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# Mitsubishi Electric AC Servo System MELSERVO-J5

MITSUBISHI ELECTRIC SERVO SYSTEM  
**MELSERVO-J5**

## Ultra-Low Inertia, Medium Capacity Servo Motors

November 2020

### HK-RT Series 1 to 7 kW

**New Product Release**  
SV2011-5E



## Compact, high power rate HK-RT series offers high-speed operation

### Product lines

■ Rotary servo motor

Ultra-low inertia, medium capacity HK-RT series HK-RT103W, HK-RT153W, HK-RT203W, HK-RT353W, HK-RT503W, HK-RT703W

### Features

- With the increased power rate (to 200 %\*<sup>1</sup> of the previous HG-RR series) and the maximum speed of 6700 r/min\*<sup>2</sup>, the servo motors can be applied to an ultra-high-throughput material handling system.
- The HK-RT series of 1 to 2 kW has a 10 % smaller flange than the previous HG-RR series of the same capacity. In addition, the servo motors of this capacity range have a single connector that connects the single cable for the power supply, encoder, and electromagnetic brake by one-touch lock, which makes wiring easy.
- The capacity of 7 kW is newly available in the ultra-low inertia servo motor series.
- The servo motors achieve a high acceleration/deceleration and high-throughput operation with low torque ripple.
- Maintenance costs are reduced because the servo motors come equipped with a batteryless absolute position encoder as standard.

\*1. This value is when the power rate at rated torque of HG-RR103 and HK-RT103W are compared.

\*2. The maximum speed varies by the model.

## High-Response Operation by Ultra-Low Inertia Servo Motors

The ultra-low inertia servo motors enable a high-response operation that reduces the cycle time of an ultra-high-throughput material handling system.

### Comparison of HG-RR (previous series) and HK-RT in 1 kW

( ) : Increased torque

Servo motor model	HG-RR103	HK-RT103W	
Rated output of a combined servo amplifier [kW]	2.0	<b>1.0 (2.0)</b>	• Smaller capacity servo amplifier
Flange size [mm]	100	<b>90</b>	• Reduced flange size (by 10%)
Rated torque [N·m]	3.2		
Maximum torque [N·m]	8.0	<b>8.0 (9.5)</b>	• Increased torque (to 118%)
Maximum speed [r/min]	4500	<b>6700</b>	• Increased speed (to 148%)
Moment of inertia J [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	1.50	<b>0.721</b>	• Lower inertia (by 52%)
Power rate at rated torque [kW/s]	67.4	<b>141</b>	• Increased responsivity (to 209%)
Motor length [mm]	145.5	<b>118.9</b>	• Reduced motor length (by 26.6 mm)

### Comparison of HK-KT (low inertia) and HK-RT in 2 kW

( ) : Increased torque

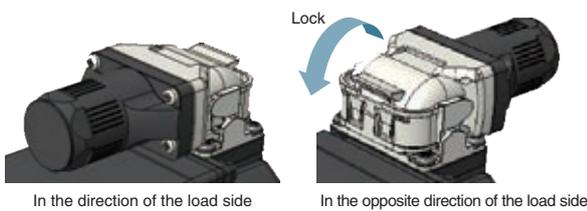
Servo motor model	HK-KT203W	HK-RT203W	
Flange size [mm]	90		
Rated torque [N·m]	6.4		
Maximum torque [N·m]	19.1 (25.5)	15.9 (19.1)	
Maximum speed [r/min]	6000	<b>6700</b>	• Increased speed (to 111%)
Moment of inertia J [ $\times 10^{-4}$ kg·m <sup>2</sup> ]	5.65	<b>1.28</b>	• Lower inertia (by 77%)
Power rate at rated torque [kW/s]	71.7	<b>317</b>	• Increased responsivity (to 442%)
Motor length [mm]	136.9	172.9	

## Single Connector/One-Touch Lock/Single Cable Type

The servo motors have the single connector\*1 that connects the single cable for the power supply, encoder, and electromagnetic brake. The one-touch lock eliminates the need for tightening screws, making wiring easy.

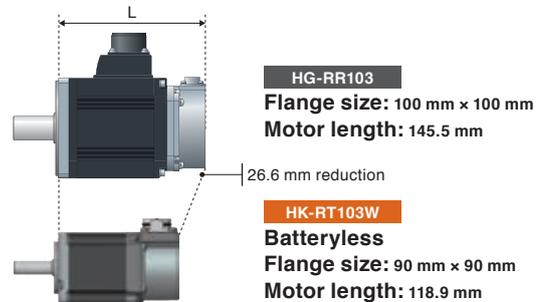
\*1. The connector is available on HK-RT103W, HK-RT153W, and HK-RT203W.

### Horizontally mounted single cable type with one-touch lock



## Compact Servo Motors with a Batteryless Absolute Position Encoder

The HK-RT series servo motors come equipped with a batteryless absolute position encoder and are more compact than the previous generation HG-RR series.



