBR1 / RBR2 basic specifications

Trogonorativo anne representa	- Regenerative and REPART Basis specifications									
Item	RBR1	RBR2								
Model	KBH-M5850-00	KBH-M5850-10								
Capacity type	120W	200W								
Resistance value	100Ω	100Ω								
Permissible braking frequency	2.5%	7.5%								
Permissible continuous braking time	12 sec.	30 sec.								
Weight	0.27kg	0.97kg								

Note. The internal thermal contact point capacity is AC250V, 2A max. ON (b contact

point) in the normal state.

Note. The built-in thermal fuse prevents abnormal heat generation which occurs by

an erroneous use. (not resettable)

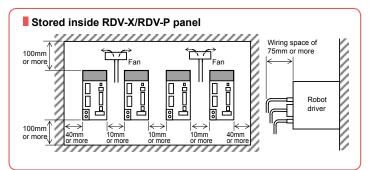
Note. When the thermal relay has worked, reduce the regeneration energy by either stopping the servo amplifier or making the deceleration time longer.

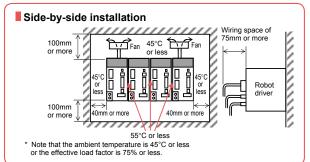
stopping the servo amplifier or making the deceleration time longer.

Note. With the regenerative unit, specifications and whether or not required may vary depending on each robot and its operation conditions.

■ Installation conditions

- Install the RDV-X/RDV-P on a vertical metal wall.
- Install the RDV-X/RDV-P in a well ventilated location, with space on all sides of the RDV-X/RDV-P.
- Ambient temperature: 0 to 55°C
- · Ambient humidity: 20 to 90% RH (no condensation)
- · When placing two or more robot drivers in one operating panel, install them as shown in the figure below.





Description

■ List of RDV-P / RDV-X terminal functions

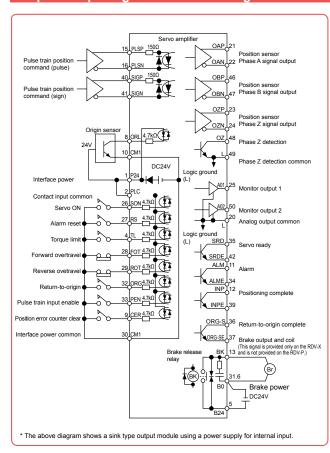
Terminal name

Termin

symbol

Type

■ Input / output signal connection diagram



		P24	Interface power	Supplies 24V DC for contact inputs. Connecting this signal to the PLC terminal allows using the internal power supply. Use this terminal only for contact input. Do not use for controlling external equipment connected to the driver, such as brakes.					
		СМ1	Interface power common	This is a ground signal for the power supply connected to P24. If using the internal power supply then input a contact signal between this signal and the contact-point signal.					
		PLC	Intelligent input common	Connect this signal to the power supply common contact input. Connect an external supply or internal power supply (P24).					
	ynal	SON	Servo ON	Setting this signal to ON turns the servo on (supplies power to motor to control it). Additionally, this signal is also used for estimating magnetic pole position when FA-90 is set to oFF4, oFF5.					
	Input signal	RS	Alarm reset	After an alarm has tripped, inputting this signal cancels the alarm. But before inputting this reset signal, first set the SON terminal to OFF and eliminate the cause of the trouble.					
		TL	Torque limit	When this signal is ON, the torque limit is enabled.					
		FOT	Forward overtravel	When this signal is OFF, the robot will not run in forward direction. (Forward direction limit signal)					
		ROT	Reverse overtravel	When this signal is OFF, the robot will not run in reverse direction. (Reverse direction limit signal)					
		ORL	Origin sensor	Input an origin limit switch signal showing the					
			_	origin area.					
		ORG	Return-to-origin Pulse train input	Inputting this signal starts return-to-origin operation. When this signal is turned on, the pulse train					
		PEN	enable	position command input is enabled.					
		CER	Position error counter clear	Inputting this signal clears the position deviation (position error) counter. (Position command value is viewed as current position.)					
	_	SRD SRDE	Servo ready	This signal is output when the servo is ready to turn on (with main power supply turned on and no alarms tripped)					
	Output signal	ALM ALME	Alarm	This signal is output when an alarm has tripped. (This signal is ON in normal state and OFF when an alarm has tripped.)					
	Outpr	INP INPE	Positioning complete	This signal is output when the deviation between the command position and current position is within the preset positioning range.					
		ORG-S ORG-SE	Return-to-origin complete	This signal is output when the return-to-origin is completed successfully.					
	Relay	BK (B24) ^{Note 1}	Brake release relay output	When the servo is ON, this terminal outputs a signal to allow releasing the brake. (FLIP-X series only)					
		AO1	Monitor output 1	Outputs speed detection values, torque commands,					
	Monitor output	AO2	Monitor output 2	etc. as analog signal voltages for monitoring. Signals to output are selected by setting parameters. These signals are only for monitoring. Do not use for control.					
	δ	L	Monitor output common	This is the ground for the monitor signal.					
		PLSP	Position	Select one of the following signal forms as the					
	on	PLSN	command pulse (pulse signal)	pulse-train position command input.					
	Position	SIGP	Position	Command pulse + direction signal Forward direction pulse train + reverse					
	ш 8	SIGN	command pulse (sign signal)	direction pulse train 3. Phase difference 2-phase pulse					
		OAP	Position concer	Outputs manitar signal obtained by dividing					
	itor	OAN	Position sensor Phase A signal	Outputs monitor signal obtained by dividing "phase A" signal of position sensor.					
	nor	ОВР	Position sensor	Outputs monitor signal obtained by dividing					
	or n	OBN	Phase B signal	"phase B" signal of position sensor.					
	ensi	OZP	Position sensor	Outputs monitor signal for position sensor "phase Z"					
	n St	OZN	Phase Z signal	signal.					
	Position sensor monitor	oz	Phase Z detection	Outputs monitor signal for position sensor "phase 7"					
	Po	L	Phase Z detection	Outputs monitor signal for position sensor "phase Z" signal.					
		ı~	common						

Common terminal input for brake power

Brake power input Input 24V DC brake power to this terminal.

B24

B24 B0 N

Accessories and part options

RDV-X/RDV-P

Standard accessories

I/O connector (no brake wiring)



RDV-X Model KBH-M4420-00 RDV-P

I/O connector (with brake wiring)



(RDV-X) KBH-M4421-00 Model RDV-P

Power supply connector



RDV-X Model KEF-M4422-00 RDV-P

■ Options

Support software **RDV-Manager**





Model	KEF-M4966-00

RDV-X

Environment

os	Microsoft Windows Vista (32bit) Note 1 / 7 (32bit/64bit) / 8, 8.1 (32bit/64bit)
CPU	Pentium4 1.8GHz or more (Recommend)
Memory	1GB or more
Hard disk	1GB of available space required on installation drive.
Disk operation	USB
Applicable controllers	RDV-X / RDV-P

Note 1. SP1 (service pack 1) or higher.

Note. Windows Vista, Windows 7, and Windows 8 / Windows 8.1 are trademarks of Microsoft Corporation registered in U.S.A. and other countries.

Communication cable Communication cable to connect PC and a controller.



Model	KEF-M538F-00

MEMO

ERCD

Dedicated for T4L / T5L / C4L / C5L

Low price and compact in size. In addition to the conventional functions, a pulse train function is added for a wider application range. This is a dedicated controller for the FLIP-X series models T4L, T5L, C4L, and C5L.

Main functions ▶ P.62





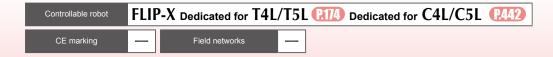


ERCD

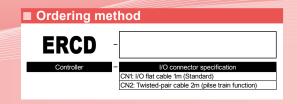
■ Basic specifications

	11.			Madal	FDOD					
NI	Iter	m er of controll	lable aves	Model	ERCD Single-axis					
		llable robots		,	Single-axis robot FLIP-X series T4L / T5L / C4L / C5L					
			connected	motor	DC24V 30W or less					
catio	Dir	nensions	connecteu	IIIOlOI	W44 × H166 × D117mm					
pecifi	M			,						
Basic specifications	loo	eight	nnlı.		0.45kg DC24V +/-10% maximum 3A to 4.5A (Variable depending on robots in use.)					
ä	l i	ut power su ve method	рріу		full-digital software servo					
	-	sition detect	ion mothod		•					
	<u> </u>				solver rmal mode: point trace movement, program operation, operation using RS-232C communication					
2	Op	erating met	hod		Pulse Train mode: operation by pulse train input					
Axis control	Pos	sition indica	tion units		mm (millimeters)					
is	Sp	eed setting			1% to 100% (Setting by 1% unit)					
â	Ac	celeration se	etting		Automatic speed setting per robot No. and payload Setting based on acceleration and deceleration parameter 1% to 100% (Setting by 1% unit)					
	Re	solution			16384 P/rev					
	Origin search method				Incremental					
Program	Pro	ogram langu	age		YAMAHA SRC					
ogra	Mu	Ititasks			4 tasks					
P	Poi	int-data inρι	ut method		Manual data input (coordinates input), Direct teaching, Remote teaching					
Š	RA				32 Kbytes with lithium battery backup (5-year life) Retains programs, point data, parameters and alarm history					
Memory	Pro	ograms			100 programs (Maximum program number) 255 steps per program 1024 steps / total or less					
ž	Poi	ints			1000 points (256 when point tracing)					
		Normal mode Note 1	Sequence inp	out	Dedicated input 8 points, General input 6 points					
		mode Note 1	Sequence output		Dedicated input 3 points, General input 6 points, Open collector output					
			Sequence inp	out	Dedicated input 5 points, General input 6 points					
			Sequence ou	tput	Dedicated input 3 points, General input 6 points, Open collector output					
Ħ	Se	Pulse train mode Note 1		Туре	1.Phase A / phase B, 2.Pulse / code, 3.CW / CCW					
External input/output	interface		Command pulse input	Mode	Line driver (+5V)					
ďξ				Frequency	Maximum 2 Mpps					
inp	2			Terminal name	PA+, PA-, PB+, PB-, PZ+, PZ-					
nal		Feedback		Туре	Phase A / phase B / phase Z					
cter		pulse outpu	ıt	Mode	Line driver (+5V)					
ш				Number of pulse	16 to 4096 P/rev					
		Power supply for sequence I/O			External DC +24V input					
	Em	ergency sto	p input		Normal close contact point input					
	Bra				Relay output (for 24V/300mA brake) 1CH					
	External communications				RS-232C 1CH (For communication with HPB or PC)					

ERCD



■ Model Overview	
Name	ERCD
Controllable robot	Deicated for T4L / T5L / C4L / C5L
Input power	DC24V +/-10% maximum 3A to 4.5A (Variable depending on robots in use.)
Operating method	Pulse train control / Programming / I/O point tracing / Operation using RS-232C communication
Maximum number of controllable axes	Single-axis
Origin search method	Incremental



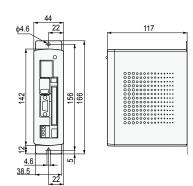
		Item Model	ERCD
Suo		Programming box	HPB, HPB-D (with enable switch)
	Options	Support software for PC	POPCOM+
	Su	Operating temperature	0°C to 40°C
	eral atio	Storage temperature	-10°C to 65°C
	ine fice	Operating humidity	35% to 85%RH (non-condensing)
	Gener	Noise resistance capacity	IEC61000-4-4 Level 2
		Protective functions	Overload overvoltage voltage drop resolver wire breakage runaway detection, etc.

Note 1. Switching between the normal mode and pulse train mode is done by use of the parameter.

■ Part names

Status LED lamp (PWR, ERR) Robot I/O connector HPB connector I/O. CN connector Power terminal block (24P, 24N, FG) EXT. CN connector

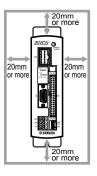
■ Dimensions



■ Installation conditions

- Install the ERCD inside the control panel.
- Install the ERCD on a vertical wall.
- Install the ERCD in a well ventilated location, with space on all sides of the ERCD (See fig. below).

• Ambient temperature : 0 to 40°C · Ambient humidity : 35 to 85% RH (no condensation)



Option

■ Connector I/O signals

ERCD

Terminal number	Signal name	Function
A-1	ABS-PT	Move the point from the origin position
B-1	INC-PT	Move the point from the current position
A-2	AUTO-R	Start automatic operation
B-2	STEP-R	Start step operation
A-3	ORG-S	Return to the origin
B-3	RESET	Reset
A-4	SERVO	Return to servo on
B-4	LOCK	Interlock
A-5	DI 0	General input 0
B-5	DI 1	General input 1
A-6	DI 2	General input 2
B-6	DI 3	General input 3
A-7	DI 4	General input 4
B-7	DI 5	General input 5
A-8	(SVCE)	Service mode input
B-8	DO 5	General output 5
A-9	DO 0	General output 0
B-9	DO 1	General output 1
A-10	DO 2	General output 2
B-10	DO 3	General output 3
A-11	DO 4	General output 4
B-11	END	End normal execution
A-12	BUSY	Executing the command
B-12	READY	Ready for operation
A-13	FG	Frame ground
B-13	FG	Frame ground
A-14	GND	Signal ground
B-14	GND	Signal ground
A-15	NC	Reserved (use inhibited)
B-15	NC	Reserved (use inhibited)
A-16	NC	Reserved (use inhibited)
B-16	NC	Reserved (use inhibited)
A-17	PA+	Feedback pulse output
B-17	PA-	Feedback pulse output
A-18	PB+	Feedback pulse output
B-18	PB-	Feedback pulse output
A-19	PZ+	Feedback pulse output
B-19	PZ-	Feedback pulse output
A-20	NC	Reserved (use inhibited)
B-20	NC	Reserved (use inhibited)

■ Pulse train I/O connector signals

Terminal number	Signal name	Function
A-1	NC	Reserved (use inhibited)
B-1	NC	Reserved (use inhibited)
A-2	NC	Reserved (use inhibited)
B-2	PCLR	Differential clear input
A-3	ORG-S	Return to the origin input
B-3	RESET	Alarm reset input
A-4	SERVO	Servo-ON input
B-4	INH	Command pulse inhibition input
A-5	DI 0	General input 0
B-5	DI 1	General input 1
A-6	DI 2	General input 2
B-6	DI 3	General input 3
A-7	DI 4	General input 4
B-7	DI 5	General input 5
A-8	NC	Reserved (use inhibited)
B-8	DO 5	General output 5
A-9	DO 0	General output 0
B-9	DO 1	General output 1
A-10	DO 2	General output 2
B-10	DO 3	General output 3
A-11	DO 4	General output 4
B-11	IN-POS	In-position output
A-12	SRDY	Servo ready output
B-12	ALM	Alarm output
A-13	FG	Frame ground
B-13	FG	Frame ground
A-14	GND	Signal ground
B-14	GND	Signal ground
A-15	PULS+	Command pulse input
B-15	PULS-	Command pulse input
A-16	DIR+	Command direction input
B-16	DIR-	Command direction input
A-17	PA+	Feedback pulse output
B-17	PA-	Feedback pulse output
A-18	PB+	Feedback pulse output
B-18	PB-	Feedback pulse output
A-19	PZ+	Feedback pulse output
B-19	PZ-	Feedback pulse output
A-20	NC	Reserved (use inhibited)
B-20	NC	Reserved (use inhibited)

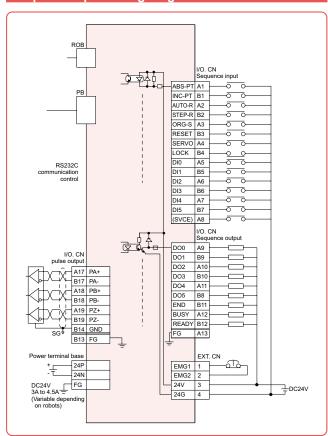
■ Robot Language Table

Command	Description	
MOVA	Moves to a point data position.	
MOVI	Moves from current position by amount of point data.	
MOVF	Moves until a specified DI input is received.	
JMP	Jumps to a specified label in the specified program.	
JMPF	Jumps to a specified label in a specified program according to the input condition.	
JMPB	Jumps to a specified label when general-purpose input or memory input is in the specified state.	
L	Defines the jump destination for a JMP or JMPF statement, etc.	
CALL	Runs another program.	
DO	Turns general-purpose output or memory output on or off.	
WAIT	Waits until general-purpose input or memory input is in the specified state.	
TIMR	Waits the specified amount of time before advancing to the next step.	
Р	Defines point variable.	
P+	Adds 1 to point variable.	
P-	Subtracts 1 from point variable.	
SRVO	Turns servo on or off.	
STOP	Temporarily stops program execution.	
ORGN	Performs return-to-origin.	
TON	Runs a specified task.	
TOFF	Stops a specified task.	

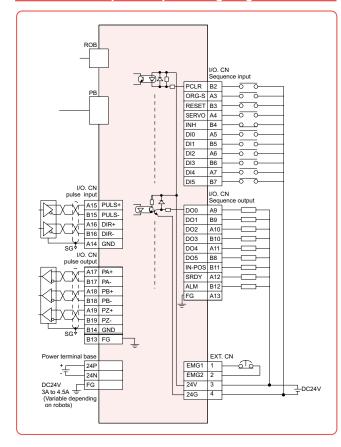
Command	Description
JMPP	Jumps to a specified label when the axis position condition meets the specified conditions.
MAT	Defines a matrix.
MSEL	Specifies a matrix to move.
MOVM	Moves to a specified pallet work position on matrix.
JMPC	Jumps to a specified label when the counter array variable C equals the specified value.
JMPD	Jumps to a specified label when the counter variable D equals the specified value.
CSEL	Specifies an array element for counter array variable C.
С	Defines counter array variable C.
C+	Adds a specified value to counter array variable C.
C-	Subtracts a specified value from counter array variable C.
D	Defines counter variable D.
D+	Adds a specified value to counter variable D.
D-	Subtracts a specified value from counter variable D.
SHFT	Shifts the coordinate position by amount of specified point data.
IN	Stores bit information on specified general-purpose input or memory input into counter variable D.
OUT	Outputs the value of counter variable D to specified generalpurpose output or memory output.
LET	Assigns the value of a specified variable to another variable.
TORQ	Defines the maximum torque command value.

ERCD

■ Input / output wiring diagram



■ Pulse train input / output wiring diagram



■ Pulse train input form

Logic	Command pulse form	CW direction	CCW direction
	Phase A / phase B		
Positive logic	Pulse / code	1	
	CW / CCW	7777	

Logic	Command pulse form	CW direction	CCW direction
Positive logic	Phase A / phase B		
Negative	Pulse / code		
logic	CW / CCW		

Accessories and part options



ERCD

Standard accessories

24V power connector (for EXT. CN)



Model	KAU-M4422-00	ERCD

I/O flat cable (CN1): 1m

Connects the standard parallel I/O to an external device. The end of the cable is cut and left as it is.



Model	KAU-M4421-00	ERCD
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I/O twisted-pair cable (CN2): 2m

Connects the parallel I/O to an external device. The end of the cable is cut and left as it is.

Note. Select CN2 when using the pulse train input equipment.



Model KAU-M4421-10	RCD
--------------------	-----

■ Options

Support software for PC (2554) POPCOM+

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



Model	KBG-M4966-00

LCC140 **ERCD** SR1-X SR1-P

Environment

OS	Microsoft Windows XP / Vista (32bit / 64Bit) / 7 (32bit / 64Bit)		
	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	50MB of available space required on installation drive.		
Disk operation	RS-232C		
Applicable controllers	SRCX/ERCX/DRCX/TRCX/SRCP/SRCD/ERCD/SR1/LCC140		

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.

Data cables

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





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

Note. This USB cable supports Windows 2000/XP or

Note. Data cable jointly used for POPCOM+, VIP+, RCX-Studio Pro

Note. USB driver for communication cable can also be downloaded from our website.

	SR1-X
_	SR1-P
	RCX221
	RCX222
е	RCX240/S
	RCX340

LCC140 ERCD

Programming box HPB/HPB-D

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





	HPB	HPB-D
Model	KBB-M5110-01	KBB-M5110-21
Enable switch	-	3-position
CE marking	Not supported	Applicable

LCC140
ERCD
SR1-X
SR1-P

MEMO

SR1-X/SR1-P

Robot controller with advanced functions

Compact design with high performance. Although with one axis, functions of upper class controllers.

Main functions ▶ P.62







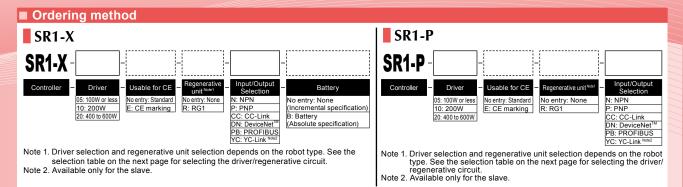
■ Basic specifications

-	Dasic spec	incations											
	Item	Model		SR1-X			SR1-P						
	Driver model		SR1-X05	SR1-X10	SR1-X20	SR1-P05	SR1-P10	SR1-P20					
	Applicable moto	or output	200V 100W or less										
	Number of cont	trollable axes	Single-axis	ngle-axis									
LS L	Controllable rol	oots	Single-axis robot F	FLIP-X (exclude T4	L, T5L)	Linear motor sin	gle-axis robot PHAS	ER					
iệi H	Maximum power	er consumption	400VA	600VA	1400VA	400VA	600VA	1400VA					
<u>i</u>	Capacity of the	connected motor	100W	200W	600W	100W	200W	600W					
specifications	Dimensions		W74 × H210 × D1	46mm	W99 × H210 × D146mm	W74 × H210 × D	146mm	W99 × H210 × D146mm					
. <u></u>	Weight		1.54kg		1.92kg	1.54kg		1.92kg					
Basic		Control power supply	Single phase AC1	00 to 115/200 to 2	30V +/-10% maximu	m 50/60Hz							
	Input power supply	Motor power supply	Single phase AC1 230V +/-10% maximum		Single phase AC200 to 230V +/-10% maximum 50/60Hz	Single phase AC 230V +/-10% maximur	100 to 115/200 to n 50/60Hz	Single phase AC200 to 230V +/-10% maximum 50/60Hz					
	Drive method		AC full-digital soft	ware servo									
	Position detecti	ion method	Multi-turn resolver	with data backup	function	Magnetic linear	scale						
-	Operating meth	nod	Programming, I/O point tracing, Remote command, Operation using RS-232C communication										
contro	Position indicat	ion units	mm (millimeters), deg (degrees)										
8	Speed setting		1% to 100% (Setting by 1% unit)										
Axis	Acceleration se	etting	Automatic speed setting per robot No. and payload Setting based on acceleration and deceleration parameter (Setting by 1% unit)										
	Resolution		16384 P/rev 1μm										
	Origin search n		Absolute, Incremental Incremental, Semi-absolute										
Program	Program langua	age	YAMAHA SRC										
oge	Multitasks		4 tasks maximum										
	Point-data inpu	t method	Manual data input (coordinate value input), Direct teaching, Teaching playback										
Memory	Programs		100 programs 255 steps / 1 programs 3000 steps / total										
ž	Points		1000 points										
	STD DIO	I/O input	Dedicated input 8 points, General input16 points										
		I/O output	Dedicated Output4 points, General output16 points										
¥	SAFETY		0 7 1	nput (Normal close	contact point input)	, service mode inp	ut						
븀	Brake output		Relay contact			-							
2	Origin sensor in		Connectable to DC 24V normally-closed contact sensor										
ع	External comm		RS-232C: 1CH (For communication with HPB / HPB-D or PC)										
=	Analog input/ou			0V) Output 2ch (0	to +10V)								
External input/output		Slots	1										
×								eral output 16 points					
ш	Options	Туре						neral output 32 points					
		.16-						neral output 32 points					
			PROFIBUS: Dedicated input 16 points, Dedicated Output 16 points, General input 32 points, General output 32 points										

Optio

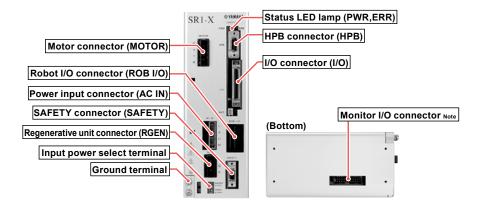


■ Model Overview					
Name	SR1-X	SR1-P			
Controllable robot	Single-axis robot FLIP-X	Linear motor single-axis robot PHASER			
	05 / 10 driver	20 driver			
Input power	Single phase 100 to 115V/200 to 230V +/-10% maximum (50/60Hz)	Single phase 200 to 230V +/-10% maximum (50/60Hz)			
Operating method	Programming / I/O point tr Operation using RS-	racing / Remote command / -232C communication			
Maximum number of controllable axes	Singl	e-axis			
Origin search method	Absolute/Incremental	Incremental/Semi-absolute			



Item	Model	SR1-X	SR1-P
Programming box Support software for P		HPB, HPB-D (with enable switch)	
Support software for P		POPCOM+	
© Operating temperature	:	0°C to 40°C	
'র্ন্ত Storage temperature		-10°C to 65°C	
Operating temperature Storage temperature Operating humidity Absolute backup batter	;	35% to 85%RH (non-condensing)	
Absolute backup batter	ry	Lithium metallic battery	_
Absolute data backup	period	1 year (in state with no power applied)	_
Noise immunity		IEC61000-4-4 Level 3	

■ Part names



Note. Cable for monitor I/O (option) is required when using this connector.

Option

Driver / regenerative unit selection table

SR1-X

															FLI	P-X												
			T4LH/ C4LH			Т9	Т9Н	F8/ C8	F8L/ C8L	F8LH/ C8LH	F10 C10	F10H	F14/ C14	F14H/ C14H	GF14XL	F17/ C17	F17L/ C17L	GF17XL	F20/ C20	F20N	N15/ N15D	N18/ N18D	B10	B14	B14H	R5	R10	R20
		05	•	•	•	•		•	•	•	•		•										•	•	•	•	•	
Driver selection	SR1-X	10					•					•		•	•													•
Selection		20														•	•	•	•	•	•	•						
Regenera-	No entry (I	None)	•	•	•	1	2	•	•	•	1	2	1	2	•	3		6	3	4			•	•	⑤	•	•	•
	R (RG1)					1	2				1	2	1	2		3	•	6	3	4	•	•			⑤			

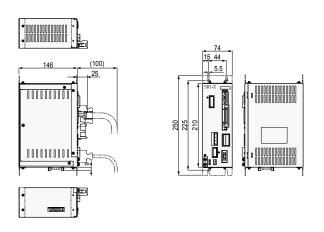
- ① Regenerative unit is needed if using in a perpendicular position and movement stroke is 700mm or more.
- Regenerative unit is needed if using at maximum speeds exceeding 1000mm per second.
 Regenerative unit is needed if using at maximum speeds exceeding 1250mm per second.
- Regenerative unit is needed if using at maximum speeds exceeding 1250mm per second
 Regenerative unit is needed if using at maximum speeds exceeding 750mm per second.
- Regenerative unit is needed if using in a perpendicular position.
 Regenerative unit is needed if using in a perpendicular position, using at maximum speeds exceeding 1000mm per second, or if using high leads (40).

SR1-P

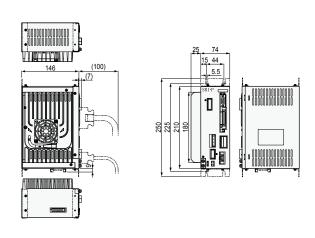
				PHASER											
			MR12/ MR12D	MR16/ MR16D	MR16H/ MR16HD	MR20/ MR20D	MR25/ MR25D	MF7/ MF7D	MF15/ MF15D	MF20/ MF20D	MF30/ MF30D	MF75/ MF75D			
		05	•	•											
Driver selection	SR1-P	10			•		•	•	•	•					
3616611011		20				•					•	•			
Regenera- No en			•	•	•	•	•	•	•						
tive unit R (R (RG1)								•	•				
	R (RGU											•			

■ Dimensions

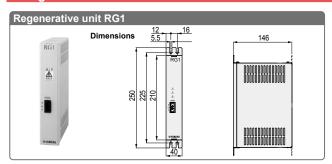
SR1-X/SR1-P 05 - 10



SR1-X/SR1-P 20



■ Regenerative unit RG1 / RGU-2



Basic specifications

Regenerative unit RGU-2

Basic specifications								
Item	RGU-2							
Model	KS5-M4107-0A (Including accessory)							
Dimensions	W40 × H250 × D157mm							
Weight	0.9kg							
Regenerative voltage	Approx. 380V or more							
Regenerative stop voltage	Approx. 360V or less							
Accessory	Cable for connection with controller (300mm)							

40

16

1

B | 5220 B | B | 530

lind.

Dimensions

157

Note. Always leave an empty space (gap of about 20mm) between this unit and the adjacent controller. Also, always use the dedicated cable when connecting the controller.

Basic specifications

2 date openimentations									
Item	RG1								
Model	KBG-M4107-0A (Including accessory)								
Dimensions	W40 × H210 × D146mm								
Weight	0.8kg								
Regenerative voltage	Approx. 380V or more								
Regenerative stop voltage	Approx. 360V or less								
Accessory	Cable for connection with controller (300mm)								

Note. Always leave an empty space (gap of about 20mm) between this unit and the adjacent controller. Also, always use the dedicated cable when connecting the controller.

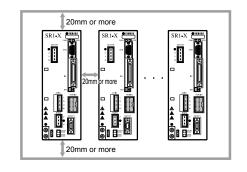
Option

■ Installation conditions

- Install the SR1-X/SR1-P inside the control panel.
- Install the SR1-X/SR1-P on a vertical wall.
- Install the SR1-X/SR1-P in a well ventilated location, with space on all sides of the SR1-X/SR1-P (See fig. at right.).

