MELFA RV-2FR RV-2FRL

Vertical 2kg type

Compact body and slender arms cover large work areas.
An ideal robot for compact cell construction.
Perfect for transporting, assembling and inspecting small components.

- ■Among the fastest moving robots in its class
  [Max. composite speed: 5.0 m/s] (RV-2FR)
- ■Standard cycle time
  [0.6 second range] (RV-2FR)
- ■Pivotal operating range: ±240°
- ■Environmental specifications [standard: IP30]
- ■Standards compliance
  Compliant with European Machinery Directives (CE) as standard.
  Compliance with other standards is available in specialized machines.
  Contact Mitsubishi Electric for details.

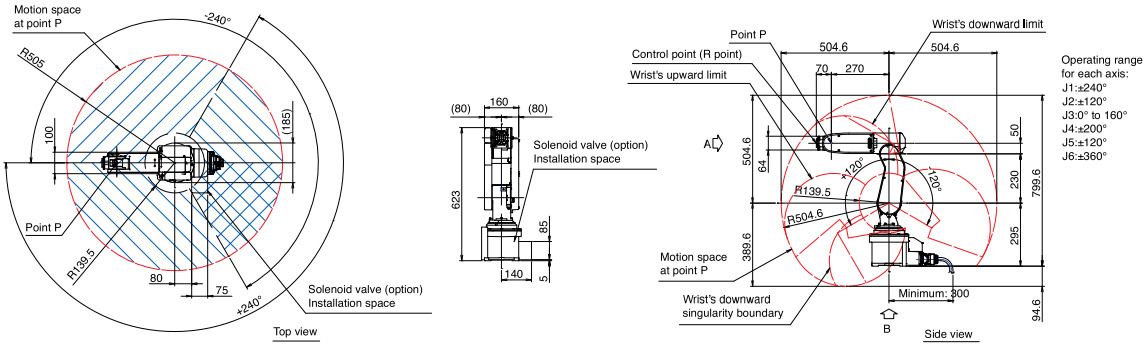
RV-2FR
RV-2FRL

Specifications

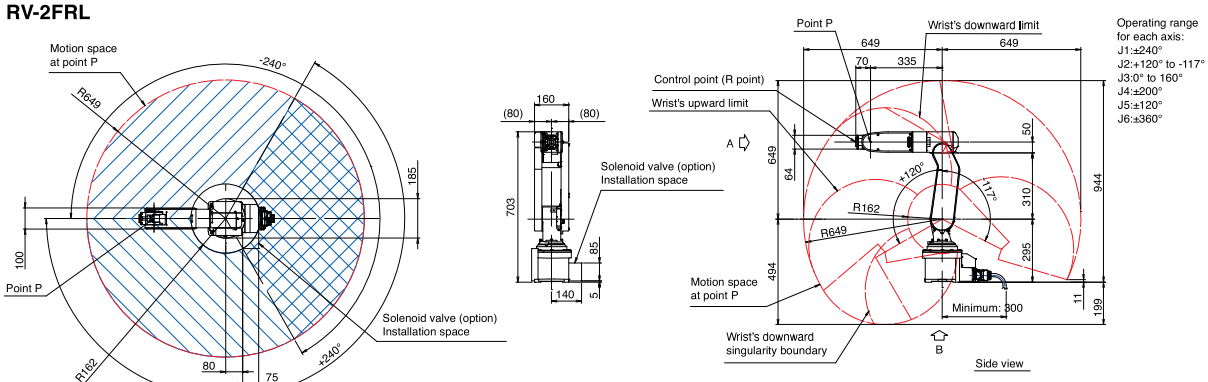
Item		Unit	RV-2FR (B)	RV-2FRL (B)
Environmental specifications			Standard	
Protection degree			IP30	
Installation			Floor type, ceiling type, (wall-mounted type *2)	
Structure			Vertical articulated robot	
Degrees of freedom			6	
Drive system *1			AC servo motor (J2, J3 and J5: with brake)	
Position detection method			Absolute encoder	
Maximum load capacity		kg	Maximum 3 (Rated 2) *5	
Arm length		mm	230+270	310+335
Maximum reach radius		mm	504	649
Operating range	J1	deg	480 (±240)	
	J2		240 (±120)	237 (-117 to +120)
	J3		160 (-0 to +160)	
	J4		400 (±200)	
	J5		240 (±120)	
	J6		720 (±360)	
Maximum speed	J1	deg/sec	300	225
	J2		150	105
	J3		300	165
	J4		450	412
	J5		450	
	J6		720	
Maximum composite speed *3		mm/sec	4955	4200
Cycle time *4		sec	0.6	0.7
Position repeatability		mm	±0.02	
Ambient temperature		°C	0 to 40	
Mass		kg	19	21
Tolerable moment	J4	Nm	4.17	
	J5		4.17	
	J6		2.45	
Tolerable amount of inertia	J4	kgm^2	0.18	
	J5		0.18	
	J6		0.04	
Tool wiring			Gripper: 4 input points/4 output points Signal cable for the multi-function gripper	
Tool pneumatic pipes			Φ4 × 4	
Machine cable			5m (connector on both ends)	
Connected controller *6			CR800-D, CR800-R, CR800-Q	

External Dimensions/Operating Range Diagram

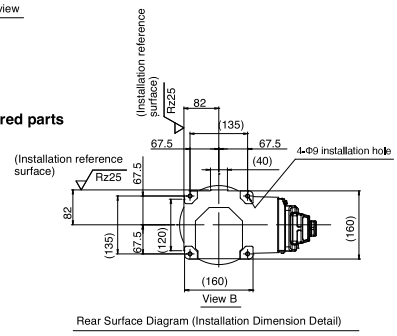
RV-2FR

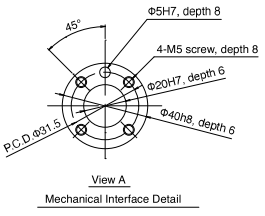


RV-2FRL



Shared parts





*Operating range limit
When the J1-axis angle is inside the range of -75°<J1<70° and the J2-axis angle is J2<-110°, operating rage of the J3-axis is limited to 80°≦J3.

