

MELSERVO MR-J2

Servo Technology that does more

The positioning drive for highest requirements



The MR-J2

With the MR-J2, MITSUBISHI ELECTRIC launches a servo drive on the market with unique functions at very compact dimensions. It was developed with great attention to a very quick and easy commissioning.

Of course, the MR-J2 servo drives meet the requirements of the EN and UL/CSA standards.

Applications

Features and flexibility make the MR-J2 the ideal drive for a very wide range of applications, e.g.:

- Packing machines
- PCB component insertion machines
- Tool changers
- Labelling machines
- Machines for the food industry
- Winding machines with tension control

Features

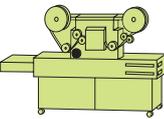
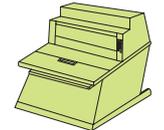
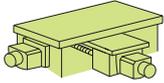
- Continuous self-optimization of the control parameters (Auto Tuning)
- Absolute shaft encoder
- Automatic motor type recognition
- RS232 interface for easy commissioning
- Digital and analog setting value preset

The extensive functions of the MELSERVO MR-J2 product line reveal a broad variety of applications to the user.

Mitsubishi servos provide significant advantages

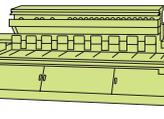
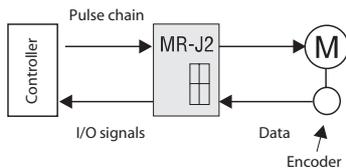
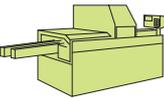
Global industrial standards

The servo amplifiers comply with all common industrial standards, norms, and directives.



Absolute encoder is standard equipment

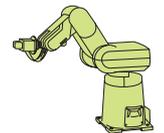
All Mitsubishi servo motors provide integrated ABS encoders. Additional return-to-origin routines, limit switches, or other sensors are not required.



More compact servo motors

Mitsubishi servo motors are even smaller now:

- the ultra-compact HC-MF series
- the low-inertia HC-RF series
- the medium-inertia HC-SF series



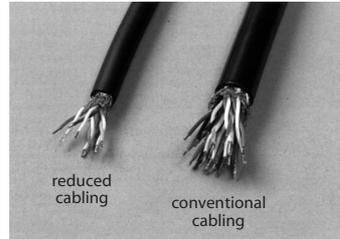
Automatic motor recognition

After the connection of the encoder, the type of servo motor is recognized automatically and all relevant motor specifications are set accordingly.

A long-winded or even wrong setting of motor parameters is avoided.

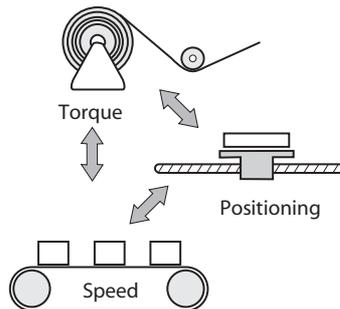
Serial encoder communications

A serial connection between motor encoder and servo amplifier reduces the cabling effort to a minimum.



Toggle function for control modes

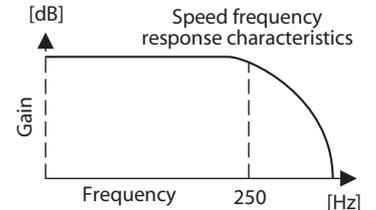
The torque, speed, and position control modes can easily be switched over.



Real-time auto-tuning

With the help of the auto-tuning function the servo unit automatically sets the gain adjustments. The individual adjustment of single applications is not required.

Since the auto-tuning applies continuously even applications with changing load inertia are supported. Hence, the user's range of applications is extended



Adaptive control

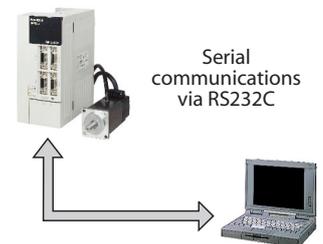
The adaptive control enables controlling of stable systems with a minimum of response times.

Vibration suppression

High-frequency vibrations are suppressed effectively even with a locked or blocked servo motor. This facilitates the construction of stable systems

Personal computer interface

All MELSERVOS provide a serial RS232C standard interface for the connection to a PC or notebook, supporting an easy and comfortable parameterization and diagnostic functions.



