

Changes for the Better

LINEAR SERVO AMPLIFIERS & MOTORS
FOR MELSERVO-J3 SERIES

Always Ahead of the Scene, Seize the Future

LINEAR SERVO

LM Series



For leading drive

The direct drive offers high rigidity and flexible machine configurations.

Easy maintenance & Improved cleanliness

Mitsubishi's linear servo motor "LM series" brings new possibilities to your systems.

Linear servo motor for advanced control and usability

For higher machine performance

- ⊙ Speeds up to 2m/s improve productivity
- ⊙ High-accuracy positioning by fully closed loop control system

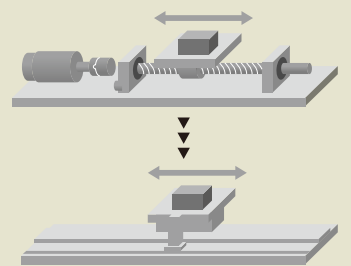
For easier use

- ⊙ No transmission mechanism - smooth and quiet operations
- ⊙ No grease splashing - suitable for clean systems

For flexible machine configurations

- ⊙ Simple and compact machine by using direct drive system
- ⊙ No thrust transmission mechanism increases machine rigidity
- ⊙ Multi-head and tandem systems can be easily configured
- ⊙ Suitable for long-stroke applications

Offers more advantage than conventional ball screw driving systems



LINEAR SERVO MOTOR

control



The perfect solution, Mitsubishi's linear servo motor

Sophisticated performance

Four series for a variety of applications

High performance and accuracy control systems

Useful engineering tools

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by MITSUBISHI

Linear servo motor for semiconductors, LCDs and material handlings.

Sophisticated performance

◎ High speed and high thrust

Max. speed: 2m/s
 Max. thrust range: 150N to 18000N
 Small size and high thrust are realized by increasing the winding density and by optimizing core and magnet geometries using electromagnetic field analysis.

◎ Create high performance systems

High performance systems such as high accuracy tandem synchronous control are achieved by using a motion controller and the SSCNET III compatible linear servo amplifier.

◎ A variety of product lines

LM-K2 series, core type with magnetic attraction counter-force, is newly introduced in addition to the conventional core, coreless and liquid-cooling core types.

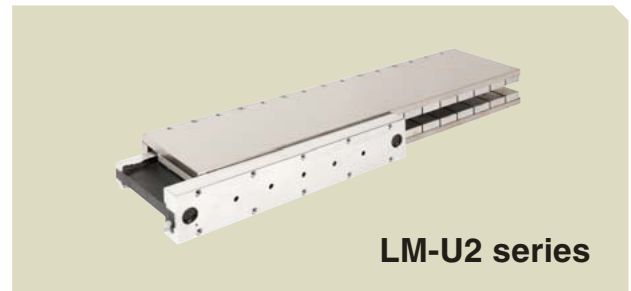
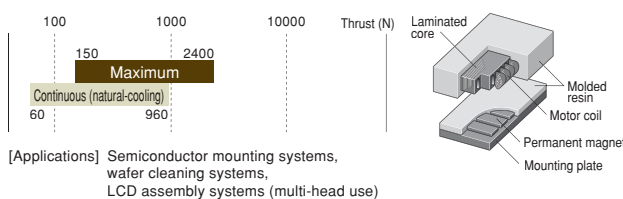
◎ Compatible with a variety of linear encoders

The linear servo motors are compatible with a variety of serial interface linear encoders, which have a minimum resolution of 0.005 μ m. A/B/Z-phase differential output type linear encoders are also offered.

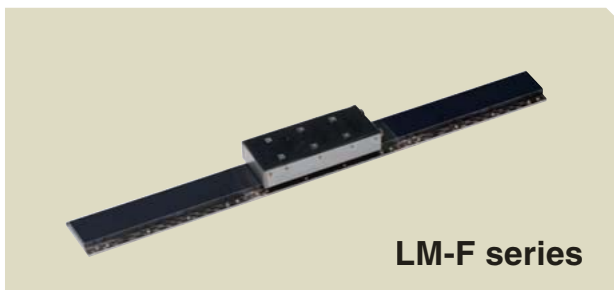
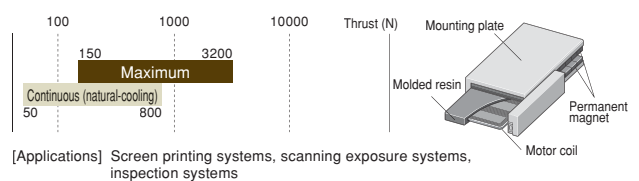
Four series for a variety of applications