RV-2FR

RV – 2 F R □ – D

Robot structure
RV: Vertical articulated robot

Maximum load capacity
2: 2kg

Series
FR: FR series

Controller type
D: CR800-D
R: CR800-R
Q: CR800-Q

Brake specification
Blank: No brake for J1, J4 and J6 axis
B: All axis with brake

RV-2FRL

RV – 2 F R L □ – D

Robot structure
RV: Vertical articulated robot

Maximum load capacity
2: 2kg

Series
FR: FR series

Controller type
D: CR800-D
R: CR800-R
Q: CR800-Q

Brake specification
Blank: No brake for J1, J4 and J6 axis
B: All axis with brake

Arm length
Blank: Standard arm
L: Long arm

*1: The standard model does not have a brake on the J1, J4, or J6 axis. There are models available with brakes included for all axes.
*2: The wall-mounted specification is a custom specification where the operating range of the J1-axis is limited.
*3: This is the value at the surface of the mechanical interface when all axes are composited.
*4: The cycle time is based on back-and-forth movement over a vertical distance of 25 mm and horizontal distance of 300 mm when the load is 1 kg.
*5: The maximum load capacity indicates the maximum payload when the mechanical interface is facing downward (±10° to the perpendicular).
*6: Select a controller according to the application. CR800-D: Standalone type, CR800-R: MELSEC iQ-R compatible type, CR800-Q: MELSEC Q compatible type.

MELFA

RV-4FR
RV-4FRL

Vertical 4kg type

Cutting-edge servo control and optimized arm construction provide extremely fast and precise heavy-duty operation. Flap-style arms provide a range of movement ideally suited to compact areas. The use of space is highly efficient. Perfect for transporting, assembling and inspecting small components.

- ■Among the fastest moving robots in its class
  [Max. composite speed: 9.0 m/s]
- ■Standard cycle time
  [0.36 s]
- ■Pivotal operating range: ±240°
- ■Environmental specifications
  [standard: IP40; oil mist: IP67; cleanroom: ISO class 3]
- ■Standards compliance
  Compliant with European Machinery Directives (CE) as standard.
  Compliance with other standards is available in specialized machines.
  Contact Mitsubishi Electric for details.

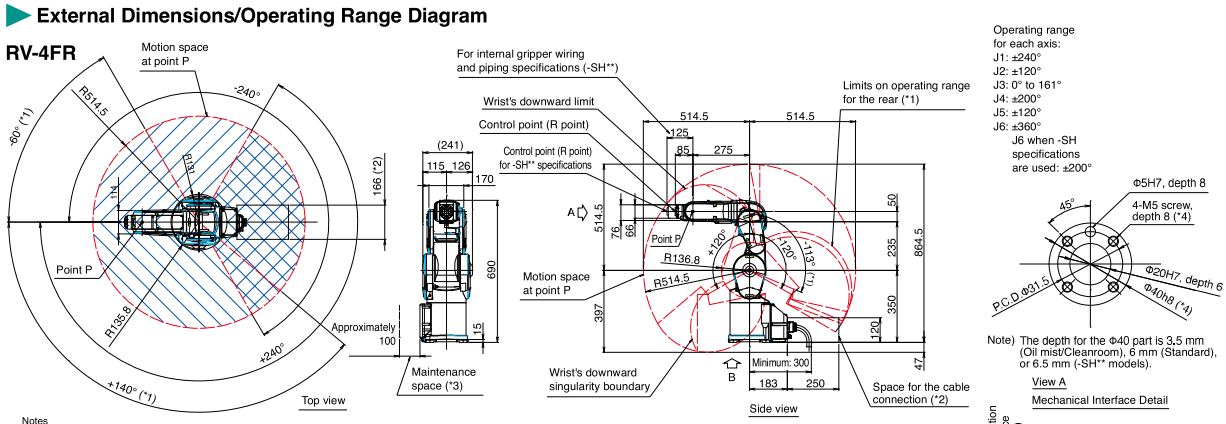
RV-4FR
RV-4FRL

Specifications

Item		Unit	RV-4FR (M) (C)	RV-4FRL (M) (C)
Environmental specifications			Standard/ Oil mist/ Cleanroom	
Protection degree			IP40 (standard)/ IP67 (oil mist) *1/ ISO class3 *7	
Installation			Floor type, ceiling type, (wall-mounted type *2)	
Structure			Vertical articulated robot	
Degrees of freedom			6	
Drive system			AC servo motor	
Position detection method			Absolute encoder	
Maximum load capacity		kg	Maximum 4 (Rated 4) *8	
Arm length		mm	235+275	310+335
Maximum reach radius		mm	515	649
Operating range	J1	deg	480 (±240)	
	J2		240 (±120)	
	J3		161 (-0 to +161)	164 (-0 to +164)
	J4		400 (±200)	
	J5		240 (±120)	
	J6		720 (±360)	
Maximum speed	J1	deg/sec	450	420
	J2		450	336
	J3		300	250
	J4		540	540
	J5		623	623
	J6		720	720
Maximum composite speed *3		mm/sec	9027	9048
Cycle time *4		sec	0.36	0.36
Position repeatability		mm	±0.02	
Ambient temperature		°C	0 to 40	
Mass		kg	39	41
Tolerable moment	J4	Nm	6.66	
	J5		6.66	
	J6		3.96	
Tolerable amount of inertia	J4	kgm^2	0.2	
	J5		0.2	
	J6		0.1	
Tool wiring			Gripper: 8 input points/8 output points Signal cable for the multi-function gripper and sensors LAN × 1 <100 BASE-TX> *5	
Tool pneumatic pipes			Primary: Φ6 × 2 Secondary: Φ4 × 8, Φ4 × 4 (from base portion to forearm)	
Machine cable			5m (connector on both ends)	
Connected controller *6			CR800-D, CR800-R, CR800-Q	

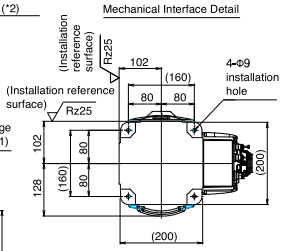
External Dimensions/Operating Range Diagram

RV-4FR



Note) The depth for the Φ40 part is 3.5 mm (Oil mist/Cleanroom), 6 mm (Standard), or 6.5 mm (-SH** models).

View A
Mechanical Interface Detail



View B
Rear Surface Diagram (Installation Dimension Detail)

Notes
*1: Limits on the operating range for the back and side parts: When the J1-axis angle is inside the range of -60°≤J1≤+140°, the operating range of the J2-axis is limited to -113°≤J2≤+120°.
*2: Make sure to leave enough space open for cable connections between devices.
*3: Make sure to leave enough space open for removing and attaching covers during maintenance work.
*4: Specify a thread engagement length of 7.5 to 8 mm.

