1.3 Servo amplifier standard specifications

(1) 200 V class

Model: MR-J4-_(-RJ)			10B	20B	40B	60B	70B	100B	200B	350B	500B	700B	11KB	15KB	22KB
Output	Rated voltage		3-phase 170 V AC												
	Rated current	[A]	1.1	1.5	2.8	3.2	5.8	6.0	11.0	17.0	28.0	37.0	68.0	87.0	126.0
Main circuit power supply input	Voltage/ Frequency	At AC input	3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz (Note 13)		3-phase 200 V AC to 240 V AC, 50 Hz/60 Hz					
		At DC input (Note 16)	283 V DC to 340 V DC												
	Rated current (Note 11)	[A]	0.9	1.5	2.6	3.2 (Note 6)	3.8	5.0	10.5	16.0	21.7	28.9	46.0	64.0	95.0
	Permissible voltage fluctuation	At AC input	3-phase or 1-phase 170 V AC to 264 V AC					3-phase or 1-phase 170 V AC to 264 V AC (Note 13)		3-phase 170 V AC to 264 V AC					
		At DC input (Note 16)	241 V DC to 374 V DC												
	Permissible frequency fluctuation		Within ±5%												
	Power supply capacity	[kVA]	Refer to section 10.2.												
	Inrush current	[A]	Refer to section 10.5.												
Control circuit power supply input	Voltage/ Frequency	At AC input	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz												
		At DC input (Note 16)	283 V DC to 340 V DC												
	Rated current	[A]	0.2								0.3				
	Permissible voltage fluctuation	At AC input	1-phase 170 V AC to 264 V AC												
		At DC input (Note 16)	241 V DC to 374 V DC												
	Permissible frequency fluctuation		Within ±5%												
	Power consumption	[W]	30								45				
	Inrush current	[A]	Refer to section 10.5.												
Interface power supply	Voltage		24 V DC ± 10%												
	Current capacity	[A]	0.3 (including CN8 connector signals) (Note 1)												
Control method			Sine-wave PWM control, current control method												
Dynamic brake			Built-in										External option (Note 9, 12)		
SSCNET III/H communication cycle (Note 8)			0.222 ms, 0.444 ms, 0.888 ms												
Fully closed loop control			Compatible (Note 7)												
Scale measurement function			Compatible (Note 10)												
Load-side encoder interface (Note 5)			Mitsubishi Electric high-speed serial communication												
Communication function			USB: connection to a personal computer or others (MR Configurator2-compatible)												
Encoder output pulses			Compatible (A/B/Z-phase pulse)												
Analog monitor			Two channels												
Protective functions			Overcurrent shut-off, regenerative overvoltage shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, regenerative error protection, undervoltage protection, instantaneous power failure protection, overspeed protection, error excessive protection, magnetic pole detection protection, and linear servo control fault protection												
Functional safety			STO (IEC/EN 61800-5-2)												

Model: MR-J4-_(-RJ)			10B	20B	40B	60B	70B	100B	200B	350B	500B	700B	11KB	15KB	22KB
Safety performance	Standards certified by CB (Note 14)		EN ISO 13849-1 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL3, EN 61800-5-2												
	Response performance		8 ms or less (STO input off → energy shut off)												
	Test pulse input (STO) (Note 3)		Test pulse interval: 1 Hz to 25 Hz Test pulse off time: Up to 1 ms												
	Mean time to dangerous failure (MTTFd)		MTTFd ≥ 100 [years] (314a)												
	Diagnostic coverage (DC)		DC = Medium, 97.6 [%]												
	Average probability of dangerous failures per hour (PFH)		PFH = 6.4×10^{-9} [1/h]												
Compliance with global standards	CE marking		LVD: EN 61800-5-1 EMC: EN 61800-3 MD: EN ISO 13849-1, EN 61800-5-2, EN 62061												
	UL standard		UL 508C												
Structure (IP rating)			Natural cooling, open (IP20)				Force cooling, open (IP20)			Force cooling, open (IP20) (Note 4)					
Close mounting (Note 2)	3-phase power supply input		Possible							Impossible					
	1-phase power supply input		Possible					Impossible							
Environment	Ambient temperature	Operation	0 ˚C to 55 ˚C (non-freezing)												
		Storage	-20 ˚C to 65 ˚C (non-freezing)												
	Ambient humidity	Operation	5 %RH to 90 %RH (non-condensing)												
		Storage													
	Ambience		Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, and dirt												
	Altitude		2000 m or less above sea level (Note 15)												
	Vibration resistance		5.9 m/s^2, at 10 Hz to 55 Hz (directions of X, Y and Z axes)												
Mass		[kg]	0.8		1.0		1.4		2.1	2.3	4.0	6.2	13.4		18.2

Note 1. 0.3 A is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points.