• Ambient temperature : 0 to 40°C

• Ambient humidity : 35 to 85% RH (no condensation)



■ [NPN, PNP type] Input/Output list

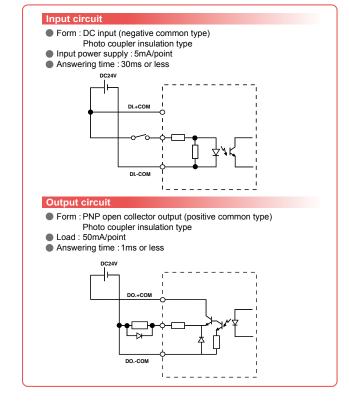
		in patroatpat not
Terminal number	Signal name	Function
1	DI.+COM	Input supply+common
2	SERVO	Return to servo on
3	INC-PT	Relative point transfer
4	ABS-PT	Absolute point transfer
5	STEP-R	Step run
6	DI 0	General input 0
7	DI 1	General input 1
8	DI 2	General input 2
9	DI 3	General input 3
10	DI 4	General input 4
11	DI 5	General input 5
12	DI 6	General input 6
13	DI 7	General input 7
14	DO.+COM	Output supply+common
15	DO.+COM	Output supply+common
16	END	Execution result (Execution complete)
17	BUSY	Executing the command
18	DO 0	General output 0
19	DO 1	General output 1
20	DO 2	General output 2
21	DO 3	General output 3
22	DO 4	General output 4
23	DO 5	General output 5
24	DO 6	General output 6
25	DO 7	General output 7

Terminal number	Signal name	Function
26	DICOM	Input supply-common
27	AUTO-R	Auto run
28	RESET	Reset
29	ORG-S	Return to the origin
30	ALMRST	Alarm reset
31	DI 8	General input 8
32	DI 9	General input 9
33	DI 10	General input 10
34	DI 11	General input 11
35	DI 12	General input 12
36	DI 13	General input 13
37	DI 14	General input 14
38	DI 15	General input 15
39	DOCOM	Output supply-common
40	DOCOM	Output supply-common
41	READY	Available to operate (Ready for operation)
42	UTL	Utility output
43	DO 8	General output 8
44	DO 9	General output 9
45	DO 10	General output 10
46	DO 11	General output 11
47	DO 12	General output 12
48	DO 13	General output 13
49	DO 14	General output 14
50	DO 15	General output 15

■ NPN type input/output circuit

Input circuit Form: DC input (positive common type) Photo coupler insulation type Input power supply: 5mA/point Answering time: 30ms or less DC24V DI.-COM Output circuit Form: NPN open collector output (negative common type) Photo coupler insulation type Load: 50mA/point Answering time: 1ms or less DC24V DO.-COM DO.-COM

■ PNP type input/output circuit



■ SAFETY connector signals			
Terminal number	Signal name	Meaning	
1	DI.COM	Input supply common	
2	LOCK	Interlock	
3	SVCE	SERVICE mode	
4	DO.COM	Output supply common	
5	MPRDY	Main power ready	
5 6 7	NC	NC	
7	NC	NC	
8	NC	NC	
9	NC	NC	
10	NC	NC	
11	EMG1	Emergency stop 1	
12	EMG2	Emergency stop 2	
13	NC	NC	
14	NC	NC	

14	NC NC		
■ Dob	of Language Table		
■ Rob	ot Language Table		
Command	Description		
MOVA	Moves to a point data position.		
MOVI	Moves from current position by amount of point data.		
MOVF	Moves until a specified DI input is received.		
JMP	Jumps to a specified label in the specified program.		
JMPF	Jumps to a specified label in a specified program according to the input condition.		
JMPB	Jumps to a specified label in a specified program when general-purpose input or memory input is in the specified state.		
L	Defines the jump destination for a JMP or JMPF statement.		
CALL	Runs another program.		
DO	Turns general-purpose output or memory output on or off.		
WAIT	Waits until general-purpose input or memory input is in the specified state.		
TIMR	Waits the specified amount of time before advancing to the next step.		
Р	Defines point variable.		
P+	Adds 1 to point variable.		
P-	Subtracts 1 from point variable.		
SRVO	Turns servo on or off.		
STOP	Temporarily stops program execution.		
ORGN	Performs return-to-origin.		
TON	Runs a specified task.		
TOFF	Stops a specified task.		
JMPP	Jumps to a specified label when the axis position condition meets the specified conditions.		
MAT	Defines a matrix.		
MSEL	Specifies a matrix to move.		
MOVM	Moves to a specified pallet work position on matrix.		
JMPC	Jumps to a specified label when the counter array variable C equals the specified value.		
JMPD	Jumps to a specified label when the counter variable D equals the specified value.		
CSEL	Specifies an array element for counter array variable C.		
С	Defines counter array variable C.		
C+	Adds a specified value to counter array variable C.		
C-	Subtracts a specified value from counter array variable C.		
D	Defines counter variable D.		
D+	Adds a specified value to counter variable D.		
D-	Subtracts a specified value from counter variable D.		
SHFT	Shifts the coordinate position by amount of specified point data.		
IN	Stores bit information on specified general-purpose input or memory input into counter variable D.		
OUT	Outputs the value of counter variable D to specified general-purpose output or memory output.		
LET	Shifts the coordinate position by amount of specified point data.		

Accessories and part options



SR1-X/SR1-P

Standard accessories

Power connector + wiring connection lever



Model KAS-M5382-00

SR1-X SR1-P RCX221 RCX222 RCX240/S

Safety connector





Connector plug model | KBG-M4424-00 Connector cover model KBG-M4425-00

SR1-P

LCC140

SR1-X

SR1-P

HPB dummy connector

Attach this to the HPB connector during operation with the programming box HPB removed.



Model KDK-M5163-00

SR1-X

NPN / PNP connector



Connector plug model | KBH-M4424-00 Connector cover model KBH-M4425-00

SR1-P RCX340

L type stay

Use to install the controller.



Model KBG-M410H-00

Note. Model No. is for a single bracket (L type stay).

SR1-X SR1-P

SR1-X

RCX222

RCX240/S

Absolute battery

Battery for absolute data back-up. (Not included with the SR1-P)

Basic specifications

Basic specifications		
Item	Absolute battery	
Battery type	Lithium metallic battery	
Battery capacity	3.6V/2,750mAh	
Data holding time	About 1 year (in state with no power applied)	
Dimensions	φ17 × L53mm	
Weight Note1	22g	



Model KAS-M53G0-1

Note 1. 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.

Battery case

This is the absolute battery holder.



		SR1-X
Model	KBG-M5395-00	RCX222
		RCX240/S

See next page for optional parts

LCC140 TS-X TS-P

RCX340

SR1-X/SR1-P

Options

Cable for monitor I/O

Cable to connect I/O connector of SR1 monitor. The cable is 1.5m long with its end cut and left

Required when using analog input / output and feedback pulse output.



	1/20 11/10/ 00	SR1-X
Model	KBG-M4421-00	SD1_D

Support software for PC (2554) POPCOM+

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



LCC140		
ERCD	KDC MARCO OR	Madal
SR1-X	KBG-M4966-00	Model
SR1-P		

Environment

os	Microsoft Windows XP / Vista (32bit/64bit) / 7 (32bit/64bit) 8,8.1 (32bit/64bit)	
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	50MB of available space required on installation drive.	
Disk operation	RS-232C	
Applicable controllers	SRCX/ERCX/DRCX/TRCX/SRCP/SRCD/ERCD/SR1/ LCC140 Note 1	

Note 1. LCC140 is applicable to Ver. 2.1.1 or later.

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.

Data cables

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





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

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

downloaded from our website.

RCX222 RCX240/S RCX340

(LCC140) ERCD SR1-X

SR1-P

RCX221

Programming box HPB/HPB-D

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



	HPB	HPB-D
Model	KBB-M5110-01	KBB-M5110-21
Enable switch	_	3-position
CE marking	Not supported	Applicable

_	LCC140
.1	ERCD
	SR1-X
_	SR1-P

Y-Link board (with connection cable)

		SR1-X
Model	KBG-M4400-60	SR1-P
		SKI-P

Note. Use the converter cable if changing to the SR1-X, SR1-P from a system using SRCX, SRCP. (See P.603).

MEMO

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.64







RCX222

■ Basic specifications

	Item	Model	RCX221	RCX221HP	RCX222	RCX222HP				
	Number of con	trollable axes	2 axes maximum							
specifications	Controllable ro	bots	Single-axis robot FLIP-X, Linear motor single-axis rol Cartesian robot XY-X, Pick		Single-axis robot FLIP-X, Cartesian robot XY-X, Pick & place robot YP-X					
ifica	Connected mo	tor 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				
bec	Maximum pow	er consumption	1700VA	2400VA	1700VA	2400VA				
O	Dimensions		W130 × H210 × D158mm							
Basi	Weight		Approx. 2.9kg	Approx. 3.1kg	Approx. 2.9kg	Approx. 3.1kg				
	Input power	Control power supply	Single phase AC200 to 230	V +/-10% maximum (50/60H	z)					
	supply	Motor power	Single phase AC200 to 230V +/-10% maximum (50/60Hz)							
	Drive method		AC full-digital software serv	/0						
	Position detect	ion method	Resolver, Magnetic linear s	cale	Multi-turn resolver with data	a backup function				
	Operating met	nod	PTP (Point to Point), Linear interpolation, Circular interpolation, Arch motion							
_	Coordinate sys	tem	Joint coordinates, Cartesian coordinates							
contro	Position indica	tion units	Pulses, mm (millimeters), deg (degrees)							
Axis co	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 s	etting		etting based on robot model tation and deceleration param		er				
	Resolution		1µm		16384 P/rev					
	Origin search	method	Incremental / Semi-absolute	е	Absolute / Incremental					
_	Program langu	age	YAMAHA BASIC (Conforming to JIS B8439 SLIM Language)							
Jran	Multitasks		8 tasks maximum							
Program	Sequence prog	gram	1 program							
	Point-data inpu	ıt method	Manual data input (coordinate value input), Direct teaching, Teaching playback							
	Memory capac	ity	364KB (total capacity of propoints is 84KB)	ogram and points) (available	program capacity during use	e of maximum number of				
>	Programs		100 program 9,999: maximum lines per program 98KB: maximum capacity per program							
Б	Points		10,000 points : maximum numbers of points							
Me	Programs Points Memory Backu	ip battery	Lithium metallic battery (ser	rvice life 4 years at 0℃ to 40°	C)					
	Internal flash n		512KB (ALL data only)							
	External memo	ory backup	SD memory card							



■ 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	to 230V +/-10% maximum (50/60Hz)				
Operating method	Programming / Remote command / Op-	eration using RS-232C communication				
Maximum number of controllable axes	2 axes maximum					
Origin search method	Incremental/Semi-absolute Absolute/Incremental					

■ Ordering method RCX222/RCX222HP RCX221/RCX221HP RCX222 -**RCX221** No entry: None R: RG2 No entry: None N1: OP.DIO24/16 (NPN) P: PNP CC: CC-Link DN: DeviceNetTM PB: PROFIBUS EN: Ethernet YC: YC-Link Note3 P1: OP.DIO24/16 (PNP) EN: Ethernet Note4 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.

 Note 4. Only when you have selected CC, DN or PB for Input/Output selection 1, you can select EN for Input/Output selection 2.

Contr RCX22 RCX22		Usable for CE No entry: Standard E: CE marking	Regenerative unit None No entry: None R: RG2	Input/Output Selection 1 N: NPN P: PNP CC: CC-Link DN: DeviceNet TM PB: PROFIBUS	No entry: None N1: OP.DIO24/16 (NPN) P1: OP.DIO24/17 (PNP) EN: Ethernet Note4
Note	1. Driver :	selection and re	generative unit sel	EN: Ethernet YC: YC-Link Note3 ection depends	on the robot type.
1	See Sp 2. The re	pecification sele generative unit	ction table on follo	wing pagė.	a model designated

- by YAMAHA or a load with a large inertia.

 Note 3. Available only for the master.

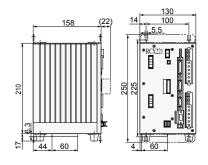
 Note 4. Only when you have selected CC, DN or PB for Input/Output selection 1, you can select EN for Input/Output selection 2.

	Item	Model	RCX221	RCX221HP	RCX222	RCX222HP						
	OTD DIO	I/O input	Dedicated input 10 points, General input 16 points									
	STD.DIO	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 i	input	Connectable to DC 24V nor	mally-closed contact senso	r							
ut pr	External comm	nunications	RS232C: 1CH D-SUB9 (fen	nale) RS422 : 1CH (RPB)								
ī/o		Slots	2 (inc.STD.DIO)									
External input/output			STD.DIO (NPN/PNP): Dedicated input 10 points, Dedicated output 12 points, General input 16 points, General output 8 points									
tern		ns T	Optional input/output (NPN/PNP): General input 24 points / General output 16 points									
Ë	Options		CC-Link: Dedicated input 16 points, Dedicated output 16 points, General input 96 points, General output 96 points (4 nodes occupied									
		Туре	DeviceNet [™] : Dedicated input 16 points, Dedicated output 16 points, General input 96 points, General output 96 points									
			PROFIBUS: Dedicated input 16 points, Dedicated output16 points, General input 96 points, General output 96 points									
			Ethernet: IEEE802.3 10Mbps (10BASE-T)									
Options	Programming I	box	RPB, RPB-E (with enable switch)									
Opti	Support softwa	are for PC	VIP+/VIP									
SL	Operating tem	perature	0°C to 40°C									
atio	Storage tempe	erature	-10°C to 65°C									
specifications	Operating hum	nidity	35% to 85%RH (non-conde	nsing)								
bec	Absolute back	up battery	_		Lithium metallic battery 3.6	V 5400mAH (2700nAH × 2)						
	Absolute data	backup period	_		1 year (in state with no power	er applied)						
General	Noise immunit	у	IEC61000-4-4 Level3									
Ö	Protecting stru	icture	e IP10									

Dimensions

RCX221

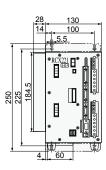




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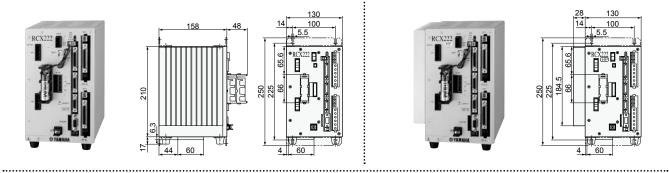
RCX221HP





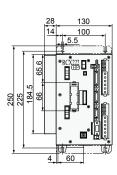
RCX222



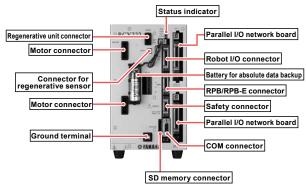


..... RCX222HP



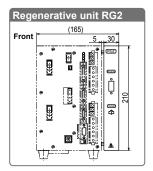


■ Part names



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



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

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.

RCY221/RCY221HP

KCX221/KCX221HP									
				РН	AS	ER			
		MR12D	MF7D	MF15D	MF20D	MF30D	MF50D	MF75D	
RCX221		•	•	•	•				
RCX221HP					•	•	•		
Regenerative	No entry (None)	•	•	•					
unit R (RG2)					•	•	lacksquare	lacksquare	

• : Applicable

RCX222/RCX222HP

			P-X	N	Ar	m ty	ype, arm	Ga	ntr	v tv	XY-X				XZ 1	type	•		YF)-X	Clean
		N15D	8D	PXYX	FXYx	×	SXYx	×	λXN	MXYx		HXYLx	SXYx (ZF)	SXYx (ZFL20)	SXYBx (ZF)	SXYBx (ZFL20)	MXYx	HXYx	YP220BX	YP320X	SXYxC
		Σ	Σ							2	axe	es							₹	፟፟፟	2 axes
RCX222				•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•
RCX222HP		•	•								•	•									
Regenerative	No entry (None)				•	•	•	0					•		•						•
unit	R (RG2)	•	•					0	•	•	•	•		•		•	•	•			

: Applicable : Select per conditions

ption

■ 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	D() (A)
	X axis	Y axis	Power capacity (VA)
	05	05	500
	10	05	700
	10	10	900
	20	05	1500
	20	10	1700
	20	20	2000
	20	20	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

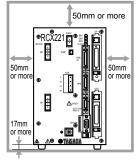
- Motor capacity exceeds a total of 450W.
- Motor capacity for perpendicular axis exceeds a total of 240W.
- The following conditions apply when perpendicular axis capacity is 240W or less.
 - perpendicular axis is 200W.
- perpendicular axis is 100W and stroke is 700mm or more.
- there are 2 perpendicular 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.

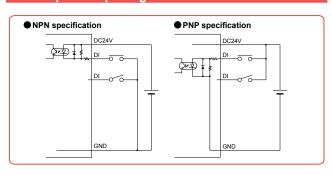
• Ambient temperature : 0 to 40°C

• Ambient humidity : 35 to 85% RH (no condensation)

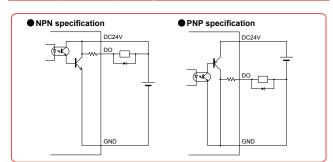


*Provide the same space dimensions for RCX222.

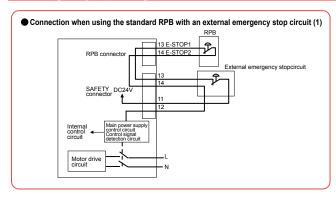
■ Example of input signal connection

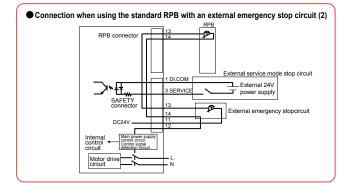


■ Example of output signal connection



■ Emergency input signal connections





■ 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

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

- · ·	0: 1	Nor	
Terminal number	Signal name	RCX221	RCX222
1	DI01	Servo ON	RUAZZZ
2	DI10	Sequence program conti	rol
3	DI03	Step run	101
4	CHK1	Check input 1	
5	DI05	I/O command run	
6	DI05	Spare Note 1	
7	DI07	Spare Note 1	
8	DI20	General input 20	
9	DI20	General input 21	
10	DI21	General input 22	
11	DI23	General input 23	
12	DI23	General input 24	
13	DI24	General input 25	
14	DI26	· ·	
15	DI27	General input 26	
16	DO00	General input 27	v oton monitor)
17	DO00	EMG monitor (emergence CPU OK	y stop monitor)
18	DO10	AUTO mode	
19	DO10	Return-to-origin complet	· · · · · · · · · · · · · · · · · · ·
20	DO11	Sequence program in pro	
21	DO12	Auto operation in progre	
22	DO13	Program reset output	<u> </u>
23	DO14	Battery alarm output Note 2	2
24	DO15	END	
25	DO10	BUSY	
26	DI12	Auto operation start	
27	DI12	AUTO mode switching	
28	DI14	ABS reset (Not in use normally)	Poturn to origin Note 3
29	DI15	Program reset	Neturn-to-origin
30	DI16	MANUAL mode	
31	DI17	Return-to-origin (In use normally)	ARS reset Note 4
32	DI30	General input 30	ADO 16361
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	DO02	Alarm	
43	DO20	General output 20	
44	DO21	General output 21	
45			
46	DO22	General output 22 General output 23	
46	DO23 DO24	General output 23	
48 49	DO25 DO26	General output 25 General output 26	
50	DO26	General output 27	
		Of is prohibited.	

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	0	Name
number	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

- Contrar Communica		
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	Jumps to a subroutine with the label specified by a	
RETURN	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	
011 10 0000	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	
IVEIVI	viewed as comments.	
SELECT CASE	Allows control flow to branch according to conditions.	
to END SELECT	<u> </u>	
SWI	Switches the currently executed program to a specified	
	program, and executes from the first line after compiling.	
WHILE to WEND		
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

"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	
001	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.	
	1. Waits until the condition in DI/DO conditional	
WAIT	expression are met.	
WAII	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-
UKGUKD	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 /	Changes communication mode and initialize the	
OFFLINE	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

1.00044.0		
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	Executes an absolute movement command on each axis
	(with torque limit option)	in the main group.
	TORQUE	Changes the maximum torque instruction for the
		specified main group axis.
		Sets the current limit time-out period on the specified
	TRQTIME	main group axis when using a torque limit setting option
		in the DRIVE statement.
		Sets the current limit time-out period on the specified
	TRQTIME	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





KAS-M5382-00 Model

SR1-P RCX221 RCX222

LCC140 TS-X TS-P SR1-X

RCX240/S RCX340

RCX222

RCX240/S

Safety connector



RCX221 Model KAS-M5370-00 RCX222

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



Model KAS-M5163-30

Standard I/O (STD.DIO) connector



RCX221 Model KAS-M533G-00 RCX222

Option I/O (OP.DIO) connector



RCX221 (RCX222)

L type stay (for installing front side, rear side.)



Model KAS-M410H-00

RCX221 RCX222

SR1-X

RCX222

RCX240/S

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

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/2,750mAh	
Data holding time	About 1 year Note1 (in state with no power applied)	
Dimensions	ф17 × L53mm	
Weight Note2	22g	



Model	KAS-M53G0-11

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.

Important)

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 RCX240/S

■ Options

Programming box RPB/RPB-E

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



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

RCX221 RCX222 RCX240/S

Support software for PC (P.556) VIP+

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 RCX240/S

Environment

os	Microsoft Windows 2000 / XP / Vista (32bit / 64Bit) / 7 (32bit / 64Bit)
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, Ethernet Note. For Ethernet communication, Ethernet unit for RCX series controller is required.
Applicable robot controllers	RCX221 / RCX222 / RCX141 / RCX142 / RCX240 / RCX240S

Note. Microsoft and Windows are registered trademarks of Microsoft Corporation.

Note. ADOBE and ADOBE READER are registered trademarks of Adobe Systems Incorporated.

Note. Ethernet is a registered trademark of Xerox Corporation.

Data cables

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





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

Note. This USB cable supports Windows 2000/XP or later. Note. Data cable jointly used for POPCOM+, VIP+, RCX-Studio Pro.

Note. USB driver for communication cable can also be downloaded from our website.

(LCC140	
(ERCD	
(SR1-X	
(SR1-P	
(DCV221	٦

RCX222 RCX240/S RCX340

RCX240/RCX240S

Robot controller with advanced functions

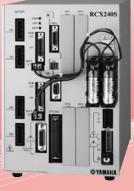
An advanced multi-axial controller newly developed based on long years of actual results! Along with a full range of functions, great engineering also makes it extremely easy to use.

Main functions ▶ P.64









RCX240S

■ Basic specifications

	Item	Model	RCX240 / RCX240S
	Number of cor	trollable axes	4 axes maximum (Control simultaneously: 4 axes)
ecifications	Controllable ro	bots	Single-axis robot FLIP-X, Linear motor single-axis robot PHASER, Cartesian robot XY-X, SCARA robot YK-XG, Pick & place robot YP-X
cat	Maximum pow	er consumption	2500VA (RCX240) / 1500VA (RCX240S)
ecifi	Capacity of the	e connected motor	1600W (RCX240) /800W (RCX240S)
Sp	Dimensions		W180 × H250 × D235mm
Basic	Weight		6.5kg
ä	Input power	Control power supply	Single phase AC200 to 230V +/-10% maximum (50/60Hz)
	supply	Motor power supply	Single phase AC200 to 230V +/-10% maximum (50/60Hz)
	Drive method		AC full-digital software servo
	Position detec	tion method	Multi-turn resolver with data backup function, Magnetic linear scale
_	Operating met	hod	PTP (Point to Point), Linear interpolation, Circular interpolation, ARCH
contro	Coordinate sys	stem	Joint coordinates, Cartesian coordinates
50	Position indica	tion units	Pulses, mm (millimeters), deg (degrees)
Axis	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 s	etting	Automatic acceleration setting based on robot model type and end mass parameter Setting based on acceleration and deceleration parameter (Setting by 1% unit)
	Origin search	method	Incremental, Absolute, Semi-absolute
_	Program langu	ıage	YAMAHA BASIC (Conforming to JIS B8439 SLIM Language)
Program	Multitasks		8 tasks maximum
Prog	Sequence pro	gram	1 program
ш	Point-data inp	ut method	Manual data input (coordinate value input), Direct teaching, Teaching playback
	Memory capad	eity	364KB (total capacity of program and points) (available program capacity during use of maximum number of points is 84KB)
emory	Programs		100 program (Max.) 9,999: maximum lines per program 98KB: maximum capacity per program
lem	Points		10,000 points: maximum numbers of points
Σ	Memory Back	up battery	Lithium metallic battery (service life 4 years at 0°C to 40°C)
	Internal flash r	nemory	512KB (ALL data only)



■ Model Overview	
Name	RCX240/RCX240S
Controllable robot Note	Cartesian robot XY-X / SCARA robot YK-X / Single-axis robot FLIP-X / Linear motor single-axis robot PHASER / Pick & place robot YP-X
Input 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	4 axes maximum
Origin search method	Incremental/Absolute

Note. For details, please refer to the controller model selection table on the next page.

■ Ordering method

RCX240 RCX240S

Controller Note1
RCX240: Standard model
RCX240S: Low capacity model

No entry: Standard E: CE marking

No entry: None R: RGU-2 R3: RGU-3 Note

N, P: Standard I/O 16/8 N1, P1: 40/24 points N2. P2: 64/40 points

DN: DeviceNet[™] PB: PROFIBUS

No entry: None VY: iVY (VISION)

Light/Tracking No entry: None TR: Light+Tracking

No entry: None GR: Gripper

BB: 4pcs Note8

Note 1. The RCX240S controller is limited to use with robots that handles 200W or lower on each axis Check the following controller selection table to find the matching model.

Note 2. The regenerative unit (option) is required when operating a model designated by YAMAHA or a load with a large inertia. Please refer to the following regenerative unit selection table. Note 3. YK500XG to YK1000XG are for RGU-3.

Note 4. Use N to N4 when NPN is selected on the I/O board, and P to P4 when PNP is selected.

Note 5. Available only for the master. (The YC-Link system controls an SR1 series single-axis controller in accordance with communications received from an RCX series multi-axis controller. Using the YC-Link system allows control of up to 8 axes (or up to 6 axes with synchronous control)).

Note 6. Use battery-less model if connecting to all-axis linear motor, or to incremental models.

Note 7. If any or Single-axis among the XY axes are absolute specifications then 2 batteries are required.

Note 8. If any or Single-axis among the ZR axes are absolute specifications then 2 batteries are required.

☆ Please note that:

The current sensor on the RCX240S cannot be set to 20A.

As a controller stocked for maintenance, please order an RCX240 that can be set to any of 05A, 10A and 20A.

	Item	Model		RCX240 / RCX240S
	CTD DIO	I/O input	Dedicated input 10 points, Genera	al input 16 points (NPN / PNP specifications selectable)
	STD.DIO	I/O output	Dedicated output 11 points, Gene	eral output 8 points
	SAFETY			tact), Service mode input (NPN/PNP specification is set according to STD. It (Enabled only when the RPB-E is used.)
	Brake output		Relay contact	
	Origin sensor i	input	Connectable to DC 24V normally-	-closed contact sensor
	External comn	nunications	RS-232C: 1CH D-SUB9 (female)	RS-422: 1CH (Dedicated RPB)
	Regenerative	unit connection	RGEN connector	
Ħ		Slots	4	
t t			Optional input/output (NPN/PNP)	General input 24 points, General output 16 points
External input/output			CC-Link	Dedicated input 16 points, Dedicated Output 16 points, General input 96 points, General output 96 points, General output 96 points (4 nodes occupied)
nal in			DeviceNet™	Dedicated input 16 points, Dedicated Output 16 points, General input 96 points, General output 96 points
Exter			PROFIBUS	Dedicated input 16 points, Dedicated Output 16 points, General input 96 points, General output 96 points
	Options	T	Ethernet	IEEE802.3 10Mbps (10BASE-T)
		Type	EtherNet/IP™	Dedicated input 16 points, dedicated output 16 points, General-purpose input 96 points, general-purpose output 96 points Conforms to Ethernet (IEEE 802.3) 10Mbps/100Mbps.
			iVY	Camera input (2ch), camera trigger input, PC connection input
			Tracking	AB phase input, lighting trigger input, lighting power supply input/output
			Lighting control	Lighting trigger input, lighting power supply input/output
			Gripper control	No. of axes: 1 axis, Position detection method: Optical rotary encoder, Min. setting distance: 0.01mm
SL	Programming	box	RPB, RPB-E (with enable switch)	
Options	Support softwa	are for PC	VIP+	
ŏ	Regenerative	unit	RGU-2, RGU-3	
ns	Operating tem	perature	0°C to 40°C	
atio	Storage tempe	erature	-10°C to 65°C	
ifi	Operating hum	nidity	35% to 85%RH (non-condensing)	
specifications	Absolute back	up battery	Lithium metallic battery 3.6V 54	00mAH (2700mAH × 2)
	Absolute data	backup period	1 year (in state with no power app	olied)
General	Noise immunit	у	IEC61000-4-4 Level 3	
Ge	Protective stru	cture	IP10	

RCX240/RCX240S

■ Controller model selection table

The RCX240S controller is limited to use with robots that handles 200W or lower on each axis and is partly modified such as for optimizing the IPM, but it is fully compatible with RCX240 operation and functions, and peripheral equipment can be used by both models.

				Х	Y-)	Κ																					,	ΥK	-X																					CL	ΕA	N				
	PXYX	ž	FXYBX	SXYX	SXYBX	NXY	MXYX	HXYX	HXYLX	YK500TW	YK120XG	YK150XG	YK180X/XG	YK220X	YK250XG	YK350XG	VKAOOXG	VK500XGI	VKEOOYG	VK600XG	YKEDOXG	VKZOOXG	VKBOOKE	YKGOOXG	VK4000VG	실	YK300XGS	2		YK600XGS	YK700XGS	YK800XGS	OXGS	YK1000XGS	YKZ50XGP		YK500XGI P	YK500XGP	Š	YK600XGP	YK600XGHP	YK700XGP	YK800XGP	YK900XGP	YK1000XGP	YK180XGC	YK220XC	YK250XGC	YK350XGC		YKSOOXC		YK600XC		0	YK1000XC
RCX240						•	•	•	•	•	Г	Г	Г	Г		Т	Т	Т	•		•							Т	•	•	•	•	•	•	Т	T		•	•	•	•	•	•	•	•	П			T		•		•	•	•	lacksquare
RCX240S	•	•	•	•	•						•			•	•	•				•)						•	•)	•						- (•	•	•			D	•)			

■ Multi-robot: Driver list for each model

For "multi-robots" that are used in combination with one or more single-axis robots, the RCX240S can be used unless the divers for the combined models include a 20A model.