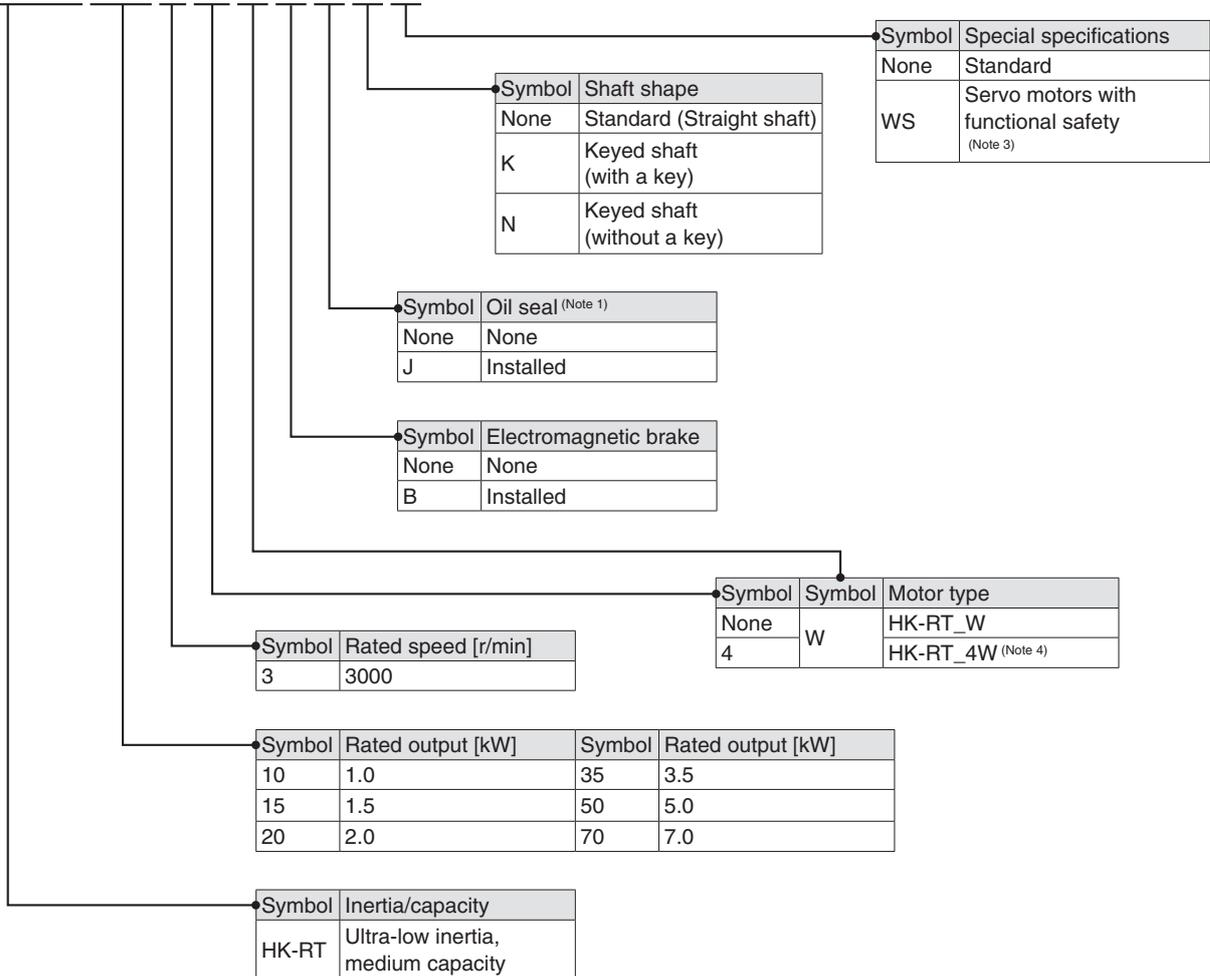
## Product Lines

The HK series boasts a product line that offers servo motors of three different capacities and inertia: HK-KT series (small capacity, low inertia), HK-ST series (medium capacity, medium inertia), and HK-RT series (medium capacity, ultra-low inertia). The servo motors are equipped with a batteryless absolute position encoder as standard.

Series	Features	Motor type	Servo amplifier power supply	Power range	Future release planned
HK-RT	Ultra-low inertia	HK-RT_W	200 V AC	1.0 kW to 7.0 kW	
			400 V AC	1.0 kW to 7.0 kW	
		HK-RT_4W	200 V AC	0.5 kW to 3.5 kW	
			400 V AC	1.0 kW to 7.0 kW	
HK-KT	Low inertia	HK-KT_W	200 V AC	0.05 kW to 2.0 kW	
			400 V AC	0.05 kW to 0.15 kW	Up to 2.0 kW
		HK-KT_4W	200 V AC	0.2 kW to 1.0 kW	
			400 V AC	0.4 kW to 2.0 kW	
HK-ST	Medium inertia	HK-ST_W	200 V AC	0.5 kW to 7.0 kW	Up to 11 kW
			400 V AC	0.5 kW to 11 kW	
		HK-ST_4_W	200 V AC	0.3 kW to 4.2 kW	Up to 5.5 kW
			400 V AC	0.5 kW to 11 kW	

## Model Designation (Note 2)

HK - RT 1 0 3    W B



- Notes: 1. The dimensions are the same regardless of whether or not an oil seal is installed.  
 2. This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.  
 3. The dimensions of the servo motors with functional safety are the same as those of the standard servo motors.  
 4. The HK-RT\_4W is planned for a future release.

## Combinations of Rotary Servo Motors and Servo Amplifiers (Note 1)

The torque can be increased by combining a large-capacity servo amplifier.

The torque characteristics vary by the combinations. Refer to the list of specifications of the rotary servo motor.

○: Standard torque    ⊙: Torque increased

Rotary servo motor		Servo amplifier MR-J5- (200 V)					MR-J5W2- (200 V)	
		100G/A	200G/A	350G/A	500G/A	700G/A		
HK-RT_W	90 x 90	HK-RT103W <small>(Note 3)</small>	○	⊙	-	-	-	○
		HK-RT153W <small>(Note 2)</small>	-	○	-	⊙	-	-
		HK-RT203W	-	○	⊙	-	-	-
	130 x 130	HK-RT353W	-	-	○	⊙	-	-
		HK-RT503W	-	-	-	○	⊙	-
		HK-RT703W	-	-	-	-	○	-

- Notes: 1. The combinations of servo motors and servo amplifiers with special specifications are the same as those of standard servo amplifiers. Refer to the servo amplifiers with the same rated output.  
 2. HK-RT153W cannot be driven by MR-J5-350\_.  
 3. The dynamic brake time constant is longer than that of when the previous HG-RR103 and MR-J4-200\_ are combined. When the time constant equivalent to that of the previous series is required, combine HK-RT103W and MR-J5-200\_. Refer to "MR-J5 User's Manual" for how to calculate the coasting distance.