Servo motors HC-MF-EC

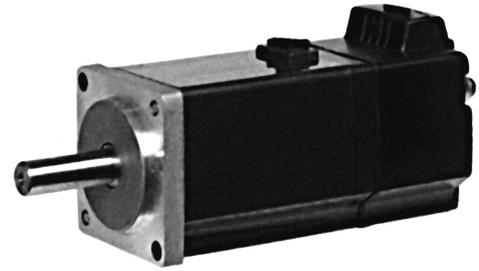
The HC-MF-EC series servo motors are specially developed for extremely highly dynamic applications and as drives with very short cycle times.

Special high-energy magnetic materials and new winding methods facilitated the construction of a servo motor with

a very small moment of inertia and very small dimensions.

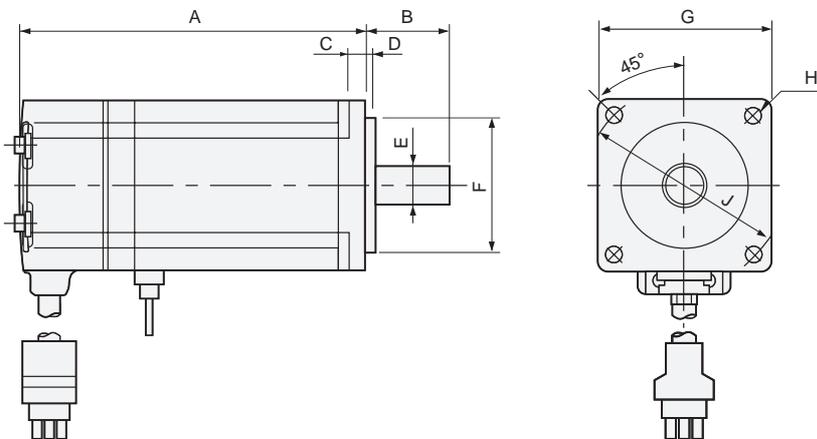
The standard high-resolution absolute shaft encoder is a new construction as well with impressively compact dimensions.

The HC-MF-EC series motors are optionally available with electromagnetic brakes.



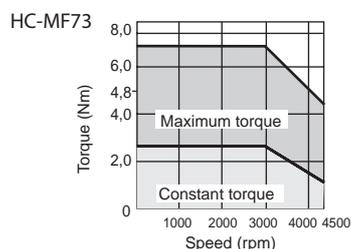
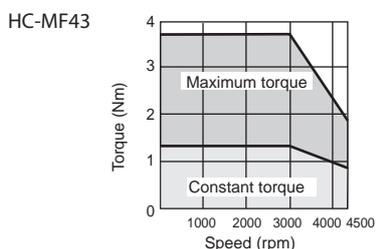
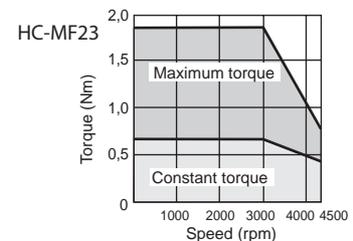
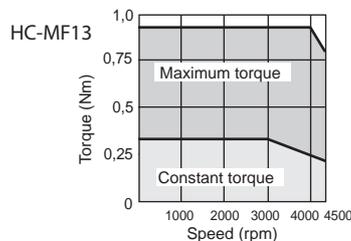
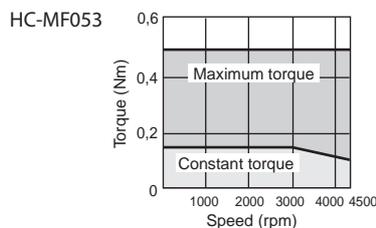
| Specifications | | HC-MF053-EC | HC-MF13-EC | HC-MF23-EC | HC-MF43-EC | HC-MF73-EC |
|---------------------------------|--------------------|--|------------|------------|------------|------------|
| Servo amplifier | | MR-J2-10A | MR-J2-10A | MR-J2-20A | MR-J2-40A | MR-J2-70A |
| Rated power | W | 50 | 100 | 200 | 400 | 750 |
| Rated torque | Nm | 0.16 | 0.32 | 0.64 | 1.3 | 2.4 |
| Maximum torque | Nm | 0.48 | 0.95 | 1.9 | 3.8 | 7.2 |
| Rated speed | 1/min | 3000 | 3000 | 3000 | 3000 | 3000 |
| Max. speed | 1/min | 4500 | 4500 | 4500 | 4500 | 4500 |
| Moment of inertia | kg cm ² | 0.019 | 0.03 | 0.088 | 0.143 | 0.68 |
| Feedback system | | Absolute encoder: 8192 pulses / revolution | | | | |
| Protection type | | IP 44 | IP 44 | IP 44 | IP 44 | IP 44 |
| Ambient temperature | °C | 0 – 40 | 0 – 40 | 0 – 40 | 0 – 40 | 0 – 40 |
| Max. humidity (no condensation) | % | 80 | 80 | 80 | 80 | 80 |
| Max. installation height | m | 1000 | 1000 | 1000 | 1000 | 1000 |
| Weight | kg | 0.5 | 0.6 | 1.2 | 1.7 | 3.1 |