											FLI	P-X											Р	НΑ	SE	R	
		T4LH	Т5ГН	T6L	T9	Т9Н	F8/F8L/F8LH	F10	F14	F14H	GF14XL	F17/F17L	GF17XL	F20/F20N	N15	N18	B10	B14/B14H	R5	R10	R20	MR12	MF7	MF15	MF20	MF30	MF75
	05A	•	•	•	•		•	•	•								•	•	•	•		•					
Driver	10A					•				•	•										•		•	•	•		
	20A											•	•	•	•	•										•	•

■ Regenerative unit selection table

			XY-	Х																			Υ	K-X	G																			-	Clea	an				
	FXYx	SXYx	λ×	ΝΧΥ	MXYx	ХХХ	5	g	g			9	9	ဗ္	GL	<u>ي</u> ق و	ם ב	E H	9	g	9	XG	×	25	98	GS	GS	GS	GS	999	GP	GP	GLP	GP	GLP	GHP	GP	GP	GP	۵.	SXYXC		ပ္ပ	CH	Э	H.	ی ر	ي ر	ي ر	, x
	3 axes	4	<u></u>	axe	3,4 axes	2	킬	YK150X	YK180X	YK180X	YK220X	YK250X		YK400X		YK500X	XKGOOX	10	YK700X	YK800X	YK900X	0	YK1200	YK300X			YK700X	ŏ.	YK900X	VKORON	YK350X	YK400X		YK500X	YK600X	YKGOOX	10	YK800X	YK900X	YK1000XG	3 axes		YK220X	YK250X		٥ I	YKSOOX			5 6
No entry (None)	•	0	T	T			•	•	•	•	•	•	•	•	•	•					П		-	•						•	•	•	•		•					•	9 6	•	•		•	•			Т	П
R (RGU-2)		0	•	•	•	•																	•																					П		•		•	•	•
R3			T	T	T		T									•	•		•	•	•	•	\exists	T	•	•	•	•	•		Т		П	•	•		•	•	•	•			Г			\top			\Box	Г

• : Required : If Z axis is 200W specifications then regenerative unit RGU-2 is required.

Conditions where regenerative unit is needed on multi robots

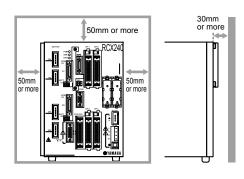
- Motor capacity exceeds a total of 450W.
- Motor capacity for perpendicular axis exceeds a total of 240W.
- B14H which maximum speed exceeds 1250mm per second.
- The following conditions apply when perpendicular axis capacity is 240W or less.
 - perpendicular axis is 200W.
 - perpendicular axis is 100W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

■ Installation conditions

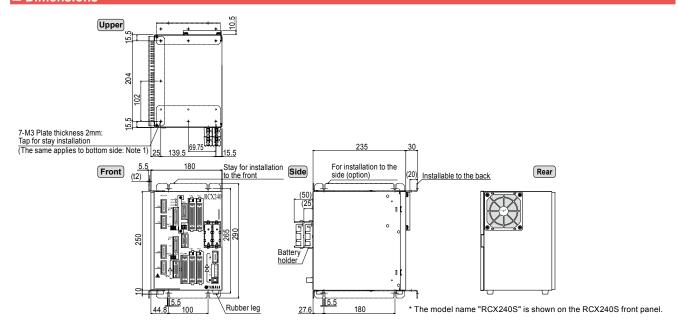
- Install the RCX240/RCX240S inside the control panel.
- Install the RCX240/RCX240S on a flat, level surface.
- Install the RCX240/RCX240S in a well ventilated location, with space on all sides of the RCX240/RCX240S (See fig. at right.).
- · Do not block the heat-sink on the side panel.
- Do not block the fan on the bottom of the controller.

• Ambient temperature : 0 to 40°C

• Ambient humidity : 35 to 85% RH (no condensation)



■ Dimensions



■ Power supply capacity and heat emission

The required power supply capacity and heat emission will vary depending on the robot type and number of axes.

Using the following table as a general guide consider the required power supply preparation and control panel size, controller installation, and cooling method.

(1) When connected to SCARA robot

	Robot type					ity Generated heat
Standard type	Clean type	Dust-proof & drip-proof type	Wall-mount / Ceiling-mount / inverse type	Orbit type	0.44	amount (W)
YK180X, 220X	_	_	_	_	500	63
YK250XG, 350XG, 400XG, 500XGL, 600XGL	YK250XGC, 350XGC, 400XGC, 500XGLC, 600XGLC	YK250XGP, 350XGP, 400XGP, 500XGLP, 600XGLP	YK300XGS, 400XGS	-	1000	75
_	YK500XC, 600XC	_	_	-	1500	88
YK550X, 500XG, 600XG	-	YK500XGP, 600XGP	YK500XGS, 600XGS	-	1700	93
-	YK700XC, 800XC, 1000XC	_	_	-	2000	100
YK600XGH, 700XG, 800XG, 900XG, 1000XG, 1200X	-	YK600XGHP, 700XGP, 800XGP, 900XGP, 1000XGP	YK700XGS, 800XGS, 900XGS, 1000XGS	YK350TW, YK500TW	2500	113

(2) When connected to 2 axis (Cartesian robot and/or multi-axis robot)

Axial current se	ensor value ^{Note}	Power capacity	Generated heat
X axis	Y axis	(VA)	amount (W)
05	05	600	65
10	05	800	70
10	10	1000	75
20	05	1100	78
20	10	1300	83
20	20	1700	93

(4) When connected to 4 axis (Cartesian robot and/or multi-axis robot)

A interest to the Note B. The Control of the Contro					
Axiai	Axial current sensor value Note			Power capacity	Generated heat
X axis	Y axis	Z axis	R axis	(VA)	amount (W)
05	05	05	05	800	70
10	05	05	05	1000	75
10	10	05	05	1100	78
10	10	10	05	1300	83
10	10	10	10	1400	85
20	05	05	05	1200	80
20	10	05	05	1400	85
20	10	10	05	1500	88
20	10	10	10	1700	93
20	20	05	05	1600	90
20	20	10	05	1800	95
20	20	10	10	2000	100
20	20	20	05	2100	103
20	20	20	10	2200	105
20	20	20	20	2500	113

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

occur.

(3) When connected to 3 axis (Cartesian robot and/or multi-axis robot)

				-
Axial cu	Axial current sensor value Note			Generated heat
X axis	Y axis	Z axis	(VA)	amount (W)
05	05	05	700	68
10	05	05	900	73
10	10	05	1000	75
10	10	10	1200	80
20	05	05	1200	80
20	10	05	1300	83
20	10	10	1500	88
20	20	05	1600	90
20	20	10	1800	95
20	20	20	2000	95

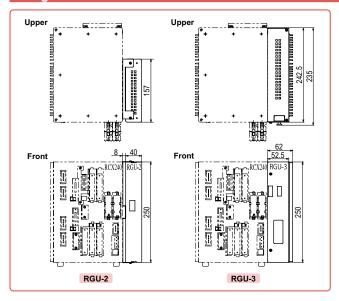
Note. Motor capacity vs. current sensor table

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.

Option

■ Regenerative unit



RGU-2 basic specifications



Item	RGU-2
Model	KX0-M4107-20 (including cable supplied with unit)
Dimensions	W40 × H250 × D157mm
Weight	0.9kg
Regenerative voltage	Approx. 380V or more
Regenerative stop voltage	Approx. 360V or less
Accessory	Cable for connection with controller (300mm)

Note. Always leave an empty space (gap of about 20mm) between this unit and the adjacent controller. Also, always use the dedicated cable when connecting the controller.

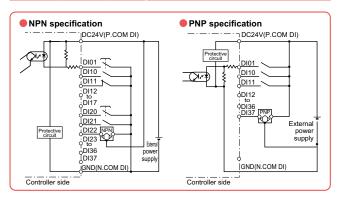
RGU-3 basic specifications



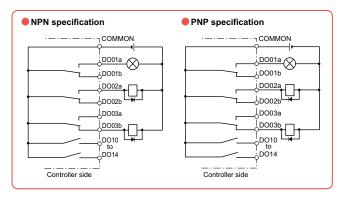
Item	RGU-3
Model	KX0-M4107-30 (including cable supplied with unit)
Dimensions	W62 × H250 × D242.5mm
Weight	3.7kg
Regenerative voltage	Approx. 380V or more
Regenerative stop voltage	Approx. 360V or less
Accessory	Cable for connection with controller (300mm)

Note. Cannot be installed as a separate unit.

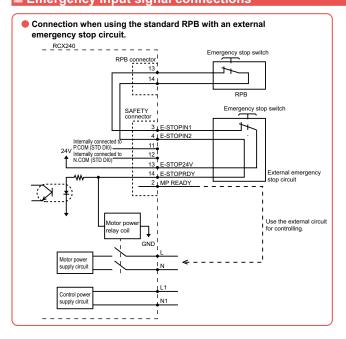
■ Example of input signal connection



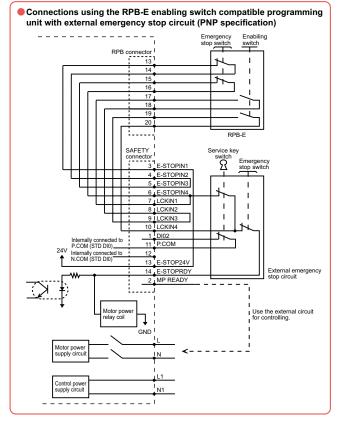
■ Example of output signal connection



■ Emergency input signal connections



Installing an external safety circuit will satisfy safety category class 4 standards. See P.615 for more information.



■ Connector input / output signals

PIN	I/O No.	Name	Note							
1	DI05	I/O command execution trigger input		PIN	I/O No.	Name	Note			
2	DI01	Servo ON input	_				27	COMMON	Relay common	
3	DI10	Sequence control			28	DO01b	CPU_OK (B contact)			
4	DI11	Interlock		29	DO01a	CPU_OK (A contact)				
5	DI12	Program start		30	DO02b	Servo ON output (B contact)	(Relay output)			
6	DI13	AUTO mode input		31	DO02a	Servo ON output (A contact)	Maximum capacity of each			
_ 7	DI14	Return-to-origin		32	DO03b	Alarm (B contact)	terminal (resistance load)			
8	DI15	Program reset		33	DO03a	Alarm (A contact)	: DC 24V 0.5A			
9	DI16	MANUAL mode input		34	DO10	AUTO mode output	Common terminal			
10	DI17	Absolute reset / Return-to-origin	Common terminal	35	DO11	Return-to-origin complete	: COMMON			
11	DI20	General input 20	: P.COMDI	36	DO12	Sequence program in-progress				
12	DI21	General input 21	N.COMDI	37	DO13	Robot program in-progress				
13	DI22	General input 22	(Photo-coupler input)	38	DO14	Program reset				
14	DI23	General input 23	NPN specification	39	DO20	General output 20				
15	DI24	General input 24	: Source type	40	DO21	General output 21	(Transistor output)			
16	DI25	General input 25	PNP specification	41	DO22	General output 22	NPN specification or PNP			
17	DI26	General input 26	: Sink type	42	DO23	General output 23	specification Maximum capacity of each terminal			
18	DI27	General input 27		43	DO24	General output 24	(resistance load):0.1A			
19	DI30	General input 30		44	DO25	General output 25	+Common terminal : DC+24V			
20	DI31	General input 31		45	DO26	General output 26	- Common terminal : GND			
21	DI32	General input 32		46	DO27	General output 27				
22	DI33	General input 33		47	DC24V	DC+24V (P.COMDI)	External power supply			
23	DI34	General input 34		48	DC24V	DC+24V (F.COMDI)	input			
24	DI35	General input 35		49	GND	GND (N.COMDI)				
25	DI36	General input 36		50	GIVE	014D (14.00MDI)				
26	DI37	General input 37								

Note. When using the CC-Link, DeviceNet[™], EtherNet/IP[™], or PROFIBUS, the dedicated inputs other than the interlock signal (DI11) of the STD.DIO that are provided on the RCX240 controller are disabled.

Additionally, when the external 24V monitor control of the system parameters is set disabled, the interlock signal (D11) becomes disabled.

■ SAFETY connector signals

Terminal	RPB connected			RPB-E connected
number	I/O No.	Name	I/O No.	Name
1	DI02	SERVICE mode	DI02	SERVICE mode
2	MP READY	Motor power ready signal	MP READY	Motor power ready signal
3	E-STOPIN 1	Emergency stop input 1	E-STOPIN 1	Emergency stop input 1
4	E-STOPIN 2	Emergency stop input 2	E-STOPIN 2	Emergency stop input 2
5	NC	NC	E-STOPIN 3	Emergency stop input 3
6	NC	NC	E-STOPIN 4	Emergency stop input 4
7	NC	NC	LCKIN 1	Enabling switch input 1
8	NC	NC	LCKIN 2	Enabling switch input 2
9	NC	NC	LCKIN 3	Enabling switch input 3
10	NC	NC	LCKIN 4	Enabling switch input 4
11	P.COM	DC+24V (P.COM DI)	P.COM	DC+24V (P.COM DI)
12	N.COM	GND (N.COM DI)	N.COM	GND (N.COM DI)
13	E-STOP 24V	Emergency stop input supply	E-STOP 24V	Emergency stop input supply
14	E-STOPRDY	Emergency stop READY signal	E-STOPRDY	Emergency stop READY signal
15	NC	NC	NC	NC

Standard functions of the controller

Function	Description
Operation mode	Automatic mode (main task: execution of program, execution of step), Program mode (main task: creation of program), Manual mode (main task: jog movement, point teaching), System mode (main task: parameter editing, data initialization), Utility mode (main task: operation of motor power source)
Command	Array declarator command (DIM statement), Assignment command (numeric value assignment statement, character string assignment statement, point definition statement), Movement related command (MOVE statement, DRIVE statement, PMOVE statement), Condition branching command (IF statement, For statement, WHILE statement), External output command (DO statement, MO statement, LO statement, TO statement, SO statement), Parameter command (ACCEL statement, OUTPOS statement, TOLE statement), Task related command (START statement, SUSPEND statement, CUT statement), Condition wait command (WAIT statement), etc.
Function	Arithmetic function (SIN function, COS function, TAN function), Character string function (STR\$ function, LEFT\$ function, MID\$ function, RIGHT\$ function), Point function (WHERE function, JTOXY function, XYTOJ function), Parameter function (ACCEL statement, OUTPOS statement, TOLE statement), etc.
Variable	Simple variable (integer type variable, real number type variable, character string type variable), Array variable (integer type variable, real number type variable, character string type variable), Point variable, Shift variable, Element variable (point element variable, shift element variable), Input/output variable, etc.
Operator	Arithmetic operator (+, -, *, /, MOD), Logical operator (AND, OR, XOR), Comparison operator (=, <, >, <>, <=, >=)
Monitor	Monitor of input/output (200ms interval)
On-line command	Key operation command (AUTO, RUN, RESET, STEP), Data handling command (READ, WRITE, ?VER, ?CONFIG), Utility command (COPY, ERA, INIT), Robot language command (independently executable command)
Data file	Program, Point, Parameter, Shift, Hand, All, Error history, etc.
Internal timer	10ms interval
Program break point	4 points at maximum

RCX240/RCX240S

■ Robot Language Table

General Co	iiiiiaiius
Language	

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
001	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.
	1. Waits until the condition in DI/DO conditional
WAIT	expression are met.
VVAII	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-
ORGORD	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
	Changes communication mode and initialize the
OFFLINE	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

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

Accessories and part options



RCX240/RCX240S

Standard accessories

Power connector + wiring connection lever



Model KAS-M5382-00

SR1-X SR1-P RCX221 RCX222 RCX240/S

RCX340

RCX240/S

SR1-X

RCX222

RCX240/S

LCC140 TS-X TS-P

Safety connector



Model KX0-M5163-00 RCX240/S

RPB terminator (dummy connector)

Attach this to the RPB connector during operation with the programming box RPB removed.



RCX221 KAS-M5163-30 RCX222 RCX240/S

Standard I/O (STD.DIO) connector



Model KX0-M533G-00 RCX240/S

L type stay (for installing front side, rear side.)



KX0-M410H-00

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

Absolute battery

Use to install the controller.

Battery for absolute data back-up.

Basic specifications

• = p		
Item	Absolute battery	
Battery type	Lithium metallic battery	
Battery capacity	3.6V/2,750mAh	
Data holding time	About 1 year Note1 (in state with no power applied)	
Dimensions	ф17 × L53mm	
Weight Note2	22g	



Model KAS-M53G0-11

Note 1. When using two batteries for each two axes. 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.

Absolute battery installation

1 to 2 batteries are required for each 2 axes.

1 batter;.....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

See next page for optional parts

SR1-X

RCX222

RCX240/S

RCX240/RCX240S

Options

L type stay (for side surface installation)

Use to install the controller.



Model KX0-M410H-10

RCX240/S

Note. Model No. is for a single bracket (L type stay).

Programming box RPB/RPB-E

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



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

RCX221 RCX222 RCX240/S

Support software for PC (2556) VIP+

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 RCX240/S

Environment

os	Microsoft Windows 2000 / XP / Vista (32bit / 64Bit) / 7 (32bit / 64Bit)
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, Ethernet Note. For Ethernet communication, Ethernet unit for RCX series controller is required.
Applicable robot controllers	RCX221 / RCX222 / RCX141 / RCX142 / RCX240 / RCX240S

Note. Microsoft and Windows are registered trademarks of Microsoft Corporation. Note. ADOBE and ADOBE READER are registered trademarks of Adobe Systems Incorporated.

Note. Ethernet is a registered trademark of Xerox Corporation.

Data cables

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



.....



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

Note. This USB cable supports Windows 2000/XP or later Note. Data cable jointly used for POPCOM+, VIP+,

RCX-Studio Pro.

Note. USB driver for communication cable can also be downloaded from our website.

U	<u> -CC140</u>	J
(ERCD)
(SR1-X)
(SR1-P)
	RCX221)

RCX222 RCX240/S RCX340

YC-Link board

Model	KX0-M4400-A1

RCX240/S

540

MEMO

RCX340

Robot controller with advanced functions

Next generation controller, all functions of which were reviewed to further improve the functions of conventional controllers.

This controller provides the features to achieve the high functionalities that can construct the equipment at high level.



Main functions ▶ P.67





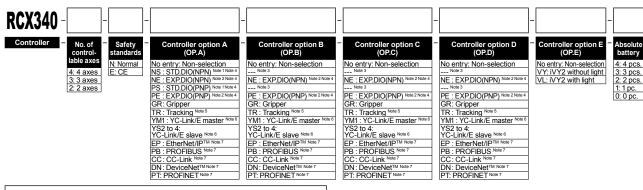
Support software for PC ▶ RCX-Studio Pro P.559

■ Basic specifications

	li I	tem	RCX340
suo	Applicable robots		YAMAHA single-axis robots, linear single-axis robots, Cartesian robots, SCARA robots (except for YK120X and YK150X), P&P robots
specifications	Connected mo	tor capacity	1600W or less (in total for 4 axes)
	Power capacity	у	2500VA
spe	Dimensions		W355 × H195 × D130mm (main unit only)
Basic	Weight		6.2kg (main unit only)
Ba	Power supply v	voltage	Single-phase 200 to 230V AC +/-10% maximum, 50/60Hz
	No. of controlla	able axes	Max. 4 axes (simultaneous control: 6 axes) Expandable to a maximum of 16 axes (four robots) via controller link
	Drive method		AC full digital servo
_	Position detect	tion method	Resolver or magnetic linear scale
contro	Control method	d	PTP motion (point to point), ARCH motion, linear interpolation, circular interpolation
20	Coordinate sys	stems	Joint coordinates, Cartesian coordinates
Axis	Position displa	y units	Pulses, mm (1/1000 steps), degree (1/1000 steps)
ã	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)
	Program language		YAMAHA BASIC II conforming to JIS B8439 (SLIM language)
	Multi-task		Max. 16 tasks
	Sequence program		1 program
ming	Memory capacity		2.1MB (Total of program and point data) (Available capacity for program when the maximum number of points is used: 300KB)
Programming	Program		100 programs (maximum number of programs) 9999 lines (maximum number of lines per program)
rog	Point		30000 points (maximum number of points)
ш	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 n	nemory	512 KB
		Input	Emergency stop ready input, 2 systems Auto mode input, 2 systems (Enabled only when the global specifications are used.)
9	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
nal	Brake output		Transistor output (PNP open collector)
ter	Origin sensor i	nput	Connectable to 24V DC B-contact (normally closed) sensor
Ext	External communications		RS-232C: 1CH (D-SUB 9-pin (female)) Ethernet: 1CH (In conformity with IEEE802.3u/IEEE802.3)



Ordering method



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).

 Note 2. [EXP.DIO] Parallel I/O board expansion specifications

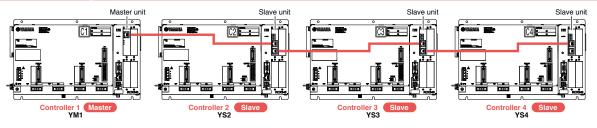
- General-purpose input 24 points, general-purpose output 16 points

 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. Be careful not to mix NPN and PNP of 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. Be careful not to mix field networks (CC/DN/PB/EP/PT).

Item		tem	RCX340
© Ot	Operating temperature		0 to 40°C
∺g St	Storage temperature		-10 to 65°C
Op Op	Operating humidity		35 to 85% RH (no condensation)
S No	Noise immunity		Conforms to IEC61000-4-4 Level 3
General specifications	otective stru	cture	IP20
යි Ap	pliance clas	ses	Class I
	Parallel	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)
		Expansion specifications	General-purpose input 24 points, general-purpose output 16 points NPN/PNP specifications are selected. (maximum 4 boards)
on board Note	CC-Link board Ver1.1/2.0 DeviceNet™ board EtherNet/IP™ board PROFIBUS board PROFINET board		Remote I/O Dedicated input/output: 16 points each General-purpose input/output: 96 points each Remote register Input/output: 16 words each
Options	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 16 axes (including four master controller axes), maximum 12 axes for slaves only
ď	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 four units Drive power: DC 24V +/-10%, 1.0A Max
	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)
iV	iVY2 unit		Camera pixels: maximum 2 million pixels, number of registered models: 254 models, number of connected cameras: maximum two units Power supply: DC24V +/-10% 1.5A Max
Pr	ogramming l	oox	PBX, PBX-E
Absolute battery		ry	3.6V 2750mAH / axis Backup retention time: About 1 year
Support software for personal computer		for personal computer	RCX-Studio Pro

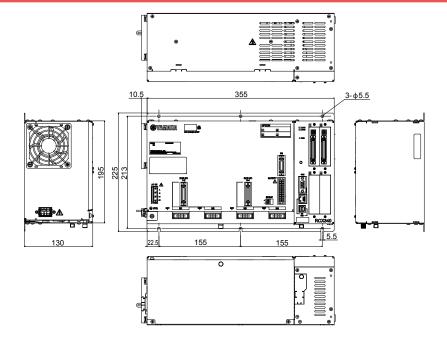
Note. There are four slots in which option boards can be installed.

■ YC-Link/E ordering explanation



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Dimensions



■ Power supply capacity and heat emission

The required power supply capacity and heat emission will vary depending on the robot type and number of axes.

Using the following table as a general guide consider the required power supply preparation and control panel size, controller installation, and cooling method.

(1) When connected to SCARA robot

Robot type						Generated
Standard type	Clean type	Dust-proof & drip-proof type	Ceiling-mount	Wall-mount / Inverse type	Power capacity (VA)	heat amount (W)
YK120XG, YK150XG –		_	_	_	300	58
YK180XG, YK180X YK220X	YK180XC, YK220XC	-	-	-	500	63
YK250XG, YK350XG YK400XG, YK500XGL YK600XGL, YK400XR	YK250XCH, YK350XCH YK400XCH, YK250XGC YK350XGC, YK400XGC YK500XGLC, YK600XGLC	YK250XGP, YK350XGP YK400XGP, YK500XGLP YK600XGLP	-	YK300XGS, YK400XGS	1000	75
-	YK500XC, YK600XC	-	-	-	1500	88
YK500XG, YK600XG YK700XGL	-	YK500XGP, YK600XGP		YK500XGS, YK600XGS	1700	93
-	YK700XC, YK800XC YK1000XC	-	-	-	2000	100
YK600XGH, YK700XG YK800XG, YK900XG YK1000XG, YK1200X	-	YK600XGHP, YK700XGP YK800XGP, YK900XGP YK1000XGP	YK350TW YK500TW	YK700XGS, YK800XGS YK900XGS, YK1000XGS	2500	113

(2) When connected to 2 axis (Cartesian robot and/or multi-axis robot)

		•	
current s	ensor value Note	Power capacity	Generated heat
axis	Y axis	(VA)	amount (W)
05	05	600	65
10	05	800	70
20	05	1100	78
10	10	1000	75
20	10	1300	83
20	20	1700	93
	current s axis 05 10 20 10 20	05 05 10 05 20 05 10 10 20 10	axis Y axis (VA) 05 05 600 10 05 800 20 05 1100 10 10 1000 20 10 1300

(3) When connected to 3 axis (Cartesian robot and/or multi-axis robot)

` '		•		,
Axial cu	rrent sensor v	/alue Note	Power capacity	Generated heat
X axis	Y axis	Z axis	(VA)	amount (W)
05	05	05	700	68
10	05	05	900	73
20	05	05	1200	80
10	10	05	1000	75
20	10	05	1300	83
20	20	05	1600	90
10	10	10	1200	80
20	10	10	1500	88
20	20	10	1800	95
20	20	20	2000	100

(4) When connected to 4 axis (Cartesian robot and/or multi-axis robot)

			-		
Axia	Axial current sensor value Note				Generated heat
X axis	Y axis	Z axis	R axis	(VA)	amount (W)
05	05	05	05	800	70
10	05	05	05	1000	75
20	05	05	05	1200	80
10	10	05	05	1100	78
20	10	05	05	1400	85
20	20	05	05	1600	90
10	10	10	05	1300	83
20	10	10	05	1500	88
20	20	10	05	1800	95
20	20	20	05	2100	103
10	10	10	10	1400	85
20	10	10	10	1700	93
20	20	10	10	2000	100
20	20	20	10	2200	105
20	20	20	20	2500	113

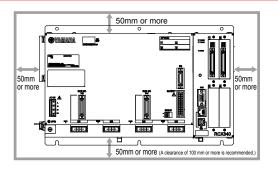
Note. Even if axial current sensor values for each axis are interchanged no problem will occur.

■ Installation conditions

- Use the screws to secure the controller to the installation plate inside the control panel so that it is in a horizontal position. Be sure to use the metallic installation plate.
- Install the RCX340 in a well ventilated location, with space on all sides of the RCX340 (See fig. at right.).