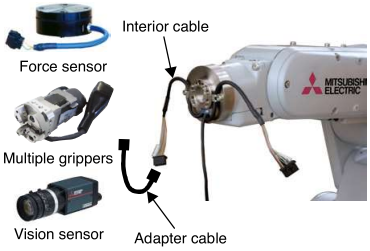
RV-4FRL

Notes
*1: Limits on the operating range for the back and side parts: When the J1-axis angle is inside the range of -35°≤J1≤+35°, the operating range of the J2-axis is limited to -114°≤J2≤+120°.
*2: Make sure to leave enough space open for cable connections between devices.
*3: Make sure to leave enough space open for removing and attaching covers during maintenance work.
*4: Specify a thread engagement length of 7.5 to 8 mm.

Mounting cable specifications (*1)

Devices that can be mounted	Model (machine no.)				
	-SH01	-SH02	-SH03	-SH04	-SH05
Air Φ4	○ (×4)	–	–	○ (×2)	○ (×2)
Gripper input 8 points	○	○	–	○	○
Vision sensor	–	○	○	–	○
Force sensor	–	○ (may be used for either device)	○	○	–
Electric gripper	–		○	–	–

*1) The J6 axis range of motion is ±200deg. Protection level is IP40.



RV-4FRL □-D-□

Robot structure
RV: Vertical articulated robot

Maximum load capacity
4: 4kg

Series
FR: FR series

Arm length
Blank: Standard arm
L: Long arm

Special device No.
SHxx: Internal wiring specifications

Controller type
D: CR800-D
R: CR800-R
Q: CR800-Q

Environment specification
Blank: Standard specifications
M: Oil mist specifications
C: Cleanroom specifications

*1: Please contact Mitsubishi Electric dealer since the environmental resistance may not be secured depending on the characteristics of oil you use. Air will need to be purged from the lines. For details, refer to the specifications sheet.
*2: The wall-mounted specification is a custom specification where the operating range of the J1-axis is limited.
*3: This is the value at the surface of the mechanical interface when all axes are composited.
*4: Value for a 25mm up/down and 300mm horizontal reciprocal movement with 1kg load. The cycle time is the value for RV-4FR-R and RV-4FRL-R.
*5: This can also be used as a spare wire (0.13sq 4-pair wire.) The wire is prepared up to inside the forearm.
*6: Select one of the following controllers according to the application. CR800-D: Standalone type, CR800-R: MELSEC iQ-R compatible type, CR800-Q: MELSEC Q Series compatible type.
*7: Preservation of cleanliness levels depends on conditions of a downstream flow of 0.3 m/s in the cleanroom and internal robot suctioning. A Φ8-mm coupler for suctioning is provided at the back of the base.
*8: The maximum load capacity indicates the maximum payload when the mechanical interface is facing downward (±10° to the perpendicular).

MELFA

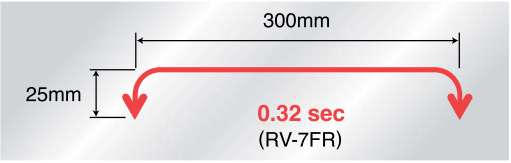
RV-7FR
RV-7FRL
RV-7FRLL

Vertical 7kg type

Cutting-edge servo control and optimized arm construction provide extremely fast and precise heavy-duty operation. Increased range of movement along each axis and slender arms to cover large work areas. An ideal robot for compact cell construction. The product line includes a model with a maximum reach radius of 1503 mm for a larger operating range.

■Among the fastest moving robots in its class
[Max. composite speed: 11.0 m/s (RV-7FR)]
■Standard cycle time [0.32 s (RV-7FR)]
■Pivotal operating range: ±240° (RV-7FR/7FRL)
■Environmental specifications
[standard: IP40; oil mist: IP67; cleanroom: ISO class 3]
■Standards compliance
Compliant with European Machinery Directives (CE) as standard.
Compliance with other standards is available in specialized machines.
Contact Mitsubishi Electric for details.

RV-7FR
RV-7FRL
RV-7FRLL



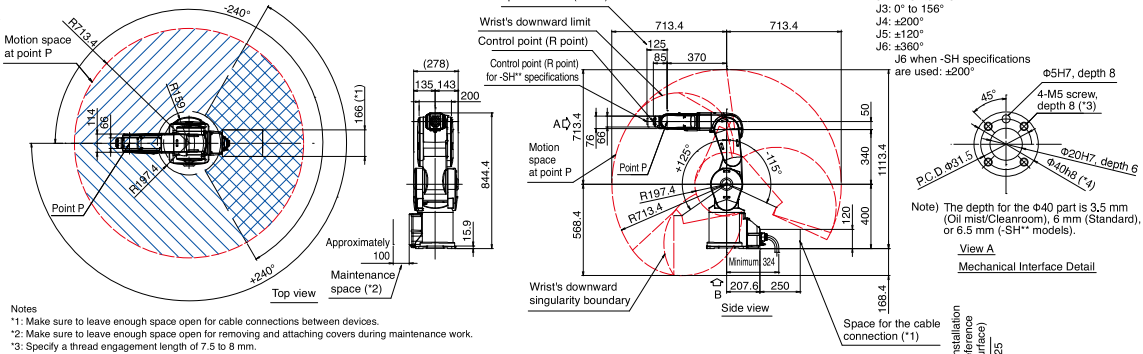
Specifications

Item		Unit	RV-7FR (M) (C)	RV-7FRL (M) (C)	RV-7FRLL (M) (C)
Environmental specifications			Standard/ Oil mist/ Cleanroom		
Protection degree			IP40 (standard)/ IP67 (oil mist) *1/ ISO class3 *7		
Installation			Floor type, ceiling type, (wall-mounted type *2)		
Structure			Vertical articulated robot		
Degrees of freedom			6		
Drive system			AC servo motor		
Position detection method			Absolute encoder		
Maximum load capacity		kg	Maximum 7 (Rated 7) *8		
Arm length		mm	340+370	435+470	565+805
Maximum reach radius		mm	713	908	1503
Operating range	J1	deg	480 (±240)		380 (±190)
	J2		240 (-115 to +125)	240 (-110 to +130)	240 (-90 to +150)
	J3		156 (-0 to +156)	162 (-0 to +162)	167.5 (-10 to +157.5)
	J4		400 (±200)		
	J5		240 (±120)		
	J6		720 (±360)		
Maximum speed	J1	deg/sec	360	288	234
	J2		401	321	164
	J3		450	360	219
	J4		337		375
	J5		450		
	J6		720		
Maximum composite speed *3		mm/sec	11064	10977	15300
Cycle time *4		sec	0.32	0.35	0.63
Position repeatability		mm	±0.02		±0.06
Ambient temperature		°C	0 to 40		
Mass		kg	65	67	130
Tolerable moment	J4	Nm	16.2		
	J5		16.2		
	J6		6.86		
Tolerable amount of inertia	J4	kgm^2	0.45		
	J5		0.45		
	J6		0.10		
Tool wiring			Gripper: 8 input points/8 output points, Signal cable for the multi-function gripper and sensors, LAN × 1 <100 BASE-TX> *5		
Tool pneumatic pipes			Primary: Φ6 × 2 Secondary: Φ4 × 8, Φ4 × 4 (from base portion to forearm)		
Machine cable			5m (connector on both ends)		
Connected controller *6			CR800-D, CR800-R, CR800-Q		