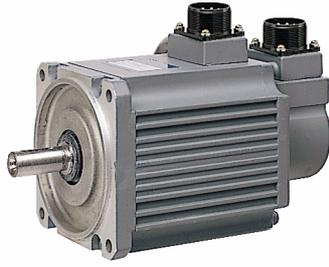
Dimensions



| Motor | HC-MF053-EC | HC-MF13-EC | HC-MF23-EC | HC-MF43-EC | HC-MF73-EC |
|-------|-------------|------------|------------|------------|------------|
| Dim. | | | | | |
| A | 89.5 | 104.5 | 108.5 | 133.5 | 150 |
| B | 25 | 25 | 30 | 30 | 40 |
| C | 5 | 5 | 7 | 7 | 8 |
| D | 2.5 | 2.5 | 3 | 3 | 3 |
| E | 8 | 8 | 14 | 14 | 19 |
| F | 30 | 30 | 50 | 50 | 70 |
| G | 40 | 40 | 60 | 60 | 80 |
| H | 2-Ø4.5 | 2-Ø4.5 | 4-Ø5.8 | 4-Ø5.8 | 4-Ø6.6 |
| J | 46 | 46 | 70 | 70 | 90 |

Torque characteristics





Servo motors HA-FF-EC

The servo motors of the HA-FF-EC series are characterized by a low moment of inertia at compact dimensions.

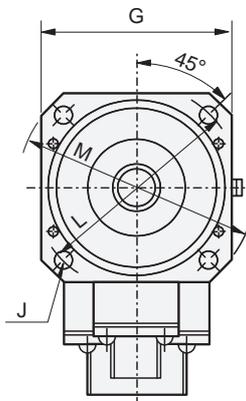
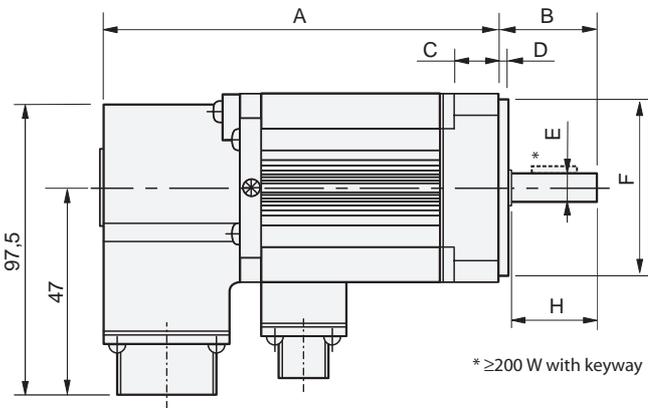
These features are achieved by special high-energy magnetic materials and new winding methods.

The standard absolute shaft encoder provides a high positioning precision and the positioning control even detects changes of position in the switched-OFF state.

The HA-FF-EC series motors are optionally available with electromagnetic brakes.

