

YAMAHA ROBOT CONTROLLERS

CONTROLLER

CONTENTS

CONTROLLER for LCMR200/GX series

YHX 610

CONTROLLER for LCM100

LCC140 620

POSITIONER

TS-S2/TS-SH/TS-X/TS-P 626

DRIVER

TS-SD 636

RDV-X/RDV-P 640

CONTROLLER

ERCD 646

SR1-X/SR1-P 652

RCX320 660

RCX221/RCX222 670

RCX340 678

OPTION DETAILS

- Support software for PC
 - TS-Manager 688
 - POPCOM+ 690
 - VIP+ 692
 - RDV-Manager 694
 - RCX-Studio 2020 696
- Handy terminal
 - HT1/HT1-D 698

- Programming box
 - HPB/HPB-D 699
 - RPB/RPB-E 700
 - PBX/PBX-E 701
- LCD Monitor option
 - TS-Monitor 702
- Touch operator interface
 - Pro-face 703
- Field network system with minimal wiring (network)
 - YHX 704
 - LCC140 705
 - TS-S2/TS-SH/TS-X/TS-P 706
 - SR1-X/SR1-P 707
 - RCX320/RCX221/RCX222/RCX340 708
 - RCX320/RCX340 709

ROBOT VISION

RCXiVY2+ System 712

ELECTRIC GRIPPER

- YRG Series 720
 - Compact single cam type
 - YRG-2005SS 721
 - Single cam type
 - YRG-2010S/2815S/4225S 722
 - Double cam type
 - YRG-2005W/2810W/4220W 723

- Screw type strait style
 - YRG-2020FS/2840FS 724
- Screw type "T" style
 - YRG-2020FT/2840FT 725
- Three fingers type
 - YRG-2004T 726
 - YRG-2013T/2820T/4230T 727

Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motor-less single axis actuator
Robonity

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & Place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCX+VYZ Electric gripper

Option

CONTROLLER FEATURE DESCRIPTION

LCMR200 / GX series

Robot controller

YHX

Linear conveyor module LCMR200
Single-axis robot GX series

P.610



Single-axis

Robot controller

LCC140

Linear conveyor module LCM100

P.620



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

Single-axis robot positioner

TS-S2/TS-SH

Stepping motor single-axis robots ... TRANSERVO ^{Note 1}

P.626



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

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

Single-axis robot positioner

TS-X/TS-P

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

P.626



Operating method	I/O point tracing/Remote command/Operation using RS-232C communication
Points	255 points
Input power	Control power supply AC100V specification: Single phase 100 to 115V AC +/-10% AC200V specification: Single phase 200 to 230V AC +/-10% Main power supply AC100V specification: Single phase 100 to 115V AC +/-10% AC200V specification: Single phase 200 to 230V AC +/-10%
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

Stepping motor single-axis robots ... TRANSERVO

P.636



Operating method	Pulse train control
Input power	Control power supply DC24V +/-10% Main 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.640



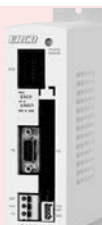
Operating method	Pulse train control
Input power	Control power supply: Single phase 200V to 230V +10% to 15 % Main power supply: Single phase/3-phase 200V to 230V +10% to 15 %
Origin search method	Incremental
Field networks	Not supported

Single-axis robot controller

ERCD

Single-axis robot T4L/T5L
Clean single-axis C4L/C5L

P.646



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

Single-axis robot controller

SR1-X/SR1-P

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

P.652



Operating method	Programming/I/O point tracing/Remote command Operation using RS-232C communication
Points	1000 points
Input power	Control power supply: Single phase 100 to 115 / 200 to 230V AC +/-10% maximum Main power supply: SR1-X05/SR1-X10 Single phase 100 to 115 / 200 to 230V AC +/-10% maximum SR1-X20 Single phase 200 to 230V AC +/-10% maximum SR1-P05/SR1-P10 Single phase 100 to 115/ 200 to 230V AC +/-10% maximum SR1-P20 Single phase 200 to 230V AC +/-10% maximum
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

RCX320

Single-axis robot..... FLIP-X
Linear motor single-axis PHASER
Cartesian robot XY-X
Pick & place..... YP-X

P.660



Operating method	Programming/Remote command/ Operation using RS-232C communication
Points	30000 points
Input power	Control power supply: Single phase 200 to 230V AC +/-10% maximum Main power supply: Single phase 200 to 230V AC +/-10% maximum
Origin search method	Absolute, Incremental
Field networks	CC-Link, DeviceNet™, EtherNet/IP™, Ethernet, PROFIBUS, PROFINET, EtherCAT

Multi-axis robot controller

RCX221/ RCX221HP

Single-axis robot..... FLIP-X
Linear motor single-axis PHASER
Cartesian robot XY-X
Pick & place..... YP-X

P.670



Operating method	Programming/Remote command/ Operation using RS-232C communication
Points	10000 points
Input power	Control power supply: Single phase 200 to 230V AC +/-10% maximum Main power supply: Single phase 200 to 230V AC +/-10% maximum
Origin search method	Incremental, Semi-absolute
Field networks	CC-Link, DeviceNet™, PROFIBUS

Multi-axis robot controller

RCX222/ RCX222HP

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

P.670



Operating method	Programming/Remote command/ Operation using RS-232C communication
Points	10000 points
Input power	Control power supply: Single phase 200 to 230V AC +/-10% maximum Main power supply: Single phase 200 to 230V AC +/-10% maximum
Origin search method	Absolute, Incremental
Field networks	CC-Link, DeviceNet™, PROFIBUS

1 to 4 axis

Multi-axis robot controller

RCX340

Single-axis robot..... FLIP-X
Linear motor single-axis PHASER
Cartesian robot XY-X
SCARA robot YK-TW, YK-XG,
YK-XE, YK-XGS,
YK-XGP
Pick & place..... YP-X










P.678



Operating method	Programming/Remote command/ Operation using RS-232C communication
Points	30000 points
Input power	Control power supply: Single phase 200 to 230V AC +/-10% maximum Main power supply: Single phase 200 to 230V AC +/-10% maximum
Origin search method	Absolute, Incremental
Field networks	CC-Link, DeviceNet™, EtherNet/IP™, Ethernet, PROFIBUS, PROFINET, EtherCAT

Articulated robots YA
Linear conveyor modules LCM
Single-axis robots CX
Motor-less single axis actuator Robotomy
Compact single-axis robots TRANSEVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & place robots YP-X
CLEAN CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXVY2+ Electric gripper
Option

CONTROLLER SPECIFICATION SHEET








Category		Robot controller		Robot positioner				Robot driver			
Name		YHX	LCC140	TS-S2	TS-SH	TS-X	TS-P	TS-SD	RDV-X	RDV-P	
External view											
Operating method		YHX Standard profile	Programming/ I/O point tracing/ Remote command/ Operation using RS-232C communication	I/O point tracing/Remote command/ Operation using RS-232C communication				Pulse train control			
Applicable robot	LCMR200	●	—	—	—	—	—	—	—	—	
	LCM100	—	●	—	—	—	—	—	—	—	
	GX	●	—	—	—	—	—	—	—	—	
	TRANSERVO	—	—	● ^{Note 2}	●	—	—	●	—	—	
	FLIP-X	T4L/T5L/C4L/C5L	—	—	—	—	—	—	—	—	—
		FLIP-X other than above	—	—	—	—	●	—	—	●	—
	PHASER	—	—	—	—	—	●	—	—	●	
	XY-X	—	—	—	—	—	—	—	—	—	
YK-X	—	—	—	—	—	—	—	—	—		
YP-X	—	—	—	—	—	—	—	—	—		
Input power	Control power supply	Single phase 200 to 230V AC +/-10% maximum (50/60Hz)		DC24V +/-10% maximum		<ul style="list-style-type: none"> ● AC100V specifications^{Note 1} (105 / 110 driver) Single phase 100 to 115V AC +/-10% maximum (50/60Hz) ● AC200V specifications (205 / 210 / 220 driver) Single phase 200 to 230V AC +/-10% maximum (50/60Hz) 		DC24V +/-10% maximum	Single phase 200 to 230V AC +10% to -15% (50/60Hz +/-5%)		
	Main power supply								Single phase / 3-phase 200 to 230V +10% to -15% (50/60Hz +/-5%)		
Number of controllable axes		Check the details page of the YHX controller.		Single-axis		Single-axis		Single-axis			
Origin search method				Incremental	Incremental	Absolute/ Incremental	Absolute/ Incremental	Incremental/ Semi-absolute	Incremental		
Maximum number of programs				100		(program not required)		—			
Maximum number of steps per program				999 steps		(program not required)		—			
Points				10,000 points		255 points		—			
Multitasks				4		—		—			
I/O points	Dedicated I/O			8 points/4 points		16 points/16 points	16 points/16 points	16 points/16 points	16 points/16 points	—	
	General I/O			16 points/16 points		—		—		—	
Field network support	CC-Link	●	●	●	●	●	●	—	—	—	
	DeviceNet	—	●	●	●	●	●	—	—	—	
	EtherNet/IP	●	●	●	●	●	●	—	—	—	
	Ethernet	—	—	—	—	—	—	—	—	—	
	PROFIBUS	—	—	—	—	—	—	—	—	—	
	ETHERCAT	●	—	●	●	●	●	—	—	—	
CE marking		●	—	●	●	●	●	●	●	●	
Programming box		YHX-PP (with enable switch)	HPB / HPB-D (with enable switch)	HT1 / HT1-D (with enable switch)				—			
Support software for PC		YHX-Studio for Standard Profile	POPCOM ⁺	TS-Manager				TS-Manager	RDV-Manager		
Detailed info page		P.610		P.620		P.626		P.636	P.640		

Note 1. 20A specifications provide only 200V.

Note 2. Exclude SG07

Note 3. 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 4. Maximum number of general-purpose I/O points when option OP.DIO boards (4 boards) are installed.

Robot controller							
ERCD	SR1-X	SR1-P	RCX320	RCX221 RCX221HP	RCX222 RCX222HP	RCX340	
							
Pulse train control/ Programming/ I/O point tracing/ Operation using RS-232C communication	Programming/I/O point tracing/ Remote command/ Operation using RS-232C communication		Programming/Remote command/ Operation using RS-232C communication				
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
●	—	—	—	—	—	—	—
—	●	—	●	●	●	●	●
—	—	●	●	●	—	●	●
—	—	—	●	●	●	●	●
—	—	—	—	—	—	—	●
—	—	—	●	—	●	●	●
DC24V +/-10% maximum	<ul style="list-style-type: none"> ● 05 / 10 / 20 driver Single phase 100 to 115V/200 to 230V AC +/-10% maximum (50/60Hz) ● 05 / 10 driver Single phase 100 to 115V/200 to 230V AC +/-10% maximum (50/60Hz) ● 20 driver Single phase 200 to 230V AC +/-10% maximum (50/60Hz) 		Single phase 200 to 230V AC +/-10% maximum (50/60Hz)				
Single-axis	Single-axis		2 axes maximum Max. number of robots 4	2 axes maximum	2 axes maximum	2 axes maximum	Max. number of robots 4 Max. number of controllable axes 16
Incremental	Absolute/ Incremental	Incremental/ Semi-absolute	Absolute/Incremental/ Semi-absolute	Incremental/ Semi-absolute	Absolute/ Incremental	Absolute/Incremental/ Semi-absolute	
100	100		100	100	100	100	
1024 steps	3000 steps		9999 steps	9999 steps	9999 steps	9999 steps	
1000 points	1000 points		30000 points	10000 points	10000 points	30000 points	
4	4		16	8	8	16	
8 points/3 points	8 points/4 points		8 points/9 points	10 points/12 points	10 points/12 points	8 points/9 points	
6 points/6 points	16 points/16 points		96 points/64 points (Max.) ^{Note 4}	40 points/24 points(Max.) ^{Note 3}	40 points/24 points(Max.) ^{Note 3}	96 points/64 points (Max.) ^{Note 4}	
—	●	●	●	●	●	●	
—	●	●	●	●	●	●	
—	—	—	●	—	—	●	
—	—	—	●	—	—	●	
—	●	●	●	●	●	●	
—	—	—	●	—	—	●	
—	—	—	●	—	—	●	
—	●	●	●	●	●	●	
HPB / HPB-D (with enable switch)			PBX /PBX-E (with enable switch)	RPB / RPB-E (with enable switch)		PBX /PBX-E (with enable switch)	
POPCOM ⁺			RCX-Studio 2020	VIP ⁺		RCX-Studio 2020	
P.646	P.652		P.660	P.670		P.678	

Controller operating methods

- Point trace : Host device specifies a binary point number and robot moves to the specified point when a start signal is input. Controller does not need a program and operates just by teaching point data.
- Remote command : Controller issues 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.
- Pulse train : 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.
- Online instructions : PC can send various commands and data directly to the robot controller via RS232C or Ethernet and receive status information and data.

YHX

Dedicated for LCMR200 / GX series

Order model: **YHX-HD**

Controller	Language	Network
	J (Japanese)	N : None
	E (English)	CC : CC-Link ¹
		PT : PROFINET ²
		EP : EtherNet/IP ³
		ES : EtherCAT ⁴

*1. CC-Link is a registered trade mark of Mitsubishi Electric Corporation.
 *2. PROFINET is a registered trade mark of PROFIBUS Nutzerorganisation e.V. (PNO).
 *3. EtherNet/IP is a registered trade mark of ODVA, Inc.
 *4. EtherCAT is a patented technology and a registered trademark licensed by Beckhoff Automation GmbH (Germany).

The YHX-HD is a set model of the host controller unit, driver power unit, and related components shown below. Each unit should be assembled by the customer.



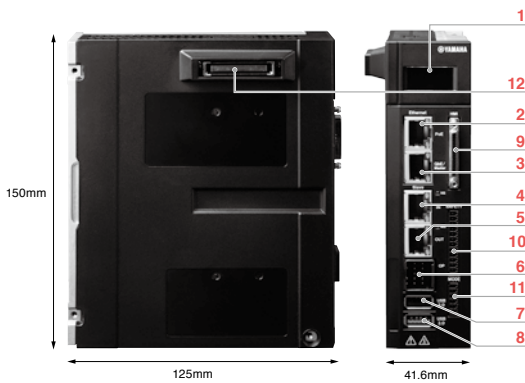
Main functions ▶ P.32

YHX-HD Configuration parts

Control unit

Host

Host controller unit



1	LCD	Indicates the status of the controller.
2	PoE	PoE compatible giga bit Ethernet connector.
3	GbE	PoE non-compatible giga bit Ethernet connector.
4	IN	LAN connector for connecting with master devices of field network communications connector (EtherNet/IP, EtherCAT, PROFINET)
5	OUT	LAN connector for connecting with other slave devices of field network communications connector (EtherNet/IP, EtherCAT, PROFINET)
6	OP	Connector for field network communications adaptors (CC-Link)
7	USB 2.0	Connector compatible with USB 2.0
8	USB 3.0	Connector compatible with USB 3.0
9	HMI	Connector for connecting with a programming pad, display and other devices
10	SAFETY	Connect with external PLC, safety devices and the like.
11	MODE	CPU OK output Programming pad AUTO/MANUAL select switch contact output
12		Connector for connection between units (control signal/Power)

This unit can control multiple robots by combining with the linear conveyor. Although the unit is compact, it is multifunctional and has an enhanced interface.

Japanese	Model	YHX-HCU
	Parts No.	KEK-M4200-0A
English	Model	YHX-HCU-E
	Parts No.	KEK-M4200-1A

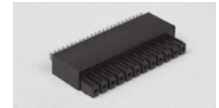


Safety connector

Host YQLink

Used for building up an external safety circuit while connecting with the safety dedicated port of a host controller.

Model	YHX-CN-SAFE
Parts No.	KEK-M4432-00

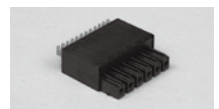


Mode connector

Host

Used for building up an external safety circuit while using the mode switch output port of a host controller unit.

Model	YHX-CN-MODE
Parts No.	KEK-M4432-10



HMI short circuit connector

Host

Used when a programming pad is not connected with a host controller. Note that if not connected, robots do not operate because the controller enters the state of emergency stop.

Model	YHX-CN-HMIS
Parts No.	KEK-M4429-00

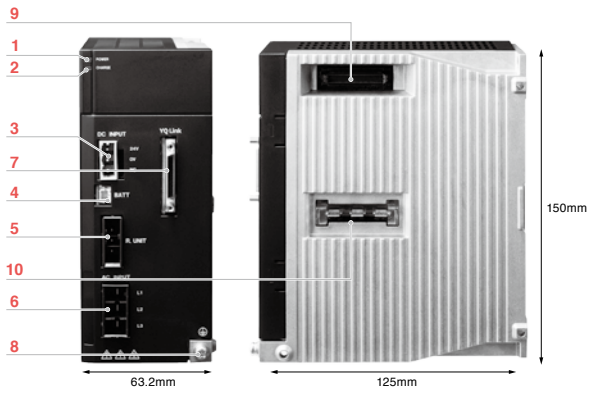


Controller

Power unit

D. Power

Driver power unit



1	POWER	Blue: 24V DC control power supply is available.
2	CHARGE	Orange: 200V AC main power supply is available and Charge*
3	DC INPUT	Control power supply connector (24V DC)
4	BATT	ABS battery connector
5	R.UNIT	Connector for connecting regenerative unit
6	AC INPUT	Main power supply connector (Single phase / 3-phase 200 to 230V AC)
7	YQLink	YQLink communications connector Connects with IO units and linear conveyor modules.
8	⊕	Grounding terminal
9	Connector for connection between units (control signal/Power)	
10	Connector for connection between units (high voltage power source for driving motors)	

* Even when the main power is turned off, the lamp is lit while any charge remains in the internal capacitor. Do not touch the main circuit and motor terminal while the lamp is lit. Doing so may cause electrical shock.

This unit supplies power to each unit. Be sure to use it together with the host controller unit or a YQLink expansion unit. Use the dedicated cables to connect with linear conveyor modules.



Model	YHX-DPU
Parts No.	KEK-M5880-0A

Control power supply connector

D. Power
 Used when supplying the control power supply.

Model	YHX-CN-CP
Parts No.	KEK-M4512-00



Main power supply connector

D. Power
 Used when supplying the main power supply.

Model	YHX-CN-DP
Parts No.	KEK-M5382-00



Regenerative unit short circuit connector

D. Power
 Used when not connecting a regenerative unit. An error is generated if the short circuit connector of a regenerative unit is not connected.

Model	YHX-CN-RUS
Parts No.	KEK-M4431-00



Selection options

Field network

EtherCAT slave

Model	YHX-NWS-ECAT
Parts No.	KEK-M440A-00

EtherNet/IP adapter (slave)

Model	YHX-NWS-ENIP
Parts No.	KEK-M440A-E0

PROFINET slave

Model	YHX-NWS-PFNET
Parts No.	KEK-M440A-N0

CC-Link slave (with adapter and connector)

Model	YHX-NWS-CCL
Parts No.	KEK-M440A-C0



Connector for CC-Link

CC-Link connector

Model	YHX-CN-CCL
Parts No.	KEK-M4872-C0



CC-Link branch-out connector

Model	YHX-CN-CCSP
Parts No.	KEK-M4873-00



<Cautionary notes on field networks>
 The YHX controllers are not equipped with a field network board. Entering the activation code, which is issued for each host controller, into the host controller unit enables field network functions. The activation code certificate comes with a host controller unit.

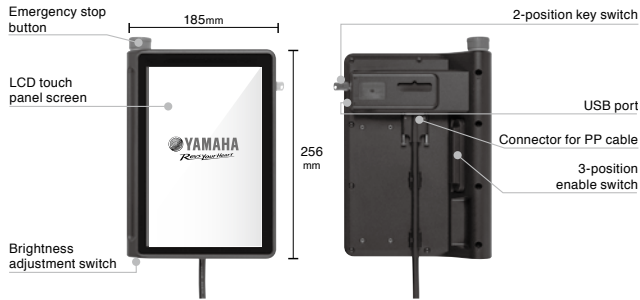
* If purchasing a field network only later on, inform us of the serial number of the host controller unit because it is necessary to issue the activation code.
 * When the CC-Link option is selected, the CC-Link adapter x 1, CC-Link connector x 2, and CC-Link branch connector x 1 are supplied with the product. When the CC-Link terminating connector is needed, order it separately.

The parts with the marks below are their respective constituent parts. **Host** ... Host controller unit **D. Power** ... Driver power unit **Regenerative unit** ... Regenerative unit **YQLink** ...YQLink expansion **Drivers** ... Driver unit

Articulated robots
YA
Linear conveyor modules
LCM
Single-axis robots
CX
Motor-less single axis actuator
Robonity
Compact single-axis robots
TRANSEVO
Single-axis robots
FLIP-X
Linear motor single-axis robots
PHASER
Cartesian robots
XY-X
SCARA robots
YK-X
Pick & Place robots
YP-X
CLEAN
CONTROLLER INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXIVY2+ Electric gripper
Option

Programming pad (cable set)

Order model: **YHX-PP6L** (KEK-M5110-0B)



Use the touch panel screen for various operation. Equipped with safety functions (emergency stop button and enable switch) and a USB connector.

Programming pad	
Model	YHX-PP
Parts No.	KEK-M5110-0A



Programming pad cable

Host		
Used when connecting a programming pad.		
6 m	Model	YHX-PP-6M
	Parts No.	KEK-M5362-61



Development environment software YHX Studio for Standard Profile

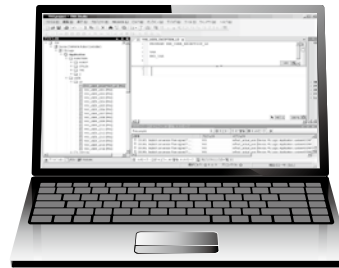
Order model: **YHX-SW-STUDIO-SP** (KEK-M4990-10)

* No USB key is attached.

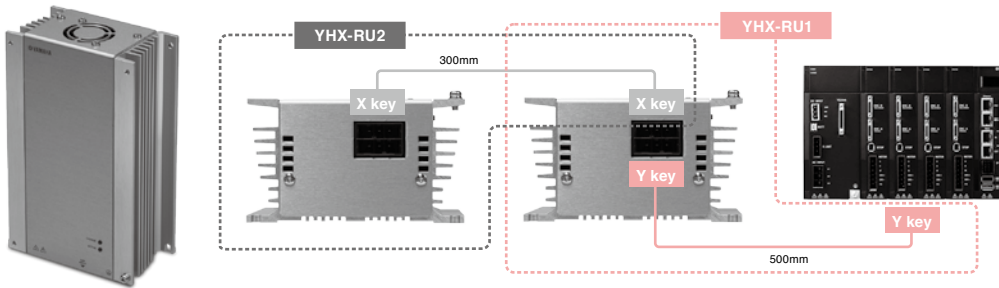
PC operating environment	OS	Windows 7 SP1/8/8.1/10 (64-bit version only for all)
	CPU	Equivalent to Intel Core (TM) i5-6200U 2.30 GHz or better.
	Memory	8 GB or larger
	Hard disc drive capacity	2 GB or more of empty space for destination of installing the YHX Studio.
	Communications port	Ethernet
	Display	1920 x 1080 or higher resolution is recommended.
	Other	Ethernet cable (Category 5 or better)
Applicable controllers	YHX Host controller unit	
Applicable robots	Robots connectable to YHX	

Microsoft, Windows and Windows 7 are the registered trademarks or the trademarks of Microsoft Corporation in the United States. Other firms' names and product names appearing in this catalog are registered trademarks or the trademarks of the respective firms or products concerned.

YHX Studio for Standard Profile is software that is used when the YHX host controller unit of the YAMAHA robot controller YHX series is set up.



Regenerative unit set



Absorbs regenerative energy generated during decelerating a robot with a large motor. Connecting two increases the capacity to absorb regenerative energy to two times.

Absorbable electric power	100 W (Equivalent to RGU 3) * 200 W when 2 are connected
Momentary maximum power	1600W
Number of connected units	Maximum 2 units
Other	Forced cooling and exhaust by fan Overheat detection for protection

Regenerative unit

Order model: **YHX-RU1** (KEK-M4107-0A)

Regenerative unit	
Model	YHX-RU
Parts No.	KEK-M5850-0A



Regenerative unit (For expansion)

Order model: **YHX-RU2** (KEK-M4107-0B)

Regenerative unit	
Model	YHX-RU
Parts No.	KEK-M5850-0A



Regenerative unit connection cable

D. Power		
Regenerative unit		
Used when connecting a regenerative unit.		
0.5 m	Model	YHX-RU-50C
	Parts No.	KEK-M5363-00



Regenerative unit expansion cable

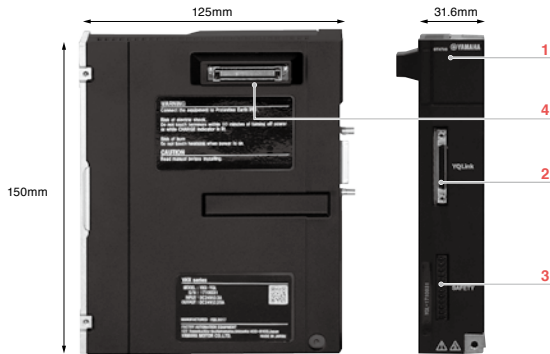
Regenerative unit		
Used when adding a regenerative unit.		
0.3 m	Model	YHX-RU-EX30C
	Parts No.	KEK-M5364-00



* For details about how to determine the regenerative unit quantity of the single-axis robot GX series, see P. 615.

YQLink expansion unit set

Order model: **YHX-YQL-SET (KEK-M4406-0B)**



1	STATUS	Blue: 24V DC power supply available Red: Error
2	YQLink	Connect with YQLink communications connector (input) driver power unit.
3	SAFETY	Connect with external PLC, safety devices and the like.
4	Connector for connection between units (control signal/Power)	

This unit cancels the physical restrictions of the universal controller for its expansion.

YQLink

YQLink expansion unit

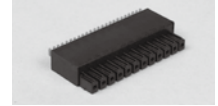
Model	YHX-YQL
Parts No.	KEK-M4406-0A

Safety connector

Host **YQLink**

Used for building up an external safety circuit while connecting with the safety dedicated port of a host controller.

Model	YHX-CN-SAFE
Parts No.	KEK-M4432-00



Other options

Battery holder box

Order model: **YHX-BATT-HLD**

D Power

Used to store the ABS batteries.
Up to eight batteries can be stored.

Model	YHX-BATT-HLD
Parts No.	KEK-M53G7-00



STOP connector

Order model: **YHX-CN-STOIN**

Drivers

Used to shut off the drive power of each driver unit.

Model	YHX-CN-STOIN
Parts No.	KEK-M5869-10



Battery holder connection cable

Order model: **YHX-BATT-15C**

D Power

Used when the battery holder box is connected.

Model	YHX-BATT-15C
Parts No.	KEK-M53G4-00



Connector for brake power

Order model: **YHX-CN-BU**

Drivers

Used when the brake power is supplied externally.
The driver is not needed when the brake power unit is used.

1 m	Model	YHX-CN-BU
	Parts No.	KEK-M4427-00



CC-Link terminating connector

Order model: **YHX-CN-CCTM**

Model	YHX-CN-CCTM
Parts No.	KEK-M4874-00



The parts with the marks below are their respective constituent parts. **Host** ... Host controller unit **D. Power** ... Driver power unit **Regenerative unit** ... Regenerative unit **YQLink** ...YQLink expansion **Drivers** ... Driver unit

Driver for single-axis robot

Order model:

Driver	Brake unit <small>Note</small>	ABS battery
A10:YHX-A10-SET	V: With brake unit	B: With ABS battery
A30:YHX-A30-SET	N: None	N: None

Note: When the external brake power is input, the brake unit cannot be used.



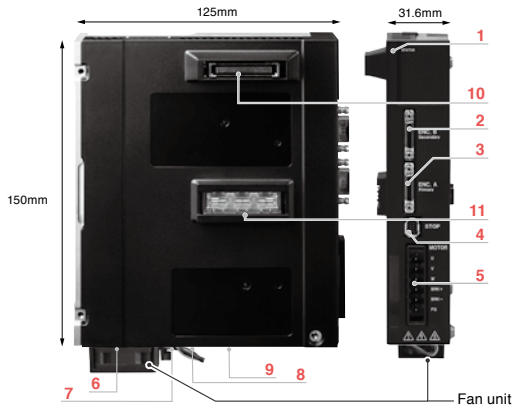
The customer assembles the necessary number of driver units between the host controller unit and driver power unit to use them.

YHX-A10-SET / YHX-A30-SET Configuration parts

Control unit

Drivers

Host controller unit 10A/30A



This unit drives robots. Use cables to connect with robots. The unit is connected to the left of the control unit.



10A Specifications	Model	YHX-A10
	Parts No.	KEK-M5800-0A
30A Specifications	Model	YHX-A30
	Parts No.	KEK-M5800-1A

Stop short circuit connector

Drivers

Used when it is not necessary to shut off the power supply to each driver unit separately.

Model	YHX-CN-STOEN
Parts No.	KEK-M5869-00



Fan unit (30A specifications only)

Drivers

Cools down a driver unit. Attached at the bottom of a driver unit to send wind to heat sinks. A driver unit made to the 30 A specification is shipped out with a fan unit.

Model	YHX-AMP-FU
Parts No.	KEK-M6195-00



1	STATUS	Blue lamp lit: Servo ON Blue lamp flashing: Servo OFF and ready for operation Blue/Red flashing in an alternate fashion: Servo OFF and not yet ready for operation Red flashing: Error
2	ENC.B	Linear scale sensor cable connection connector dedicated for circulation unit
3	ENC.A	Connector for connecting robot cable (encoder cable)
4	STOP	Use this to build up a circuit to shut off the power to a motor. When not used, connect with the "STOP short circuit connector"
5	MOTOR	Connector for connecting robot cable (power line) · Output U/W/W current output, Brake output
6	Connector for connecting a fan	Fan unit connector *
7	BATT connector	ABS battery connector
8	Power supply output for brake	Brake unit connector
9	Power supply input for holding braking effort	External power supply connector for brake unit or brake
10	Connector for connection between units (control signal/Power)	
11	Connector for connection between units (high voltage power source for driving motors)	

* Fan unit is equipped as standard for 30 A specifications.

Selection options

ABS battery

D. Power Drivers

Model	YHX-AMP-BATT
Parts No.	KEK-M53G0-00



Brake unit

Drivers

A unit for releasing braking effort of the robot* with a brake. Enables robot brake control without an external electrical wiring. Installed at the bottom of a driver unit.

Model	YHX-AMP-BU
Parts No.	KEK-M5317-00

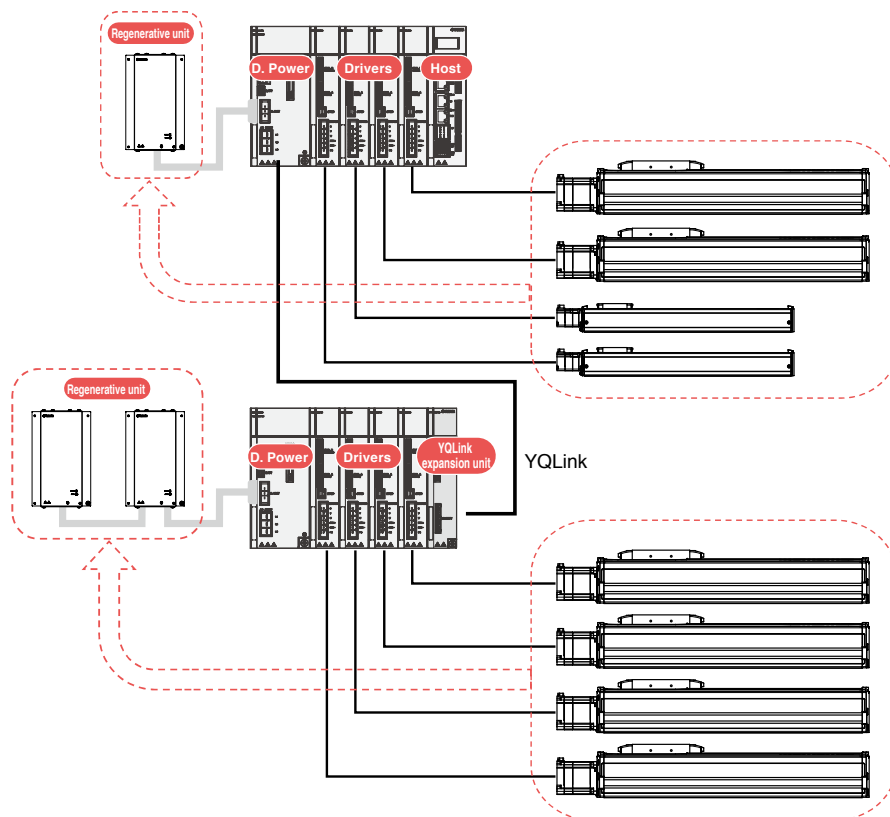


* Unable to release the braking effort of a robot with a brake if a brake unit is not available or if a 24V DC power supply is not connected.

The parts with the marks below are their respective constituent parts. Host ... Host controller unit D. Power ... Driver power unit Regenerative unit ... Regenerative unit YQLink ...YQLink expansion Drivers ... Driver unit

Procedure to determine the regenerative unit quantity (Single-axis robot GX series)

The number of regenerative units to be connected to the **D. Power** is determined depending on the configuration of the single-axis robot GX series operated by each **Drivers** connected to this **D. Power**.



When the following conditions are satisfied, one regenerative unit needed.

1. The total motor capacity of vertically installed single-axis robots is 400 W or more.
2. The vertically installed single-axis robots include the following.
 - GX07: Lead is 5 mm and stroke is 1000 mm or more.
 - GX10: Lead is 5 mm and stroke is 500 mm or more.
 - GX10: Lead is 10 mm and stroke is 500 mm or more.
 - GX10: Lead is 20 mm and stroke is 1200 mm or more.
3. The horizontally installed single-axis robots include the following.
 - GX16: Lead is 20 mm and stroke is 500 to 800 mm.
 - GX20: Lead is 20 mm and stroke is 550 to 800 mm.
4. The horizontally installed single-axis robots satisfy the following conditions.
 - The total number of GX12, GX16, and GX20 robots is 3 or more.
 - The total number of GX16 and GX20 robots is 2 or more.

When the single-axis robot with an operating duty (*) of 50% or more is used for 1 axis or more, two regenerative units are needed.

1. The total number of vertically installed GX10, GX12, GX16, and GX20 robots is 8 axes or more.
2. The total number of vertically installed GX12, GX16, and GX20 robots is 7 axes or more.
3. The total number of vertically installed GX16 and GX20 robots is 4 axes or more.
4. The vertically installed GX20 robots are connected to 4 axes or more.
5. The total number of horizontally installed GX10, GX12, GX16, and GX20 robots is 6 axes or more.

* The operating duty is calculated by the following formula.

$$\text{Operating duty} = \text{Total robot movement time} \div 1 \text{ cycle time} \times 100[\%]$$

For the robot that reciprocates in one cycle, the total forward and backward movement time becomes the "total robot movement time".

Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
GX

Motor-less single axis actuator
Robonity

Compact single-axis robots
TRANSERO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & Place robots
YP-X

CLEAN CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCXIVY2+ Electric gripper

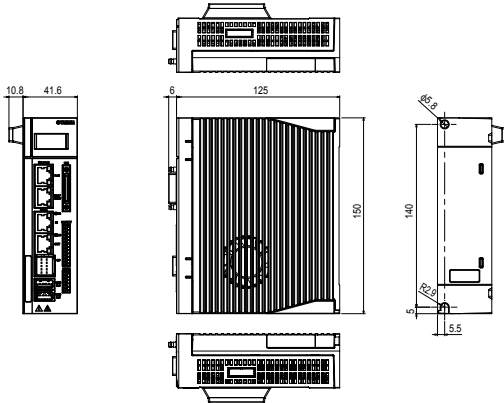
Option

- Articulated robots YA
- Linear CONVEYOR modules LCM
- Single-axis robots CX
- Motor-less single axis actuator Robonity
- Compact single-axis robots TRANSERO
- Single-axis robots FLIP-X
- Linear motor single-axis robots PHASER
- Cartesian robots XY-X
- SCARA robots YK-X
- Pick & Place robots YP-X
- CLEAN CONTROLLER INFORMATION
- Robot positioner
- Pulse string driver
- Robot controller RCKXVY2+
- Electric gripper
- Option

External view of each unit

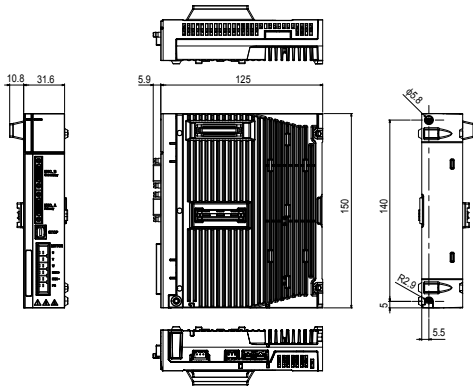
Host controller unit

YHX-HCU KEK-M4200-0A



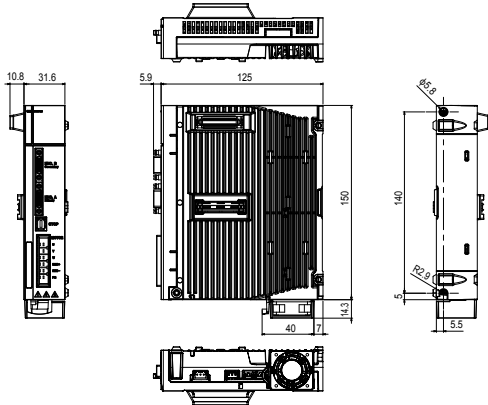
Driver unit 10A

YHX-A10 KEK-M5800-0A



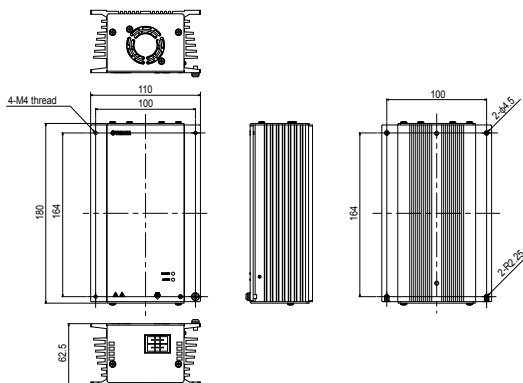
Driver unit 30A

YHX-A30 KEK-M5800-1A



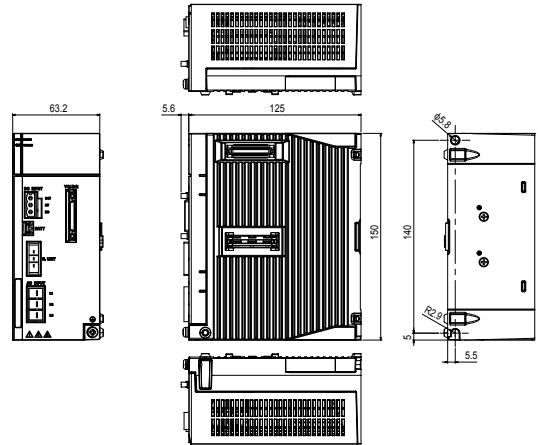
Regenerative unit

YHX-RU KEK-M5850-0A



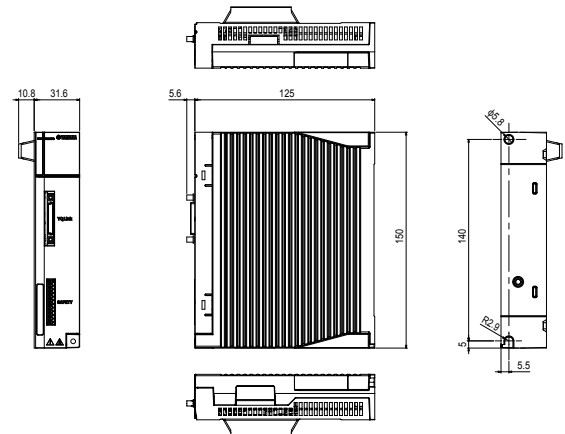
Driver power unit

YHX-DPU KEK-M5880-0A



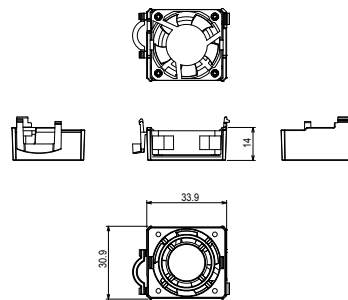
YQLink expansion unit

YHX-YQL KEK-M4406-0A



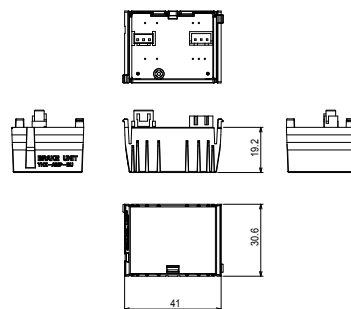
Fan unit

YHX-AMP-FU KEK-M6195-00



Brake unit

YHX-AMP-BU KEK-M5317-00



Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motor-less single axis actuator
Robotomy

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & place robots
YP-X

CLEAN CONTROLLER INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCXV2+ Electric gripper

Option

Basic specifications

Host

Host controller unit

Japanese	Model	YHX-HCU
	Parts No.	KEK-M4200-0A
English	Model	YHX-HCU-E
	Parts No.	KEK-M4200-1A

Item		Host controller unit
Power supply	Control power supply	Voltage: 21.6 to 26.4V DC (24V +/-10%) Current: 3.5 A (Including PoE)
	Connector	Giga bit Ethernet · Compatible with PoE yet 1 port (23W) · Not compatible with PoE yet 1 port Field network (Slave) Select one from the following 4 kinds. · EtherCAT · CC-Link* · EtherNet/IP * A separate adaptor is necessary. · PROFINET USB · USB 2.0 1 Port (Bus power 0.5 A) · USB 3.0 1 port (Bus power 1.0 A)
	HMI	Connector for connecting programming pad
	SAFETY	Emergency stop contact output Enable switch contact output Emergency stop input
	MODE	CPU OK output Programming pad AUTO/MANUAL select key switch output
Indicator	LCD	128 x 64 dots, Yellow
Dimensions		41.6x150x125 (mm)
Weight		750g
Protection structure / Protection rating		IP20 / class 1

D. power

Driver power unit

Model	YHX-DPU
Parts No.	KEK-M5880-0A

Item		Driver power unit
Power supply	Control power supply	Voltage: 21.6 to 26.4V DC (24V +/-10%) Current: 0.5A
	Main power supply	Input: Single phase / 3-phase 180 to 253V AC / (200 to 230V AC +/-10%), 50/60 Hz Power supply capacity: Single phase 3.5 kVA 3-phase 6 kVA
Connection motor capacity		Single phase within 1.6 kW, 3-phase within 3.0kW / Driver unit within 16 units (16 axes)
Connector	Regenerative	Regenerative unit connector
	External I/F	YQLink
	ABS Battery	ABS Battery connector
Dimensions		63.2x150x125 (mm)
Weight		1050g
Protection structure / Protection rating		IP20 / class 1

Regenerative unit

Regenerative unit

Model	YHX-RU
Parts No.	KEK-M5850-0A

Item		Regenerative unit
Power supply	Input	254 to 357V DC (Controller DCBUS connected)
Connector		Regenerative connector (For connecting regenerative unit/ For adding regenerative unit)
Dimensions		62.5x180x110 (mm)
Weight		1450g
Protection structure / Protection rating		IP20 / class 1

YQLink

YQLink expansion unit

Model	YHX-YQL
Parts No.	KEK-M4406-0A

Item		YQLink expansion unit
Power supply	Control power supply	Voltage: 21.6 to 26.4V DC (24V +/-10%) Current: 0.3A
	Connector	External I/F SAFETY
Dimensions		31.6x150x125 (mm)
Weight		380g
Protection structure / Protection rating		IP20 / class 1

Driver

Driver unit

Servo motor specifications (10A)

Model	YHX-A10
Parts No.	KEK-M5800-0A

Driver unit

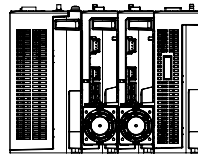
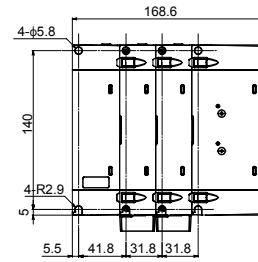
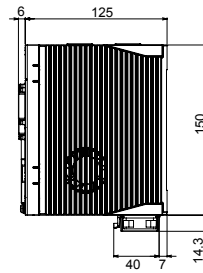
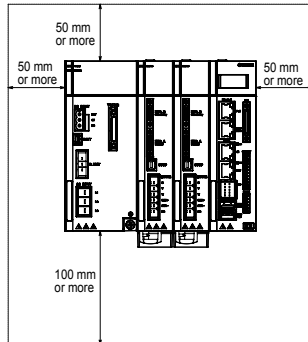
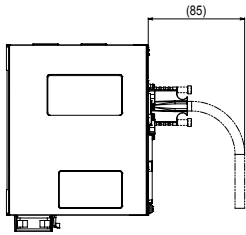
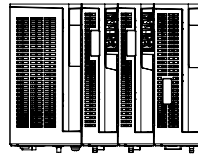
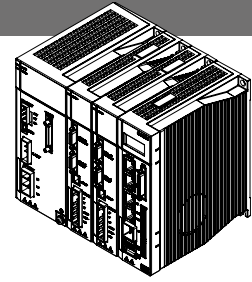
Servo motor specifications (30A)

Model	YHX-A30
Parts No.	KEK-M5800-1A

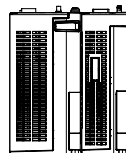
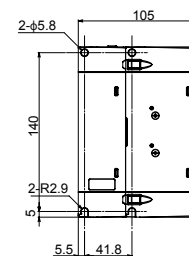
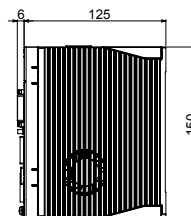
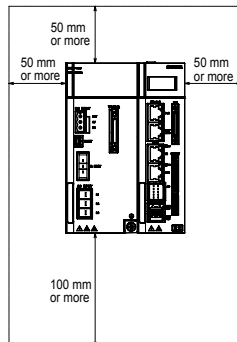
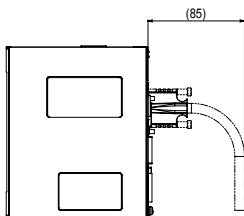
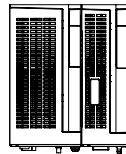
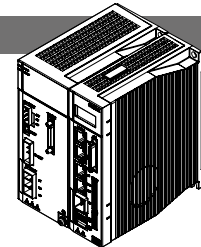
Item		Driver unit 10A/30A
Power supply	Control power supply	Voltage: 21.6 to 26.4V DC (24V +/-10%) Current: 0.8A (Including brake unit power supply)
	Connector	ENC.A ENC.B STOP MOTOR ABS Battery Fan unit connector Brake unit connector
Dimensions		31.6x150x125 (mm)
Weight		10A : 560g / 30A : 570g (Including accessory fan unit)
Protection structure / Protection rating		IP20 / class

External view of YHX unit combination

Combination of host controller (HCU), driver unit (A30), and driver power unit (DPU)



Combination of host controller (HCU) and driver power unit (DPU)



- Articulated robots YA
- Linear CONVEYOR modules LCM
- Single-axis robots CX
- Motor-less single axis actuator Robonity
- Compact single-axis robots TRANSEVO
- Single-axis robots FLIP-X
- Linear motor single-axis robots PHASER
- Cartesian robots XY-X
- SCARA robots YK-X
- Pick & Place robots YP-X
- CLEAN CONTROLLER INFORMATION
- Robot positioner
- Pulse string driver
- Robot controller
- RCXIVY2+ Electric gripper
- Option

Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motorless single axis actuator
Robomity

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & Place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCXVY2+ Electric gripper

Option

LCC140

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.