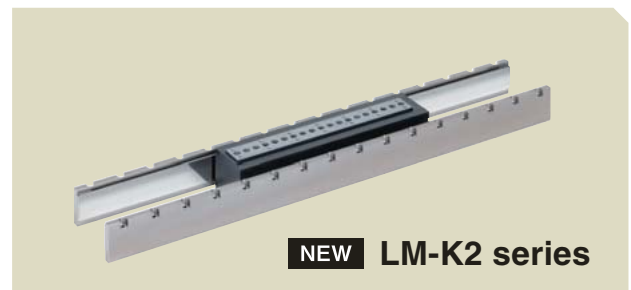
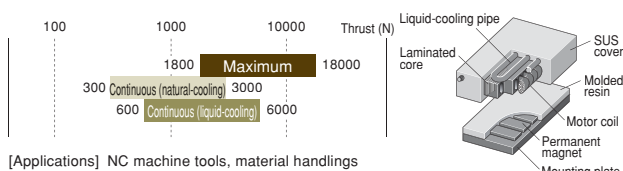
Core type suitable for space-saving
 The magnetic attraction force contributes to high rigidity.



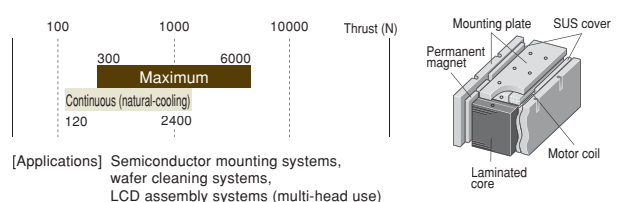
Coreless type without cogging resulting in small speed fluctuation
 The structure with no magnetic attraction force extends life of the linear guides.



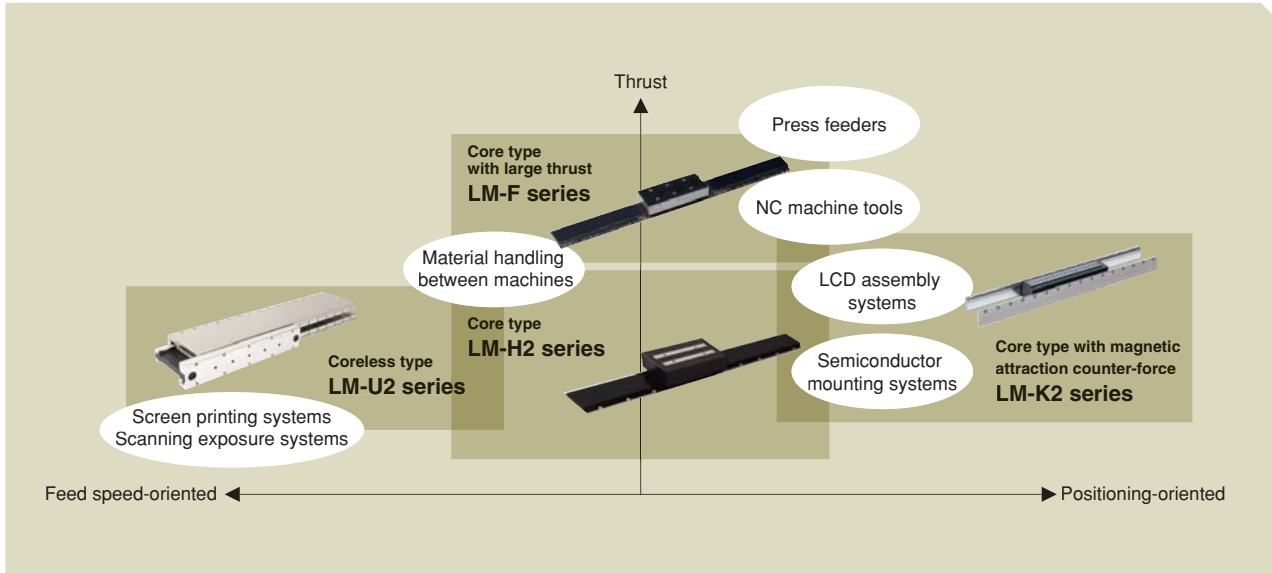
Core type compact linear servo motor
 The integrated liquid-cooling system doubles the continuous thrust. The magnetic attraction force contributes to high rigidity.



