

MELFA RV-2A/RV-3AJ RV-2AM/RV-3AJM

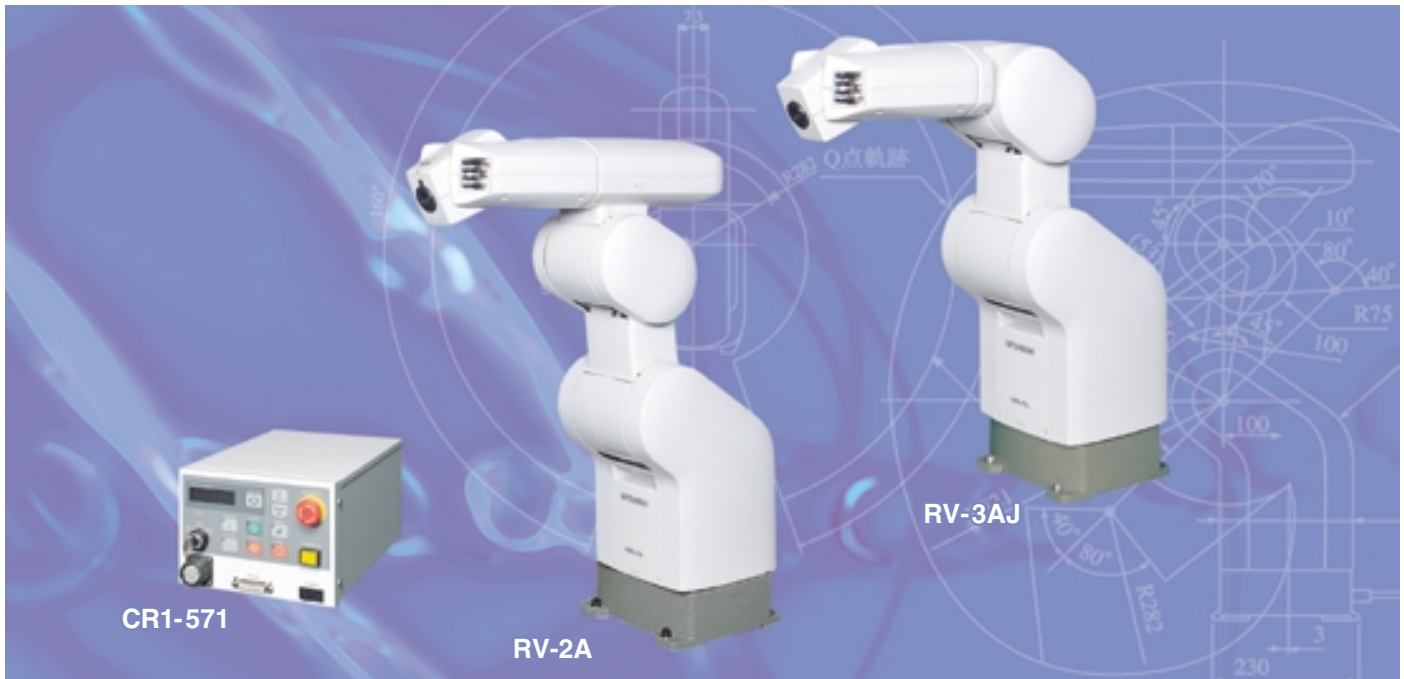


Mitsubishi Electric Industrial Robots are manufactured at a factory certified for ISO14001 (standards for environmental management systems) and ISO9001 (standards for quality assurance management systems).



A Novel Series of Compact Robots is Ready to Serve Your Various Needs

These novel compact robots are faster, more reliable, and more user-friendly than earlier models. The precision for following the path is enhanced and the contact time is minimized as a result of using a new model motor encoder. At the same time, their controller has been made more compact and light-weight, being equipped as well with capabilities of network communications through Ethernet or CC-Link. Energy saving and safety in operation have also been fully considered; these combinations can serve your needs in various fields of applications.