LCC140

Main functions ▶ P.27



Programming box
▶ **HPB/HPB-D**
P.699



Support software for PC
▶ **POPCOM+**
P.690

Basic specifications

Item	LCC140	
Controllable robot	Linear conveyor module LCM100	
Power supply capacity	350 VA	
External dimensions	W:402.5 × H:229 × D:106.5 mm	
Weight	4.8 kg	
Control power supply input	Single-phase 200 to 230 V AC +/-10% (50/60 Hz)	
Main power supply input	Single-phase 200 to 230 V AC +/-10% (50/60 Hz)	
Control method	AC fully digital software servo	
Position detection method	Magnetic linear scale	
Emergency stop input	Normal close contact input	
Output signal	Contact output: MPRDY	
Communication	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 temperature	0 to 40 °C	
Storage temperature	-10 to 65 °C	
Usage humidity	35 to 85%RH (no dewing)	
Noise resistance	IEC61000-4-4 level 3	
CC-Link unit	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	

Controllable robot	LCM100	P.184
CE marking	—	Field networks
		CC-Link DeviceNet EtherNet/IP

■ Model Overview		
Name	LCC140	
Controllable robot	Linear conveyor module LCM100	
Input power	Control power supply	Single phase 200 to 230V AC +/-10% maximum (50/60Hz)
	Main power supply	
Operating method	Programming/I/O point tracing/Remote command/ Operation using RS-232C communication	

■ Ordering method

LCC140 - 10

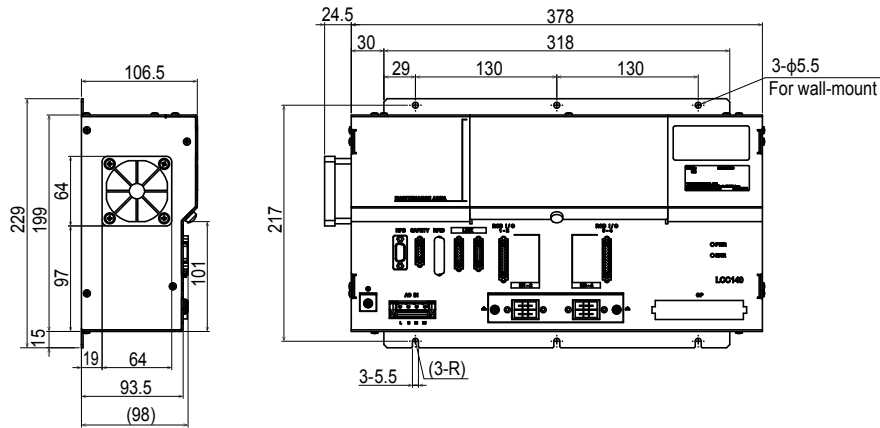
Controller	Current sensor	Network option <small>Note</small>
	10:10A	No entry: None CC: CC-Link DN: DeviceNet™ EP: EtherNet/IP™

Note. For 2MT, be sure to select an appropriate network option.

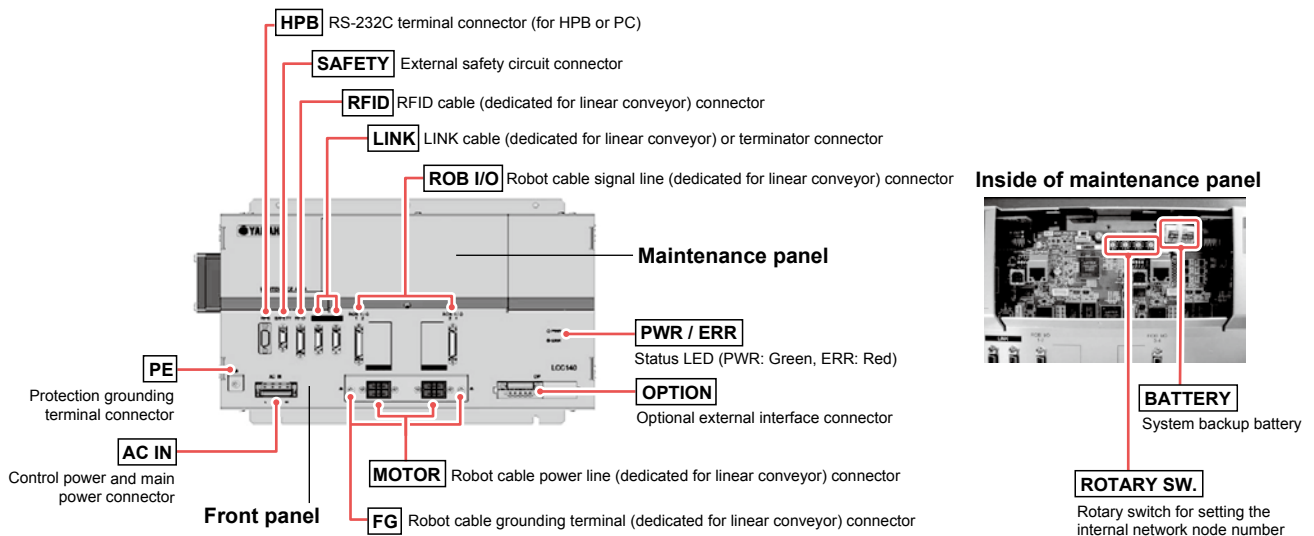
Item		LCC140		
DeviceNet™ unit	Applicable DeviceNet™ specifications	Volume 1 Release2.0, Volume 2 Release2.0		
	DeviceNet™ Conformance test	Compliant with CT24		
	Device profile/Device type number	Generic Device (keyable) / 2B Hex		
	Vendor name/Vendor ID	YAMAHA MOTOR CO.,LTD. / 636		
	Product code	21		
	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	6m or less	
		Total branch length	39m or less/500Kbps, 78m or less/250Kbps, 156m or less/125Kbps	
	Monitor LED	None		
Number of DeviceNet™ I/O points/number of occupied channels	General-purpose input 32 points	General-purpose output 32 points	Input: 24byte Output: 24byte	
	Dedicated input 16 points	Dedicated output 16 points		
	Input register 8 words	Output register 8 words		
EtherNet/IP™ unit	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	Input: 24byte Output: 24byte
Dedicated input 16 points		Dedicated output 16 points		
	Input register 8 words	Output register 8 words		

- Articulated robots YA
- Linear conveyor modules LCM
- Single-axis robots CX
- Motor-less single axis actuator Robomity
- Compact single-axis robots TRANSEVO
- Single-axis robots FLIP-X
- Linear motor single-axis robots PHASER
- Cartesian robots XY-X
- SCARA robots YK-X
- Pick & place robots YP-X
- CLEAN CONTROLLER
- INFORMATION
- Robot positioner
- Pulse string driver
- Robot controller
- RCXVY2+ Electric gripper
- Option

■ Dimensions

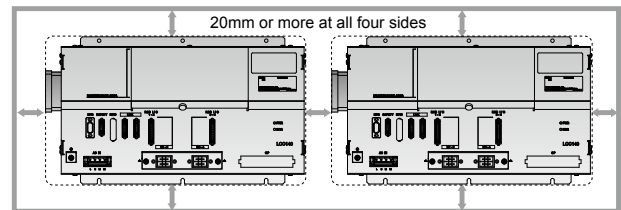


■ Part names



■ 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 motors	Power supply capacity			Heat generation quantity (during operation)
		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

Option parts

LCC140



Options

● Power connector + wiring connection lever

One set of parts per LCC140 is required.



Model	KAS-M5382-00
-------	--------------

- LCC140
- TS-X
- TS-P
- SR1-X
- SR1-P
- RCX320
- RCX221
- RCX222
- 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.



Model	KDK-M5163-00
-------	--------------

- LCC140
- SR1-X
- SR1-P

● SAFETY connector

One connector per LCC140 is required.



Model	Not wired	KDK-M5370-10
	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.



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

- LCC140

● 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

P.699

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
- ERCD
- SR1-X
- SR1-P

● Support software for PC POPCOM+

P.690

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

● POPCOM+ environment

OS	Windows XP (32bit), Vista, 7, 8 / 8.1, 10 (Supported version: V.2.1.1 or later)
CPU	Processor that meets or exceeds the suggested requirements for the OS being used.
Memory	Suggested amount of memory or more for the OS being used.
Hard disk	50MB of available space required on installation drive.
Disk operation	RS-232C
Applicable controllers	SRCX to SR1, DRCX, TRCX, ERCX, ERCD, 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

Articulated robots YA
 Linear conveyor modules LCM
 Single-axis robots CX
 Motor-less single axis actuator Robomity
 Compact single-axis robots TRANSEVO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & place robots YP-X
 CLEAN
 CONTROLLER
 INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXVY2+ Electric gripper
 Option

Options

Data cables

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



Model	USB type (5m)	KBG-M538F-00
	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
- RCX320
- RCX221
- RCX222
- RCX340

RFID

RFID * (manufactured by BALLUFF GmbH)

Reader/writer cable



* This cable is a flexible cable.

Model	3m	: KDK-M6300-00
	5m	: KDK-M6300-10
	10m	: KDK-M6300-20

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	0.5m+2m	: 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)



Model	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

Robot cable for LCM100



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

Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motorless single axis actuator
Robomity

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & Place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCXVY2+ Electric gripper

Option

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.



TS-S2

TS-SH

TS-X

TS-P

Main functions ▶ P.94



Handy terminal
▶ HT1/HT1-D
P.698



Support software for PC
▶ TS-Manager
P.688

■ Basic specifications

■ TS-S2/TS-SH

Item		TS-S2	TS-SH
Basic specifications	Number of controllable axes	Single-axis	
	Controllable robots	TRANSERVO series	
	Current consumption	2.5A (Rating) 4.5A (Max.)	3.5A (Rating) 6.5A (Max.)
	Dimensions	W30 × H162 × D82mm	W30 × H162 × D123mm
Weight	Approx. 0.2kg		Approx. 0.3kg
	Input power supply	DC24V +/-10%	
Control power supply	Control power supply	DC24V +/-10%	
	Main power supply	DC24V +/-10%	
Control method		Closed loop vector control method	
Operating method		I/O point tracing (Positioning operation by specifying point number) / Remote command	
Operation types		Positioning, merge-positioning, push, and jog operations	
Axis control	Position detection method	Resolver	Resolver with multi-turn absolute function
	Resolution	20480 pulses/rev. or 4096 pulses/rev. depending on the robot	
	Origin search method	Incremental	Absolute / Incremental
Points	Points	255 points	
	Point type setting	(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	
External input/output	I/O interface	Selectable from the following: NPN, PNP, CC-Link, DeviceNet™, EtherNet/IP™, PROFINET	
	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)	
	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)	
	External communications	RS-232C 1CH	
Safety circuit		Emergency stop input, emergency stop contact output (1 system: When the HT1 is used.)	
Options	Handy terminal	HT1, HT1-D (with enable switch)	
	Support software for PC	TS-Manager	
General specifications	Operating temperature / Operating humidity	0°C to 40°C, 35% to 85%RH (non-condensing)	
	Storage temperature/ Storage humidity	-10°C to 65°C, 10% to 85%RH (non-condensing)	
	Atmosphere	Indoor location not exposed to direct sunlight. No corrosive, flammable gases, oil mist, or dust particles	
	Anti-vibration	All XYZ directions 10 to 57Hz unidirectional amplitude 0.075mm 57 to 150Hz 9.8m/s ²	
	Protective functions	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.

Controllable robot	TS-S2/TS-SH ▶ TRANSERVO P.253	TS-X ▶ FLIP-X P.295	TS-P ▶ PHASER P.341
CE marking	Field networks CC-Link DeviceNet EtherNet/IP PROFINET		

Model Overview

Name	TS-S2	TS-SH	TS-X/TS-P
Controllable robot	Dedicated compact single-axis TRANSERVO		TS-X: Single-axis robot FLIP-X TS-P: Linear motor single-axis PHASER
Input power	Control power supply	DC24V +/-10%	● AC100V specifications Control power supply Single phase 100 to 115V AC +/-10%
	Main power supply		● AC200V specifications Control power supply Single phase 200 to 230V AC +/-10%
Operating method	I/O point tracing / Remote command / Operation using RS-232C communication		
Maximum number of controllable axes	Single-axis		
Origin search method	Incremental	Absolute / Incremental	TS-X: Absolute / Incremental TS-P: Absolute / Semi-absolute

Ordering method

TS-S2/TS-SH (TRANSERVO)

Robot positioner	Type	I/O	Battery Note 1
S2: TS-S2 SH: TS-SH	No entry: Standard S: Sensor	NP: NPN PN: PNP CC: CC-Link DN: DeviceNet™ EP: EtherNet/IP™ PT: PROFINET GW: With no I/O board	B: With battery (Absolute model) N: None (Incremental model)

Note 1. Battery can only be selected for TS-SH. (Not provided for TS-S2).

TS-X/TS-P (FLIP-X/PHASER)

Controller	Driver: Power supply voltage/ Power capacity	Regenerative unit	LCD monitor	Input/Output Selection	Battery Note 2
TSX: TS-X TSP: TS-P	105: 100V / 100W more less 110: 100V / 200W 205: 200V / 100W more less 210: 200V / 200W 220: 200V / 400 to 600W	No entry: None R: With RGT R: With RGU-2	No entry: None L: With LCD	NP: NPN PN: PNP CC: CC-Link DN: DeviceNet™ EP: EtherNet/IP™ PT: PROFINET GW: With no I/O board	B: With battery (Absolute model) N: None (Incremental model)

Note 2. Battery can only be selected for TS-X. (Not provided for TS-P).

TS-X/TS-P

Item	TS-X / TS-P					
	100V AC input		200V AC input			
Basic specifications	Driver model	TS-X105 / TS-P105	TS-X110 / TS-P110	TS-X205 / TS-P205	TS-X210 / TS-P210	TS-X220 / TS-P220
	Number of controllable axes	Single-axis				
	Controllable robots	TS-X: Single-axis robot FLIP-X series TS-P: Linear motor single-axis robot PHASER series				
	Power capacity	400VA	600VA	400VA	600VA	1400VA
	Dimensions	W58 × H162 × D131mm				W70 × H162 × D131mm
	Weight	Approx. 0.9kg				Approx. 1.1kg
	Input power supply	Control power supply		Single phase 100 to 115V AC +/-10% 50/60Hz		
		Main power supply		Single phase 100 to 115V AC +/-10% 50/60Hz		
	Control method	Closed loop vector control method				
	Operating method	I/O point tracing (Positioning operation by specifying point number) / Remote command				
	Operation types	Positioning, merge-positioning, push, and jog operations				
	Position detection method	TS-X: Resolver with multi-rotation absolute function TS-P: Magnetic type linear scale				
	Resolution	TS-X: 16384 pulses/rev. TS-P: 1μm				
	Origin search method	TS-X: Absolute / Incremental TS-P: Incremental / Semi-absolute				
	Number of points	255 points				
	Point type setting	(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				
	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)				
	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)				
	External communications	RS-232C 1CH				
	Power supply for brake	DC24V +/-10% 300mA (prepared by the customer)				
	Safety circuit	Emergency stop input, main power input ready output, emergency stop contact output (1 system: When the HT1 is used.)				
	Handy terminal	HT1, HT1-D (with enable switch)				
	Support software for PC	TS-Manager				
	Operating temperature / Operating humidity	0°C to 40°C, 35% to 85%RH (non-condensing)				
	Storage temperature / Storage humidity	-10°C to 65°C, 10% to 85%RH (non-condensing)				
	Atmosphere	Indoor location not exposed to direct sunlight. No corrosive, flammable gases, oil mist, or dust particles				
	Anti-vibration	All XYZ directions 10 to 57Hz unidirectional amplitude 0.075mm 57 to 150Hz 9.8m/s ²				
	Protective functions	Position detection error, power module error, temperature error, overload, overvoltage, low voltage, excessive position deviation, overcurrent, motor current error				
	Protective structure	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	T5LH/ C5LH	T6L/ C6L	T9	T9H	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
Power supply voltage / Current sensor	TS-X	105	●	●	●		●	●	●	●		●		●								●	●	●	●	●	
		110				●					●			●													●
		205	●	●	●	●		●	●	●	●		●										●	●	●	●	●
		210				●					●			●													
	220										●		●	●			●	●	●	●	●						●
Regenerative unit	No entry (None)				(1)	(2)				(1)	(2)	(1)	(2)	●	(3)		(6)	(3)	(4)			●					
	R (RGT)				(1)	(2)				(1)	(2)	(1)	(2)	●	(3)	●	(6)	(3)	(4)	●	●				(5)		

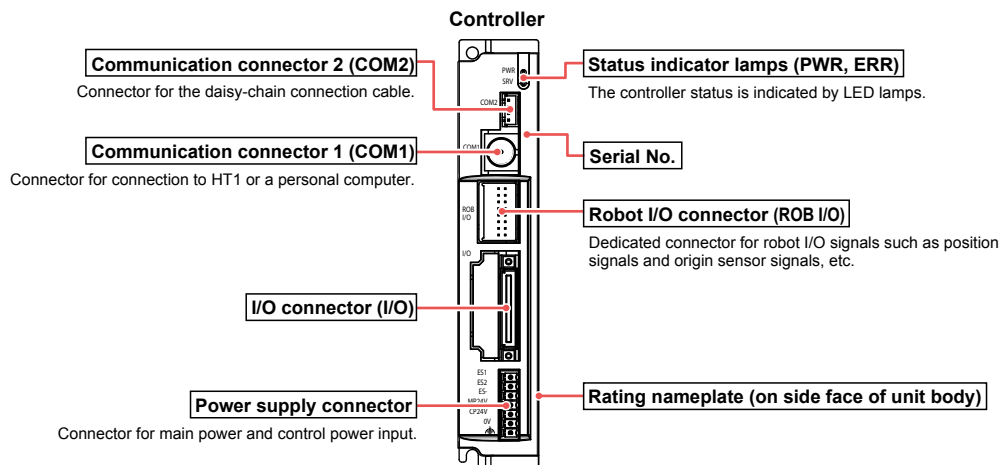
- (1) Regenerative unit is needed if using in a perpendicular position and movement stroke is 700mm or more.
 (2) Regenerative unit is needed if using in a perpendicular position.
 (3) [The following arrangements require a regeneration unit.]
 • Using in the upright position.
 • To move at a speed exceeding 1,000 mm/sec horizontally.
 • High lead (40) used horizontally.
 (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

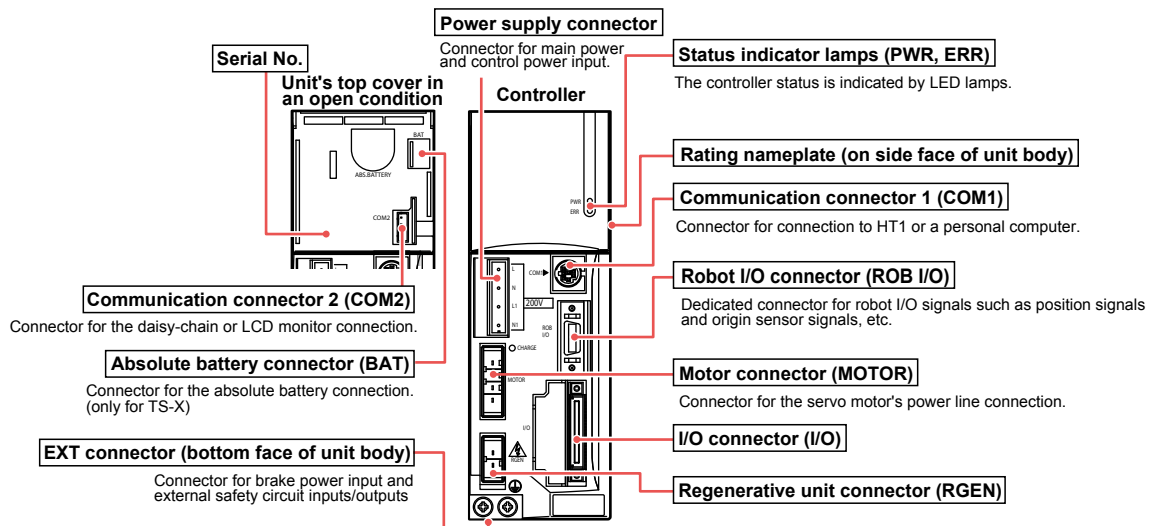
		MF7/7D	MF15/15D	MF20/20D	MF30/30D	MF75/75D
Power supply voltage / Current sensor	TS-P	105				
		110	●		●	
		205				
		210	●		●	
	220				●	●
Regenerative unit	No entry (None)		●			
	R (RGT)		●		●	
	R (RGU-2)					●

Part names

TS-S2/TS-SH

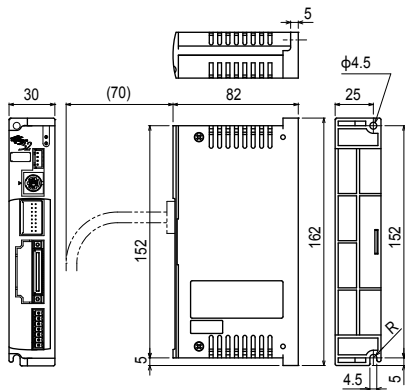


TS-X/TS-P

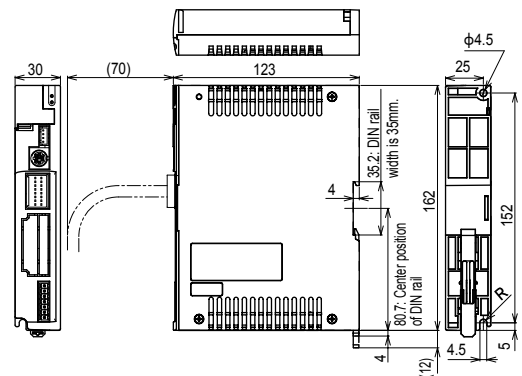


■ Dimensions

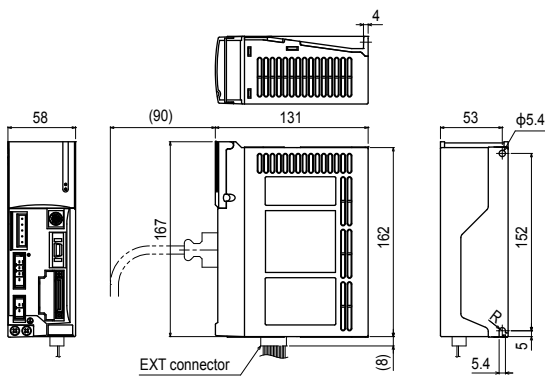
■ TS-S2



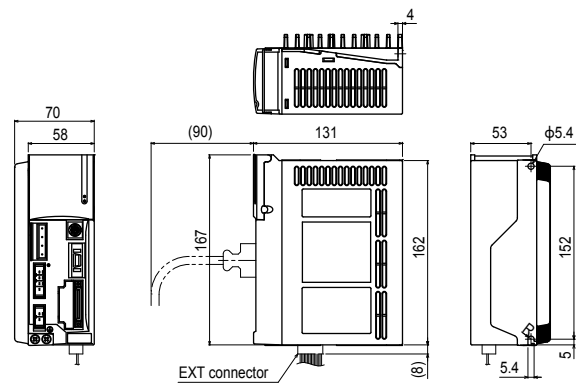
■ TS-SH



■ TS-X/TS-P (105/110/205/210)



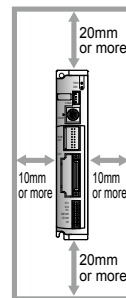
■ TS-X/TS-P (220)



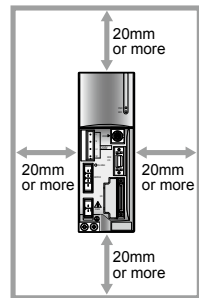
■ Installation conditions

- 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)

■ TS-S2/TS-SH



■ TS-X/TS-P



■ 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.

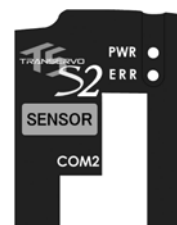
TS-S2 / TS-SH (Standard specifications)

“BK” label is affixed to the front of the controller.



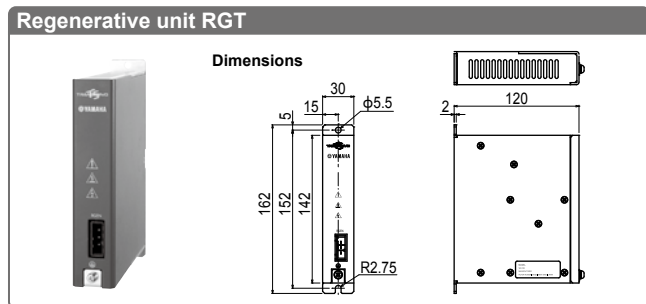
TS-S2S / TS-SHS (Sensor specifications)

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



Articulated robots YA
 Linear conveyer modules LCM
 Single-axis robots CX
 Motor-less single axis actuator Robonity
 Compact single-axis robots TRANSERO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & Place robots YP-X
 CLEAN
 CONTROLLER
 INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXIVY2+ Electric gripper
 Option

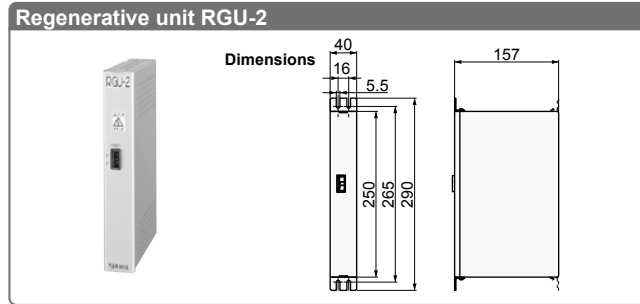
Regenerative unit RGT/RGU-2



Basic specifications

Item	RGT
Model	KCA-M4107-0A (including cable supplied with unit)
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 adjacent controller.
Also, always use the dedicated cable when connecting the controller.



Basic specifications

Item	RGU-2 (TS-P)
Model	KCA-M4107-2A (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.

Data overview

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

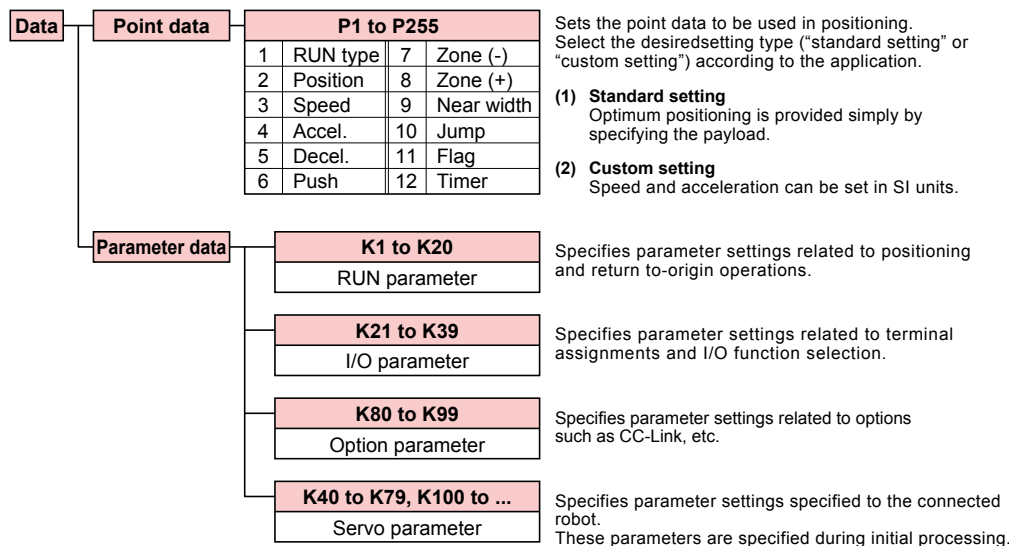
Point data

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".

Data structure



Point data

Point data item list

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 (-)	
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"

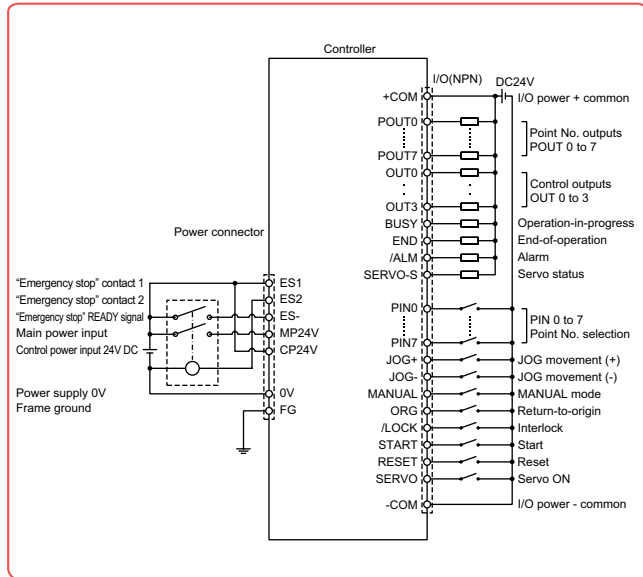
There are 2 setting types for point data ("standard setting" or "custom setting"). Select the desired setting type according to the application.

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 specifying 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.

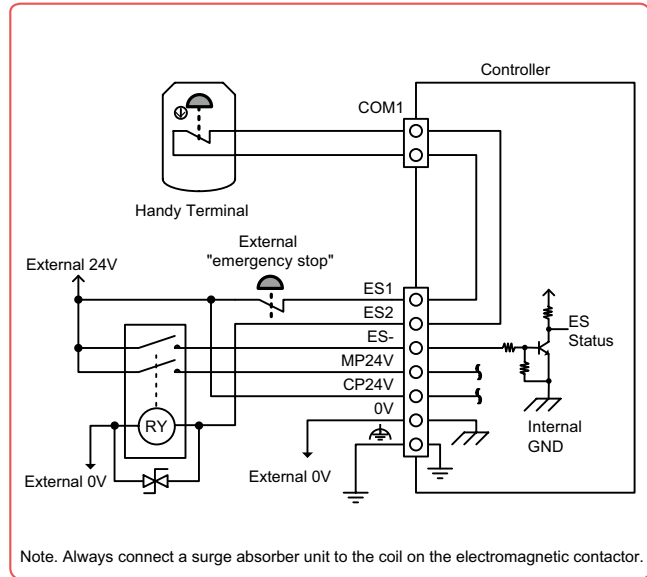
NPN type input / output wiring diagram

TS-S2/TS-SH



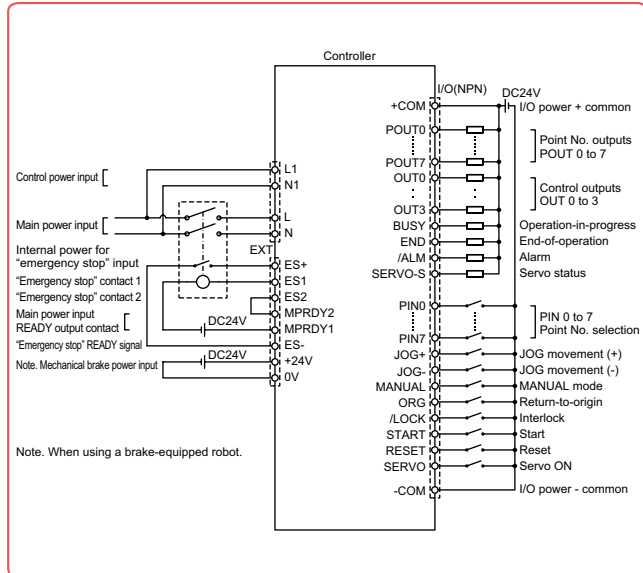
Emergency stop circuit example

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



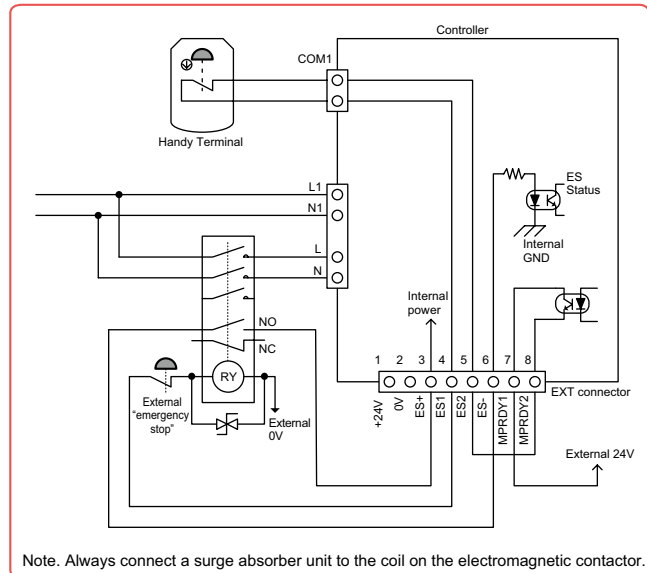
Note. Always connect a surge absorber unit to the coil on the electromagnetic contactor.

TS-X



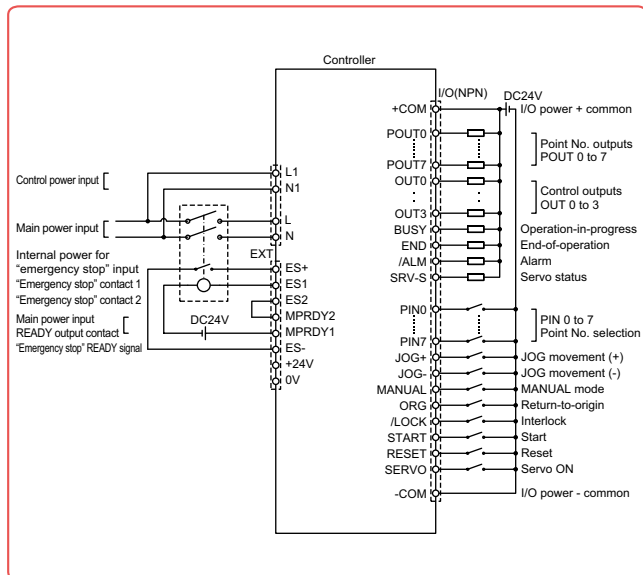
Note. When using a brake-equipped robot.

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



Note. Always connect a surge absorber unit to the coil on the electromagnetic contactor.

TS-P



Installing an external safety circuit will satisfy safety category class 4 standards. See P.748 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
PNP	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

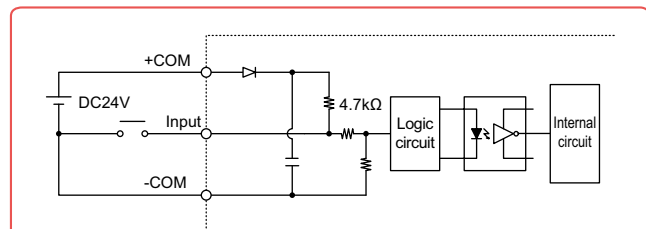
Articulated robots
YA
Linear conveyor modules
LCM
Single-axis robots
CX
Motor-less single axis actuator
Robonity
Single-axis robots
Compact
TRANSEVO
Single-axis robots
FLIP-X
Single-axis robots
PHASER
Linear motor
XY-X
Cartesian robots
YK-X
SCARA robots
Pick & place robots
YP-X
CLEAN CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXVY2+ Electric gripper
Option

I/O signals (NPN / PNP)

No.	Signal Name	Description	No.	Signal Name	Description	
A1	+COM	I/O power input, positive common (24VDC +/-10%)	B1	POUT0	Point No. outputs	
A2			B2	POUT1		
A3	NC	No connection	B3	POUT2		
A4			B4	POUT3		
A5	PIN0	Point No. select	B5	POUT4		
A6	PIN1		B6	POUT5		
A7	PIN2		B7	POUT6		
A8	PIN3		B8	POUT7		
A9	PIN4		B9	OUT0		
A10	PIN5		B10	OUT1		
A11	PIN6		B11	OUT2		
A12	PIN7		B12	OUT3		
A13	JOG+		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 connection	
A18	START	Start	B18	NC		
A19	RESET	Reset	B19	-COM	I/O power input, negative common (0V)	
A20	SERVO	Servo ON	B20			

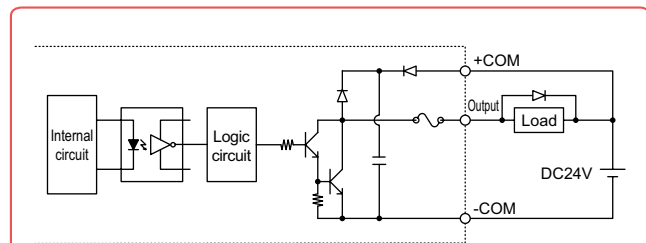
NPN type I/O circuit details

Input circuit



Type : DC input (plus common type)
 Photo-coupler isolation format
Load : 24VDC +/- 10%, 5.1mA
 OFF voltage : 19.6Vmin (1.0mA)
 ON voltage : 4.9Vmax (4.0mA)

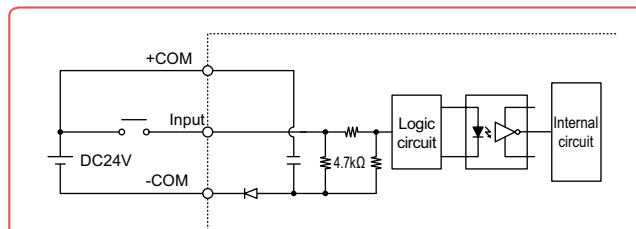
Output circuit



Type : NPN open collector output
 (Minus common type)
 Photo-coupler isolation format
Load : 24VDC, 50mA/point

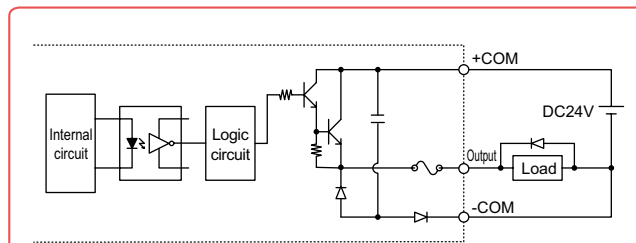
PNP type I/O circuit details

Input circuit



Type : DC input (minus common type)
 Photo-coupler isolation format
Load : 24VDC +/- 10%, 5.5mA
 ON voltage : 19.6Vmin (4.5mA)
 OFF voltage : 4.9Vmax (1.1mA)

Output circuit



Type : PNP open collector output
 (Plus common type)
 Photo-coupler isolation format
Load : 24VDC, 50mA/point

Accessories and part options

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



Standard accessories

● Power connector

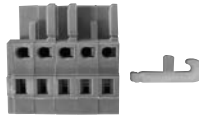


Model KCC-M4421-00

TS-S2
TS-SH
TS-SD

● Power connector (AC100V specifications)

Included when 100V model is purchased

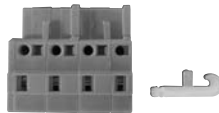


Model KCA-M5382-00

TS-X
TS-P

● Power connector (AC200V specifications)

Included when 200V model is purchased

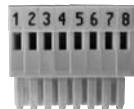


Model KAS-M5382-00

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

● EXT connector

For braking power and safety circuit connections.



