



Changes for the Better

MITSUBISHI ELECTRIC INDUSTRIAL ROBOT

MELFA RV-3S/3SJ Series



▶ RV-3S



▶ RV-3SJ

MELFA
RV-S series

Nagoya works, Mitsubishi Electric Corporation, has acquired certification for systems of environmental management under ISO 14001, and for quality management systems under ISO 9001.



Introducing the RV-3S Series - the ultimate compact

Mitsubishi's original robot dedicated motor and dedicated servo amplifier have been newly developed to improve the robot's movement and basic performance. A variety of functions, realized with the 64-bit RISC processor, provide solutions for our customer's high value-added systems.

MELFA RV-S series

Speedy

Fastest in the class

Tact times can be reduced with fastest high-speed movement in the compact robot category (*1).

*1 Maximum composite speed 5.5m/s (RV-3S: 57% Up to RV-2A model)

Strong

High payload capacity, highly rigid arm and improved environmental performance

The maximum 3.5kg payload capacity (downward only) is able to applicate with complicated hand effectors.

Specialist

Skillful works with diverse functions

Diverse functions allow compliance with various applications, efficient teaching work, reduced tact time, and reduced system costs and maintenance costs.

Compliance function Multi-task function Collision detection function

Position restoring function Maintenance forecast function

Through the significant points function **New function**



RV-3S
<6-axis Robot>



RV-3SJ
<5-axis Robot>



CR1B-571

Features

Improved Productivity

Fastest in the small robots

The device's tact time can be greatly reduced with the maximum composite speed of 5.5m/sec.

Diverse lineup configuration

The 3kg payload robot has been newly added to the S Series to enhance the Mitsubishi Electric vertical robot lineup.

Standard models can be suspended from the ceiling. Wall-hanging installation is possible with works shipping special specifications.

*The J1 axis movement range is limited with the wall hanging type

Compliance with environmental protection

All axes (arm section, body section) comply with IP65 with the standard specifications. Clean room specifications are available with works shipping special specifications.

Improved position repeatability

Position repeatability of $\pm 0.02\text{mm}$ is realized. (Conventional model: $\pm 0.04\text{mm}$)

Arm shape designed to accommodate peripheral devices

The degree of layout freedom in the device has been improved by reducing the elbow arm protrusion, and reducing the steering axis interference range. This new series realizes a compact device and helps to save space.

Reduction of Maintenance Cost

Additional maintenance functions

The maintenance period is announced beforehand by the maintenance forecast function and position restoration function, allowing timely maintenance and a reduction of total maintenance costs.

Powered and Improved

Increased number of hand input/output points: 8/8 points

*Hand output interface (when option card is mounted)

*Conventional RV-2A: 4/4 points

The tact time can be improved by increasing the number of secondary air pipes and enhancing the response.

New functions

Through the significant points function allows a freer peripheral layout.

The significant point eliminates the need to halt work, and allows teaching work to be completed easily.

Teaching, step operation and automatic operation can be handled in the same manner, thereby improving workability.

Compatibility

Compatible with RV-2A/3AJ

[Compatible installation and end effector shape]

The conventional model can easily be changed to this new series. The device's performance can also be improved by replacing the models.