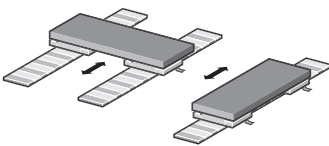
Core type with magnetic attraction counter-force
 The magnetic attraction counter-force structure extends life of the linear guides and contributes to lowering audible noise.



Application chart

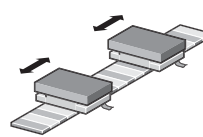


Linear servo motor application examples



Tandem configuration

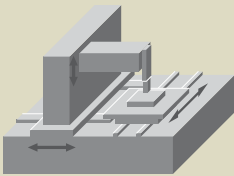
The linear servo motors can be configured in tandem especially for large systems that require highly accurate synchronous operation between two axes.



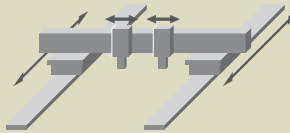
Multi-head configuration

Multi-head systems enable control of two motor coils independently, thereby simplifying machine mechanisms. This system is suitable for machines that require short tact time.

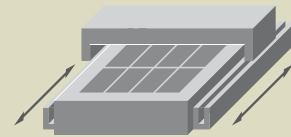
- Machine tools
- XYZ stage



- Semiconductor/LCD manufacturing systems
- Electrical parts assembling/manufacturing systems



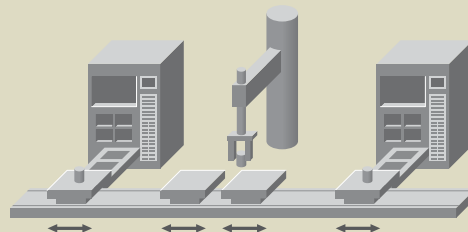
- Screen printing systems
- Large LCD coaters



- Material handling systems



- Multi-head material handling between machines



Mitsubishi supports total systems from controllers to servo

High performance and accuracy control system

By configuring Mitsubishi motion controller and SSCNET III servo amplifier, high accuracy synchronous operation and multiple operations are realized. The fully closed control system offers high accuracy control.

Industry leading control performance

SSCNET III compatible servo amplifier

【MR-J3-B-RJ004】

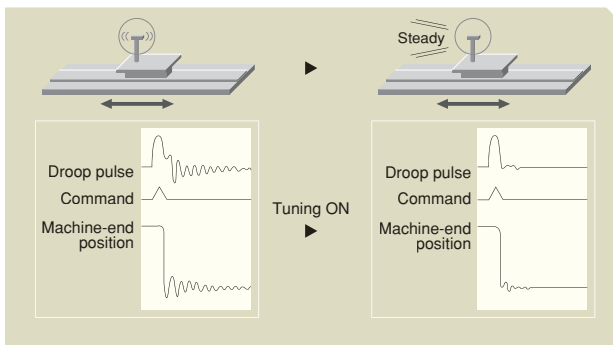
- ⊙ Gains are adjusted easily using “real time auto-tuning”.
- ⊙ Resonances and vibrations are suppressed using “advanced vibration suppression control” and “adaptive filter II”.
- ⊙ “Robust disturbance compensation” function suppresses uneven speeds caused by disturbance.



Automatically suppresses low frequency vibration

Advanced vibration suppression control

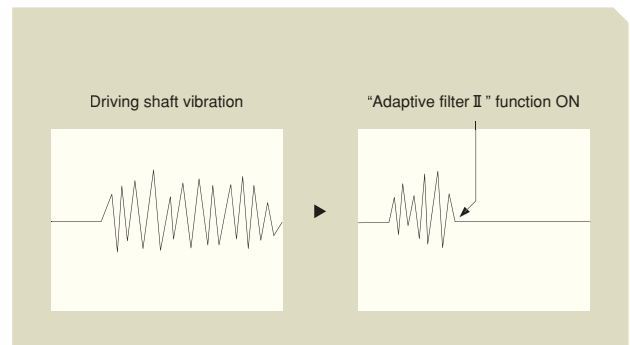
- ⊙ This function suppresses 100Hz or lower frequency vibration that occurs when a driving part stops.