• Ambient temperature : 0 to 40°C

• Ambient humidity : 35 to 85% RH (no condensation)



■ Standard specification I/O connector signal list

Pin I/O No. Signal name Remarks		tandar	d specification I/O connector sig	nal list
2	Pin	I/O No.	Signal name	Remarks
3 DI 03 Spare Do not use. 4 CHK 1 Check signal 1 Short-circuit with CHK2. 5 DI 05 Spare Do not use. 6 DI 06 Dedicated input: Stop Do not use. 7 DI 07 Spare Do not use. 8 DI 20 General-purpose input 20 Do not use. 9 DI 21 General-purpose input 21 Do not use. 10 DI 22 General-purpose input 22 Do not use. 11 DI 23 General-purpose input 23 Do not use. 12 DI 24 General-purpose input 25 Do not use. 15 DI 27 General-purpose input 27 Do not use. 16 DO 03 Spare Do not use. 17 DO 01 Dedicated output CPU OK Do not use. 18 DO 10 Dedicated output Return-to-origin complete 20 DO 11 Dedicated output Return-to-origin complete 20 DO 12 Dedicated output Return-to-origin complete 21			Dedicated input: Servo ON input	
4 CHK 1 Check signal 1 Short-circuit with CHK2. 5 DI 05 Spare Do not use. 6 DI 06 Dedicated input: Stop Do not use. 7 DI 07 Spare Do not use. 8 DI 20 General-purpose input 20 Do not use. 9 DI 21 General-purpose input 21 Do not use. 10 DI 22 General-purpose input 23 General-purpose input 23 12 DI 23 General-purpose input 24 General-purpose input 25 14 DI 26 General-purpose input 26 Do not use. 15 DI 27 General-purpose input 27 Do not use. 16 DO 00 Spare Do not use. 17 DO 01 Dedicated output CPU OK Dedicated output Return-to-origin complete 20 DO 12 Dedicated output Return-to-origin complete 20 DO 12 Dedicated output Return-to-origin complete 21 DO 13 Dedicated output Program reset status output 22 DO 14 Dedicated output Wrogra	2	DI 10	Dedicated input: Sequence control	
CHK CHK2 Check signal With CHK2.	3	DI 03	Spare	
5 DI 05 Spare Do not use. 6 DI 06 Dedicated input: Stop Do not use. 7 DI 07 Spare Do not use. 8 DI 20 General-purpose input 20 Do not use. 9 DI 21 General-purpose input 21 Do not use. 10 DI 22 General-purpose input 22 Do not use. 11 DI 23 General-purpose input 23 Do not use. 12 DI 24 General-purpose input 25 Do not use. 15 DI 27 General-purpose input 26 Do not use. 15 DI 27 General-purpose input 27 Do not use. 16 DO 00 Spare Do not use. 17 DO 01 Dedicated output CPU OK Do not use. 18 DO 10 Dedicated output Return-to-origin complete 20 DO 12 Dedicated output Return-to-origin complete 20 DO 12 Dedicated output Program-reset status output 23 DO 14 Dedicated output Warning output 24	4	CHK 1	Check signal 1	
7 DI 07 Spare Do not use. 8 DI 20 General-purpose input 20 9 DI 21 General-purpose input 21 10 DI 22 General-purpose input 22 11 DI 23 General-purpose input 23 12 DI 24 General-purpose input 25 14 DI 26 General-purpose input 27 15 DI 27 General-purpose input 27 16 DO 00 Spare Do not use. 17 DO 01 Dedicated output CPU OK 18 DO 10 Dedicated output Return-to-origin complete 20 DO 11 Dedicated output Return-to-origin complete 20 DO 12 Dedicated output Return-to-origin complete 20 DO 13 Dedicated output Return-to-origin complete 20 DO 13 Dedicated output Return-to-origin complete 20 DO 13 Dedicated output Return-to-origin complete 21 DO 13 Dedicated output Return-to-origin complete 22 DO 14 Dedicated input: Automatic operamin-progress	5	DI 05	Spare	Do not use.
8 DI 20 General-purpose input 20 9 DI 21 General-purpose input 21 10 DI 22 General-purpose input 22 11 DI 23 General-purpose input 23 12 DI 24 General-purpose input 24 13 DI 25 General-purpose input 25 14 DI 26 General-purpose input 26 15 DI 27 General-purpose input 27 16 DO 00 Spare Do not use. 17 DO 01 Dedicated output CPU OK 18 DO 10 Dedicated output AUTO mode output 19 DO 11 Dedicated output Return-to-origin complete 20 DO 12 Dedicated output Robot program-in-progress 21 DO 13 Dedicated output Robot program-in-progress 22 DO 14 Dedicated output Warning output 23 DO 15 Dedicated output Warning output 24 DO 16 Spare Do not use. 25 DO 17 Spare Do not use. 26 DI 12 Dedi	6	DI 06	Dedicated input: Stop	
9 DI 21 General-purpose input 21 10 DI 22 General-purpose input 22 11 DI 23 General-purpose input 23 12 DI 24 General-purpose input 24 13 DI 25 General-purpose input 25 14 DI 26 General-purpose input 26 15 DI 27 General-purpose input 27 16 DO 00 Spare Do not use. 17 DO 01 Dedicated output Return-to-origin complete 20 DO 12 Dedicated output Return-to-origin complete 20 DO 12 Dedicated output Return-to-origin complete 20 DO 13 Dedicated output Robot program-in-progress 21 DO 13 Dedicated output Robot program in-progress 22 DO 14 Dedicated output Warning output 23 DO 15 Dedicated output Warning output 24 DO 16 Spare Do not use. 25 DO 17 Spare Do not use. 26 DI 12 Dedicated input: Return-to-origin (for INC axis)	7	DI 07	Spare	Do not use.
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■ Expanded specification I/O connector signal list

Signal name

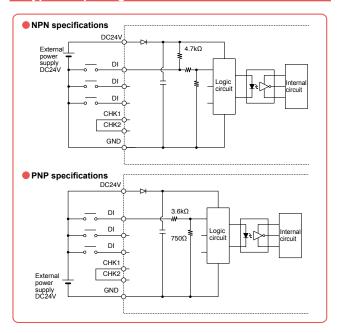
Pin (ID-4) (ID-2) (ID-2) (ID-4)

Pin	(ID=1)	(ID=2)	(ID=3)	(ID=4)	Signal name
1					Reserved
2	DI 10	DI 40	DI 70	DI 120	General-purpose input 10,40,70,120
3					Reserved
4	DI 11	DI 41	DI 71	DI 121	General-purpose input 11,41,71,121
5					Reserved
6					Reserved
7					Reserved
8	DI 20	DI 50	DI 100	DI 130	General-purpose input 20,50,100,130
_ 9	DI 21	DI 51	DI 101	DI 131	General-purpose input 21,51,101,131
10	DI 22	DI 52	DI 102	DI 132	General-purpose input 22,52,102,132
11	DI 23	DI 53	DI 103	DI 133	General-purpose input 23,53,103,133
12	DI 24	DI 54	DI 104	DI 134	General-purpose input 24,54,104,134
13	DI 25	DI 55	DI 105	DI 135	General-purpose input 25,55,105,135
14	DI 26	DI 56	DI 106	DI 136	General-purpose input 26,56,106,136
15	DI 27	DI 57	DI 107	DI 137	General-purpose input 27,57,107,137
16					Reserved
17					Reserved
18	DO 10	DO 30	DO 50	DO 70	General-purpose output 10,30,50,70
19	DO 11	DO 31	DO 51	DO 71	General-purpose output 11,31,51,71
20	DO 12	DO 32	DO 52	DO 72	General-purpose output 12,32,52,72
21	DO 13	DO 33	DO 53	DO 73	General-purpose output 13,33,53,73
22	DO 14	DO 34	DO 54	DO 74	General-purpose output 14,34,54,74
23	DO 15	DO 35	DO 55	DO 75	General-purpose output 15,35,55,75
24	DO 16	DO 36	DO 56	DO 76	General-purpose output 16,36,56,76
25	DO 17	DO 37	DO 57	DO 77	General-purpose output 17,37,57,77
26	DI 12	DI 42	DI 72	DI 122	General-purpose input 12,42,72,122
27	DI 13	DI 43	DI 73	DI 123	General-purpose input 13,43,73,123
28	DI 14	DI 44	DI 74		General-purpose input 14,44,74,124
29	DI 15	DI 45	DI 75		General-purpose input 15,45,75,125
30	DI 16	DI 46	DI 76		General-purpose input 16,46,76,126
31	DI 17	DI 47	DI 77	DI 127	General-purpose input 17,47,77,127
32	DI 30	DI 60	DI 110	DI 140	General-purpose input 30,60,110,140
33	DI 31	DI 61	DI 111	DI 141	General-purpose input 31,61,111,141
34	DI 32	DI 62	DI 112		General-purpose input 32,62,112,142
35	DI 33	DI 63	DI 113		General-purpose input 33,63,113,143
36	DI 34	DI 64	DI 114		General-purpose input 34,64,114,144
37	DI 35	DI 65	DI 115		General-purpose input 35,65,115,145
38	DI 36	DI 66	DI 116		General-purpose input 36,66,116,146
39	DI 37	DI 67	DI 117	DI 147	General-purpose input 37,67,117,147
40					Reserved
41					Reserved
42		DO 40	DO 60	 DO 100	Reserved
44	DO 20 DO 21	DO 40 DO 41	DO 60 DO 61		General purpose output 20,40,60,100
44	DO 21	DO 41	DO 61	DO 101	General-purpose output 21,41,61,101 General-purpose output 22,42,62,102
46	DO 22	DO 42	DO 62		General-purpose output 23,43,63,103
46	DO 23	DO 43	DO 63		General-purpose output 24,44,64,104
48	DO 24	DO 44	DO 64		
49	DO 26	DO 45	DO 65		General purpose output 25,45,65,105
50	DO 26	DO 46			General purpose output 26,46,66,106
50	DO 27	DU 47	DO 67	וטט וטז	General-purpose output 27,47,67,107

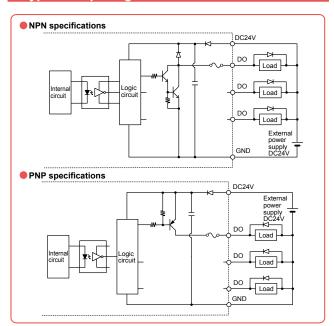
■ Standard specification I/O connector pin assignment lists

Pin	I/O No.	Name
1	DI01	Servo ON
2	DI10	SEQ enable
3	DI03	(Spare)
4	CHK1	Check input 1
5	DI05	(Spare)
6	DI06	STOP
7	DI07	(Spare)
8	DI20	General-purpose input
9	DI21	General-purpose input
10	DI22	General-purpose input
11	DI23	General-purpose input
12	DI24	General-purpose input
13	DI25	General-purpose input
14	DI26	General-purpose input
15	DI27	General-purpose input
16	DO00	(Spare)
17	DO01	CPUOK
18	DO10	AUTO
19	DO10	ORGOK
20	DO12	SEQRUN
21	DO12	RUN
22	DO14	RESET
23	DO15	WARNING
24	DO16	(Spare)
25	DO17	(Spare)
26	DI12	RUN
27	DI12	(Spare)
28	DI14	ORIGIN (for INC axis)
29	DI15	RESET
30	DI16	ALMRST
31	DI17	ORIGIN(for ABS axis)
32	DI30	General-purpose input
33	DI31	General-purpose input
34	DI31	General-purpose input
35	DI32	General-purpose input
36	DI34	General-purpose input
37	DI35	General-purpose input
38	DI36	General-purpose input
39	DI37	General-purpose input
40	CHK2	Check input 2
41	DO02	SERVO
41	DO02	ALARM
43	DO20	
43	DO20 DO21	General purpose output
44	DO21	General purpose output
45	DO22	General purpose output
46		General purpose output
47	DO24	General-purpose output
	DO25	General purpose output
49	DO26	General purpose output
50	DO27	General-purpose output

■ Typical input signal connection



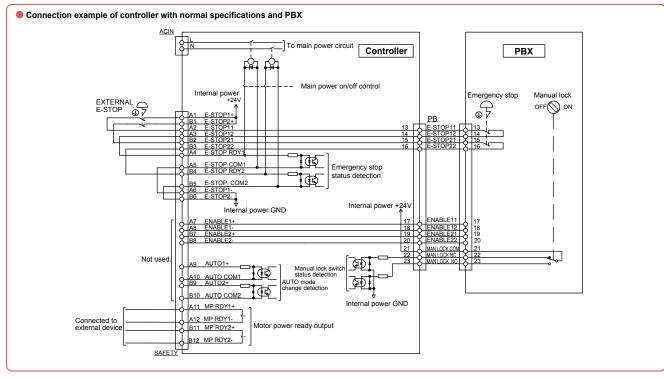
■ Typical output signal connection

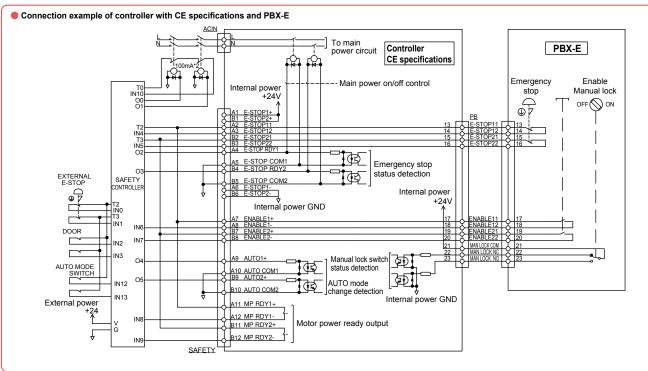


■ Basic functions

Function	Description	
Operation modes	AUTO mode (Major functions: program creation, program execution, step execution, etc.) MANUAL mode (Major functions: jog movement, point data teaching, parameter editing, etc.)	
Commands	Array declaration commands (DIM statement) Assignment commands (Numeric assignment, character string assignment, point definition statements, etc.) Movement commands (MOVE, DRIVE, PMOVE statements, etc.) Conditional branching commands (IF, FOR, WHILE statements, etc.) External output commands (DO, MO, LO, TO, SO statements) Parameter commands (ACCEL, OUTPOS, TOLE statements, etc.) Condition wait command (WAIT statement) Task related commands (START, SUSPEND, CUT statements, etc.)	etc.
Functions	Arithmetic functions (SIN, COS, TAN functions, etc.) Character string functions (STR\$, LEFT\$, MID\$, RIGHT\$ functions, etc.) Point functions (WHERE, JTOXY, XYTOJ functions, etc.) Parameter functions (ACCEL, OUTPOS, TOLE statements, etc.)	etc.
Variables	Simple variables (integer variables, real variables, character variables) Array variables (integer variables, real variables, character variables) Point variables Shift variables I/O variables	etc.
Arithmetic operation	Arithmetic operators (+, -, *, /, MOD) Logic operators (AND, OR, XOR) Relational operators (=, <, >, <>, <=, >=)	
Monitor	I/O status monitor (200 ms intervals)	
Online commands	Program operation commands (RUN, STOP, RESET, STEP, etc.) Utility commands (COPY, ERA, INIT, etc.) Data handling commands (READ, WRITE, etc.) Robot language commands (independent-executable commands)	
Data files	Program, point, parameter, shift, hand, all, error history	etc.
Internal timer	Timer count variable (TCOUNTER), 1 ms interval	
Program break points	Max. 32 points	

■ Emergency input signal connections





■ Robot Language Table

General commands

Command	Description
DIM	Declares the array variable name and the number of elements.
LET	Executes a specified assignment statement.
REM	Expresses a comment statement.

Arithmetic commands

- 7 11 11 11 11 11	
Command	Description
ABS	Acquires the absolute value of a specified value.
ATN	Acquires the arctangent of the specified value.
ATN2	Acquires the arctangent of the specified X-Y coordinates.
cos	Acquires the cosine value of a specified value.
DEGRAD	Converts a specified value to radians (↔RADDEG).
DIST	Acquires the distance between 2 specified points.
INT	Acquires an integer for a specified value by truncating all decimal fractions.
LSHIFT	Shifts a value to the left by the specified bit count. (←RSHIFT)
RADDEG	Converts a specified value to degrees. (↔DEGRAD)
RSHIFT	Shifts a value to the right by the specified bit count. (←LSHIFT)
SIN	Acquires the sine value for a specified value.
SQR	Acquires the square root of a specified value.
TAN	Acquires the tangent value for a specified value.

Date / time

Command	Description
DATE \$	Acquires the date as a "yy/mm/dd" format character string.
TCOUNTER	Outputs count-up values at 1ms intervals starting from the point when the TCOUNTER variable is reset.
TIME \$	Acquires the current time as an "hh:mm:ss" format character string.
TIMER	Acquires the current time in seconds, counting from midnight.

Character string operation

Command	Description
CHR\$	Acquires a character with the specified character code.
LEFT\$	Extracts a character string comprising a specified number of digits from the left end of a specified character string.
LEN	Acquires the length (byte count) of a specified character string.
MID \$	Extracts a character string of a desired length from a specified character string.
ORD	Acquires the character code of the first character in a specified character string.
RIGHT \$	Extracts a character string comprising a specified number of digits from the right end of a specified character string.
STR\$	Converts a specified value to a character string (↔VAL).
VAL	Converts the numeric value of a specified character string to an actual numeric value. (←STR\$)

Point, coordinates, shift coordinates

Command	Description
CHANGE	Switches the hand of a specified robot.
HAND	Defines the hand of a specified robot.
JTOXY	Converts joint coordinate data to Cartesian coordinate data of a specified robot. (↔XYTOJ)
LEFTY	Sets the hand system of a specified robot to the left-handed system.
LOCx	Specifies/acquires point data for a specified axis or shift data for a specified element.
PATH	Sets the movement path.
Pn	Defines points within a program.
PPNT	Creates point data specified by a pallet definition number and pallet position number.
RIGHTY	Sets the hand system of a specified robot to the right- handed system.
Sn	Defines the shift coordinates within the program.
SHIFT	Sets the shift coordinate for a specified robot by using the shift data specified by a shift variable.
XYTOJ	Converts the point variable Cartesian coordinate data to the joint coordinate data of a specified robot. (

Branching commands

Description	
Terminates the FOR to NEXT statement loop.	
Executes the FOR to NEXT statement repeatedly until a specified value is exceeded.	
Jumps to a subroutine with the label specified by GOSUB statement, and executes that subroutine.	
Unconditionally jumps to the line specified by a label.	
Allows control flow to branch according to conditions.	
Jumps to a subroutine with labels specified by a GOSUB statement in accordance with the conditions, and executes that subroutine.	
Jumps to label-specified lines in accordance with the conditions.	
Allows control flow to branch according to conditions.	
Controls repeated operations.	

Error control

Command	Description	
	Acquires the error code number of an error which has occurred / the line number where an error occurred.	
ON ERROR	This command allows the program to jump to the error processing routine specified by the label without stopping the program, or it stops the program and displays the error message.	
RESUME	Resumes program execution after error recovery processing.	

Program control

Command	Description	
CALL	Calls a sub-procedure.	
HALT	Stops the program and performs a reset.	
HALTALL	Stops and resets all programs.	
HOLD	Temporarily stops the program.	
HOLDALL	Temporarily stops all programs.	
PGMTSK	Acquires the task number in which a specified program is registered.	
PGN	Acquires the program number from a specified program name.	
SGI	Assigns/acquires the value to a specified integer type static variable.	
SGR	Assigns/acquires the value to a specified real type static variable.	
SWI	Switches the program being executed, then begins execution from the first line.	
TSKPGM	Acquires the program number which is registered in a specified task.	

Task control

Command	Description	
CHGPRI	Changes the priority ranking of a specified task.	
CUT	Terminates another task currently being executed or temporarily stopped.	
EXIT TASK	Terminates its own task which is in progress.	
RESTART	Restarts another task during a temporary stop.	
START	Specifies the task number and priority ranking of a specified program, and starts that program.	
SUSPEND	Temporarily stops another task which is being executed.	

Robot operations

Command	Description	
DRIVE	Moves a specified axis of a specified robot to an absolute position.	
DRIVEI	Moves a specified axis of a specified robot to a relative position.	
MOTOR	Controls the motor power status.	
MOVE	Performs absolute movement of all axes of a specified robot.	
MOVEI	Performs relative movement of all axes of a specified robot.	
MOVET	Performs relative movement of all axes of a specified robot when the tool coordinate is selected.	
ORIGIN	Performs return-to-origin.	
PMOVE	Executes the pallet movement command of a specified robot.	
PUSH	Executes a pushing operation in the axis unit.	
SERVO	Controls the servo ON/OFF of a specified axis or all axes of specified robot.	

Status acquisition

	·	
Command	Description	
ABSRPOS	Acquires the machine reference value for specified robot axes. (Valid only for axes whose return-to-origin method is set as "mark".)	
ARMCND	Acquires the current arm status of a specified robot.	
ARMSEL	Specifies/acquires the current "hand system" setting of a specified robot.	
ARMTYP	Specifies/acquires the "hand system" setting of a specified robot.	
CURTQST	Acquires the current torque value ratio of a specified axis to the rated torque.	
MCHREF	Acquires the return-to-origin or absolute-search machine reference value for specified robot axes. (Valid only for axes whose return-to-origin method is set as "sensor" or "stroke-end".)	
MTRDUTY	Acquires the motor load factor of the specified axis.	
PSHRSLT	Acquires the status at the end of the PUSH statement.	
PSHSPD	Specifies/acquires the push speed parameter.	
PSHTIME	Specifies/acquires the push time parameter.	
WAIT ARM	Waits until the axis operation of a specified robot is completed.	
WHERE	Reads out the current position of the arm of a specified robot in joint coordinates (pulse).	
WHRXY	Reads out the current position of the arm of a specified robot as Cartesian coordinates (mm, degrees).	

Status change

Status		
Command	Description	
ACCEL	Specifies/acquires the acceleration coefficient parameter of a specified robot.	
ARCHP1	Specifies/acquires the arch position 1 parameter of a specified robot.	
ARCHP2	Specifies/acquires the arch position 2 parameter of a specified robot.	
ASPEED	Specifies/acquires the AUTO movement speed of a specified robot.	
AXWGHT	Specifies/acquires the axis tip weight parameter of a specified robot.	
CHANGE	Switches the hand of a specified robot.	
DECEL	Specifies/acquires the deceleration rate parameter of a specified robot.	
HAND	Defines the hand of a specified robot.	
LEFTY	Sets the hand system of a specified robot to the left-handed system.	
ORGORD	Specifies/acquires the axis sequence parameter for performing return-to-origin and an absolute search operation in a specified robot.	
OUTPOS	Specifies/acquires the "OUT position" parameter of a specified robot.	
PDEF	Defines the pallet used to execute pallet movement commands.	
PSHFRC	Specifies/acquires the "Push force" parameter.	
PSHJGSP	Specifies/acquires the push judge speed threshold parameter.	
PSHMTD	Specifies/acquires the push method parameter.	
RIGHTY	Sets the hand system of a specified robot to the right- handed system.	
SETGEP	Sets the General Ethernet Port.	
SPEED	Changes the program movement speed of a specified robot.	
TOLE	Specifies/acquires the tolerance parameter of a specified robot.	
WEIGHT	Specifies/acquires the tip weight parameter of a specified robot.	

PATH control

Command	Description	
PATH	Specifies the PATH motion path.	
PATH END	Ends the path setting for PATH motion.	
PATH SET	Starts the path setting for PATH motion.	
PATH START	Starts the PATH motion.	

Torque control

Command	Description	
	Acquires the current torque value ratio of a specified axis to the rated torque.	
CURTRQ	Acquires the current torque value of the specified axis of a specified robot.	
PUSH	Executes a pushing operation in the axis unit.	
TORQUE	Specifies/acquires the maximum torque command value which can be set for a specified axis of a specified robot.	
	·	

Input/output control

Command	Description	
DELAY	Waits for the specified period (units: ms).	
DO	Outputs a specified value to the DO port or acquires the DO status.	
LO	Outputs a specified value to the LO port to enable/disable axis movement or acquires the LO status.	
МО	Outputs a specified value to the MO port or acquires the MO status.	
OUT	Turns ON the bits of the specified output ports and terminates the command statement.	
RESET	Turns the bit of a specified output port OFF.	
SET	Turns the bit at the specified output port ON.	
SI	Acquires a specified SI status.	
SID	Acquires a specified serial input's double-word information status.	
SIW	Acquires a specified serial input's word information status.	
so	Outputs a specified value to the SO port or acquires the SO status.	
SOD	Outputs a specified serial output's double-word information or acquires the output status.	
sow	Outputs a specified serial output's word information or acquires the output status.	
то	Outputs a specified value to the TO port or acquires the TO status.	
WAIT	Waits until the conditions of the DI/DO conditional expression are met (with time-out).	

Communication control

Command	Description	
CLOSE	Close the specified General Ethernet Port.	
ETHSTS	Acquires the Ethernet port status.	
GEPSTS	Acquires the General Ethernet Port status.	
OFFLINE	Sets a specified communication port to the "offline" mode.	
ONLINE	Sets the specified communication port to the "online" mode.	
OPEN	Opens the specified General Ethernet Port.	
SEND	Sends a file.	

Accessories and part options

RCX340

Standard accessories

Power connector + wiring connection lever



Model KAS-M5382-00

SR1-P RCX221 RCX222 RCX240/S RCX340

LCC140 TS-X TS-P SR1-X

Safety connector



Model KCX-M5370-00 RCX340

RCX221 RCX222 Model KAS-M5163-30 RCX240/S RCX340

NPN / PNP connector

PBX terminator (dummy connector)

tion with the programming box PBX removed.

Attach this to the PBX connector during opera-



Connector plug model KBH-M4424-00 Connector cover model KBH-M4425-00

SR1-X SR1-P RCX340

RCX340

Absolute battery

Battery for absolute data back-up.

Basic specifications

Busio specii	ioutions
Item	Absolute battery
Battery type	Lithium metallic battery
	3.6V/2,750mAh
Data holding time	About 1 year Note1 (in state with no power applied)
Dimensions	ф17 × L53mm
Weight Note2	22g



Model KCA-M53G0-01

Note 1. When using two batteries for each two axes.

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.

Absolute battery

- 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

Dust cover for COM connector

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Dust cover for LAN connector Model KCX-M658K-00 RCX340

RCX340 **Dust cover for USB connector** Model KCX-M658K-00

(LCC140) ERCD SR1-X SR1-P

RCX221

RCX222

RCX240/S

■ Options

External 24V power supply connector for brake + wiring lever



RCX340 Model KCX-M6500-10

Programming box PBX/PBX-E

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



Туре	Language	Cable length		RCX340
	lananasa	5m	KCX-M5110-1J	
	Japanese	12m	KCX-M5110-3J	
PBX	English	5m	KCX-M5110-1E	
PDA	English	12m	KCX-M5110-3E	
	Chinaga	5m	KCX-M5110-1C	
	Chinese	12m	KCX-M5110-3C	
	lananasa	5m	KCX-M5110-0J	
PBX-E	Japanese	12m	KCX-M5110-2J	
(with	Castiala	5m	KCX-M5110-0E	
ènable	English	12m	m KCX-M5110-2E	
switch)	Chinese	5m	KCX-M5110-0C	
	Crimese	12m	KCX-M5110-2C	
Display language switching USB for PBX			Model	
		вх	CX-M6498-00	
		k	CX-M657E-00	

	Model
Display language switching USB for PBX	KCX-M6498-00
USB cable	KCX-M657E-00

KCX-M4990-10

(RCX340)

RCX-Studio Pro (USB key included)

Model

Support software for PC (2559) **RCX-Studio Pro**

This is support software for operating the RCX340 controller.

A USB key is supplied to the RCX-Studio Pro to prevent robot operation mistakes.





available at a special price. Please contact Yamaha for details. Functional limitations depending on USB key presence

Note. Although it is possible to install this software on multiple PCs, the functionality is limited if there is

no USB key (see table below). Additional USB keys (additional licenses) are

Function	USB key present	USB key absent
Connecting to the controller	0	×
Saving the file data	0	×
Emulator function	0	0
Real Time Trace	0	△ Emulator only
Cycletime Calculator	0	×
iVY2 editor	0	×
Data Difference	0	Except data saving

Environment

os	Microsoft Windows XP / Vista (32/64bit) / 7 (32/64bit) / 8 (32/64bit) / 8.1 (32/64bit)
CPU	Intel [®] Core [™] 2 Duo 2 GHz or higher is recommended
Memory	1 GB or more is recommended
Hard disk	80MB or more free space in the RCX-Studio Pro installation destination
Communication port	Communication cable: serial communication port, Ethernet, or USB port USB key: USB port (one port)
Display	1024×768 or higher resolution, 256 colors or higher
Other	CD-ROM drive Dedicated communication cable (for D-Sub or for USB) Ethernet cable (category 5 or higher)
Applicable robot controllers	RCX340

Note. Microsoft, Windows, Windows XP, Windows Vista, Windows 7, Windows 8 and Windows 8.1 are either registered trademarks or trademarks of Microsoft Corporation in the United

States and/or other countries.

Other company names and product names listed in this manual may be the trademarks or registered trademarks of their respective companies.

Data	cab	les
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Communication cable for RCX-Studio Pro. Select from USB cable or D-sub cable.





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

Note. This USB cable supports Windows 2000/XP or later. Note. Data cable jointly used for POPCOM+, VIP+,

RCX-Studio Pro.

Note. USB driver for communication cable can also be downloaded from our website.

	downloaded from our website.	RCX340
YC-Link/E master board	Model KCX-M4410-M0	RCX340
YC-Link/E slave board	Model KCX-M4410-S0	RCX340
YC-Link/E cable (1m)	Model KCX-M6479-10	RCX340

Support software for PC

Option details

S-Manager

Besides basic functions, such as point data edit and backup, this support software TS-Manager incorporates various convenient functions to efficiently process the system debugging and analysis. The TS-Manager helps you in every scene from the system setup to the maintenance.

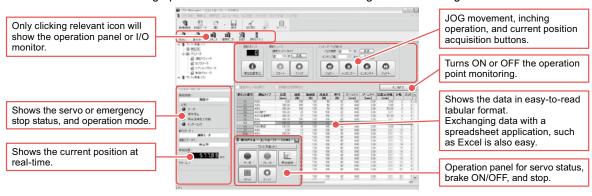


▼ Applicable controllers	
TS-S2 TS-SH TS-X TS-P	P.490
TS-SD	P.500

■ Features

1 Basic functions

Detailed settings by point, such as the position information, operation pattern, speed, acceleration, and deceleration settings, and robot parameter settings can be set, edited, and backed up. Additionally, the basic operation of the robot, such as JOG movement or inching operation can also be controlled through the TS-Manager.

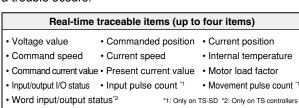


Note. Excel is a registered trademark of Microsoft Corporation in the United States and/or other countries.

2 Real-time trace

This function traces the current position, speed, load factor, current value, and voltage value at real-time. Additionally,

as trigger conditions are set, data can be automatically obtained when these conditions are satisfied. Furthermore, as a zone is specified from the monitor results, the maximum value, minimum value, and average value can be calculated. These values are useful for the analysis if a trouble occurs.

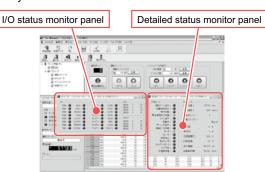


Specify a zone for calculation. Calculates the maximum value, minimum value. average value. and root mean square value in Traces data at real-time. a specified zone.

3 Various monitor functions and detailed error logs

The robot operation status (operation mode or servo status) and I/O status can be monitored.

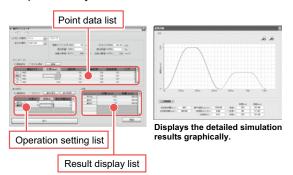
Additionally, the Alarm Log screen also displays the input/output I/O status in addition to the carrier position, speed, operation status, current value, and voltage value in case of an alarm. This greatly contributes to the status analysis.



4 Operation simulation

As the operation condition data or point data is input, a period of time necessary for operation is simulated.

Use of this function makes it possible to select an optimal model before purchase and simulate the speed and acceleration/deceleration settings without use of actual machine. It is also possible to link this operation simulation function with the TS-Manager main software. This easily affects the point data you have edited in the actual machine.