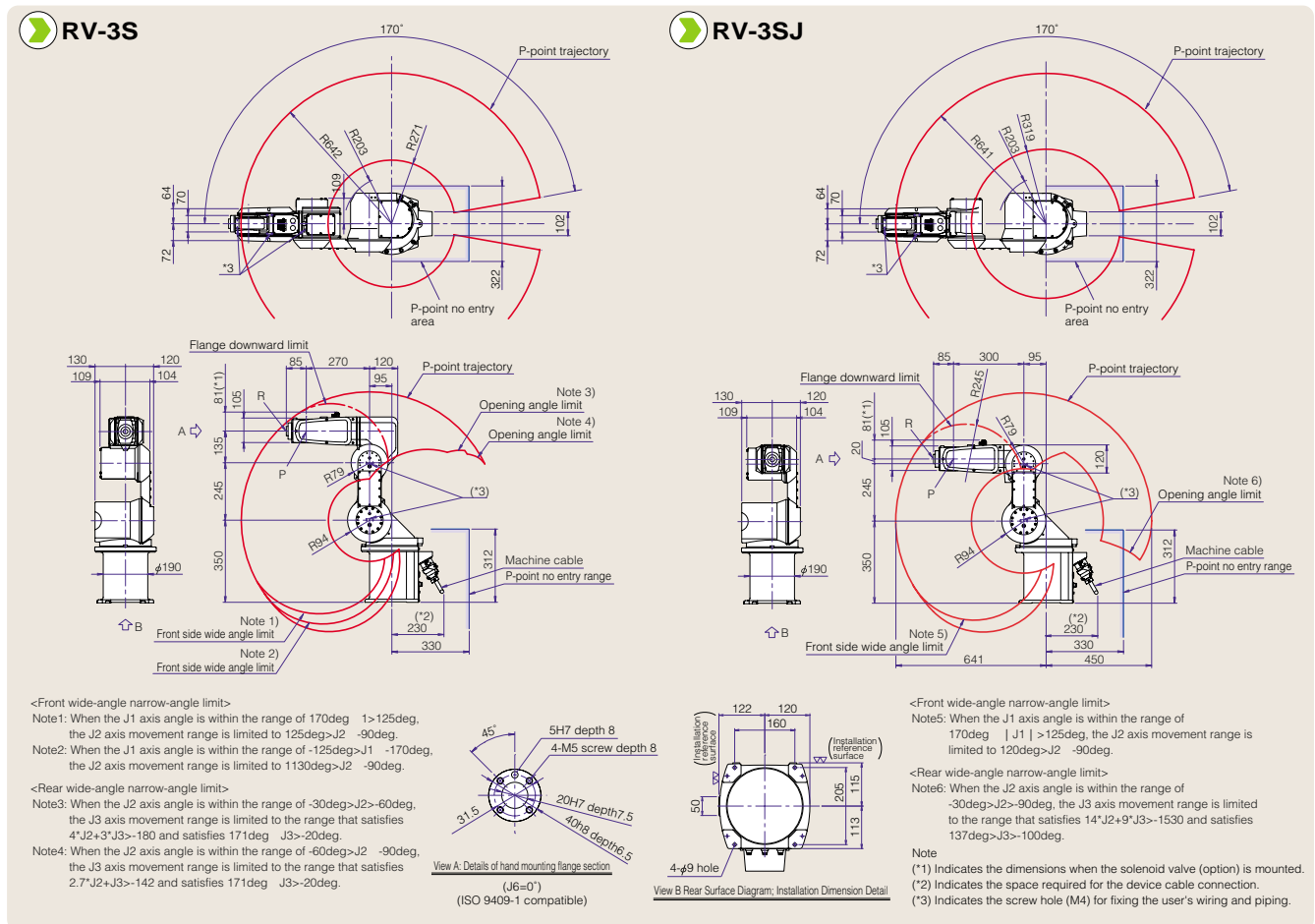
Model Structure

Robot type		RV-3S	RV-3SC	RV-3SJ	RV-3SJC	RV-3S-SM	RV-3SJ-SM
Robot arm (*3)	Number of axes	6 axes		5 axes		6 axes	5 axes
	Oil mist specifications (IP65)		-		-		
	Clean-room specifications (Class 10)	-		-		-	-
	Open type (IP20)					-	-
Controller	Dust protection specifications (IP54)	-	-	-	-	(*2)	(*2)

*2: The controller protection box is enclosed as a standard with the "-SM" specifications. CR1B-MB (protection box) is enclosed with CR1B-571 (IP20).

*3: The 6-axes model does not have brakes on the J4 axis or J6 axis. The 5-axis model does not have brakes on the J6 axis.

Robot Arm Outside Dimension / Movement Range Diagrams



Specification

● Robot Arm

Type		Unit	RV-3S/3SC	RV-3SJ/3SJC
Machine class			Standard (oil mist)/Clean	
Installation			Floor mount, Ceiling, (wall hanging *4)	
Protection class/Clean specifications			IP65/class 10 *5	
Degrees of freedom *6			6	5
Controller			CR1B-571	
Operating range	J1	deg	340	340
	J2		225	225
	J3		191	237
	J4		320	—
	J5		240	
	J6		720	
Maximum speed *7	J1	deg/s	250	250
	J2		187	187
	J3		250	250
	J4		412	—
	J5		412	
	J6		660	
Maximum composite speed (R point) *7		mm/sec	5,500	5,300
Payload capacity	Rated	kg	3	
	Maximum	kg	3.5	
Position repeatability (At rated load)		mm	±0.02	
Mass		kg	37	33
Tolerable moment	J4	N•m	5.83	—
	J5		5.84	
	J6		3.9	
Tolerable inertia *8	J4	kg•m²	0.137	—
	J5		0.137	
	J6		0.047	
Tool wiring			8 hand input points, 8 output points, 8-wire spare wire (with AWG#24 [0.2mm²] shielded)	
Tool pneumatic pipes	Primary		φ6 X 2 pipes	
	Secondary		φ4 X 8 pipes (option)	

*4: Wall hanging model is works shipping special specifications which is limited J1 range.