## HK-RT\_W (ultra-low inertia, medium capacity)

Specifications when connected with a 200 V servo amplifier (Note 7)

Flange size		[mm]	90 x 90			130 x 130		
Rotary servo motor model		HK-RT	103W	153W	203W	353W	503W	703W
Continuous running duty (Note 4)	Rated output	[kW]	1.0	1.5	2.0	3.5	5.0	7.0
	Rated torque (Note 5)	[N·m]	3.2	4.8	6.4	11.1	15.9	22.3
Maximum torque (Note 3)		[N·m]	8.0 (9.5)	11.9 (12.9)	15.9 (19.1)	27.9 (33.4)	47.7 (55.7)	66.8
Rated speed (Note 4)		[r/min]	3000					
Maximum speed (Note 4)		[r/min]	6700			6000		5000
Power rate at continuous rated torque	Standard	[kW/s]	141	251	317	280	403	655
	With electromagnetic brake	[kW/s]	95.6	182	249	189	301	512
Rated current		[A]	5.2	11	9.5	16	25	28
Maximum current (Note 3)		[A]	17 (21)	34 (42)	30 (37)	51 (62)	90 (110)	102
Moment of inertia J	Standard	[ $\times 10^{-4}$ kg·m <sup>2</sup> ]	0.721	0.909	1.28	4.44	6.29	7.58
	With electromagnetic brake	[ $\times 10^{-4}$ kg·m <sup>2</sup> ]	1.06	1.25	1.63	6.57	8.41	9.70
Recommended load to motor inertia ratio (Note 1)			11 times or less			10 times or less		
Speed/position detector			Batteryless absolute/incremental 26-bit encoder (resolution: 67,108,864 pulses/rev)					
Oil seal			None (Servo motors with an oil seal are available. (HK-RT_J))					
Electromagnetic brake			None (Servo motors with an electromagnetic brake are available. (HK-RT_B))					
Thermistor			None					
Insulation class			155 (F)					
Structure			Totally enclosed, natural cooling (IP rating: IP67) (Note 2, 6)			Totally enclosed, natural cooling (IP rating: IP67) (Note 2)		
Vibration resistance *1		[m/s <sup>2</sup> ]	X: 24.5, Y: 49			X: 24.5, Y: 24.5		
Vibration rank			V10 <sup>-3</sup>					
Permissible load for the shaft *2	L	[mm]	40			55		
	Radial	[N]	686			980		
	Thrust	[N]	196			490		
Mass	Standard	[kg]	3.6	4.4	5.9	13	17	20
	With electromagnetic brake	[kg]	4.7	5.5	7.0	15	19	23

- Notes:
1. Contact your local sales office if the load to motor inertia ratio exceeds the value in the table.
  2. The shaft-through portion is excluded. Refer to the asterisk 4 of "Annotations for Rotary Servo Motor Specifications" in this brochure for the shaft-through portion.
  3. The values in brackets are applicable when the torque is increased by combining a larger-capacity servo amplifier. Refer to "Combinations of Rotary Servo Motors and Servo Amplifiers" in this brochure for the available combinations.
  4. The continuous running duty and the speed are not guaranteed when the power supply voltage is dropped.
  5. When unbalanced torque is generated, such as in a vertical lift machine, keep the unbalanced torque of the machine under 70 % of the servo motor rated torque.
  6. When IP67 cables are required, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION. (Email: osb.webmaster@melsc.jp)
  7. For the environment and the compliance with global standards and regulations for the servo motors, refer to "Environment" and "Compliance with Global Standards and Regulations" in "MELSERVO-J5 catalog (L(NA)03179ENG)".

Refer to "Annotations for Rotary Servo Motor Specifications" in this brochure for details about asterisks 1 to 3.

## Electromagnetic brake specifications (Note 1)

Model		HK-RT	103WB	153WB	203WB	353WB	503WB	703WB
Type			Spring actuated type safety brake					
Rated voltage			24 V DC (-10 % to 0 %)					
Power consumption		[W] at 20 °C	13.8			23		
Electromagnetic brake static friction torque		[N·m]	9.5 or higher			16 or higher		
Permissible braking work	Per braking	[J]	64			400		
	Per hour	[J]	640			4000		
Electromagnetic brake life (Note 2)	Number of braking times		5000					
	Work per braking	[J]	64			400		

- Notes:
1. The electromagnetic brake is for holding. It cannot be used for deceleration applications.
  2. Brake gap is not adjustable. Electromagnetic brake life is defined as the time period until readjustment is needed.

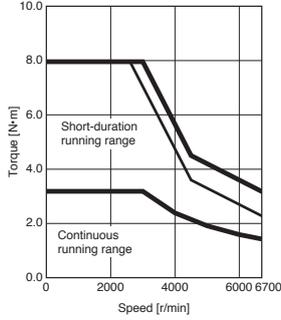
## HK-RT\_W Torque Characteristics (Note 1)

