Changes for the Better

MITSUBISHI ELECTRIC

INDUSTRIAL ROBOTS

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).

ISO 14001 JACO UKAS ENVIRONMENTAL MANAGEMENT 051

BVQI ISO 9001 UKAS QUALITY MANAGEMENT 008

A Novel Series of Compact Robots are Ready to Serve Your Various Ne

These novel compact robots are faster, more reliable, and more user-friendly than earlier models. Path precision has been enhanced and contact time minimized with a new, high precision 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. The new controller results in significant energy savings and improves operational safety. 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

Model		Units	6-axis type RV-2A	6-axis type RV-2AM	5-axis type RV-3AJ	5-axis type 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 (wrist)		kg	2		3	
Maximum reach radius		mm	621		630	
Working area	J1	Deg.	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	Deg./s	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

Model name	I/O	CE	Power supply
RV-2A(M)-S11	Sink	—	AC180~253V, 1 phase
RV-2A(M)-S12	Source	CE	AC207~253V, 1 phase
RV-3AJ(M)-S11	Sink	—	AC180~253V, 1 phase
RV-3AJ(M)-S12	Source	CE	AC207~253V, 1 phase

Note: Please choose S11 or S12 according to delivery destination since non S** types are Japanese specification models.

*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 0.1kW.
*4. The size of 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 input/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	180~253VAC, single phase 207~253VAC, single phase at CE
	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, eeds

Features

Enhanced operation performance
Operational performance has been enhanced as a result of using a new model motor encoder. High-speed operations are available because of higher-speed movements in the articulation 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, with improved functions, performance and expandability. The robot language (MELFA-BASIC IV) supports a full set of commands that allow you to cope with advanced operations.

A complete set of optional 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.

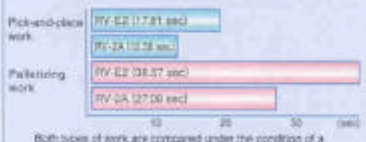
Compatibility with RV-E series
Two kinds of robot languages, MELFA-BASIC IV and MoveMaster (MoveMaster Command), are included in the standard configuration.

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

Comparison with RV-E (controller)

(earlier model) Controller for RV-E — CR1-571

Cycle time faster by 30% than earlier model

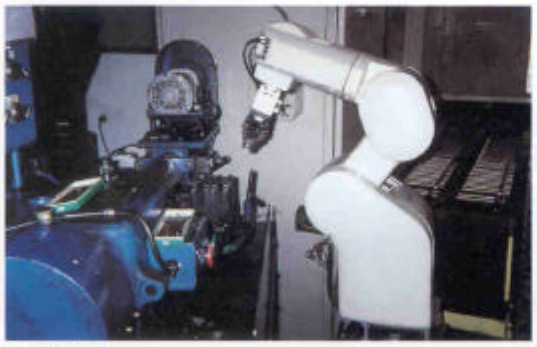


Both types of work are compared under the condition of a specific pattern of operation that we chose.