Model KCA-M5370-00

TS-X
TS-P

● Dummy connector



Model KCA-M5163-00

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

● I/O cables (2m/20-core*2)



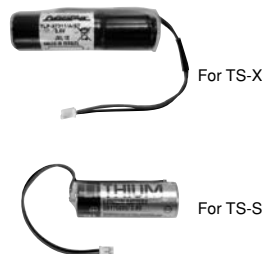
Model KCA-M4421-20

TS-S2
TS-SH
TS-X
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 / 2,700mAh
Data holding time	About 1 year (in state with no power applied)	
Dimensions	φ18 × L60mm	φ17 × L53mm
Weight	24g	21g



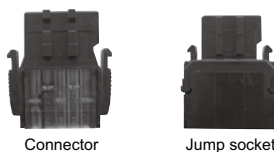
Model KCA-M53G0-10 (For TS-X)
KCA-M53G0-02 (For TS-SH)

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.

TS-X
TS-SH
RCX320
RCX340

● CC-Link connector (CC-Link specifications)

Included when CC-Link model is purchased



Model Connector^{Note} KCA-M4872-00
Jump socket KCA-M4873-00

Note. This is a single connector type. (Insert two connectors into a branching socket.)

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

See next page for optional parts

Articulated robots YA
Linear conveyor modules LCM
Single-axis robots CX
Motor-less single axis actuator Robotomy
Compact single-axis robots TRANSEVO
Single-axis robots FLIP-X
Linear motor PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & Place robots YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXVY2+ Electric gripper
Option

Options

● Handy terminal HT1/HT1-D

P.698



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

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

● Support software TS-Manager

P.688



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

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

● TS-Manager environment

OS	Windows 2000, XP (32bit), Vista, 7, 8 / 8.1, 10 (Supported version: V.1.4.5 or later)
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 series

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.



Model	USB type (5m)	KCA-M538F-A0
	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

● Daisy chain and gateway connection cable



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

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

● CC-Link termination connector (CC-Link specifications)



Model	KCA-M4874-00
-------	--------------

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

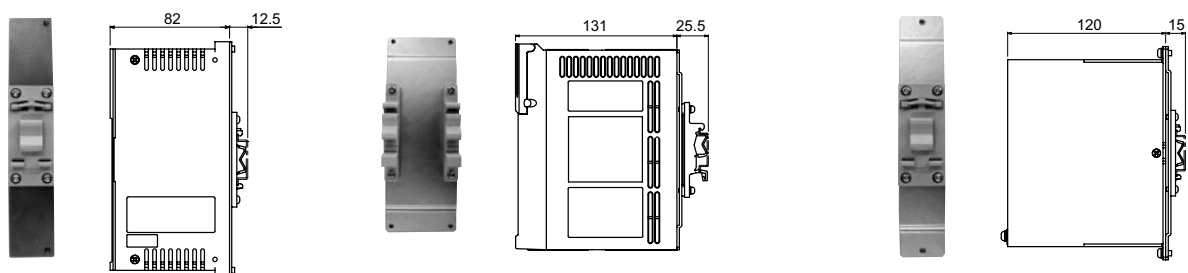
● TS-Monitor (LCD monitor) P.702



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

TS-X
TS-P

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



Model	For TS-S2
	KCC-M499A-00

TS-S2

Model	For TS-X / TS-P
	KCA-M499A-00

TS-X

TS-P

Model	For TS-X / TS-P with RGT
	KCA-M499A-10

TS-X

TS-P

Articulated robots YA
Linear conveyor modules LCM
Single-axis robots GX
Motorless single axis actuator Robomity
Compact single-axis robots TRANSEVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & Place robots YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXVY2+ Electric gripper
Option

TS-SD

- CE compliance
- Only for pulse train control
- Dedicated 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.93



Support software for PC

▶ TS-Manager

P.688



TS-SD

Basic specifications

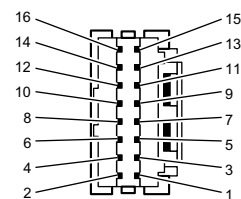
Item	TS-SD
Basic specifications	
Number of controllable axes	Single-axis
Controllable robots	TRANSERVO series ^{Note}
Current consumption	3A (Rating) 4.5A (Max.)
Dimensions	W30 × H162 × D82mm
Weight	Approx. 0.2kg
Input power supply	Control power supply
	Main power supply
Operating method	Pulse train control
Control method	Closed loop vector control method
Position detection method	Resolver
Resolution	20480 P/rev, 4096 P/rev
Origin search method	Incremental
Axis control	
Pulse train command input	Line driver method : 500 kpps or less Open collector method : 100 kpps or less (DC5 to 24V +/- 10%)
Input	Servo ON (SERVO), reset (RESET) origin search (ORG)
Output	Servo status (SRV-S), alarm (/ALM), positioning completion (IN-POS), return-to-origin end status (ORG-S)
External communications	RS-232C 1CH
External input/output	
Support software for PC	TS-Manager
Options	
Operating temperature	0°C to 40°C
Storage temperature	-10°C to 65°C
Operating humidity	35% to 85%RH (non-condensing)
Storage humidity	10% to 85%RH (non-condensing)
Atmosphere	Indoor location not exposed to direct sunlight. No corrosive, flammable gases, oil mist, or dust particles
Anti-vibration	All XYZ directions 10 to 57Hz unidirectional amplitude 0.075mm 57 to 150Hz 9.8m/s ²
General specifications	
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

I/O connector



Controllable robot	TRANSERVO P253
CE marking	
Field networks	—

Model Overview

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

Ordering method

Controller only **Robot + Controller**

TS-SD Note

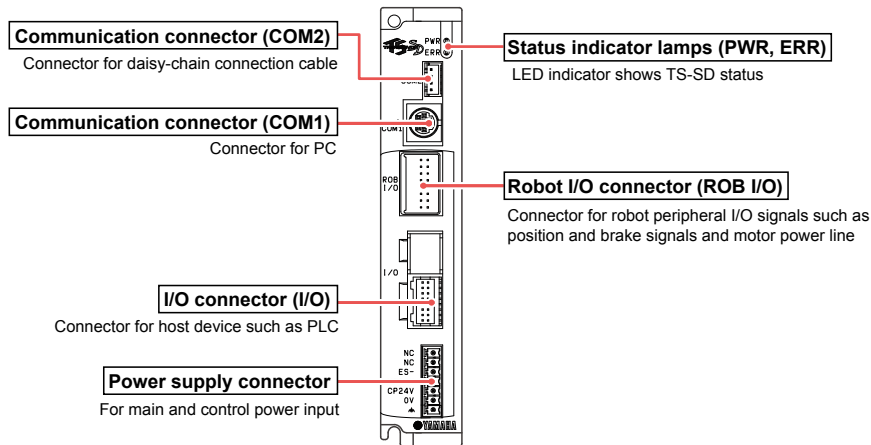
Controller Robot model — Cable length — Controller — I/O cable

TRANSERVO Series 1L: 1 meter
 3L: 3 meters
 5L: 5 meters
 10L: 10 meters
 (flexible cables)

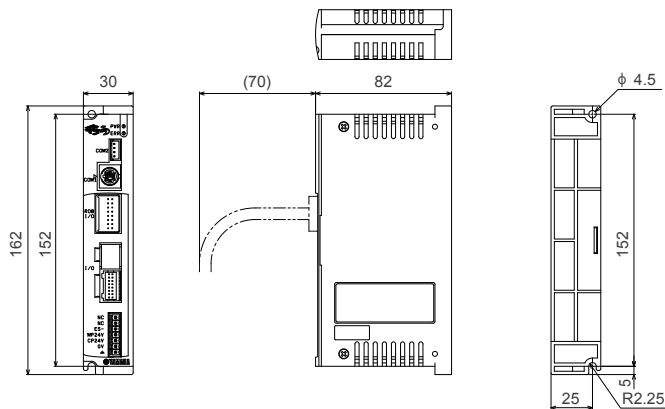
SD 1

Note. I/O cable (1 meter) comes supplied with unit.

Part names



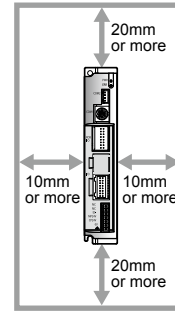
Dimensions



- Articulated robots **YA**
- Linear conveyor modules **LCM**
- Single-axis robots **CX**
- Motor-less single axis actuator **Robomity**
- Compact single-axis robots **TRANSERVO**
- Single-axis robots **FLIP-X**
- Linear motor single-axis robots **PHASER**
- Cartesian robots **XY-X**
- SCARA robots **YK-X**
- Pick & Place robots **YP-X**
- CLEAN
- CONTROLLER**
- INFORMATION
- Robot positioner
- Pulse string driver
- Robot controller
- RCXIVY2+ Electric gripper
- Option

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)

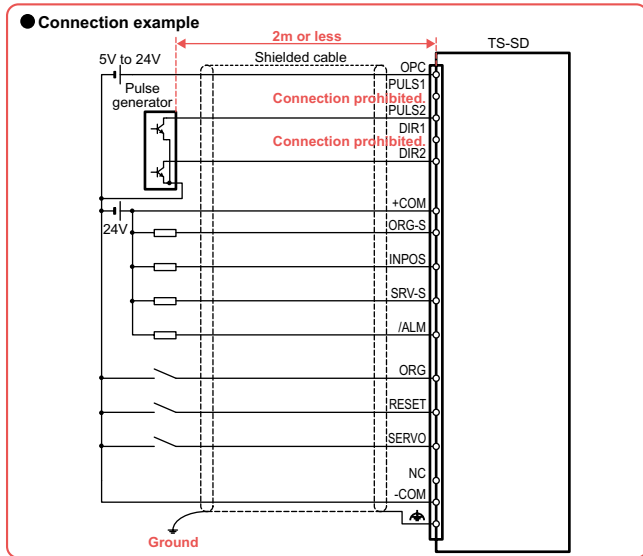


I/O signal list

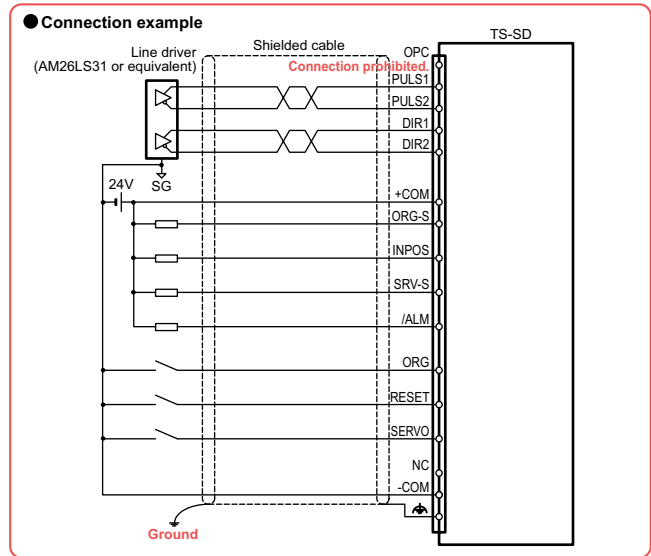
Type	Signal Name	Open collector	Line driver	Description
Inputs	OPC	Open collector power supply input	(Connection prohibited. ^{Note 2})	Input the power supply for the open collector. (DC5 to 24V +/- 10%)
	PULS1	(Connection prohibited. ^{Note 1})	Command pulse input (+)	Input terminal for pulse train input commands. Select from 3 command forms by changing parameters.
	DIR1	(Connection prohibited. ^{Note 1})	Command direction input (+)	
	PULS2	Command pulse input	Command pulse input (-)	• Phase A/Phase B input
	DIR2	Command direction input	Command direction input (-)	• Pulse/Sign input
	ORG	Return-to-origin	←	Starts return-to-origin when ON and stops it when OFF.
	RESET	Reset	←	Alarm reset
Outputs	SREVO	Servo ON	←	ON: servo on; OFF: servo off.
	ORG-S	Return-to-origin end status	←	ON at return-to-origin end.
	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]



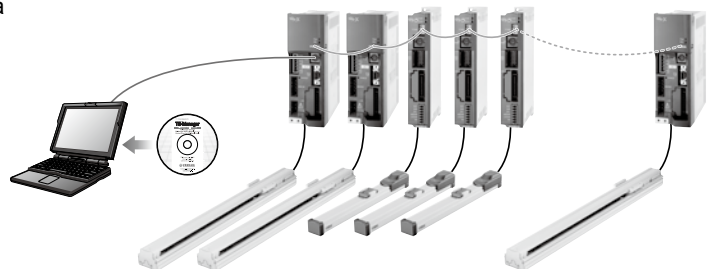
Input / output signal connection diagram [line driver]



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



TS-SD

Standard accessories

● **Power connector**



Model KCC-M4421-00

TS-S2
TS-SH
TS-SD

● **I/O cables (1m)**



Model KCC-M5362-00

TS-SD

Options

● **Support software TS-Manager**

P.688



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

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

● **TS-Manager environment**

OS	Windows 2000, XP (32bit), Vista, 7, 8 / 8.1, 10 (Supported version: V.1.4.5 or later)
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 series

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.



Model USB type (5m) KCA-M538F-A0
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

● **Daisy chain and gateway connection cable**



Model KCA-M532L-00 (300mm)

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

YA	Articulated robots
LCM	Linear conveyor modules
CX	Single-axis robots
Robonity	Motor-less single axis actuator
TRANSEVO	Compact single-axis robots
FLIP-X	Single-axis robots
PHASER	Linear motor single-axis robots
XY-X	Cartesian robots
YK-X	SCARA robots
YP-X	Pick & Place robots
CLEAN	CLEAN
CONTROLLER	CONTROLLER
INFORMATION	INFORMATION
Robot positioner	Robot positioner
Pulse string driver	Pulse string driver
Robot controller	Robot controller
RCXIVY2+	RCXIVY2+ Electric gripper
Option	Option

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.



RDV-X

RDV-P

Main functions ▶ P.92



Support software for PC

▶ RDV-Manager

P.694

Basic specifications

Item		RDV-X			RDV-P			
Driver model		RDV-X205	RDV-X210	RDV-X220	RDV-P205	RDV-P210	RDV-P220	RDV-P225
Number of controllable axes		Single-axis						
Controllable robots		Single-axis robot FLIP-X			Linear motor single-axis robot PHASER			
Basic specifications	Capacity of the connected motor	200V 100W or less	200V 200W or less	200V 600W or less	200V 100W or less	200V 200W or less	200V 400W or less	200V 750W or less
	Maximum power consumption	0.3kVA	0.5kVA	0.9kVA	0.3kVA	0.5kVA	0.9kVA	1.3kVA
	Dimensions	W40×H160×D140mm			W40×H160×D170mm	W40×H160×D140mm		W40×H160×D170mm
	Weight	0.7kg		1.1kg	0.7kg		1.1kg	1.2kg
Input power supply	Control power supply	Single phase 200 to 230V +10% to -15%, 50/60Hz +/-5%						
	Main power supply	Single phase / 3-phase 200 to 230V +10% to -15%, 50/60Hz +/-5%						
Axis control	Position detection method	Resolver			Magnetic linear scale			
	Control system	Sine-wave PWM (pulse width modulation)						
	Control mode	Position control						
	Maximum speed ^{Note 1}	5000rpm			3.0m/s			
Input/output related function	Position command 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 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						
	Output signal	Open collector signal output (usable for sink/source) (1) Servo ready (2) Alarm (3) Positioning completed (4) Return-to-origin complete						
	Relay output signal	Braking cancel signal (24V 375mA)			-			
	Position output	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.							
Internal function	Display	5-digit number indicator, Control power LED						
	External operator	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.						
	Regenerative braking circuit	Included (but without braking resistor)						
	Dynamic brake ^{Note 4}	Included (Operation conditions can be set.) (No DB resistor, connection: 2-phase short circuit)						Included (Operation conditions can be set.) (with DB resistor, connection: 2-phase short circuit)
Protective function ^{Note 2}	Semi-enclosure type (IP20)							
Protective functions	Over-current, overload, braking resistor overload, main circuit overvoltage, memory error, etc.							

Controllable robot	RDV-X ▶ FLIP-X ^{Note 1} P.295	RDV-P ▶ PHASER P.341
CE marking		Field networks

Note 1. Exclude T4 / T5 / C4 / C5 / YMS

Model Overview

Name		RDV-X	RDV-P
Controllable robot		Single-axis robot FLIP-X ^{Note 1}	Linear motor single-axis robot PHASER
Input power	Control power supply	Single phase 200 to 230V +10% to -15% (50/60Hz +/-5%)	
	Main power supply	Single phase / 3-phase 200 to 230V +10% to -15% (50/60Hz +/-5%)	
Operating method		Pulse train control	
Maximum number of controllable axes		Single-axis	
Origin search method		Incremental	

Ordering method

RDV-X

RDV-X **2**

Controller	Power-supply voltage 2: AC200V	Driver ^{Note} 05: 100W or less 10: 200W or less 20: 600W or less	Regenerative unit ^{Note} No entry: None RBR1 RBR2
-------------------	--	---	--

Note. Driver selection and regenerative unit selection depend on the robot type. See the selection table on the next page for selecting the driver/regenerative circuit.

RDV-P

RDV-P **2**

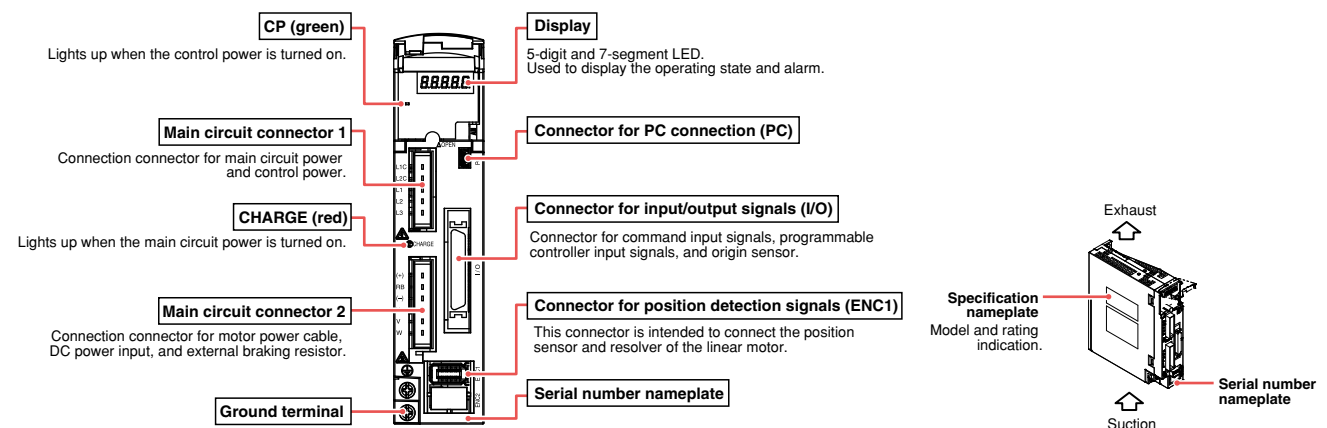
Controller	Power-supply voltage 2: AC200V	Driver ^{Note} 05: 100W or less 10: 200W or less 20: 400W or less 25: 750W or less	Regenerative unit ^{Note} No entry: None RBR1 RBR2
-------------------	--	---	--

Note. Driver selection and regenerative unit selection depend on the robot type. See the selection table on the next page for selecting the driver/regenerative circuit.

Item		RDV-X			RDV-P			
Driver model		RDV-X205	RDV-X210	RDV-X220	RDV-P205	RDV-P210	RDV-P220	RDV-P225
Options	Support software for PC	RDV-Manager						
General specifications	Operating temperature	0°C to +55°C						
	Storage temperature ^{Note 5}	-10°C to +70°C						
	Operating humidity	20% to 90%RH (non-condensing)						
	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



Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motor-less single axis actuator
Robotomy

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & Place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

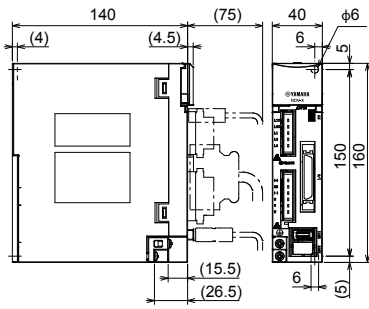
RCXIVY2+ Electric gripper

Option

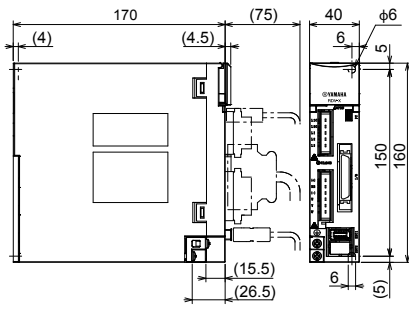
RDV-X/RDV-P

■ Dimensions

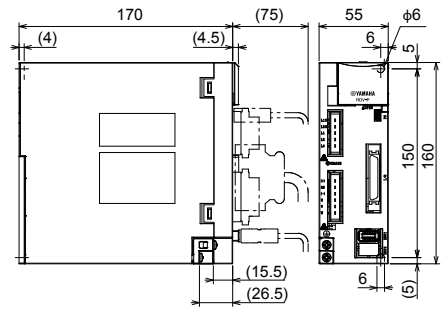
RDV-X205/210 RDV-P205/210



RDV-X220 RDV-P220



RDV-P225



■ Driver / regenerative unit selection table

RDV-X

		FLIP-X																												
		T4LH/C4LH	T5LH/C5LH	T6L/C6L	T9	T9H	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	R20	
Driver selection	RDV-X	05	●	●	●		●	●		●		●																		
		10				●					●		●												●	●		●	●	
		20													●	●	●	●	●	●	●	●	●	●						
Regenerative unit	No entry (None)	●	●																											
	RBR1			●	●	●	●	●	●	●	●	●	●	●	①	①		①	●	●	●	●	●	●	●	●	●	●	●	
	RBR2														①	①		①												

① If placed horizontally the RBR1 is required, if placed vertically then RBR2 is required.

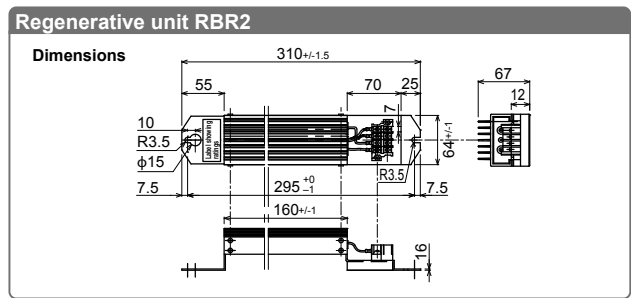
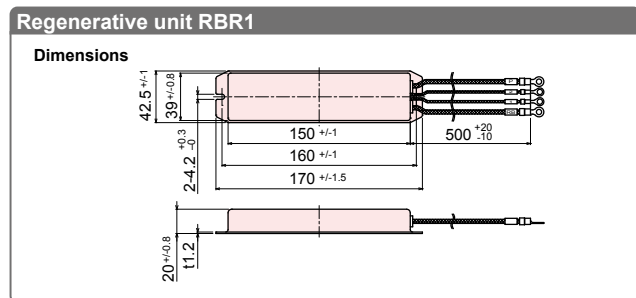
RDV-P

		PHASER				
		MF7/MF7D	MF15/MF15D	MF20/MF20D	MF30/MF30D	MF75/MF75D
Driver selection	RDV-P	05				
		10	●	●	●	
		20			●	
		25				●
Regenerative unit	RBR1	●	●	●	●	
	RBR2					●

■ 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.



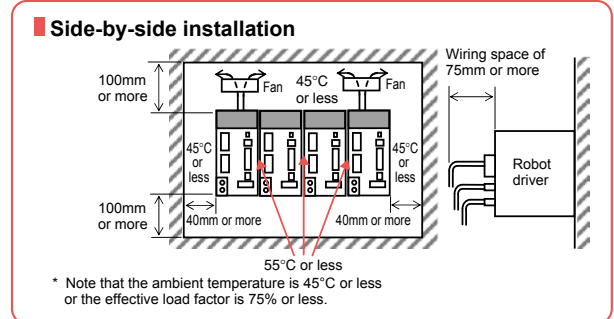
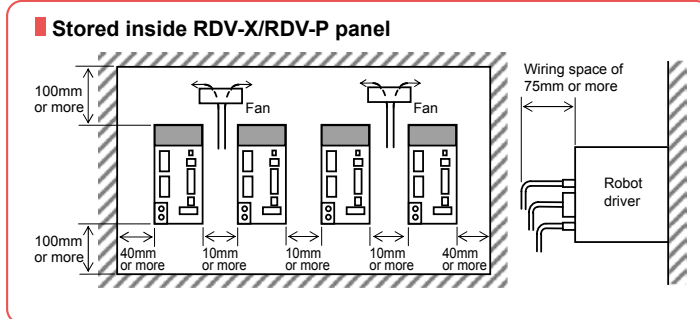
● Regenerative unit RBR1 / RBR2 basic specifications

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

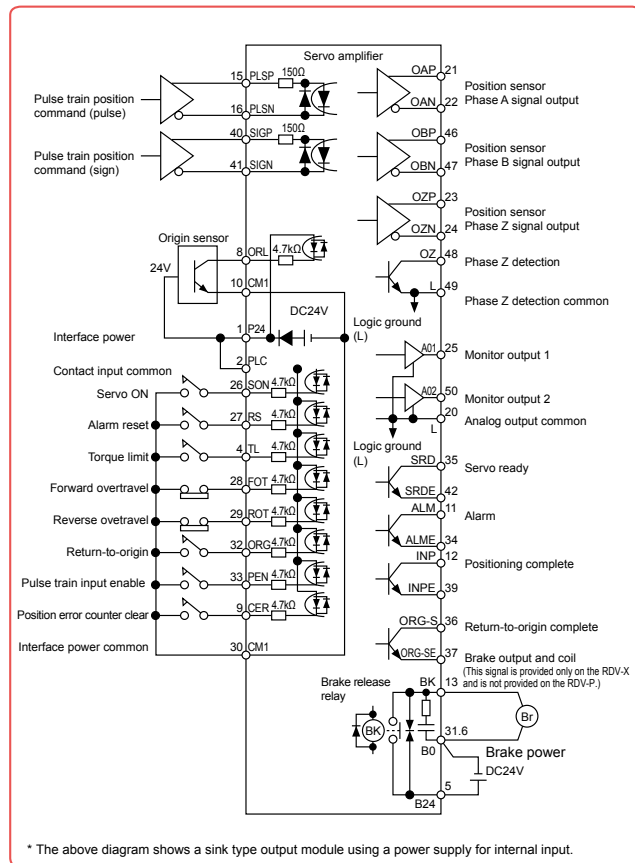
Note. The internal thermal contact point capacity is AC250V, 2A max. ON (b contact point) in the normal state.
 Note. The built-in thermal fuse prevents abnormal heat generation which occurs by an erroneous use. (not resettable)
 Note. When the thermal relay has worked, reduce the regeneration energy by either stopping the servo amplifier or making the deceleration time longer.
 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.



Input / output signal connection diagram



List of RDV-P / RDV-X terminal functions

Type	Terminal symbol	Terminal name	Description
Input signal	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.
	CM1	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).
	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.
	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	Inputting this signal starts return-to-origin operation.
Output signal	PEN	Pulse train input enable	When this signal is turned on, the pulse train positioning 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	Servo ready	This signal is output when the servo is ready to turn on (with main power supply turned on and no alarms tripped)
	SRDE	Servo ready	This signal is output when an alarm has tripped. (This signal is ON in normal state and OFF when an alarm has tripped.)
	ALM	Alarm	This signal is output when the deviation between the command position and current position is within the preset positioning range.
	ALME	Alarm	This signal is output when the deviation between the command position and current position is within the preset positioning range.
	INP	Positioning complete	This signal is output when the deviation between the command position and current position is within the preset positioning range.
	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	Return-to-origin complete	This signal is output when the return-to-origin is completed successfully.
	ORG-SE	Return-to-origin complete	This signal is output when the return-to-origin is completed successfully.
Relay output	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, 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.
	AO2	Monitor output 2	Outputs speed detection values, torque commands, 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.
Monitor output	L	Monitor output common	This is the ground for the monitor signal.
	PLSP	Position command pulse (pulse signal)	Select one of the following signal forms as the pulse-train position command input.
	PLSN	Position command pulse (pulse signal)	Select one of the following signal forms as the pulse-train position command input.
Position command	SIGP	Position command pulse (pulse signal)	1. Command pulse + direction signal
	SIGN	Position command pulse (pulse signal)	2. Forward direction pulse train + reverse direction pulse train
	SIGN	Position command pulse (pulse signal)	3. Phase difference 2-phase pulse
Position sensor monitor	OAP	Position sensor Phase A signal	Outputs monitor signal obtained by dividing "phase A" signal of position sensor.
	OAN	Position sensor Phase A signal	Outputs monitor signal obtained by dividing "phase A" signal of position sensor.
	OBP	Position sensor Phase B signal	Outputs monitor signal obtained by dividing "phase B" signal of position sensor.
	OBN	Position sensor Phase B signal	Outputs monitor signal obtained by dividing "phase B" signal of position sensor.
	OZP	Position sensor Phase Z signal	Outputs monitor signal for position sensor "phase Z" signal.
	OZN	Position sensor Phase Z signal	Outputs monitor signal for position sensor "phase Z" signal.
Braking power input	OZ	Phase Z detection	Outputs monitor signal for position sensor "phase Z" signal.
	L	Phase Z detection common	Outputs monitor signal for position sensor "phase Z" signal.
Braking power input	B24 ^{Note 1}	Brake power input	Input 24V DC brake power to this terminal.
	B0 ^{Note 1}	Brake power common	Common terminal input for brake power.

Note 1. B24, B0 and BK are available only with RDV-X, and not with RDV-P.

Accessories and part options

RDV-X/RDV-P



Standard accessories

- I/O connector (no brake wiring)



Model KBH-M4420-00

RDV-X
RDV-P

- I/O connector (with brake wiring)



Model KBH-M4421-00

RDV-X
RDV-P

- Power supply connector



Model KEF-M4422-00

RDV-X
RDV-P

Options

- Support software RDV-Manager

P.694



Model KEF-M4966-00

RDV-X
RDV-P

Environment

OS	Windows Vista SP1 (32bit) ^{Note 1} , 7, 8 / 8.1
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 series

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

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

- Communication cable

Communication cable to connect PC and a controller.



Model KEF-M538F-01

RDV-X
RDV-P

Articulated robots YA
Linear conveyor modules LCM
Single-axis robots CX
Motorless single axis actuator Robomity
Compact single-axis robots TRANSEVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & Place robots YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXVY2+ Electric gripper
Option

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.

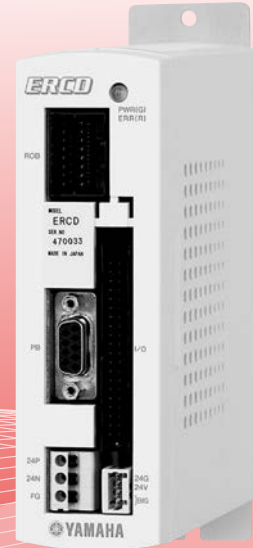
Main functions ▶ P.98



Programming box
 ▶ HPB/HPB-D
 P.699



Support software for PC
 ▶ POPCOM+
 P.690



ERCD

Basic specifications

Item		ERCD	
Number of controllable axes		Single-axis	
Controllable robots		Single-axis robot FLIP-X series T4L / T5L / C4L / C5L	
Basic specifications	Capacity of the connected motor	DC24V 30W or less	
	Dimensions	W44 × H166 × D117mm	
	Weight	0.45kg	
	Input power supply	DC24V +/-10% maximum 3A to 4.5A (Variable depending on robots in use.)	
Axis control	Drive method	AC full-digital software servo	
	Position detection method	Resolver	
	Operating method	Normal mode: point trace movement, program operation, operation using RS-232C communication Pulse Train mode: operation by pulse train input	
	Position indication units	mm (millimeters)	
	Speed setting	1% to 100% (Setting by 1% unit)	
	Acceleration setting	1. Automatic speed setting per robot No. and payload 2. Setting based on acceleration and deceleration parameter 1% to 100% (Setting by 1% unit)	
	Resolution	16384 P/rev	
	Origin search method	Incremental	
Program	Program language	YAMAHA SRC	
	Multitasks	4 tasks	
Memory	Point-data input method	Manual data input (coordinates input), Direct teaching, Remote teaching	
	RAM	32 Kbytes with lithium battery backup (5-year life) Retains programs, point data, parameters and alarm history	
	Programs	100 programs (Maximum program number) 255 steps per program 1024 steps / total or less	
	Points	1000 points (256 when point tracing)	
External input/output	Normal mode ^{Note 1}	Sequence input	Dedicated input 8 points, General input 6 points
		Sequence output	Dedicated input 3 points, General input 6 points, Open collector output
	Pulse train mode ^{Note 1}	Sequence input	Dedicated input 5 points, General input 6 points
		Sequence output	Dedicated input 3 points, General input 6 points, Open collector output
		Command pulse input	Type
	Mode		Line driver (+5V)
	Frequency		Maximum 2 Mpps
	Feedback pulse output	Terminal name	PA+, PA-, PB+, PB-, PZ+, PZ-
		Type	Phase A / phase B / phase Z
		Mode	Line driver (+5V)
Number of pulse		16 to 4096 P/rev	
Power supply for sequence I/O		External DC +24V input	
Emergency stop input		Normal close contact point input	
Brake output		Relay output (for 24V/300mA brake) 1CH	
External communications		RS-232C 1CH (For communication with HPB or PC)	

Controllable robot	FLIP-X Dedicated for T4L/T5L P.300	Dedicated for C4L/C5L P.568
CE marking	—	Field networks —

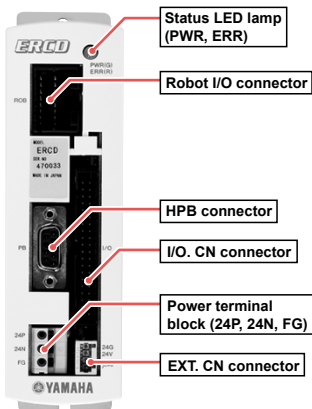
Model Overview	
Name	ERCD
Controllable robot	Dedicated for T4L / T5L / C4L / C5L
Input power	DC24V +/-10% maximum 3A to 4.5A (Variable depending on robots in use.)
Operating method	Pulse train control / Programming / I/O point tracing / Operation using RS-232C communication
Maximum number of controllable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

Ordering method	
ERCD	Controller
	I/O connector specification
	CN1: I/O flat cable 1m (Standard) CN2: Twisted-pair cable 2m (pulse train function)

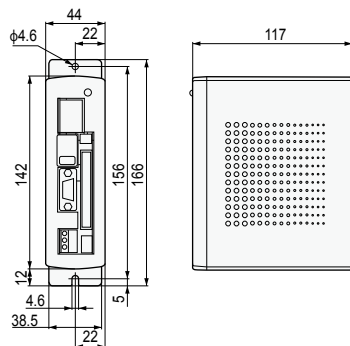
Item		ERCD
Options	Programming box	HPB, HPB-D (with enable switch)
	Support software for PC	POPCOM+
General specifications	Operating temperature	0°C to 40°C
	Storage temperature	-10°C to 65°C
	Operating humidity	35% to 85%RH (non-condensing)
	Noise resistance capacity	IEC61000-4-4 Level 2
	Protective 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

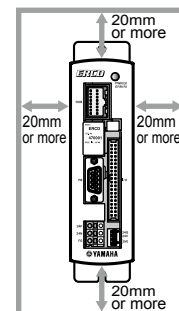


Dimensions



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)



Articulated robots YA
 Linear conveyor modules LCM
 Single-axis robots CX
 Motor-less single axis actuator Robotomy
 Compact single-axis robots TRANSEVO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & place robots YP-X
 CLEAN
 CONTROLLER
 INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXIVY2+ Electric gripper
 Option

Connector I/O signals

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

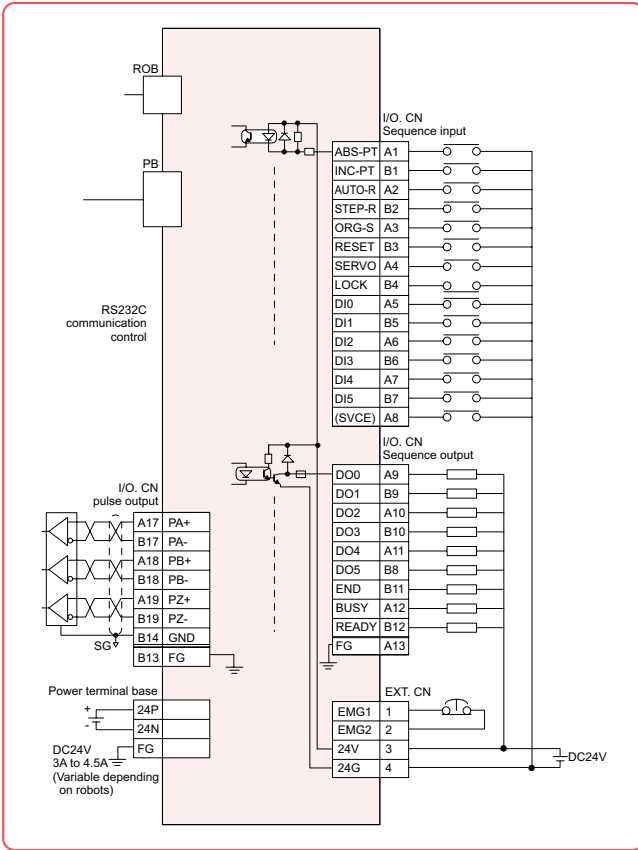
Terminal number	Signal name	Function
A-1	NC	Reserved (use inhibited)
B-1	NC	Reserved (use inhibited)
A-2	NC	Reserved (use inhibited)
B-2	PCLR	Differential clear input
A-3	ORG-S	Return to the origin input
B-3	RESET	Alarm reset input
A-4	SERVO	Servo-ON input
B-4	INH	Command pulse inhibition input
A-5	DI 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

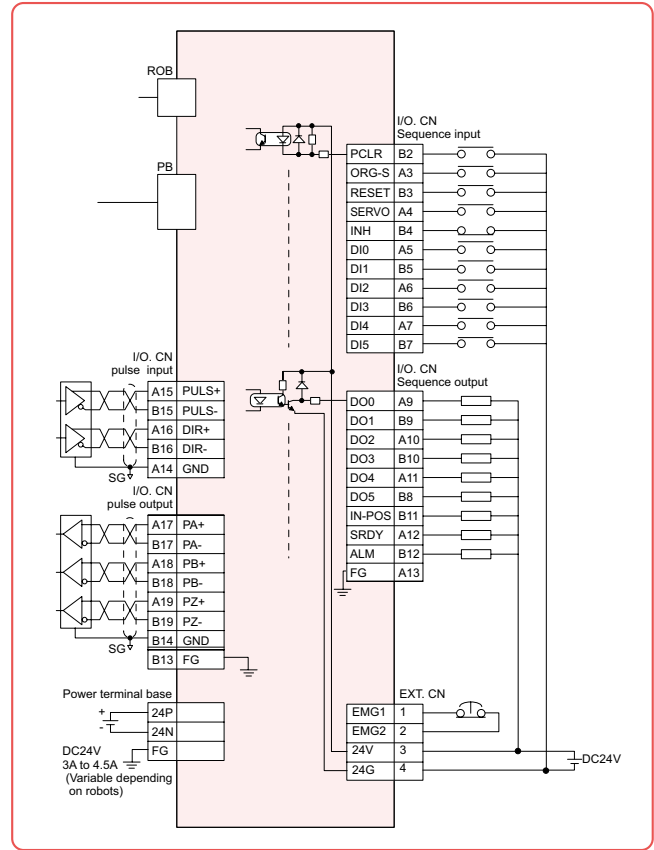
Command	Description
MOVA	Moves to a point data position.
MOVI	Moves from current position by amount of point data.
MOVF	Moves until a specified DI input is received.
JMP	Jumps to a specified label in the specified program.
JMPF	Jumps to a specified label in a specified program according to the input 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.
P	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.
C	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.

Input / output wiring diagram



Pulse train input / output wiring diagram



Pulse train input form

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

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

Articulated robots YA
 Linear conveyor modules LCM
 Single-axis robots CX
 Motor-less single axis actuator Robotomy
 Compact single-axis robots TRANSEVO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & place robots YP-X
 CLEAN CONTROLLER INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXIVY2+ Electric gripper
 Option

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
-------	--------------	------

- **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.



Model	KAU-M4421-10	ERCD
-------	--------------	------

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

Options

- **Support software for PC P.690**

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	Windows XP (32bit), Vista, 7, 8 / 8.1, 10 (Supported version: V.2.1.1 or later)
CPU	Processor that meets or exceeds the suggested requirements for the OS being used.
Memory	Suggested amount of memory or more for the OS being used.
Hard disk	50MB of available space required on installation drive.
Disk operation	RS-232C
Applicable controllers	SRCX to SR1, DRCX, TRCX, ERCX, ERCD, 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.