*1: Please contact Mitsubishi Electric dealer since the environmental resistance may not be secured depending on the characteristics of oil you use.
*2: The wall-mounted specification is a custom specification where the operating range of the J1-axis is limited.
*3: This is the value at the surface of the mechanical interface when all axes are composited.
*4: Value for a 25mm up/down and 300mm horizontal reciprocal movement with 1kg.The cycle time is the value for RV-7FR-R, RV-7FRL-R, RV-7FRLL-R.
*5: Can also be used as a spare line (0.13 sq. mm, 4-pair cable) for conventional models.
*6: Select either controller according to your application. CR800-D: Standalone type, CR800-R: MELSEC iQ-R compatible type, CR800-Q: MELSEC Q Series compatible type.
*7: Preservation of cleanliness levels depends on conditions of a downstream flow of 0.3 m/s in the cleanroom and internal robot suctioning. A Φ8-mm coupler for suctioning is provided at the back of the base.
*8: The maximum load capacity indicates the maximum payload when the mechanical interface is facing downward (±10° to the perpendicular).

External Dimensions/Operating Range Diagram

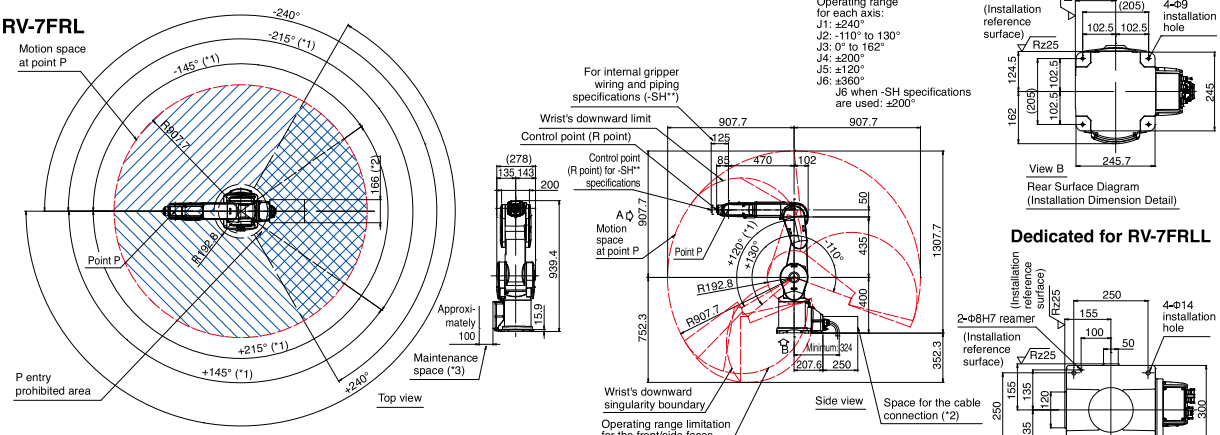
RV-7FR



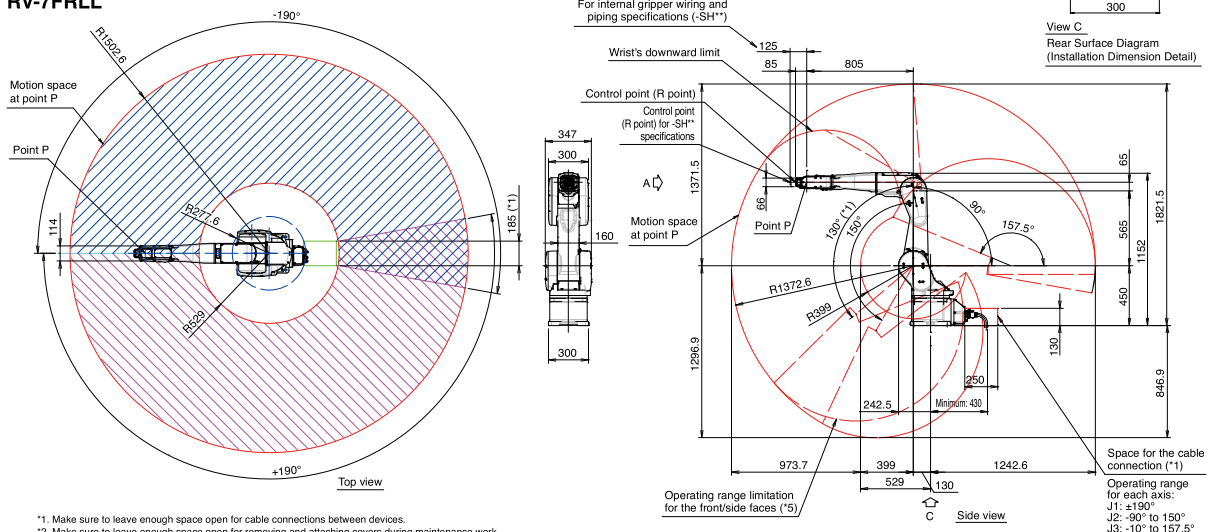
Note) The depth for the Φ40 part is 3.5 mm (Oil mist/Cleanroom), 6 mm (Standard), or 6.5 mm (-SH** models).

Notes
*1: Make sure to leave enough space open for cable connections between devices.
*2: Make sure to leave enough space open for removing and attaching covers during maintenance work.
*3: Specify a thread engagement length of 7.5 to 8 mm.

RV-7FRL



RV-7FRLL



*1. Make sure to leave enough space open for cable connections between devices.
*2. Make sure to leave enough space open for removing and attaching covers during maintenance work.
*3. Specify a thread engagement length of 7.5 to 8 mm.
*4. Limits on the operating range for the front part: When the J1-axis angle is inside the range of +145°≦J1≦+215° or -145°≦J1≦-215°, the operating range of the J2-axis is limited to -110°≦J2≦+120°.
*5. Limits on the operating range for the front part: When the J1-axis angle is inside the range of J1≧+120° or J1≦120°, the operating range of the J2-axis is limited to -90°≦J2≦+130°.
*6. Refer to the standard specification manual for detailed specification of -SH.