Compact Controller

An A4-size robot controller



Compact, Light-weight 6-axis Unit

Compact, light-weight, and enhanced performance of operation



For Manufacturing Applications

A complete set of functions including network



Environmental Safety

Energy-saving overall motor maximum capacity of only 360W

Basic Specifications

Main Body

		6-axis type		5-axis type	
Model	Units	RV-2A	RV-2AM	RV-3AJ	RV-3AJM
Degrees of freedom		6		5	
Driving method		AC servomotor (J1~J3 and J5 axis brake attached)			
Position sensing method		Absolute encoder			
Maximum load capacity (rating)	kg	2		3	
Maximum reach radius	mm	621		630	
Working area	J1	320 (−160~+160)			
	J2	180 (−45~+135)			
	J3	120 (+50~+170)		135 (0~+135)	
	J4	320 (−160~+160)		—	
	J5	240 (−120~+120)			
	J6	400 (−200~+200)			
Maximum speed	J1	150			
	J2	150			
	J3	180		—	
	J4	240		—	
	J5	180			
	J6	330			
Repeat position accuracy	mm	±0.04			
Ambient temperature	°C	0–40			
Weight	kg	Approx. 37	Approx. 38	Approx. 33	Approx. 34
Tool wiring *1		6 wires for hand-check work (4-point inputs and 2 power supply lines, the hand unit); 4-point outputs for air-hand (the shoulder unit); 1-point output for motor-driven hand (the hand unit); 4 spare wires (0.3 mm2 in size, arranged from the base through the end of fore-arm).			
Tool air-tubing		Primary: ø6×2 ports Secondary: ø4×4 ports	Primary: ø6×2 ports Secondary: ø4×6 ports	Primary: ø6×2 ports Secondary: ø4×4 ports	Primary: ø6×2 ports Secondary: ø4×6 ports
Protective structure		IP30	IP54	IP30	IP54

*1: An air-hand interface (option) is required when tool outputs are used.

*2: 3 slots when an expansion-option box (option) is installed.

*3: The power consumption during typical patterns of operations is about 0.6kW.

*4: The size or mass excludes the expansion-option box (option).

Note: These specifications may be changed without prior notice.

Controller

Model	Units	CR1-571
Path control method		PTP control and CP control
Number of controlled axis	Axis	Concurrent control of up to 6 axes
CPU		64bit RISC/DSP
Main functions		Indirect interpolation, direct interpolation, 3-dimensional radii interpolation, palletizing, condition branching, subroutines, multi-tasking, optimum adjustable speed control, optimum override control, optimum route connection, etc.
Programming language		MELFA-BASIC IV or MoveMaster language (MoveMaster Command)
Position teaching method		Direct and remote teaching, and MDI method
Memory capacity	Number of teaching points	Point/prg 2,500
	Number of steps	Step/prg 5,000
	Number of programs	Program 88
External input/output	General-purpose input/output	Point 16/16 (max. when using options: 240/240)
	Exclusive	Point Allocated by general output (1 "STOP" point is fixed)
	Hand opening/closing	Point 4/0 (when using options: 4/4)
	Door-switch input	Point 1
Interface	RS232C	Port 1 (for the connection of a PC, vision sensor, etc.)
	RS422	Port 1 (for exclusive to the connection of teaching box)
	Hand-exclusive slot	Slot 1 (electric hand and pneumatic hand interface only)
	Expansion slot *2	Slot 0 (when option is used: 3 [for expansion options])
	Robot input/output	Channel 1 (for connecting parallel I/O unit)
Ambient temperature	°C	0~40
Ambient humidity	%RH	45~85
Power supply	Input voltage limit	V 180~242VAC, single phase
	Power capacity *3	kVA 0.7
Grounding	Ω	100 or less (D-type grounding)
Structure		Self-supported floor type, open structure
Outside dimension *4	mm	212 (W)×290 (D)×151 (H)
Weight *4	kg	Approx. 8
Protective structure		IP20 (IP54: when using CR1 protective box)

from Mitsubishi, RV-2A/3AJ, eds

Features



Enhanced operation performance

Operation performances have been enhanced as a result of using a new model motor encoder. High-speed operations are available because of higher-speed movements in the directions of the wrist axis. In addition, the standard configuration employs a brake-equipped motor for the robot wrist (J5 axis), ensuring higher reliability.



Compact and high-performance controller

This controller requires only an A4-size area for installation (the smallest for this class of our robot products). A 64-bit RISC CPU is used, and then functions, performances, and expandability have been greatly improved. The robot language (MELFA-BASIC IV) supports a full set of commands that allow you to cope with advanced operations.



A complete set of option utilities including network communications

Network communications through Ethernet or CC-Link are fully available. Advanced systems can be readily configured by using a variety of optional control functions, such as additional axis control and built-in vision sensor. Moreover, SupportWare (compatible with Windows 95, 98, and 2000) is available, which provides not only programming function and simulation function but also remote monitoring function that can be operated from a remote site; your startup and maintenance work can be facilitated.