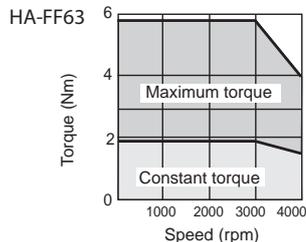
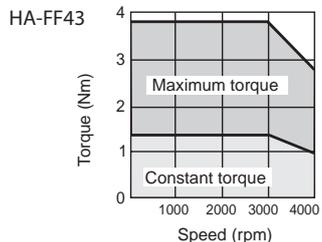
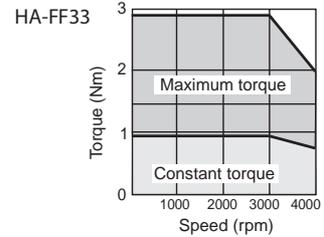
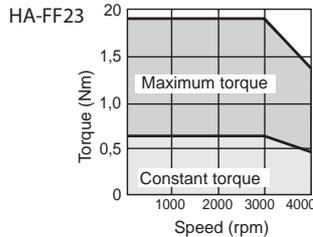
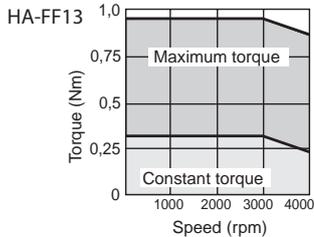
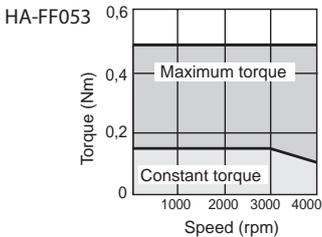
| Specifications | | HA-FF053-EC | HA-FF13-EC | HA-FF23-EC | HA-FF33-EC | HA-FF43-EC | HA-FF63-EC |
|---------------------------------|--------------------|--|------------|------------|------------|------------|------------|
| Servo amplifier | | MR-J2-10A | MR-J2-10A | MR-J2-20A | MR-J2-40A | MR-J2-40A | MR-J2-60A |
| Rated power | W | 50 | 100 | 200 | 300 | 400 | 600 |
| Rated torque | Nm | 0.16 | 0.32 | 0.64 | 0.95 | 1.3 | 1.9 |
| Maximum torque | Nm | 0.48 | 0.95 | 1.9 | 2.9 | 3.8 | 5.7 |
| Rated speed | 1/min | 3000 | 3000 | 3000 | 3000 | 3000 | 3000 |
| Max. speed | 1/min | 4000 | 4000 | 4000 | 4000 | 4000 | 4000 |
| Moment of inertia | kg cm ² | 0.063 | 0.095 | 0.35 | 0.5 | 0.98 | 1.2 |
| Feedback system | | Absolute encoder: 8192 pulses / revolution | | | | | |
| Protection type | | IP 54 | IP 54 | IP 54 | IP 54 | IP 54 | IP 54 |
| Ambient temperature | °C | 0 – 40 | 0 – 40 | 0 – 40 | 0 – 40 | 0 – 40 | 0 – 40 |
| Max. humidity (no condensation) | % | 80 | 80 | 80 | 80 | 80 | 80 |
| Max. installation height | m | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 |
| Weight | kg | 1.8 | 2 | 2.6 | 2.9 | 4.7 | 5.3 |

Dimensions



| Motor | HA-FF053-EC | HA-FF13-EC | HA-FF23-EC | HA-FF33-EC | HA-FF43-EC | HA-FF63-EC |
|--------|-------------|------------|------------|------------|------------|------------|
| Dim. A | 120 | 137 | 145 | 162 | 169 | 184 |
| Dim. B | 30 | 30 | 30 | 30 | 40 | 40 |
| Dim. C | 12 | 12 | 14 | 14 | 16 | 16 |
| Dim. D | 2.5 | 2.5 | 3 | 3 | 3 | 3 |
| Dim. E | 8 | 8 | 11 | 11 | 16 | 16 |
| Dim. F | 50 | 50 | 70 | 70 | 95 | 95 |
| Dim. G | 54 | 54 | 76 | 76 | 100 | 100 |
| Dim. H | 25 | 25 | 25 | 25 | 35 | 35 |
| Dim. J | 4-Ø4.5 | 4-Ø4.5 | 4-Ø5.5 | 4-Ø5.5 | 4-Ø9 | 4-Ø9 |
| Dim. L | 60 | 60 | 90 | 90 | 115 | 115 |
| Dim. M | 68 | 68 | 100 | 100 | 135 | 135 |

Torque characteristics



Servo motors HC-SF

The motors HC-SF are designed for a medium moment of inertia and are used for a wide range of applications.