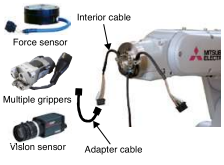
Mounting cable specifications (*1)

Devices that can be mounted	Model (machine no.)				
	-SH01	-SH02	-SH03	-SH04	-SH05
Air Φ4	○ (×4)	–	–	○ (×2)	○ (×2)
Gripper input 8 points	○	○	–	○	○
Vision sensor	–	○	○	–	○
Force sensor	–	○ (may be used for either device)	○	○	–
Electric gripper	–		○	–	–

*1) The J6 axis range of motion is ±200deg. Protection level is IP40.

RV–7FRL□–D–□

- **Robot structure** — RV: Vertical articulated robot
- **Maximum load capacity** — 7: 7kg
- **Series** — FR: FR series
- **Arm length** — Blank: Standard arm; L or LL: Long arm
- **Environment specification** — Blank: Standard specifications; M: Oil mist specifications; C: Cleanroom specifications
- **Controller type** — D: CR800-D; R: CR800-R; Q: CR800-Q
- **Special device No.** — SHxx: Internal wiring specifications



MELFA

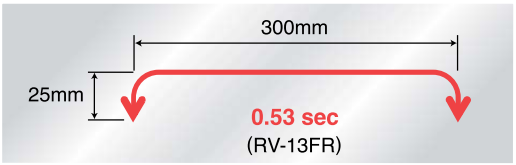
RV-13FR
RV-13FRL

Vertical 13kg type

RV-13FR
RV-13FRL

Cutting-edge servo control and optimized arm construction provide extremely fast and precise heavy-duty operation. Optimized arm length and 6 joints for a broader range of movement support a wide range of layouts. Designed to withstand environmental conditions, it can be used in a wide range of applications without having to worry about the installation environment. Suitable for various types of work, such as transporting mechanical parts, assembling electrical components and even packaging products such as pharmaceuticals and foodstuffs.

- ■Among the fastest moving robots in its class
  [Max. composite speed: 10.5 m/s (RV-13FR)]
- ■Standard cycle time [0.53 s (RV-13FR)]
- ■Pivotal operating range: ±190°
- ■Environmental specifications
  [standard: IP40; oil mist: IP67; cleanroom: ISO class 3]
- ■Standards compliance
  Compliant with European Machinery Directives (CE) as standard.
  Compliance with other standards is available in specialized machines.
  Contact Mitsubishi Electric for details.

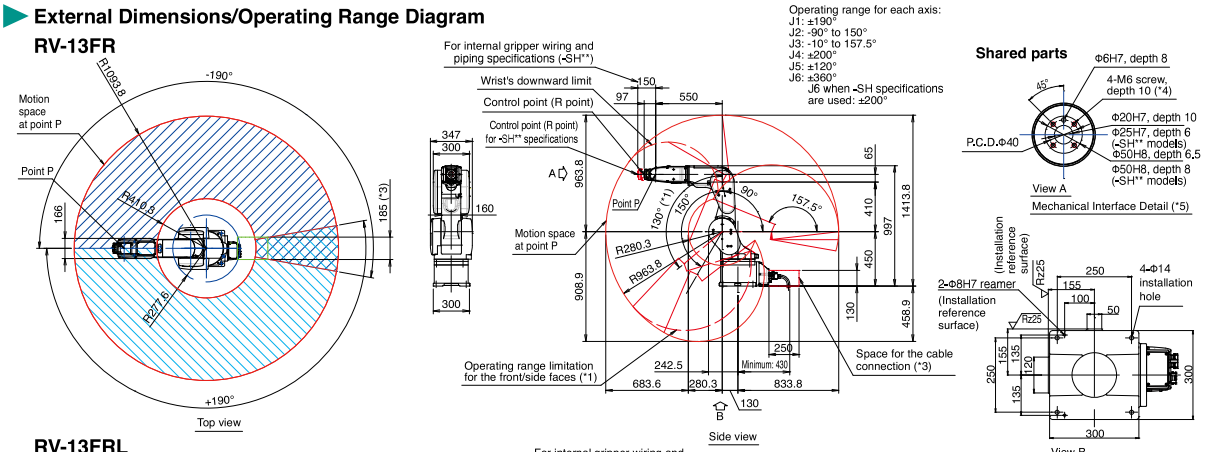


Specifications

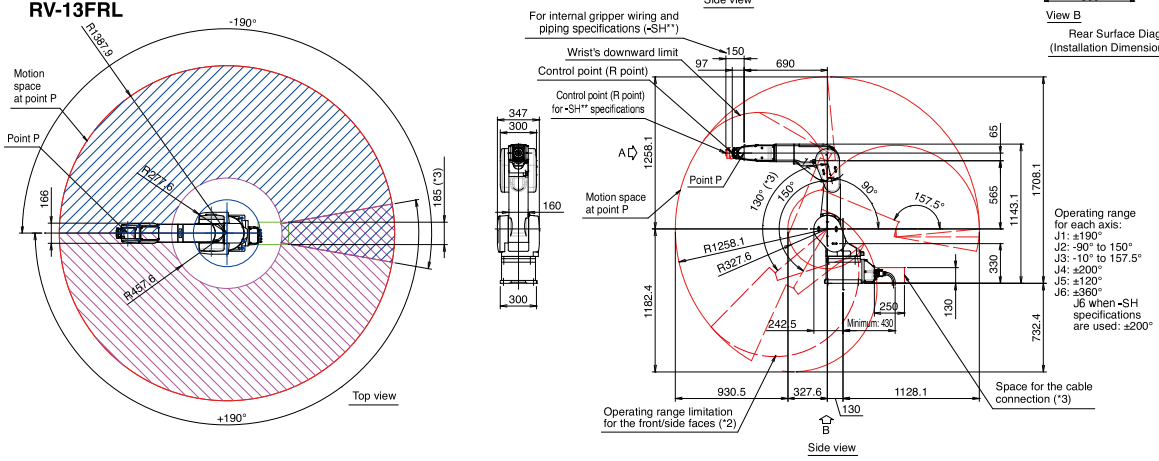
Item		Unit	RV-13FR (M) (C)	RV-13FRL (M) (C)
Environmental specifications			Standard/ Oil mist/ Cleanroom	
Protection degree			IP40 (standard)/ IP67 (oil mist) *1/ ISO class3 *7	
Installation			Floor type, ceiling type, (wall-mounted type *2)	
Structure			Vertical articulated robot	
Degrees of freedom			6	
Drive system			AC servo motor	
Position detection method			Absolute encoder	
Maximum load capacity		kg	Maximum 13 (Rated 12) *8	
Arm length		mm	410+550	565+690
Maximum reach radius		mm	1094	1388
Operating range	J1	deg	380 (±190)	
	J2		240 (-90 to +150)	
	J3		167.5 (-10 to +157.5)	
	J4		400 (±200)	
	J5		240 (±120)	
	J6		720 (±360)	
Maximum speed	J1	deg/sec	290	234
	J2		234	164
	J3		312	219
	J4		375	375
	J5		375	375
	J6		720	720
Maximum composite speed *3		mm/sec	10450	9700
Cycle time *4		sec	0.53	0.68
Position repeatability		mm	±0.05	
Ambient temperature		°C	0 to 40	
Mass		kg	120	130
Tolerable moment	J4	Nm	19.3	
	J5		19.3	
	J6		11	
Tolerable amount of inertia	J4	kgm^2	0.47	
	J5		0.47	
	J6		0.14	
Tool wiring			Gripper: 8 input points/8 output points Signal cable for the multi-function gripper and sensors LAN × 1 <100 BASE-TX> *5	
Tool pneumatic pipes			Primary: Φ6 × 2 Secondary: Φ6 × 8, Φ4 × 4 (from base portion to forearm)	
Machine cable			5m (connector on both ends)	
Connected controller *6			CR800-D, CR800-R, CR800-Q	