2. When closely mounting the servo amplifiers, operate them at the ambient temperature of 0 ˚C to 45 ˚C or at 75% or smaller effective load ratio.
3. Test pulse is a signal which instantaneously turns off a signal to the servo amplifier at a constant period for external circuit to self-diagnose.
4. Except for the terminal block.
5. MR-J4-_B servo amplifier is compatible only with two-wire type. MR-J4-_B-RJ servo amplifier is compatible with two-wire type, four-wire type, and A/B/Z-phase differential output method. Refer to table 1.1 for details.

6 The rated current is 2.9 A when the servo amplifier is used with UL or CSA compliant servo motor.

7. For the compatible version of fully closed loop system, refer to table 1.1. Check the software version of the servo amplifier with MR Configurator2.
8. The communication cycle depends on the controller specifications and the number of axes connected.
9. Use an external dynamic brake for this servo amplifier. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at emergency stop. Ensure the safety in the entire equipment.
10. For the compatible version for the scale measurement function, refer to table 1.1. Check the software version of the servo amplifier with MR Configurator2.
11. This value is applicable when a 3-phase power supply is used.
12. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB (Dynamic brake interlock) in [Pr. PD07] to [Pr. PD09]. Failure to do so will cause the servo amplifier to become servo-off when an instantaneous power failure occurs.
13. When using 1-phase 200 V AC to 240 V AC power supply, operate the servo amplifier at 75% or smaller effective load ratio.
14. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether STO input diagnosis by TOFB output is performed or not. For details, refer to the Function column of [Pr. PF18] in section 5.2.6.
15. Follow the restrictions in section 2.7 when using this product at altitude exceeding 1000 m and up to 2000 m above sea level.
16. The DC power supply input is available only with MR-J4-_B-RJ servo amplifiers. For the connection example of the power circuit when a DC input is used, refer to app. 15.

(2) 400 V class

Model: MR-J4-_(-RJ)		60B4	100B4	200B4	350B4	500B4	700B4	11KB4	15KB4	22KB4
Output	Rated voltage	3-phase 323 V AC								
	Rated current [A]	1.5	2.8	5.4	8.6	14.0	17.0	32.0	41.0	63.0
Main circuit power supply input	Voltage/Frequency	3-phase 380 V AC to 480 V AC, 50 Hz/60 Hz								
	Rated current [A]	1.4	2.5	5.1	7.9	10.8	14.4	23.1	31.8	47.6
	Permissible voltage fluctuation	3-phase 323 V AC to 528 V AC								
	Permissible frequency fluctuation	Within ±5%								
	Power supply capacity [kVA]	Refer to section 10.2.								
	Inrush current [A]	Refer to section 10.5.								
Control circuit power supply input	Voltage/Frequency	1-phase 380 V AC to 480 V AC, 50 Hz/60 Hz								
	Rated current [A]	0.1			0.2					
	Permissible voltage fluctuation	1-phase 323 V AC to 528 V AC								
	Permissible frequency fluctuation	Within ±5%								
	Power consumption [W]	30			45					
	Inrush current [A]	Refer to section 10.5.								
Interface power supply	Voltage	24 V DC ± 10%								
	Current capacity [A]	0.3 (including CN8 connector signals) (Note 1)								
Control method		Sine-wave PWM control, current control method								
Dynamic brake		Built-in						External option (Note 6, 8)		
SSCNET III/H communication cycle (Note 5)		0.222 ms, 0.444 ms, 0.888 ms								
Fully closed loop control		Compatible								
Scale measurement function		Compatible (Note 7)								
Load-side encoder interface (Note 4)		Mitsubishi Electric high-speed serial communication								
Communication function		USB: connection to a personal computer or others (MR Configurator2-compatible)								
Encoder output pulses		Compatible (A/B/Z-phase pulse)								
Analog monitor		Two channels								
Protective functions		Overcurrent shut-off, regenerative overvoltage shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, regenerative error protection, undervoltage protection, instantaneous power failure protection, overspeed protection, error excessive protection, magnetic pole detection protection, and linear servo control fault protection								
Functional safety		STO (IEC/EN 61800-5-2)								
Safety performance	Standards certified by CB (Note 9)	EN ISO 13849-1 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL3, EN 61800-5-2								
	Response performance	8 ms or less (STO input off → energy shut off)								
	Test pulse input (STO) (Note 2)	Test pulse interval: 1 Hz to 25 Hz Test pulse off time: Up to 1 ms								
	Mean time to dangerous failure (MTTFd)	MTTFd ≥ 100 [years] (314a)								
	Diagnosis converge (DC)	DC = Medium, 97.6 [%]								
	Average probability of dangerous failures per hour (PFH)	PFH = 6.4×10^{-9} [1/h]								
Compliance with global standards	CE marking	LVD: EN 61800-5-1 EMC: EN 61800-3 MD: EN ISO 13849-1, EN 61800-5-2, EN 62061								
	UL standard	UL 508C								
Structure (IP rating)		Natural cooling, open (IP20)		Force cooling, open (IP20)		Force cooling, open (IP20) (Note 3)				
Close mounting		Impossible								