Safety and energy saving are fully considered

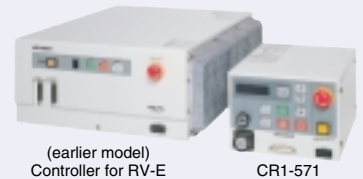
The teaching box uses 3-position deadman switches. For the machines of 6-axis specifications, an interface for door-switch input is incorporated. Alarm monitoring function implemented by multitasking function will assure safety in operation. Furthermore, energy saving in your plant can be advanced by the low motor power consumption of 80W and the total power consumption of 360W.

Compatibility with RV-E series

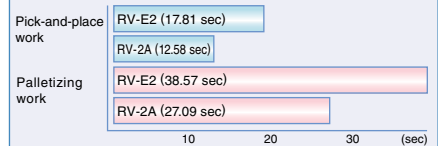
Two kinds of robot languages, MELFA-BASIC IV and MoveMaster (MoveMaster Command), are included in the standard configuration.

Note that "Windows" and "Windows 95, 98, and 2000" are registered trademarks of Microsoft Corporation in the United States and other countries.

Comparison with RV-E (controller)



Cycle time faster by 30% than earlier model

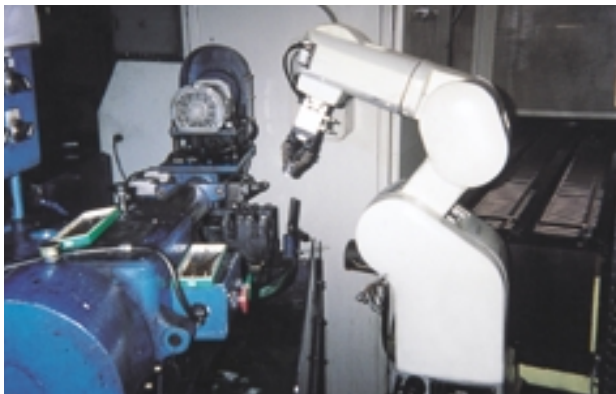


Both types of work are compared under the condition of a specific pattern of operation that we chose.

Major Functions of New Model Controller

- ① Optimum accelerating and decelerating control
- ② Optimum override control
- ③ Optimum path finding
- ④ Orthogonal compliance control
- ⑤ Multitasking