When connected with a 200 V servo amplifier

— : For 3-phase 200 V AC  
 — : For 1-phase 200 V AC

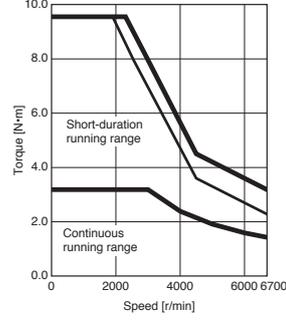
### HK-RT103W

Standard torque



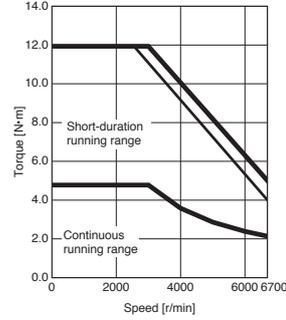
### HK-RT103W

Torque increased



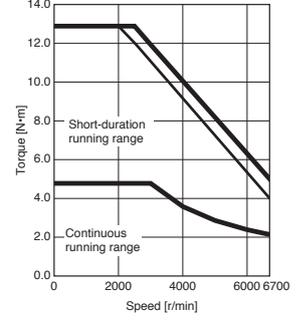
### HK-RT153W

Standard torque



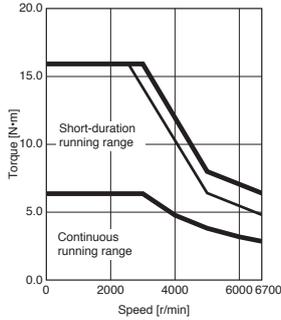
### HK-RT153W

Torque increased



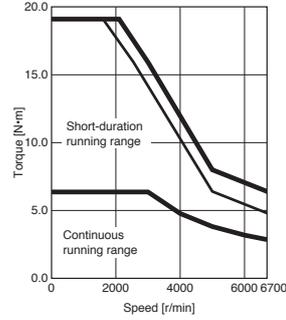
### HK-RT203W

Standard torque



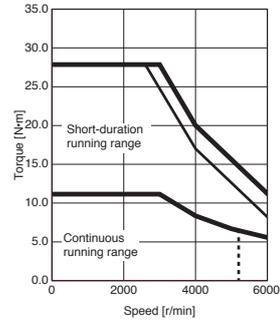
### HK-RT203W

Torque increased



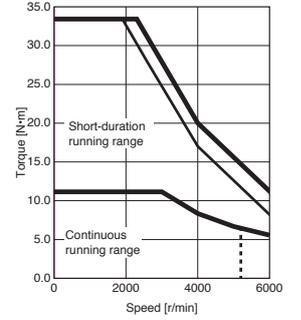
### HK-RT353W

Standard torque



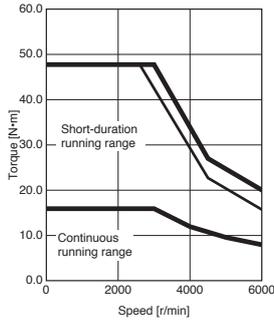
### HK-RT353W

Torque increased



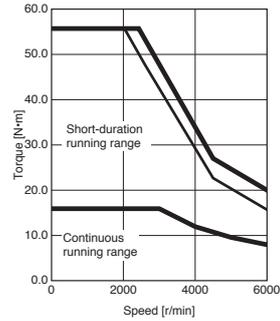
### HK-RT503W

Standard torque



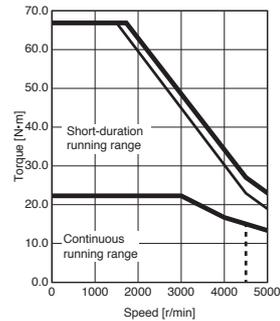
### HK-RT503W

Torque increased



### HK-RT703W

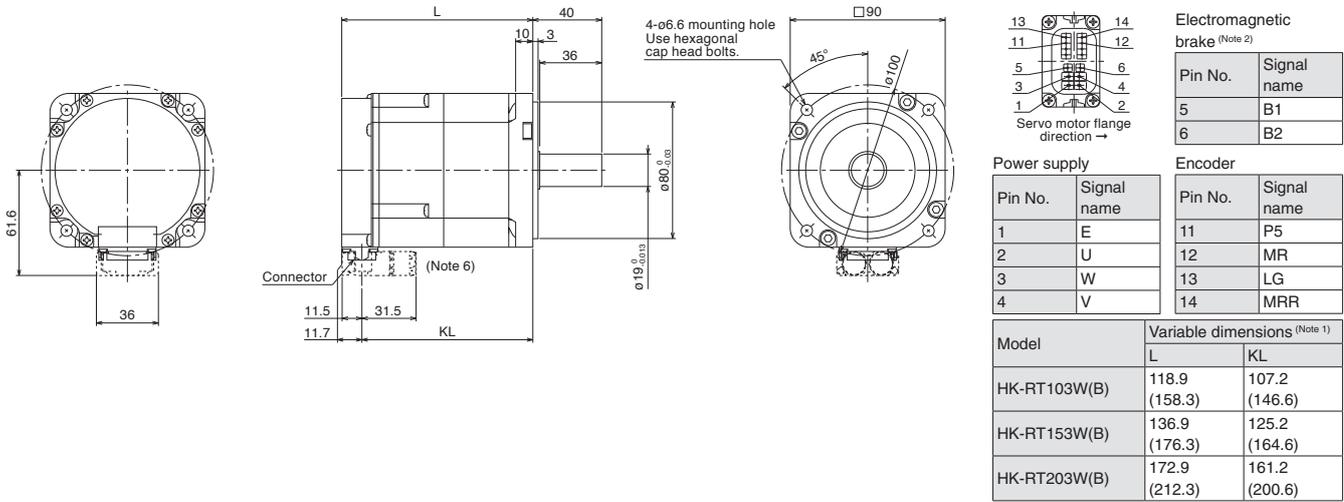
Standard torque



Notes: 1. Torque drops when the power supply voltage is below the specified value. - - - : A rough indication of the possible continuous running range for 3-phase 170 V AC