Model: MR-J4-_(-RJ)			60B4	100B4	200B4	350B4	500B4	700B4	11KB4	15KB4	22KB4
Environment	Ambient temperature	Operation	0 ˚C to 55 ˚C (non-freezing)								
		Storage	-20 ˚C to 65 ˚C (non-freezing)								
	Ambient humidity	Operation	5 %RH to 90 %RH (non-condensing)								
		Storage									
	Ambience		Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, and dirt								
	Altitude		2000 m or less above sea level (Note 10)								
	Vibration resistance		5.9 m/s^2, at 10 Hz to 55 Hz (directions of X, Y and Z axes)								
Mass [kg]			1.7		2.1	3.6	4.3	6.5	13.4		18.2

Note 1. 0.3 A is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points.

2. Test pulse is a signal which instantaneously turns off a signal to the servo amplifier at a constant period for external circuit to self-diagnose.
3. Except for the terminal block.
4. MR-J4-B4 servo amplifier is compatible only with two-wire type. MR-J4-B4-RJ servo amplifier is compatible with two-wire type, four-wire type, and A/B/Z-phase differential output method. Refer to table 1.1 for details.
5. The communication cycle depends on the controller specifications and the number of axes connected.
6. Use an external dynamic brake for this servo amplifier. Failure to do so will cause an accident because the servo motor does not stop immediately but coasts at emergency stop. Ensure the safety in the entire equipment.
7. For the compatible version for the scale measurement function, refer to table 1.1. Check the software version of the servo amplifier with MR Configurator2.
8. The external dynamic brake cannot be used for compliance with SEMI-F47 standard. Do not assign DB (Dynamic brake interlock) in [Pr. PD07] to [Pr. PD09]. Failure to do so will cause the servo amplifier to become servo-off when an instantaneous power failure occurs.
9. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether STO input diagnosis by TOFB output is performed or not. For details, refer to the Function column of [Pr. PF18] in section 5.2.6.
10. Follow the restrictions in section 2.7 when using this product at altitude exceeding 1000 m and up to 2000 m above sea level.