Main Applications



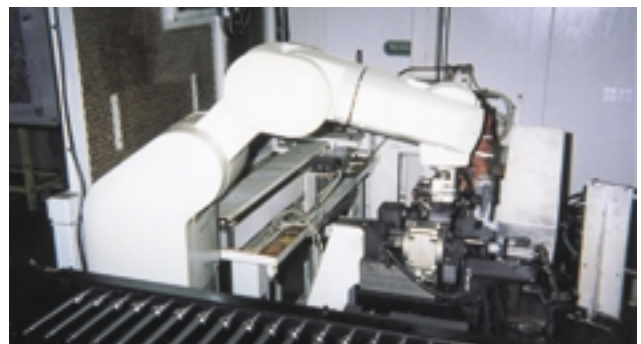
Manufacturing



Soldering work

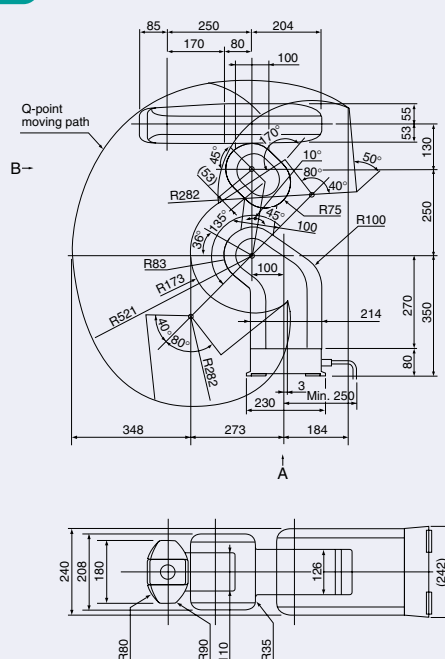


Training system



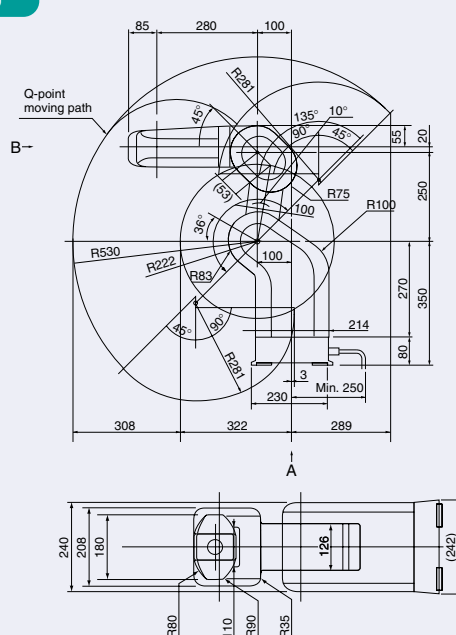
Automobile-part transfer

RV-2A



The drawing consists of three parts:

- Top View:** A circular path with a 160° arc. It features a central vertical assembly with dimensions: 73 (height of the top part), R630 (radius of the outer arc), R207 (radius of the middle arc), and R322 (radius of the bottom arc). A label 'Q' points to the top of the central assembly.
- Section viewed from A:** A cross-section of the circular path. It shows a 160° arc with a 205mm width. The height is 122mm. There are four mounting holes (4-ø9) and a mounting reference plane. Dimensions include 115mm and 102.5mm from the reference plane to the mounting holes.
- Section viewed from A:** A cross-section of the central assembly. It shows a 4-M5 screw with a depth of 8mm (P.C. ø31.5). There are two holes: ø5H7 with a depth of 8mm and ø20H7 with a depth of 3mm. The total height is ø40H8.



Section viewed from A

Connector for connecting inter-device cable (power lines)

Connector for connecting inter-device cable (signal lines)

Power supply socket

(2.5) 212 (2.5)

151

(31) 150 (31) (15)