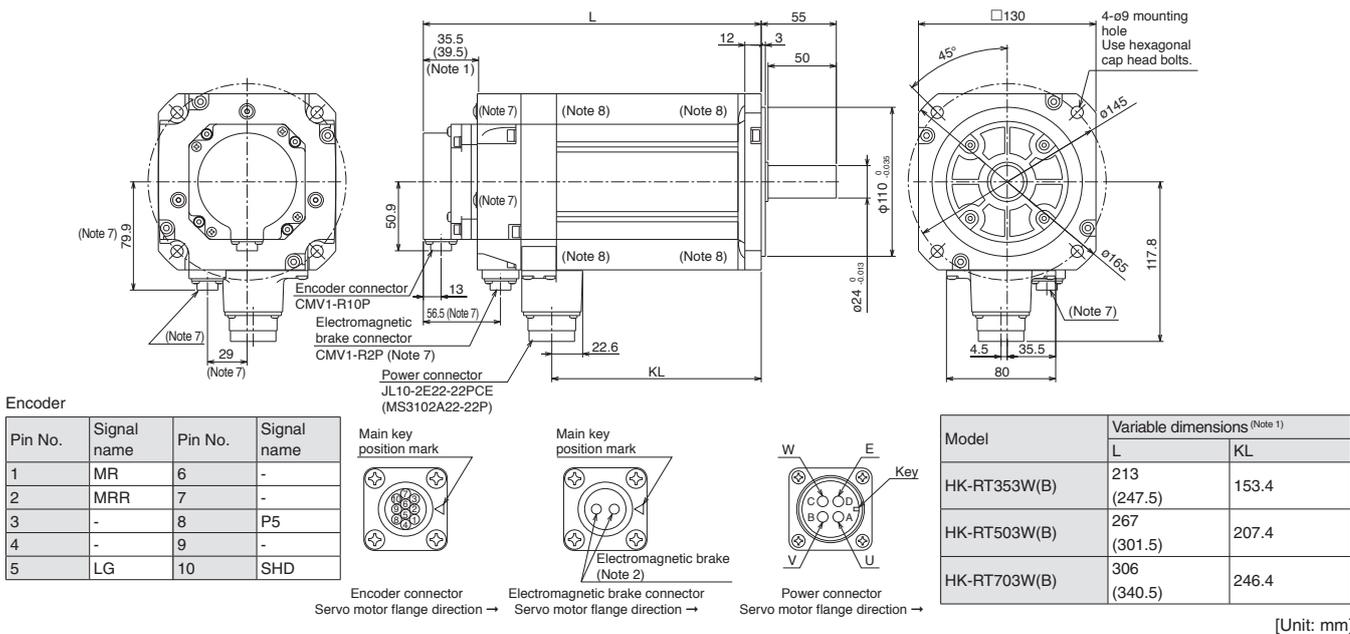
## HK-RT Series Dimensions (Note 3, 4, 5)

### HK-RT103W(B), HK-RT153W(B), HK-RT203W(B)



[Unit: mm]

### HK-RT353W(B), HK-RT503W(B), HK-RT703W(B)



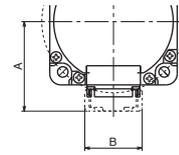
[Unit: mm]

- Notes:
1. The dimensions in brackets are for the models with an electromagnetic brake.
  2. The electromagnetic brake terminals do not have polarity.
  3. The dimensions are the same regardless of whether or not an oil seal is installed.
  4. Use a friction coupling to fasten a load.
  5. The actual dimensions may be up to 3 mm larger than those shown in the drawing because of shifting and variance of parts that occur during the assembly and manufacture of the rotary servo motors. The dimensions and tolerances shown are applicable at a temperature of 20 °C and may vary depending on the ambient temperature. Design the machine to allow for sufficient space.
  6. The dimensions are applicable when a dual type motor cable is led to the load side. Refer to "HK-RT Series Connector Dimensions" in this brochure for the dimensions when leading the cable to the opposite to the load side or leading vertically and when using a single type motor cable.
  7. Only for the models with an electromagnetic brake.
  8. HK-RT703W(B) has screw holes (M6, screw depth: 10.5 mm) for eyebolts. When using eyebolts, use a washer of φ14 mm or larger. Tighten the bolt until the washer is closely attached to the servo motor's surface.

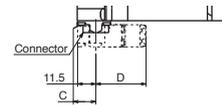
## HK-RT Series Connector Dimensions

Cable direction: load side/opposite to load side

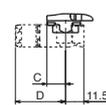
Model	Variable dimensions							
	Dual cable type				Single cable type			
	A	B	C	D	A	B	C	D
HK-RT103W HK-RT153W HK-RT203W	61.6	36	11.7	31.5	64.4	32	11.7	40



Cable direction: load side



Cable direction: opposite to load side

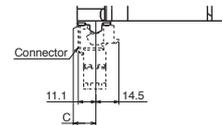
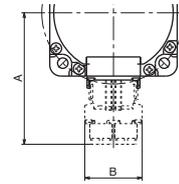


\* The drawing shows a dual cable type as an example.

[Unit: mm]

Cable direction: vertical

Model	Variable dimensions					
	Dual cable type			Single cable type		
	A	B	C	A	B	C
HK-RT103W HK-RT153W HK-RT203W	88.2	36	11.7	96.7	32	11.7



\* The drawing shows a dual cable type as an example.

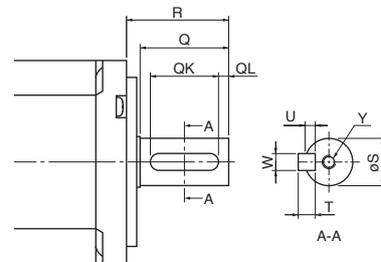
[Unit: mm]

## HK-RT Series with Special Shaft Dimensions

Servo motors with the following specifications are also available.