(3) 100 V class

Model: MR-J4-_(-RJ)		10B1	20B1	40B1
Output	Rated voltage	3-phase 170 V AC		
	Rated current [A]	1.1	1.5	2.8
Main circuit power supply input	Voltage/Frequency	1-phase 100 V AC to 120 V AC, 50 Hz/60 Hz		
	Rated current [A]	3.0	5.0	9.0
	Permissible voltage fluctuation	1-phase 85 V AC to 132 V AC		
	Permissible frequency fluctuation	Within ±5%		
	Power supply capacity [kVA]	Refer to section 10.2.		
	Inrush current [A]	Refer to section 10.5.		
Control circuit power supply input	Voltage/Frequency	1-phase 100 V AC to 120 V AC, 50 Hz/60 Hz		
	Rated current [A]	0.4		
	Permissible voltage fluctuation	1-phase 85 V AC to 132 V AC		
	Permissible frequency fluctuation	Within ±5%		
	Power consumption [W]	30		
	Inrush current [A]	Refer to section 10.5.		
Interface power supply	Voltage	24 V DC ± 10%		
	Current capacity [A]	0.3 (including CN8 connector signals) (Note 1)		
Control method		Sine-wave PWM control, current control method		
Dynamic brake		Built-in		
SSCNET III/H communication cycle (Note 6)		0.222 ms, 0.444 ms, 0.888 ms		
Fully closed loop control		Compatible (Note 5)		
Scale measurement function		Compatible (Note 7)		
Load-side encoder interface (Note 4)		Mitsubishi Electric high-speed serial communication		
Communication function		USB: connection to a personal computer or others (MR Configurator2-compatible)		
Encoder output pulses		Compatible (A/B/Z-phase pulse)		
Analog monitor		Two channels		
Protective functions		Overcurrent shut-off, regenerative overvoltage shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, regenerative error protection, undervoltage protection, instantaneous power failure protection, overspeed protection, error excessive protection, magnetic pole detection protection, and linear servo control fault protection		
Functional safety		STO (IEC/EN 61800-5-2)		
Safety performance	Standards certified by CB (Note 8)	EN ISO 13849-1 Category 3 PL e, IEC 61508 SIL 3, EN 62061 SIL CL3, EN 61800-5-2		
	Response performance	8 ms or less (STO input off → energy shut off)		
	Test pulse input (STO) (Note 3)	Test pulse interval: 1 Hz to 25 Hz Test pulse off time: Up to 1 ms		
	Mean time to dangerous failure (MTTFd)	MTTFd ≥ 100 [years] (314a)		
	Diagnostic coverage (DC)	DC = Medium, 97.6 [%]		
	Average probability of dangerous failures per hour (PFH)	PFH = 6.4×10^{-9} [1/h]		
Compliance with global standards	CE marking	LVD: EN 61800-5-1 EMC: EN 61800-3 MD: EN ISO 13849-1, EN 61800-5-2, EN 62061		
	UL standard	UL 508C		
Structure (IP rating)		Natural cooling, open (IP20)		
Close mounting (Note 2)		Possible		

Model: MR-J4-_(-RJ)			10B1	20B1	40B1
Environment	Ambient temperature	Operation	0 °C to 55 °C (non-freezing)		
		Storage	-20 °C to 65 °C (non-freezing)		
	Ambient humidity	Operation	5 %RH to 90 %RH (non-condensing)		
		Storage			
	Ambience		Indoors (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, and dirt		
	Altitude		2000 m or less above sea level (Note 9)		
	Vibration resistance		5.9 m/s^2, at 10 Hz to 55 Hz (directions of X, Y and Z axes)		
Mass [kg]			0.8		1.0

Note 1. 0.3 A is the value applicable when all I/O signals are used. The current capacity can be decreased by reducing the number of I/O points.

2. When closely mounting the servo amplifiers, operate them at the ambient temperature of 0 °C to 45 °C or at 75% or smaller effective load ratio.
3. Test pulse is a signal which instantaneously turns off a signal to the servo amplifier at a constant period for external circuit to self-diagnose.
4. MR-J4-_B servo amplifier is compatible only with two-wire type. MR-J4-_B-RJ servo amplifier is compatible with two-wire type, four-wire type, and A/B/Z-phase differential output method. Refer to table 1.1 for details.
5. For the compatible version of fully closed loop system, refer to table 1.1. Check the software version of the servo amplifier with MR Configurator2.

6 The communication cycle depends on the controller specifications and the number of axes connected.

7. For the compatible version for the scale measurement function, refer to table 1.1. Check the software version of the servo amplifier with MR Configurator2.
8. The safety level depends on the setting value of [Pr. PF18 STO diagnosis error detection time] and whether STO input diagnosis by TOFB output is performed or not. For details, refer to the Function column of [Pr. PF18] in section 5.2.6.
9. Follow the restrictions in section 2.7 when using this product at altitude exceeding 1000 m and up to 2000 m above sea level.