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

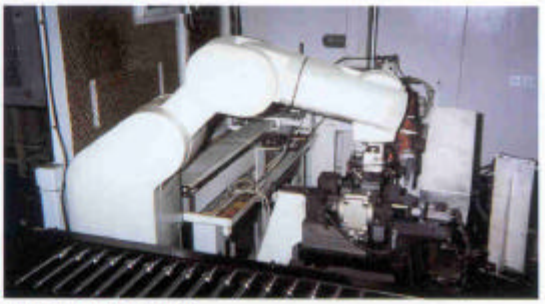
Main Applications



Manufacturing

Soldering work

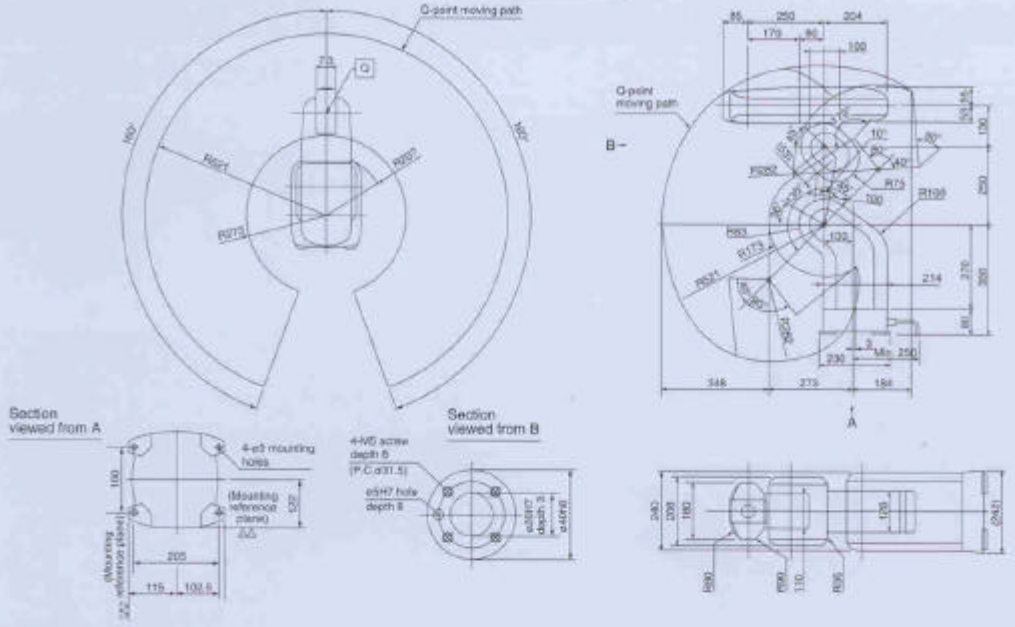
Training system



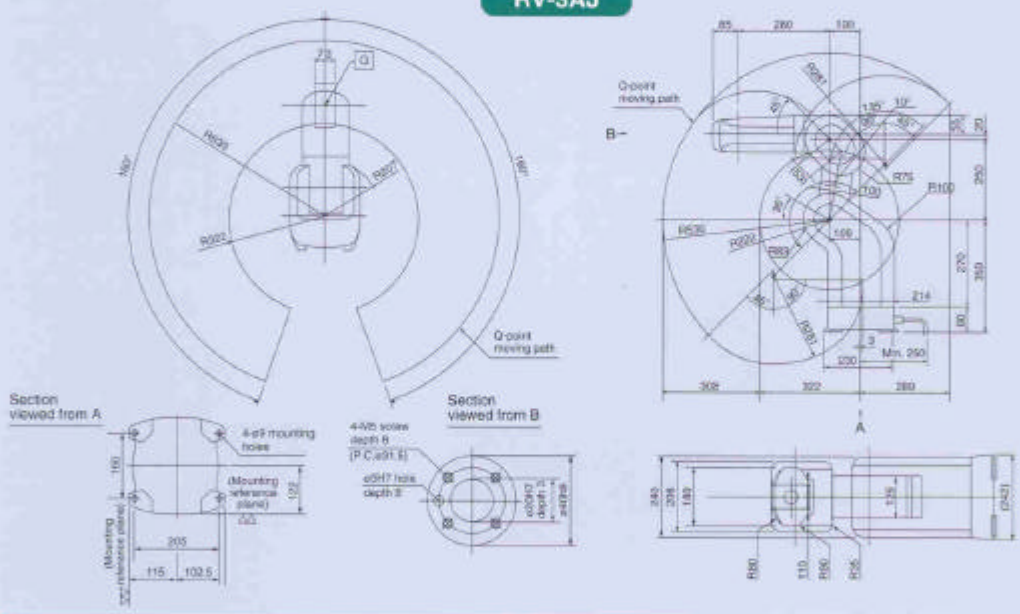
Automobile-part transfer

Robot Main Body External Dimensions

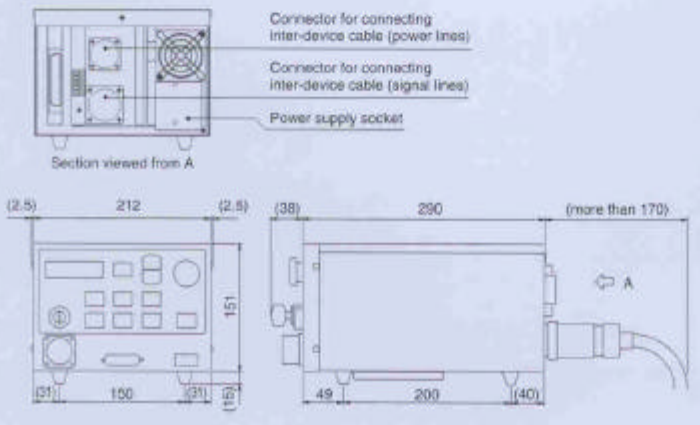
RV-2A



RV-3AJ

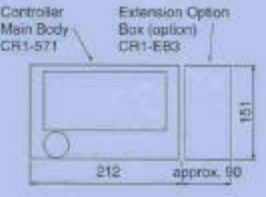


Controller External Dimensions



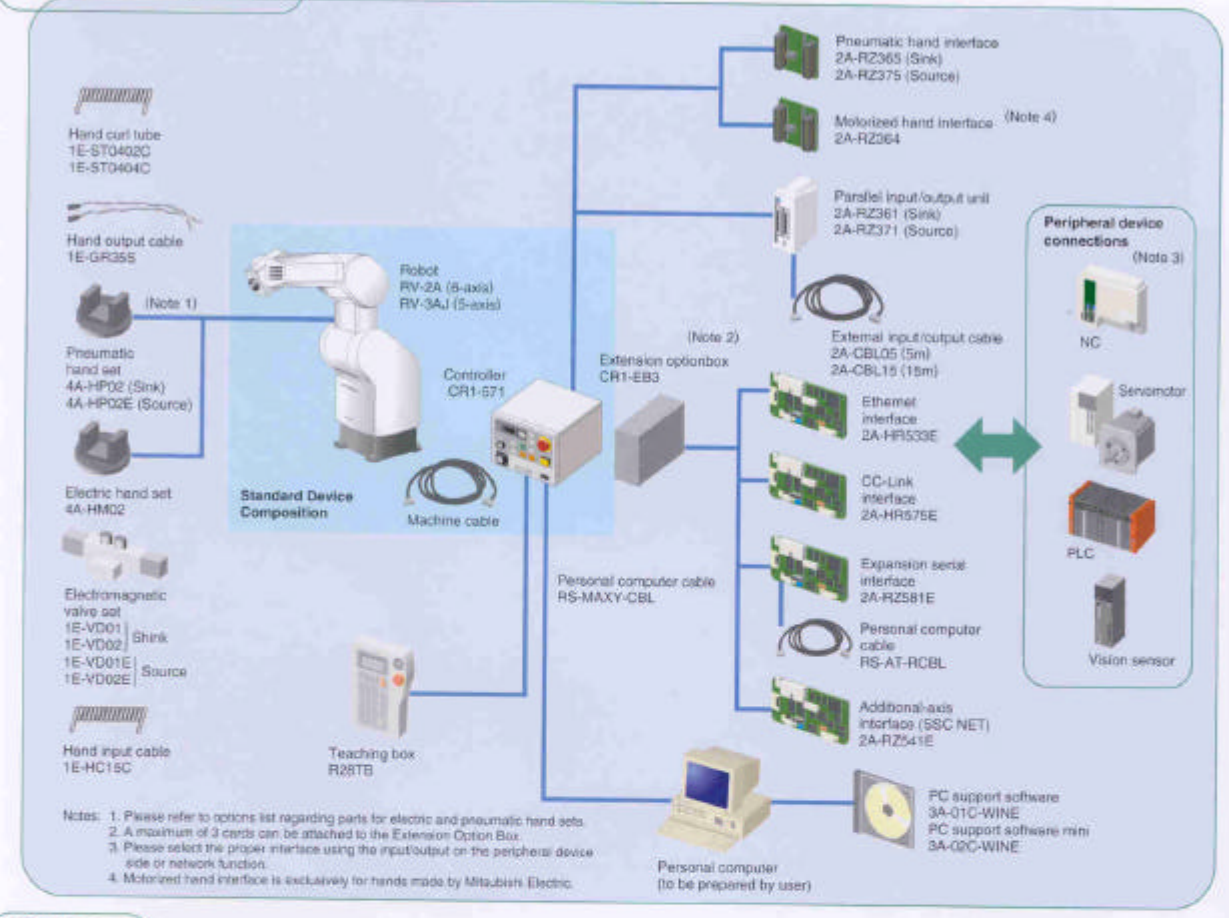
● Dimensions with Extension Option Box (CR1-EB3) Attached

*When optional expansion card is installed.



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

System Configuration



Notes: 1. Please refer to options list regarding parts for electric and pneumatic hand sets.
2. A maximum of 3 cards can be attached to the Extension Option Box.
3. Please select the proper interface using the input/output on the peripheral device side or network function.
4. Motorized hand interface is exclusively for hands made by Mitsubishi Electric.