*5: Air suction from inside is required for the Clean room Class 10.

*6: The 6-axis model does not have brakes on the J4 axis or J6 axis. The 5-axis model does not have brakes on the J6 axis.

*7: The maximum speed is the value when the optimum acceleration/deceleration mode is valid. (Flange surface)

*8: When the optimum acceleration/deceleration mode is valid, a value up to double the indicated specification value can be set.

Note: The flange must be fixed in the downward direction to use the maximum payload capacity.

● **Controller**

Type		Unit	CR1B-571
Path control method			PTP control, CP control
Number of axes controlled			Up to 6 axes simultaneously
CPU			64bit RISC/DSP
Main functions			Palletizing, multi-task Optimum acceleration/deceleration control, optimum override control optimum path connection function, torque limit command, XYZ compliance control, collision detection function, maintenance forecast function, position restoration function
Robot language			MELFA-BASIC IV/MOVEMASTER language
Position teaching method			Teaching method, MDI method
Memory capacity	Numbers of teaching points	points	2,500
	Number of steps	steps	5,000
	Number of programs	steps	88
Program creation procedures			Personal computer or teaching pendant
External I/O	General-purpose I/O	points	16 inputs/16 outputs (up to 240/240 when using the optional, additional I/O unit)
	Dedicated I/O		Assigned from general-purpose I/O (one point, "STOP," is fixed)
	Hand open/close	points	8 inputs/0 output (maximum 8-point option) *9
	Emergency stop input	points	1
	Emergency stop output	points	1
	Door switch input	points	1
Interface	RS-232C	ports	1 (for connecting a personal computer, vision sensor etc.)
	RS-422	ports	1 (for connecting a teaching pendant)
	Slot dedicated to hand	slots	1 (for connecting a pneumatic hand interface)
	Extension slot	slots	0 (When using options: 3) (For expansion options)
	Robot I/O link	channels	1 (for connecting a parallel I/O unit)
Ambient temperature		°C	0 to 40
Ambient humidity		%RH	45 to 85
Power supply	Voltage range	V	Single phase, AC180 to 242 *10
	Power capacity	KVA	1.0
External dimensions *11 (Including legs)		mm	212 (W) X 290 (D) X 165 (H)
Mass *11		kg	Approx. 8
Structure			Self-contained floor type/closed structure
Grounding		Ω	100 or less (D-class grounding)

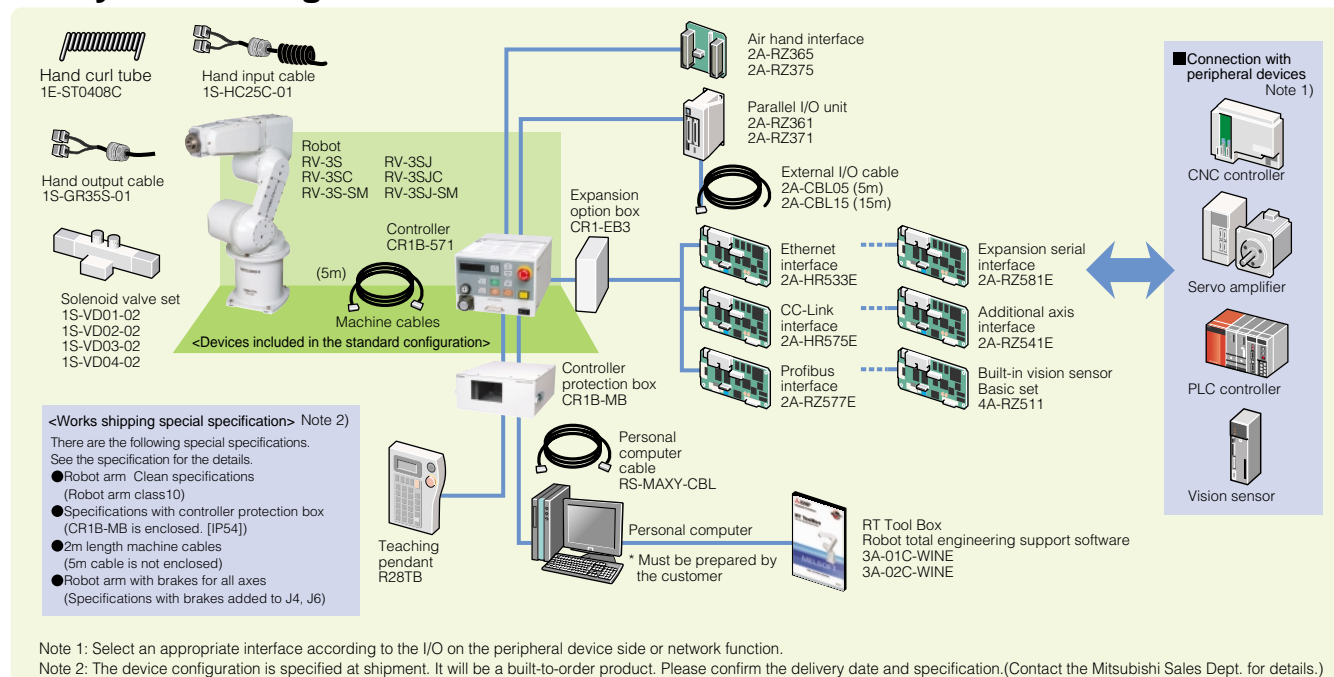
*9 The air-hand interface (option) is required to use the 8point hand output.