External Dimensions/Operating Range Diagram

RV-13FR



RV-13FRL

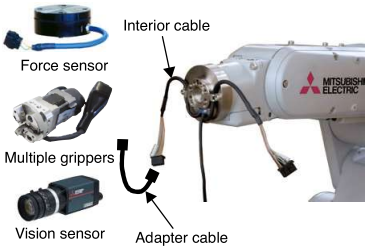


*1: Operating range for the front and side parts: When the J1-axis angle is inside the range of J1≥+120° or J1≤-130°, the operating range of the J2-axis is limited to -90°≤J2≤+130°.
*2: Make sure to leave enough space open for cable connections between devices.
*3: Specify a thread engagement length of 10 to 9mm.
*4: Refer to the standard specification manual for detailed specification of -SH.
*5: Please refer to the standard specification for detailed specifications of the -SH models.

Mounting cable specifications (*1)

Devices that can be mounted	Model (machine no.)				
	-SH01	-SH02	-SH03	-SH04	-SH05
Air Φ4	○ (×4)	–	–	○ (×2)	○ (×2)
Gripper input 8 points	○	○	–	○	○
Vision sensor	–	○	○	–	○
Force sensor	–	○ (may be used for either device)	○	○	–
Electric gripper	–		○	–	–

*1) The J6 axis range of motion is ±200deg. Protection level is IP40.



RV-13FRL□-D-□

Robot structure
RV: Vertical articulated robot

Maximum load capacity
13: 13kg

Series
FR: FR series

Arm length
Blank: Standard arm
L: Long arm

Special device No.
SHxx: Internal wiring specifications

Controller type
D: CR800-D
R: CR800-R
Q: CR800-Q

Environment specification
Blank: Standard specifications
M: Oil mist specifications
C: Cleanroom specifications

*1: Please contact Mitsubishi Electric dealer since the environmental resistance may not be secured depending on the characteristics of oil you use.
*2: The wall-mounted specification is a custom specification where the operating range of the J1-axis is limited.
*3: This is the value at the surface of the mechanical interface when all axes are composited.
*4: Value for a 25mm up/down and 300mm horizontal reciprocal movement with 5kg load. The cycle time is the value for RV-13FR-R and RV-13FRL-R.
*5: Can also be used as a spare line (0.13 sq. mm, 4-pair cable) for conventional models. Provided up to the inside of the forearm.
*6: Select either controller according to your application. CR800-D: Standalone type, CR800-R: MELSEC iQ-R compatible type, CR800-Q: MELSEC Q Series compatible type.
*7: Preservation of cleanliness levels depends on conditions of a downstream flow of 0.3 m/s in the cleanroom and internal robot suctioning. A Φ8-mm coupler for suctioning is provided at the back of the base.
*8: The maximum load capacity indicates the maximum payload when the mechanical interface is facing downward (±10° to the perpendicular).

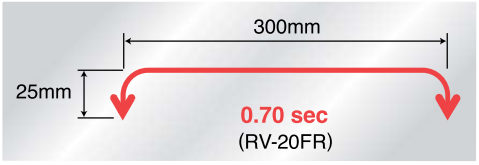
MELFA
RV-20FR

Vertical 20kg type

Cutting-edge servo control and optimized arm construction provide extremely portable and precise heavy-duty operation. Optimized arm length and 6 joints for a broader range of movement support a wide range of layouts. Designed to withstand environmental conditions, it can be used in a wide range of applications without having to worry about the installation environment. Plenty of scope for using multiple grippers or multi-function grippers and capable of handling work such as transporting high-load mechanical parts, assembling electrical components and packaging pharmaceutical products.

■Standard cycle time [0.7 s]
■Pivotal operating range: ±190°
■Environmental specifications
[standard: IP40; oil mist: IP67; cleanroom: ISO class 3]
■Standards compliance
Compliant with European Machinery Directives (CE) as standard.
Compliance with other standards is available in specialized machines.
Contact Mitsubishi Electric for details.