(38) 290

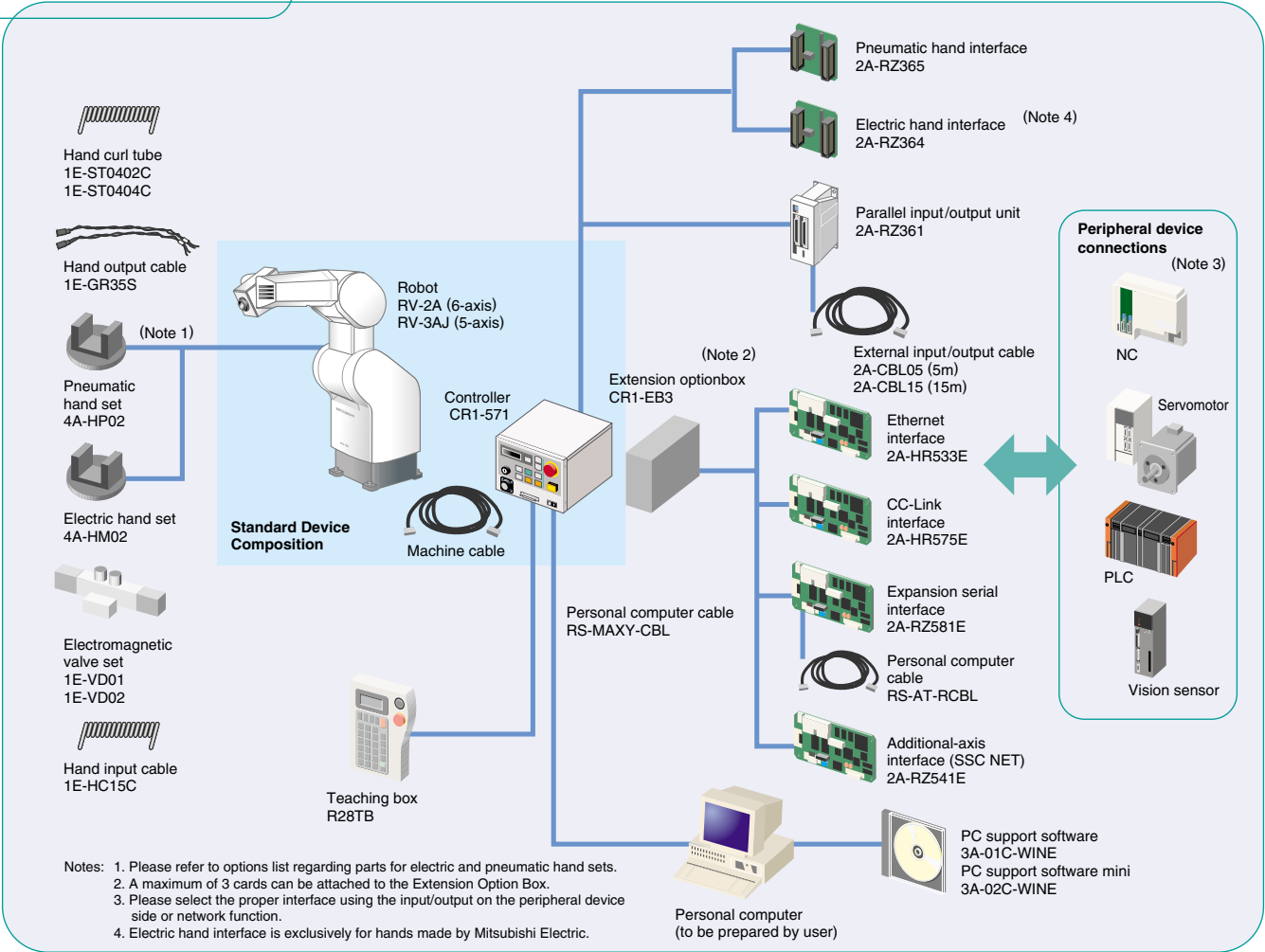
49 200

- *When optional expansion card is installed.

Diagram illustrating a 2D array layout in memory. The array is represented as a large rectangle divided into two main sections. The left section is labeled '212' and contains a smaller rectangle and a circle. The right section is labeled 'approx. 90' and contains a vertical rectangle labeled '151'.