K: Keyed shaft (with a double round-ended key) (Note 1)

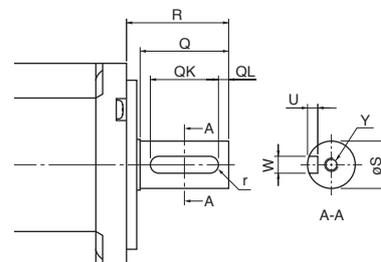
Model	Variable dimensions									
	S	R	Q	W	QK	QL	U	T	Y	
HK-RT103WK HK-RT153WK HK-RT203WK	19 <sup>0</sup> <sub>-0.013</sub>	40	36	6	25	5	3.5	6	M5 Screw depth: 20	
HK-RT353WK HK-RT503WK HK-RT703WK	24 <sup>0</sup> <sub>-0.013</sub>	55	50	8	36	5	4	7	M8 Screw depth: 20	



[Unit: mm]

N: Keyed shaft (without a key) (Note 1, 2)

Model	Variable dimensions								
	S	R	Q	W	QK	QL	U	r	Y
HK-RT103WN HK-RT153WN HK-RT203WN	19 <sup>0</sup> <sub>-0.013</sub>	40	36	6 <sup>0</sup> <sub>-0.03</sub>	25	5	3.5 <sup>+0.1</sup> <sub>0</sub>	3	M5 Screw depth: 20
HK-RT353WN HK-RT503WN HK-RT703WN	24 <sup>0</sup> <sub>-0.013</sub>	55	50	8 <sup>0</sup> <sub>-0.038</sub>	36	5	4 <sup>+0.2</sup> <sub>0</sub>	4	M8 Screw depth: 20



[Unit: mm]

Notes: 1. Do not use the servo motors with a keyed shaft for frequent start/stop applications as this may cause the damage to the shaft.  
2. The servo motor is supplied without a key. The user needs to prepare a key.

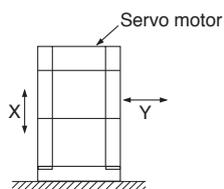
## Power Supply Capacity

Rotary servo motor	Servo amplifier <sup>(Note 3)</sup>	Power supply capacity [kVA] <sup>(Note 1, 2)</sup>	
HK-RT_W	HK-RT103W	MR-J5-100G/A	1.7
		MR-J5-200G/A	1.7
		MR-J5W2-1010G	1.7
	HK-RT153W	MR-J5-200G/A	2.5
		MR-J5-500G/A	3.1
	HK-RT203W	MR-J5-200G/A	3.5
		MR-J5-350G/A	3.5
	HK-RT353W	MR-J5-350G/A	5.5
		MR-J5-500G/A	6.4
	HK-RT503W	MR-J5-500G/A	7.5
MR-J5-700G/A		8.8	
HK-RT703W	MR-J5-700G/A	13.3	

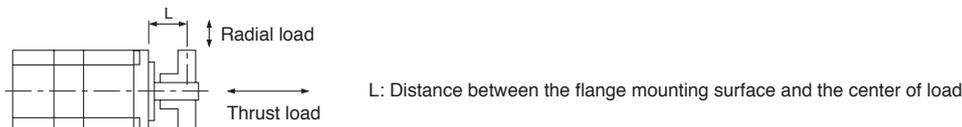
- Notes:
1. The power supply capacity varies depending on the power supply impedance.
  2. The listed values are the power supply capacity for one servo motor. For the multi-axis servo amplifiers, calculate the power supply capacity with the equation below:  
Power supply capacity [kVA] = Sum of power supply capacity [kVA] of the connected servo motors
  3. Note that the power supply capacity for servo amplifiers with special specifications is the same as that for standard servo amplifiers. Refer to the servo amplifiers with the same rated output.

## Annotations for Rotary Servo Motor Specifications

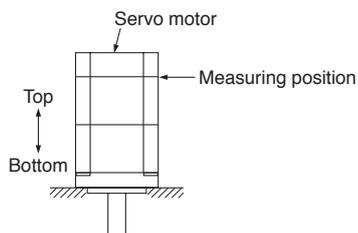
- \*1. The vibration direction is shown in the diagram below. The numerical value indicates the maximum value of the component (commonly the bracket in the opposite direction of the load side).  
Fretting tends to occur on the bearing when the servo motor stops. Thus, maintain vibration level at approximately one-half of the allowable value.



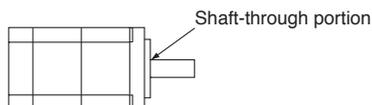
- \*2. Refer to the diagram below for the permissible load for the shaft. Ensure that loads applied on the shaft do not exceed the values specified in the table. The values in the table are applicable when each load is applied singly.



- \*3. V10 indicates that the amplitude of the servo motor itself is 10 μm or less. The following shows mounting orientation and measuring position of the servo motor during the measurement:



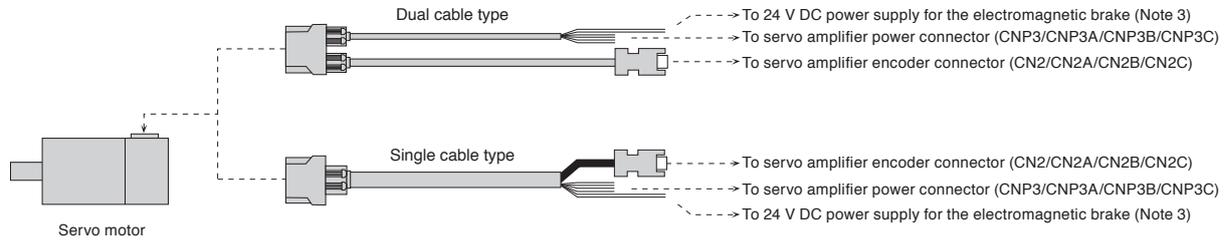
- \*4. Refer to the diagram below for the shaft-through portion.



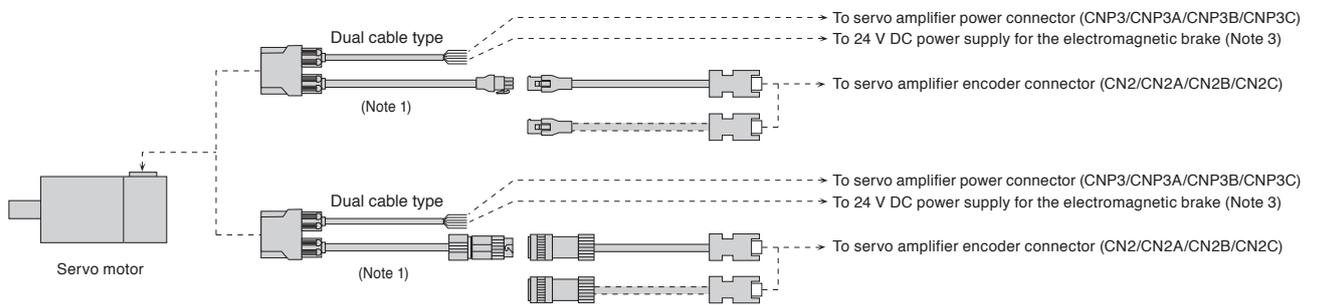
## Configuration Example for Rotary Servo Motors (Note 2)