RV-20FR

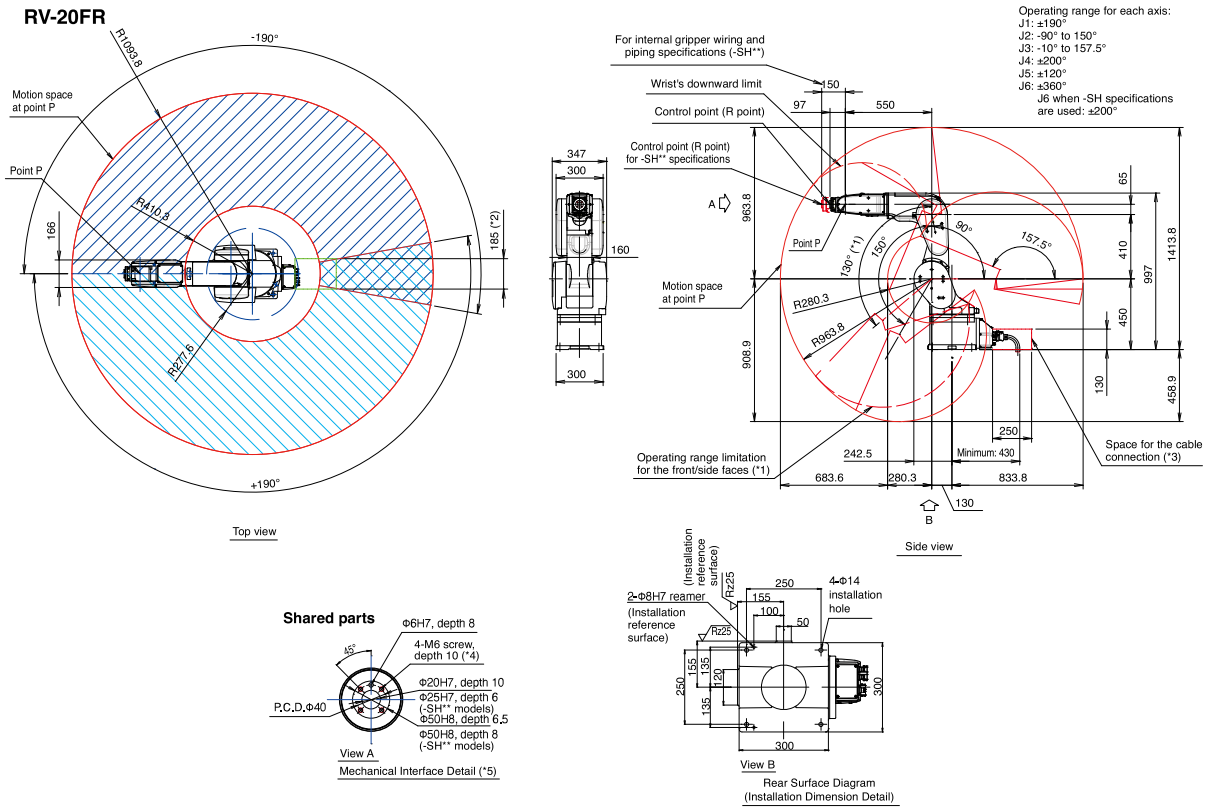


Specifications

Item		Unit	RV-20FR (M) (C)
Environmental specifications			Standard/ Oil mist/ Cleanroom
Protection degree			IP40 (standard)/ IP67 (oil mist) *1/ ISO class3 *7
Installation			Floor type, ceiling type, (wall-mounted type *2)
Structure			Vertical articulated robot
Degrees of freedom			6
Drive system			AC servo motor
Position detection method			Absolute encoder
Maximum load capacity		kg	Maximum 20 (Rated 15) *8
Arm length		mm	410+550
Maximum reach radius		mm	1094
Operating range	J1	deg	380 (±190)
	J2		240 (-90 to +150)
	J3		167.5 (-10 to +157.5)
	J4		400 (±200)
	J5		240 (±120)
	J6		720 (±360)
Maximum speed	J1	deg/sec	110
	J2		110
	J3		110
	J4		124
	J5		125
	J6		360
Maximum composite speed *3		mm/sec	4200
Cycle time *4		sec	0.70
Position repeatability		mm	±0.05
Ambient temperature		°C	0 to 40
Mass		kg	120
Tolerable moment	J4	Nm	49.0
	J5		49.0
	J6		11
Tolerable amount of inertia	J4	kgm^2	1.40
	J5		1.40
	J6		0.14
Tool wiring			Gripper: 8 input points/8 output points Signal cable for the multi-function gripper and sensors LAN × 1 <100 BASE-TX> *5
Tool pneumatic pipes			Primary: Φ6 × 2 Secondary: Φ6 × 8, Φ4 × 4 (from base portion to forearm)
Machine cable			5m (connector on both ends)
Connected controller *6			CR800-D, CR800-R, CR800-Q

External Dimensions/Operating Range Diagram

RV-20FR

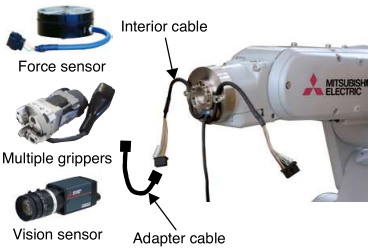


*1: Operating range for the front and side parts: When the J1-axis angle is inside the range of J1≥+120° or J1≤-130°, the operating range of the J2-axis is limited to -90°≤J2≤+130°.
*2: Make sure to leave enough space open for cable connections between devices.
*3: Specify a thread engagement length of 10 to 9mm.
*4: Refer to the standard specification manual for detailed specification of -SH.

Mounting cable specifications (*1)

Devices that can be mounted	Model (machine no.)				
	-SH01	-SH02	-SH03	-SH04	-SH05
Air Φ4	○ (×4)	–	–	○ (×2)	○ (×2)
Gripper input 8 points	○	○	–	○	○
Vision sensor	–	○	○	–	○
Force sensor	–	○ (may be used for either device)	○	○	–
Electric gripper	–		○	–	–

*1) The J6 axis range of motion is ±200deg. Protection level is IP40.



RV-20FR□-D-□

Robot structure
RV: Vertical articulated robot

Maximum load capacity
20: 20kg

Series
FR: FR series

Special device No.
SHxx: Internal wiring specifications

Controller type
D: CR800-D
R: CR800-R
Q: CR800-Q

Environment specification
Blank: Standard specifications
M: Oil mist specifications
C: Cleanroom specifications

*1: Please contact Mitsubishi Electric dealer since the environmental resistance may not be secured depending on the characteristics of oil you use.
*2: The wall-mounted specification is a custom specification where the operating range of the J1-axis is limited.
*3: This is the value at the surface of the mechanical interface when all axes are composited.
*4: Value for a 25mm up/down and 300mm horizontal reciprocal movement with 5kg load. The cycle time is the value for RV-20FR-R.
*5: Can also be used as a spare line (0.13 sq. mm, 4-pair cable) for conventional models. Provided up to the inside of the forearm.
*6: Select either controller according to your application. CR800-D: Standalone type, CR800-R: MELSEC iQ-R compatible type, CR800-Q: MELSEC Q Series compatible type.
*7: Preservation of cleanliness levels depends on conditions of a downstream flow of 0.3 m/s in the cleanroom and internal robot suctioning.
A Φ8-mm coupler for suctioning is provided at the back of the base.
*8: The maximum load capacity indicates the maximum payload when the mechanical interface is facing downward (±10° to the perpendicular).

MELFA

RV-35FR
RV-50FR
RV-80FR

Vertical 35/50/80kg type

RV-35FR
RV-50FR
RV-80FR

It is ideal for handling large workpieces and heavy objects such as processing machine LD/ULD applications, packing processes, and palletizing processes.

▪ **FR series maximum reach and maximum payload**
Maximum reach :2100mm,payload:35/50/80kg.

▪ **Manage the entire line with a sequencer**
Compatible with the iQ Platform.
Easy linkage with sequencers realizes comprehensive management of the entire line and wiring saving.