Model	USB type (5m)	KBG-M538F-00	LCC140
	D-Sub type 9pin-9pin (5m)	KAS-M538F-10	ERCD
			SR1-X
			SR1-P
Note. This USB cable supports Windows 2000/XP or later.			RCX320
Note. Data cable jointly used for POPCOM+, VIP+, RCX-Studio Pro and RCX-Studio 2020.			RCX221
Note. USB driver for communication cable can also be downloaded from our website.			RCX222
			RCX340

- **Programming box P.699**

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



	HPB	HPB-D	LCC140
Model	KBB-M5110-01	KBB-M5110-21	ERCD
Enable switch	-	3-position	SR1-X
CE marking	Not supported	Applicable	SR1-P

Articulated robots YA
Linear conveyor modules LCM
Single-axis robots CX
Motorless single axis actuator Robomity
Compact single-axis robots TRANSEVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & Place robots YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXVY2+ Electric gripper
Option

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.98

Programming box
 ▶ **HPB/HPB-D**
 P.699

Support software for PC
 ▶ **POPCOM+**
 P.690

Basic specifications

Item		SR1-X			SR1-P			
Basic specifications	Driver model	SR1-X05	SR1-X10	SR1-X20	SR1-P05	SR1-P10	SR1-P20	
	Applicable motor output	200V 100W or less	200V 200W or less	200V 600W or less	200V 100W or less	200V 200W or less	200V 600W or less	
	Number of controllable axes	Single-axis						
	Controllable robots	Single-axis robot FLIP-X (exclude T4L, T5L)			Linear motor single-axis robot PHASER			
	Maximum power consumption	400VA	600VA	1400VA	400VA	600VA	1400VA	
	Capacity of the connected motor	100W	200W	600W	100W	200W	600W	
	Dimensions	W74 × H210 × D146mm			W99 × H210 × D146mm		W74 × H210 × D146mm	
Weight	1.54kg			1.92kg		1.92kg		
Input power supply	Control power supply	Single phase AC100 to 115/200 to 230V +/-10% maximum 50/60Hz						
	Main power supply	Single phase AC100 to 115/200 to 230V +/-10% maximum 50/60Hz		Single phase AC200 to 230V +/-10% maximum 50/60Hz	Single phase AC100 to 115/200 to 230V +/-10% maximum 50/60Hz		Single phase AC200 to 230V +/-10% maximum 50/60Hz	
Axis control	Drive method	AC full-digital software servo						
	Position detection method	Multi-turn resolver with data backup function			Magnetic linear scale			
	Operating method	Programming, I/O point tracing, Remote command, Operation using RS-232C communication						
	Position indication units	mm (millimeters), deg (degrees)						
	Speed setting	1% to 100% (Setting by 1% unit)						
	Acceleration setting	1. Automatic speed setting per robot No. and payload 2. Setting based on acceleration and deceleration parameter (Setting by 1% unit)						
	Resolution	16384 P/rev				1μm		
Origin search method	Absolute, Incremental			Incremental, Semi-absolute				
Program	Program language	YAMAHA SRC						
	Multitasks	4 tasks maximum						
	Point-data input method	Manual data input (coordinate value input), Direct teaching, Teaching playback						
Memory	Programs	100 programs 255 steps / 1 programs 3000 steps / total						
	Points	1000 points						
External input/output	STD.DIO	I/O input	Dedicated input 8 points, General input 16 points					
		I/O output	Dedicated Output 4 points, General output 16 points					
	SAFETY	Emergency stop input (Normal close contact point input), service mode input						
	Brake output	Relay contact				-		
	Origin sensor input	Connectable to DC 24V normally-closed contact sensor						
	External communications	RS-232C: 1CH (For communication with HPB / HPB-D or PC)						
	Analog input/output	Input 1ch (0 to +10V) Output 2ch (0 to +10V)						
		Slots	1					
	Options	Type	NPN/PNP: Dedicated input 8 points, Dedicated Output 4 points, General input 16 points, General output 16 points					
			CC-Link: Dedicated input 16 points, Dedicated Output 16 points, General input 32 points, General output 32 points					
DeviceNet™: Dedicated input 16 points, Dedicated Output 16 points, General input 32 points, General output 32 points								
PROFIBUS: Dedicated input 16 points, Dedicated Output 16 points, General input 32 points, General output 32 points								

Controllable robot	SR1-X ▶ FLIP-X P.295	SR1-P ▶ PHASER P.341
CE marking		Field networks

Model Overview

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

Ordering method

SR1-X

Controller	Driver	Usable for CE	Regenerative unit^{Note1}	Input/Output Selection	Battery
	05: 100W or less 10: 200W 20: 400 to 600W	No entry: Standard E: CE marking	No entry: None R: RG1	N: NPN P: PNP CC: CC-Link DN: DeviceNet TM PB: PROFIBUS TM YC: YC-Link ^{Note2}	No entry: None (Incremental specification) B: Battery (Absolute specification)

Note 1. Driver selection and regenerative unit selection depends on the robot type. See the selection table on the next page for selecting the driver/regenerative circuit.
 Note 2. Available only for the slave.

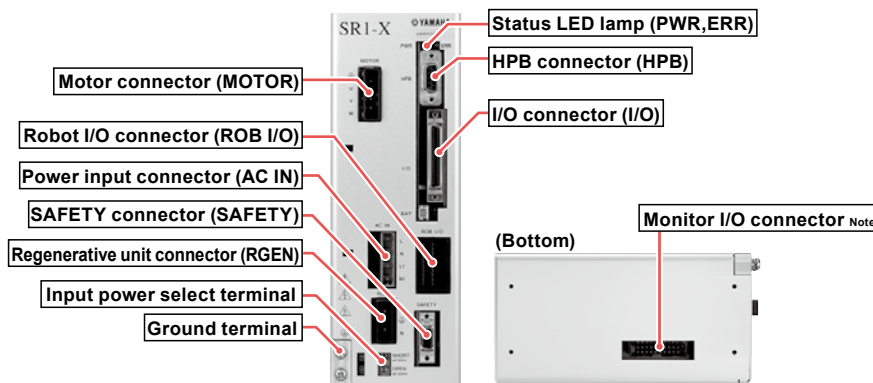
SR1-P

Controller	Driver	Usable for CE	Regenerative unit^{Note1}	Input/Output Selection
	05: 100W or less 10: 200W 20: 400 to 600W	No entry: Standard E: CE marking	No entry: None R: RG1 ^{Note2}	N: NPN P: PNP CC: CC-Link DN: DeviceNet TM PB: PROFIBUS TM YC: YC-Link ^{Note3}

Note 1. Driver selection and regenerative unit selection depends on the robot type. See the selection table on the next page for selecting the driver/regenerative circuit.
 Note 2. For the MF75, the regenerative unit is "RGU-2".
 Note 3. Available only for the slave.

Item	SR1-X	SR1-P
Options	Programming box Support software for PC	HPB, HPB-D (with enable switch) POPCOM+
General Specifications	Operating temperature	0°C to 40°C
	Storage temperature	-10°C to 65°C
	Operating humidity	35% to 85%RH (non-condensing)
	Absolute backup battery	Lithium metallic battery
	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.

Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motor-less single axis actuator
Robonity

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCXVY2+ Electric gripper

Option

SR1-X/SR1-P

Driver / regenerative unit selection table

SR1-X

			FLIP-X																											
			T4LH/C4LH	T5LH/C5LH	T6L/C6L	T9	T9H	F8/C8	F8L/C8L	F8LH/C8LH	F10	F10H	F14/C14	F14H/C14H	GF14XL	F17/C17	F17L/C17L	GF17XL	F20/C20	F20N	N15/N15D	N18/N18D	B10	B14	B14H	R5	R10	R20		
Driver selection	SR1-X	05	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
		10					●						●		●	●														●
		20																												
Regenerative unit	No entry (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.
- 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).

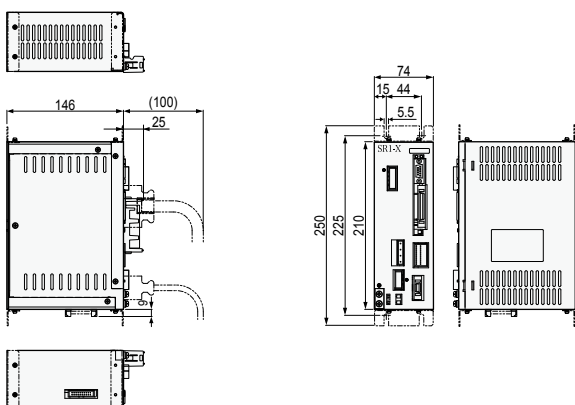
- ④ Regenerative unit is needed if using at maximum speeds exceeding 1000mm per second.
- ⑤ Regenerative unit is needed if using at maximum speeds exceeding 1250mm per second.
- ⑥ Regenerative unit is needed if using at maximum speeds exceeding 750mm per second.

SR1-P

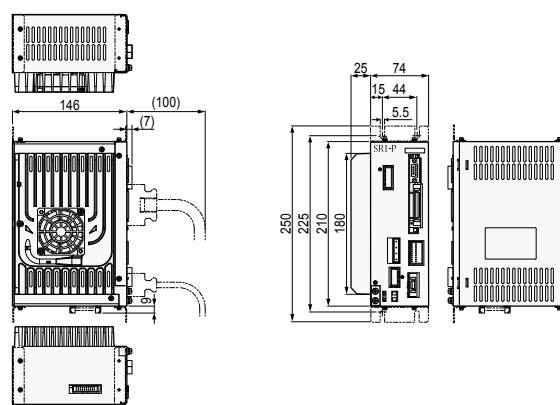
			PHASER				
			MF7/MF7D	MF15/MF15D	MF20/MF20D	MF30/MF30D	MF75/MF75D
Driver selection	SR1-P	05					
		10	●	●	●		
		20				●	●
Regenerative unit	No entry (None)	●	●				
	R (RG1)			●	●		
	R (RGU-2)					●	

Dimensions

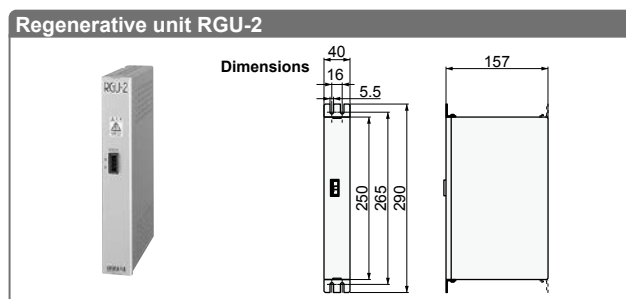
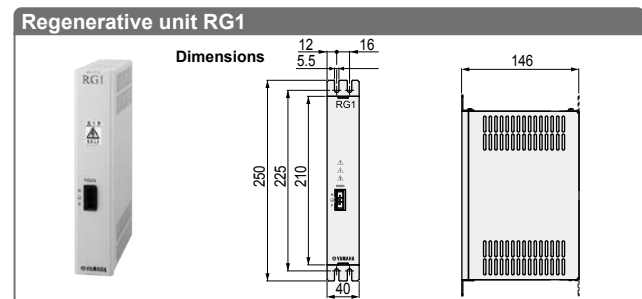
SR1-X/SR1-P 05 - 10



SR1-X/SR1-P 20



Regenerative unit RG1 / RGU-2



Basic specifications

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.

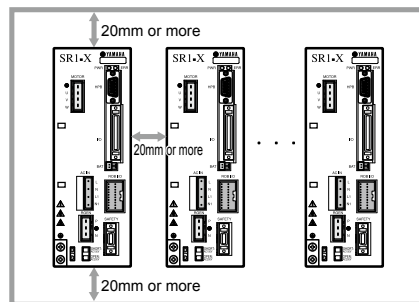
Basic specifications

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)

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.

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

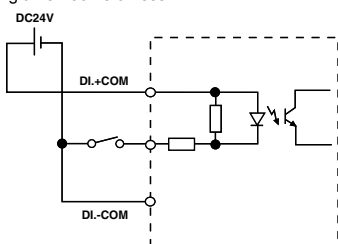
Terminal number	Signal name	Function
1	DI.+COM	Input supply+common
2	SERVO	Return to servo on
3	INC-PT	Relative point transfer
4	ABS-PT	Absolute point transfer
5	STEP-R	Step run
6	DI 0	General input 0
7	DI 1	General input 1
8	DI 2	General input 2
9	DI 3	General input 3
10	DI 4	General input 4
11	DI 5	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	DI.-COM	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	DO.-COM	Output supply-common
40	DO.-COM	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

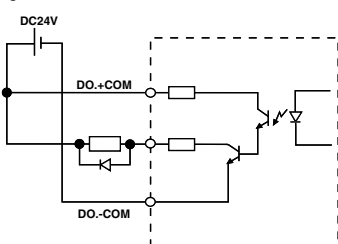
Input circuit

- Form : DC input (positive common type)
Photo coupler insulation type
- Input power supply : 5mA/point
- Answering time : 30ms or less



Output circuit

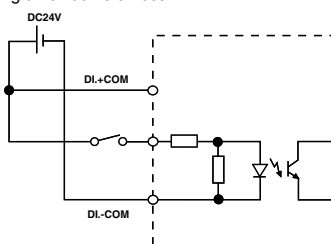
- Form : NPN open collector output (negative common type)
Photo coupler insulation type
- Load : 50mA/point
- Answering time : 1ms or less



PNP type input/output circuit

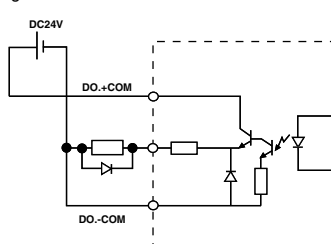
Input circuit

- Form : DC input (negative common type)
Photo coupler insulation type
- Input power supply : 5mA/point
- Answering time : 30ms or less



Output circuit

- Form : PNP open collector output (positive common type)
Photo coupler insulation type
- Load : 50mA/point
- Answering time : 1ms or less



Articulated robots YA
 Linear conveyer modules LCM
 Single-axis robots CX
 Motor-less single axis actuator Robotomy
 Compact single-axis robots TRANSEVO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & place robots YP-X
 CLEAN
 CONTROLLER
 INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXIVY2+ Electric gripper
 Option

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
6	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

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 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.
P	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.
C	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

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

Safety connector



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

- 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

- LCC140
- SR1-X
- SR1-P

NPN / PNP connector



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

- SR1-X
- SR1-P
- RCX320
- 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

Absolute battery

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

Basic specifications

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



Model KAS-M53G0-12

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.

- SR1-X
- RCX222

Battery case

This is the absolute battery holder.



Model KBG-M5395-00

- SR1-X
- RCX222

See next page for optional parts

Articulated robots YA
 Linear conveyor modules LCM
 Single-axis robots CX
 Motor-less single axis actuator Robotomy
 Compact single-axis robots TRANSEVO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & Place robots YP-X
 CLEAN
 CONTROLLER
 INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXVY2+ Electric gripper
 Option

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 as it is. Required when using analog input / output and feedback pulse output.



Model KBG-M4421-00

SR1-X
SR1-P

● Support software for PC **P.690** **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	Windows XP (32bit), Vista, 7, 8 / 8.1, 10 (Supported version: V.2.1.1 or later)
CPU	Processor that meets or exceeds the suggested requirements for the OS being used.
Memory	Suggested amount of memory or more for the OS being used.
Hard disk	50MB of available space required on installation drive.
Disk operation	RS-232C
Applicable controllers	SRCX to SR1, DRCX, TRCX, ERCX, ERCD, 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.



Model	USB type (5m)	KBG-M538F-00
	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
RCX320
RCX221
RCX222
RCX340

● Programming box **HPB/HPB-D** **P.699**

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

● YC-Link board (with connection cable)

Model KBG-M4400-60

SR1-X
SR1-P

Note. Use the converter cable if changing to the SR1-X, SR1-P from a system using SRCX, SRCP. (See P.743).

Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motorless single axis actuator
Robomity

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & Place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCXVY2+ Electric gripper

Option

RCX320

● Robot controller with advanced functions

A 2-axis model of the RCX340 controller has been launched finally.
The high-level equipment construction such as simultaneous control of multiple robots is achieved by the advanced functionality and flexible expandability.



RCX320

Main functions ▶ P.102



Programming box
▶ PBX/PBX-E
P.701



Support software for PC
▶ RCX-Studio 2020
P.696

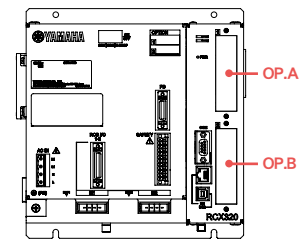
Ordering method

RCX320							
Controller	No. of controllable axes 2: 2 axes 1: 1 axes	Safety standards N: Normal E: CE	Regenerative unit <small>Note 8</small> No entry: None R: YHX-RU1	Controller option A (OP.A) No entry: Non-selection NS : STD.DIO(NPN) <small>Note 1 Note 4</small> NE : EXP.DIO(NPN) <small>Note 1 Note 4</small> PS : STD.DIO(PNP) <small>Note 1 Note 4</small> PE : EXP.DIO(PNP) <small>Note 2 Note 4</small> GR: Gripper TR : Tracking <small>Note 5</small> YM1 : YC-Link/E master <small>Note 6</small> YS2 to 4: YC-Link/E slave <small>Note 6</small> EP : EtherNet/IP™ <small>Note 7</small> PB : PROFIBUS <small>Note 7</small> CC : CC-Link <small>Note 7</small> DN : DeviceNet™ <small>Note 7</small> PT : PROFINET <small>Note 7</small> ES : EtherCAT <small>Note 7</small>	Controller option B (OP.B) No entry: Non-selection --- <small>Note 3</small> NE : EXP.DIO(NPN) <small>Note 2 Note 4</small> --- <small>Note 3</small> PE : EXP.DIO(PNP) <small>Note 2 Note 4</small> GR: Gripper TR : Tracking <small>Note 5</small> YM1 : YC-Link/E master <small>Note 6</small> YS2 to 4: YC-Link/E slave <small>Note 6</small> EP : EtherNet/IP™ <small>Note 7</small> PB : PROFIBUS <small>Note 7</small> CC : CC-Link <small>Note 7</small> DN : DeviceNet™ <small>Note 7</small> PT : PROFINET <small>Note 7</small> ES : EtherCAT <small>Note 7</small>	Vision System No entry: Non-selection WY: with RCXIVY2+, without lighting WL: with RCXIVY2+, with lighting	Absolute battery 2: 2 pcs. 1: 1 pc. 0: 0 pc.

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

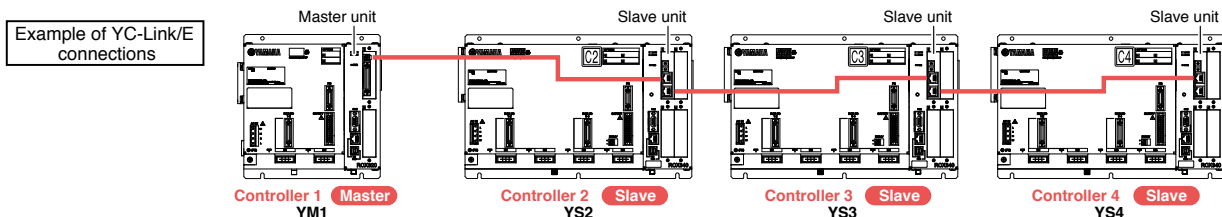
- Note 1. [STD.DIO] Parallel I/O board standard specifications
Dedicated input 8 points, dedicated output 9 points, general-purpose input 16 points, general-purpose output 8 points
Do not mix with field bus (CC/DN/PB/EP/PT/ES).
- Note 2. [EXP.DIO] Parallel I/O board expansion specifications
General-purpose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

Controller option board position



YC-Link/E explanation

Using the inter-controller communication "YC-Link/E", the RCX320 and RCX340 are connected and up to 14 axes (4 robots) can be expanded. The YC-Link/E can be executed by the program of only the master controller. This contributes to great reduction of the system startup time.



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

* For customers who export robot controllers to Korea, connecting two or more RCX320 controllers using the YC-Link/E may not be compliant with the KCs system. Please contact us when considering such connections.

Controllable robot	XY-X P363	FLIP-X P295	PHASER P341	YP-X P553
--------------------	------------------	--------------------	--------------------	------------------

CE marking		Field networks	CC-Link	DeviceNet	EtherNet/IP	Ethernet			EtherCAT
------------	--	----------------	---------	-----------	-------------	----------	--	--	----------

Basic specifications

Item		RCX320	
Basic specifications	Applicable robots	YAMAHA single-axis robots, linear single-axis robots, P&P robots	
	Connected motor capacity	1200W or less (in total for 2 axes)	
	Power capacity	2400VA	
	Dimensions	W213 × H195 × D130mm (main unit only)	
	Weight	3.6kg (main unit only)	
	Input power supply	Control power supply Main power supply	Single-phase 200 to 230V AC +/-10% maximum, 50/60Hz Single-phase 200 to 230V AC +/-10% maximum, 50/60Hz
Axis control	No. of controllable axes	Max. 2 axes Up to four units of the RCX320 and RCX340 can be connected using the inter-controller communication "YC-Link/E".	
	Drive method	AC full digital servo	
	Position detection method	Resolver or magnetic linear scale	
	Control method	PTP motion (point to point), ARCH motion, linear interpolation, circular interpolation	
	Coordinate systems	Joint coordinates, Cartesian coordinates	
	Position display units	Pulses, mm (1/1000 steps), degree (1/1000 steps)	
	Speed setting	0.01 to 100% (below 1% can be changed by programming)	
	Acceleration/deceleration setting	Optimized by robot model and tip weight parameter Setting by acceleration coefficient and deceleration rate parameters (1% steps) * Can be changed by programming. Zone control (For SCARA robots only, optimized according to arm posture)	
Programming	Program language	YAMAHA BASIC II conforming to JIS B8439 (SLIM language)	
	Multi-task	Max. 16 tasks	
	Sequence program	1 program	
	Memory capacity	2.1MB (Total of program and point data) (Available capacity for program when the maximum number of points is used: 300KB)	
	Program	100 programs (maximum number of programs) 9999 lines (maximum number of lines per program)	
	Point	30000 points (maximum number of points)	
	Point teaching method	MDI (coordinate data input), direct teaching, teaching playback, offline teaching (data input from external unit)	
	System backup (Internal memory backup)	Lithium battery (service life about 4 years at 0 to 40°C)	
External I/O	SAFETY	Input	Emergency stop ready input, 2 systems Auto mode input, 2 systems (Enabled only when the global specifications are used.)
		Output	Emergency stop contact output, 2 systems Enable contact output, 2 systems (Enabled only when the PBX-E is used.) Motor power ready output, 2 systems
	Brake output	Transistor output (PNP open collector)	
	Origin sensor input	Connectable to 24V DC B-contact (normally closed) sensor	
	External communications	RS-232C: 1CH (D-SUB 9-pin (female))	
		Ethernet: 1CH (In conformity with IEEE802.3u/IEEE802.3) 100Mbps/10Mbps (100BASE-TX/10BASE-T) Applicable to Auto Negotiation RS-422: 1CH (Dedicated to PBX)	
General specifications	Operating temperature	0 to 40°C	
	Storage temperature	-10 to 65°C	
	Operating humidity	35 to 85% RH (no condensation)	
	Atmosphere	Indoor location not exposed to direct sunlight. *No corrosive, flammable gases, oil mist, or dust particles	
	Anti-vibration	All XYZ directions 10 to 57Hz unidirectional amplitude 0.075mm 57 to 150Hz 9.8m/s ²	
	Protective functions	Position detection error, power module error, temperature error, overload, overvoltage, low voltage, excessive position deviation, overcurrent, motor current error	
	Noise immunity	Conforms to IEC61000-4-4 Level 3	
	Protective structure	IP20	
Appliance classes	Class I		
Options	Parallel I/O board	Standard specifications	Dedicated input 8 points, dedicated output 9 points General-purpose input 16 points, general-purpose output 8 points NPN/PNP specifications are selected. (maximum 1 board)
		Expansion specifications	General-purpose input 24 points, general-purpose output 16 points NPN/PNP specifications are selected. (maximum 4 boards)
	Option board	CC-Link board Ver1.1/2.0	Remote I/O
		DeviceNet™ board	Dedicated input/output: 16 points each General-purpose input/output: 96 points each
		EtherNet/IP™ board	
		PROFIBUS board	
		PROFINET board	Remote register Input/output: 16 words each
	YC-Link/E board (master/slave)	Communication cycle: 1 ms, control cycle: minimum 1 ms / maximum 8 ms, maximum number of robot units: four units Maximum number of control axes: total 14 axes (including two master controller axes), maximum 12 axes for slaves only Position detection method: optical rotary encoder, minimum setting distance: 0.01 mm Speed setting: 20 to 100% relative to the maximum parameter speed, number of connected gripper units: maximum two units Drive power: DC 24V +/-10%, 1.0A Max	
	YRG (gripper) board		
	Tracking board	Number of connected encoders: maximum two units, supported encoders: 26LS31/26C31 equivalent line driver (RS422 compliant) Encoder power supply: DC5V (2 counter (ch) total 500 mA or less) (supplied from controller)	
RCXiVY2+ unit	Camera pixels: maximum 5 million pixels, number of registered models: 254 models, number of connected cameras: maximum two units Power supply: DC24V +/-10% 1.5A Max		
Programming box	PBX, PBX-E		
Absolute battery	3.6V 2700mAh / axis Backup retention time: About 1 year		
Support software for personal computer	RCX-Studio 2020		

Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motor-less single-axis actuator
Robomity

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

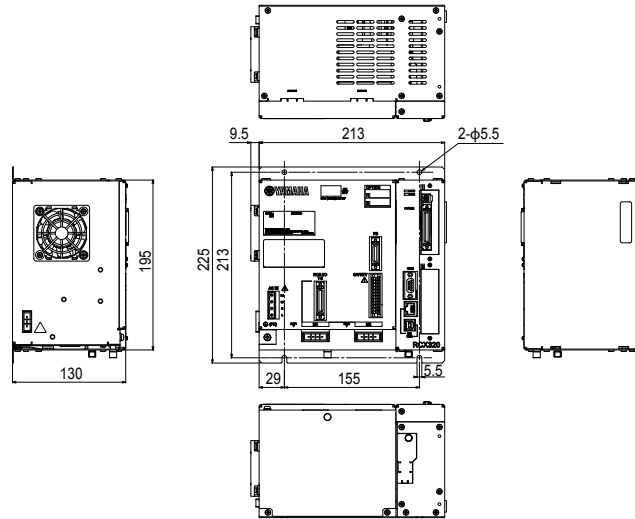
Pulse string driver

Robot controller

RCXiVY2+ Electric gripper

Option

■ 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.

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

Axial current sensor value		Power capacity (VA)	Generated heat amount (W)
X axis	Y axis		
05	05	500	53
10	05	700	58
20	05	1500	78
10	10	900	63
20	10	1700	83
20	20	2400	100

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

Motor capacity vs. current sensor table

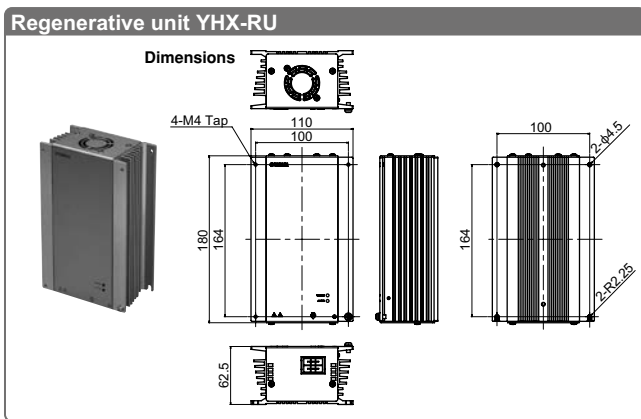
Connected motor capacity	Current sensor
100W or less	05
200W	10
400W or more	20

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.

■ Regenerative unit YHX-RU1



● Basic specifications

Item	YHX-RU1	
Model	KEK-M4107-0A (including cable supplied with unit)	
Dimensions	W62.5×H180×D110mm	
Weight	1.45kg	
Absorbable electric power	100 W (Equivalent to RGU 3)	
Power Supply	Input	
	254 to 357 V DC (Controller DCBUS Connecting)	
Connector	Regenerative unit connector (for unit connection and extension)	
Installation Environment	Working Temperature	0 to 40 °C
	Working Humidity	35 to 85% RH (No Condensation)
	Location of Use	Altitude 2,000 m or lower and indoor (free from corrosive gases and dust)
	Storage Temperature	-10 to 65 °C
	Vibration Withstanding	1G
Protective Construction / Rating	IP20 / Class 1	
Accessory	Cable for connection with controller (500mm)	

● Regenerative unit selection table

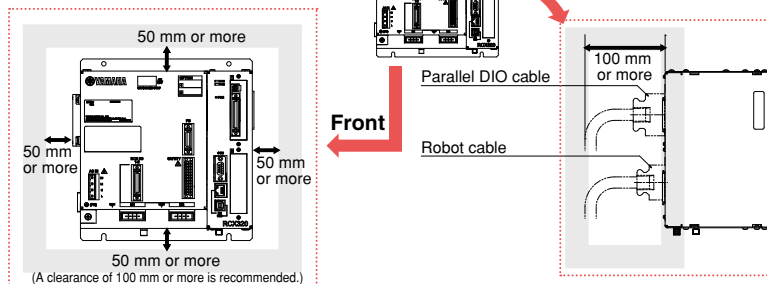
Whether the regenerative unit is needed is automatically determined by the robot model.

Regenerative unit	PHASER		FLIP-X		XY-X												YP-X		Clean
	MF7D	MF15D	MF20D	MF30D	MF50D	MF75D	N15D	N18D	Arm type, Gantry type, Moving arm type, Pole type				XZ type				YP220BX	YP320X	SXYXC
No entry (None)	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
R (YHX-RU1)	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

● : Applicable ○ : Select per conditions

■ 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 RCX320 in a well ventilated location, with space on all sides of the RCX320 (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
1	DI 01	Dedicated input: Servo ON input	
2	DI 10	Dedicated input: Sequence control	
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	
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 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 Sequence program-in-progress	
21	DO 13	Dedicated output Robot program-in-progress	
22	DO 14	Dedicated output Program reset status 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: Automatic operation start	
27	DI 13	Spare	Do not use.
28	DI 14	Dedicated input: Return-to-origin (for INC axis)	
29	DI 15	Dedicated input: Program reset input	
30	DI 16	Dedicated input: Alarm reset input	
31	DI 17	Dedicated input: Return-to-origin (for ABS axis)	
32	DI 30	General-purpose input 30	
33	DI 31	General-purpose input 31	
34	DI 32	General-purpose input 32	
35	DI 33	General-purpose input 33	
36	DI 34	General-purpose input 34	
37	DI 35	General-purpose input 35	
38	DI 36	General-purpose input 36	
39	DI 37	General-purpose input 37	
40	CHK 2	Check signal 2	Short-circuit with CHK1.
41	DO 02	Dedicated output: Servo ON output	
42	DO 03	Dedicated output: Alarm output	
43	DO 20	General-purpose output 20	
44	DO 21	General-purpose output 21	
45	DO 22	General-purpose output 22	
46	DO 23	General-purpose output 23	
47	DO 24	General-purpose output 24	
48	DO 25	General-purpose output 25	
49	DO 26	General-purpose output 26	
50	DO 27	General-purpose output 27	

■ Expanded specification I/O connector signal list

Pin	I/O No. (ID=1)	I/O No. (ID=2)	I/O No. (ID=3)	I/O No. (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	DI 124	General-purpose input 14,44,74,124
29	DI 15	DI 45	DI 75	DI 125	General-purpose input 15,45,75,125
30	DI 16	DI 46	DI 76	DI 126	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	DI 142	General-purpose input 32,62,112,142
35	DI 33	DI 63	DI 113	DI 143	General-purpose input 33,63,113,143
36	DI 34	DI 64	DI 114	DI 144	General-purpose input 34,64,114,144
37	DI 35	DI 65	DI 115	DI 145	General-purpose input 35,65,115,145
38	DI 36	DI 66	DI 116	DI 146	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	---	---	---	---	Reserved
43	DO 20	DO 40	DO 60	DO 100	General-purpose output 20,40,60,100
44	DO 21	DO 41	DO 61	DO 101	General-purpose output 21,41,61,101
45	DO 22	DO 42	DO 62	DO 102	General-purpose output 22,42,62,102
46	DO 23	DO 43	DO 63	DO 103	General-purpose output 23,43,63,103
47	DO 24	DO 44	DO 64	DO 104	General-purpose output 24,44,64,104
48	DO 25	DO 45	DO 65	DO 105	General-purpose output 25,45,65,105
49	DO 26	DO 46	DO 66	DO 106	General-purpose output 26,46,66,106
50	DO 27	DO 47	DO 67	DO 107	General-purpose output 27,47,67,107

Note. The IDs are set using the parameter.

Articulated robots
YA

Linear conveyer modules
LCM

Single-axis robots
CX

Motor-less single axis actuator
Robotomy

Compact single-axis robots
TRANSERO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & place robots
YP-X

CLEAN CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCXVY2+ Electric gripper

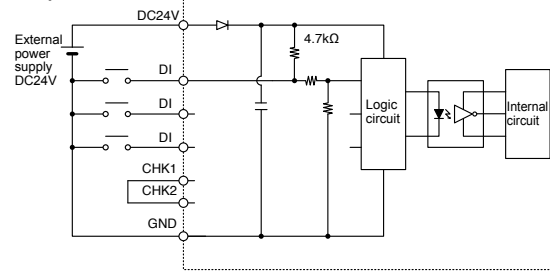
Option

Standard specification I/O connector pin assignment lists

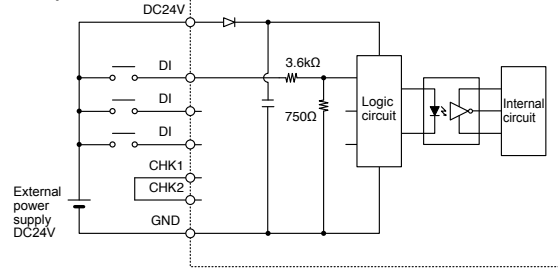
Pin	I/O No.	Name
1	DI01	Servo ON
2	DI10	SEQ enable
3	DI03	(Spare)
4	CHK1	Check input 1
5	DI05	(Spare)
6	DI06	STOP
7	DI07	(Spare)
8	DI20	General-purpose input
9	DI21	General-purpose input
10	DI22	General-purpose input
11	DI23	General-purpose input
12	DI24	General-purpose input
13	DI25	General-purpose input
14	DI26	General-purpose input
15	DI27	General-purpose input
16	DO00	(Spare)
17	DO01	CPUOK
18	DO10	AUTO
19	DO11	ORGOK
20	DO12	SEQRUN
21	DO13	RUN
22	DO14	RESET
23	DO15	WARNING
24	DO16	(Spare)
25	DO17	(Spare)
26	DI12	RUN
27	DI13	(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	DI32	General-purpose input
35	DI33	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
42	DO03	ALARM
43	DO20	General-purpose output
44	DO21	General-purpose output
45	DO22	General-purpose output
46	DO23	General-purpose output
47	DO24	General-purpose output
48	DO25	General-purpose output
49	DO26	General-purpose output
50	DO27	General-purpose output

Typical input signal connection

NPN specifications

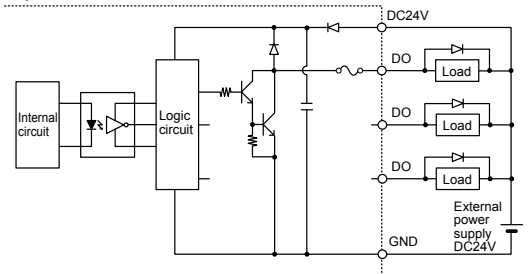


PNP specifications

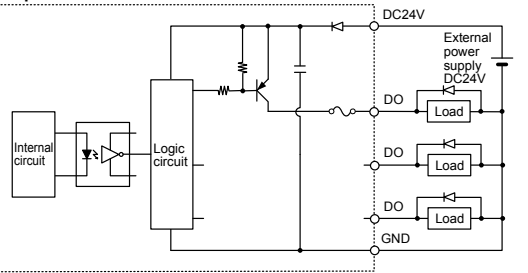


Typical output signal connection

NPN specifications



PNP specifications

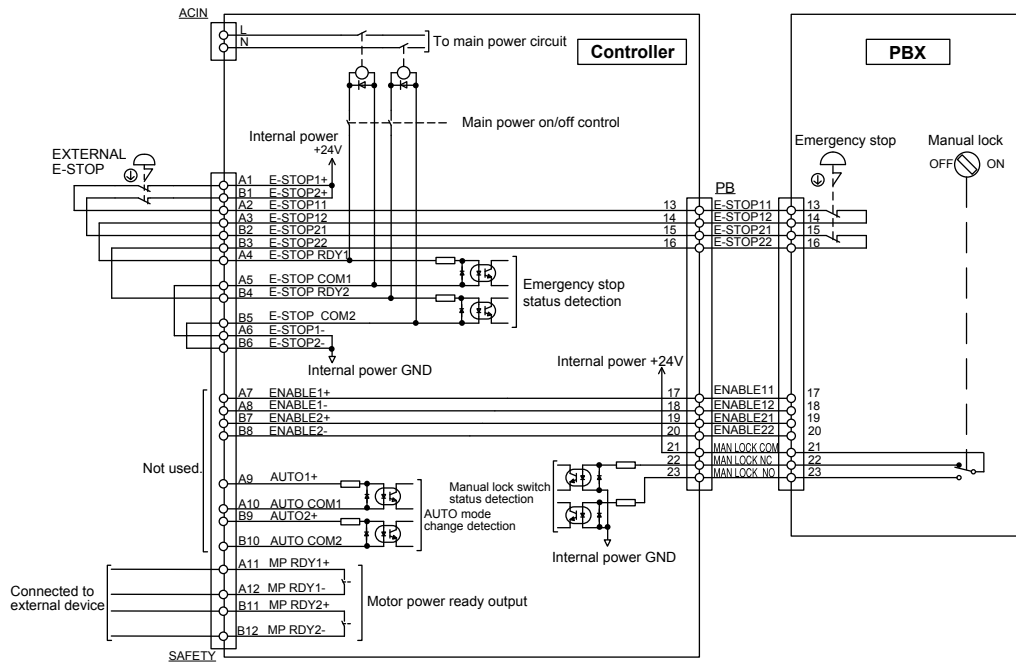


Basic functions

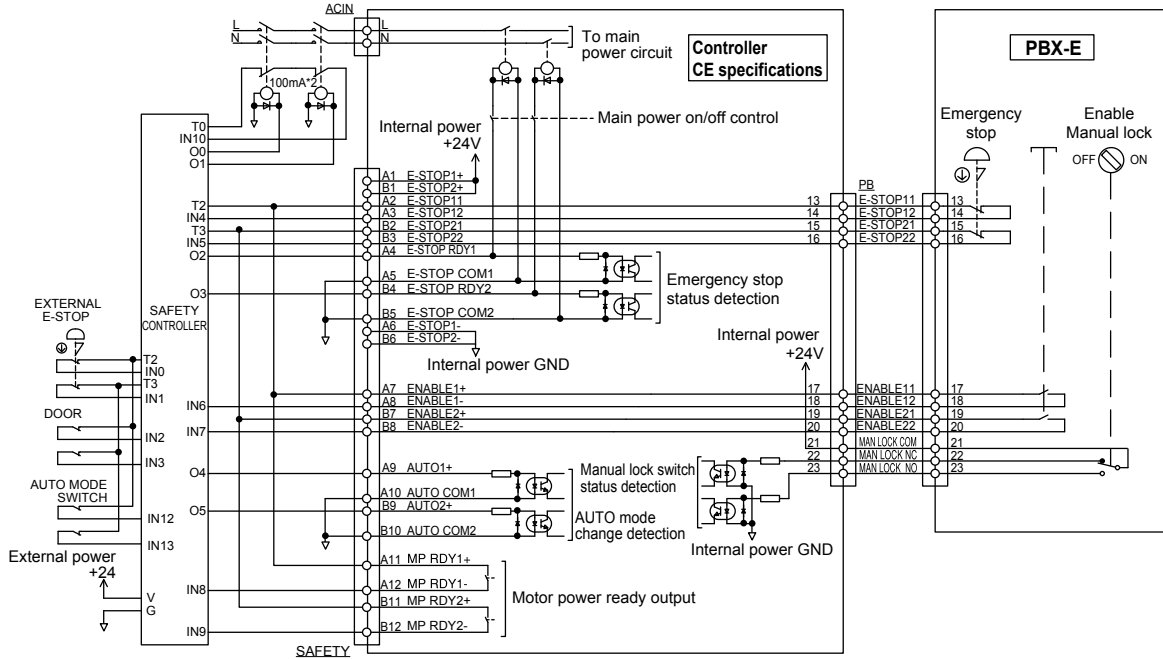
Function	Description
Operation modes	AUTO mode (Major functions: program creation, program execution, step execution, etc.) MANUAL mode (Major functions: jog movement, point data teaching, parameter editing, etc.)
Commands	Array declaration commands (DIM statement) Assignment commands (Numeric assignment, 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

● Connection example of controller with normal specifications and PBX



● Connection example of controller with CE specifications and PBX-E



- Articulated robots **YA**
- Linear conveyer modules **LCM**
- Single-axis robots **CX**
- Motor-less single axis actuator **Robomity**
- Compact single-axis robots **TRANSEVO**
- Single-axis robots **FLIP-X**
- Linear motor single-axis robots **PHASER**
- Cartesian robots **XY-X**
- SCARA robots **YK-X**
- Pick & Place robots **YP-X**
- CLEAN CONTROLLER INFORMATION
- Robot positioner
- Pulse string driver
- Robot controller
- RCXVY2+ Electric gripper
- Option

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

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. (↔JTOXY).

Branching commands

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

Error control

Command	Description
ERR / ERL	Acquires the error code number of an error which has occurred / the line number where an error occurred.
ON ERROR GOTO	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 a 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**

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
CURTQST	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.
MO	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.
TO	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.

Articulated robots YA
 Linear conveyer modules LCM
 Single-axis robots CX
 Motor-less single-axis actuator Robotomy
 Compact single-axis robots TRANSEVO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & place robots YP-X
 CLEAN
 CONTROLLER
 INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXIVY2+ Electric gripper
 Option

Accessories and part options

RCX320



Standard accessories

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

● Power connector + wiring connection lever



Model KAS-M5382-00

● Safety connector



Model KCX-M5370-00

- RCX320
- RCX340

● PBX terminator (dummy connector)

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



Model KFR-M5163-00

- RCX320
- RCX221
- RCX222
- RCX340

● NPN / PNP connector



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

- SR1-X
- SR1-P
- RCX320
- RCX340

● Absolute battery

Battery for absolute data back-up.

● Basic specifications

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



Model KCA-M53G0-02

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.

- RCX320
- RCX340
- TS-SH

Important Absolute battery installation conditions

1 batteries are required for each 1 axes.
● 1 battery,Data storage time of approximately 6 months (with no power applied)
Note. No absolute battery is required for the incremental or semi-absolute axis.