HK-RT103W/HK-RT153W/HK-RT203W (Cable direction: load side/opposite to load side/vertical) (Note 4, 5)

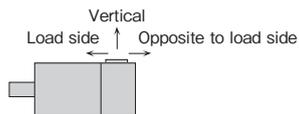
### ● Cable length of 10 m or shorter



### ● Cable length of over 10 m



- Notes:
1. Secure this cable as it does not have a long bending life.
  2. Cables drawn with dashed lines need to be fabricated by users. Refer to "Rotary Servo Motor User's Manual" when fabricating the cables.
  3. This is for the servo motors with an electromagnetic brake.
  4. When a vertically mounted cable is led out, the lock lever of the connector must be on the load side.
  5. The cable direction in the configuration examples is in the opposite direction to the load side.
- Cables can be led out in the direction of the load side, the opposite to the load side, and vertical, depending on the option to be used. These cable directions are shown below.



## Cables

Cable type	Cable length	IP rating (Note 1)	Electromagnetic brake wire	Cable direction	Bending life (Note 5)	Model (Note 6)
Dual cable type	10 m or shorter (direct connection type)	IP65 (Note 3)	Available	In the direction of the load side	Long bending life	MR-AEPB2CBL_M-A1-H
					Standard	MR-AEPB2CBL_M-A1-L
				In the opposite direction of the load side	Long bending life	MR-AEPB2CBL_M-A2-H
					Standard	MR-AEPB2CBL_M-A2-L
				Vertical (Note 4)	Long bending life	MR-AEPB2CBL_M-A5-H
					Standard	MR-AEPB2CBL_M-A5-L
			Not available	In the direction of the load side	Long bending life	MR-AEP2CBL_M-A1-H
					Standard	MR-AEP2CBL_M-A1-L
				In the opposite direction of the load side	Long bending life	MR-AEP2CBL_M-A2-H
					Standard	MR-AEP2CBL_M-A2-L
				Vertical (Note 4)	Long bending life	MR-AEP2CBL_M-A5-H
					Standard	MR-AEP2CBL_M-A5-L
	Over 10 m (junction type) (Note 2)	IP20	Available	In the direction of the load side	Long bending life	MR-AEPB2J10CBL03M-A1-L, MR-AEKCBL_M-H
					Standard	MR-AEPB2J10CBL03M-A1-L, MR-AEKCBL_M-L
				In the opposite direction of the load side	Long bending life	MR-AEPB2J10CBL03M-A2-L, MR-AEKCBL_M-H
					Standard	MR-AEPB2J10CBL03M-A2-L, MR-AEKCBL_M-L
				Vertical (Note 4)	Long bending life	MR-AEPB2J10CBL03M-A5-L, MR-AEKCBL_M-H
					Standard	MR-AEPB2J10CBL03M-A5-L, MR-AEKCBL_M-L
			Not available	In the direction of the load side	Long bending life	MR-AEP2J10CBL03M-A1-L, MR-AEKCBL_M-H
					Standard	MR-AEP2J10CBL03M-A1-L, MR-AEKCBL_M-L
				In the opposite direction of the load side	Long bending life	MR-AEP2J10CBL03M-A2-L, MR-AEKCBL_M-H
					Standard	MR-AEP2J10CBL03M-A2-L, MR-AEKCBL_M-L
				Vertical (Note 4)	Long bending life	MR-AEP2J10CBL03M-A5-L, MR-AEKCBL_M-H
					Standard	MR-AEP2J10CBL03M-A5-L, MR-AEKCBL_M-L
	IP65 (Note 3)	Available	In the direction of the load side	Long bending life	MR-AEPB2J20CBL03M-A1-L, MR-AENSCBL_M-H	
				Standard	MR-AEPB2J20CBL03M-A1-L, MR-AENSCBL_M-L	
			In the opposite direction of the load side	Long bending life	MR-AEPB2J20CBL03M-A2-L, MR-AENSCBL_M-H	
				Standard	MR-AEPB2J20CBL03M-A2-L, MR-AENSCBL_M-L	
			Vertical (Note 4)	Long bending life	MR-AEPB2J20CBL03M-A5-L, MR-AENSCBL_M-H	
				Standard	MR-AEPB2J20CBL03M-A5-L, MR-AENSCBL_M-L	
		Not available	In the direction of the load side	Long bending life	MR-AEP2J20CBL03M-A1-L, MR-AENSCBL_M-H	
				Standard	MR-AEP2J20CBL03M-A1-L, MR-AENSCBL_M-L	
			In the opposite direction of the load side	Long bending life	MR-AEP2J20CBL03M-A2-L, MR-AENSCBL_M-H	
				Standard	MR-AEP2J20CBL03M-A2-L, MR-AENSCBL_M-L	
			Vertical (Note 4)	Long bending life	MR-AEP2J20CBL03M-A5-L, MR-AENSCBL_M-H	
				Standard	MR-AEP2J20CBL03M-A5-L, MR-AENSCBL_M-L	
Single cable type	10 m or shorter (direct connection type)	IP65 (Note 3)	Available	In the direction of the load side	Long bending life	MR-AEPB1CBL_M-A1-H
					Standard	MR-AEPB1CBL_M-A1-L
				In the opposite direction of the load side	Long bending life	MR-AEPB1CBL_M-A2-H
					Standard	MR-AEPB1CBL_M-A2-L
				Vertical (Note 4)	Long bending life	MR-AEPB1CBL_M-A5-H
					Standard	MR-AEPB1CBL_M-A5-L
			Not available	In the direction of the load side	Long bending life	MR-AEP1CBL_M-A1-H
					Standard	MR-AEP1CBL_M-A1-L
				In the opposite direction of the load side	Long bending life	MR-AEP1CBL_M-A2-H
					Standard	MR-AEP1CBL_M-A2-L
				Vertical (Note 4)	Long bending life	MR-AEP1CBL_M-A5-H
					Standard	MR-AEP1CBL_M-A5-L