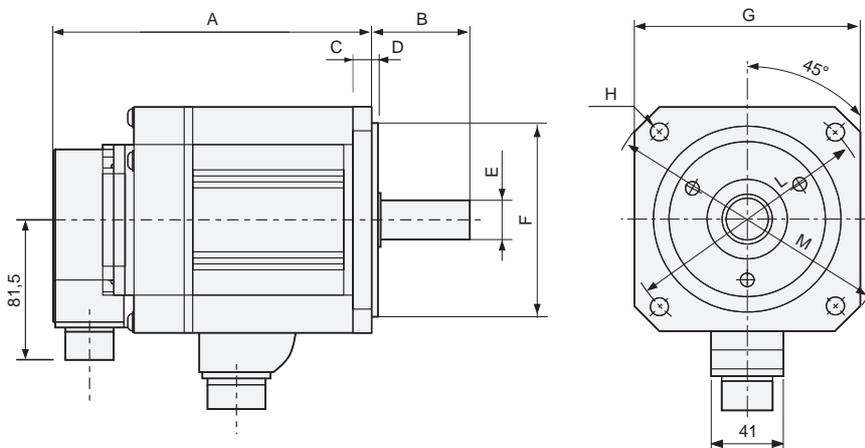
The HC-SF series is particularly constructed for applications requiring high protection types at compact dimensions.

The HA-FF-EC series motors are optionally available with electromagnetic brakes.



| Specifications | | HC-SF52 | HC-SF102 | HC-SF152 | HC-SF202 | HC-SF352 |
|---------------------------------|--------------------|---|------------|------------|------------|------------|
| Servo amplifier | | MR-J2-60A | MR-J2-100A | MR-J2-200A | MR-J2-200A | MR-J2-350A |
| Rated power | W | 500 | 1000 | 1500 | 2000 | 3500 |
| Rated torque | Nm | 2.39 | 4.78 | 7.16 | 9.55 | 16.7 |
| Maximum torque | Nm | 7.16 | 14.4 | 21.6 | 28.5 | 50.1 |
| Rated speed | 1/min | 2000 | 2000 | 2000 | 2000 | 2000 |
| Max. speed | 1/min | 3000 | 3000 | 3000 | 2500 | 2500 |
| Moment of inertia | kg cm ² | 6.6 | 13.7 | 20 | 42.5 | 82 |
| Feedback system | | Absolute encoder: 16384 pulses / revolution | | | | |
| Protection type | | IP 65 | IP 65 | IP 65 | IP 65 | IP 65 |
| Ambient temperature | °C | 0 – 40 | 0 – 40 | 0 – 40 | 0 – 40 | 0 – 40 |
| Max. humidity (no condensation) | % | 80 | 80 | 80 | 80 | 80 |
| Max. installation height | m | 1000 | 1000 | 1000 | 1000 | 1000 |
| Weight | kg | 5 | 7 | 9 | 12 | 19 |

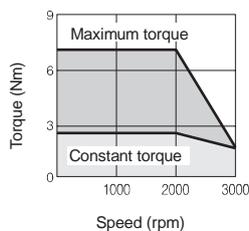
Dimensions



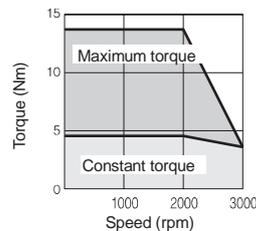
| Motor Dim. | HC-SF52 | HC-SF102 | HC-SF152 | HC-SF202 | HC-SF352 |
|------------|---------|----------|----------|----------|----------|
| A | 120 | 145 | 170 | 145 | 187 |
| B | 55 | 55 | 55 | 79 | 79 |
| C | 12 | 12 | 12 | 18 | 18 |
| D | 3 | 3 | 3 | 3 | 3 |
| E | 24 | 24 | 24 | 35 | 35 |
| F | 110 | 110 | 110 | 114.3 | 114.3 |
| G | 130 | 130 | 130 | 176 | 176 |
| H | 4-Ø9 | 4-Ø9 | 4-Ø9 | 4-Ø13.5 | 4-Ø13.5 |
| L | 145 | 145 | 200 | 200 | 200 |
| M | 165 | 165 | 165 | 230 | 230 |