▪ **Improvement of safety for collaborative applications**
Functional safety compatible. Realize collaboreative work with people and eliminate safety fences.
We support safe and highly efficient line construction.

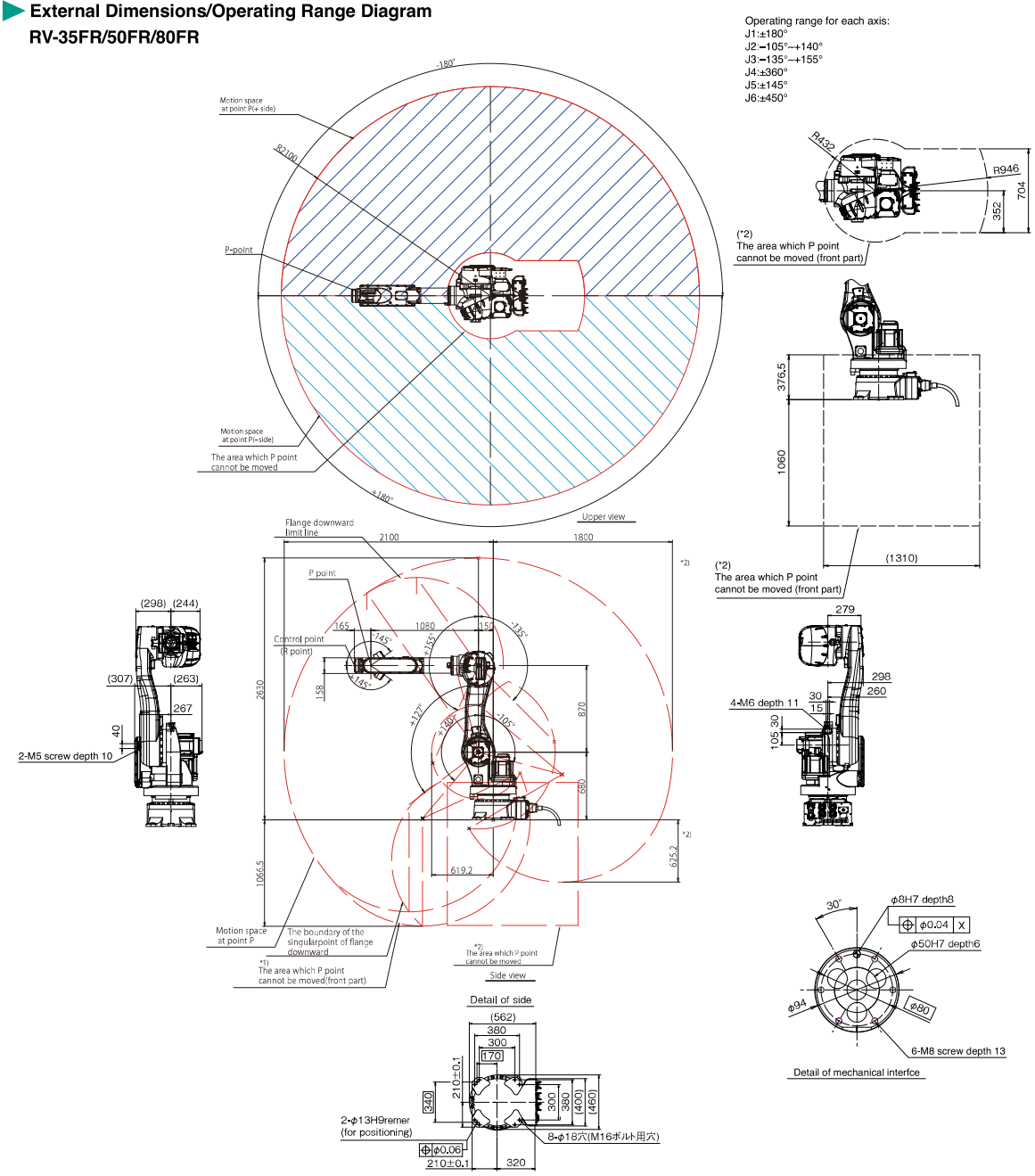
Specifications

Item		Unit	RV-35FR	RV-50FR	RV-80FR
Environmental specifications			Standard/ Oil mist		
Protection degree			Wrist equivalent to IP67,Body equivalent to IP65(standard) Whole body equivalent to IP67(oil mist)		
Installation			Floor type		
Structure			Vertical articulated robot		
Degrees of freedom			6		
Drive system			AC servo motor		
Position detection method			Absolute encoder		
Maximum load capacity		kg	35	50	80
Arm length		mm	870+1080		
Maximum reach radius		mm	2100		
Operating range	J1	deg	360 (±180)		
	J2		245 (-105~140)		
	J3		290 (-135~155)		
	J4		720 (±360)		
	J5		290 (±145)		
	J6		900 (±450)		
Maximum speed*1	J1	deg/sec	180	180	180
	J2		180	180	180
	J3		185	185	160
	J4		260	260	185
	J5		260	260	165
	J6		360	360	280
Maximum composite speed*2		mm/sec	13400	13400	12700
Position repeatability		mm	±0.06		
Ambient temperature		°C	0 to 45		
Mass		kg	560		
Tolerable moment	J4	Nm	210	210	336
	J5		210	210	336
	J6		130	130	194
Tolerable amount of inertia	J4	kgm^2	19.6	28	34
	J5		19.6	28	34
	J6		7.7	11	13.7
Tool wiring			12 input points/8 output points LAN × 1 <Category 5e-compliant>		
Tool pneumatic pipes			Φ10×2		
Connected controller			CR860-D/CR860-R/CR860-Q		

*1 Values in the table indicate the maximum speed, and the actual speed of each axis varies depending on factors such as the posture, load, and the amount of movement.
*2 This is the value at the center point of the mechanical interface when all axes are combined. The value is a theoretical value calculated from the maximum speed of each joint.

External Dimensions/Operating Range Diagram

RV-35FR/50FR/80FR



1. The posture of side view
The following figure shown a robot at the position of:J1=0°,J2=0°,J3=90°,J4=0°,J5=0°,J6=0°
2. *1)Rear face operating limit:When the J axis angle is J1<=-137° or +137°<=J1,
the J2 axis operation is limited to J2<=+127°
3. *2) The area which P point cannot be moved : P point cannot move to this area.This limitation is valid at factory shipping,
but it can be released by parameter MELTEXS.

RV-□FR□-□

Robot structure
RV:Vertical articulated robot

Maximum load capacity
35:35kg
50:50kg
80:80kg

Series
FR:FR Series

Controller type
D:CR860-D
R:CR860-R
Q:CR860-Q

Environment specification
Blank: Standard specifications
M: Oil mist specifications