Options

	Name	Model No.	Description/Specification	Remarks
Main body options	Motorized hand set	4A-HM02	Main hand unit, curl cable, motorized hand interface, adapter, installation bolts	
	Pneumatic hand set (sink type) / (source type)	4A-HP02 / 4A-HP02E	Main hand unit, curl tube (1 set), pneumatic hand interface, solenoid valve (1 set), adapter, installation bolts	
	Solenoid valve set (sink type) / (source type)	1E-VD01 / 1E-VD01E	1 set (sink) / (source)	
		1E-VD02 / 1E-VD02E	2 set (sink) / (source)	
	Hand output cable	1E-GR35S	350mm length	
	Hand input cable	1E-HC15C	370mm length (including 150mm curl cable)	
	Hand curl tube (1 set: 2 pieces)	1E-ST0402C	Utilizing 1 set, external diameter ø4×2.5mm	
	Hand curl tube (2 set: 4 pieces)	1E-ST0404C	Utilizing 2 sets, external diameter ø4×2.5mm	
	Hand adapter	BU144D697H01	for conversion of flange attached to mutual hand of RV-E	
Controller options	Teaching box	R28TB	IP65, cable length 7m	
	Pneumatic hand interface (sink type) / (source type)	2A-RZ365 / 2A-RZ371	Output: 8 points (sink) / (source)	
	Parallel input/output interface (sink type) / (source type)	2A-RZ361 / 2A-RZ371	Output: 32 points, Input: 32 points (sink) / (source)	
	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 (455×482×202) dedicated to CR1 controller	Dedicated to CR1
	Ethernet interface	2A-HR533E	10base-T 10Mbps	*1 Attached to extension box
	CC-Link interface	2A-HR575E	CC-Link intelligent remote station (1 or 4 stations) (32 points/32points per station	
	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)	
	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
Maintenance parts	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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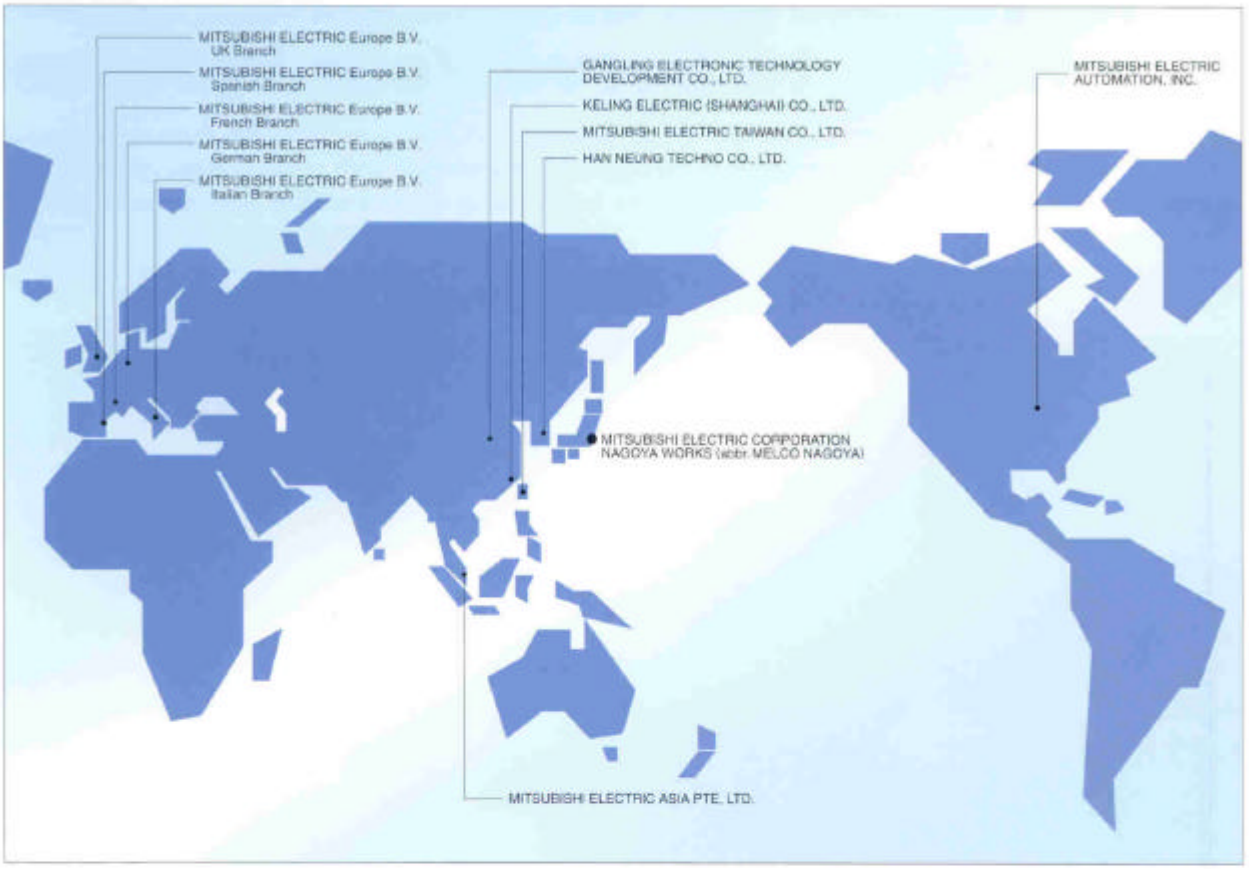

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⚠ Safety Warning
To ensure proper use of the products listed in this catalog, please be sure to read the instruction manual prior to use.

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L-174-1-C5706-A NA-0111 Printed in Japan (OKA)

New publication, effective Nov. 2001
Specifications subject to change without notice.