1.4 Combinations of servo amplifiers and servo motors

POINT

- When a 1-phase 200 V AC input is used, the maximum torque of 400% cannot be achieved with HG-JR series servo motor.
- When you use the MR-J4-100B(-RJ) or MR-J4-200B(-RJ) with the 1-phase 200 V AC input, contact your local sales office for the torque characteristics of the HG-UR series, HG-RR series, and HG-JR series servo motors.

(1) 200 V class

Servo amplifier	Rotary servo motor						Linear servo motor (primary side)	Direct drive motor
	HG-KR	HG-MR	HG-SR	HG-UR	HG-RR	HG-JR		
MR-J4-10B(-RJ)	053 13	053 13						
MR-J4-20B(-RJ)	23	23					LM-U2PAB-05M-0SS0 LM-U2PBB-07M-1SS0	TM-RFM002C20 TM-RG2M002C30 (Note 1) TM-RU2M002C30 (Note 1) TM-RG2M004E30 (Note 1) TM-RU2M004E30 (Note 1)
MR-J4-40B(-RJ)	43	43					LM-H3P2A-07P-BSS0 LM-H3P3A-12P-CSS0 LM-K2P1A-01M-2SS1 LM-U2PAD-10M-0SS0 LM-U2PAF-15M-0SS0	TM-RFM004C20 TM-RG2M004E30 (Note 1, 3) TM-RU2M004E30 (Note 1, 3) TM-RG2M009G30 (Note 1) TM-RU2M009G30 (Note 1)
MR-J4-60B(-RJ)			51 52			53	LM-U2PBD-15M-1SS0	TM-RFM006C20 TM-RFM006E20
MR-J4-70B(-RJ)	73	73		72		73	LM-H3P3B-24P-CSS0 LM-H3P3C-36P-CSS0 LM-H3P7A-24P-ASS0 LM-K2P2A-02M-1SS1 LM-U2PBF-22M-1SS0	TM-RFM012E20 TM-RFM012G20 TM-RFM040J10
MR-J4-100B(-RJ)			81 102			53 (Note 2) 103		TM-RFM018E20
MR-J4-200B(-RJ)			121 201 152 202	152	103 153	73 (Note 2) 103 (Note 2) 153 203	LM-H3P3D-48P-CSS0 LM-H3P7B-48P-ASS0 LM-H3P7C-72P-ASS0 LM-FP2B-06M-1SS0 LM-K2P1C-03M-2SS1 LM-U2P2B-40M-2SS0	
MR-J4-350B(-RJ)			301 352	202	203	153 (Note 2) 203 (Note 2) 353	LM-H3P7D-96P-ASS0 LM-K2P2C-07M-1SS1 LM-K2P3C-14M-1SS1 LM-U2P2C-60M-2SS0	TM-RFM048G20 TM-RFM072G20 TM-RFM120J10
MR-J4-500B(-RJ)			421 502	352 502	353 503	353 (Note 2) 503	LM-FP2D-12M-1SS0 LM-FP4B-12M-1SS0 LM-K2P2E-12M-1SS1 LM-K2P3E-24M-1SS1 LM-U2P2D-80M-2SS0	TM-RFM240J10
MR-J4-700B(-RJ)			702			503 (Note 2) 601 701M 703	LM-FP2F-18M-1SS0 LM-FP4D-24M-1SS0	
MR-J4-11KB(-RJ)						801 12K1 11K1M 903	LM-FP4F-36M-1SS0	
MR-J4-15KB(-RJ)						15K1 15K1M	LM-FP4F-48M-1SS0	
MR-J4-22KB(-RJ)						20K1 25K1 22K1M		

Note 1. This is available with servo amplifiers with software version C8 or later.
2. This combination increases the maximum torque of the servo motor to 400%.
3. This combination increases the rated torque and the maximum torque.