● Dust cover for COM connector

Model KR7-M5395-10

- RCX320
- RCX340

● Dust cover for LAN connector

Model KCX-M658K-10

- RCX320
- RCX340

● Dust cover for USB connector

Model KCX-M658K-00

- RCX320
- RCX340

Options

● Programming box PBX/PBX-E

P.701

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



PBX

Type	Language	Cable length	Model
PBX	Japanese	5m	KCX-M5110-1J
		12m	KCX-M5110-3J
	English	5m	KCX-M5110-1E
		12m	KCX-M5110-3E
	Chinese	5m	KCX-M5110-1C
		12m	KCX-M5110-3C
PBX-E (with enable switch)	Japanese	5m	KCX-M5110-0J
		12m	KCX-M5110-2J
	English	5m	KCX-M5110-0E
		12m	KCX-M5110-2E
	Chinese	5m	KCX-M5110-0C
		12m	KCX-M5110-2C
Display language switching USB for PBX			Model
			KCX-M6498-00
USB cable			KCX-M657E-00

RCX320
RCX340

● Support software for PC RCX-Studio 2020

P.696

This is support software for operating the RCX320 / RCX340 controller.
 A USB key is supplied to the RCX-Studio 2020 to prevent robot operation mistakes.



USB key

Model	RCX-Studio 2020 Basic (USB key Blue)	Model
		KCX-M4990-40
	RCX-Studio 2020 Pro (USB key Purple)	Model
		KCX-M4990-50

RCX320
RCX340

Note. Even when there is no USB key, RCX-Studio 2020 can be used as function restricted version.
 For details about the functions of the function restricted, Basic, and Pro versions, see P.696.

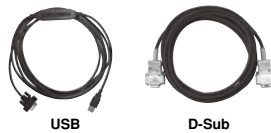
● Basic specifications

Supported language	Japanese, English, Chinese
OS ^{Note1}	Microsoft Windows 7 SP1(32/64bit) / 8.1 (32 bit / 64 bit) / 10 (32 bit / 64 bit)
Execution environment	.NET Framework 4.5 or more
CPU	Recommended: Intel Core i5 2 GHz or more, Minimum: Intel Celeron 2 GHz or more, 3D-SIM is invalid.: Intel Core 2 Duo 2 GHz or more
Memory	Recommended: 8 GB or more, Minimum: 4 GB or more, 3D-SIM is invalid: 1 GB or more
Hard disk capacity	1GB of available space required on installation drive
Communication Port	Communication cable: Serial communication port, Ethernet port, or USB port
Others	Dedicated commutation cable (For D-Sub or USB) Ethernet cable (category 5 or better) USB port: 1 port (For USB key)
Applicable robot controllers	RCX320 / RCX340
Applicable robot	YAMAHA robot that can be connected to the RCX340, RCX320.

Note. Microsoft, Windows 7, Windows 8.1, and Windows 10 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

Communication cable for RCX-Studio 2020.
 Select from USB cable or D-sub cable.



[RCX320/RCX340]
 Ethernet cable (category 5 or higher) is also supported.

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

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

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

● YC-Link/E master board

Model	KCX-M4400-M0
-------	--------------

RCX320
RCX340

● YC-Link/E slave board

Model	KCX-M4400-S0
-------	--------------

RCX320
RCX340

● YC-Link/E cable (1m)

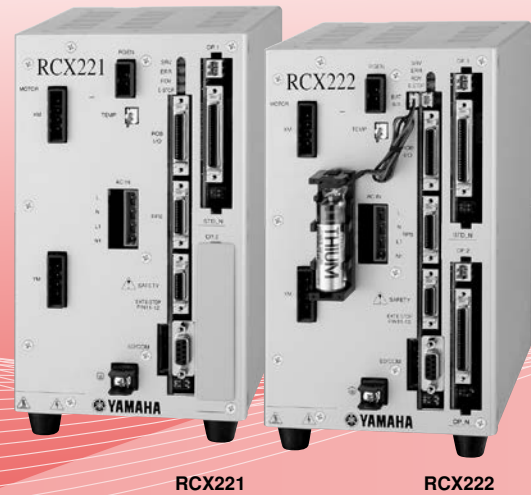
Model	KCX-M6479-10
-------	--------------

RCX320
RCX340

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.



RCX221

RCX222

Main functions ▶ P.100



Programming box
▶ RPB/RPB-E
P.700



Support software for PC
▶ VIP+
P.692

Basic specifications

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

Controllable robot	RCX221 ▶ XY-X P.363, FLIP-X P.295, PHASER P.341, YP-X P.553
	RCX222 ▶ XY-X P.363, FLIP-X P.295, YP-X P.553
CE marking	
Field networks	

Model Overview

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

Ordering method

RCX221/RCX221HP

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

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

RCX222/RCX222HP

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

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

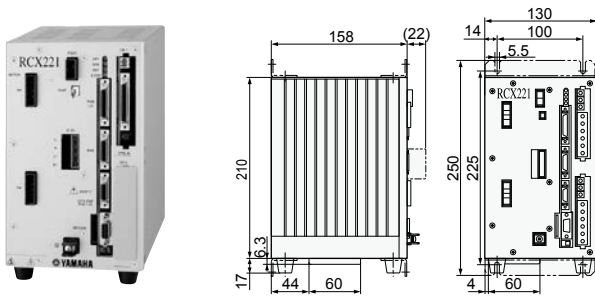
Item		RCX221	RCX221HP	RCX222	RCX222HP	
External input/output	STD.DIO	I/O input	Dedicated input 10 points, General input 16 points			
		I/O output	Dedicated Output12 points, General output 8 points			
	SAFETY		Emergency stop input (Relay contact), Service mode input (NPN/PNP specification is set according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

Articulated robots YA
 Linear motor axes robots LCM
 Single-axis robots CX
 Motor-less single axis actuator Robomity
 Compact single-axis robots TRANSEVO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & place robots YP-X
 CLEAN
 CONTROLLER INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXIVY2+ Electric gripper
 Option

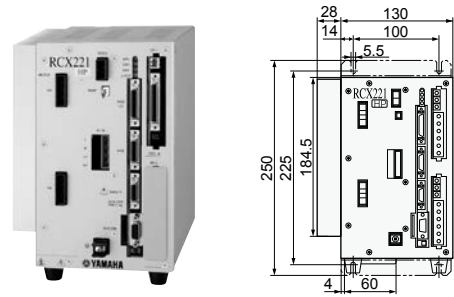
RCX221/RCX222

Dimensions

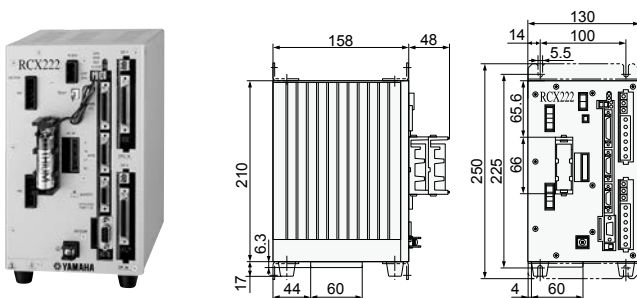
RCX221



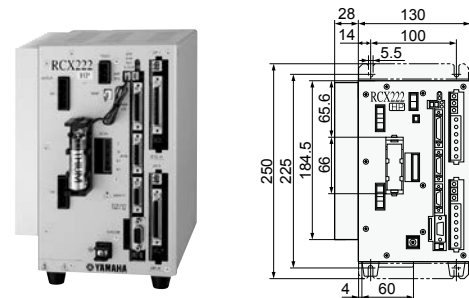
RCX221HP



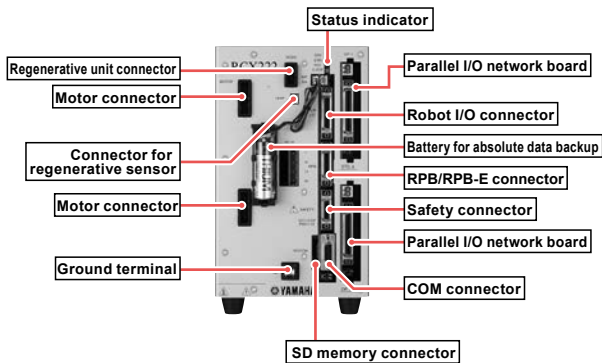
RCX222



RCX222HP

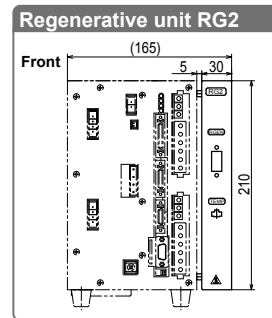


Part names



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 unit.

Basic specifications

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

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

Specification selection table

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

RCX221/RCX221HP

	PHASER					
	MF7D	MF15D	MF20D	MF30D	MF50D	MF75D
RCX221	●	●	●	●	●	●
RCX221HP	●	●	●	●	●	●
Regenerative unit R (RG2)	●	●	●	●	●	●

● : Applicable

RCX222/RCX222HP

	FLIP-X	XY-X												YP-X	Clean					
		Arm type, Gantry type, Moving arm type, Pole type						XZ type												
		PXYx	FXYx	FXyBx	SXYx	SXYBx	NXY	MXyX	HXYx	HXYLx	SXYx (ZF)	SXYx (ZFL20)	SXYBx (ZF)	SXYBx (ZFL20)	MXyX	HXYx	YP220BX	YP320X	SXYxC	
RCX222	N15D	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
RCX222HP	N18D	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Regenerative unit R (RG2)		●	●	●	●	●	○	●	●	●	●	●	●	●	●	●	●	●	●	●

● : Applicable ○ : Select per conditions

Power capacity

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

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

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

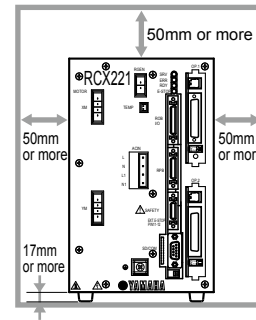
Note. Motor output of the B14H is 200W but the current sensor is 05.

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.

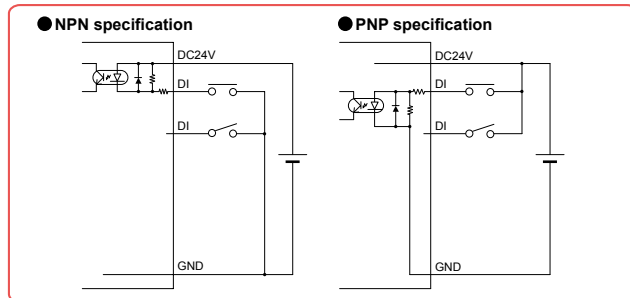
Installation conditions

- 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)

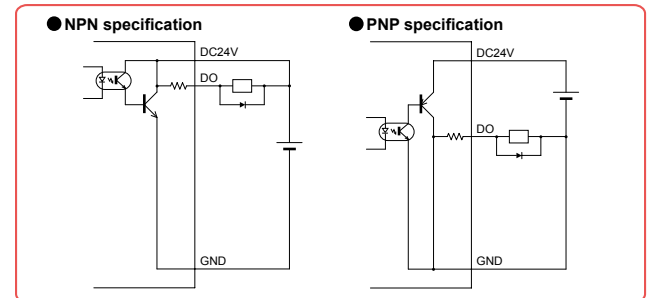


*Provide the same space dimensions for RCX222.

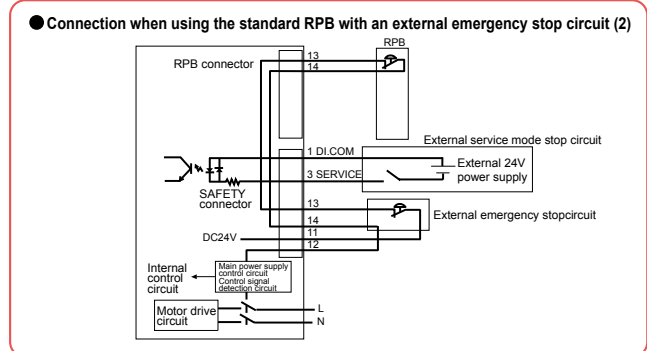
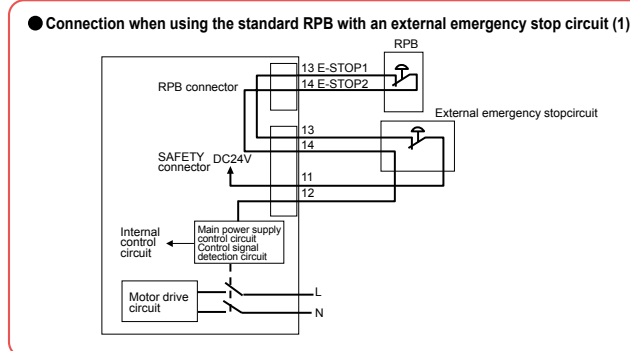
Example of input signal connection



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

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

Note 1. Use of DI06, DI07 is prohibited.

Note 2. DO15 is a memory backup battery voltage drop alarm output.

Note 3. Set origin return for axes using incremental specifications and axes using semi-absolute specifications.

Note 4. Set origin return on axes using absolute specifications.

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

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

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

Robot Language Table

General commands

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

Robot operation

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

I/O control

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

Coordinate control

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

Condition change

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

Communication control

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

Screen control

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

Key control

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

Procedure

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

Task control

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

Error control

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

PATH control

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

Torque control

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

Articulated robots
YA

Linear conveyer modules
LCM

Single-axis robots
CX

Motor-less single axis actuator
Robomity

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCXV2+ Electric gripper

Option

Accessories and part options

RCX221/RCX222



Standard accessories

● Power connector + wiring connection lever



Model KAS-M5382-00

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

● Safety connector



Model KAS-M5370-00

- RCX221
- RCX222

● RPB terminator (dummy connector)

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



Model KFR-M5163-00

- RCX320
- RCX221
- RCX222
- RCX340

● Standard I/O (STD.DIO) connector



Model KAS-M533G-00

- RCX221
- RCX222

● Option I/O (OP.DIO) connector



Model KAS-M533G-10

- RCX221
- RCX222

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

Use to install the controller.



Model KAS-M410H-00

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

- RCX221
- RCX222

● Absolute battery

Battery for absolute data back-up.
(Not included with the RCX221)

● Basic specifications

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



Model KAS-M53G0-12

Note 1. When using 2 batteries.
Note 2. Weight of battery itself.

Note. The absolute battery is subject to wear and requires replacement.

If trouble occurs with the memory then remaining battery life is low so replace the absolute battery. The battery replacement period depends on usage conditions. But generally you should replace the battery after about 1 year counting the total time after connecting to the controller and left without turning on the power.

- SR1-X
- RCX222

Important

Absolute battery installation conditions

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

● Battery case

This is the absolute battery holder.



Model KBG-M5395-00

- SR1-X
- RCX222

Options

● Programming box RPB/RPB-E

P.700

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



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

RCX221
RCX222

● Support software for PC VIP+

P.692

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



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

RCX221
RCX222

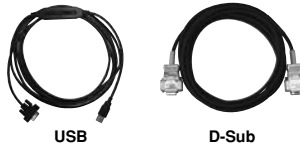
● Environment

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

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

● Data cables

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



Model	USB type (5m)	KBG-M538F-00
	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 and RCX-Studio 2020.
 Note. USB driver for communication cable can also be downloaded from our website.

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

Articulated robots YA
 Linear conveyer modules LCM
 Single-axis robots CX
 Motor-less single axis actuator Robotomy
 Compact single-axis robots TRANSEVO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & Place robots YP-X
 CLEAN
 CONTROLLER
 INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXVY2+ Electric gripper
 Option

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.



RCX340

Main functions ▶ P.102



Programming box
▶ **PBX/PBX-E**
P.701



Support software for PC
▶ **RCX-Studio 2020**
P.696

Basic specifications

Item		RCX340	
Basic specifications	Applicable robots	YAMAHA single-axis robots, linear single-axis robots, Cartesian robots, SCARA robots (except for YK120X and YK150X), P&P robots	
	Connected motor capacity	1600W or less (in total for 4 axes)	
	Power capacity	2500VA	
	Dimensions	W355 × H195 × D130mm (main unit only)	
	Weight	6.2kg (main unit only)	
Input power supply	Control power supply	Single-phase 200 to 230V AC +/-10% maximum, 50/60Hz	
	Main power supply	Single-phase 200 to 230V AC +/-10% maximum, 50/60Hz	
Axis control	No. of controllable 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 detection method	Resolver or magnetic linear scale	
	Control method	PTP motion (point to point), ARCH motion, linear interpolation, circular interpolation	
	Coordinate systems	Joint coordinates, Cartesian coordinates	
	Position display units	Pulses, mm (1/1000 steps), degree (1/1000 steps)	
	Speed setting	0.01 to 100% (below 1% can be changed by programming)	
Acceleration/deceleration setting		Optimized by robot model and tip weight parameter Setting by acceleration coefficient and deceleration rate parameters (1% steps) * Can be changed by programming. Zone control (For SCARA robots only, optimized according to arm posture)	
Programming	Program language	YAMAHA BASIC II conforming to JIS B8439 (SLIM language)	
	Multi-task	Max. 16 tasks	
	Sequence program	1 program	
	Memory capacity	2.1MB (Total of program and point data) (Available capacity for program when the maximum number of points is used: 300KB)	
	Program	100 programs (maximum number of programs) 9999 lines (maximum number of lines per program)	
	Point	30000 points (maximum number of points)	
	Point teaching method	MDI (coordinate data input), direct teaching, teaching playback, offline teaching (data input from external unit)	
	System backup (Internal memory backup)	Lithium battery (service life about 4 years at 0 to 40°C)	
External I/O	Internal flash memory	512 KB	
	SAFETY	Input	Emergency stop ready input, 2 systems Auto mode input, 2 systems (Enabled only when the global specifications are used.)
		Output	Emergency stop contact output, 2 systems Enable contact output, 2 systems (Enabled only when the PBX-E is used.) Motor power ready output, 2 systems
	Brake output	Transistor output (PNP open collector)	
	Origin sensor input	Connectable to 24V DC B-contact (normally closed) sensor	
	External communications		RS-232C: 1CH (D-SUB 9-pin (female)) Ethernet: 1CH (In conformity with IEEE802.3u/IEEE802.3) 100Mbps/10Mbps (100BASE-TX/10BASE-T) Applicable to Auto Negotiation
			RS-422: 1CH (Dedicated to PBX)

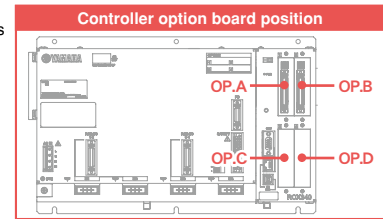
Controllable robot	XY-X P363	YK-X P491	FLIP-X P295	PHASER P341	YP-X P553
CE marking	Field networks				

Ordering method

RCX340								
Controller	No. of controllable axes	Safety standards	Controller option A (OP.A)	Controller option B (OP.B)	Controller option C (OP.C)	Controller option D (OP.D)	Controller option E (OP.E)	
	4: 4 axes 3: 3 axes 2: 2 axes	N: Normal E: CE K: KCs	No entry: Non-selection NS: STD.DIO(NPN) Note 1 Note 4 NE: EXP.DIO(NPN) Note 2 Note 4 PS: STD.DIO(PNP) Note 1 Note 4 PE: EXP.DIO(PNP) Note 2 Note 4 GR: Gripper TR: Tracking Note 5 YM1: YC-Link/E master Note 6 YS2 to 4: YC-Link/E slave Note 6 EP: EtherNet/IP™ Note 7 PB: PROFIBUS Note 7 CC: CC-Link Note 7 DN: DeviceNet™ Note 7 PT: PROFINET Note 7 ES: EtherCAT Note 7	No entry: Non-selection NE: EXP.DIO(NPN) Note 2 Note 4 PE: EXP.DIO(PNP) Note 2 Note 4 GR: Gripper TR: Tracking Note 5 YM1: YC-Link/E master Note 6 YS2 to 4: YC-Link/E slave Note 6 EP: EtherNet/IP™ Note 7 PB: PROFIBUS Note 7 CC: CC-Link Note 7 DN: DeviceNet™ Note 7 PT: PROFINET Note 7 ES: EtherCAT Note 7	No entry: Non-selection NE: EXP.DIO(NPN) Note 2 Note 4 PE: EXP.DIO(PNP) Note 2 Note 4 GR: Gripper TR: Tracking Note 5 YM1: YC-Link/E master Note 6 YS2 to 4: YC-Link/E slave Note 6 EP: EtherNet/IP™ Note 7 PB: PROFIBUS Note 7 CC: CC-Link Note 7 DN: DeviceNet™ Note 7 PT: PROFINET Note 7 ES: EtherCAT Note 7	No entry: Non-selection NE: EXP.DIO(NPN) Note 2 Note 4 PE: EXP.DIO(PNP) Note 2 Note 4 GR: Gripper TR: Tracking Note 5 YM1: YC-Link/E master Note 6 YS2 to 4: YC-Link/E slave Note 6 EP: EtherNet/IP™ Note 7 PB: PROFIBUS Note 7 CC: CC-Link Note 7 DN: DeviceNet™ Note 7 PT: PROFINET Note 7 ES: EtherCAT Note 7	No entry: Non-selection WY: with RCXiVY2+, without lighting WL: with RCXiVY2+, with lighting	4: 4 pcs. 3: 3 pcs. 2: 2 pcs. 1: 1 pc. 0: 0 pc.

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

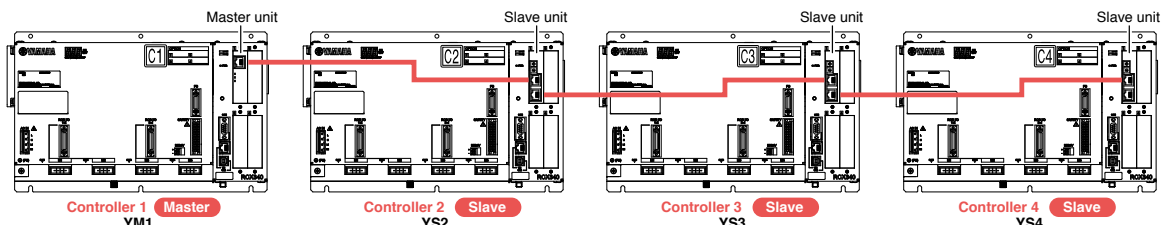
- Note 1. [STD.DIO] Parallel I/O board standard specifications
Dedicated input 8 points, dedicated output 9 points, general-purpose input 16 points, general-purpose output 8 points
Do not mix with field bus (CC/DN/PB/EP/PT/ES).
- Note 2. [EXP.DIO] Parallel I/O board expansion specifications
General-purpose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



Item		RCX340	
General specifications	Operating temperature	0 to 40°C	
	Storage temperature	-10 to 65°C	
	Operating humidity	35 to 85% RH (no condensation)	
	Noise immunity	Conforms to IEC61000-4-4 Level 3	
	Protective structure	IP20	
	Appliance classes	Class I	
Options	Parallel I/O board	Standard specifications	Dedicated input 8 points, dedicated output 9 points General-purpose input 16 points, general-purpose output 8 points NPN/PNP specifications are selected. (maximum 1 board)
		Expansion specifications	General-purpose input 24 points, general-purpose output 16 points NPN/PNP specifications are selected. (maximum 4 boards)
	Option board	CC-Link board Ver1.1/2.0	Remote I/O
		DeviceNet™ board	Dedicated input/output: 16 points each General-purpose input/output: 96 points each
		EtherNet/IP™ board	Remote register
		PROFIBUS board	Input/output: 16 words each
		PROFINET board	
	EtherCAT board		
	YC-Link/E board (master/slave)	Communication cycle: 1 ms, control cycle: minimum 1 ms / maximum 8 ms, maximum number of robot units: four units Maximum number of control axes: total 16 axes (including four master controller axes), maximum 12 axes for slaves only	
	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)		
RCXiVY2+ unit	Camera pixels: maximum 5 million pixels, number of registered models: 254 models, number of connected cameras: maximum two units Power supply: DC24V +/-10% 1.5A Max		
Programming box	PBX, PBX-E		
Absolute battery	3.6V 2700mAh / axis Backup retention time: About 1 year		
Support software for personal computer	RCX-Studio 2020		

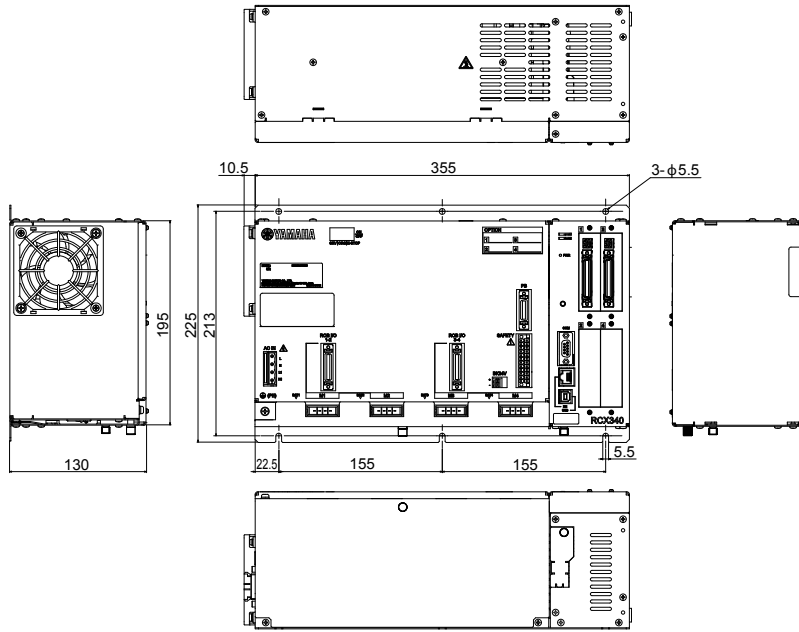
Note. There are four slots in which option boards can be installed.

YC-Link/E ordering explanation



* For customers who export robot controllers to Korea, connecting the RCX340 or RCX320 to the RCX340 using the YC-Link/E may not be compliant with the KCs system. Please contact us when considering such connections.

■ 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					Power capacity (VA)	Generated heat amount (W)
Standard type	Clean type	Dust-proof & drip-proof type	Ceiling-mount	Wall-mount / Inverse type		
YK120XG, YK150XG	-	-	-	-	300	58
YK180XG, YK180X, YK220X	YK180XC, YK220XC	-	-	-	500	63
YK250XG, YK350XG, YK400XG, YK500XGL, YK600XGL, YK400XE-4	YK250XCH, YK350XCH, YK400XCH, YK250XGC, YK350XGC, YK400XGC, YK500XGLC, YK600XGLC	YK250XGP, YK350XGP, YK400XGP, YK500XGLP, YK600XGLP	-	YK300XGS, YK400XGS	1000	75
-	YK500XC, YK600XC	-	-	-	1500	88
YK500XE-10, YK500XG, YK610XE-10, YK600XG, YK710XE-10, 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)

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

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

Axial current sensor value ^{Note}			Power capacity (VA)	Generated heat amount (W)
X axis	Y axis	Z axis		
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

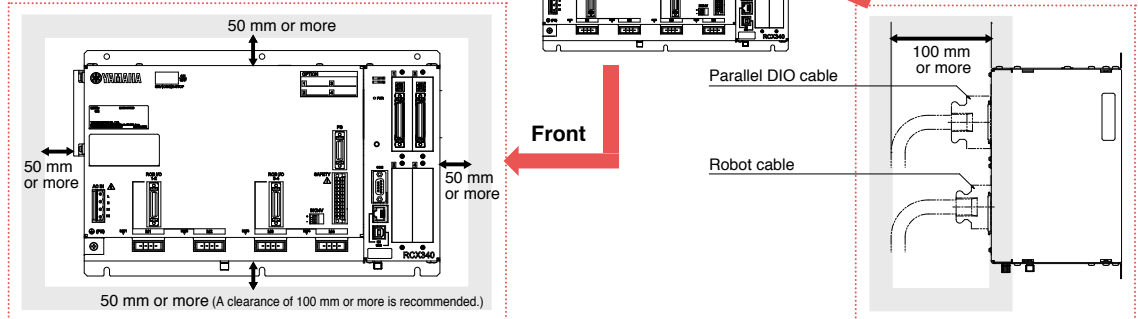
(4) When connected to 4 axis (Cartesian robot and/or multi-axis robot)

Axial current sensor value ^{Note}				Power capacity (VA)	Generated heat amount (W)
X axis	Y axis	Z axis	R axis		
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
1	DI 01	Dedicated input: Servo ON input	
2	DI 10	Dedicated input: Sequence control	
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	
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 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 Sequence program-in-progress	
21	DO 13	Dedicated output Robot program-in-progress	
22	DO 14	Dedicated output Program reset status 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: Automatic operation start	
27	DI 13	Spare	Do not use.
28	DI 14	Dedicated input: Return-to-origin (for INC axis)	
29	DI 15	Dedicated input: Program reset input	
30	DI 16	Dedicated input: Alarm reset input	
31	DI 17	Dedicated input: Return-to-origin (for ABS axis)	
32	DI 30	General-purpose input 30	
33	DI 31	General-purpose input 31	
34	DI 32	General-purpose input 32	
35	DI 33	General-purpose input 33	
36	DI 34	General-purpose input 34	
37	DI 35	General-purpose input 35	
38	DI 36	General-purpose input 36	
39	DI 37	General-purpose input 37	
40	CHK 2	Check signal 2	Short-circuit with CHK1.
41	DO 02	Dedicated output: Servo ON output	
42	DO 03	Dedicated output: Alarm output	
43	DO 20	General-purpose output 20	
44	DO 21	General-purpose output 21	
45	DO 22	General-purpose output 22	
46	DO 23	General-purpose output 23	
47	DO 24	General-purpose output 24	
48	DO 25	General-purpose output 25	
49	DO 26	General-purpose output 26	
50	DO 27	General-purpose output 27	

Expanded specification I/O connector signal list

Pin	I/O No. (ID=1)	I/O No. (ID=2)	I/O No. (ID=3)	I/O No. (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	DI 124	General-purpose input 14,44,74,124
29	DI 15	DI 45	DI 75	DI 125	General-purpose input 15,45,75,125
30	DI 16	DI 46	DI 76	DI 126	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	DI 142	General-purpose input 32,62,112,142
35	DI 33	DI 63	DI 113	DI 143	General-purpose input 33,63,113,143
36	DI 34	DI 64	DI 114	DI 144	General-purpose input 34,64,114,144
37	DI 35	DI 65	DI 115	DI 145	General-purpose input 35,65,115,145
38	DI 36	DI 66	DI 116	DI 146	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	---	---	---	---	Reserved
43	DO 20	DO 40	DO 60	DO 100	General-purpose output 20,40,60,100
44	DO 21	DO 41	DO 61	DO 101	General-purpose output 21,41,61,101
45	DO 22	DO 42	DO 62	DO 102	General-purpose output 22,42,62,102
46	DO 23	DO 43	DO 63	DO 103	General-purpose output 23,43,63,103
47	DO 24	DO 44	DO 64	DO 104	General-purpose output 24,44,64,104
48	DO 25	DO 45	DO 65	DO 105	General-purpose output 25,45,65,105
49	DO 26	DO 46	DO 66	DO 106	General-purpose output 26,46,66,106
50	DO 27	DO 47	DO 67	DO 107	General-purpose output 27,47,67,107

Note. The IDs are set using the parameter.

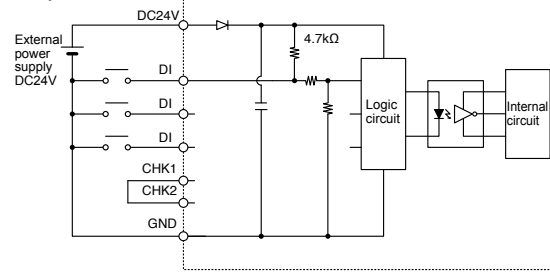
Articulated robots YA
 Linear conveyor modules LCM
 Single-axis robots CX
 Motor-less single-axis robots Robotomy
 Compact single-axis robots TRANSERO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & place robots YP-X
 CLEAN CONTROLLER INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXIVY2+ Electric gripper
 Option

Standard specification I/O connector pin assignment lists

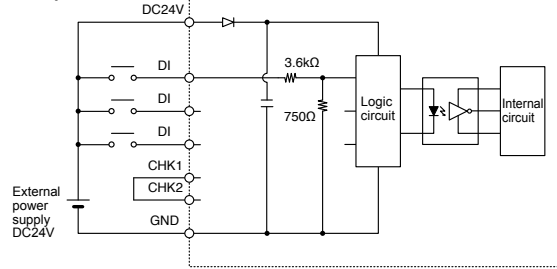
Pin	I/O No.	Name
1	DI01	Servo ON
2	DI10	SEQ enable
3	DI03	(Spare)
4	CHK1	Check input 1
5	DI05	(Spare)
6	DI06	STOP
7	DI07	(Spare)
8	DI20	General-purpose input
9	DI21	General-purpose input
10	DI22	General-purpose input
11	DI23	General-purpose input
12	DI24	General-purpose input
13	DI25	General-purpose input
14	DI26	General-purpose input
15	DI27	General-purpose input
16	DO00	(Spare)
17	DO01	CPUOK
18	DO10	AUTO
19	DO11	ORGOK
20	DO12	SEQRUN
21	DO13	RUN
22	DO14	RESET
23	DO15	WARNING
24	DO16	(Spare)
25	DO17	(Spare)
26	DI12	RUN
27	DI13	(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	DI32	General-purpose input
35	DI33	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
42	DO03	ALARM
43	DO20	General-purpose output
44	DO21	General-purpose output
45	DO22	General-purpose output
46	DO23	General-purpose output
47	DO24	General-purpose output
48	DO25	General-purpose output
49	DO26	General-purpose output
50	DO27	General-purpose output

Typical input signal connection

NPN specifications

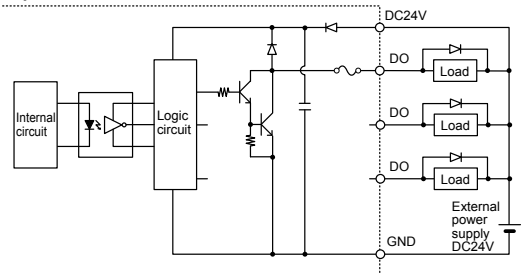


PNP specifications

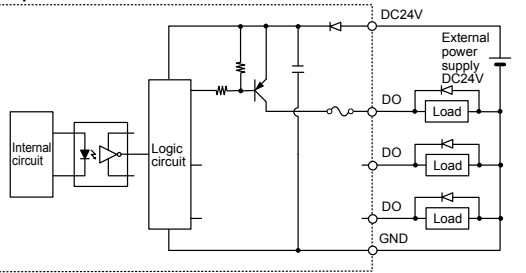


Typical output signal connection

NPN specifications



PNP specifications



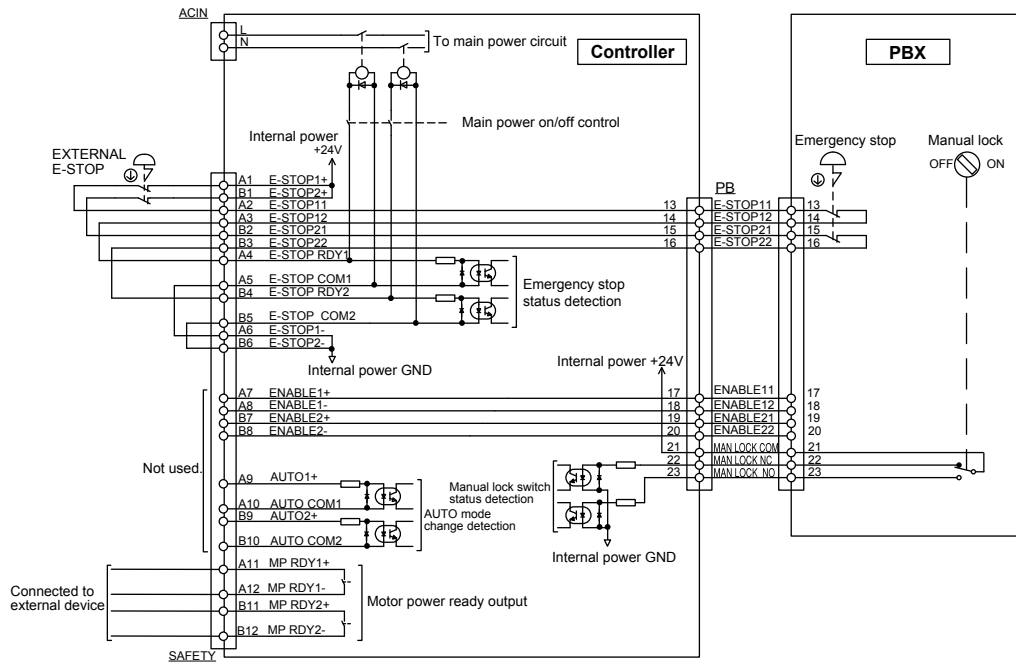
Basic functions

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

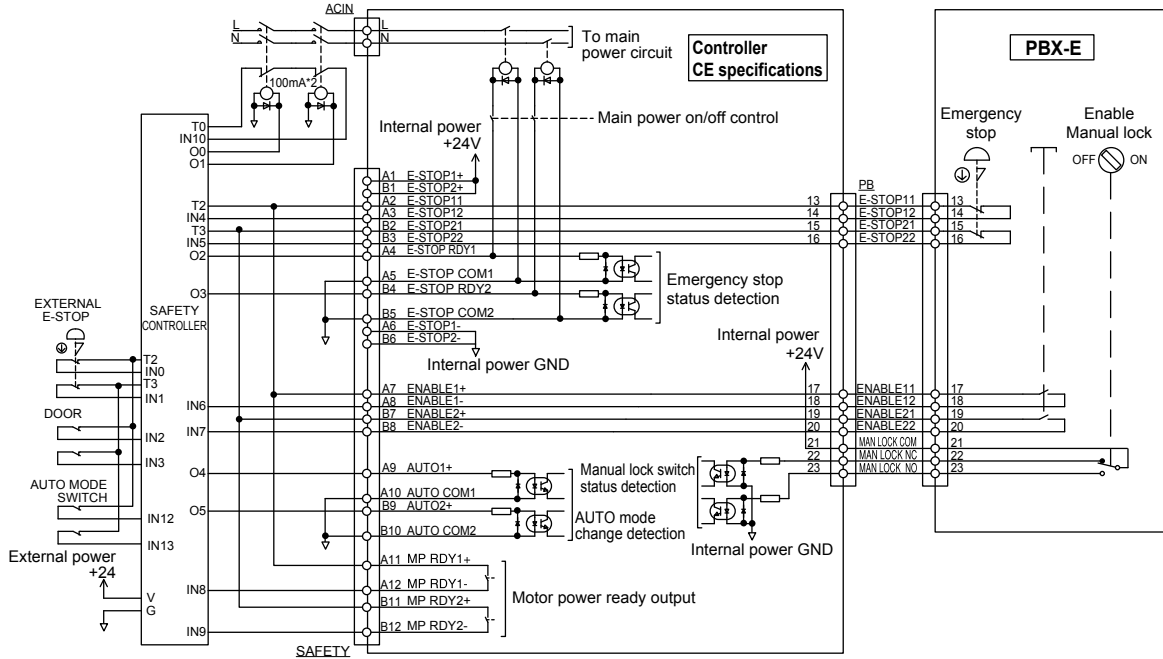
Emergency input signal connections

Articulated robots
 YA
 Linear conveyor modules
 LCM
 Single-axis robots
 CX
 Motor-less single axis actuator
 Robomity
 Compact single-axis robots
 TRANSERO
 Single-axis robots
 FLIP-X
 Linear motor single-axis robots
 PHASER
 Cartesian robots
 XY-X
 SCARA robots
 YK-X
 Pick & place robots
 YP-X
 CLEAN CONTROLLER INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXVY2+ Electric gripper
 Option

Connection example of controller with normal specifications and PBX



Connection example of controller with CE specifications and PBX-E



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

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. (↔JTOXY).

Branching commands

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

Error control

Command	Description
ERR / ERL	Acquires the error code number of an error which has occurred / the line number where an error occurred.
ON ERROR GOTO	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 a 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**

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
CURTQST	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.
MO	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.
TO	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.

Articulated robots YA
 Linear conveyer modules LCM
 Single-axis robots CX
 Motor-less single-axis actuator Robotomy
 Compact single-axis robots TRANSEVO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & place robots YP-X
 CLEAN CONTROLLER
 INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXIVY2+ Electric gripper
 Option

Accessories and part options



RCX340

Standard accessories

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

● Power connector + wiring connection lever



Model KAS-M5382-00

● Safety connector



Model KCX-M5370-00

- RCX320
- RCX340

● PBX terminator (dummy connector)

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



Model KFR-M5163-00

- RCX320
- RCX221
- RCX222
- RCX340

● NPN / PNP connector



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

- SR1-X
- SR1-P
- RCX320
- RCX340

● Absolute battery

Battery for absolute data back-up.

● Basic specifications

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



Model KCA-M53G0-02

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.

- RCX320
- RCX340
- TS-SH

Important Absolute battery installation conditions

1 batteries are required for each 1 axes.

● 1 battery.....Data storage time of approximately 6 months (with no power applied)

Note. No absolute battery is required for the incremental or semi-absolute axis.

● Dust cover for COM connector

Model KR7-M5395-10

- RCX320
- RCX340

● Dust cover for LAN connector

Model KCX-M658K-10

- RCX320
- RCX340

● Dust cover for USB connector

Model KCX-M658K-00

- RCX320
- RCX340

Options

- **External 24V power supply connector for brake + wiring lever**



Model	KCX-M6500-10	RCX340
-------	--------------	---------------

- **Programming box PBX/PBX-E**

P.701



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

Type	Language	Cable length	Model	RCX320	RCX340
PBX	Japanese	5m	KCX-M5110-1J		
		12m	KCX-M5110-3J		
	English	5m	KCX-M5110-1E		
		12m	KCX-M5110-3E		
	Chinese	5m	KCX-M5110-1C		
		12m	KCX-M5110-3C		
PBX-E (with enable switch)	Japanese	5m	KCX-M5110-0J		
		12m	KCX-M5110-2J		
	English	5m	KCX-M5110-0E		
		12m	KCX-M5110-2E		
	Chinese	5m	KCX-M5110-0C		
		12m	KCX-M5110-2C		
			Model		
Display language switching USB for PBX			KCX-M6498-00		
USB cable			KCX-M657E-00		

- **Support software for PC RCX-Studio 2020**

P.696



USB key

This is support software for operating the RCX320 / RCX340 controller. A USB key is supplied to the RCX-Studio 2020 to prevent robot operation mistakes.



Model	RCX-Studio 2020 Basic (USB key blue)	KCX-M4990-40	RCX320	RCX340
	RCX-Studio 2020 Pro (USB key purple)	KCX-M4990-50		

Note. Even when there is no USB key, RCX-Studio 2020 can be used as function restricted version. For details about the functions of the function restricted, Basic, and Pro versions, see P.696.