Torque characteristics

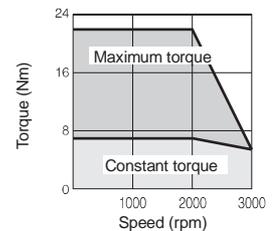
HC-SF52



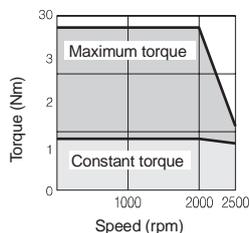
HC-SF102



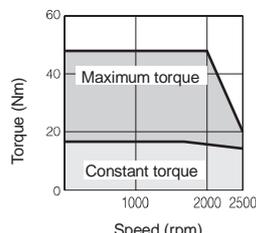
HC-SF152

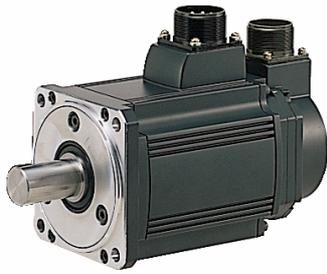


HC-SF202



HC-SF352





Servo motors HC-RF

The HC-RF series servo motors are constructed for extremely highly dynamic applications in the medium performance range. It features lowest moments of inertia.

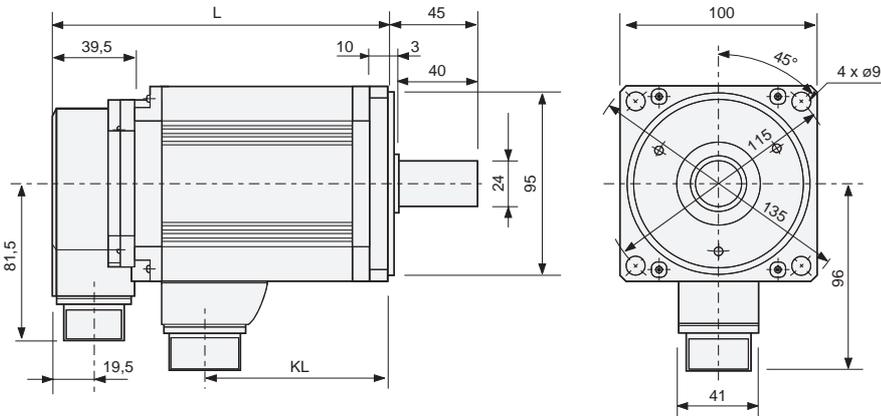
The integrated absolute shaft encoder provides a resolution of 16384 pulses per revolution

and thus achieves lowest speed fluctuations even at lower speed.

The HC-RF series motors are optionally available with electromagnetic brakes.

| Specifications | | HC-RF103 | HC-RF153 | HC-RF203 |
|---------------------------------|--------------------|---|------------|------------|
| Servo amplifier | | MR-J2-200A | MR-J2-200A | MR-J2-350A |
| Rated power | W | 1000 | 1500 | 2000 |
| Rated torque | Nm | 3.18 | 4.78 | 6.37 |
| Maximum torque | Nm | 7.95 | 11,9 | 15.9 |
| Rated speed | 1/min | 3000 | 3000 | 3000 |
| Max. speed | 1/min | 4500 | 4500 | 4500 |
| Moment of inertia | kg cm ² | 1.5 | 1.9 | 2.3 |
| Feedback system | | Absolute encoder: 16384 pulses / revolution | | |
| Protection type | | IP 65 | IP 65 | IP 65 |
| Ambient temperature | °C | 0 – 40 | 0 – 40 | 0 – 40 |
| Max. humidity (no condensation) | % | 80 | 80 | 80 |
| Max. installation height | m | 1000 | 1000 | 1000 |
| Weight | kg | 3.9 | 5.0 | 6.2 |