*10. The power voltage fluctuation rate is within 10%.

*11. The size and weight do not include the expansion box for mounting options.

Mitsubishi Electric Industrial Robots MELFA RV-3S/3SJ Series

System Configuration



Configuration Options

Classification	Name	Type	Specifications	Model compatibility				Remark
				RV-3S	RV-6S	RV-12S	RV-2A/3AJ	
Robot arm	Solenoid valve	1S-VD01-02	1 connection with solenoid valve cable			x	x	
		1S-VD02-02	2 connections with solenoid valve cable			x	x	
		1S-VD03-02	3 connections with solenoid valve cable			x	x	
		1S-VD04-02	4 connections with solenoid valve cable			x	x	
	Hand output cable	1S-GR35S-01	Terminal end is not processed, supporting 4 connections				x	
	Hand input cable	1S-HC25C-01	8-points support, with grommet				x	
	Hand curl tube	1E-ST0408C	Support for φ4-4			x		
	Machine cables extension (Fixed)	1S-05CBL-03	Extension type, amount of extension: 5m		x	x	x	
		1S-10CBL-03	Extension type, amount of extension: 10m		x	x	x	
		1S-15CBL-03	Extension type, amount of extension: 15m		x	x	x	
Controller	Machine cables extension (Flexible)	1S-05LCBL-03	Extension type, amount of extension: 5m		x	x	x	
		1S-10LCBL-03	Extension type, amount of extension: 10m		x	x	x	
		1S-15LCBL-03	Extension type, amount of extension: 15m		x	x	x	
	Changing operating range for J1	1S-DH-03	Stopper for changing (Changeable to ±30, 60, 90, 120) Changed by the user		x	x	-	
	Personal computer support software (Windows)	3A-01C-WINE	Support software on Windows (CD-ROM)					
	Personal computer support software-mini (Windows)	3A-02C-WINE	Simplified version support software on Windows (CD-ROM)					
	Personal computer cable	RS-MAXY-CBL	For PC-AT (DOS/V) compatible machines, 3m					
		RS-AT-RCBL	For PC-AT (DOS/V) compatible machines, 3m L-type					
	Teaching pendant	R28TB	IP65, 7m cable length					
		R28TB-15	IP65, 15m cable length					
	Pneumatic hand interface (Sink)	2A-RZ365	DO: 8 (Sink)					
	Pneumatic hand interface (Source)	2A-RZ375	DO: 8 (Source)					
	Parallel I/O unit (Sink)	2A-RZ361	DI: 32 (Sink)/DO: 32 (Sink)					
	Parallel I/O unit (Source)	2A-RZ371	DI: 32 (Source)/DO: 32 (Source)					
	External I/O cable	2A-CBL05	Terminal end not processed 5m length					
		2A-CBL15	Terminal end not processed 15m length					
	Ethernet interface	2A-HR533E	10 base-T 10Mbps					
	CC-Link interface	2A-HR575E	CC-Link intelligent remote station (32 points/32 points per station)					
	Profibus interface	2A-RZ577E	Profibus-DP SLAVE					
	Built-in vision sensor Basic set *12	4A-RZ511	Basic set for one camera					Japanese only
	Expansion serial interface	2A-RZ581E	RS-232C/422 each 1ch					
	Additional axis interface	2A-RZ541E	Control up to 8 axes with SSCNET					
	Expansion option box	CR1-EB3	Required when mounting expansion interface.		x	x		Dedicated for CR1, CR1B
	Controller protection box	CR1B-MB	Enclose CR1B-571 for dust-proof measures.		x	x		

*12: The basic set contains the options required to use one camera. Select from the independent options if the basic set does not satisfy the user's specifications.

: Available soon

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