■ TS-Manager



Model	KCA-M4966-0J (Japanese)
Model	KCA-M4966-0E (English)

■ TS-Manager environment

OS	Microsoft Windows 2000/XP/Vista (32bit/64bit)/7 (32bit/64bit)
CPU	Exceeding the environment recommended by the OS being used
Memory	Exceeding the environment recommended by the OS being used
Hard disk	Vacant capacity of more than 20MB in the installation destination drive
Communication port	Serial (RS-232C), USB
Applicable controllers	TS-S2/TS-SH/TS-X/TS-P/TS-SD

 $Note.\ Windows\ is\ the\ registered\ trademark\ of\ US\ Microsoft\ Corporation\ in\ U.S.A.\ and\ other\ countries.$

■ Data cables (5m)

Communication cable for TS-Manager. Select from USB cable or D-sub cable.



USB type (5m) KCA-M538F-A0 Model D-Sub type (5m) KCA-M538F-01

Note. USB driver for communication cable can also be downloaded from our website.

TS-P TS-SD

Option details

Support software for PC

POPCOM+

POPCOM+ is an easy to operate application software that makes tasks such as robot operation, writing-editing programs, and point teaching easy to visually understand.



▼Applicable controllers

LCC140 P.484

ERCD P.510

. . . .

SR1-X SR1-P

■ Features

1 Easy to use

All items necessary for robot operation are displayed on single screen. There is no need to remember the menu structure so that it can be easily operated with mouse control by anybody.



2 Program editing

Edit amendment, cut, copy, paste, syntax check and program entry can be performed efficiently with function keys.



3 Point editing

Edit amendment, cut, copy, paste, syntax check, teach and trace functions are provided.



4 Help function

If you need some detailed information, robot language etc. during operation, operate [F1] key or [HELP] key to recall useful information on the screen.



5 Robot operation

By connecting between a computer and the controller with a communication cable, the controller can control the robot in the same way as a HPB / HPB-D (programming box).

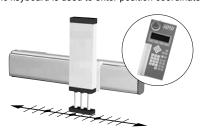


6 Creating point data

There are three methods available for creating the point data.

MDI (Manual Data Input) teaching

The numeric keyboard is used to enter position coordinate data directly.



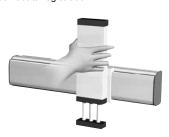
Remote teaching

The robot arm is actually moved to the target position using the keys for point data registration.



Direct teaching

The robot arm is manually moved to the target position with the servo motors off for point data registration.



■ PC supporting software POPCOM+ ■ POPCOM+ environment



POPCOM+ software model KBG-M4966-00

	OS	Microsoft Windows XP / Vista (32bit/64bit) / 7 (32bit/64bit) /	
	00	8,8.1 (32bit/64bit)	
	CPU	Processor that meets or exceeds the suggested requirements for	
	CFU	the OS being used.	
	Memory	Suggested amount of memory or more for the OS being used.	
	Hard disk	50MB of available space required on installation drive.	
	Disk operation	RS-232C	
•	Applicable controllers	SRCX/ERCX/DRCX/TRCX/SRCP/SRCD/ERCD/SR1/LCC140 Note 1	

Note 1. LCC140 is applicable to Ver. 2.1.1 or later.

LCC140 ERCD SR1-X SR1-P RCX221 RCX222 RCX240/S RCX340

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.

■ Data cables (5m)

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



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

Note. This USB cable supports Windows 2000/XP or later. Note. Data cable jointly used for POPCOM+, VIP+, RCX-Studio Pro.

Note. USB driver for communication cable can also be downloaded from our website.

■ Controller & data cable / converter adapter matchup table

Controller Data cables	ERCD SR1-X/SR1-P LCC140 (9Pin)	ERCX DRCX (25Pin)
[9Pin-9Pin cable] • KAS-M538F-10 (SSC-2-5L)	Needs no converter adapter	9Pin-25Pin converter adapter KBB-M657E-01

■ 9Pin-25Pin converter adapter

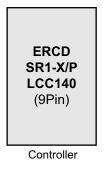
This is an adapter for converting the female D-sub25Pin to a female D-sub9Pin. This adapter is needed if using the ERCX and DRCX.

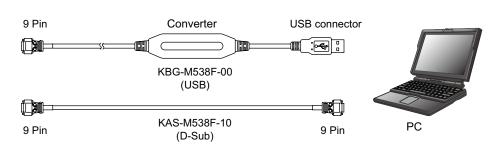


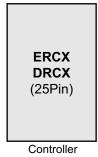
Model KBB-M657E-01

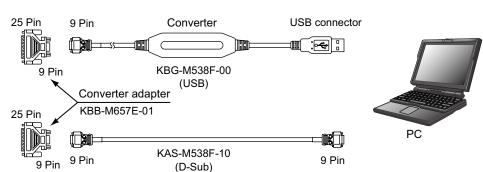
Note. It is unnecessary when using ERCD or SR1-X, SR1-P.

■ Controller and data cable connection diagrams









Option details

Support software for PC

Windows

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



▼Applicable controllers

RCX221 RCX222

P.524

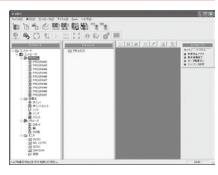
RCX240 RCX240S

P.532

■ Features

1 GUI updated for enhanced usability

The user interface has been improved with the VIP Windows function kept as it is so as to achieve more ease of use.



2 Data displayed in the tree view form

The data included in the controller is displayed legibly.



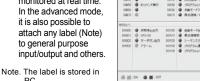
3 Fully equipped tool bar

Each of various functions can be executed by simple one click on the tool bar.



4 Expanded monitor function

The I/O conditions and variables in the controller can be monitored at real time.





5 Data operation using the new drag & drop function

The data can be stored easily by using the drag & drop function. Likewise, the stored data can be restored to the controller by operating the mouse only.



6 Input the data in the work sheet form (Parameter, Point data)

It is also possible to copy and paste the data from the other spread sheet (chart calculation software).



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7 Syntax coloring when editing the program

When reserved words (character string reserved as the robot language) are inputted, they are colored automatically, making them noted at one glance for easier program editing.



8 Program execution monitor

The step being performed during the program execution can be monitored. Thus, it ispossible to check which step is performed without stopping the program, thereby debugging of the program is made much easier.



9 List appointing (point where the system is restored)

It is possible to create the system restoration point at any timing. By doing so at important points in the system constructing process when, for example, something faulty is found after the system was changed, the system can be returned to the state before such change easily.



■ VIP PLUS function

1 Easy to use

With a number of robot operation items provided on one screen, any operator can operate easily without memorizing the menu construction.



5 Robot operation

By connecting PC and controller with communication cable, robot operation will be available by the on-line command.



2 Programming editing

The program, point, parameter, shift, and hand can be edited on the PC alone. Equipped with the function selector having the command searching function which enables to input the robot language with ease.



6 On-line editing

Connecting a PC and the controller with a communication cable enable to edit data from robot controllers just as with RPB / RPB-E.



3 Data check function

Provided with the equivalent data check function to that of a robot controller, it is possible to correct data errors before operation.



7 Creating point data There are three methods available for creating the point data.

MDI (Manual Data Input) teaching

The numeric keyboard is used to enter position coordinate data directly.



4 Help function

When more information is needed during operation, press the [F1] or [HELP] key, and the help screen will appear.



LCC140 ERCD

SR1-X

SR1-P

RCX221

RCX222

RCX240/S

RCX340

Remote teaching

The robot arm is actually moved to the target position using the keys for point data registration.



Direct teaching

The robot arm is manually moved to the target position with the servo motors off for point data registration.

■ Support software for PC VIP+



	14340 144000 00
Model	KX0-M4966-00

Environment

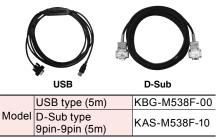
os	Microsoft Windows 2000 / XP / Vista (32bit / 64Bit) / 7 (32bit / 64Bit)
CPU	Processor that meets or exceeds the suggested requirements for the OS being used.
Memory	Suggested amount of memory or more for the OS being used.
Hard disk	40MB of available space required on installation drive.
Communication method	RS-232C, Ethernet Note. For Ethernet communication, Ethernet unit for RCX series controller is required.
Applicable robot controllers	RCX221 / RCX222 / RCX141 / RCX142 / RCX240 / RCX240S

Note. Microsoft and Windows are registered trademarks of Microsoft Corporation.

Note. ADOBE and ADOBE READER are registered trademarks of Adobe Systems Incorporated. Note. Ethernet is a registered trademark of Xerox Corporation.

■ Data cables (5m)

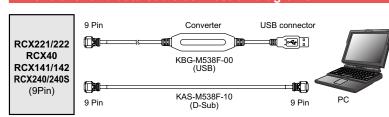
Communication cable for VIP+. Select from USB cable or D-sub cable



Note. This USB cable supports Windows 2000/XP or later Note. Data cable jointly used for POPCOM+, VIP+, RCX-Studio Pro

Note. USB driver for communication cable can also be downloaded from our website

■ Controller and data cable connection diagrams



Support software for PC

V-Manager

RDV-Manager is software for RDV-X/RDV-P. Using the Windows operating computer, it is possible to set parameters, to monitor the position, speed and torque and to have graphics displayed, assuring pleasant and easy operation in the Windows Vista, Windows 7 or Windows 8 / Windows 8.1 environment.



▼Applicable controllers

RDV-X RDV-P

■ Features

Option details

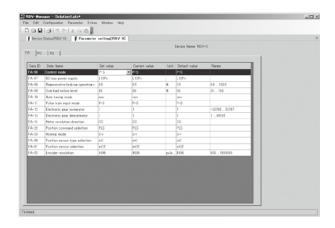
1 Monitoring function

It is possible to monitor the operation condition and output state in real time. Additionally, the terminal can be operated forcibly to check the operation.

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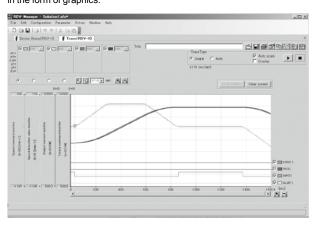
2 Setting parameters

It is possible to set, change, print and store the parameters.



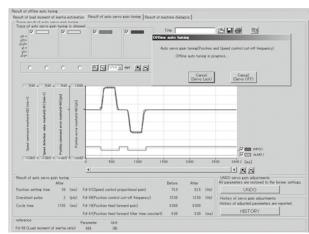
3 Operation tracing function

It is possible to have the servo motor speed and electric current displayed in the form of graphics.



4 Offline auto tuning function

The load moment of inertia can be estimated and the automatic servo gain can be adjusted.



■ Support software RDV-Manager ■ Environment

RDV-Manager is RDV-X / RDV-P dedicated software.



Model KEF-M4966-00

os	Microsoft Windows Vista(32bit) Note 1 / 7(32bit/64bit) / 8, 8.1(32bit/64bit)
CPU	Pentium4 1.8GHz or more (Recommend)
Memory	1GB or more
Hard disk	1GB of available space required on installation drive.
Disk operation	USB
Applicable controllers	RDV-X / RDV-P

Note 1. SP1 (service pack 1) or higher. Note. Windows Vista, Windows 7, and Windows 8 / Windows 8.1 are trademarks of Microsoft Corporation registered in U.S.A. and other countries.

Communication cable for PC supporting software RDV-Manager (3m)

Communication cable to connect PC and a controller.



Model KEF-M538F-00

X-Studio Pro

▼Applicable controllers

RCX340

P.542

This is dedicated support software for the RCX340 controller. It is a further advance in ease-of-use over the previous RCX-Studio. Emulator functionality is also provided, contributing to full-scale system startup.





■ Features

1 Evaluation

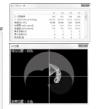
Emulator function provided

By operating the controller on a PC, programs can be created and debugged even without a controller. Cycle time can also be calculated, greatly reducing the time for software design.

Cycle time calculator

Cycle time between two points can be easily calculated in two steps. Choosing a model is easily done; simply select a model and enter the position.





2 Design

Easy-to-use operation allows speedy setup

Program entry support functionality is provided. Program editing and data editing.

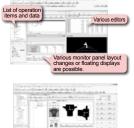
Inter-operation with other manufacturer's line simulators

Software made by other companies can be connected to the emulator of the RCX-Studio Pro, allowing check ing for interference between robots in the facility.

Note. Software made by other companies is provided by the customer

iVY2 editor provided

Integration of iVY2 Studio makes it unnecessary to switch between software: this improves productivity.



3 After installation

Realtime trace

Continuous output of the controller's internal data allows the status to be checked at any time. Even if no measuring device is present, the current waveform can be obtained for peace of mind.



Application debugging function

Debugging information for multiple tasks can be displayed simultaneously.



4 Maintenance

Data comparison tool

Two specified data items can be compared, and the difference shown Comparison of entire ALL files and comparison of individual programs is also possible

Direct comparison with online data is also possible, greatly shortening the time required for maintenance tasks



RCX-Studio Pro software





RCX-Studio Pro KCX-M4990-10 Model (USB key included)

Note. Although it is possible to install this software on multiple PCs, the functionality is limited if there is no USB key (see P.551).

Additional USB keys (additional licenses) are available at a special price. Please contact Yamaha for details.

os	Microsoft Windows XP / Vista (32/64bit) / 7 (32/64bit) / 8 (32/64bit) / 8.1 (32/64bit)
CPU	Intel® Core™ 2 Duo 2 GHz or higher is recommended
Memory 1 GB or more is recommended	
Hard disk	80MB or more free space in the RCX-Studio Pro installation destination
Communication port	Communication cable: serial communication port, Ethernet, or USB port USB key: USB port (one port)
Display	1024×768 or higher resolution, 256 colors or higher
Other	CD-ROM drive Dedicated communication cable (for D-Sub or for USB) Ethernet cable (category 5 or higher)
Applicable robot controllers	RCX340

Note. Microsoft, Windows, Windows XP, Windows Vista, Windows 7, Windows 8 and Windows 8.1 are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries Other company names and product names listed in this manual may be the trademarks or registered trademarks of their respective companies.

■ Data cables (5m)

Communication cable for RCX-Studio Pro-Select from USB cable or D-sub cable





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

Note. This USB cable supports Windows 2000/XP or later. Note. Data cable jointly used for POPCOM+, VIP+, RCX-Studio Pro

Note. USB driver for communication cable can also be downloaded from our website

LCC140	ERCD
SR1-X	SR1-P
RCX221	RCX222
RCX240/S	RCX340

Handy terminal

/HT1-D

This Handy Terminal is a device that can perform any operation such as robot manual operation, point data edit, teaching, and parameter setting, etc. Has graphic LCD display with backlight for easy viewing.

▼Applicable controllers

TS-S2 TS-SH

TS-X TS-P P.490

■ HT1 / HT1-D basic specifications HT1-D HT1 Name External view Applicable controllers TS-S2 / TS-SH / TS-X / TS-P KCA-M5110-1J(3.5m) KCA-M5110-0J(3.5m) Japanese specifications KCA-M5110-6J(10m) KCA-M5110-7J(10m) Model KCA-M5110-0E(3.5m) KCA-M5110-1E(3.5m) English specifications KCA-M5110-7E(10m) KCA-M5110-6E(10m) Display Dot matrix monochrome display (with backlighting) 32 characters × 10 lines Operation keys Mechanical switch Emergency stop button Normally closed contact point (with lock function) Enable switch 3-position Safety connector 15 pin D-sub connector (male) CE marking Not supported Applicable Operating temperature 0°C to 40°C Operating humidity 35% to 85%RH (non-condensing) **Dimensions** W88 × H191 × D45mm (Emergency stop button not included.)

■ Part names and function

Strap holder

Cable length

Weight

Attaching a short strap or necklace strap here prevents dropping the HT1 while operating it or installing it onto equipment.

LCD screen

This is a liquid crystal display (LCD) screen with 32 characters × 10 lines (pixel display), showing the operation menus and various types of information.

Data edit keys

Use these keys to select menus and edit various data.

Connector cable

This cable connects to the ontroller. One end of this cable is terminated with an 8-pin MD connector (male). Plug this cable into the COM1 connector on the controller front panel.



3.5m / 10m

Pressing this button during operation immediately stops robot movement. To release this button, turn it clockwise Releasing this button also cancels emergency stop.

260g (not including cable)

Run/stop keys

Use these keys to operate the robot for teaching or positioning, or to stop operation. The early are also provided to move the robot in jog mode.

■ HT1-D rear side

This switch is effective for use with remote safety circuits. This switch cuts off the circuit when pressed or released but allows circuit operation when in the middle position.



300g (not including cable)

(only on HT1-D)

Use with remote safety circuits triggered by the emergency stop button or enable switch.

Programming box

Option details

HPB/HPB-D

All operations can be performed from this device including manual robot operation, programming entry and editing, teaching and setting parameters. The display works interactively with the operator so even an absolute beginner can easily learn how to use programming box.

▼ Applicable of	▼Applicable controllers		
LCC140	P.484		
ERCD	P.510		
SR1-X SR1-P	P.516		

■ HPB	/ HPB-D	basic spe	cifications

Name		НРВ	HPB-D		
External	l view	And Hone Hone Hone Hone Hone Hone Hone Hone			
Model	Using with ERCD, SR1-X, SR1-P	KBB-M5110-01 (without a conversion adaptor)	KBB-M5110-21 (without a conversion adaptor)		
wodei	Using with ERCX, SRCP30, DRCX	KBB-M5110-0A (with a conversion adaptor)	KBB-M5110-2A (with a conversion adaptor)		
Display		LCD (20characters × 4 lines)	LCD (20characters × 4 lines)		
Emergency stop button		Normally closed contact point (with lock function)			
Enable switch		_	3-position		
CE marking		Not supported	Applicable		
Memory back-up device		SD Memory card			
Operating temperature		0°C to 40°C			
Operating humidity		35% to 85%RH (non-condensing)			
Dimensi	ons	W107 × H230 × D53mm (Strap holder, emergency stop button not included.)			
Weight		650g			
Cable length		3.5m			

■ Part names and function

Emergency stop button

Performs a robot emergency stop when pressed during robot operation. Release the button lock (locks when pressed) by turning the button in the CW direction. After releasing the button, a servo recovery must be performed from the HPB (or by I/O operation) in order to recover from the emergency stop status.

Liquid crystal display

This is a 20-character, 4-line LCD screen. The operation menu and other information are displayed here.

Connector cable

Connects the HPB to the controller. A D-Sub 9-pin connector (male) is provided at one end of the cable.



HPB

Attaching a short strap or necklace strap here prevents dropping the HPB while operating it or installing it onto equipment.

SD memory card connector

An SD memory card can be inserted here. SD memory cards are provided by the customer.

Operation keys

These keys are used to operate the robot and to enter programs and data, etc.
The keys are divided into 2 main groups: function keys and data entry/operation keys. (For operation key details, see Chapter 3, "Basic operations".)

■ HPB-D rear side

Safety connector (HPB-D only)

Use this connector with the emergency stop or enable switch to configure an external safety circuit. Attaching the supplied 15-pin D-sub connector (female) directly to this safety connector enables the emergency stop button only.



3-position enable switch (HPB-D only)

This switch is effective for use with an external safety circuit.

This switch opens (cuts off) the circuit when pressed or released.

Pressing it to mid-position connects the circuit. Use this switch as the enable switch in Service mode, so that the external safety circuit triggers emergency stop on the robot when this switch is pressed or released.

A conversion adapter for HPB

The adapter converts from 25 pins to 9 pins. If the HPB was ordered along with a converter adapter then this adapter comes packed along with the unit.



Model KBB-M657E-01

Note. It is unnecessary when using ERCD or SR1-X,

Option details

Programming box

RPB/RPB-E

All operations can be performed from this device including manual robot operation, programming entry and editing, teaching and setting parameters. The display works interactively with the operator so even an absolute beginner can easily learn how to use programming box.

▼Applicable controllers

RCX221 RCX222

P.524

RCX240 RCX240S

P.532

Customers using the RCX141 / RCX142 controllers should use the connector converter cable (See P.603.)

■ RPB / RPB-E basic specifications

Name	RPB	RPB-E
External view		
Applicable controllers	RCX221 / RCX222 / RCX240 / RCX240S	
Model	KBK-M5110-10	KBK-M5110-00
Display	LCD (40characters 8 lines)	
Emergency stop button	Normally closed contact point (with lock function)	
Enable switch	-	3-position
CE marking	Not supported	Applicable
Operating temperature	0°C to 40°C	
Operating humidity	35% to 85%RH (non-condensing)	
Dimensions	W180 × H250 × D50mm (Strap holder, emergency st	top button not included.)
Weight	600g	
Cable length	5m (Standard), 12m (Options)	

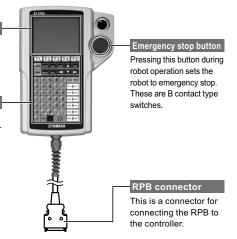
■ Part names and function

Display (screen) Liquid crystal display

(LCD) shows different types of information with 8 lines × 40 characters. Contrast is adjustable.

Sheet ke

These are key switches for operating the robot or entering programs, etc. These are broadly grouped into 3 blocks consisting of function keys, control keys, and data keys.



■ RPB-E rear side



3-position enable switch (only on RPB-E)

This switch is usable as part of an external (remote) safety circuit.

Pressing this switch inwards or releasing it cuts off the (RPB/robot) circuit. However that circuit is operable when this switch is in middle position.

This enable switch is usually operable in service mode. It functions as part of an external safety circuit so that releasing the enable switch or pressing it inwards set the robot to emergency stop.

▼Applicable controllers

P.542

RCX340

Option details

Programming box

PBX-E

This programming box is applicable to three languages, "Japanese", "English", and "Chinese". Use of a color display makes it possible to improve the visibility. Work to add or edit functions becomes easy, allowing even personnel without programming skill to operate this programming box.

A function to save the controller data into the USB memory is incorporated.

■ PBX/PBX-E basic specifications

			T	
Name		PBX	PBX-E	
Extern	al view			
Applic	able controllers	RCX340		
	Japanese language model	KCX-M5110-1J (5m) KCX-M5110-3J (12m)	KCX-M5110-0J (5m) KCX-M5110-2J (12m)	
Model	English language model	KCX-M5110-1E (5m) KCX-M5110-3E (12m)	KCX-M5110-0E (5m) KCX-M5110-2E (12m)	
	Chinese language model	KCX-M5110-1C (5m) KCX-M5110-3C (12m)	KCX-M5110-0C (5m) KCX-M5110-2C (12m)	
Displa	y screen	Color LCD (320 × 240 dot)		
Emerg	ency stop button	Normally-closed contract (with lock function)		
Enable	e switch	Not provided	3-position type	
Manua	al lock selector switch	90°, 2-notch		
Power		+12 V DC		
Opera	ting environment	Ambient temperature for use: 0 to 40 °C, Ambient temperature for storage: -10 to 60 °C Humidity: 35 to 80% (no condensation)		
Dimen	sions (mm)	W141 × H245 × D45 (excluding projecting parts)		
Cable	length	5 m or 12 m (Select either)		
Weigh	t	440 g (excluding the cable)	460 g (excluding the cable)	

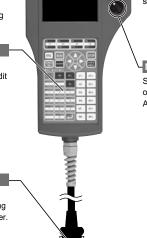
■ Part names and function



display (LCD), showing various types of information

Operation keys

Use these keys to operate the robot or edit any data.



Emergency stop button

This is a normally closed, self-lock switch.

Manual lock switch

Switches the controller operation mode between AUTO and MANUAL.

■ Display language switching USB for PBX

	Model
Display language switching USB for PBX	KCX-M6498-00
USB cable	KCX-M657E-00

■ PBX-E rear side

USB connector Connects the USB memory and programming box.

3-position enable switch (PBX-E only)

This switch is provided for safety. Pressing it to mid-position only allows robot operation.

connect the programming box to the robot controller.

Option details

LCD Monitor option

onitor

Integrated into the controller unit, the TS-monitor needs no connections to the handy terminal or PC and checks operation status, current position, error information, etc. The TS-monitor even allows the operator on the scene or service personnel to easily check the controller status.

Total operating time is also displayed which is convenient to schedule maintenance periods.

Note. The TS-Monitor cannot be installed on the controller when using a daisy-chain connection or when using a gateway connection

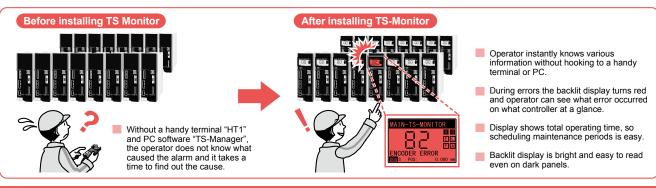
▼Applicable controllers

TS-X TS-P

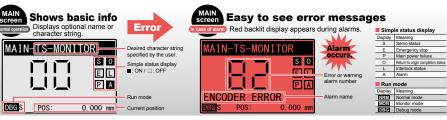
P.490



The TS Monitor Advantage

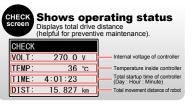


■ Features

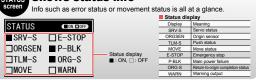


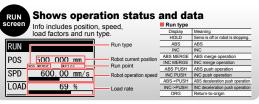


INFORMATION	
CONT : TS-X-10A	Controller name
VER : 1. 03. 105	Controller software version
R0B0T:F14-20	Robot name
P. TYP: CUSTOM	Point type





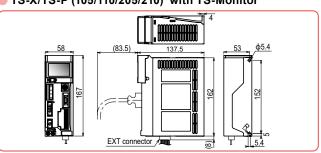




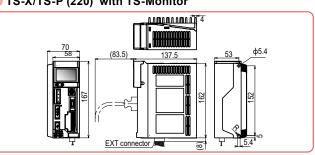
Shows I/O status Displays input/output bit states FEDCBA98 Input signal status * Displays the status of input bit 0 to 15. 765432 FEDCBA98 Output signal status * Displays the status of output bit 0 to 15. 765432110 F E D C B SERVO RESET START /LOCK ORG 7 6 5 4 3 2 1 0 PIN7 PIN6 PIN5 PIN4 PIN3 PIN2 PIN1 PIN0 F E D C B A 9 8 SRV-S /ALM END BUSY OUT3 OUT2 OUT1 OUT0

TS-X/TS-P dimensions (with TS-Monitor)

TS-X/TS-P (105/110/205/210) with TS-Monitor



TS-X/TS-P (220) with TS-Monitor



TS-Monitor basic specifications

		KCA-M5119-00	
Model	TS-P	KCA-M5119-10	
Effective display size		W40.546 × H25.63mm	
Screen display		Graphic monochrome LCD	

Backlight	Blue and red, 2-color LCD
Contrast adjustment	5 steps
Number of display dots	128 × 64 dots

Touch operator interface

GP4000 series

Connecting GP4000 Series made by Pro-face to Robot Positioner, TS-S2, TS-SH, TS-X, TS-P enables you to use a lot of functions as well as basic operations on Touch Operator Interface.

Free download of the program file from the Pro-face home page

http://www.proface.com

▼Applicable controllers **TS-S2** TS-SH P.490 TS-X TS-P

■ Features

Option details

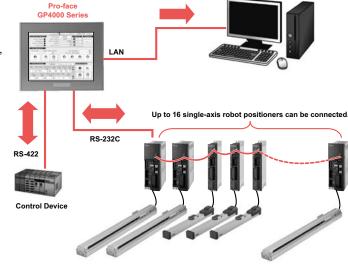
1 Can easily check a state and change settings.

- · Check the status (the current position, speed etc)
- · Basic operations such as Jog operation, inching operation, return to origin, error reset etc.
- · Set, edit, or back up point data and parameters
- · Check triggered alarms and detailed descriptions of alarm history

2 Supports 3 languages

· Supports Japanese, English, and Chinese (simplified, traditional)





Screen details

Diagnostic Screen

When a problem occurs, you can check the detailed descriptions of the alarm history, so you can understand easily what the cause is.

ш	Alarm F		roop [i]	NXX .	1 TS-S	S783-1	246	Ľ
		100 Contents (7)	9 15/6			_	5	
		Message]				_ 0		
3		88:0VE L070						
4	1	Meaning) Everland dates	tion fewd w	es exced	id.			
4	1	Pessible Cause				a		
4	Time	29(84:27)	Position	-296, 89	Speed	-3.68		
4	Status[HULD Paint	Carr	rent -88	Vol tage			
	nput.	EDEENS	El o	otrut[][]	0.00	0.8.8	230	ī
-1	- 0	0 5 4 3 2 3	10	10 6	5 8 3	2 1 3	153	Ļ
20	and the same	My					72.50	÷
	Factor	Contents	Time	Position	Speed [wo/s]	Run Storout	Point	ŀ
lo.			[dthte]					
to.	88	OVER LIVE	29:24:27	-295, 66	-2,68	HILD	8	
1 2	88 82	OVER LIVE OUXCOLS ESSUE						
1 2 3			29:24:27	-496, 15	-2,68	HOLD	8	
1 2	82	DIXXXX EXXX	29:24:27	-496, 15 358, 89	-1,68 -1998,88	HILD	8	ľ

Position Data Editing Screen

You can edit and back up point data (255 points). No

Note. Settings for it and a USB storage required.

Pair	11-0918							STRONO	
Ib.	Run Type	Position [an]	Ioeed [1]	Accel.	Decel.	Puth [2]	Zone - [m]	Zone + [rm]	8
- 1	FES MERSE	13,96	136	108	108	85	8.83	8.08	Œ
2	FES MERGE	23, 90	136	106	308	85	83.3	83.3	
2	RES MERSE	13, 96	126	106	308	85	6.03	6.08	
4	RES	43.90	126	108	328	85	83.3	83.3	
5	RES	53,90	136	108	108	85	8.83	0.08	
- 6	RIS .	63, 98	136	106	108	85	63.3	6.08	
7	RES	72, 96	126	106	109	85	63.3	6.08	
2	RES	110.00	136	108	109	85	8.83	8.88	
5	RIS	153, 96	136	108	108	85	83.3	83.3	
18	RES	283, 98	126	106	109	85	6.00	89.9	
11	RRS	65, 42	136	108	108	85	83.3	8.08	le
12									18
								- 0	
lite	Bo Look R (0×4)	- 5			le l		Pelead	Doenlo:	5

I/O Monitor Screen

Displays both general I/O and dedicated I/O together. You can quickly check the I/O status.