(2) 400 V class

Servo amplifier	Rotary servo motor		Linear servo motor (primary side)
	HG-SR	HG-JR	
MR-J4-60B4(-RJ)	524	534	
MR-J4-100B4(-RJ)	1024	534 (Note) 734 1034	
MR-J4-200B4(-RJ)	1524 2024	734 (Note) 1034 (Note) 1534 2034	
MR-J4-350B4(-RJ)	3524	1534 (Note) 2034 (Note) 3534	
MR-J4-500B4(-RJ)	5024	3534 (Note) 5034	
MR-J4-700B4(-RJ)	7024	5034 (Note) 6014 701M4 7034	
MR-J4-11KB4(-RJ)		8014 12K14 11K1M4 9034	
MR-J4-15KB4(-RJ)		15K14 15K1M4	
MR-J4-22KB4(-RJ)		20K14 25K14 22K1M4	LM-FP5H-60M-1SS0

Note. This combination is for increasing the maximum torque of the servo motor to 400%.

(3) 100 V class

Servo amplifier	Rotary servo motor		Linear servo motor (primary side)	Direct drive motor
	HG-KR	HG-MR		
MR-J4-10B1(-RJ)	053 13	053 13		
MR-J4-20B1(-RJ)	23	23	LM-U2PAB-05M-0SS0 LM-U2PBB-07M-1SS0	TM-RFM002C20 TM-RG2M002C30 (Note 1) TM-RU2M002C30 (Note 1) TM-RG2M004E30 (Note 1) TM-RU2M004E30 (Note 1)
MR-J4-40B1(-RJ)	43	43	LM-H3P2A-07P-BSS0 LM-H3P3A-12P-CSS0 LM-K2P1A-01M-2SS1 LM-U2PAD-10M-0SS0 LM-U2PAF-15M-0SS0	TM-RFM004C20 TM-RG2M004E30 (Note 1, 2) TM-RU2M004E30 (Note 1, 2) TM-RG2M009G30 (Note 1) TM-RU2M009G30 (Note 1)

Note 1. This is available with servo amplifiers with software version C8 or later.
2. This combination increases the rated torque and the maximum torque.

1.5 Function list

The following table lists the functions of this servo. For details of the functions, refer to each section of the detailed description field.

Function	Description	Detailed explanation
Model adaptive control	This realizes a high response and stable control following the ideal model. The two-degrees-of-freedom-model model adaptive control enables you to set a response to the command and response to the disturbance separately. Additionally, this function can be disabled. Refer to section 7.5 for disabling this function. This is used with servo amplifiers with software version B4 or later. Check the software version of the servo amplifier with MR Configurator2.	
Position control mode	This servo amplifier is used as a position control servo.	
Speed control mode	This servo amplifier is used as a speed control servo.	
Torque control mode	This servo amplifier is used as a torque control servo.	
High-resolution encoder	High-resolution encoder of 4194304 pulses/rev is used as the encoder of the rotary servo motor compatible with the MELSERVO-J4 series.	
Absolute position detection system	Merely setting a home position once makes home position return unnecessary at every power-on.	Chapter 12
Gain switching function	You can switch gains during rotation and during stop, and can use an input device to switch gains during operation.	Section 7.2
Advanced vibration suppression control II	This function suppresses vibration at the arm end or residual vibration.	Section 7.1.5
Machine resonance suppression filter	This is a filter function (notch filter) which decreases the gain of the specific frequency to suppress the resonance of the mechanical system.	Section 7.1.1
Shaft resonance suppression filter	When a load is mounted to the servo motor shaft, resonance by shaft torsion during driving may generate a mechanical vibration at high frequency. The shaft resonance suppression filter suppresses the vibration.	Section 7.1.3
Adaptive filter II	Servo amplifier detects mechanical resonance and sets filter characteristics automatically to suppress mechanical vibration.	Section 7.1.2
Low-pass filter	Suppresses high-frequency resonance which occurs as servo system response is increased.	Section 7.1.4
Machine analyzer function	Analyzes the frequency characteristic of the mechanical system by simply connecting a MR Configurator2 installed personal computer and servo amplifier. MR Configurator2 is necessary for this function.	
Robust filter	This function provides better disturbance response in case low response level that load to motor inertia ratio is high for such as roll send axes.	[Pr. PE41]
Slight vibration suppression control	Suppresses vibration of ±1 pulse produced at a servo motor stop.	[Pr. PB24]
Auto tuning	Automatically adjusts the gain to optimum value if load applied to the servo motor shaft varies.	Section 6.3
Brake unit	Used when the regenerative option cannot provide enough regenerative power. Can be used for the 5 kW or more servo amplifier.	Section 11.3
Power regeneration converter	Used when the regenerative option cannot provide enough regenerative power. Can be used for the 5 kW or more servo amplifier.	Section 11.4
Regenerative option	Used when the built-in regenerative resistor of the servo amplifier does not have sufficient regenerative capability for the regenerative power generated.	Section 11.2
Alarm history clear	Alarm history is cleared.	[Pr. PC21]
Output signal selection (device settings)	The output devices including ALM (Malfunction) and DB (Dynamic brake interlock) can be assigned to certain pins of the CN3 connector.	[Pr. PD07] to [Pr. PD09]
Output signal (DO) forced output	Output signal can be forced on/off independently of the servo status. Use this function for checking output signal wiring, etc.	Section 4.5.1 (1) (d)
Test operation mode	Jog operation, positioning operation, motor-less operation, DO forced output, and program operation can be used. MR Configurator2 is necessary for this function.	Section 4.5
Analog monitor output	Servo status is output in terms of voltage in real time.	[Pr. PC09], [Pr. PC10]
MR Configurator2	Using a personal computer, you can perform the parameter setting, test operation, monitoring, and others.	Section 11.7
Linear servo system	Linear servo system can be configured using a linear servo motor and linear encoder.	Chapter 14
Direct drive servo system	Direct drive servo system can be configured to drive a direct drive motor.	Chapter 15