Performances can be greatly enhanced with the help of RV-2A/3AJ

System Configuration

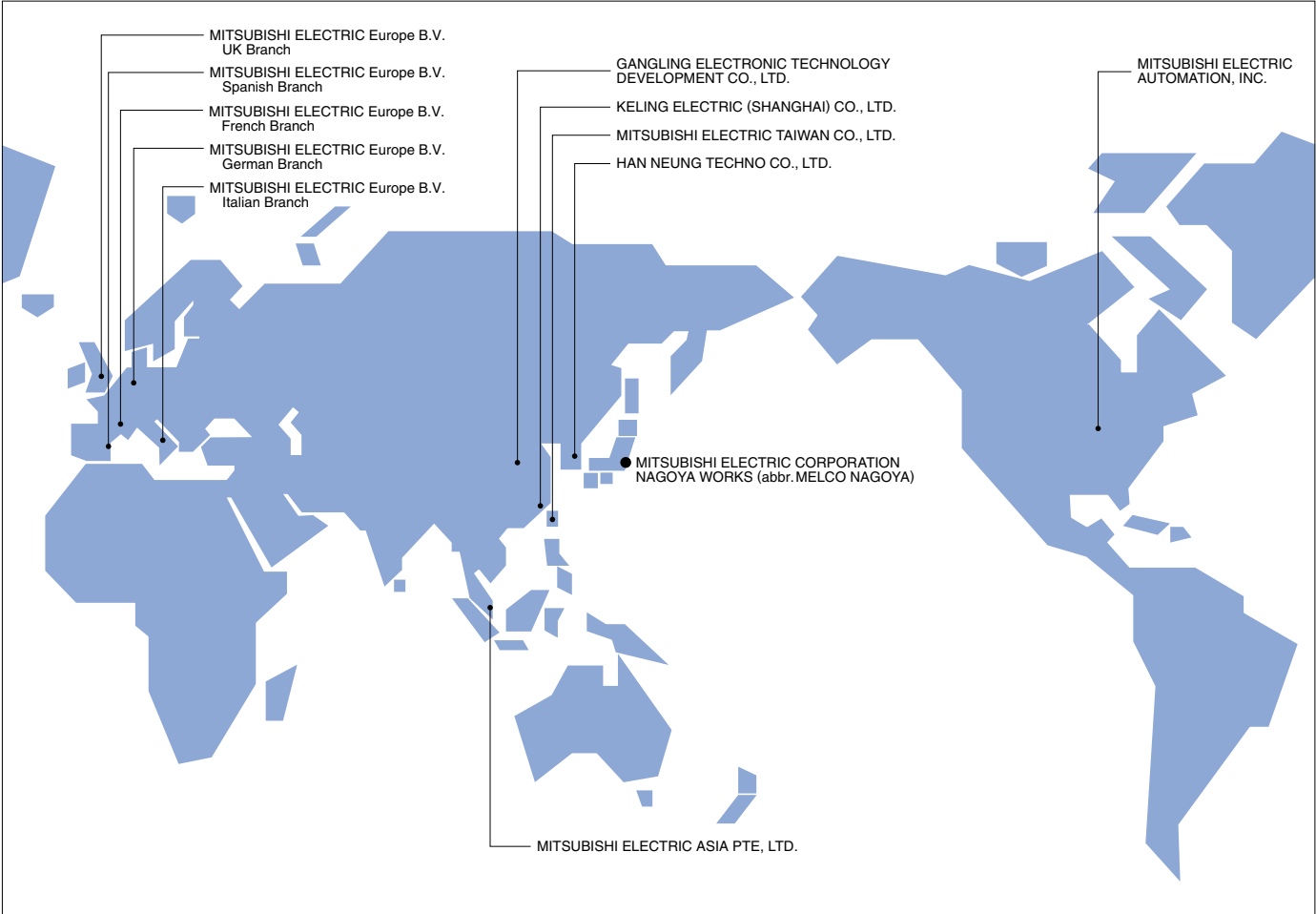


Options

	Name	Model No.	Description/Specification	Remarks
Main body options	Electric hand set	4A-HM02	Main hand unit, curl cable, electric hand interface, adapter, installation bolts	
	Pneumatic hand set	4A-HP02	Main hand unit, curl tube (1 set), pneumatic hand interface, electromagnetic valve (1 set), adapter, installation bolts	
	Electromagnetic valve set	1E-VD01E	1 set	
		1E-VD02E	2 sets	
	Hand output cable	1E-GR35S	350mm length	
	Hand input cable	1E-HC15C	370mm length	
	Hand curl tube (1 set: 2 pieces)	1E-ST0402C	Utilizing 1 set, external diameter $\phi 4 \times 2.5$ mm	
Controller options	Hand curl tube (2 set: 4 pieces)	1E-ST0404C	Utilizing 2 sets, external diameter $\phi 4 \times 2.5$ mm	
	Hand adapter	BU144D697H01	for conversion of flange attached to mutual hand of RV-E	
	Teaching box	R28TB	IP65, cable length 7m	
	Pneumatic hand interface (sink type)	2A-RZ365	Output: 8 points (sink)	
	Parallel Input/Output interface (sink type)	2A-RZ361	Output: 32 points, Input: 32 points (sink)	
	External Input/Output cable	2A-CBL05	One terminal untreated, 5m length	
		2A-CBL15	One terminal untreated, 15m length	
	CR1 protection box	CR1-MB	Oil-mist protection box (455×492×202) dedicated to CR1 controller	Dedicated to CR1
	Ethernet interface	2A-HR533E	10base-T 10Mbps	
	CC-Link interface	2A-HR575E	CC-Link intelligent remote station (1 or 4 stations), 32 points/32points per station	*1 Attached to extension box
	Additional axis interface	2A-RZ541E	SSCNET compatible (applicable servo system: MR-J2S, up to 8 axis)	
	Expansion serial interface	2A-RZ581E	RS-232C/422, 1 channel each (422 can be switched to 232C)	
	Extension option box	CR1-EB3	Option card expansion unit, 3 slots	Note 1
	Personal computer support software (Windows®)	3A-01C-WINE	Windows® compatible support software with simulation function (CD-ROM)	
Maintenance parts	Personal computer support software mini (Windows®)	3A-02C-WINE	Simplified version of Windows® compatible support software (CD-ROM)	
	Personal computer cable	RS-MAXY-CBL	for PC-AT (DOS/V) compatible PCs; 3m long cable; straight-angle type	
		RS-AT-RCBL	for PC-AT (DOS/V) compatible PCs; 3m long cable; right-angle type; for the serial interface to be used for CR1 controller expansion	*1 Attached to extension box
	Battery for memory-backup	A6BAT	for those used inside mechanisms	
		ER6	for those used in the controller	

Note 1: Required when options marked by *1 are used.
* Windows® is a registered trademark of Microsoft Corporation.

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Safety Warning

To ensure proper use of the products listed in this catalog,
please be sure to read the instruction manual prior to use.



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