	Larguage	Rode 1 TS-S	5883-1258 (to
(A) Skaliker			
- 3		- 87	
rine 🍙	J00+ 🚓	F0078 @	(UT) @
111 @	300-	F0071 @	(00)
100 @	MWIN. @	F0072 @	0JT2 @
110 @	000 😩	F0013 @	(UT) @
	JUDY CONTROL C	F0074 @	0073
205	STAT @	10075	00 @
ns e	RESET @	F0076 @	775.TI @
1117 @	SERVO 🕝	F00177 @	507-5 @
W.X		MOT	
ane.	- 8	KUTE	0
4101	0	MOUT)	6
411/2	0	HOU72	6
ATRO		400 TS	

Parameter Editing Screen

While checking parameters of robot positioners in the list, you can set them with the pull-down menu.

		Language []			SR#3-1258	ileo
Pa	Run raweter	(J/O Paramoter	10	otion rameter	Serve Parameter	
No.		imo	thi t		Setting	
1	(-)Soft	Limit	/m			3, 80
		Limit	198		26	3. 20
3	IN-posit		788			3, 85
4	Fush Hod				hing, no err, J	ugde
6	Posh Jul	pe Time	196	No 4		×
6	Push Spe	ed	my/s	Po.	shing, no err, J	upde
7	Zone(+)		rm	Positio	ming, ne err. J	udon
8	Zone(+)		799		ing, with err, J	
9	Speed Or	erride	1 1	Position:	ing, with err. J	udon
18	Jon Stree	d	1			180
11	Inching	kii dish	788			. 20
12	MOVE Out	put Level	MY/S			3, 21
13	Origin 5	send	867/10		1	3, 20
14	Origin 6	irection				COM
15	Origin 6	oondinate			Stan	dand
15	Origin 5	Self-t	799			3, 80

Information Monitor Screen

The screen can display the robot status and the operation status. You can check immediately the robot condition.

Status Nation	Sin Minister	
● P206E	Position [em]	2.8
@ TEMS	Speed(rm/s)	0.80
@ 000-5	Ren Print	
€ 70% € 70%	Rin Status	HILD
② 1093/30	Current Value[1]	-
② NWE-S ③ SERVO	Load Factor(X)	
© IE/EI	Voltage[V]	23.8
	Terperature[] [- 8
€ LIW € ZSTWILS	Distance [kn]	33, 255
₽ P-000	Total Time(dhos) [29:07:12

Connecting Selection Screen

You can connect up to 16 robot positioners simultaneously with GP-Pro EX Ver.3.0 multi-axis feature.

		La	ng.age	1 75-	5 578	3-1258 1:
Some	ctions					
Koća	Change	Type	Robet	Warsion	1/F	Position
1	OFF ON		SR#3-1258	1, 86, 111		0.00
2	OFF ON	TS-X-854	T4H-62	1, 86, 111		0.3
3	OFF ON					
4	OFF ON					
5	OFF ON					
.6	OFF ON	1				
7	OFF ON	1				
3	OFF ON					
9	OFF ON	1				
112	OFF ON	1				
	OFF ON	1				
12.	OFF ON					
13	OFF ON					
114	OFF ON	1				
15	OFF ON	1				
110	OFF ON	1				

Contact; Pro-face TEL:06-6613-1101 FAX:06-6613-5888

Option details

Field network system with minimal wiring

NETWORK

LCC140

P.484

■ CC-Link Basic specifications for network modules

Item	Network modules CC-Link
Applicable controllers	LCC140
CC-Link compatible version	Ver. 1.10
Remote station type	Remove device station
Number of occupied stations	Fixed to 2 stations
Station number	1 to 63 (Set from HPB)
Communication speed	10M/5M/2.5M/625K/156Kbps (Set using HPB or POPCOM+.)
Shortest length between stations	0.2 m or more
Total length	100m/10Mbps, 160m/5Mbps, 4000m/2.5Mbps, 900m/625Kbps, 1200m/156Kbps
Monitor LED	None
CC-Link I/O points	General-purpose input 32 points, General-purpose output 32 points Dedicated input 16 points, Dedicated output 16 points Input register 8 words Output register 8 words

Device Vet Basic specifications for network modules

Item		Network modules DeviceNet [™]	
Applicable controllers		LCC140	
Applicable DeviceNet™ specifications		Volume 1 Release2.0 Volume 2 Release2.0	
DeviceNet™ Conformance test		Compliant with CT24	
Device profile / Device type number		Generic Device (keyable) / 2B Hex	
Vendor name/Vendor ID		YAMAHA MOTOR CO.,LTD. / 636	
Product code		21	
Product revision		1.0	
EDS file name		Yamaha_LCC1(DEV).eds	
MAC ID setting		0 to 63 (Set using HPB or POPCOM+.)	
Communication speed setting		500K/250K/125Kbps (Set using HPB or POPCOM+.)	
Communication data		Predefined Master/Slave Connection Set: Group 2 only server Dynamic connection support (UCMM): None Support for divided transmission of explicit message: Yes	
Network length	Total length	100m/500Kbps, 250m/250Kbps, 500m/125Kbps	
	Branch length/Total branch length	6m or less/39m or less, 6m or less/78m or less, 6m or less/156m or less	
Monitor LED		None	
Number of DeviceNet™ I/O points/ number of occupied channels		General-purpose input 32 points, General-purpose output 32 points Dedicated input 16 points, Dedicated output 16 points Input register 8 words Output register 8 words	Input: 24byte Output: 24byte

EtherNet/IP Basic specifications for network modules

Item	Network modules EtherNet/IP [™]		
Applicable controllers	LCC140		
Applicable software version	LCC140: Ver. 64.07 or higher HPB/HPB-D: Ver. 24.06 or higher POPCOM ⁺ : Ver. 2.1.0 or higher		
Applicable EtherNet/IP™ specifications	Volume 1: Common Industrial protocol(CIP™) Edition 3.14 Volume 2: EtherNet/IP™ Adaptation of CIP Edition 1.15		
EtherNet/IP™ Conformance test	Compliant with CT11		
Device profile/Device type number	Generic Device (keyable) / 2B Hex		
Vendor name/Vendor ID	YAMAHA MOTOR CO.,LTD. / 636		
Product code	23		
Product revision	1.1		
EDS file name	Yamaha_LCC1(EIP2).eds		
Communication speed	10Mbps / 100Mbps		
Connector specifications	RJ-45 connector (8-pole modular connector), 2 ports		
Applicable cable specifications	STP cable (double shield) with CAT 5e or higher		
Maximum cable length	100m		
Monitor LED	Module Status(MS), Network Status(NS), Link/Activity: Port1-2		
Number of EtherNet/IP™ I/O points/ number of occupied channels	General-purpose input 32 points, General-purpose output 32 points Dedicated input 16 points, Dedicated output 16 points Input register 8 words Output register 8 words	Input: 24byte Output: 24byte	

TS-S2/TS-SH/TS-X/TS-P

P.490)

■ CC-Link Basic specifications for network modules

Item	Network modules CC-Link
Applicable controllers	TS-S2 / TS-SH / TS-X / TS-P
Version supporting CC-Link	Ver. 1.10
Remote node type	Remote device node
Number of occupied nodes	1 node
Node number setting	1 to 64
Communication speed setting	10Mbps, 5Mbps, 2.5Mbps, 625Kbps, 156Kbps
No. of CC-Link inputs/outputs	Input 16 points , Output 16 points
Shortest distance between nodes ^{Note1}	0.2m or more
Overall extension distance ^{Note1}	100m/10Mbps, 160m/5Mbps, 400m/2.5Mbps, 900m/625Kbps, 1200m/156Kbps
Monitor LED	L RUN, L ERR, SD, RD

Note 1. These values apply when a cable that supports CC-Link Ver.1.10 is used.

DeviceNet Basic specifications for network modules

Item		Network modules DeviceNet [™]
Applicable	controllers	TS-S2 / TS-SH / TS-X / TS-P
Applicable	DeviceNet [™] specifications	Volume 1 Release2.0/Volume 2 Release2.0
Device type		Generic Device (device number 0)
Number of	foccupied CH	Input 6ch, Output 6ch
MAC ID se	etting	0 to 63
Communication speed setting		500Kbps, 250Kbps, 125Kbps
DeviceNe	t [™] inputs/outputs	Input 16 points, Output 16 points
	Overall extension distance	100m/500Kbps, 250m/250Kbps, 500m/125Kbps
ienath	Branch length	6m or less
	Overall branch length	39m or less/500Kbps, 78m or less/250Kbps, 156m or less/125Kbps
Monitor LED		Module, Network

Ether Vet/IP Basic specifications for network modules

Item	Network modules EtherNet/IP™
Applicable controllers	TS-S2 / TS-SH /TS-SH/TS-X/TS-P ^{Note}
Applicable EtherNet/IP [™] specifications	Volume1: Common Industrial Protocol (CIP [™]) Edition 3.8 Voluime2: EtherNet/IP [™] Adaptation Edition 1.9
Device type	Generic Device (device number 43)
Number of occupied CH	Input 6ch, Output 6ch
Ethernet interface	10BASE-T/100BASE-TX
Network length	100m
Monitor LED	MS, NS, Activity, Link

Note. Supported by controller software version V1.10.121 or later. Necessary parameters can be set with the support tool, HT-1 (V1.13 or later) and TS-Manager (V1.3.3 or later).

PROFU"

Basic specifications for network modules

Item	Network modules PROFINET
Applicable controllers	TS-S2/TS-SH/TS-X/TS-P ^{Note}
Network specification conformance	PROFINET IO V2.2
Conformance class	Conformance Class B / IO Device
Input/output data size	Input 6 words, output 6 words
Transmission speed	100Mbps(Auto-negotiation)
Network length	100m
Monitor LED	MS, NS, Activity, Link

Note. Supported by controller software version V1.14.136 or later. Necessary parameters can be set with the support tool, HT-1 (V1.16 or later) and TS-Manager (V1.4.4 or later).

Option details

Field network system with minimal wiring

NETWORK

SR1-X/SR1-P

P.516

Easic specifications for network modules

Item	Network modules CC-Link
Applicable controllers	ERCX / SR1-P / SR1-X / SRCP30 / DRCX
Version supporting CC-Link	Ver. 1.10
Remote node type	Remote device node
Number of occupied nodes	Two nodes fixed
Node number setting	1 to 63
Communication speed setting	10Mbps, 5Mbps, 2.5Mbps, 625Kbps, 156Kbps
No. of CC-Link I/O Note1	General input 32 points, General output 32 points, Dedicated input 16 points, Dedicated Output 16 points
Parallel external I/O (ERCX, SRCP30, DRCX only)	All points usable as parallel external I/O for controller. Each point controllable from master station sequencer (PLC) by emulated serialization, regardless of robot program.
Shortest distance between nodes Note2	0.2m or more
Overall length Note2	100m/10Mbps, 160m/5Mbps, 400m/2.5Mbps, 900m/625Kbps, 1200m/156Kbps
Monitor LED	RUN, ERR, SD, RD

Note 1. Controller I/Os are updated every 10ms.

Note 2. These values apply when a cable that supports CC-Link Ver 1.10 is used.

Device Net Basic specifications for network modules

	•		
Item		Network modules DeviceNet [™]	
Applicable of	controllers	ERCX / SR1-P / SR1-X / SRCP30 / DRCX	
Applicable I	DeviceNet [™] specifications	Volume 1 Release2.0/Volume 2 Release2.0	
Device type		Generic Device (device number 0)	
Number of	occupied CH	Input 2ch Note1, Output 2ch Note1	
MAC ID set	ting	0 to 63	
Communica	ation speed setting	500Kbps, 250Kbps, 125Kbps	
DeviceNet ^{TI}	M I/O Note2	General input 16 points Notes, General output 16 points Notes, Dedicated input 16 points, Dedicated Output 16 points	
Parallel ext (ERCX, SR	ernal I/O CP30, DRCX only)	All points usable as parallel external I/O for controller. Each point controllable from master station sequencer (PLC) by emulated serialization, regardless of robot program.	
Network	Overall length Note4	100m/500Kbps, 250m/250Kbps, 500m/125Kbps	
length	Branch length/Overall branch length	6m or less/39m or less, 6m or less/78m or less, 6m or less/156m or less	
Monitor LEI	D	Module, Network	

Note 1. Inputs / Outputs are 12ch each when using SR1-P / SR1-X with extension model.

Note 2. Controller I/Os are updated every 10ms.

Note 3. General Inputs / Outputs are 32 each when using SR1-P / SR1-X with extension model.

Note 4. These values apply when a thick cable is used. The distance is less when a fine cable is used or when thick and fine cables are mixed in use.

PROFI

Basic specifications for network modules

Item	Network modules PROFIBUS
Applicable controllers	ERCX / SR1-P / S R1-X / SRCP30 / DRCX
Communication profile	PROFIBUS-DP slave
Number of occupied nodes	1 node
Setting of station address	0 to 126
Communication speed setting	9.6Kbps, 19.2Kbps, 93.75Kbps, 187.5Kbps, 500Kbps, 1.5Mbps, 3Mbps, 6Mbps, 12Mbps (automatic recognition)
PROFIBUS I/O Note	General input 32 points, General output 32 points, Dedicated input 16 points, Dedicated Output 16 points
Parallel external I/O (ERCX / DRCX only)	All points usable as parallel external I/O for controller. Each point controllable from master station sequencer (PLC) by emulated serialization, regardless of robot program.
Overall length	100m/12Mbps, 200m/1.5Mbps, 400m/500Kbps, 1000m/187.5Kbps, 1200m/9.6K · 19.2K · 93.75Kbps

Note. The shortest I/O update interval of the controller is 10ms but the actual I/O update time varies depending on the update time with the master station.

Ethernet Basic specifications for network modules

Item	Network modules Ethernet
Applicable controllers	ERCX / SRCP30 / DRCX
Network specification	As specified for Ethernet (IEEE802.3)
Connector specification	RJ-45 connector (8-pole modular connector) 1 port
Baud rate / Communication mode	10Mbps (10BASE-T) / Half Duplex (Half-duplex)
Network protocol	Application layer: TELNET / Transport layer: TCP / Network layer: IP, ICMP, ARP / Data link layer: CSMA/CD / Physical layer: 10BASE-T
Number of simultaneous log inputs	1
Setting of IP address, etc.	Set from HPB / HPB-D
Monitor LED	Run, Collision, Link, Transmit, Receive

■ CC-Link Basic specifications for network modules

Item	Network modules CC-Link
Applicable controllers	RCX221 / RCX222 / RCX240 / RCX240S / RCX340
Version supporting CC-Link	Ver. 1.10
Remote station type	Remote device node
Number of occupied stations	Fixed to 4 stations
Station number setting	1 to 61 (set from the Rotary swich on board)
Communication speed setting	10Mbps, 5Mbps, 2.5Mbps, 625Kbps, 156Kbps (set from the Rotary swich on board)
No. of CC-Link I/O Note1	General input 96 points, General output 96 points, Dedicated input 16 points, Dedicated output 16 points
Parallel external I/O Note2	A function that simulates serial communication enables individual control of the various points from a master sequencer, regardless of the robot program.
Shortest distance between nodes Note3	0.2 m or more
Overall length Note3	100m/10Mbps, 150m/5Mbps, 200m/2.5Mbps, 600m/625Kbps, 1200m/156Kbps
Monitor LED	RUN, ERR, SD, RD

Note 1. Controller I/Os are updated every 10ms.

Note 2. With RCX 141/142, the exclusive input of the parallel I/O cannot be used other than the interlock input. With RCX221 / 222, the exclusive input of the parallel I/O cannot be used. (The interlock input terminal is located on the SAFETY connector side.)

Note 3. These values apply when a cable that supports CC-Link Ver.1.10 is used.

Device Vet Basic specifications for network modules

	Item	Network modules DeviceNet TM
Applicable co	ontrollers	RCX221 / RCX222 / RCX240 / RCX240S / RCX340
Applicable D	eviceNet [™] specifications	Volume 1 Release2.0 / Volume 2 Release2.0
Device Profile Name		Generic Device (device number 0)
Number of or	ccupied CH Note1	Normal: Input/output 24ch each, Compact: Input/output 2ch each
MAC ID setti	ng	0 to 63
	n speed setting	500Kbps, 250Kbps, 125Kbps (set using DIP switch on board)
DeviceNet TM	Normal	General input 96 points, General output 96 points, Dedicated input 16 points, Dedicated output 16 points
I/O Note2	Compact	General input 16 points, General output 16 points, Dedicated input 16 points, Dedicated output 16 points
Parallel exter	rnal I/O Note3	The master module and up to four ports can be controlled regardless of the robot program by using the pseudoserialization function.
	Overall length Note4	100m/500Kbps, 250m/250Kbps, 500m/125Kbps
	Branch length / Overall branch length	6m max./39m max., 6m max./78m max., 6m max./156m max.
Monitor LED		MS (Module Status), NS (Network Status)

Note 1. Use the robot parameter to select Normal or Compact. However, with the controllers earlier than Ver.9.08 of RCX221 / 222, this selection is not available and the setting remains the same as Normal.

Note 2. Controller I/Os are updated every 10ms.

Note 3. With RCX221 / 222, the exclusive input of the parallel I/O cannot be used. (The interlock input terminal is located on the SAFETY connector side.)

Note 4. These values apply when a thick cable is used. The distance is less when a fine cable is used or when thick and fine cables are mixed in use.

PRQF O

Basic specifications for network modules

Item	Network modules PROFIBUS
Applicable controllers	RCX221 / RCX222 / RCX240 / RCX240S / RCX340
Communication profile	PROFIBUS-DP slave
Number of occupied nodes	1 node
Setting of station address	1 to 99 (set using Rotary switch on board)
Setting of communication speed	9.6Kbps, 19.2Kbps, 93.75Kbps, 187.5Kbps, 500Kbps, 1.5Mbps, 3Mbps, 6Mbps, 12Mbps (automatic recognition)
PROFIBUS I/O Note1	General input 96 points, General output 96 points, Dedicated intput 16 points, Dedicated output 16 points
Parallel external I/O Note2	The master module and up to four ports can be controlled regardless of the robot program by using the pseudoserialization function.
Overall length	100m/3M·6M·12Mbps, 200m/1.5Mbps, 400m/500Kbps, 1000m/187.5Kbps, 1200m/9.6K·19.2K·93.75Kbps
Monitor LED	RUN, ERR, SD, RD, DATA-EX

Note 1. The shortest I/O update interval of the controller is 10ms but the actual I/O update time varies depending on the update time with the master station Note 2. With RCX221 / 222, the exclusive input of the parallel I/O cannot be used. (The interlock input terminal is located on the SAFETY connector side.)

Ethernet Basic specifications for network modules

Item	Network modules Ethernet
Applicable controllers	RCX221 / RCX222 / RCX240 / RCX240S / RCX340
Network specification	As specified for Ethernet (IEEE802.3)
Connector specification	RJ-45 connector (8-pole modular connector) 1 port
Baud rate	10Mbps (10BASE-T)
Communication mode	Half Duplex (Half-duplex)
Network protocol	Application layer: TELNET / Transport layer: TCP / IP Network layer: IP, ICMP, ARP / Data link layer: CSMA/CD / Physical layer: 10BASE-T
Number of simultaneous log inputs	1
Setting of IP address, etc.	Set from RPB
Monitor LED	Run, Collision, Link, Transmit, Receive

Option details

Field network system with minimal wiring

NETWORK

RCX240/RCX240S (532) RCX340 (542)

EtherNet/IP Basic specifications for network modules

Item		Ne	etwork modules EtherNet/IP™			
Controller model	RCX240 / RCX240	S / RCX340				
Software version	HOST: Ver.10.64 or higher /IP+: Ver.2.5.0 or higher					
Network specifications	Conforms to Ether	Conforms to Ethernet (IEEE 802.3).				
Applicable EtherNet/IP™ specifications	Volume 1 : Commo Volume 2 : EtherN	on Industrial pr et/IP™ Adapta	otocol (CIP™) Edition 3.8 tion Edition 1.9			
Device type	Generic Device (D	evice No. 43)				
Data size	48 bytes each for i	18 bytes each for input/output				
Transmission speed	10 Mbps/100 Mbps					
Connector specifications	RJ-45 connector (8-pole modular connector) 1 port					
Cable specifications	Refer to "4.1. LAN cable" in Chapter 2 of this user's manual.					
Max. cable length	100 m					
	Input (48 bytes in total)	byte 0-3 byte 4-31	Dedicated word input : 2 words General purpose word input : 14 words			
EtherNet/IP™ input/output points Note		byte 32-33 byte 34-47	Dedicated bit input : 16 points General-purpose bit input : 96 points			
EtherNet/IP Input/output points	Output	byte 0-3 byte 4-31	Dedicated word output : 2 words General-purpose word output : 14 words			
	(48 bytes in total)	byte 32-33 byte 34-47	Dedicated bit output : 16 points General-purpose bit output : 96 points			
Parallel external input	Regardless of the robot program, the master module and up to four ports can be controlled using the emulated serialization function.					
Settings, such as IP address	The settings are m	ade with the p	rogramming box (RPB) or VIP+ (via a COM port or telnet).			
Monitor LEDs	Activity, Network S	Status, Link, Mo	odule Status			
CPU BOARD ASSY	KX0-M4210-2XX (R	efer to "3. Insta	lling into the robot controller" in Chapter 1 of this user's manual.)			

Note. Controller's I/O update intervals are 10 ms at shortest, but actual I/O update intervals may vary depending on the update time for the master station.

Field network system with minimal wiring

NETWORK

RCX340

P.542



Option details

Basic specifications for network modules

Item		Network modules PROFINET		
Applicable controllers	RCX340			
Supported software versions	RCX340 : V1.21 or PBX/PBX-E : V1.0 RCX-Studio : V1.0	8 or later		
Network specification conformance	PROFINET IO V2.	2		
Conformance class	Conformance Class	ss B / IO Device		
Vendor Name / Vendor_ID	YAMAHA MOTOR	CO.,LTD. / 0x02D5		
Station Type / Device_ID	YAMAHA RCX3 PI	ROFINET / 0x0001		
Product revision	1.00			
GSD file name	GSDML-V2.3-YMC-RCX3-20150203.xml			
Transmission speed	00Mbps (Auto-negotiation)			
Connector specifications	RJ-45 connector (RJ-45 connector (8-pole modular connector) 2 ports		
Conforming cable specifications	CAT 5e or higher S	STP cable (double shield)		
Max. cable length	100m			
Monitor LEDs	Module Status(MS	s), Network Status(NS), Link/Activity:Port1-2		
		Dedicated word input 2 words (4 bytes)		
		General-purpose word input 14 words (28 bytes)		
	Input : 48bytes	Dedicated bit input 16 bits (2 bytes)		
		General-purpose bit input 96 bits (12 bytes)		
Input/output data size		Reserved area 2 bytes		
input/output data size		Dedicated word output 2 words (4 bytes)		
		General-purpose word output 14 words (28 bytes)		
	Output : 48bytes	Dedicated bit output 16 bits (2 bytes)		
		General-purpose bit output 96 bits (12 bytes)		
		Reserved area 2 bytes		

Applicable controllers ► RCX240/RCX240S

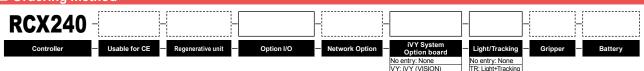
Robot with image processing functions

"SEARCH and TAKE" "CHECK POSITION and **ASSEMBLE**"

YAMAHA offers a whole new production line concept that eliminates time-consuming teaching and positioning tasks with "iVY-system".

Main functions ▶ P.72

■ Ordering method



Note. For details on the various selection items, refer to P.533

■ Basic specifications

iVY board

Item		iVY board	
	Applicable controllers	RCX240 / RCX240S	
SL	Pixels	640 (H) × 480 (V) (300,000 pixels, VGA)	
atio	Settable part types	40 part types	
Basic specifications	Connectable cameras	Maximum 2 units Note. Note. If connecting 2 units, then must be the same model	
Sic	Camera types	Double speed compatible analog camera	
В	Memory	128MB SDRAM, 256MB miniSD card	
External I/F		Ethernet (100BASE-TX)	
Search method		Edge search (Correlative edge filter, Sobel filter)	
	Trigger	S/W trigger, H/W trigger, Camera internal synch	
Image input	External trigger input	2 points	
	Search function	Position offset, Auto registry of point data	
Functions	ID recognition (usage planned)	QR-Code [Model2], DataMatrix	
Setup support functions		Calibration, image save function, model registration Note, fiducial mark registration Note, monitor function Note	

Note. Requires Windows PC.

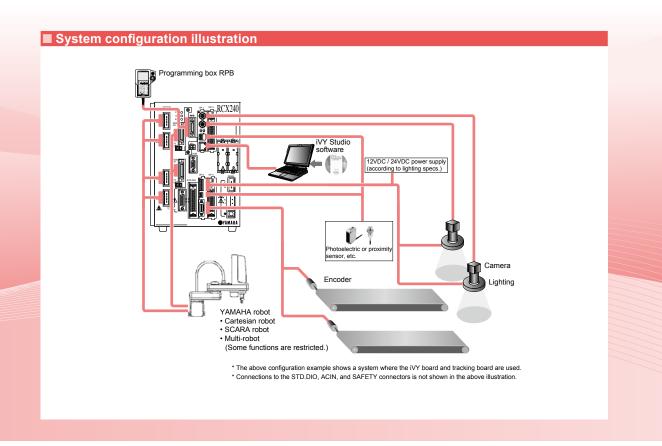
Lighting control board (option)

Iter	n	Lighting control board (option)
	Applicable controllers	RCX240 / RCX240S
	Number of lighting connected units	Up to 2 units
specifications	Light adjusting system	PWM control (0 to 100%) (Cycle 60kHz) Stroboscopic light (10 to 33000us)
ific	Trigger	S/W trigger, H/W trigger
bec	External trigger input	2 points
Basic s	Lighting power input	12VDC or 24VDC (Supplied from outside commonly to 2 channels)
В	Lighting output	When DC12V is supplied: Less than 30W with 2 channels totaled When DC24V is supplied: Less than 60W with 2 channels totaled

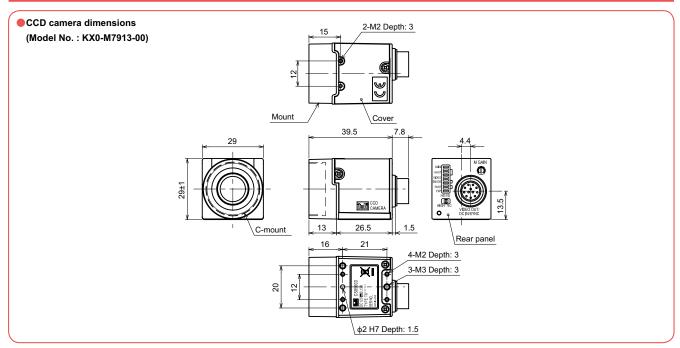
Tracking board (Options)

Iter	n		Tracking board (option)
	Apı	olicable controllers	RCX240 / RCX240S
	_	Light adjusting system	Up to 2 units
	control section	Light adjusting system	PWM control (0 to 100%) (Cycle 60kHz) Stroboscopic light (10 to 33000us)
	se	Trigger	S/W trigger, H/W trigger
	Iol	External trigger input	2 points
		Lighting power input	12VDC or 24VDC (Supplied from outside commonly to 2 channels)
specifications	Lighting	Lighting output	When DC12V is supplied: Less than 30W with 2 channels totaled When DC24V is supplied: Less than 60W with 2 channels totaled
spe		Number of encoder connected units	Up to 2 units
Basic	tion	Encoder power source	DC5V (Less than 500mA with 2 channels totaled) (Supplied from controller)
	input section	Applicable encoder	Line driver equivalent to 26LS31 / 26C31 (Conforming to RS-422)
	npr	Input phase	$A, \overline{A}, B, \overline{B}, \overline{Z}, \overline{Z}$
	Φ	Maximum response frequency	2MHz
	٦	Counter / Step-up multiplication	0 to 65535 / Double, quadruple
		Other	Provided with broken wire detect function

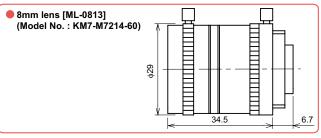
Note. The tracking board is required when using the tracking function.

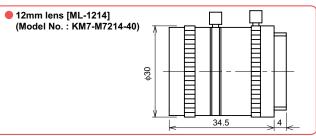


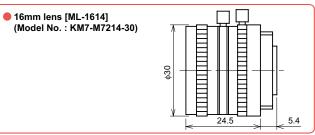
■ Dimensional outlines CCD camera

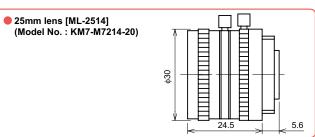


Lenses









Standard lens angle-of-view table

	Focal length	Aperture value	Angle- (deg	ot-view rees)	approach
	(mm)	(F No.)	Vertical	Horizontal	distance (m)
8mm lens [ML-0813]	8	F1.3-CLOSE	45.0	57.8	0.2
12mm lens [ML-1214]	12	F1.4-CLOSE	21.9	29.0	0.3
16mm lens [ML-1614]	16	F1.4-CLOSE	23.0	30.4	0.4
25mm lens [ML-2514]	25	F1.4-CLOSE	21.6	28.5	0.5

Note. Field-of-view table for our standard lenses. As the field-of-view widens, distortion on image edges may increase.