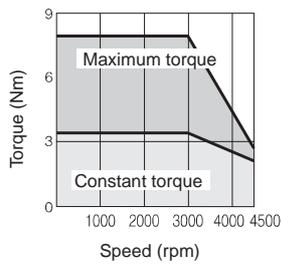
Dimensions



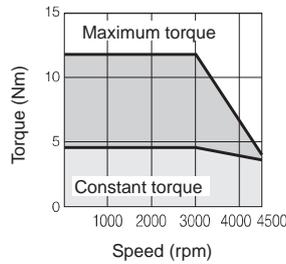
| Motor Dim. | HC-RF103 | HC-RF153 | HC-RF203 |
|------------|----------|----------|----------|
| L | 147 | 172 | 197 |
| KL | 71 | 96 | 121 |

Torque characteristics

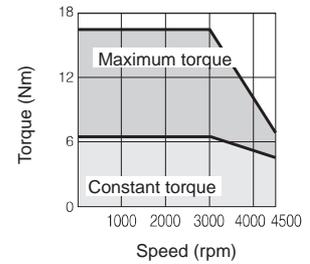
HC-RF103



HC-RF153



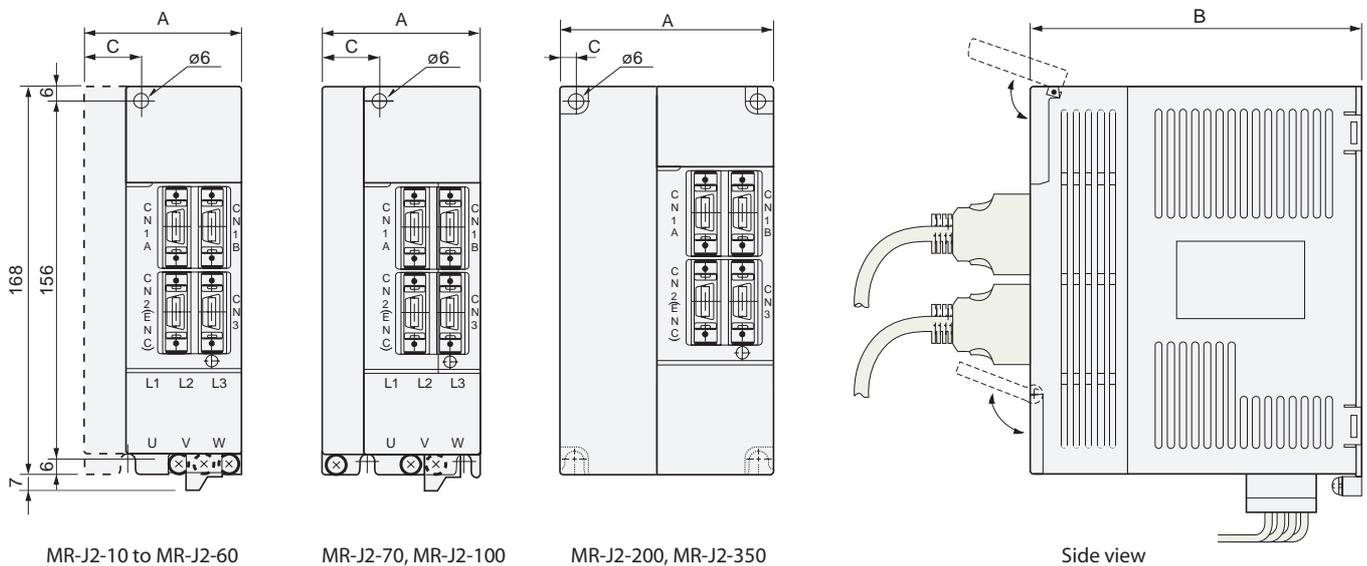
HC-RF203



Specifications of servo amplifiers

| Type | MR-J2-10A | MR-J2-20A | MR-J2-40A | MR-J2-60A | MR-J2-70A | MR-J2-100A | MR-J2-200A | MR-J2-350A | |
|-----------------------------------|--|--|-----------|-----------|-----------|------------|------------|------------|-----|
| Connected voltage | 3-phase, 200 – 230 V AC; 50 / 60 Hz (1-phase connection supplied up to MR-J2-70A) | | | | | | | | |
| Voltage range | V AC | 170 – 253 | | | | | | | |
| Control system | Sinusoidal PWM | | | | | | | | |
| Speed frequency response | Min. 250 Hz | | | | | | | | |
| Protection functions | Overcurrent, overvoltage, overload, motor overheating, feedback alarm, brake unit overload, undervoltage alarm, excessive speed, excessive position deviation | | | | | | | | |
| Torque limitation | 0 – ±10 V DC input/ max. torque | | | | | | | | |
| Max. input pulse frequency | kpps | Max. 400 (differential input) / 200 (open collector input) | | | | | | | |
| In-position range | 0 to ±10000 pulses | | | | | | | | |
| Max. deviation | ±80 pulses | | | | | | | | |