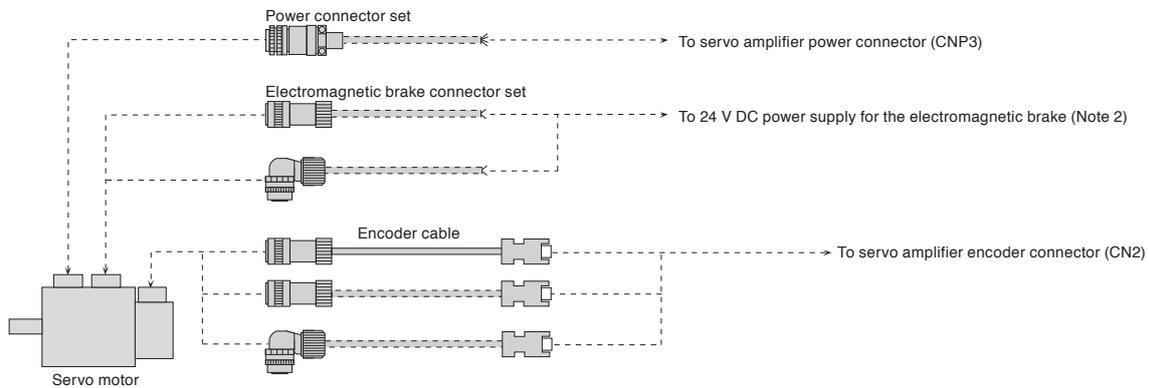
## Connector set

Application	IP rating (Note 1)	Connector shape	Type of connection	Model (Note 6)
For junction	IP20	Straight	-	MR-ECNM
	IP67		One-touch	MR-J3SCNS

- Notes:
1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo motor. If the IP rating of the servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.
  2. The two types of cables indicated are required.
  3. When IP67 cables are required, please contact Mitsubishi Electric System & Service Co., Ltd. OVERSEAS SERVICE SECTION. (Email: osb.webmaster@melsc.jp)
  4. When a vertically mounted cable is led out, the lock lever of the connector must be on the load side.
  5. Long bending life cables and standard cables are for moving parts and fixed parts respectively.
  6. Refer to "MELSERVO-J5 catalog (L(NA)03179ENG)" for details of the cables and the connectors.

## Configuration Example for Rotary Servo Motors (Note 1)

HK-RT353W/HK-RT503W/HK-RT703W



Notes: 1. Cables drawn with dashed lines need to be fabricated by users. Refer to "Rotary Servo Motor User's Manual" when fabricating the cables.  
2. This is for the servo motors with an electromagnetic brake.

### Cables

Application	IP rating (Note 1)	Bending life (Note 3)	Length	Model (Note 4)
Encoder	IP67	Long bending life	2 m to 10 m	MR-J3ENSCBL_M-H
			20 m to 50 m	MR-AENSCBL_M-H
		Standard	2 m to 10 m	MR-J3ENSCBL_M-L
			20 m to 30 m	MR-AENSCBL_M-L

### Connector set

Application	IP rating (Note 1)	Connector shape	Type of connection	Model (Note 2, 4)
Encoder	IP67	Straight	One-touch	MR-J3SCNS
			Screw	MR-ENCNS2
		Angle	One-touch	MR-J3SCNSA
			Screw	MR-ENCNS2A
Power supply	IP67	Straight	One-touch	MR-APWCNS5
Electromagnetic brake	IP67	Straight	One-touch	MR-BKCNS1
			Screw	MR-BKCNS2
		Angle	One-touch	MR-BKCNS1A
			Screw	MR-BKCNS2A

Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo motor. If the IP rating of the servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.  
2. Use the option connector set indicated to fabricate a cable.  
3. Long bending life cables and standard cables are for moving parts and fixed parts respectively.  
4. Refer to "MELSERVO-J5 catalog (L(NA)03179ENG)" for details of the cables and the connectors.

## Connection Example of Rotary Servo Motors and Servo Amplifiers

Refer to "Rotary Servo Motor User's Manual" for details.

## Selection Example of Wires for Rotary Servo Motors

Refer to "Rotary Servo Motor User's Manual" for details.

# Mitsubishi Electric AC Servo System MELSERVO-J5

## Product List

### Rotary servo motors

Item		Flange size	Model	Rated output	Rated speed
HK-RT series B: With an electromagnetic brake	HK-RT_W	90 x 90	HK-RT103W(B)	1.0 kW	3000 r/min
			HK-RT153W(B)	1.5 kW	3000 r/min
			HK-RT203W(B)	2.0 kW	3000 r/min
		130 x 130	HK-RT353W(B)	3.5 kW	3000 r/min
			HK-RT503W(B)	5.0 kW	3000 r/min
			HK-RT703W(B)	7.0 kW	3000 r/min
Servo motors with functional safety HK-RT series B: With an electromagnetic brake	HK-RT_W_WS	90 x 90	HK-RT103W(B)WS	1.0 kW	3000 r/min
			HK-RT153W(B)WS	1.5 kW	3000 r/min
			HK-RT203W(B)WS	2.0 kW	3000 r/min
		130 x 130	HK-RT353W(B)WS	3.5 kW	3000 r/min
			HK-RT503W(B)WS	5.0 kW	3000 r/min
			HK-RT703W(B)WS	7.0 kW	3000 r/min

## MITSUBISHI ELECTRIC CORPORATION

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### SAFETY WARNING

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