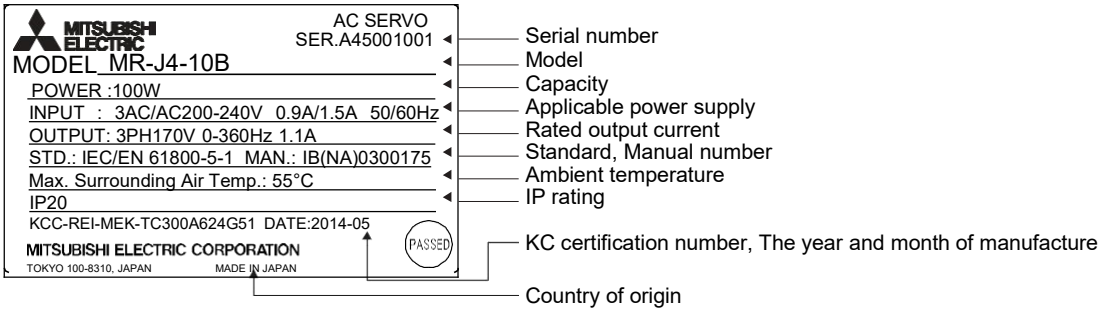
Function	Description	Detailed explanation
Fully closed loop system	Fully closed loop system can be configured using the load-side encoder. This is used with servo amplifiers with software version A3 or later. Check the software version of the servo amplifier with MR Configurator2.	Chapter 16
One-touch tuning	Gain adjustment is performed just by one click on a certain button on MR Configurator2. MR Configurator2 is necessary for this function.	Section 6.2
SEMI-F47 function (Note)	Enables to avoid triggering [AL. 10 Undervoltage] using the electrical energy charged in the capacitor in case that an instantaneous power failure occurs during operation. Use a 3-phase for the input power supply of the servo amplifier. Using a 1-phase 100 V AC/200 V AC for the input power supply will not comply with SEMI-F47 standard.	[Pr. PA20] [Pr. PF25] Section 7.4
Tough drive function	This function makes the equipment continue operating even under the condition that an alarm occurs. The tough drive function includes two types: the vibration tough drive and the instantaneous power failure tough drive.	Section 7.3
Drive recorder function	This function continuously monitors the servo status and records the status transition before and after an alarm for a fixed period of time. You can check the recorded data on the drive recorder window on MR Configurator2 by clicking the "Graph" button. However, the drive recorder will not operate on the following conditions. 1. You are using the graph function of MR Configurator2. 2. You are using the machine analyzer function. 3. [Pr. PF21] is set to "-1". 4. The controller is not connected (except the test operation mode). 5. An alarm related to the controller is occurring.	[Pr. PA23]
STO function	This function is a functional safety that complies with IEC/EN 61800-5-2. You can create a safety system for the equipment easily.	
Servo amplifier life diagnosis function	You can check the cumulative energization time and the number of on/off times of the inrush relay. This function gives an indication of the replacement time for parts of the servo amplifier including a capacitor and a relay before they malfunction. MR Configurator2 is necessary for this function.	
Power monitoring function	This function calculates the power running energy and the regenerative power from the data in the servo amplifier such as speed and current. For the SSCNET III/H system, MR Configurator2 can display the data, including the power consumption. Since the servo amplifier can send the data to a servo system controller, you can analyze the data and display the data on a display.	
Machine diagnosis function	From the data in the servo amplifier, this function estimates the friction and vibrational component of the drive system in the equipment and recognizes an error in the machine parts, including a ball screw and bearing. MR Configurator2 is necessary for this function.	
Master-slave operation function	The function transmits a master axis torque to slave axes using driver communication and the torque as a command drives slave axes by torque control. This is used with servo amplifiers with software version A8 or later. Check the software version of the servo amplifier with MR Configurator2.	Section 17.2
Scale measurement function	The function transmits position information of a scale measurement encoder to the controller by connecting the scale measurement encoder in semi closed loop control. This is used with servo amplifiers with software version A8 or later. Check the software version of the servo amplifier with MR Configurator2.	Section 17.3
J3 compatibility mode	This amplifier has "J3 compatibility mode" which compatible with the previous MR-J3-B series. Refer to section 17.1 for software versions.	Section 17.1
Continuous operation to torque control mode	This enables to smoothly switch the mode from position control mode/speed control mode to torque control mode without stopping. This also enables to decrease load to the machine and high quality molding without rapid changes in speed or torque. For details of the continuous operation to torque control mode, refer to the manuals for servo system controllers.	[Pr. PB03] Refer to the servo system controller manual used.
Lost motion compensation function	This function improves the response delay occurred when the machine moving direction is reversed. This is used with servo amplifiers with software version B4 or later. Check the software version of the servo amplifier with MR Configurator2.	Section 7.6
Super trace control	This function sets constant and uniform acceleration/deceleration droop pulses to almost 0. This is used with servo amplifiers with software version B4 or later. Check the software version of the servo amplifier with MR Configurator2.	Section 7.7