Viewing angle, WD, and magnification when using close-up ring

viewing ungie, 175, and magnification when using close up mig								
01	8mm lens [ML-0813]			3]	12mm lens [ML-1214]			
Close-up ring (mm)	Viewing (mm)	g angle (mm)	WD	Magnifi-	Viewing (mm)	g angle (mm)	WD	Magnifi-
(11111)	Vertical	Horizontal	(mm)	cation	Vertical	Horizontal	(mm)	cation
None	72	96	148	0.05	77	103	248	0.05
0.5	32	43	59	0.11	41	55	125	0.09
0.5	57	77	115	0.06	89	119	289	0.04
1	21	27	34	0.18	28	38	80	0.13
	29	38	52	0.13	45	59	136	0.08
1.5	26	34	22	0.24	21	29	57	0.17
1.5	19	26	31	0.19	30	40	85	0.12
2	_	_	-	-	17	23	42	0.21
	_	_	_	-	22	30	59	0.16
5	_	_	_	_	_	_	_	_
5	_	_	_	_	_	_	_	_

01	16mm lens [ML-1614] 25mm lens [ML-				[ML-251	4]		
Close-up ring (mm)	Viewing (mm)	g angle <mm)< td=""><td>WD (mm)</td><td>Magnifi- cation</td><td>Viewing (mm)</td><td>g angle ×mm)</td><td>WD (mm)</td><td>Magnifi- cation</td></mm)<>	WD (mm)	Magnifi- cation	Viewing (mm)	g angle ×mm)	WD (mm)	Magnifi- cation
(11111)	Vertical	Horizontal	(mm)	Cation	Vertical	Horizontal	(mm)	Callon
None	82	109	358	0.04	65	87	458	0.06
0.5	48	64	206	0.07	48	64	338	0.08
0.5	117	156	515	0.03	181	242	1270	0.02
1	34	45	143	0.11	38	50	269	0.10
'	58	78	252	0.06	91	121	637	0.12
1.5	26	35	108	0.14	31	42	223	0.12
1.5	39	52	164	0.09	60	81	425	0.06
2	22	29	86	0.17	27	36	191	0.13
2	29	39	120	0.12	45	60	320	0.08
5	10	14	35	0.35	14	19	103	0.25
3	12	16	42	0.31	18	24	130	0.20

Notes

- •This table shows viewing angles when using the standard lens and close-up ring. (If no close-up ring this is closest approach.)

- If not using a close-up ring, then a WD smaller than the value in this table cannot be used.

 If using a close-up ring, then only a WD close to this value can be used.

 The values in this table are at most only a reference and do not signify an absolute index.

 To find viewing angle and WD other than for our standard lens, visit our website at:

Accessories and part options

iVY System

iVY board

■ Standard accessories



Model	
Model Without power supply harness KX0-M4402 With power supply harness KX0-M4402	2-00

Note. If newly adding an iVY, choose the model with harness.

iVY board accessories

Name	Single unit model	Set Model	
Camera trigger input cable connector	KX0-M657L-00	KYO MEEZK OO	
Custom tool	KX0-M657M-00	KX0-M657K-00	

Support software for PC iVY Studio

iVY Studio is support software for the iVY system that allows registering part types and reference marks as well as monitoring the work search status during automatic robot operation by connecting to the robot controller.



Environme	nt
Software model	KX0-M4988-00
os	Microsoft Windows 2000 / XP / Vista Note. The 64 bit version is not subject to the operation warranty.
CPU	Exceeding the environment recommended by the OS being used
Memory	64MB or more (Recommend)
Hard disk	Vacant capacity of more than 40MB in the installation destination drive Note. Besides the above, also requires memory space for storing images and data.
Display	800 × 600 dots or more, 32768 colors (16bit High Color) or more (recommended)
Network	TCP/IP Ethernet port × 1

iVY System

■ Options

Lighting control board

Model KX0-M4400-G0	
--------------------	--

Required options for the lighting control board

Name	Single unit model	Set Model	
Lighting power cable connector	KX0-M657L-10	KX0-M657K-10	
Wiring lever	KX0-M657M-10	NAU-IVIOS/N-1U	
Lighting input trigger cable connector	KX0-M657L-00	KX0-M657K-00	
Custom tool	KX0-M657M-00	NAU-IVIOS/N-UU	

Tracking board

Model	KX0-M4400-E0
-------	--------------

Required options for the tracking board

Name	Single unit model	Set Model	
Lighting power cable connector	KX0-M657L-10	KX0-M657K-10	
Wiring lever	KX0-M657M-10	KAU-10007K-10	
Lighting input trigger cable connector	KX0-M657L-00	KX0-M657K-00	
Custom tool	KX0-M657M-00		
AB phase input cable connector	KX0-M657L-20	KYO MGEZK 20	
AB phase input cable connector case	KX0-M657M-20	KX0-M657K-20	

Camera cable

Cable for connecting the camera to the iVY board.



	3.5m	KX0-M66F3-00
		KX0-M66F3-10
	9.5m (relay 3.5m+6m) Relay cable 3.5m	KX0-M66F0-20
	Relay cable 3.5m	KX0-M66F4-00
	7m (relay 1m+6m)	KX0-M66F0-30
	Relay cable 1m	KX0-M66F4-10

Note. When installing a camera cable in a moving section, use a relay cable so that it can be easily replaced if needed.

CCD camera



Model	KX0-M7913-00

Lens



Model		KIVI7-IVI7214-60 (IVIL-0813)
	12mm	KM7-M7214-40 (ML-1214) KM7-M7214-30 (ML-1614)
	16mm	KM7-M7214-30 (ML-1614)
	25mm	KM7-M7214-20 (ML-2514)

Close-up ring



Model	0.5mm	KX0-M7215-00
	1.0mm	KX0-M7215-10 KX0-M7215-20
	2.0mm	KX0-M7215-20
	5.0mm	KX0-M7215-30

LAN cable with shield cloth (5m)



Model	KX0-M55G0-00
-------	--------------

Tracking encoder cable (10m)



Model	KX0-M66AF-00
Model	IVVO-INIOOVI -OO

Applicable controllers ► RCX340

Robot with image processing functions

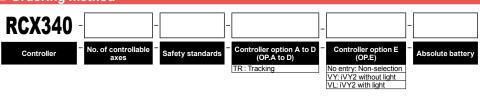
Integrated Robot Vision System with "plug-and-play" simplicity.

Basic specifications have been dramatically enhanced while retaining the current iVY system's ease of use.



Main functions ▶ P.78

■ Ordering method

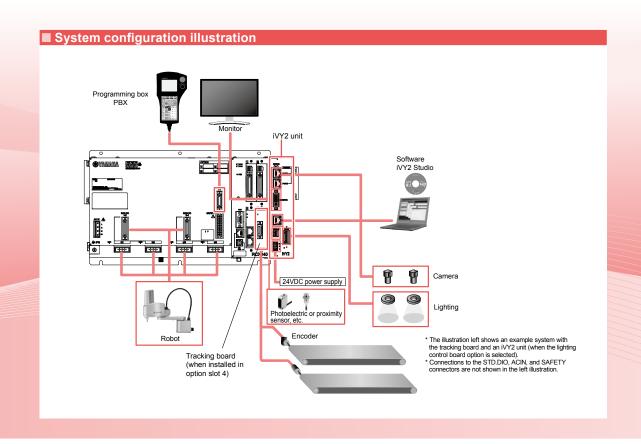


Note. For details on the various selection items, refer to P.543

■ Basic specifications

Pohot vision basic specifications

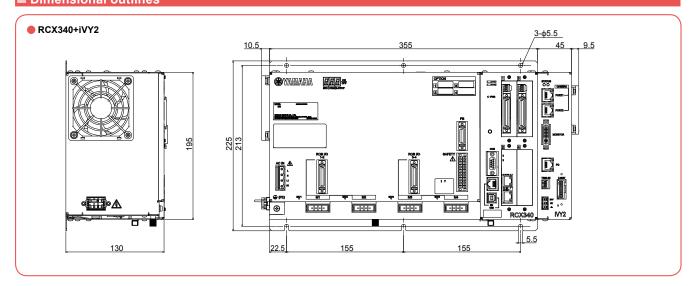
Item		m	iVY2 unit		
	Applicat	ole controllers	RCX340		
	Number	of screen pixels	648(H) × 494(V) (300,000 pixels, VGA) 1280(H) × 966(V) (1,300,000 pixels, SXGA) 1624(H) × 1236(V) (2,000,000 pixels, UXGA)		
	Model s	etting capacity	254 models		
	Number	of connectable cameras	Max. 2 cameras		
specifications Ex	Connect	table camera	GigE camera (VGA, SXGA, UXGA) PoE: IEEE802.3af 1 ch up to 7W		
	External	l interface	Ethernet (1000BASE-T) Note. For setting and monitor operations		
	External monitor output		OVI-I Note. Also usable with an analog monitor by using a conversion adaptor. Monitor resolution: 1024 × 768		
	Power s	upply	DC24V +/-10% 1.5A Max.		
	Dimensi	ons	W45 × H195 × D130 (iVY2 unit only)		
	Weight		0.8kg (iVY2 unit only, when the lighting control board option is selected)		
Search method			Edge search (correlated edge filter, Sobel filter)		
Image	Trigger r	mode	S/W trigger, H/W trigger		
capturing	External	l trigger input	2 points		
Function			Position detection, automatic point data generation		
Camera installa	ation posit	ion	Fixed to the fixed camera (up, down) or robot (Y-axis, Z-axis). Perpendicular to the workpiece to be captured.		
Setting support function			Calibration, image save function, model registration ^{Note} , fiducial mark registration ^{Note} , monitor function ^{Note} Note. iVY2 Studio function (requires a Windows PC)		
		Number of connectable lighting units	Max. 2 lighting units		
		Modulated light format	PWM modulated light control (0 to 100%), PWM frequency switchable 62.5 kHz/125 kHz		
Lighting control	ontions	ivioudiated light format	Continuous light, strobe light (follows camera exposure)		
Lighting control options	- options	Lighting power input	12VDC or 24VDC (external supply shared by both channels)		
		Lighting output	For 12VDC supply: Total of less than 40W for both channels. For 24VDC supply: Total of less than 80W for both channels.		



Tracking board basic Specifications

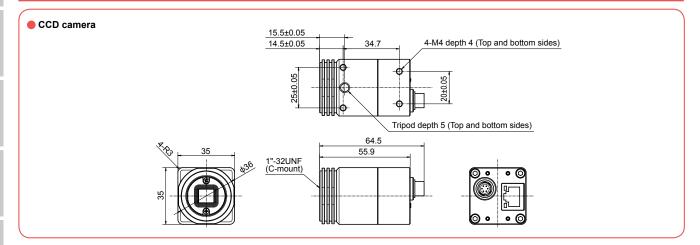
	Item	Tracking board		
Applicable controllers Number of connected encoders Encoder power supply	Applicable controllers	RCX340		
	Number of connected encoders	Up to 2 units.		
	5VDC (2 counters total 500 mA or less) (Supplied from controller)			
	Applicable encoder	26LS31/26C31 or equivalent line driver (RS-422 compliance).		
Basic specifications	Input phase	$A, \overline{A}, B, \overline{B}, Z, \overline{Z}$		
·	Max. response frequency	2MHz or less		
	Counter	0 to 65535		
	Multiplier	4x		
	Other	With disconnection detection function		

■ Dimensional outlines

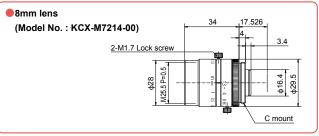


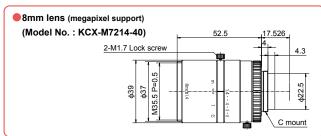
■ Dimensional outlines

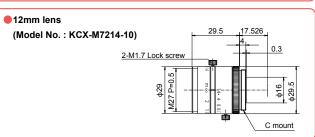
iVY2 System

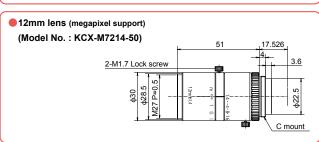


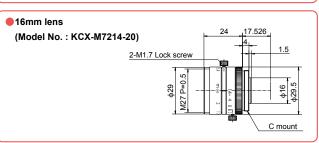
■ Lenses

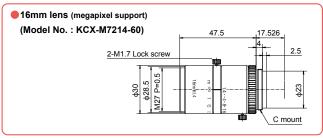


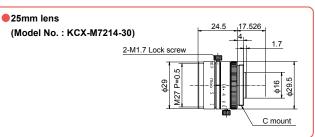


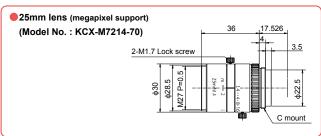












■ Lens characteristics

		Model Focal length [mm]	Aperture value [F No.]	Angle-of-view (degrees)		Angle-of-view (degrees)		Closest approach distance [m]
Lens	Model			With 1/3 inch sensor KCX-M6541-00 (300,000 pixel camera) KCX-M6541-10 (1,300,000 pixel camera)		With 1/1.8 inch sensor KCX-M6541-20 (2,000,000 pixel camera)		
				Vertical	Horizontal	Vertical	Horizontal	[···]
8mm	KCX-M7214-00	8	F1.3-CLOSE	25.21	33.2	37.08	47.59	0.2
12mm	KCX-M7214-10	12	F1.4-CLOSE	16.48	21.86	24.51	31.88	0.3
16mm	KCX-M7214-20	16	F1.4-CLOSE	12.57	16.71	18.77	24.51	0.4
25mm	KCX-M7214-30	25	F1.4-CLOSE	8.18	10.89	12.25	16.06	0.5
8mm (megapixel support)	KCX-M7214-40	8	F1.4-F16	25.36	33.4	37.3	47.86	0.1
12mm (megapixel support)	KCX-M7214-50	12	F1.4-F16	16.65	22.08	24.76	32.2	0.1
16mm (megapixel support)	KCX-M7214-60	16	F1.4-F16	12.68	16.85	18.92	24.72	0.1
25mm (megapixel support)	KCX-M7214-70	25	F1.4-F16	8.24	10.97	12.33	16.16	0.15

Note. This table shows the angle-of-view for Yamaha's standard lenses. If the angle-of-view is greater, there might be more distortion at the edge of the image.

■ Angle-of-view size, WD, and magnification when close-up ring is used

Close-up			Lens							
ring [mm]			8 mm 12 mm KCX-M7214-00 KCX-M7214-10		16 mm KCX-M7214-20		25 mm KCX-M7214-30			
		WD [mm]	20	00	30	00	40	00	5	00
	Angle-of-view size	KCX-M6541-00 (300,000 pixels)	96.2 ×	126.2	91.4 ×	119.9	91.4 ×	119.9	71.7	× 94.1
None	X×Y	KCX-M6541-10 (1,300,000 pixels)	95.4 ×	126.4	90.6	× 120	90.6	× 120	71.1	× 94.2
	[mm]	KCX-M6541-20 (2,000,000 pixels)	143.2 >			178.7		178.7		× 140.1
	Op	otical magnification	0.0)40	0.0)51
		WD [mm]	69.5	118.6	143	296.8	222	524.1	358.5	1269.4
	Angle-of-view size	KCX-M6541-00 (300,000 pixels)	36.6 × 48	59 × 77.4	45.7 × 60	91.4 × 119.9	51.5 × 67.6	118 × 154.7	51.5 × 67.6	182.8 × 239.8
0.5	X×Y	KCX-M6541-10 (1,300,000 pixels)	36.3 × 48	58.5 × 77.5	45.3 × 60	90.6 × 120	51.1 × 67.7	116.9 × 154.9	51.1 × 67.7	181.1 × 240
	[mm]	KCX-M6541-20 (2,000,000 pixels)	54.4 × 71.5	87.8 × 115.3	68 × 89.4	136 × 178.7	76.6 × 100.7	175.5 × 230.5	76.6 × 100.7	271.9 × 357.3
	Op	otical magnification	0.100	0.062	0.080	0.040	0.071	0.031	0.071	0.020
		WD [mm]	38.7	53.8	91.3	142.3	152	257.1	280.8	635.9
	Angle-of-view size	KCX-M6541-00 (300,000 pixels)	22.6 × 29.6	29.5 × 38.7	30.5 × 40	45.7 × 60	36.2 × 47.5	60 × 78.7	40.2 × 52.7	91.4 × 119.9
1.0	X × Y [mm]	KCX-M6541-10 (1,300,000 pixels)	22.4 × 29.7	29.3 × 38.8	30.2 × 40	45.3 × 60	35.9 × 47.6	59.4 × 78.7	39.9 × 52.8	90.6 × 120
		KCX-M6541-20 (2,000,000 pixels)	33.6 × 44.2	43.9 × 57.7	45.4 × 59.6	68 × 89.4		89.2 × 117.2		136 × 178.7
	Or	otical magnification	0.162	0.124	0.120	0.080	0.101	0.061	0.091	0.040
		WD [mm]			65.4	90.8	114.5	168.1	230.9	424.7
	Angle-of-view size	KCX-M6541-00 (300,000 pixels)			22.8 × 29.8	30.3 × 39.7	27.7 × 36.4	39.8 × 52.2	33 × 43.2	61 × 80
1.5		KCX-M6541-10 (1,300,000 pixels)			22.5 × 29.9	30 × 39.7	27.5 × 36.4	39.4 × 52.2	32.7 × 43.3	60.4 × 80
	[mm]	KCX-M6541-20 (2,000,000 pixels)			33.8 × 44.4	45 × 59.1	41.2 × 54.2	59.2 × 77.7	49 × 64.4	90.7 × 119.1
	Op	otical magnification			0.161	0.121	0.132	0.092	0.111	0.060
		WD [mm]			50	65.1	91.2	123.6	196.3	319.1
	Angle-of-view size	KCX-M6541-00 (300,000 pixels)			18.2 × 23.9	22.8 × 29.8	22.6 × 29.6	30 × 39.4	28.2 × 36.9	46.3 × 60.7
2.0	X×Y	KCX-M6541-10 (1,300,000 pixels)			18.1 × 23.9	22.5 × 29.9	22.4 × 29.7	29.7 × 39.4	27.9 × 37	45.9 × 60.8
	[mm]	KCX-M6541-20 (2,000,000 pixels)			27.1 × 35.6	33.8 × 44.4	33.6 × 44.2	44.6 × 58.6	41.9 × 55	68.9 × 90.5
	Or	otical magnification			0.201	0.161	0.162	0.122	0.130	0.079
		WD [mm]							104.2	129
	Angle-of-view size	KCX-M6541-00 (300,000 pixels)							14.7 × 19.2	18.4 × 24.1
5.0	X×Y	KCX-M6541-10 (1,300,000 pixels)							14.5 × 19.2	18.3 × 24.2
	[mm]	KCX-M6541-20 (2,000,000 pixels)							21.8 × 28.6	27.4 × 36
	Or	otical magnification							0.250	0.199

Note. WD is the lens tip reference.

Close-up			Lens							
ring [mm]		8 mm lens f KCX-M	8 mm lens for megapixel 12 mm KCX-M7214-40 K		mm lens for megapixel KCX-M7214-50		16 mm lens for megapixel KCX-M7214-60		25 mm lens for megapixel KCX-M7214-70	
	WD [mm]	1	100		100		100		150	
	Angle-of-view size KCX-M6541-00 (300,000 pixels	52.3	52.3 × 68.5		36.6 × 48		26.9 × 35.3		24.6 × 32.2	
None	X × Y KCX-M6541-10 (1,300,000 pixel:	51.8	× 68.6	36.3	× 48	26.7	× 35.3	24.4	× 32.3	
	[mm] KCX-M6541-20 (2,000,000 pixels	3) 77.7 >	102.1	54.4	× 71.5	40 ×	52.6	36.5	× 48	
	Optical magnification	0.0	0.070		0.100		0.136		0.149	
	WD [mm]	46	113.6	66.1	283.2	77.8	505.4	130.3	1232.2	
	Angle-of-view size KCX-M6541-00 (300,000 pixels	27.7 × 36.4	58.1 × 76.2	25.4 × 33.3	89.2 × 117	22.1 × 28.9	118 × 154.7	21.7 × 28.4	182.8 × 239.8	
0.5	X × Y KCX-M6541-10 (1,300,000 pixels	s) 27.5 × 36.4	57.5 × 76.2	25.2 × 33.4	88.4 × 117.1	21.9 × 29	116.9 × 154.9	21.5 × 28.5	181.1 × 240	
	[mm] KCX-M6541-20 (2,000,000 pixels	s) 41.2 × 54.2	86.4 × 113.5	37.8 × 49.7	132.7 × 174.3	32.8 × 43.1	175.5 × 230.5	32.2 × 42.3	271.9 × 357.3	
	Optical magnification	0.132	0.063	0.144	0.041	0.166	0.031	0.169	0.020	
	WD [mm]			47.2	131.9	62.6	243	114.6	607.2	
	Angle-of-view size KCX-M6541-00 (300,000 pixels)		19.8 × 26	45.2 × 59.2	18.6 × 24.4	59 × 77.4	19.4 × 25.4	91.4 × 119.9	
1.0	X × Y KCX-M6541-10 (1,300,000 pixel:	3)		19.6 × 26	44.8 × 59.3	18.4 × 24.4	58.5 × 77.5	19.2 × 25.4	90.6 × 120	
	[mm] KCX-M6541-20 (2,000,000 pixel:	s)		29.4 × 38.7	67.2 × 88.3	27.7 × 36.3	87.8 × 115.3	28.8 × 37.9	136 × 178.7	
	Optical magnification			0.185	0.081	0.197	0.062	0.189	0.040	
	WD [mm]			35.2	81.4	51.5	155.5	102	398.9	
	Angle-of-view size KCX-M6541-00 (300,000 pixels)		16.3 × 21.4	32.7 × 42.9	16.1 × 21.1	39.4 × 51.6	17.5 × 23	61 × 80	
1.5	X × Y KCX-M6541-10 (1,300,000 pixels	s)		16.1 × 21.4	32.4 × 42.9	15.9 × 21.1	39 × 51.7	17.4 × 23	60.4 × 80	
	[mm] KCX-M6541-20 (2,000,000 pixels	5)		24.2 × 31.8	48.6 × 63.8	23.9 × 31.4	58.5 × 76.9	26.1 × 34.2		
	Optical magnification			0.225	0.112	0.228	0.093	0.209	0.060	
	WD [mm]			26.9	56.2	43	111.7	91.5	294.7	
	Angle-of-view size KCX-M6541-00 (300,000 pixels			13.8 × 18.1	22.5 × 29.5	14.2 × 18.6	29.8 × 39	16 × 21	45.7 × 60	
2.0	X × Y KCX-M6541-10 (1,300,000 pixels			13.7 × 18.1	22.3 × 29.5	14 × 18.6	29.5 × 39.1	15.9 × 21	45.3 × 60	
	[mm] KCX-M6541-20 (2,000,000 pixels	3)		20.5 × 26.9	33.4 × 43.9	21 × 27.6	44.3 × 58.1	23.8 × 31.3	68 × 89.4	
	Optical magnification			0.266	0.163	0.259	0.123	0.229	0.080	
	WD [mm]							53.9	107.2	
	Angle-of-view size KCX-M6541-00 (300,000 pixels							10.5 × 13.8	18.3 × 24	
5.0	X × Y KCX-M6541-10 (1,300,000 pixels							10.4 × 13.8	18.2 × 24	
	[mm] KCX-M6541-20 (2,000,000 pixel	6)						15.6 × 20.5	27.2 × 35.8	
	Optical magnification							0.349	0.200	

Note. The above table shows the field of view when the standard lens and close-up ring are used. (Closest distance value is shown in No Close-up Ring column).

Note. If a close-up ring is not used, a WD less than the value shown in this table cannot be used.

Note. If a close-up ring is used, only WD in the region of this value can be used.

Note. Values in this table are for reference only; Actual values may vary.

Accessories and part options

iVY2 System

■ Standard accessories

iVY2 unit

The iVY2 unit adds robot vision to the RCX340 robot controller.



	No lighting	KCX-M4400-V0
Model		KCX-M4400-L0

iVY2 unit accessories

Name	Individual model
Camera trigger input cable connector	KX0-M657K-00
24V power supply connector	KCF-M5382-00

Support software for PC iVY2 Studio

iVY2 Studio is support software for the iVY2 system that allows registering part types and reference marks as well as monitoring the work search status during automatic robot operation by connecting to the robot controller.



Environment

LIIVII OIIIIICIIL	
Software model	KCX-M4988-00
os	Microsoft Windows XP / Vista (32bit/64bit) / 7 (32bit/64bit) / 8, 8.1 (32bit/64bit)
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 capacity	16MB of available space required on installation drive.
Display	800×600 dot, or higher, 32768 colors (16bit High Color) or higher (recommended)
Communication Port	Ethernet Port of TCP/IP

Note. Microsoft, Windows XP, Windows Vista, Windows 7, Windows 8, 8.1 are registered trademarks of the Microsoft Corporation, USA.

■ Options

CCD camera



		300,000 pixel	648×494 (VGA)	KCX-M6541-00
- 1	Model	1,300,000 pixel	1280×966 (SXGA)	KCX-M6541-10
		2,000,000 pixel	1624×1236 (UXGA)	KCX-M6541-20

Lens



	8mm	KCX-M7214-00
	12mm	KCX-M7214-10
	16mm	KCX-M7214-20
Model	25mm	KCX-M7214-30
Model	8mm (megapixel support)	KCX-M7214-40
	12mm (megapixel support)	KCX-M7214-50
	16mm (megapixel support)	KCX-M7214-60
	25mm (megapixel support)	KCX-M7214-70

Close-up ring



		KX0-M7215-00
Madal	1.0mm	KX0-M7215-10
wodei	1.0mm 2.0mm	KX0-M7215-20
		KX0-M7215-30

Lighting control board

This board adds lighting control functionality to the iVY2 system. (Installed in the iVY2 unit when shipped)

This board adds conveyor tracking functional-

Model KCX-M4403-L0	Model	KCX-M4403-L0
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Lighting control board accessories

Name	Model
Lighting power cable connector	KX0-M657K-10

/lodel	KCX-M4400-T0

Tracking board accessories

Name	Single unit model
AB phase input cable connector	KX0-M657K-20

Recommended option cable Note

Name	Single unit model
AB phase input cable (10 m. only for counter 1)	KX0-M66AF-00

Note. Not included.

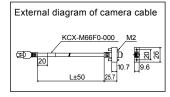
We can provide an option that is pre-wired to the AB phase input cable connector.

Camera cable

Tracking board

ity to the RCX340 controller.

Cable for connecting the camera to the iVY2 board.



	5m	KCX-M66F0-00
Model	10m	KCX-M66F0-10
	15m	KCX-M66F0-20

LAN cable with shield cloth (5 m)



Model	KX0-M55G0-00
IVIOUCI	11/10-1010000-00

YRG Series

Simple gripper operation and control via the YAMAHA robot language. Just install a gripper control board into the controller and set the electrical gripper as an additional robot axis.

Main functions ▶ P.86





YRG-2020FS/YRG-2840FS



YRG-2020FT/YRG-2840FT





YRG-2004T YRG-2013T YRG-2820T YRG-4230T

■ Structure

Single cam structure



Unique cam structure is simple and compact. The fingers work due to external force since no self-locking is used.

Double cam structure



Unique double cam structure with gear. Simple design gives high gripping power yet body is Ball screw structure



Belt-driven ground ball screw delivers a long stroke with high efficiency and high precision.

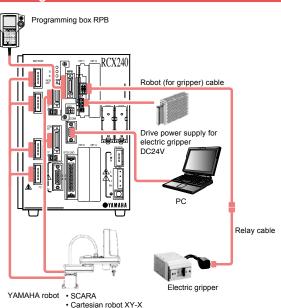
Compact ball guide structure



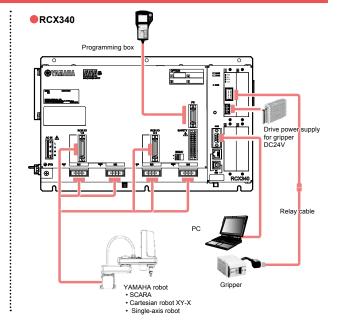
Use of special cams provides light weight and compactness. Ideal for grasping and moving a round workpiece made of glass or similar material.

■ System configuration illustration

RCX240



Single-axis robot



Compact single cam type

'RG-2005SS



■ Basic specifications					
Mardala		V/DQ 000500			
Model n	ame	YRG-2005SS			
Model n	umber	KCF-M2010-A0			
l la lalia a	Max. continuous rating (N)	5			
Holding power	Min. setting (% (N))	30 (1.5)			
power	Resolution (% (N))	1 (0.05)			
Open/cl	ose stroke (mm)	3.2			
	Max. rating (mm/sec)	100			
Speed	Min. setting (% (mm/sec))	20 (20)			
Speed	Resolution (% (mm/sec))	1 (1)			
	Holding speed (Max.) (%)	50			
Repetitiv	ve positioning accuracy (mm)	+/-0.02			
	nechanism	Linear guide			
Max. ho	lding weight Note 1 (kg)	0.05			
Weight ((a)	90			

- Hoding power control : 30 to 100% (1% steps) Speed control : 20 to 100% (1% steps) Acceleration control : 1 to 100% (1% steps) Multipoint position control : 10,000 max.

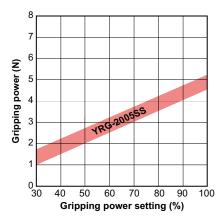
Note. Design the finger as short and lightweight as possible.

Note. Set the parameters and holding power (%) of the holding movement command so that any excessive shock is not applied to the finger during operation.

Note. When installing or uninstalling the finger, tighten the bolts while the finger is being held securely so that any excessive force or shock is not applied to the guide block. Note. Workpiece weight that is able to be held may greatly vary depending on the material, shape, and/or holding surface conditions of the finger.

Note 1. Design the weight of a workpiece to be held so that it is approximately 1/10 to 1/20 of the holding power. (Consider further allowance when moving and swinging the gripper that keeps holding a workpiece.)