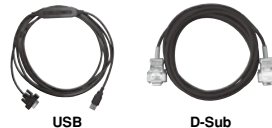
- **Basic specifications**

Supported language	Japanese, English, Chinese
OS ^{Note1}	Microsoft Windows 7 SP1(32/64bit) / 8.1 (32 bit / 64 bit) / 10 (32 bit / 64 bit)
Execution environment	.NET Framework 4.5 or more
CPU	Recommended: Intel Core i5 2 GHz or more, Minimum: Intel Celeron 2 GHz or more, 3D-SIM is invalid.: Intel Core 2 Duo 2 GHz or more
Memory	Recommended: 8 GB or more, Minimum: 4 GB or more, 3D-SIM is invalid: 1 GB or more
Hard disk capacity	1GB of available space required on installation drive
Communication Port	Communication cable: Serial communication port, Ethernet port, or USB port
Others	Dedicated commutation cable (For D-Sub or USB) Ethernet cable (category 5 or better) USB port: 1 port (For USB key)
Applicable robot controllers	RCX320 / RCX340
Applicable robot	YAMAHA robot that can be connected to the RCX340, RCX320.

Note. Microsoft, Windows 7, Windows 8.1, and Windows 10 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**

Communication cable for RCX-Studio 2020. Select from USB cable or D-sub cable.



USB

D-Sub

[RCX320/RCX340]
 Ethernet cable (category 5 or higher) is also supported.

Model	USB type (5m)	KBG-M538F-00	LCC140
	D-Sub type 9pin-9pin (5m)	KAS-M538F-10	ERCD
			SR1-X
			SR1-P
			RCX320
			RCX221
			RCX222
			RCX340

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

- **YC-Link/E master board**

Model	KCX-M4400-M0	RCX320	RCX340
-------	--------------	---------------	---------------

- **YC-Link/E slave board**

Model	KCX-M4400-S0	RCX320	RCX340
-------	--------------	---------------	---------------

- **YC-Link/E cable (1m)**

Model	KCX-M6479-10	RCX320	RCX340
-------	--------------	---------------	---------------

Articulated robots
YA
 Linear conveyor modules
LCM
 Single-axis robots
CX
 Motor-less single axis actuator
Robonity
 Compact single-axis robots
TRANSEVO
 Single-axis robots
FLIP-X
 Linear motor single-axis robots
PHASER
 Cartesian robots
XY-X
 SCARA robots
YK-X
 Pick & place robots
YP-X
CLEAN
CONTROLLER
INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXVY2+ Electric gripper
Option

Support software for PC

TS-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 P.626
- TS-X
- TS-P

- TS-SD P.636

■ 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.

- Only clicking relevant icon will show the operation panel or I/O monitor.
- JOG movement, inching operation, and current position acquisition buttons.
- Turns ON or OFF the operation point monitoring.
- Shows the data in easy-to-read tabular format. Exchanging data with a spreadsheet application, such as Excel is also easy.
- Operation panel for servo status, brake ON/OFF, and stop.
- Shows the servo or emergency stop status, and operation mode.
- Shows the current position at real-time.

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.

Real-time traceable items (up to four items)		
• Voltage value	• Commanded position	• Current position
• Command speed	• Current speed	• Internal temperature
• Command current value	• Present current value	• Motor load factor
• Input/output I/O status	• Input pulse count *1	• Movement pulse count *1
• Word input/output status*2		

*1: Only on TS-SD *2: Only on TS controllers

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

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.

- I/O status monitor panel
- Detailed status monitor panel

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.

- Point data list
- Operation setting list
- Result display list
- Displays the detailed simulation results graphically.

■ TS-Manager



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

■ TS-Manager environment

OS	Windows 2000, XP (32bit), Vista, 7, 8 / 8.1, 10 (Supported version: V.1.4.5 or later)
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 series

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.



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

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

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

YA	Articulated robots
LCM	Linear CONVEYOR modules
CX	Single-axis robots
Robonity	Motor-less single axis actuator
TRANSEVO	Compact single-axis robots
FLIP-X	Single-axis robots
PHASER	Linear motor single-axis robots
XY-X	Cartesian robots
YK-X	SCARA robots
YP-X	Pick & Place robots
CLEAN	
CONTROLLER	
INFORMATION	
	Robot positioner
	Pulse string driver
	Robot controller
	RCA+VYZ Electric gripper

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.620**

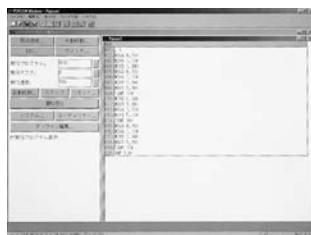
ERCD **P.646**

SR1-X **P.652**
SR1-P

■ Features

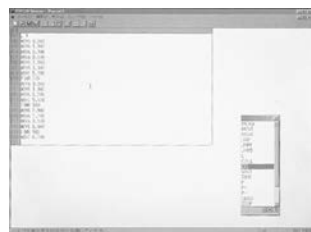
1 Easy to use

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.



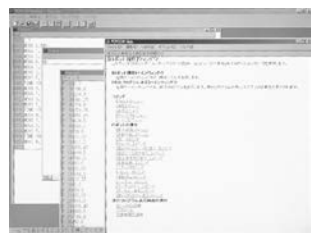
3 Point editing

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).

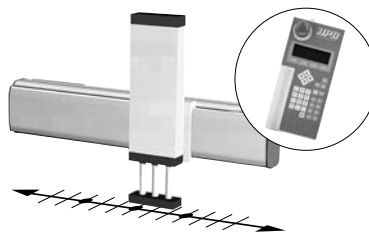


6 Creating point data

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.



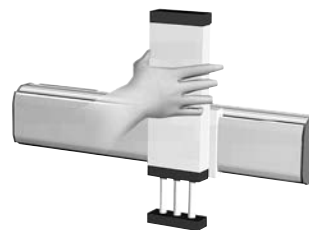
● Remote teaching

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+ software model | KBG-M4966-00

■ POPCOM+ environment

OS	Windows XP (32bit), Vista, 7, 8 / 8.1, 10 (Supported version: V.2.1.1 or later)
CPU	Processor that meets or exceeds the suggested requirements for the OS being used.
Memory	Suggested amount of memory or more for the OS being used.
Hard disk	50MB of available space required on installation drive.
Disk operation	RS-232C
Applicable controllers	SRCX to SR1, DRCX, TRCX, ERCX, ERCD, 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 (5m)

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



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

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

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

- Articulated robots YA
- Linear conveyors LCM
- Single-axis robots CX
- Motor-less single axis actuator Robonity
- Compact single-axis robots TRANSERO
- Single-axis robots FLIP-X
- Linear motor PHASER
- Cartesian robots XY-X
- SCARA robots YK-X
- Pick & Place robots YP-X
- CLEAN
- CONTROLLER
- INFORMATION
- Robot positioner
- Pulse string driver
- Robot controller
- RCX+VYZ Electric gripper
- Option

Support software for PC

VIP+ Windows

Visual Integrated Programming

▼Applicable controllers

RCX221
RCX222

P.670

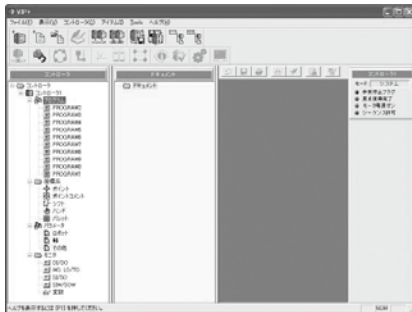
VIP+ is an easy to operate application software that makes tasks such as robot operation, writing-editing programs, and point teaching easy to visually understand.



■ 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.



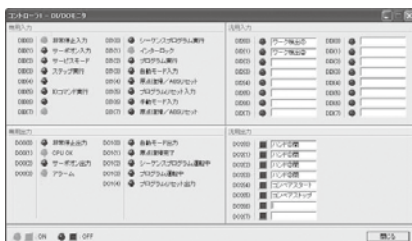
3 Fully equipped tool bar

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. In the advanced mode, it is also possible to attach any label (Note) to general purpose input/output and others.



Note. The label is stored in PC.

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.



Select the data to be stored.

Drag the selected data to the document window and drop it there.

Specify the file name and this completes the storage procedure.

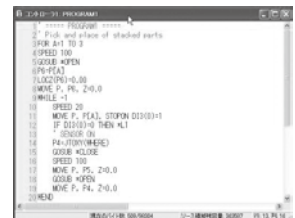
6 Input the data in the work sheet form (Parameter, Point data)

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



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.



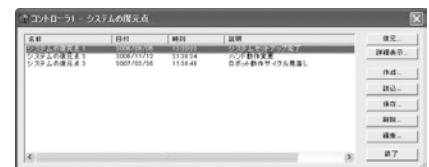
8 Program execution monitor

The step being performed during the program execution can be monitored. Thus, it is possible 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)

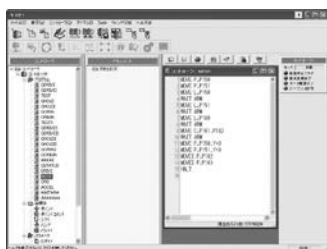
It is possible to create the system restoration point at any timing. By doing so at important points in the system constructing process when, for example, something faulty is found after the system was changed, the system can be returned to the state before such change easily.



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.



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.



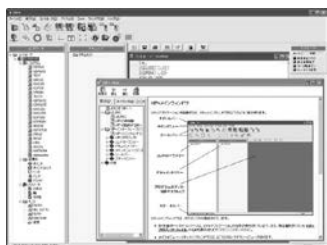
3 Data check function

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



4 Help function

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



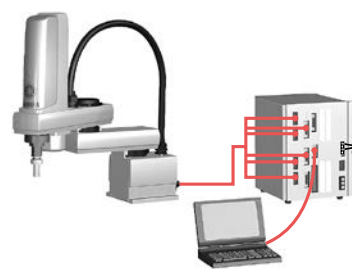
5 Robot operation

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



6 On-line editing

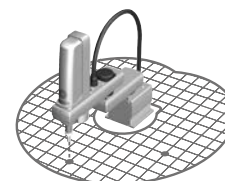
Connecting a PC and the controller with a communication cable enable to edit data from robot controllers just as with RPB / RPB-E.



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.



● **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.

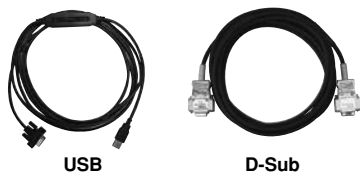
Support software for PC VIP+



Model	KX0-M4966-00
-------	--------------

Data cables (5m)

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



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

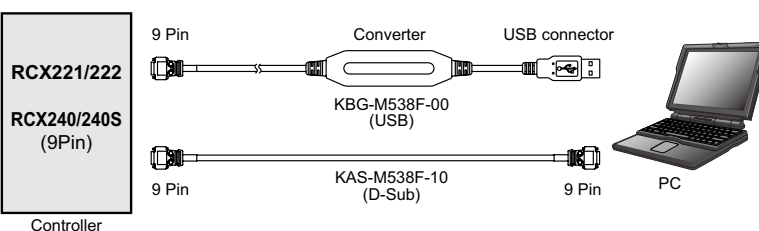
Note. This USB cable supports Windows 2000/XP or later.
 Note. Data cable jointly used for POPCOM+, VIP+, RCX-Studio Pro.
 Note. USB driver for communication cable can also be downloaded from our website.

Environment

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

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

Controller and data cable connection diagrams



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

Option details

Support software for PC

RDV-Manager

▼Applicable controllers

RDV-X
RDV-P

P.640

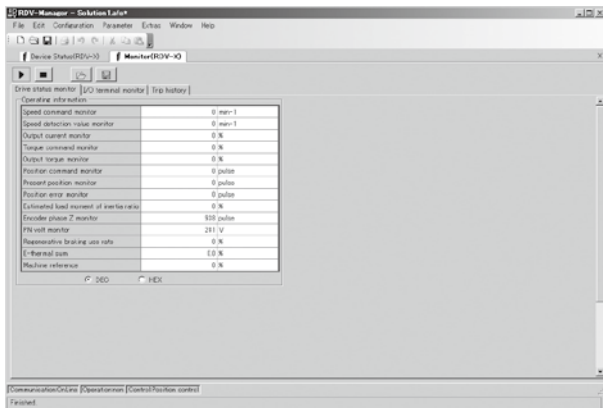
RDV-Manager is software for RDV-X/RDV-P. Using the Windows operating computer, it is possible to set parameters, to monitor the position, speed and torque and to have graphics displayed, assuring pleasant and easy operation in the Windows Vista, Windows 7 or Windows 8 / Windows 8.1 environment.



Features

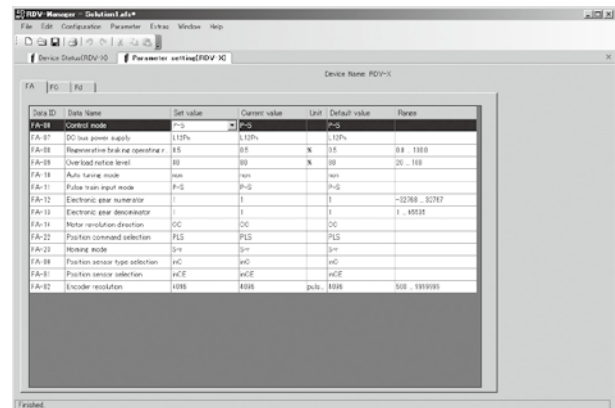
1 Monitoring function

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.



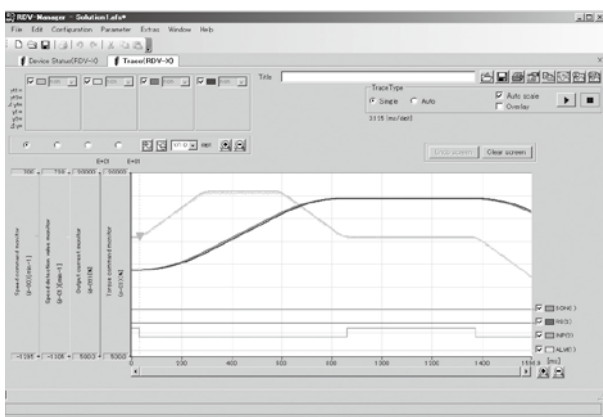
2 Setting parameters

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



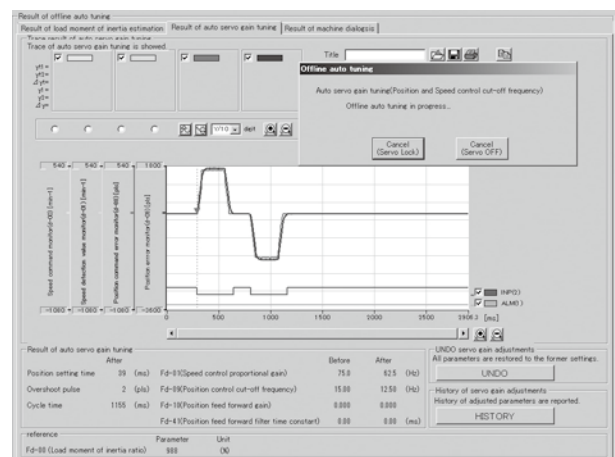
3 Operation tracing function

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

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



Model KEF-M4966-00

Environment

OS	Windows Vista SP1 (32bit) ^{Note 1} , 7, 8 / 8.1, 10
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 series

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

Note. Windows is the registered trademark of US Microsoft Corporation 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-01

Articulated robots YA
Linear conveyor modules LCM
Single-axis robots GX
Motorless single axis actuator Robomity
Compact single-axis robots TRANSEVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & Place robots YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXVY2+ Electric gripper
Option

Support software for PC

RCX-Studio 2020

▼Applicable controllers

RCX320 **P660**

RCX340 **P678**

New functions such as 3D simulator function and program template (program template automatic creation function) are added for ease of user operation.



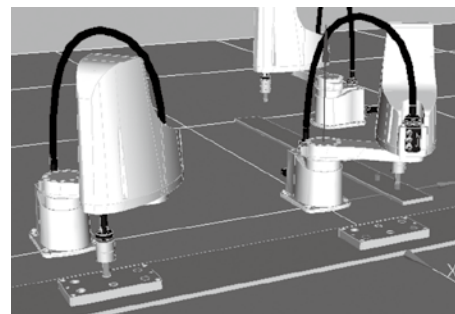
■ Features

1 3D simulator

● Layout can be verified beforehand without connecting robot

Robots and peripheral devices are displayed in 3D, and the robot operation is simulated on PC.

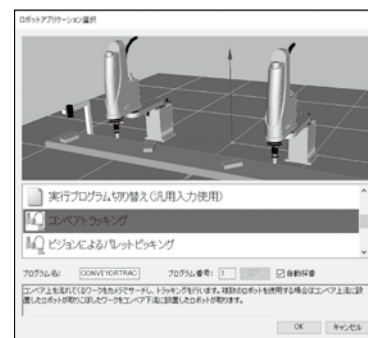
- ▶ Robot layout, teaching, and debugging can be performed.
- ▶ Physical interference between the robot and peripheral device can be checked before operation is started.



2 Program template (Program template automatic creation function)

● Program creation time can be shortened greatly.

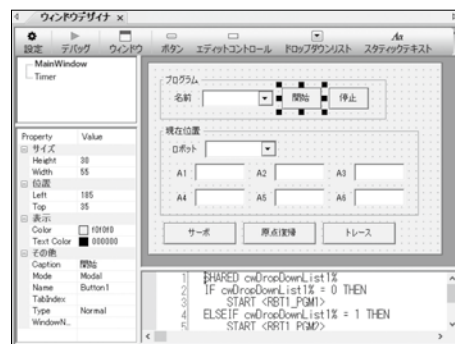
Program templates for 10 types of applications are incorporated. Just following the steps to perform the operation creates a program template automatically.



3 Custom window creation

● Operation screens suitable for the customer's equipment can be created.

GUIs for operators that are displayed on the panel computer can be created.



4 Other existing functions

All useful features from RCX-Studio Pro are succeeded to help supporting from startup to maintenance.

Cycle time calculator

Real time trace

Data comparison



RCX-Studio 2020 software

Software can be downloaded from YAMAHA's WEB site (member site) together with RCX-Studio 2020 Basic or RCX-Studio 2020 Pro.



Basic specifications

Product name	RCX-Studio 2020 Basic	RCX-Studio 2020 Pro
Type ^{Note1}	KCX-M4990-40	KCX-M4990-50
License management	USB key (blue) ^{Note2}	USB key (purple)
Supported language	Japanese, English, Chinese	
OS ^{Note3}	Microsoft Windows 7 SP1(32/64bit) / 8.1 (32 bit / 64 bit) / 10 (32 bit / 64 bit)	
Execution environment	.NET Framework 4.5 or more	
CPU	Recommended: Intel Core i5 2 GHz or more, Minimum: Intel Celeron 2 GHz or more, 3D-SIM is invalid.: Intel Core 2 Duo 2 GHz or more	
Memory	Recommended: 8 GB or more, Minimum: 4 GB or more, 3D-SIM is invalid: 1 GB or more	
Hard disk capacity	1GB of available space required on installation drive	
Communication Port	Communication cable: Serial communication port, Ethernet port, or USB port	
Others	Dedicated commutation cable (For D-Sub or USB) Ethernet cable (category 5 or better) USB port: 1 port (For USB key)	
Applicable controller	RCX340/RCX320	
Applicable robot	YAMAHA robot that can be connected to the RCX340, RCX320.	

Note 1. This shows the software package type. The software is common to two products and can be downloaded from YAMAHA's WEB site.

Note 2. Common to the conventional model RCX-Studio Pro.

Note 3. Microsoft, Windows 7, Windows 8.1, and Windows 10 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.

USB key

A USB key is supplied to the RCX-Studio 2020 to prevent irregular movement of robots. There will be limitations of software functions (see below chart):

Functions	When the USB key is not connected	RCX-Studio 2020 Basic (blue) ^{Note.}	RCX-Studio 2020 Pro (purple) ^{Note.}
Backup/restore via data transfer	Valid	Valid	Valid
Controller operation in online mode	Invalid	Valid	Valid
File save	Invalid	Valid	Valid
Real Time Trace	Only data save is invalid.	Valid	Valid
Cycle Time Calculator	Starting only (No calculating)	Valid	Valid
iVY2 editor	Starting only (No connecting)	Valid	Valid
Data Difference	Except data saving	Valid	Valid
3D simulator function	Only capturing is invalid.	Valid	Valid
Custom window	Valid	Valid	Valid
Program template	Only file output is invalid.	Valid	Valid
CAD data read	STL, OBJ, VRML	Valid	Valid
	STEP	Invalid	Valid
CAD to point conversion	Invalid	Invalid	Valid

Note. USB key color

Data cables (5m)

Communication cable for RCX-Studio 2020. Select from USB cable or D-sub cable



[RCX320/RCX340]
Ethernet cable (category 5 or higher) is also supported.

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

Note. This USB cable supports Windows 2000/XP or later.

Note. The communication cable is common to POPCOM+, VIP+, RCX-Studio Pro, and RCX-Studio 2020.

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

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

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

Handy terminal

HT1/HT1-D



▼Applicable controllers

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

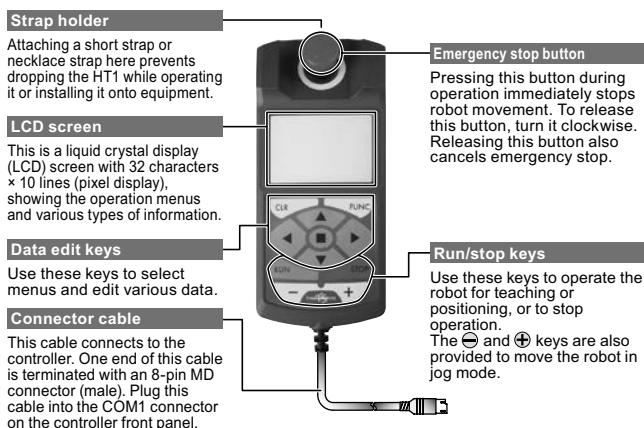
P.626

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.

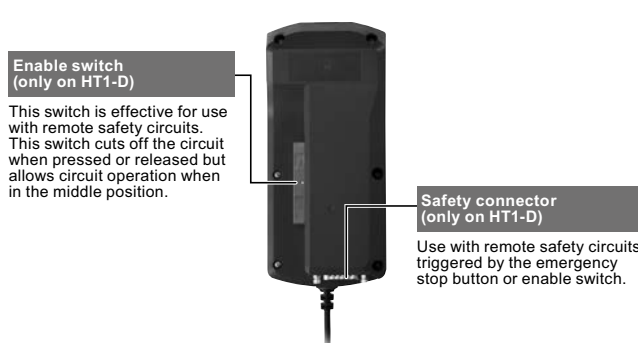
■ HT1 / HT1-D basic specifications

Name		HT1	HT1-D
External view			
Applicable controllers		TS-S2 / TS-SH / TS-X / TS-P	
Model	Japanese specifications	KCA-M5110-0J(3.5m) KCA-M5110-6J(10m)	KCA-M5110-1J(3.5m) KCA-M5110-7J(10m)
	English specifications	KCA-M5110-0E(3.5m) KCA-M5110-6E(10m)	KCA-M5110-1E(3.5m) KCA-M5110-7E(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.)	
Weight		260g (not including cable)	300g (not including cable)
Cable length		3.5m / 10m	

■ Part names and function



■ HT1-D rear side





Programming box

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 controllers	
LCC140	P.620
ERCD	P.646
SR1-X SR1-P	P.652

HPB / HPB-D basic specifications

Name	HPB	HPB-D
External view		
Model	Using with ERCD, SR1-X, SR1-P KBB-M5110-01 (without a conversion adaptor)	KBB-M5110-21 (without a conversion adaptor)
Display	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)	
Dimensions	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.

Strap hole
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".)

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-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 (KS9-M532E-00 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.

Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motor-less single axis actuator
Robonity

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCX+VYZ Electric gripper

Programming box

RPB/RPB-E



▼Applicable controllers

RCX221
RCX222 **P.670**

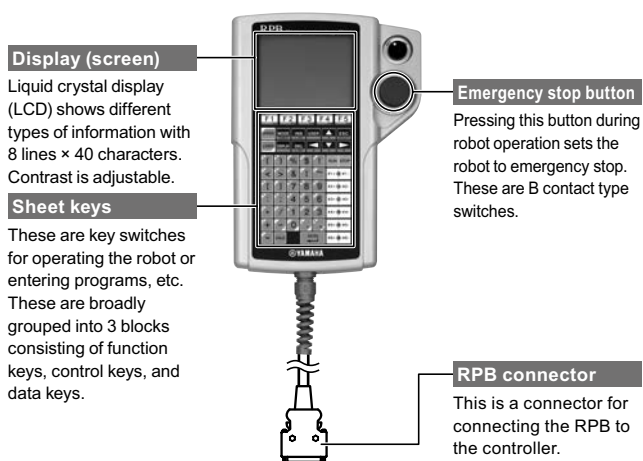
RCX240
RCX240S **P.762**

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.

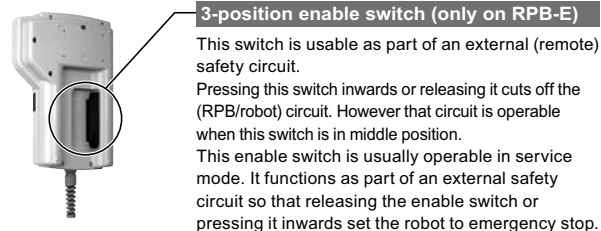
■ RPB / RPB-E basic specifications

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 stop button not included.)	
Weight	600g	
Cable length	5m (Standard), 12m (Options)	

■ Part names and function



■ RPB-E rear side



Programming box

PBX/PBX-E

▼Applicable controllers



RCX320 P.660

RCX340 P.678

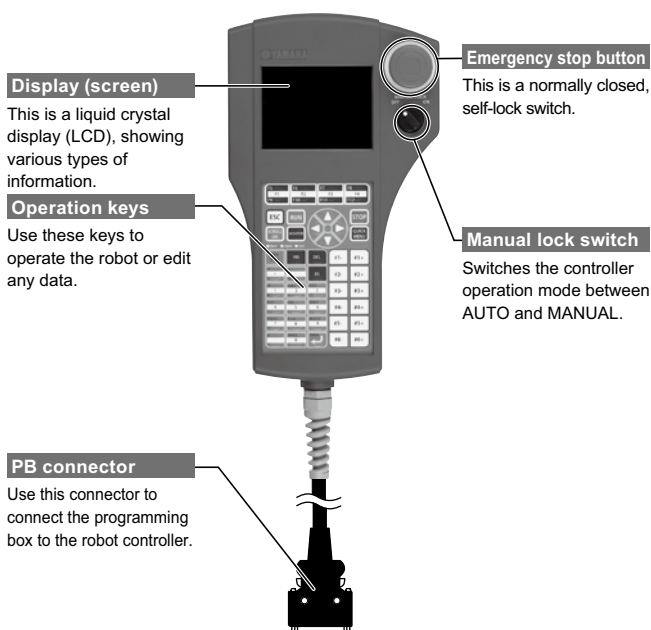
This programming box is applicable to three languages, “Japanese”, “English”, and “Chinese”. Use of a color display makes it possible to improve the visibility. Work to add or edit functions becomes easy, allowing even personnel without programming skill to operate this programming box.

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

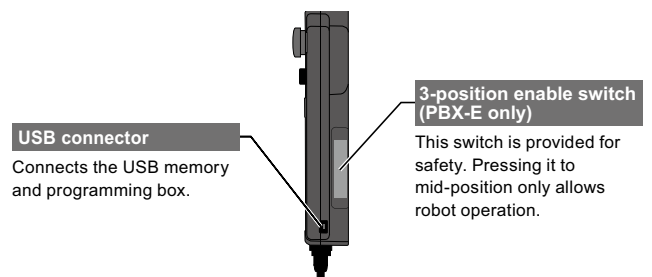
■ PBX/PBX-E basic specifications

Name	PBX	PBX-E	
External view			
Applicable controllers	RCX320 / RCX340		
Model	Japanese language model	KCX-M5110-1J (5m) KCX-M5110-3J (12m)	KCX-M5110-0J (5m) KCX-M5110-2J (12m)
	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)
Display screen	Color LCD (320 × 240 dot)		
Emergency stop button	Normally-closed contact (with lock function)		
Enable switch	Not provided	3-position type	
Manual lock selector switch	90°, 2-notch		
Power	+12 V DC		
Operating environment	Ambient temperature for use: 0 to 40 °C, Ambient temperature for storage: -10 to 60 °C Humidity: 35 to 80% (no condensation)		
Dimensions (mm)	W141 × H245 × D45 (excluding projecting parts)		
Cable length	5 m or 12 m (Select either)		
Weight	440 g (excluding the cable)	460 g (excluding the cable)	

■ Part names and function



■ PBX-E rear side



[Accessories]

■ Display language switching USB for PBX

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

* The data for updating the PBX (language switch data) can be downloaded from the website shown below.

<https://global.yamaha-motor.com/business/robot/download/>

Articulated robots
YALinear conveyor modules
LCMSingle-axis robots
CXMotor-less single axis actuator
RobomityCompact single-axis robots
TRANSEVOSingle-axis robots
FLIP-XLinear motor single-axis robots
PHASERCartesian robots
XY-XSCARA robots
YK-XPick & place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCX+VYZ Electric gripper

Option

Option details

LCD Monitor option

TS-Monitor

▼ Applicable controllers

TS-X
TS-P

P626



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.

The TS Monitor Advantage

Before installing TS Monitor



Without a handy terminal "HT1" and PC software "TS-Manager", the operator does not know what caused the alarm and it takes a time to find out the cause.

After installing TS-Monitor



MAIN-TS-MONITOR
02
ENCODER ERROR
DBG S POS: 0.000 mm

- Operator instantly knows various information without hooking to a handy terminal or PC.
- During errors the backlit display turns red and operator can see what error occurred on what controller at a glance.
- Display shows total operating time, so scheduling maintenance periods is easy.
- Backlit display is bright and easy to read even on dark panels.

Features

MAIN screen

Shows basic info
Displays optional name or character string.

Error

Desired character string specified by the user.
Simple status display
■ ON / □ OFF
Run mode
Current position

MAIN screen

Easy to see error messages
Red backlit display appears during alarms.

Alarm occurs.

Error or warning alarm number
Alarm name

Display	Meaning
S	Servo status
E	Emergency stop
P	Main power failure
O	Return-to-origin completion status
L	Interlock status
A	Alarm

Run mode	Meaning
NRM	Normal mode
MON	Monitor mode
DBG	Debug mode

I/O screen

Shows I/O status
Displays input/output bit states.

Input signal status
* Displays the status of input bit 0 to 15.

Output signal status
* Displays the status of output bit 0 to 15.

Bit signal correspondence table

	F	E	D	C	B	A	9	8
IN	SERVO	RESET	START	LOCK	ORG	MANUAL	JOG	JOG+
	7	6	5	4	3	2	1	0
	F	E	D	C	B	A	9	8
OUT	SRV-S	ALM	END	BUSY	OUT3	OUT2	OUT1	OUT0
	7	6	5	4	3	2	1	0
	POU17	POU16	POU15	POU14	POU13	POU12	POU11	POU10

INFORMATION screen

Shows machine info
Displays the connected robot and version.

Controller name
Controller software version
Robot name
Point type

STATUS screen

Shows status info
Info such as error status or movement status is all at a glance.

Status display
■ ON, □ OFF

Display	Meaning
SRV-S	Servo status
ORG-SEN	Origin sensor
TLM-S	Push status
MOVE	Move status
E-STOP	Emergency stop
P-BLK	Main power failure
ORG-S	Return-to-origin completion status
WARN	Warning output

CHECK screen

Shows operating status
Displays total drive distance (helpful for preventive maintenance).

Internal voltage of controller
Temperature inside controller
Total startup time of controller (Day : Hour : Minute)
Total movement distance of robot

RUN screen

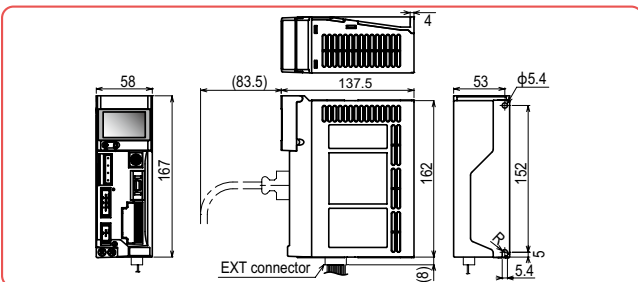
Shows operation status and data
Info includes position, speed, load factors and run type.

Run type
Robot current position
Run point
Robot operation speed
Load rate

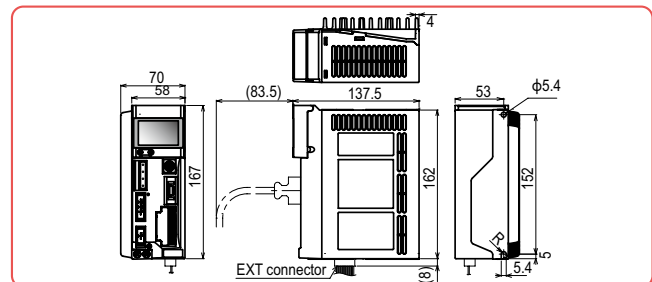
Display	Meaning
HOLD	Servo is off or robot is stopping
ABS	ABS
INC	INC
ABS MERGE	ABS merge operation
INC MERGE	INC merge operation
ABS PUSH	ABS push operation
INC PUSH	INC push operation
ABS->PUSH	ABS deceleration push operation
P-BLK	Main power failure
INC->PUSH	INC deceleration push operation
ORG	Return-to-origin

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

Model	TS-X	KCA-M5119-00
	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

Pro-face GP4000 series

▼Applicable controllers

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

P.626

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
<https://www.proface.com>

■ Features

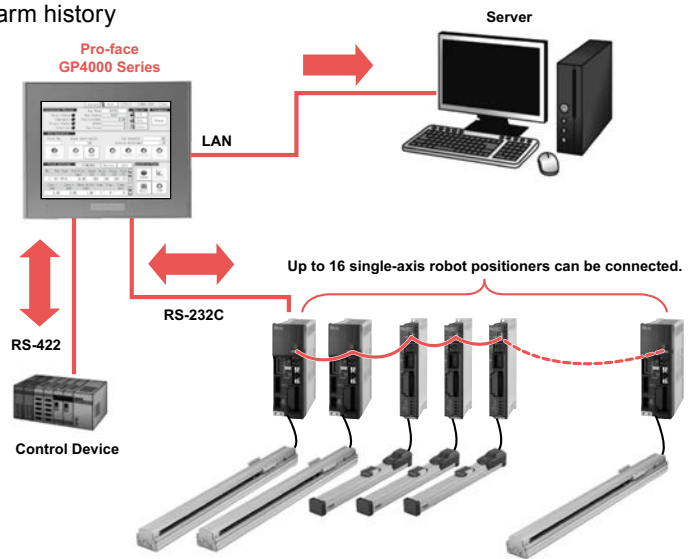
1 Can easily check a state and change settings.

- 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)

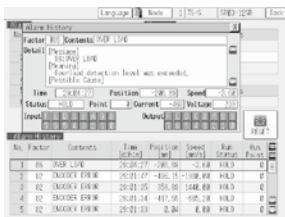
Without opening the control panel, you can check the status and change the settings on Touch Operator Interface alone.



■ Screen details

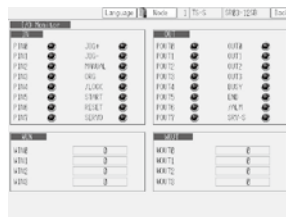
Diagnostic Screen

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



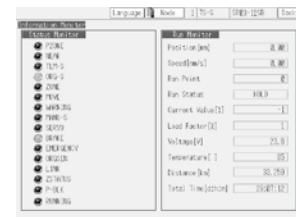
I/O Monitor Screen

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



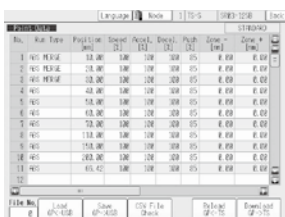
Information Monitor Screen

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



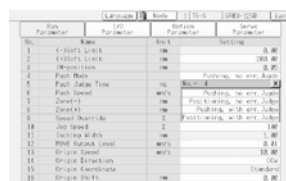
Position Data Editing Screen

You can edit and back up point data (255 points).
Note. Settings for it and a USB storage required.



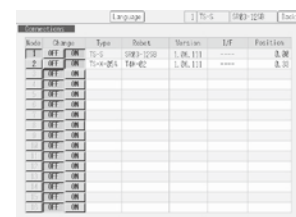
Parameter Editing Screen

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



Connecting Selection Screen

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



Contact; Pro-face web site (Schneider Electric Japan Holdings Ltd)
<https://www.proface.com>

Articulated robots
YA
Linear CONVEYOR modules
LCM
Single-axis robots
CX
Motor-less single axis actuator
Robotomy
Compact single-axis robots
TRANSEVO
Single-axis robots
FLIP-X
Linear motor single-axis robots
PHASER
Cartesian robots
XY-X
SCARA robots
YK-X
Pick & Place robots
YP-X
CLEAN
CONTROLLER INFORMATION
Robot positioner
Pulse string driver
Robot gripper
RCX-HV2 Electric gripper
Option

Field network system with minimal wiring

NETWORK

YHX

Each field path setting file can be downloaded from the website.
<https://global.yamaha-motor.com/business/robot/download/fieldbus/>

P.610

■ EtherNet/IP™ Basic specifications for network

Item	EtherNet/IP™
Applicable controllers	YHX
Network specifications	As specified for Ethernet (IEEE802.3)
Applicable EtherNet/IP™ specifications	Volume 1: Common Industrial protocol(CIP™) Edition 3.21 Volume 2: EtherNet/IP™ Adaptation Edition 1.22
Device type	Generic Device (device number 43)
Communication speed	10Mbps / 100 Mbps
Connector specifications	RJ-45 connector (8-pole modular connector), 2 ports
Cable specifications	EtherNet/IP™ Refer to "2.1 LAN cable" in Chapter 2 of this user's manual.
Maximum cable length	100 m
Input/output data size	Input: 1408byte (704 words) Output: 1408byte (704 words)
Setting of IP address, etc.	Set from YHX-Studio
Monitor LED	Module Status(MS), Network Status(NS), Link/Activity: Port1-2

■ PROFINET® Basic specifications for network

Item	PROFINET
Applicable controllers	YHX
Network specification conformance	PROFINET IO V2.33
Conformance class	Conformance Class C
Vendor Name/Vendor_ID	YAMAHA Motor co., Ltd. / 0x02D5
Station Type/Device_ID	YAMAHA-YHX-HCU / 0x002B
Product revision	1.00
Communication speed	100Mbps
Connector specifications	RJ-45 connector (8-pole modular connector), 2 ports
Cable specifications	STP cable (double shield) with CAT 5e or higher
Maximum cable length	100 m
Input/output data size	Input: 1408byte (704 words) Output: 1408byte (704 words)
Monitor LED	Module Status(MS), Network Status(NS), Link/Activity: Port1-2

■ EtherCAT® Basic specifications for network

Item	EtherCAT
Applicable controllers	YHX
ESI file name	YAMAHA YHX EtherCAT 1_01.xml
Communication speed	100Mbps
Connector specifications	RJ-45 connector (8-pole modular connector) 2 ports
Cable specifications	STP cable (double shield) with CAT 5e or higher
Maximum cable length	100 m
Input/output data size	Input: 1408byte (704 words) Output: 1408byte (704 words)
Monitor LEDs	RUN, ERROR, Link/Activity:Port1-2

■ CC-Link Basic specifications for network

Item	CC-Link
Applicable controllers	YHX
CC-Link compatible version	Ver. 2.00
Remote station type	Remove device station
Number of occupied stations	Fixed to 4 stations
Station number	1 to 61
Communication speed	10Mbps, 5Mbps, 2.5Mbps, 625kbps, 156kbps
Shortest length between stations	0.2 m or more
Total length	100m/10Mbps, 150m/5Mbps, 200m/2.5Mbps, 600m/625kbps, 1200m/156kbps
Input/output data size	Input: 368byte (184 words) Output: 368byte (184 words)
Monitor LED	L RUN, L ERROR

Field network system with minimal wiring

NETWORK

LCC140

Each field path setting file can be downloaded from the website.
<https://global.yamaha-motor.com/business/robot/download/fieldbus/>

P.620

CC-Link Basic specifications for network

Item	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

DeviceNet Basic specifications for network

Item	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

Item	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

Articulated
robots
YALinear conveyor
modules
LCMSingle-axis robots
CXMotor-less single
axis actuator
RobotityCompact
single-axis robots
TRANSEVOSingle-axis robots
FLIP-XLinear motor
single-axis robots
PHASERCartesian
robots
XY-XSCARA
robots
YK-XPick & place
robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot
positionerPulse string
driverRobot
controllerRCX+VYZ
Electric
gripper

Option

Field network system with minimal wiring

NETWORK

Each field path setting file can be downloaded from the website.
<https://global.yamaha-motor.com/business/robot/download/fieldbus/>

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

P.626

 **Basic specifications for network**

Item	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.

 **Basic specifications for network**

Item	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 occupied CH	Input 6ch, Output 6ch	
MAC ID setting	0 to 63	
Communication speed setting	500Kbps, 250Kbps, 125Kbps	
DeviceNet™ inputs/outputs	Input 16 points, Output 16 points	
Network length	Overall extension distance	100m/500Kbps, 250m/250Kbps, 500m/125Kbps
	Branch length	6m or less
	Overall branch length	39m or less/500Kbps, 78m or less/250Kbps, 156m or less/125Kbps
Monitor LED	Module, Network	

 **Basic specifications for network**

Item	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 Volume2: 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).

 **Basic specifications for network**

Item	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).

Field network system with minimal wiring

NETWORK

SR1-X/SR1-P

Each field path setting file can be downloaded from the website.
<https://global.yamaha-motor.com/business/robot/download/fieldbus/>

P.652

CC-Link Basic specifications for network

Item	CC-Link
Applicable controllers	SR1-X / SR1-P
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.

DeviceNet Basic specifications for network

Item	DeviceNet™
Applicable controllers	SR1-X / SR1-P
Applicable 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 setting	0 to 63
Communication speed setting	500Kbps, 250Kbps, 125Kbps
DeviceNet™ I/O ^{Note2}	General input 16 points ^{Note3} , General output 16 points ^{Note3} , 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.
Network length	Overall length ^{Note4} 100m/500Kbps, 250m/250Kbps, 500m/125Kbps
Branch length/Overall branch length	6m or less/39m or less, 6m or less/78m or less, 6m or less/156m or less
Monitor LED	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.