| Speed control range | 1 : 5000 | | | | | | | | |
| Analog setting value | V DC | 0 – ±10 / max. speed | | | | | | | |
| Speed fluctuation rate | Max. -0,03 % (load fluctuation 0 to 100 %); max. ±0,02 % (voltage fluctuation ±10 %); max. ±0,02 % (ambient temperature 25 °C ±10 °C with external analog setting value) | | | | | | | | |
| External torque limitation | V DC | 0 – ±8 / max. torque | | | | | | | |
| Structure | IP 00 | | | | | | | | |
| Ambient temperature for operation | °C | 0 – 55 (no frost) | | | | | | | |
| Ambient temperature for storage | -20 – +65 °C | | | | | | | | |
| Max. humidity | % | 90 (no condensation) | | | | | | | |
| Environmental conditions | No dust, no corrosive gas, no flammable gas, no oil mist | | | | | | | | |
| Max. installation height | m | 1000 | | | | | | | |
| Max. vibration resistance | G | 0.6 | | | | | | | |
| Weight | kg | 0.7 | 0.7 | 1.1 | 1.1 | 1.7 | 1.7 | 2.0 | 2.0 |

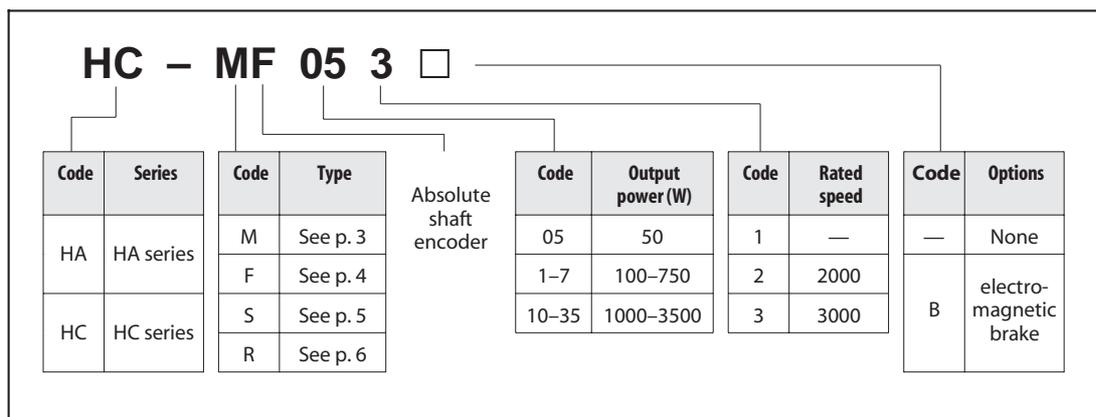
Dimensions of servo amplifier



| Amplifier | A | B | C |
|------------|----|-----|----|
| MR-J2-10A | 50 | 135 | 6 |
| MR-J2-20A | 50 | 135 | 6 |
| MR-J2-40A | 70 | 135 | 22 |
| MR-J2-60A | 70 | 135 | 22 |
| MR-J2-70A | 70 | 190 | 22 |
| MR-J2-100A | 70 | 190 | 22 |
| MR-J2-200A | 90 | 195 | 6 |
| MR-J2-350A | 90 | 195 | 6 |

Model designation

Model designation of servo motors



Model designation of servo amplifiers