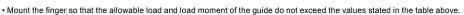
■ Gripping power vs. gripping power setting (%)



 Graph shows a general guide to gripping power versus gripping power setting (%). Variations will appear in the actual gripping power.

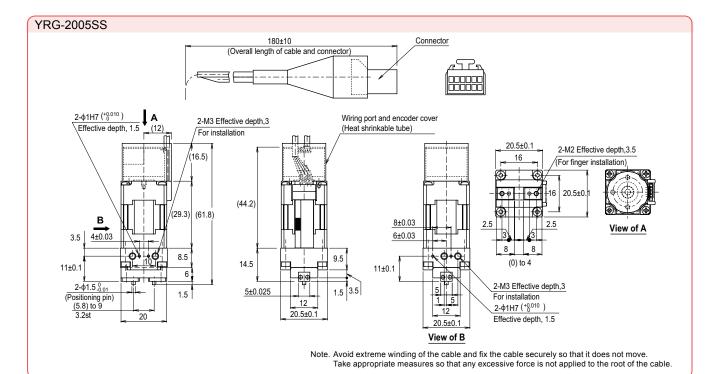
Allowable load and load moment

				YRG-2005SS
0 14	Allowable load	F	Ν	12
	Allowable pitching moment	Мр	N•m	0.04
Guide	Allowable yawing moment	Му	N•m	0.04
	Allowable rolling moment	Mr	N•m	0.08
	Max. weight (1 pair)		g	10
Finger	Max. holding position	L	mm	20
	Max. overhang	Н	mm	20



• Make the adjustment so that the finger weight, holding length (L) from the installation surface to the holding point, and overhang (H)

do not exceed the values stated in the table above Please contact your YAMAHA sales dealer for further information on combination of L and H.



YRG Series

Single cam type

RG-2010S/2815S/4225S



Bas	■ Basic specifications						
Model name		YRG-2010S	YRG-2815S	YRG-4225S			
Model n	umber	KCF-M2011-A0 KCF-M2011-B0		KCF-M2011-C0			
Holding power	Max. continuous rating (N)	6	22	40			
	Min. setting (% (N))	30 (1.8) 30 (6.6)		30 (12)			
	Resolution (% (N))	1 (0.06)	1 (0.22)	1 (0.4)			
Open/cl	ose stroke (mm)	7.6	14.3	23.5			
	Max. rating (mm/sec)	100					
Speed	Min. setting (% (mm/sec))	20 (20)					
	Resolution (% (mm/sec))	1 (1)					
	Holding speed (Max.) (%)	50					

Hoding power control: 30 to 100% (1% steps)
 Speed control: 20 to 100% (1% steps)
 Acceleration control: 1 to 100% (1% steps)
 Multipoint position control: 10,000 max

0.06

160

Repetitive positioning accuracy (mm)

Max. holding weight Note 1 (kg)

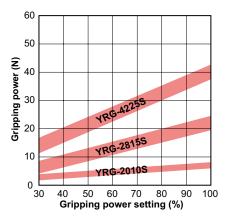
Guide mechanism

Weight (g)

- Note. Design the finger as short and lightweight as possible. Note. Set the parameters and holding power (%) of the holding movement command so that any excessive shock is not applied to the finger during operation.

 Note. When installing or uninstalling the finger, tighten the bolts while the finger is being
- held securely so that any excessive force or shock is not applied to the guide block. Note. Workpiece weight that is able to be held may greatly vary depending on the mate-
- rial, shape, and/or holding surface conditions of the finger. Note 1. Design the weight of a workpiece to be held so that it is approximately 1/10 to 1/20 of the holding power. (Consider further allowance when moving and swinging the gripper that keeps holding a workpiece.)

■ Gripping power vs. gripping power setting (%)



Graph shows a general guide to gripping power versus gripping power setting (%).
 Variations will appear in the actual gripping power.

Allowable load and load moment

		YRG-2010S	YRG-2815S	YRG-4225S		
	Allowable load	F	N	450	350	600
Guide	Allowable pitching moment	Мр	N•m	0.7	0.5	1.1
Guide	Allowable yawing moment	Му	N•m	8.0	0.6	1.3
	Allowable rolling moment	Mr	N•m	2.3	2.8	8.6
	Max. weight (1 pair)		g	15	30	50
Finger	Max. holding position	L	mm	20	20	25
	Max. overhang	Н	mm	20	25	30

+/-0.02

Linear guide

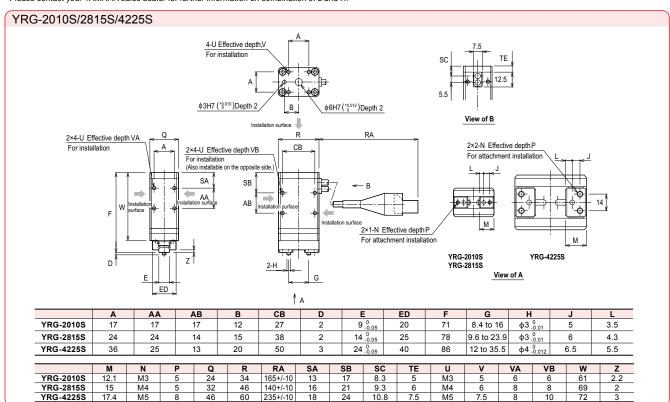
0.22

300

0.4

580

- · Mount the finger so that the allowable load and load moment of the guide do not exceed the values stated in the table above.
- Make the adjustment so that the finger weight, holding length (L) from the installation surface to the holding point, and overhang (H) do not exceed the values stated in the table above.
- Please contact your YAMAHA sales dealer for further information on combination of L and H.



Double cam type

/RG-2005W/2810W/4220W

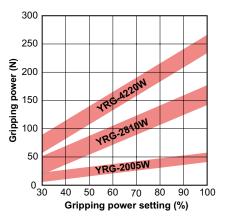


Basic specifications							
Model n	ame	YRG-2005W	YRG-2810W	YRG-4220W			
Model n	umber	KCF-M2012-A0	KCF-M2012-B0	KCF-M2012-C0			
	Max. continuous rating (N)	50	150	250			
Holding	Min. setting (% (N))	30 (15)	30 (45)	30 (75)			
power	Resolution (% (N))	1 (0.5)	1 (1.5)	1 (2.5)			
Open/close stroke (mm)		5	10	19.3			
	Max. rating (mm/sec)	60	60	45			
Spood	Min. setting (% (mm/sec))	20 (12)	20 (12)	20 (9)			
Speed	Resolution (% (mm/sec))	1 (0.6) 1 (0.7)		1 (0.45)			
	Holding speed (Max.) (%)	50					
Repetitive positioning accuracy (mm)		1) +/-0.03					
Guide m	nechanism	Linear guide					
Max. ho	lding weight Note 1 (kg)	0.5 1.5 2.5		2.5			
			800				

- Hoding power control: 30 to 100% (1% steps) Speed control: 20 to 100% (1% steps) Acceleration control: 1 to 100% (1% steps) Multipoint position control: 10,000 max.
- Note. Design the finger as short and lightweight as possible. Note. Set the parameters and holding power (%) of the holding movement command so that any excessive shock is not applied to the finger during operation.

 Note. When installing or uninstalling the finger, tighten the bolts while the finger is being
- held securely so that any excessive force or shock is not applied to the guide block. Note. Workpiece weight that is able to be held may greatly vary depending on the mate-
- rial, shape, and/or holding surface conditions of the finger.
- Note 1. Design the weight of a workpiece to be held so that it is approximately 1/10 to 1/20 of the holding power. (Consider further allowance when moving and swinging the gripper that keeps holding a workpiece.)

■ Gripping power vs. gripping power setting (%



 Graph shows a general guide to gripping power versus gripping power setting (%). Variations will appear in the actual gripping power.

Allowable load and load moment

м

22.5

27.5

37

YRG-2005W

YRG-2810W

YRG-4220W

N

МЗ

M4

M5

Р

5

8

Q

24

32

46

R

34

46

60

RA

165+/-10

140+/-10

235+/-10

SA

13

16

18

SB

21

24

sc

8.3

9.3

10.8

ΤE

6

7.5

U

МЗ

M4

M5

6

7.5

VA

6

8

8

VΒ

6

8

10

w

64

71

76

х

52

67

96

X1

54

61

63

z

2.2

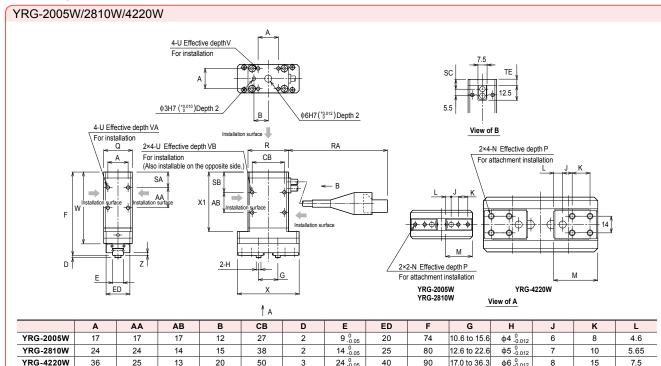
2

3

			YRG-2005W	YRG-2810W	YRG-4220W
Allowable load	F	N	1000	1000	2000
Allowable pitching moment	Мр	N•m	6.7	8.1	20.1
Allowable yawing moment	Му	N•m	4	4.8	12
Allowable rolling moment	Mr	N•m	5.1	7.8	25.9
Max. weight (1 pair)		g	40	80	200
Max. holding position	L	mm	30	30	50
Max. overhang	Н	mm	20	20	30
/ !	Allowable pitching moment Allowable yawing moment Allowable rolling moment Max. weight (1 pair) Max. holding position	Allowable pitching moment Mp Allowable yawing moment My Allowable rolling moment Mr Max. weight (1 pair) Max. holding position L	Allowable pitching moment Allowable yawing moment Allowable rolling moment Mr N•m Max. weight (1 pair) Max. holding position Mp N•m g day.	Allowable pitching moment Mp N•m 6.7 Allowable yawing moment My N•m 4 Allowable rolling moment Mr N•m 5.1 Max. weight (1 pair) g 40 Max. holding position L mm 30	Allowable pitching moment Mp N•m 6.7 8.1 Allowable yawing moment My N•m 4 4.8 Allowable rolling moment Mr N•m 5.1 7.8 Max. weight (1 pair) g 40 80 Max. holding position L mm 30 30

- Mount the finger so that the allowable load and load moment of the guide do not exceed the values stated in the table above
- Make the adjustment so that the finger weight, holding length (L) from the installation surface to the holding point, and overhang (H)
- do not exceed the values stated in the table above.

 Please contact your YAMAHA sales dealer for further information on combination of L and H.



YRG Series

Screw type strait style

RG-2020FS/2840FS



■ Basic specifications					
Model n	ame	YRG-2020F			
Model n	umber	KCF-M2013-			
	Max. continuous rating (N)	50			

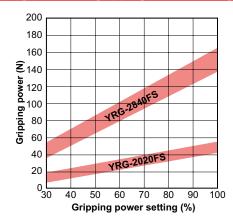
Model n	ame	YRG-2020FS YRG-2840F		
Model number		KCF-M2013-A0	KCF-M2013-B0	
LL-LP	Max. continuous rating (N)	50	150	
Holding power	Min. setting (% (N))	30 (15)	30 (45)	
power	Resolution (% (N))	1 (0.5)	1 (1.5)	
Open/cl	ose stroke (mm)	19	38	
	Max. rating (mm/sec)	50	50	
Spood	Min. setting (% (mm/sec))	20 (10)	20 (10)	
Speed	Resolution (% (mm/sec))	1 (0.5)	1 (0.5)	
	Holding speed (Max.) (%)	50	50	
Repetitiv	re positioning accuracy (mm)	+/-0.01	+/-0.01	
Guide m	nechanism	Linear guide		
Max. ho	ding weight Note 1 (kg) 0.5 1.5		1.5	
Weight ((g)	420	880	

- Hoding power control : 30 to 100% (1% steps) Speed control : 20 to 100% (1% steps) Acceleration control : 1 to 100% (1% steps) Multipoint position control : 10,000 max.
- Note. Design the finger as short and lightweight as possible. Note. Set the parameters and holding power (%) of the holding movement command so

- that any excessive shock is not applied to the finger during operation.

 Note. When installing or uninstalling the finger, tighten the bolts while the finger is being
- held securely so that any excessive force or shock is not applied to the guide block. Note. Workpiece weight that is able to be held may greatly vary depending on the material, shape, and/or holding surface conditions of the finger.
- Note 1. Design the weight of a workpiece to be held so that it is approximately 1/10 to 1/20 of the holding power. (Consider further allowance when moving and swinging the gripper that keeps holding a workpiece.)

■ Gripping power vs. gripping power setting (%)



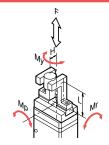
• Graph shows a general guide to gripping power versus gripping power setting (%). Variations will appear in the actual gripping power.

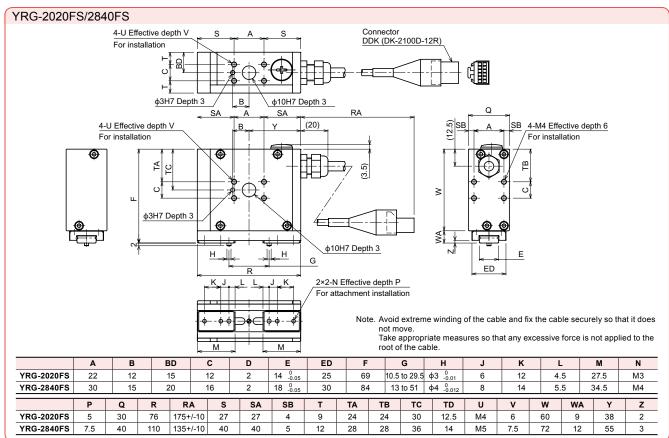
Allowable load and load moment

			YRG-2020FS	YRG-2840FS	
Guide	Allowable load	F	N	1000	1300
	Allowable pitching moment	Мр	N•m	3.5	5
	Allowable yawing moment	My	N•m	4.2	6
	Allowable rolling moment	Mr	N•m	7.3	12.7
Finger	Max. weight (1 pair)		g	40	80
	Max. holding position	L	mm	30	30
	Max. overhang	Н	mm	20	20

- · Mount the finger so that the allowable load and load moment of the guide do not exceed the values stated in the table above
- Make the adjustment so that the finger weight, holding length (L) from the installation surface to the holding point,
- and overhang (H) do not exceed the values stated in the table above.

 Please contact your YAMAHA sales dealer for further information on combination of L and H.





Screw type "T" style

RG-2020FT/2840FT



■ Basic specifications

Model n	ame	YRG-2020FT	YRG-2840FT	
Model number		KCF-M2013-A0	KCF-M2013-B0	
LI. Library	Max. continuous rating (N)	50	150	
Holding power	Min. setting (% (N))	30 (15)	30 (45)	
power	Resolution (% (N))	1 (0.5)	1 (1.5)	
Open/cl	ose stroke (mm)	19	38	
	Max. rating (mm/sec)	50	50	
Casad	Min. setting (% (mm/sec))	20 (10)	20 (10)	
Speed	Resolution (% (mm/sec))	1 (0.5)	1 (0.5)	
	Holding speed (Max.) (%)	50	50	
Repetitive positioning accuracy (mm)		+/-0.01	+/-0.01	
Guide mechanism		Linear guide		
Max. ho	lding weight Note 1 (kg)	0.5	1.5	
Weight	(g)	420	890	
Max. ho	Iding weight Note 1 (kg)	0.5	1.5	

- Hoding power control: 30 to 100% (1% steps) Speed control: 20 to 100% (1% steps) Acceleration control : 1 to 100% (1% steps) Multipoint position control: 10,000 max.
- Note. Design the finger as short and lightweight as possible. Note. Set the parameters and holding power (%) of the holding movement command so

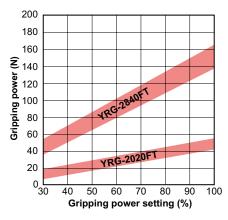
- that any excessive shock is not applied to the finger during operation.

 Note. When installing or uninstalling the finger, tighten the bolts while the finger is being held securely so that any excessive force or shock is not applied to the guide block.

 Note. Workpiece weight that is able to be held may greatly vary depending on the mate-
- rial, shape, and/or holding surface conditions of the finger.

Note 1. Design the weight of a workpiece to be held so that it is approximately 1/10 to 1/20 of the holding power. (Consider further allowance when moving and swinging the gripper that keeps holding a workpiece.)

■ Gripping power vs. gripping power setting (%)



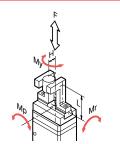
Graph shows a general guide to gripping power versus gripping power setting (%).
 Variations will appear in the actual gripping power.

Allowable load and load moment

		YRG-2020FT	YRG-2840FT		
	Allowable load	F	N	1000	1300
Guide	Allowable pitching moment	Мр	N•m	3.5	5
Guide	Allowable yawing moment	My	N•m	4.2	6
	Allowable rolling moment	Mr	N•m	7.3	12.7
	Max. weight (1 pair)		g	40	80
Finger	Max. holding position	L	mm	30	30
	Max. overhang	Н	mm	20	20

- Mount the finger so that the allowable load and load moment of the guide do not exceed the values stated in the table above.
- Make the adjustment so that the finger weight, holding length (L) from the installation surface to the holding point,
- and overhang (H) do not exceed the values stated in the table above.

 Please contact your YAMAHA sales dealer for further information on combination of L and H.



'RG-2020F							tion of E a										
KG-2020F	1/2040	UF I															
				Connect DDK (Dr	or K-2100D-12F	(3)			J Effective r installation		SA	A	*	SA	<u></u>		
												•	- 6		TACTA		
7	4-U Effec		th V					RA	=		<u>Н</u> G			H	T		
`	\		Α \$	S		*			1			K	>				
ф3H7 Dep ф10H7 De	oth 3		• • • • • • • • • • • • • • • • • • •		4-U Effective depth V For installation	_/	Q ZAA SE	B D		it does r	ective de nament instrument instrume woot move	stallation vinding of	the cab	M solle and fi	x the cab	ble securel force is not	
		,		_			ì			to the ro	ot of the	cable.					
	Α	В	С	D	E	ED	F	G	H	J	JA	K		L	M	N	Р
YRG-2020FT	22	12	12	2	14 -0.05	25	39	10.5 to 29.5	- 0.01	6	12	12		4.5	27.5	M3	5
YRG-2840FT	30	15	16	2	18 -0.05	30	52	13 to 51	φ4 _{-0.012}	8	14	14		5.5	34.5	M4	7.5
	Q	R	RA		SA SB	Т	TA	ТВ	TC	TD	TE	U	٧	W	Y	Z	ZA
YRG-2020FT	30	76	175+/-10		27 4	24	9	24	30	12.5	12.5	M4	6	60	38	2	9
YRG-2840FT	40	110	135+/-10	40	40 5	28	12	28	36	14	14	M5	7.5	72	55	3	12

YRG Series

Three fingers type

YRG-2004T



■ Basic specifications	■ Gripping
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	no opodinounono	
Model name		YRG-2004T
Model n	umber	KCF-M2015-A0
	Max. continuous rating (N)	2.5
Holding power	Min. setting (% (N))	30 (0.75)
power	Resolution (% (N))	1 (0.025)
Open/close stroke (mm)		3.5
	Max. rating (mm/sec)	100
Casad	Min. setting (% (mm/sec))	20 (20)
Speed	Resolution (% (mm/sec))	1 (1)
	Holding speed (Max.) (%)	50
Repetitive positioning accuracy (mm)		+/-0.03
Guide mechanism		Linear guide
Max. holding weight Note 1 (kg)		0.02
Weight	(g)	90

• Hoding power control: 30 to 100% (1% steps) • Speed control: 20 to 100% (1% steps) • Acceleration control: 1 to 100% (1% steps) • Multipoint position control: 10,000 max.

Note. Design the finger as short and lightweight as possible. Note. Set the parameters and holding power (%) of the holding movement command so

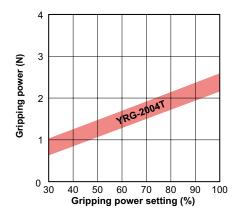
that any excessive shock is not applied to the finger during operation.

Note. When installing or uninstalling the finger, tighten the bolts while the finger is being

held securely so that any excessive force or shock is not applied to the guide block. Note. Workpiece weight that is able to be held may greatly vary depending on the material, shape, and/or holding surface conditions of the finger.

Note 1. Design the weight of a workpiece to be held so that it is approximately 1/10 to 1/20 of the holding power. (Consider further allowance when moving and swinging the gripper that keeps holding a workpiece.)

power vs. gripping power setting (%)



 Graph shows a general guide to gripping power versus gripping power setting (%). Variations will appear in the actual gripping power.

■ Allowable load and load moment

				YRG-2004T
	Allowable load		N	6
Finger	Allowable pitching moment		N•m	0.02
	Max. weight (1 pair)		g	10
	Max. holding position	L	mm	15

•When the external forces Fa and Fb are applied to a potion the distance (L) apart from the finger installation surface, the load (F) and moment (M) are calculated from the formulas shown below.

 $F = Fa + W \times g$ $M = Fb \times L$

Load [N]

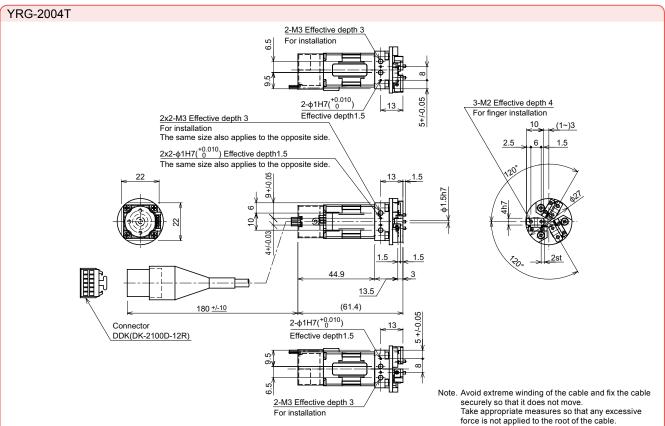
M: Moment [N•m]
L: Distance of point of external force application [m]

:External force [N] :External force [N] Fb W

Workpiece weight [Kg] Gravity acceleration [m/s²]

 $\begin{array}{ll} g \; : \; \text{Gravity acceleration prime J} \\ \text{H} \; : \; \text{Distance of holding point [m]} \end{array}$

External force : Fb Distance of holding External force : Fa Work: W Finger



External force : Fb Distance of holding

Three fingers type

YRG-2013T/2820T/4230T



Bas	ic specifications				
Model n	ame	YRG-2013T	YRG-2820T	YRG-4230T	
Model n			CF-M2015-B0 KCF-M2015-C0		
	Max. continuous rating (N)	2	10	20	
Holding	Min. setting (% (N))	30 (0.6)	30 (3)	30 (6)	
power	Resolution (% (N))	1 (0.02)	1 (0.1)	1 (0.2)	
Open/cl	ose stroke (mm)	13	20	30	
	Max. rating (mm/sec)	100			
Cnood	Min. setting (% (mm/sec))	20 (20)			
Speed	Resolution (% (mm/sec))	1 (1)	1 (1)	1 (1)	
	Holding speed (Max.) (%)	50	50	50	
Repetitiv	e positioning accuracy (mm)	+/-0.03			
	nechanism	Linear guide			
Max. ho	lding weight Note 1 (kg)	0.02	0.1	0.2	
Weight ((g)	190	340	640	

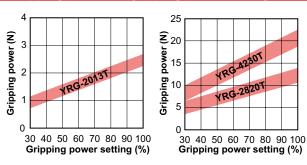
- Hoding power control: 30 to 100% (1% steps) Speed control: 20 to 100% (1% steps) Acceleration control: 1 to 100% (1% steps) Multipoint position control: 10,000 max.

- Note. Design the finger as short and lightweight as possible. Note. Set the parameters and holding power (%) of the holding movement command so
- that any excessive shock is not applied to the finger during operation.

 Note. When installing or uninstalling the finger, tighten the bolts while the finger is being held securely so that any excessive force or shock is not applied to the guide block Note. Workpiece weight that is able to be held may greatly vary depending on the mate-
- rial, shape, and/or holding surface conditions of the finger.

Note 1. Design the weight of a workpiece to be held so that it is approximately 1/10 to 1/20 of the holding power. (Consider further allowance when moving and swinging the gripper that keeps holding a workpiece.)

■ Gripping power vs. gripping power setting (%)



· Graph shows a general guide to gripping power versus gripping power setting (%) Variations will appear in the actual gripping power

> External force: Fa Work: W Finger

Allowable load and load moment

				YRG-2013T	YRG-2820T	YRG-4230T
	Allowable load		N	20	30	50
Finger	Allowable pitching moment		N•m	0.1	0.2	0.4
Filigei	Max. weight (1 pair)		g	20	30	50
	Max. holding position	L	mm	20	30	40

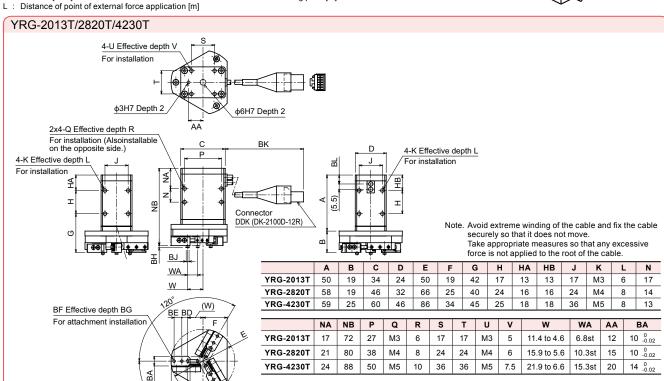
• When the external forces Fa and Fb are applied to a potion the distance (L) apart from the finger installation surface, the load (F) and moment (M) are calculated from the formulas shown below.

F = Fa + W × g M = Fb × L

Load [N]

Moment [N•m]
Distance of point of external force application [m]

:External force [N] :External force [N] Workpiece weight [Kg] Gravity acceleration [m/s²] w Distance of holding point [m]



ВВ

16

19.5

22.5

YRG-2013T

YRG-2820T

YRG-4230T

ВВ

вс

2.5

2.5

2.5

BD

10

6

6

BE

8

10

BF

3x1-M3

3x2-M3

3x2-M4

BG

6

8

вн

2

3

BJ

ф3 _{-0.01}

ф3 _{-0.01}

 $\varphi4~^0_{-0.012}$

BK

165+/-10

140+/-10

235+/-10

BL

8.3

9.3

10.8

tion

■ Electric gripper basic specifications

YRG Series

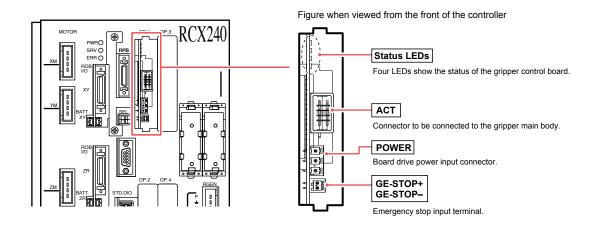
Item		Specifications			
Basic	Applicable controller	RCX240/RCX240S	RCX340		
specifications	Number of connection grippers	Max. 2 units (One unit per slot, max. 2 slots)	Max. 4 units		
Control method PTP motion					
	Min. setting unit	0.01mm			
Axis control	Position indication unit	Pulses, mm (millimeters)			
	Speed setting	20 to 100% (in 1% steps, Changeable by the program.)			
Acceleration setting 1 to 100% (in 1% steps, Setting by the acceleration parameter)					
Programming	Teaching	MDI (coordinate data input), direct teaching, teaching playback,offline teaching (data input from external unit)			

■ Gripper control board specifications

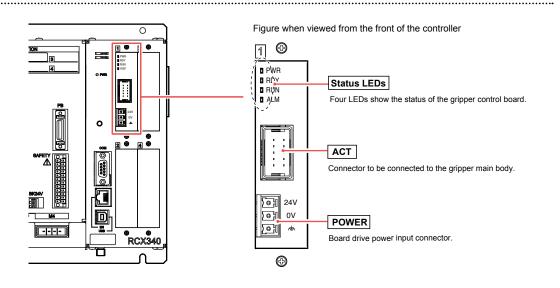
Item		Specifications		
	No. of axes	1 axis		
Axis control	Position detection method	Optical rotary encoder		
AXIS CONTION	Min. setting distance	0.01mm		
	Speed setting	Set in the range of 20 to 100% to the max. parameter speed.		
Protective alarm		Overcurrent, overload, voltage failure, system failure, position deviation over, feedback error, etc.		
LED status indication		POWER (Green), RUN (Green), READY (Yellow), ALARM (Red)		
Power supply	Drive power	DC 24V +/-10% 1.0A Max.		

■ Part names and functions

RCX240



RCX340



Accessories and part options



YRG Series

Standard accessories

Gripper control board

Madal	For RCX240/RCX240S	KX0-M4400-F1
wodei	For RCX340	KCX-M4400-G0

RCX240/S RCX340

Note. This board includes a 24V supply connector.

Robot (for gripper) cable



	3.5m	KCF-M4751-31
Model	5m	KCF-M4751-51
	10m	KCF-M4751-A1

RCX240/S RCX340

Note. Be sure to adjust the total length of the robot (for gripper) cable and relay cable to 14m or less.

Relay cable



Model	0.5m	KCF-M4811-11	
	1m	KCF-M4811-21	
	1.5m	KCF-M4811-31	RO
	2m	KCF-M4811-41	
	2.5m	KCF-M4811-51	
	3m	KCF-M4811-61	
	3.5m	KCF-M4811-71	
	4m	KCF-M4811-81	

CX240/S CX340

Connector for 24V power supply



Model	KCF-M5382-00

RCX240/S (RCX340)

RCX240/S

Connector for gripper emergency stop



Model	KCF-M5370-00

Note. Not included with the RCX340.

MEMO