PROFIBUS Basic specifications for network

Item	PROFIBUS
Applicable controllers	SR1-X / SR1-P
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

Item	Ethernet
Applicable controllers	SR1-X / SR1-P
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

Articulated robots
YALinear conveyor modules
LCMSingle-axis robots
CXMotor-less single axis actuator
RobonityCompact single-axis robots
TRANSEVOSingle-axis robots
FLIP-XLinear motor single-axis robots
PHASERCartesian robots
XY-XSCARA robots
YK-XPick & place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCX+VYZ Electric gripper

Option

Option details

Field network system with minimal wiring

NETWORK

Each field path setting file can be downloaded from the website.
<https://global.yamaha-motor.com/business/robot/download/fieldbus/>

RCX320 P.660 RCX221/RCX222 P.670 RCX340 P.678

CC-Link Basic specifications for network

Item	CC-Link
Applicable controllers	RCX320 / RCX221 / RCX222 / 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 RCX320/RCX221/RCX222 (Set from the rotary switch on the board) RCX340 (Set from the programming box or support software)
Communication speed setting	10Mbps, 5Mbps, 2.5Mbps, 625Kbps, 156Kbps (set from the Rotary switch 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. In case of RCX320/RCX221/RCX222, the controller I/Os are updated every 10ms.
 For RCX 340, the controller I/Os are updated every 5ms for the shortest. The actual update time changes depending on the communication cycle of the master unit.
 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.

DeviceNet Basic specifications for network

Item	DeviceNet™
Applicable controllers	RCX320 / RCX221 / RCX222 / RCX340
Applicable DeviceNet™ specifications	Volume 1 Release2.0 / Volume 2 Release2.0
Device Profile Name	Generic Device (device number 0)
Number of occupied CH ^{Note1}	Normal: Input/output 24ch each, Compact: Input/output 2ch each
MAC ID setting	0 to 63
Transmission speed setting	500Kbps, 250Kbps, 125Kbps (set using DIP switch on board)
DeviceNet™ I/O ^{Note2}	Normal: General input 96 points, General output 96 points, Dedicated input 16 points, Dedicated output 16 points Compact: General input 16 points, General output 16 points, Dedicated input 16 points, Dedicated output 16 points
Parallel external I/O ^{Note3}	The master module and up to four ports can be controlled regardless of the robot program by using the pseudoserialization function.
Network length	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. In case of RCX320/RCX221/RCX222, the controller I/Os are updated every 10ms.
 For RCX 340, the controller I/Os are updated every 5ms for the shortest. The actual update time changes depending on the communication cycle of the master unit.
 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.

PROFIBUS Basic specifications for network

Item	PROFIBUS
Applicable controllers	RCX320 / RCX221 / RCX222 / 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 input 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. In case of RCX320/RCX221/RCX222, 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.
 For RCX 340, the controller I/Os are updated every 5ms for the shortest. The actual update time changes depending on the communication cycle of the master unit.
 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.)

Articulated robots
YA
Linear CONVEYOR modules
LCM
Single-axis robots
CX
Motor-less single axis actuator
Robonity
Compact single-axis robots
TRANSEVO
Single-axis robots
FLIP-X
Linear motor single-axis robots
PHASER
Cartesian robots
XY-X
SCARA robots
YK-X
Pick & place robots
YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXIVY2+ Electric gripper
Option

Field network system with minimal wiring

NETWORK

Each field path setting file can be downloaded from the website.
<https://global.yamaha-motor.com/business/robot/download/fieldbus/>

RCX320 P.660 RCX340 P.678

EtherNet/IP™ Basic specifications for network

Item	EtherNet/IP™		
Applicable controllers	RCX320 / RCX340		
Network specifications	Conforms to Ethernet (IEEE 802.3).		
Applicable EtherNet/IP™ specifications	Volume 1 : Common Industrial protocol (CIP™) Edition 3.14 Volume 2 : EtherNet/IP™ Adaptation Edition 1.15		
Device type	Generic Device (Device No. 43)		
Data size	48 bytes each for input/output		
Transmission speed	10 Mbps/100 Mbps		
Connector specifications	RJ-45 connector (8-pole modular connector) 2 port		
Cable specifications	Refer to "2.1 LAN cable" in Chapter 2 of this user's manual.		
Max. cable length	100 m		
EtherNet/IP™ input/output points <small>Note</small>	Input (48 bytes in total)	byte 0-3	Dedicated word input : 2 words
		byte 4-31	General purpose word input : 14 words
	Output (48 bytes in total)	byte 0-3	Dedicated bit input : 16 points
		byte 4-31	General-purpose bit input : 96 points
Output (48 bytes in total)	byte 0-3	Dedicated word output : 2 words	
	byte 4-31	General-purpose word output : 14 words	
Output (48 bytes in total)	byte 32-33	Dedicated bit output : 16 points	
	byte 34-47	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 made with the programming box (PBX) or RCX-Studio 2020.		
Monitor LEDs	Network Status, Module Status		

Note. The controller I/Os are updated every 5ms for the shortest. The actual update time changes depending on the communication cycle of the master unit.

PROFINET® Basic specifications for network

Item	PROFINET		
Applicable controllers	RCX320 / RCX340		
Supported software versions	RCX320 / RCX340 : V1.21 or later PBX/PBX-E : V1.08 or later RCX-Studio : V1.0.1 or later RCX-Studio Pro : V2.0.0 or later		
Network specification conformance	PROFINET IO V2.2		
Conformance class	Conformance Class B / IO Device		
Vendor Name / Vendor_ID	YAMAHA MOTOR CO.,LTD. / 0x02D5		
Station Type / Device_ID	YAMAHA RCX3 PROFINET / 0x0001		
Product revision	1.00		
Transmission speed	100 Mbps (Auto-negotiation)		
Connector specifications	RJ-45 connector (8-pole modular connector) 2 ports		
Conforming cable specifications	CAT 5e or higher STP cable (double shield)		
Max. cable length	100 m		
Monitor LEDs	Module Status(MS), Network Status(NS), Link/Activity:Port1-2		
Input/output data size <small>Note</small>	Input : 48bytes	Dedicated word input 2 words (4 bytes)	
		General-purpose word input 14 words (28 bytes)	
		Dedicated bit input 16 bits (2 bytes)	
		General-purpose bit input 96 bits (12 bytes)	
	Output : 48bytes	Reserved area 2 bytes	
		Dedicated word output 2 words (4 bytes)	
		General-purpose word output 14 words (28 bytes)	
		Dedicated bit output 16 bits (2 bytes)	
Output : 48bytes		General-purpose bit output 96 bits (12 bytes)	
Output : 48bytes		Reserved area 2 bytes	

Note. The controller I/Os are updated every 5ms for the shortest. The actual update time changes depending on the communication cycle of the master unit.

Articulated robots
YALinear conveyor modules
LCMSingle-axis robots
CXMotor-less single-axis actuator
RobotomyCompact single-axis robots
TRANSEVOSingle-axis robots
FLIP-XLinear motor single-axis robots
PHASERCartesian robots
XY-XSCARA robots
YK-XPick & Place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCX+VYZ Electric gripper

Option

Option details

Field network system with minimal wiring

NETWORK

Each field path setting file can be downloaded from the website.
<https://global.yamaha-motor.com/business/robot/download/fieldbus/>

RCX320 P.660 RCX340 P.678

Basic specifications for network

Item	EtherCAT	
Applicable controllers	RCX320 / RCX340	
Supported software versions	RCX320 / RCX340 : V1.62 or later PBX/PBX-E : V1.13 or later RCX-Studio Pro : V2.1.9 or later	
ESI file name	YAMAHA RCX340 EtherCAT 1_00.xml	
Transmission speed	100 Mbps (Auto-negotiation)	
Connector specifications	RJ-45 connector (8-pole modular connector) 2 ports	
Conforming cable specifications	CAT 5e or higher STP cable (double shield)	
Max. cable length	100 m	
Monitor LEDs	RUN, ERROR, Link/Activity:Port1-2	
Input/output data size ^{Note}	Input : 48bytes	Dedicated word input 2 words (4 bytes)
		General-purpose word input 14 words (28 bytes)
		Dedicated bit input 16 bits (2 bytes)
		General-purpose bit input 96 bits (12 bytes)
	Output : 48bytes	Reserved area 2 bytes
		Dedicated word output 2 words (4 bytes)
		General-purpose word output 14 words (28 bytes)
		Dedicated bit output 16 bits (2 bytes)
		General-purpose bit output 96 bits (12 bytes)
		Reserved area 2 bytes

Note. The controller I/Os are updated every 5ms for the shortest. The actual update time changes depending on the communication cycle of the master unit.

Basic specifications for network

Item	Ethernet
Applicable controllers	RCX320 / 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 / 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

Articulated robots YA
 Linear CONVEYOR modules LCM
 Single-axis robots CX
 Motor-less single axis actuator Robonity
 Compact single-axis robots TRANSEVO
 Single-axis robots FLIP-X
 Linear motor single-axis robots PHASER
 Cartesian robots XY-X
 SCARA robots YK-X
 Pick & place robots YP-X
 CLEAN
 CONTROLLER
 INFORMATION
 Robot positioner
 Pulse string driver
 Robot controller
 RCXIVY2+ Electric gripper
 Option

Articulated robots YA
Linear conveyor modules LCM
Single-axis robots CX
Motorless single axis actuator Robomity
Compact single-axis robots TRANSEVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & Place robots YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXVY2+ Electric gripper
Option

RCXiVY2+ System

Applicable controllers ▶
RCX3 series

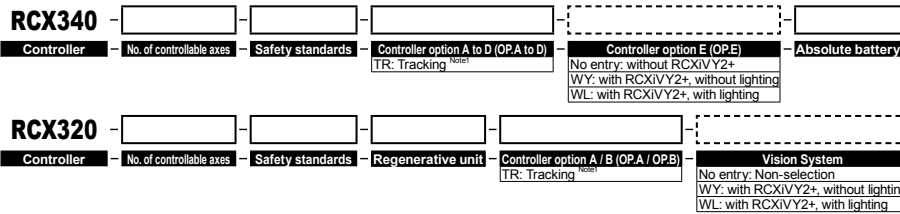
● Robot with image processing functions

Integrated Robot Vision System with “plug-and-play” simplicity.
New functions have been added to the conventional iVY2 to make the vision system even easier to use.



Main functions ▶ P.108

■ Ordering method



For details on the various selection items
RCX320 ▶ P.660
RCX340 ▶ P.679

Note1. Only one tracking board can be selected.

■ Basic specifications

● Robot vision basic specifications

Item		RCXiVY2+ unit
Basic specifications	Applicable controllers	RCX340 / RCX320
	Number of screen pixels	720(H) × 540(V) (400,000 pixels) 1440(H) × 1080(V) (1,600,000 pixels) 2048(H) × 1536(V) (3,200,000 pixels) 2592(H) × 1944(V) (5,000,000 pixels) ^{Note1}
	Model setting capacity	254 models
	Number of connectable cameras	2 cameras (8 units when the HUB is used.)
	Connectable camera	GigE camera PoE: IEEE802.3af 1 ch up to 7W
	External interface	Ethernet (1000BASE-T) ^{Note2} USB 2.0 2Ch (Up to 5V 2.5W / ch)
	External monitor output	DVI-I ^{Note3} Monitor resolution: 1024 × 768 Vertical periodic frequency: 60 Hz Horizontal periodic frequency: 48.4 kHz
	Power supply	24 VDC +/- 10%, Maximum 1.5 A
	Dimensions	W45 × H195 × D130 (RCXiVY2+ unit only)
	Weight	0.8kg (RCXiVY2+ unit only, when the lighting control board option is selected)
	Operating environment	Compliant with the RCX340/RCX320 controller.
	Storage environment	Compliant with the RCX340/RCX320 controller.
	Search method	Edge search, Measuring search, Blob search, Code search
Image capturing	Trigger mode	S/W trigger, H/W trigger
	External trigger input	2 points
Function	Position detection, coordinate conversion, automatic point data generation, distortion and inclination correction	
Camera installation position	Fixed to the fixed camera (up, down) or robot (Y-axis, Z-axis). Vertical direction to the image capturing target workpiece is recommended.	
Setting support function	Calibration, image save function, model registration ^{Note4} , fiducial mark registration ^{Note4} , measuring registration ^{Note4} , blob registration ^{Note4} , code registration ^{Note4} , monitor function ^{Note4}	
Lighting control options	Number of connectable lighting units	Maximum 2
	Modulated light format	PWM modulated light control (0 to 100%), PWM frequency switchable 62.5 kHz/ 125 kHz Continuous light, strobe light (follows camera exposure)
	Lighting power input	12V DC or 24V DC (external supply shared by both channels)
	Lighting output	For 12V DC supply: Total of less than 40W for both channels. For 24V DC supply: Total of less than 80W for both channels.

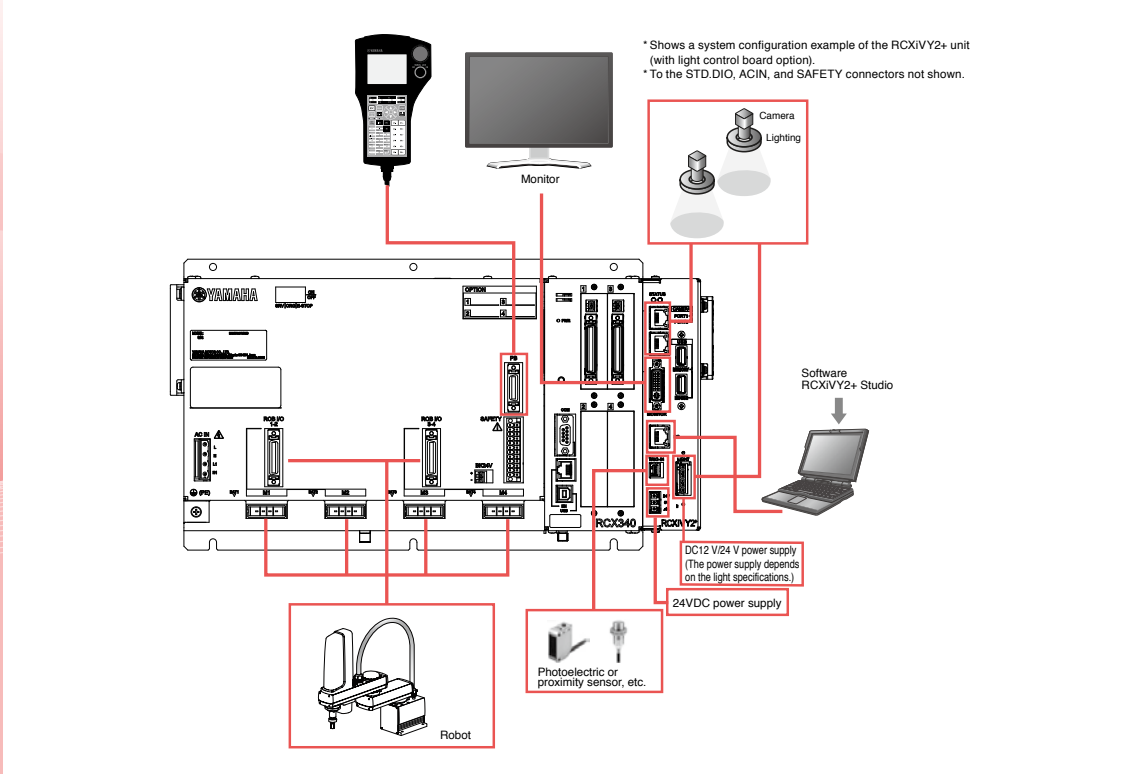
Note1. Since the rolling shutter is used, the tracking is not supported.

Note2. For setting and monitor operations

Note3. Also usable with an analog monitor by using a conversion adaptor.

Note4. RCXiVY2+ Studio function (requires a Windows PC)

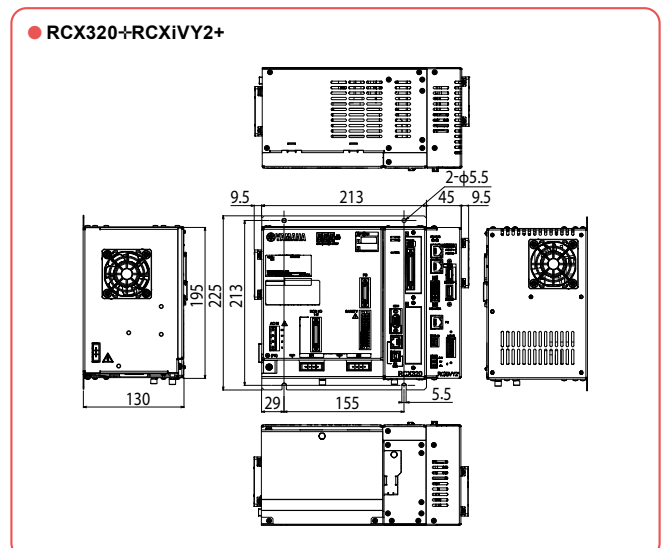
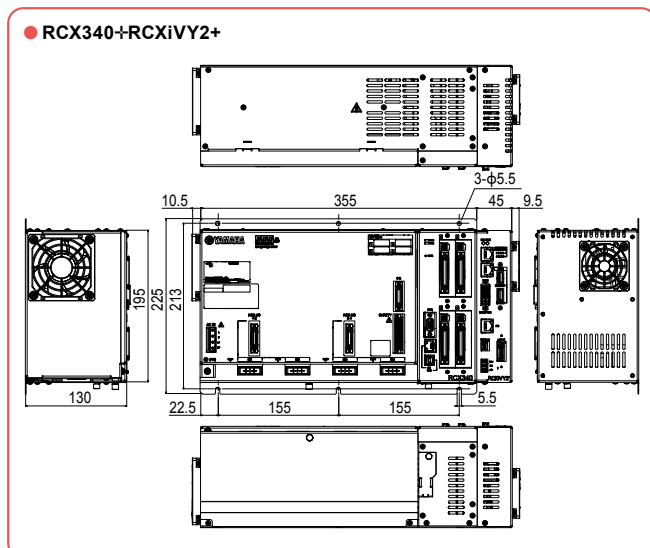
System configuration illustration



Tracking board basic Specifications

Item		Tracking board
Basic specifications	Applicable controllers	RCX340 / RCX320
	Number of connected encoders	Up to 2 units.
	Encoder power supply	5VDC (2 counters total 500 mA or less) (Supplied from controller)
	Applicable encoder	26LS31/26C31 or equivalent line driver (RS-422 compliance).
	Input phase	A, \bar{A} , B, \bar{B} , Z, \bar{Z}
	Max. response frequency	2MHz or less
	Counter	0 to 65535
	Multiplier	4x
	Other	With disconnection detection function

Dimensional outlines



Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motor-less single axis actuator
Robotomy

Compact single-axis robots
TRANSERO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCX+VY2

Option

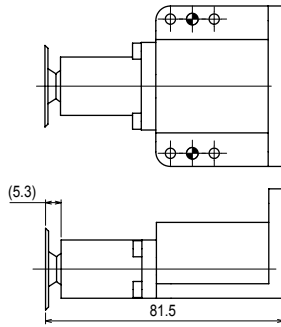
Dimensional outlines

Calibration jig

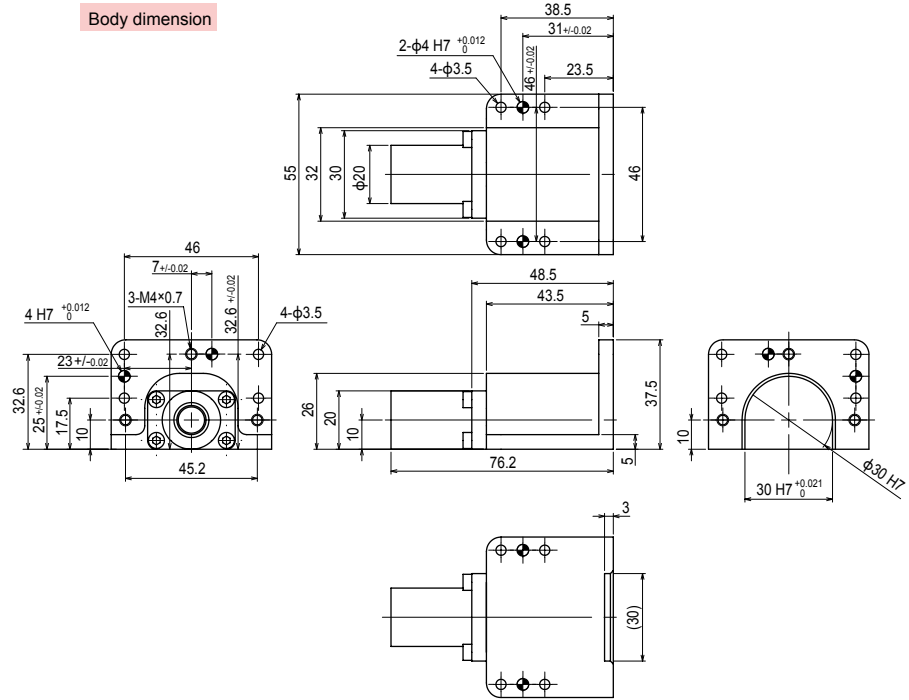
Calibration jig

(Model: KCX-M7200-00)

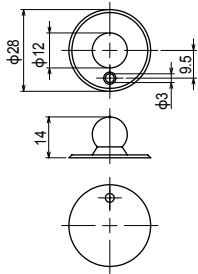
Mark gripper dimension



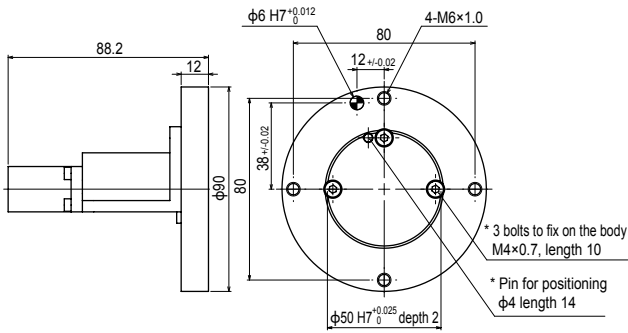
Body dimension



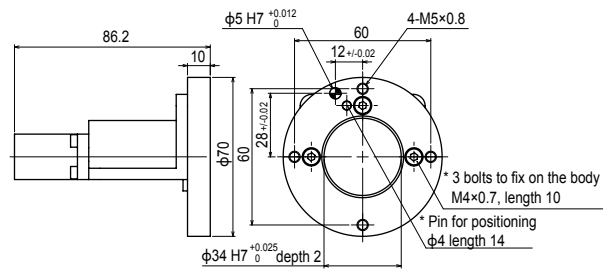
Mark dimension



When using attachment (large)



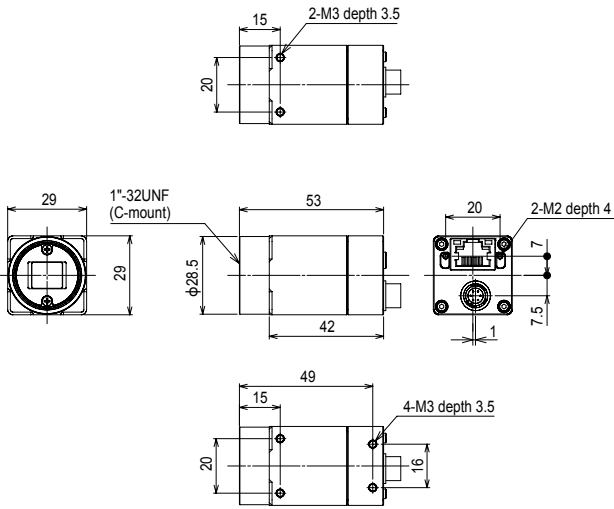
When using attachment (small)



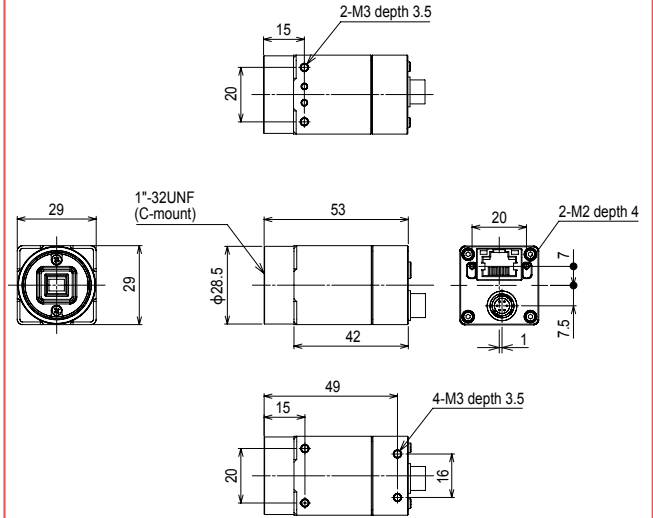
Dimensional outlines

Camera

- CMOS camera
(400,000 pixel • 1,600,000 pixel • 3,200,000 pixel)

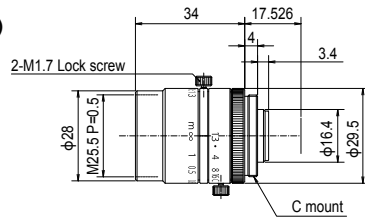


- CMOS camera
(5,000,000 pixel)

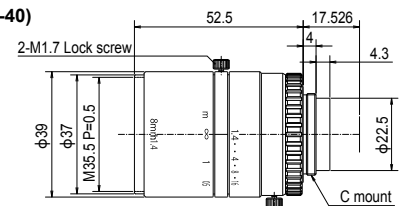


Lenses

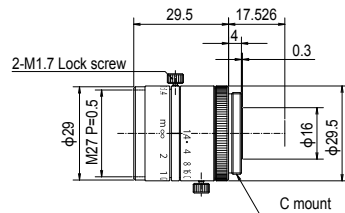
- 8mm lens
(Model: KCX-M7214-00)



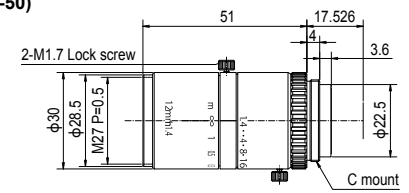
- 8mm lens (megapixel support)
(Model: KCX-M7214-00)



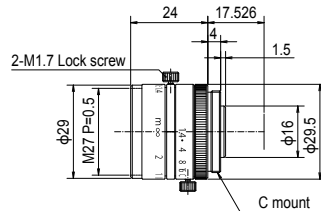
- 12mm lens
(Model: KCX-M7214-10)



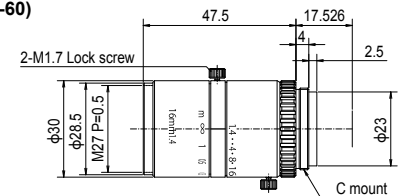
- 12mm lens (megapixel support)
(Model: KCX-M7214-50)



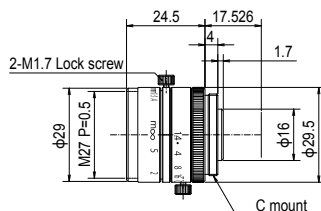
- 16mm lens
(Model: KCX-M7214-20)



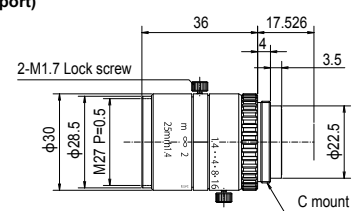
- 16mm lens (megapixel support)
(Model: KCX-M7214-60)



- 25mm lens
(Model: KCX-M7214-30)



- 25mm lens (megapixel support)
(Model: KCX-M7214-70)



Articulated robots
YA

Linear conveyor modules
LCM

Single-axis robots
CX

Motor-less single axis actuator
Robonity

Compact single-axis robots
TRANSEVO

Single-axis robots
FLIP-X

Linear motor single-axis robots
PHASER

Cartesian robots
XY-X

SCARA robots
YK-X

Pick & place robots
YP-X

CLEAN

CONTROLLER

INFORMATION

Robot positioner

Pulse string driver

Robot controller

RCX+VY2

Option

■ Lens characteristics

Lens	Model	Focal length [mm]	Aperture value [F No.]	Angle-of-view (degrees)								Closest approach distance [m]
				KFR-M6541-00 (400,000 pixel camera)		KFR-M6541-10 (1,600,000 pixel camera)		KFR-M6541-20 (3,200,000 pixel camera)		KFR-M6541-30 (5,000,000 pixel camera)		
				Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	Vertical	Horizontal	
8mm	KCX-M7214-00	8	F1.3-CLOSE	27.13	36.09	26.85	35.69	37.57	49.23	30.72	40.60	0.2
12mm	KCX-M7214-10	12	F1.4-CLOSE	17.23	23.01	17.05	22.74	24.11	31.95	19.57	26.03	0.3
16mm	KCX-M7214-20	16	F1.4-CLOSE	13.17	17.50	13.03	17.30	18.48	24.44	14.97	19.83	0.4
25mm	KCX-M7214-30	25	F1.4-CLOSE	8.57	11.42	8.47	11.29	12.05	16.01	9.74	12.95	0.5
8mm (megapixel support)	KCX-M7214-40	8	F1.4-F16	26.47	34.83	26.20	34.44	36.68	47.61	29.97	39.21	0.1
12mm (megapixel support)	KCX-M7214-50	12	F1.4-F16	17.49	23.19	17.31	22.92	24.47	32.19	19.86	26.23	0.1
16mm (megapixel support)	KCX-M7214-60	16	F1.4-F16	13.28	17.69	13.14	17.48	18.64	24.69	15.09	20.04	0.1
25mm (megapixel support)	KCX-M7214-70	25	F1.4-F16	8.62	11.48	8.52	11.34	12.12	16.09	9.80	13.02	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 ring [mm]		Lens	Lens			
			8 mm KCX-M7214-00	12 mm KCX-M7214-10	16 mm KCX-M7214-20	25 mm KCX-M7214-30
None	WD [mm]		200	300	400	500
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	97.8 × 130.5	93 × 124	93 × 124	72.9 × 97.2
		KFR-M6541-10 (1,600,000 pixels)	98.6 × 130.5	93.7 × 124	93.7 × 124	73.5 × 97.2
		KFR-M6541-20 (3,200,000 pixels)	139.2 × 185.7	132.2 × 176.5	132.2 × 176.5	103.7 × 138.4
		KFR-M6541-30 (5,000,000 pixels)	112.3 × 150	106.7 × 142.5	106.7 × 142.5	83.7 × 111.7
	Optical magnification		0.038	0.040	0.040	0.051
0.5	WD [mm]		69.5	118.6	143	222
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	37.2 × 49.6	60 × 80	46.5 × 62	93 × 124
		KFR-M6541-10 (1,600,000 pixels)	37.5 × 49.6	60.4 × 80	46.8 × 62	93.7 × 124
		KFR-M6541-20 (3,200,000 pixels)	52.9 × 70.6	85.3 × 113.8	66.1 × 88.2	132.2 × 176.5
		KFR-M6541-30 (5,000,000 pixels)	42.7 × 57	68.8 × 91.9	53.3 × 71.2	106.7 × 142.5
	Optical magnification		0.100	0.062	0.080	0.040
1.0	WD [mm]		38.7	53.8	91.3	142.3
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	22.9 × 30.6	30 × 40	31 × 41.3	46.5 × 62
		KFR-M6541-10 (1,600,000 pixels)	23.1 × 30.6	30.2 × 40	31.2 × 41.3	46.8 × 62
		KFR-M6541-20 (3,200,000 pixels)	32.6 × 43.5	42.6 × 56.9	44 × 58.8	66.1 × 88.2
		KFR-M6541-30 (5,000,000 pixels)	26.3 × 35.1	34.4 × 45.9	35.5 × 47.5	53.3 × 71.2
	Optical magnification		0.162	0.124	0.120	0.080
1.5	WD [mm]		65.4	90.8	114.5	168.1
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	23.1 × 30.8	30.7 × 40.9	28.1 × 37.5	40.4 × 53.9
		KFR-M6541-10 (1,600,000 pixels)	23.2 × 30.8	30.9 × 40.9	28.4 × 37.5	40.7 × 53.9
		KFR-M6541-20 (3,200,000 pixels)	32.8 × 43.8	43.7 × 58.3	40 × 53.4	57.5 × 76.7
		KFR-M6541-30 (5,000,000 pixels)	26.5 × 35.4	35.2 × 47.1	32.3 × 43.1	46.4 × 61.9
	Optical magnification		0.161	0.121	0.132	0.092
2.0	WD [mm]		50	65.1	91.2	123.6
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	18.5 × 24.6	23.1 × 30.8	22.9 × 30.6	30.4 × 40.6
		KFR-M6541-10 (1,600,000 pixels)	18.6 × 24.6	23.2 × 30.8	23.1 × 30.6	30.7 × 40.6
		KFR-M6541-20 (3,200,000 pixels)	26.3 × 35.1	32.8 × 43.8	32.6 × 43.5	43.3 × 57.8
		KFR-M6541-30 (5,000,000 pixels)	21.2 × 28.3	26.5 × 35.4	26.3 × 35.1	35 × 46.7
	Optical magnification		0.201	0.161	0.162	0.122
5.0	WD [mm]		104.2	129	104.2	129
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	14.8 × 19.8	18.6 × 24.9	14.8 × 19.8	18.6 × 24.9
		KFR-M6541-10 (1,600,000 pixels)	15 × 19.8	18.8 × 24.9	15 × 19.8	18.8 × 24.9
		KFR-M6541-20 (3,200,000 pixels)	21.1 × 28.2	26.5 × 35.4	21.1 × 28.2	26.5 × 35.4
		KFR-M6541-30 (5,000,000 pixels)	17 × 22.8	21.4 × 28.6	17 × 22.8	21.4 × 28.6
	Optical magnification		0.250	0.199	0.250	0.199

Note. WD is the lens tip reference.

Close-up ring [mm]		Lens	Lens			
			8 mm lens for megapixel KCX-M7214-40	12 mm lens for megapixel KCX-M7214-50	16 mm lens for megapixel KCX-M7214-60	25 mm lens for megapixel KCX-M7214-70
None	WD [mm]		100	100	100	150
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	53.1 × 70.8	37.2 × 49.6	27.3 × 36.4	24.9 × 33.2
		KFR-M6541-10 (1,600,000 pixels)	53.5 × 70.8	37.5 × 49.6	27.5 × 36.4	25.1 × 33.2
		KFR-M6541-20 (3,200,000 pixels)	75.5 × 100.8	52.9 × 70.6	38.8 × 51.9	35.5 × 47.3
		KFR-M6541-30 (5,000,000 pixels)	61 × 81.4	42.7 × 57	31.3 × 41.9	28.6 × 38.2
	Optical magnification		0.070	0.100	0.136	0.149
0.5	WD [mm]		46	113.6	77.8	130.3
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	28.1 × 37.5	59 × 78.7	22.4 × 29.8	120 × 160
		KFR-M6541-10 (1,600,000 pixels)	28.4 × 37.5	59.5 × 78.7	22.5 × 29.8	120.9 × 160
		KFR-M6541-20 (3,200,000 pixels)	40 × 53.4	83.9 × 112	31.8 × 42.5	170.6 × 227.7
		KFR-M6541-30 (5,000,000 pixels)	32.3 × 43.1	67.7 × 90.4	25.7 × 34.3	137.7 × 183.8
	Optical magnification		0.132	0.063	0.166	0.031
1.0	WD [mm]		47.2	131.9	62.6	114.6
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	20.1 × 26.8	45.9 × 61.2	18.8 × 25.1	60 × 80
		KFR-M6541-10 (1,600,000 pixels)	20.2 × 26.8	46.2 × 61.2	19 × 25.1	60.4 × 80
		KFR-M6541-20 (3,200,000 pixels)	28.5 × 38.1	65.3 × 87.1	26.8 × 35.8	85.3 × 113.8
		KFR-M6541-30 (5,000,000 pixels)	23 × 30.8	52.7 × 70.3	21.6 × 28.9	68.8 × 91.9
	Optical magnification		0.185	0.081	0.197	0.062
1.5	WD [mm]		35.2	81.4	51.5	102
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	16.5 × 22	33.2 × 44.2	16.3 × 21.7	40 × 53.3
		KFR-M6541-10 (1,600,000 pixels)	16.6 × 22	33.4 × 44.2	16.4 × 21.7	40.3 × 53.3
		KFR-M6541-20 (3,200,000 pixels)	23.5 × 31.3	47.2 × 63	23.2 × 30.9	56.8 × 75.9
		KFR-M6541-30 (5,000,000 pixels)	18.9 × 25.3	38.1 × 50.8	18.7 × 25	45.9 × 61.2
	Optical magnification		0.225	0.112	0.228	0.093
2.0	WD [mm]		43	111.7	91.5	294.7
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	14.3 × 19.1	30.2 × 40.3	16.2 × 21.6	46.5 × 62
		KFR-M6541-10 (1,600,000 pixels)	14.4 × 19.1	30.4 × 40.3	16.3 × 21.6	46.8 × 62
		KFR-M6541-20 (3,200,000 pixels)	20.4 × 27.2	43 × 57.3	23.1 × 30.8	66.1 × 88.2
		KFR-M6541-30 (5,000,000 pixels)	16.4 × 22	34.7 × 46.3	18.6 × 24.8	53.3 × 71.2
	Optical magnification		0.259	0.123	0.229	0.080
5.0	WD [mm]		53.9	107.2	53.9	107.2
	Angle-of-view size X × Y [mm]	KFR-M6541-00 (400,000 pixels)	10.6 × 14.2	18.6 × 24.8	10.6 × 14.2	18.6 × 24.8
		KFR-M6541-10 (1,600,000 pixels)	10.7 × 14.2	18.7 × 24.8	10.7 × 14.2	18.7 × 24.8
		KFR-M6541-20 (3,200,000 pixels)	15.1 × 20.2	26.4 × 35.3	15.1 × 20.2	26.4 × 35.3
		KFR-M6541-30 (5,000,000 pixels)	12.2 × 16.3	21.3 × 28.5	12.2 × 16.3	21.3 × 28.5
	Optical magnification		0.349	0.200	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

RCXiVY2+ System

Standard accessories

● RCXiVY2+ unit

The RCXiVY2+ unit adds robot vision to the RCX340/RCX320 robot controller.



● RCXiVY2+ unit

Model	No lighting	KFR-M4400-V0
	With lighting	KFR-M4400-L0

● RCXiVY2+ unit accessories

Name	Model
Trigger input cable connector set	KX0-M657K-00
24V power supply connector	KCF-M5382-00

● Support software for PC RCXiVY2+ Studio

RCXiVY2+ Studio is programming software for the RCXiVY2+ 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.



Download from website (member site)

● Environment

OS	Microsoft Windows XP / Vista (32 bit / 64 bit) / 7 (32 bit / 64 bit) / 8, 8.1 (32 bit / 64 bit) / 10 (32 bit / 64 bit)
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	30MB of available space required on installation drive. * Additional vacant space is required for saving images and data.
Display	800 x 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, and Windows 10 are registered trademarks of the Microsoft Corporation, USA.

Note. Ethernet is a registered trademark of the XEROX Corporation, USA.

- YA Articulated robots
- LCM Linear conveyor modules
- CX Single-axis robots
- Robonity Motor-less single axis actuator
- TRANSEVO Compact single-axis robots
- FLIP-X Single-axis robots
- PHASER Linear motor single-axis robots
- XY-X Cartesian robots
- YK-X SCARA robots
- YP-X Pick & place robots
- CLEAN
- CONTROLLER
- INFORMATION
- Robot positioner
- Pulse string driver
- Robot controller
- RCXiVY2
- Option

Options

● CMOS camera



Model	400,000 pixel	720(H) × 540(V)	KFR-M6541-00
	1,600,000 pixel	1440(H) × 1080(V)	KFR-M6541-10
	3,200,000 pixel	2048(H) × 1536(V)	KFR-M6541-20
	5,000,000 pixel	2592(H) × 1944(V)	KFR-M6541-30

● Lens



Model	8mm	KCX-M7214-00
	12mm	KCX-M7214-10
	16mm	KCX-M7214-20
	25mm	KCX-M7214-30
	8mm (megapixel support)	KCX-M7214-40
	12mm (megapixel support)	KCX-M7214-50
	16mm (megapixel support)	KCX-M7214-60
	25mm (megapixel support)	KCX-M7214-70

* Common to iVY2.

● Close-up ring



Model	0.5mm	KX0-M7215-00
	1.0mm	KX0-M7215-10
	2.0mm	KX0-M7215-20
	5.0mm	KX0-M7215-40

● Lighting control board

This board adds lighting control functionality to the RCXiVY2+ system. (Installed in the RCXiVY2+ unit when shipped)

● Lighting control board

Name	Model
Lighting control board	KCX-M4403-L0

● Lighting control board accessories

Name	Model
Lighting power cable connector set	KX0-M657K-10

● Tracking board

This board adds conveyor tracking functionality to the RCX340/RCX320 controller.

● Tracking board

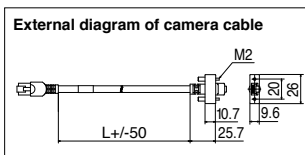
Name	Model
Tracking board	KCX-M4400-T0

● Tracking board accessories

Name	Model
Tracking encoder connector	KX0-M657K-20

● Camera cable

Cable for connecting the camera to the RCXiVY2+ board.



Cable length (L)	Model
5m	KCX-M66F0-00
10m	KCX-M66F0-10
15m	KCX-M66F0-20

* Common to iVY2.

● LAN cable with shield cloth (5 m)



Model	KX0-M55G0-00
-------	--------------

● Tracking encoder cable (10 m)



Model	KX0-M66AF-00
-------	--------------

● Calibration jig (Large and small attachments are provided.)