Note. For servo system controllers which are available with this, contact your local sales office.

1.6 Model designation

(1) Rating plate

The following shows an example of rating plate for explanation of each item.



(2) Model

The following describes what each block of a model name indicates. Not all combinations of the symbols are available.

MR - J 4 - 6 0 B 4 - R J

Series

Rated output

Symbol	Rated output [kW]
10	0.1
20	0.2
40	0.4
60	0.6
70	0.75
100	1
200	2
350	3.5
500	5
700	7
11K	11
15K	15
22K	22

SSCNETIII/H interface

Special specifications

Symbol	Special specifications
None	Standard
-RJ	Fully closed loop control four-wire type/load-side encoder A/B/Z-phase input compatible/Compatible with MR-D30 functional safety unit
-ED	MR-J4-_B_ without a dynamic brake (Note 2)
-RU	MR-J4-_B_-RJ without a dynamic brake (Note 2)
-PX	MR-J4-_B_ without regenerative resistor (Note 1)
-RZ	MR-J4-_B_-RJ without regenerative resistor (Note 1)
-EB	MR-J4-_B_ with a special coating specification (3C2) (Note 3)
-KS	MR-J4-_B_-RJ with a special coating specification (3C2) (Note 3)

Power supply

Symbol	Power supply
None	3-phase or 1-phase 200 V AC to 240 V AC
1	1-phase 100 V AC to 120 V AC
4	3-phase 380 V AC to 480 V AC

Note 1. Indicates a servo amplifier of 11 kW to 22 kW that does not use a regenerative resistor as standard accessory. Refer to app. 11.2 for details.

2. Dynamic brake which is built in 7 kW or smaller servo amplifiers is removed. Refer to app. 11.1 for details.

3. Type with a specially-coated servo amplifier board (IEC 60721-3-3 Class 3C2). Refer to app. 11.3 for details.