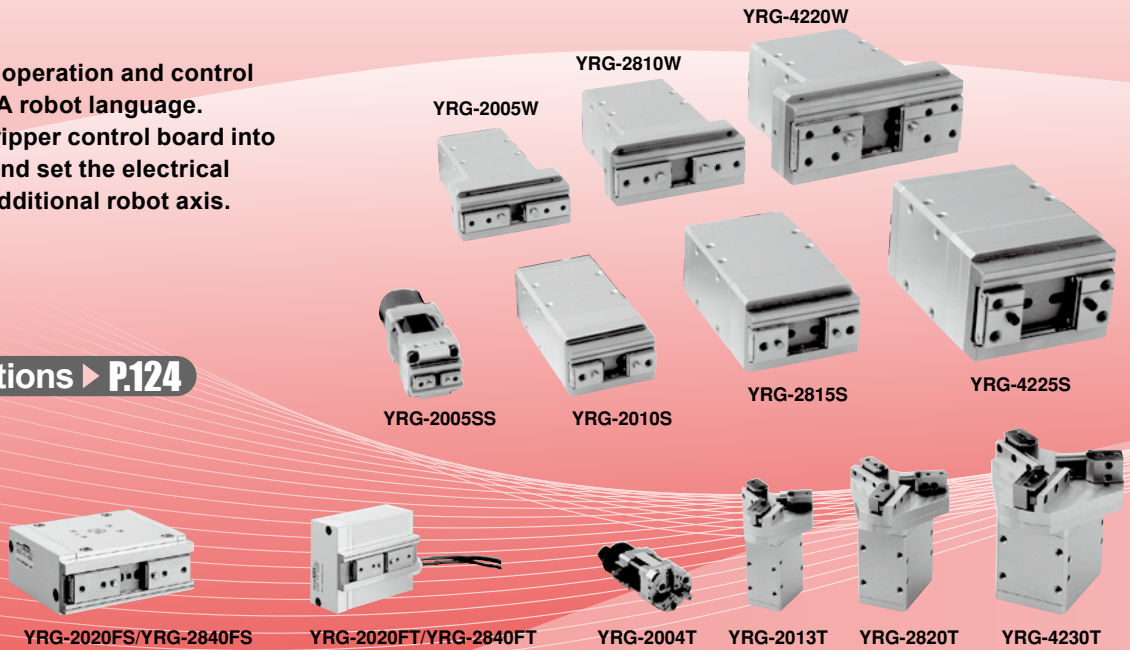
Model	KCX-M7200-00
-------	--------------

Articulated robots YA
Linear conveyor modules LCM
Single-axis robots CX
Motorless single axis actuator Robomity
Compact single-axis robots TRANSEVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & Place robots YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXVY2+ Electric gripper
Option

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.124




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 compact.
- Ball screw structure

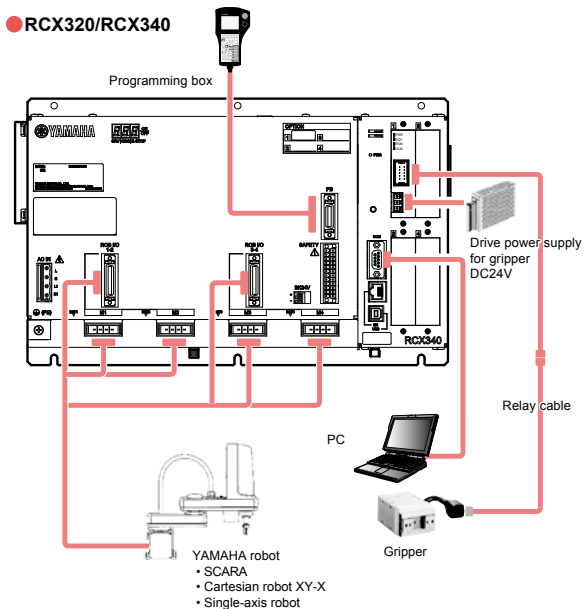


Belt-driven ground ball screw delivers a long stroke with high efficiency and high precision.
- Compact ball guide structure



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



Compact single cam type

YRG-2005SS



Basic specifications

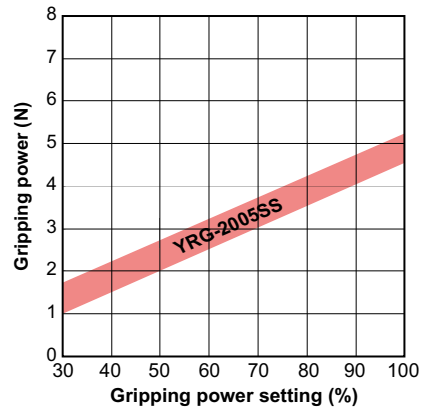
Model name		YRG-2005SS
Model number		KCF-M2010-A0
Holding power	Max. continuous rating (N)	5
	Min. setting (% (N))	30 (1.5)
	Resolution (% (N))	1 (0.05)
Open/close stroke (mm)		3.2
Speed	Max. rating (mm/sec)	100
	Min. setting (% (mm/sec))	20 (20)
	Resolution (% (mm/sec))	1 (1)
	Holding speed (Max.) (%)	50
Repetitive positioning accuracy (mm)		+/-0.02
Guide mechanism		Linear guide
Max. holding weight ^{Note 1} (kg)		0.05
Weight (g)		90

- Holding power control: 30 to 100% (1% steps)
- Acceleration control : 1 to 100% (1% steps)
- Speed control : 20 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. The maximum gripping weight is the upper limit weight when the workpiece is gripped with maximum continuous rated gripping force.
 Determine the weight of the workpiece to be gripped by considering the upper limit weight and the inertia force due to acceleration/deceleration and rotary operation in the gripped state.

Gripping power vs. gripping power setting (%)

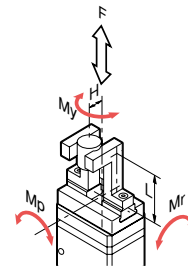


- Graph shows a general guide to gripping power versus gripping power setting (%). Variations will appear in the actual gripping power.

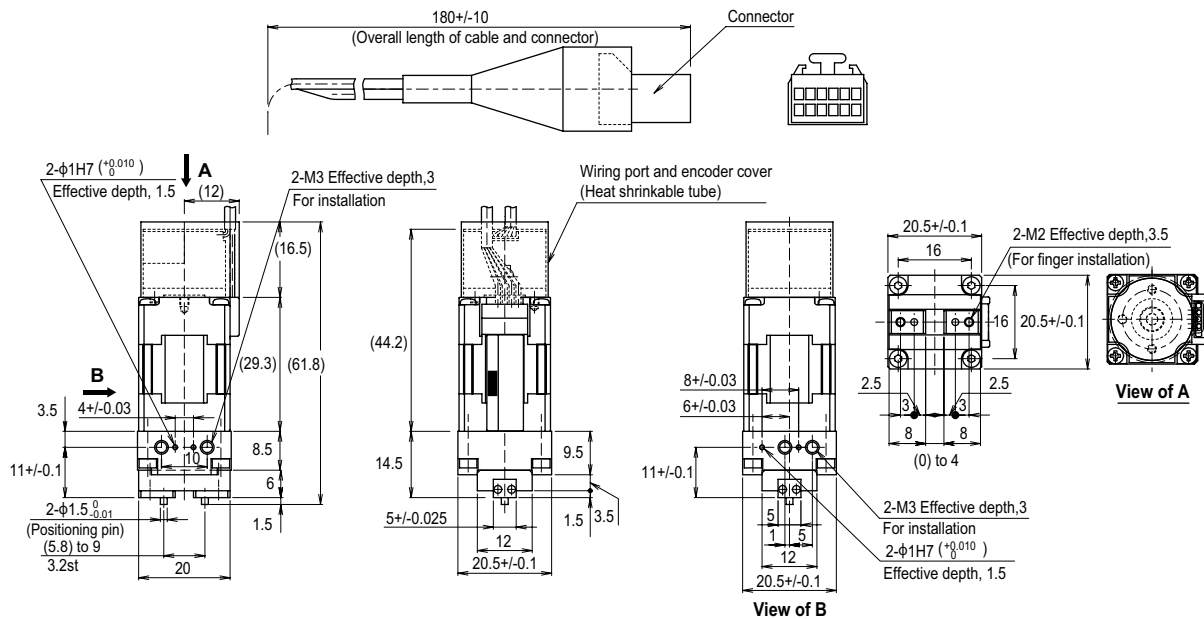
Allowable load and load moment

		YRG-2005SS		
Guide	Allowable load	F	N	12
	Allowable pitching moment	Mp	N·m	0.04
	Allowable yawing moment	My	N·m	0.04
	Allowable rolling moment	Mr	N·m	0.08
Finger	Max. weight (1 pair)		g	10
	Max. holding position	L	mm	20
	Max. overhang	H	mm	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.



YRG-2005SS



Note. Avoid extreme winding of the cable and fix the cable securely so that it does not move. Take appropriate measures so that any excessive force is not applied to the root of the cable.

- Articulated robots YA
- Linear conveyor modules LCM
- Single-axis robots CX
- Motor-less single axis actuator Robotomy
- Compact single-axis robots TRANSEVO
- Single-axis robots FLIP-X
- Linear motor single-axis robots PHASER
- Cartesian robots XY-X
- SCARA robots YK-X
- Pick & place robots YP-X
- CLEAN
- CONTROLLER
- INFORMATION
- Robot positioner
- Pulse string driver
- Robot controller
- Electric gripper
- Option

YRG Series

Single cam type

YRG-2010S/2815S/4225S



Basic specifications

Model name	YRG-2010S	YRG-2815S	YRG-4225S	
Model number	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/close stroke (mm)	7.6	14.3	23.5	
Speed	Max. rating (mm/sec)	100		
	Min. setting (% (mm/sec))	20 (20)		
	Resolution (% (mm/sec))	1 (1)		
	Holding speed (Max.) (%)	50		
Repetitive positioning accuracy (mm)	±0.02			
Guide mechanism	Linear guide			
Max. holding weight ^{Note 1} (kg)	0.06	0.22	0.4	
Weight (g)	160	300	580	

- Holding 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.

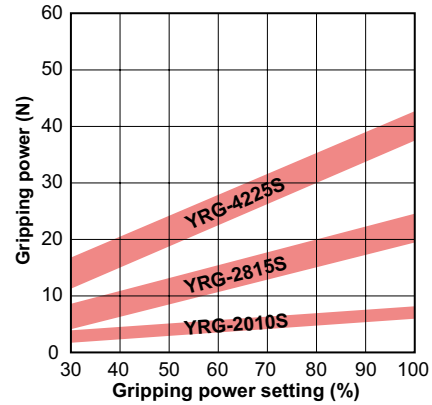
Note. When installing or uninstalling the finger, tighten the bolts while the finger is being held securely so that any excessive force or shock is not applied to the guide block.

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. The maximum gripping weight is the upper limit weight when the workpiece is gripped with maximum continuous rated gripping force.

Determine the weight of the workpiece to be gripped by considering the upper limit weight and the inertia force due to acceleration/deceleration and rotary operation in the gripped state.

Gripping power vs. gripping power setting (%)

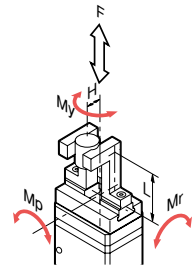


- Graph shows a general guide to gripping power versus gripping power setting (%). Variations will appear in the actual gripping power.

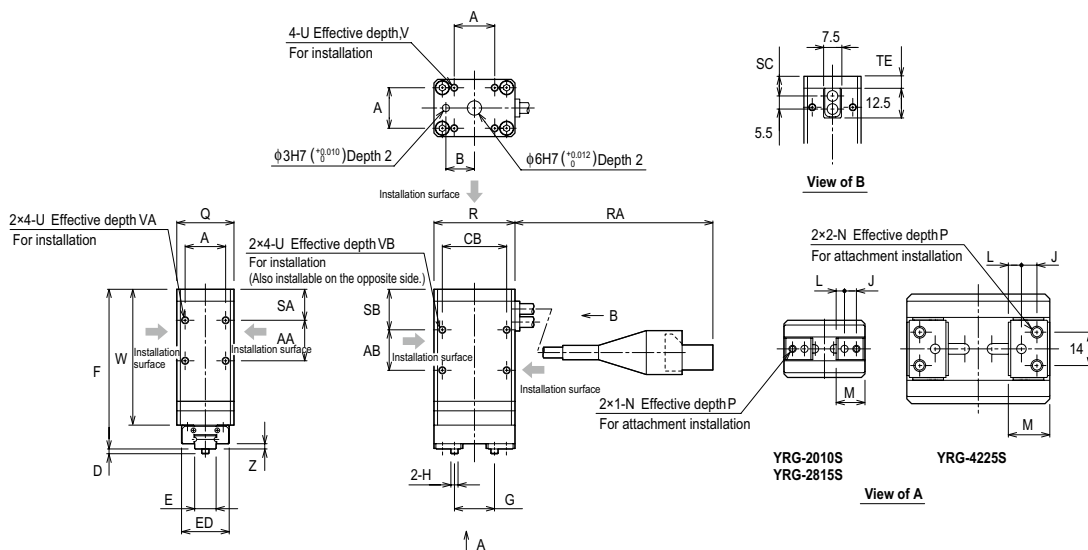
Allowable load and load moment

			YRG-2010S	YRG-2815S	YRG-4225S
Guide	Allowable load	F N	450	350	600
	Allowable pitching moment	Mp N•m	0.7	0.5	1.1
	Allowable yawing moment	My N•m	0.8	0.6	1.3
	Allowable rolling moment	Mr N•m	2.3	2.8	8.6
Finger	Max. weight (1 pair)	g	15	30	50
	Max. holding position	L mm	20	20	25
	Max. overhang	H mm	20	25	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-2010S/2815S/4225S



	A	AA	AB	B	CB	D	E	ED	F	G	H	J	L
YRG-2010S	17	17	17	12	27	2	9 ⁰ _{-0.05}	20	71	8.4 to 16	φ3 ⁰ _{-0.01}	5	3.5
YRG-2815S	24	24	14	15	38	2	14 ⁰ _{-0.05}	25	78	9.6 to 23.9	φ3 ⁰ _{-0.01}	6	4.3
YRG-4225S	36	25	13	20	50	3	24 ⁰ _{-0.05}	40	86	12 to 35.5	φ4 ⁰ _{-0.012}	6.5	5.5

	M	N	P	Q	R	RA	SA	SB	SC	TE	U	V	VA	VB	W	Z
YRG-2010S	12.1	M3	5	24	34	165+/-10	13	17	8.3	5	M3	5	6	6	61	2.2
YRG-2815S	15	M4	5	32	46	140+/-10	16	21	9.3	6	M4	6	8	8	69	2
YRG-4225S	17.4	M5	8	46	60	235+/-10	18	24	10.8	7.5	M5	7.5	8	10	72	3

Double cam type

YRG-2005W/2810W/4220W



Basic specifications

Model name	YRG-2005W	YRG-2810W	YRG-4220W	
Model number	KCF-M2012-A0	KCF-M2012-B0	KCF-M2012-C0	
Holding power	Max. continuous rating (N)	50	150	250
	Min. setting (% (N))	30 (15)	30 (45)	30 (75)
	Resolution (% (N))	1 (0.5)	1 (1.5)	1 (2.5)
Open/close stroke (mm)	5	10	19.3	
Speed	Max. rating (mm/sec)	60	60	45
	Min. setting (% (mm/sec))	20 (12)	20 (12)	20 (9)
	Resolution (% (mm/sec))	1 (0.6)	1 (0.7)	1 (0.45)
	Holding speed (Max.) (%)	50		
Repetitive positioning accuracy (mm)	±0.03			
Guide mechanism	Linear guide			
Max. holding weight ^{Note 1} (kg)	0.5	1.5	2.5	
Weight (g)	200	350	800	

- Holding power control : 30 to 100% (1% steps)
- Acceleration control : 1 to 100% (1% steps)
- Speed control : 20 to 100% (1% steps)
- Multipoint position control : 10,000 max.

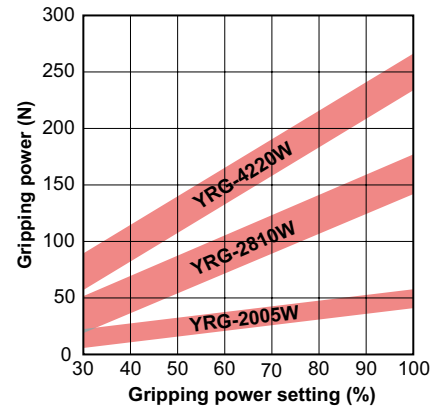
Note. Design the finger as short and lightweight as possible. Note. Set the parameters and holding power (%) of the holding movement command so that any excessive shock is not applied to the finger during operation.

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. The maximum gripping weight is the upper limit weight when the workpiece is gripped with maximum continuous rated gripping force. Determine the weight of the workpiece to be gripped by considering the upper limit weight and the inertia force due to acceleration/deceleration and rotary operation in the gripped state.

Gripping power vs. gripping power setting (%)

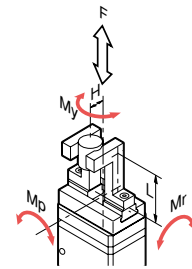


- Graph shows a general guide to gripping power versus gripping power setting (%). Variations will appear in the actual gripping power.

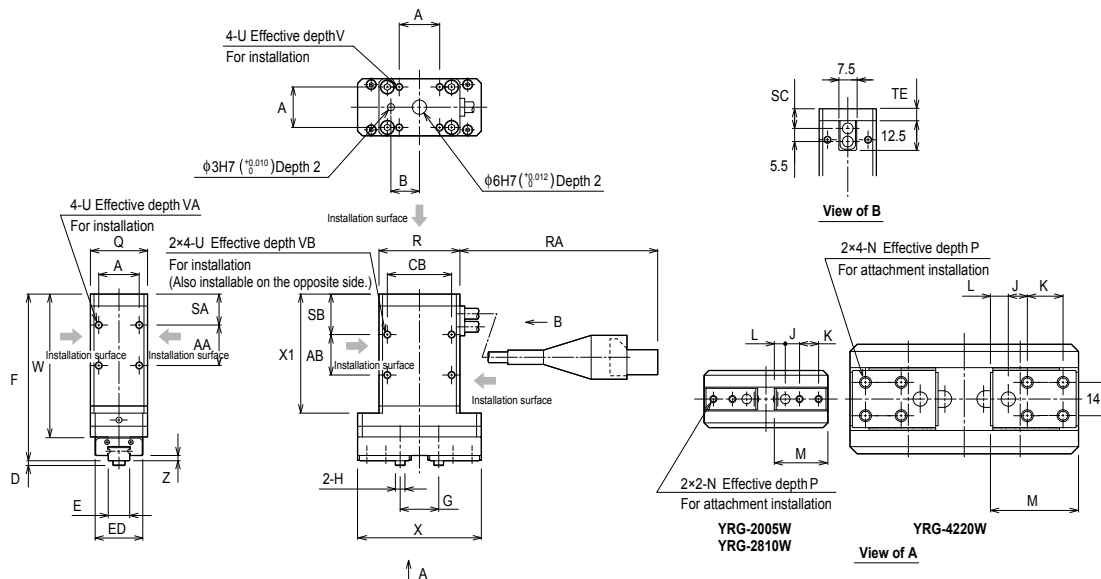
Allowable load and load moment

				YRG-2005W	YRG-2810W	YRG-4220W
Guide	Allowable load	F	N	1000	1000	2000
	Allowable pitching moment	Mp	N·m	6.7	8.1	20.1
	Allowable yawing moment	My	N·m	4	4.8	12
	Allowable rolling moment	Mr	N·m	5.1	7.8	25.9
Finger	Max. weight (1 pair)			40	80	200
	Max. holding position	L	mm	30	30	50
	Max. overhang	H	mm	20	20	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-2005W/2810W/4220W



	A	AA	AB	B	CB	D	E	ED	F	G	H	J	K	L
YRG-2005W	17	17	17	12	27	2	9 ⁰ _{-0.05}	20	74	10.6 to 15.6	φ4 ⁰ _{-0.012}	6	8	4.6
YRG-2810W	24	24	14	15	38	2	14 ⁰ _{-0.05}	25	80	12.6 to 22.6	φ5 ⁰ _{-0.012}	7	10	5.65
YRG-4220W	36	25	13	20	50	3	24 ⁰ _{-0.05}	40	90	17.0 to 36.3	φ6 ⁰ _{-0.012}	8	15	7.5

	M	N	P	Q	R	RA	SA	SB	SC	TE	U	V	VA	VB	W	X	X1	Z
YRG-2005W	22.5	M3	5	24	34	165±/10	13	17	8.3	5	M3	5	6	6	64	52	54	2.2
YRG-2810W	27.5	M4	5	32	46	140±/10	16	21	9.3	6	M4	6	8	8	71	67	61	2
YRG-4220W	37	M5	8	46	60	235±/10	18	24	10.8	7.5	M5	7.5	8	10	76	96	63	3

YRG Series

Screw type straight style

YRG-2020FS/2840FS



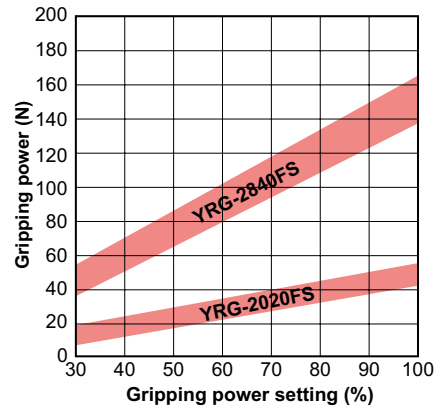
Basic specifications

Model name	YRG-2020FS	YRG-2840FS
Model number	KCF-M2013-A0	KCF-M2013-B0
Holding power	Max. continuous rating (N)	50
	Min. setting (% (N))	30 (15)
	Resolution (% (N))	1 (0.5)
Open/close stroke (mm)		19
	Max. rating (mm/sec)	50
	Min. setting (% (mm/sec))	20 (10)
Speed	Resolution (% (mm/sec))	1 (0.5)
	Holding speed (Max.) (%)	50
	Repetitive positioning accuracy (mm)	+/-0.01
Guide mechanism	Linear guide	
Max. holding weight ^{Note 1} (kg)	0.5	1.5
Weight (g)	420	880

- Holding power control : 30 to 100% (1% steps)
- Acceleration control : 1 to 100% (1% steps)
- Speed control : 20 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. The maximum gripping weight is the upper limit weight when the workpiece is gripped with maximum continuous rated gripping force.
 Determine the weight of the workpiece to be gripped by considering the upper limit weight and the inertia force due to acceleration/deceleration and rotary operation in the gripped state.

Gripping power vs. gripping power setting (%)

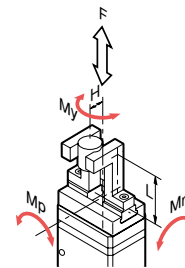


• Graph shows a general guide to gripping power versus gripping power setting (%). Variations will appear in the actual gripping power.

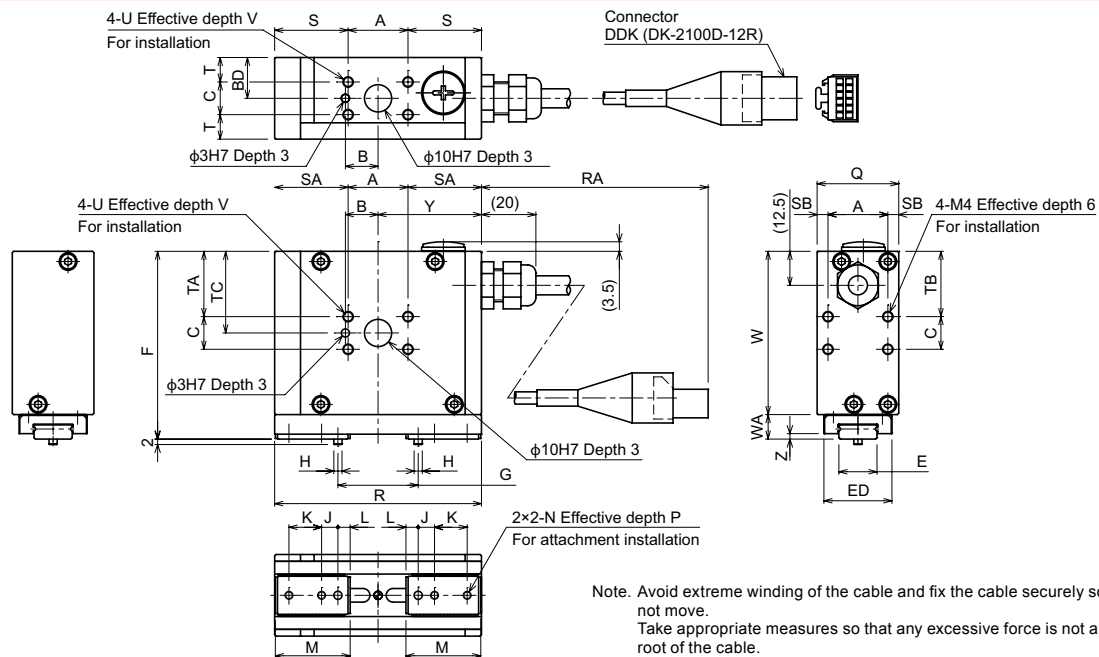
Allowable load and load moment

			YRG-2020FS	YRG-2840FS
Guide	Allowable load	F N	1000	1300
	Allowable pitching moment	Mp 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	H 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.



YRG-2020FS/2840FS



Note. Avoid extreme winding of the cable and fix the cable securely so that it does not move. Take appropriate measures so that any excessive force is not applied to the root of the cable.

	A	B	BD	C	D	E	ED	F	G	H	J	K	L	M	N
YRG-2020FS	22	12	15	12	2	14 ⁰ _{-0.05}	25	69	10.5 to 29.5	φ3 ⁰ _{-0.01}	6	12	4.5	27.5	M3
YRG-2840FS	30	15	20	16	2	18 ⁰ _{-0.05}	30	84	13 to 51	φ4 ⁰ _{-0.012}	8	14	5.5	34.5	M4

	P	Q	R	RA	S	SA	SB	T	TA	TB	TC	TD	U	V	W	WA	Y	Z
YRG-2020FS	5	30	76	175+/-10	27	27	4	9	24	24	30	12.5	M4	6	60	9	38	2
YRG-2840FS	7.5	40	110	135+/-10	40	40	5	12	28	28	36	14	M5	7.5	72	12	55	3

Screw type "T" style

YRG-2020FT/2840FT



Basic specifications

Model name	YRG-2020FT	YRG-2840FT
Model number	KCF-M2014-A0	KCF-M2014-B0
Holding power	Max. continuous rating (N)	50
	Min. setting (% (N))	30 (15)
	Resolution (% (N))	1 (0.5)
Open/close stroke (mm)		19
		38
Speed	Max. rating (mm/sec)	50
	Min. setting (% (mm/sec))	20 (10)
	Resolution (% (mm/sec))	1 (0.5)
	Holding speed (Max.) (%)	50
Repetitive positioning accuracy (mm)	+/-0.01	+/-0.01
Guide mechanism	Linear guide	
Max. holding weight ^{Note 1} (kg)	0.5	1.5
Weight (g)	420	890

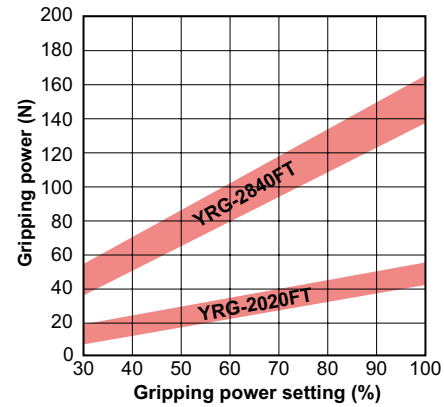
- Holding power control : 30 to 100% (1% steps)
- Acceleration control : 1 to 100% (1% steps)
- Speed control : 20 to 100% (1% steps)
- Multipoint position control : 10,000 max.

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. The maximum gripping weight is the upper limit weight when the workpiece is gripped with maximum continuous rated gripping force.
 Determine the weight of the workpiece to be gripped by considering the upper limit weight and the inertia force due to acceleration/deceleration and rotary operation in the gripped state.

Gripping power vs. gripping power setting (%)

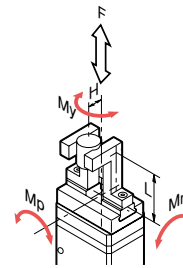


- Graph shows a general guide to gripping power versus gripping power setting (%). Variations will appear in the actual gripping power.

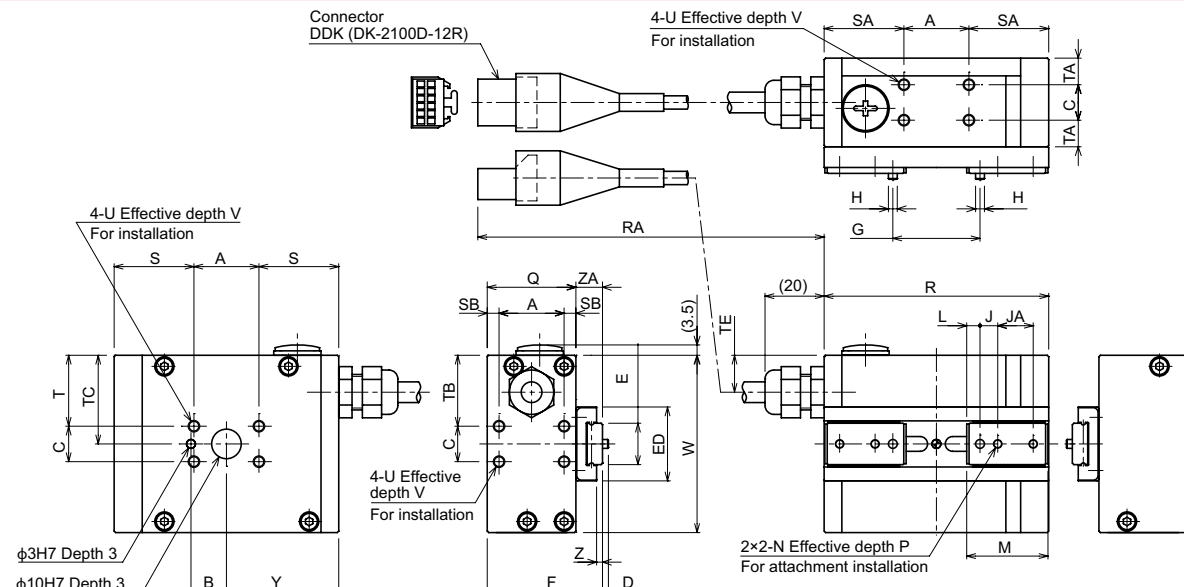
Allowable load and load moment

Guide	Allowable load	YRG-2020FT		YRG-2840FT	
		F	N		
	Allowable load		1000		1300
	Allowable pitching moment	Mp	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	H	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.



YRG-2020FT/2840FT



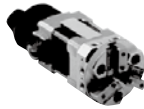
Note. Avoid extreme winding of the cable and fix the cable securely so that it does not move.
 Take appropriate measures so that any excessive force is not applied to the root of the cable.

	A	B	C	D	E	ED	F	G	H	J	JA	K	L	M	N	P		
YRG-2020FT	22	12	12	2	14 _{0-0.05}	25	39	10.5 to 29.5	φ3 _{0-0.01}	6	12	12	4.5	27.5	M3	5		
YRG-2840FT	30	15	16	2	18 _{0-0.05}	30	52	13 to 51	φ4 _{0-0.012}	8	14	14	5.5	34.5	M4	7.5		
	Q	R	RA	S	SA	SB	T	TA	TB	TC	TD	TE	U	V	W	Y	Z	ZA
YRG-2020FT	30	76	175+/-10	27	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

Model name	YRG-2004T	
Model number	KCF-M2015-A0	
Holding power	Max. continuous rating (N)	2.5
	Min. setting (% (N))	30 (0.75)
	Resolution (% (N))	1 (0.025)
Open/close stroke (mm)	3.5	
Speed	Max. rating (mm/sec)	100
	Min. setting (% (mm/sec))	20 (20)
	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	

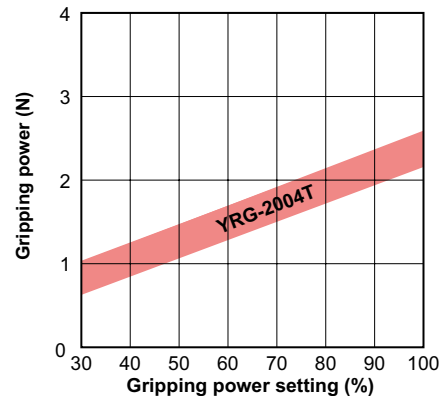
- Holding power control : 30 to 100% (1% steps)
- Acceleration control : 1 to 100% (1% steps)
- Speed control : 20 to 100% (1% steps)
- Multipoint position control : 10,000 max.

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. The maximum gripping weight is the upper limit weight when the workpiece is gripped with maximum continuous rated gripping force.
 Determine the weight of the workpiece to be gripped by considering the upper limit weight and the inertia force due to acceleration/deceleration and rotary operation in the gripped state.

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-2004T	
Finger	Allowable load	N	6
	Allowable pitching moment	N·m	0.02
	Max. weight (1 pair)	g	10
	Max. holding position	L mm	15

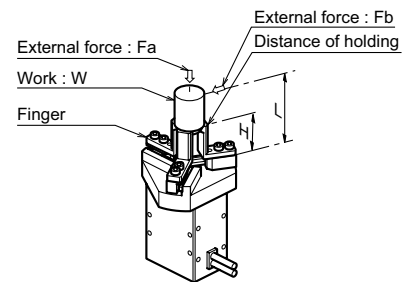
• When the external forces F_a and F_b are applied to a portion the distance (L) apart from the finger installation surface, the load (F) and moment (M) are calculated from the formulas shown below.

$$F = F_a + W \times g$$

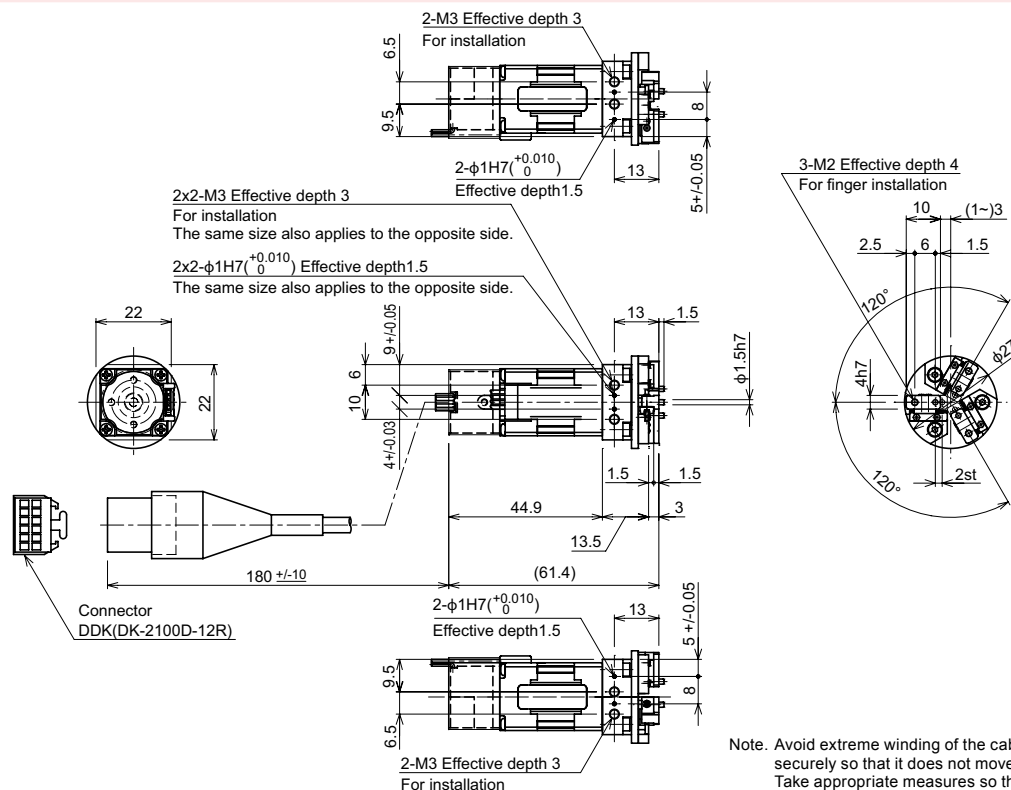
$$M = F_b \times L$$

F_a : External force [N]
 F_b : External force [N]
 W : Workpiece weight [Kg]
 g : Gravity acceleration [m/s^2]
 H : Distance of holding point [m]

F : Load [N]
 M : Moment [N·m]
 L : Distance of point of external force application [m]



YRG-2004T



Note. Avoid extreme winding of the cable and fix the cable securely so that it does not move. Take appropriate measures so that any excessive force is not applied to the root of the cable.

Three fingers type

YRG-2013T/2820T/4230T



Basic specifications

Model name	YRG-2013T	YRG-2820T	YRG-4230T	
Model number	KCF-M2015-B0	KCF-M2015-C0	KCF-M2015-D0	
Holding power	Max. continuous rating (N)	2	10	20
	Min. setting (% (N))	30 (0.6)	30 (3)	30 (6)
	Resolution (% (N))	1 (0.02)	1 (0.1)	1 (0.2)
Open/close stroke (mm)	13	20	30	
Speed	Max. rating (mm/sec)	100		
	Min. setting (% (mm/sec))	20 (20)		
	Resolution (% (mm/sec))	1 (1)	1 (1)	1 (1)
	Holding speed (Max.) (%)	50	50	50
Repetitive positioning accuracy (mm)	±0.03			
Guide mechanism	Linear guide			
Max. holding weight ^{Note 1} (kg)	0.02	0.1	0.2	
Weight (g)	190	340	640	

- Holding power control : 30 to 100% (1% steps)
- Acceleration control : 1 to 100% (1% steps)
- Speed control : 20 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. The maximum gripping weight is the upper limit weight when the workpiece is gripped with maximum continuous rated gripping force.
 Determine the weight of the workpiece to be gripped by considering the upper limit weight and the inertia force due to acceleration/deceleration and rotary operation in the gripped state.

Allowable load and load moment

		YRG-2013T	YRG-2820T	YRG-4230T	
Finger	Allowable load	N	20	30	50
	Allowable pitching moment	N·m	0.1	0.2	0.4
	Max. weight (1 pair)	g	20	30	50
	Max. holding position	L mm	20	30	40

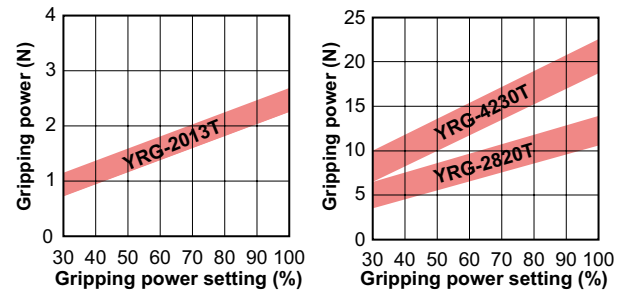
• When the external forces Fa and Fb are applied to a portion the distance (L) apart from the finger installation surface, the load (F) and moment (M) are calculated from the formulas shown below.

$$F = Fa + W \times g$$

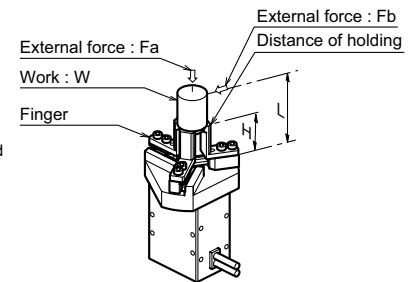
$$M = Fb \times L$$

Fa : External force [N]
 Fb : External force [N]
 W : Workpiece weight [Kg]
 g : Gravity acceleration [m/s²]
 H : Distance of holding point [m]

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.



YRG-2013T/2820T/4230T

	A	B	C	D	E	F	G	H	HA	HB	J	K	L	N
YRG-2013T	50	19	34	24	50	19	42	17	13	13	17	M3	6	17
YRG-2820T	58	19	46	32	66	25	40	24	16	16	24	M4	8	14
YRG-4230T	59	25	60	46	86	34	45	25	18	18	36	M5	8	13

	NA	NB	P	Q	R	S	T	U	V	W	WA	AA	BA
YRG-2013T	17	72	27	M3	6	17	17	M3	5	11.4 to 4.6	6.8st	12	10 ⁰ _{-0.02}
YRG-2820T	21	80	38	M4	8	24	24	M4	6	15.9 to 5.6	10.3st	15	10 ⁰ _{-0.02}
YRG-4230T	24	88	50	M5	10	36	36	M5	7.5	21.9 to 6.6	15.3st	20	14 ⁰ _{-0.02}

	BB	BC	BD	BE	BF	BG	BH	BJ	BK	BL
YRG-2013T	16	2.5	10	***	3x1-M3	8	2	φ3 ⁰ _{-0.01}	165±/10	8.3
YRG-2820T	19.5	2.5	6	8	3x2-M3	6	2	φ3 ⁰ _{-0.01}	140±/10	9.3
YRG-4230T	22.5	2.5	6	10	3x2-M4	8	3	φ4 ⁰ _{-0.012}	235±/10	10.8

Electric gripper basic specifications

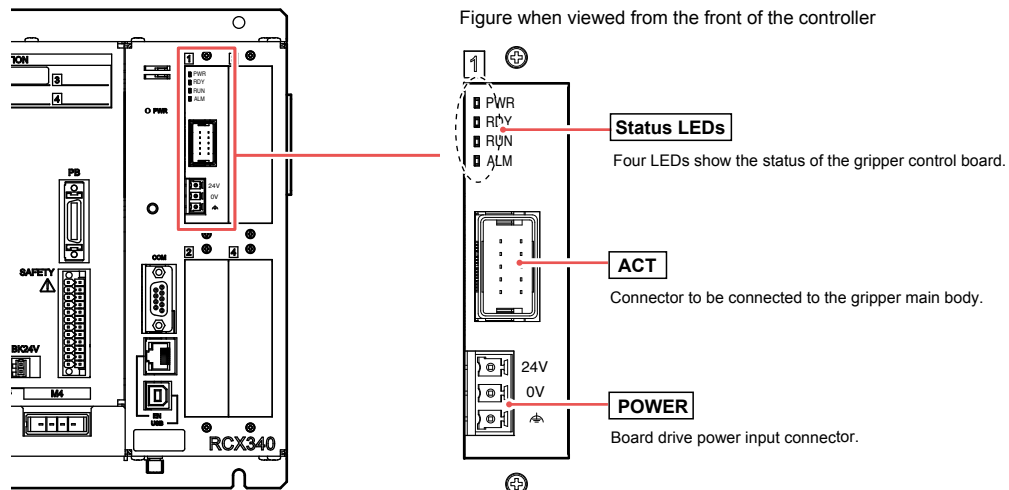
Item		Specifications
Basic specifications	Applicable controller	RCX320 / RCX340
	Number of connection grippers	Max. 4 units
Axis control	Control method	PTP motion
	Min. setting unit	0.01mm
	Position indication unit	Pulses, mm (millimeters)
	Speed setting	20 to 100% (in 1% steps, Changeable by the program.)
Programming	Acceleration setting	1 to 100% (in 1% steps, Setting by the acceleration parameter)
	Teaching	MDI (coordinate data input), direct teaching, teaching playback, offline teaching (data input from external unit)

Gripper control board specifications

Item		Specifications
Axis control	No. of axes	1 axis
	Position detection method	Optical rotary encoder
	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

RCX320 / RCX340



Accessories and part options

YRG Series



Standard accessories

● **Gripper control board**

Model KCX-M4400-G0

RCX320

Note. This board includes a 24V supply connector.

RCX340

● **Robot (for gripper) cable**



Model	3.5m	KCF-M4751-31
	5m	KCF-M4751-51
	10m	KCF-M4751-A1

RCX320

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
	2m	KCF-M4811-41
	2.5m	KCF-M4811-51
	3m	KCF-M4811-61
	3.5m	KCF-M4811-71
4m	KCF-M4811-81	

RCX320

RCX340

● **Connector for 24V power supply**



Model KCF-M5382-00

RCX320

RCX340

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

MEMO

Articulated robots YA
Linear conveyor modules LCM
Single-axis robots CX
Motorless single axis actuator Robonity
Compact single-axis robots TRANSEVO
Single-axis robots FLIP-X
Linear motor single-axis robots PHASER
Cartesian robots XY-X
SCARA robots YK-X
Pick & Place robots YP-X
CLEAN
CONTROLLER
INFORMATION
Robot positioner
Pulse string driver
Robot controller
RCXIVY2+ Electric gripper
Option