Automatically suppresses resonance

Adaptive filter II

- ⊙ Resonance on the driving mechanism, such as a ball screw, can be suppressed automatically using this filter.



Drives 2 axes by one unit

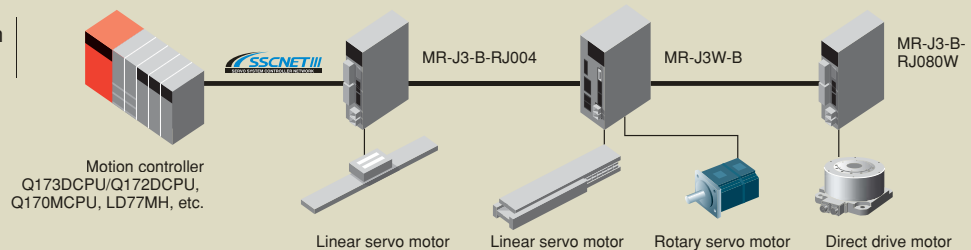
2-axis servo amplifier

【MR-J3W series】

- ⊙ Same level of functionality and performance as MR-J3.
- ⊙ Reduced wiring and space-savings in a cabinet.
- ⊙ Combinable with a rotary servo motor as well.



System configuration examples



Servo system network enabling high speed and accuracy by optical fiber

Achieves full duplex baud rate up to 50Mbps and high-speed serial communication with cycle times as fast as 0.44ms

Improves noise immunity by using optical fiber cables

Enables synchronous control with rotary and linear servo motors

Enables long distance wiring up to 800m per system



Useful engineering tools

Servo setup software

【MR Configurator2】

MR Configurator2 supports servo systems from setup to maintenance. With this software, monitor display, diagnostics, reading/writing parameters and test operations are performed easily. Setup of the servo amplifier can be completed just by following guidance displays of the servo assistant function.

A variety of monitor functions

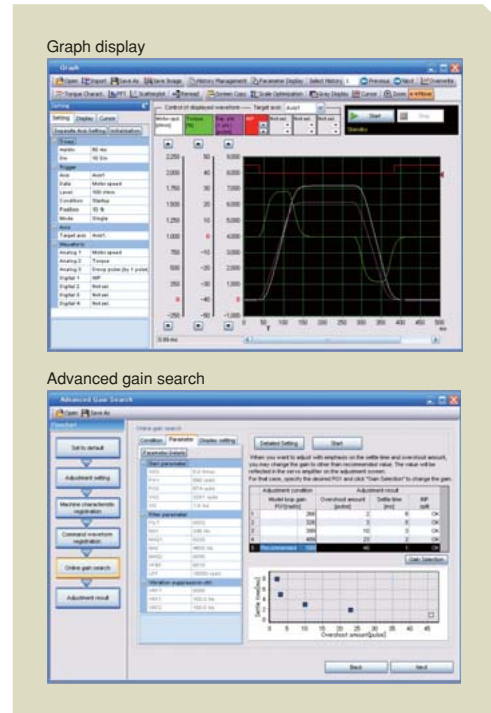
Graph display function is equipped to display servo motor status such as command pulses, droop pulses and speeds by a trigger of input signals.

Machine analyzer operation function

This function automatically inputs random torque to the servo motor and analyzes frequency characteristics. Machine resonance suppression filter can be set easily based on the result.

Advanced gain search function

While changing gains automatically, this function sets an optimal gain that achieves shortest settling time with low overshoot and vibration.



Find out optimal system configurations

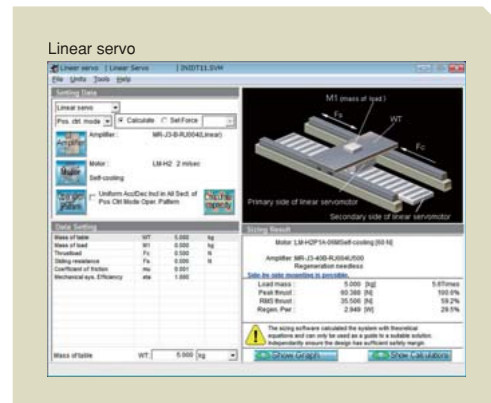
【Capacity selection software】

Optimal servo amplifier, linear servo motor and optional regeneration unit can be selected just by entering constants and operation pattern.

Features

- (1) Feedrate and thrust can be displayed in graph format during the selection process.
- (2) Calculation process can be displayed.

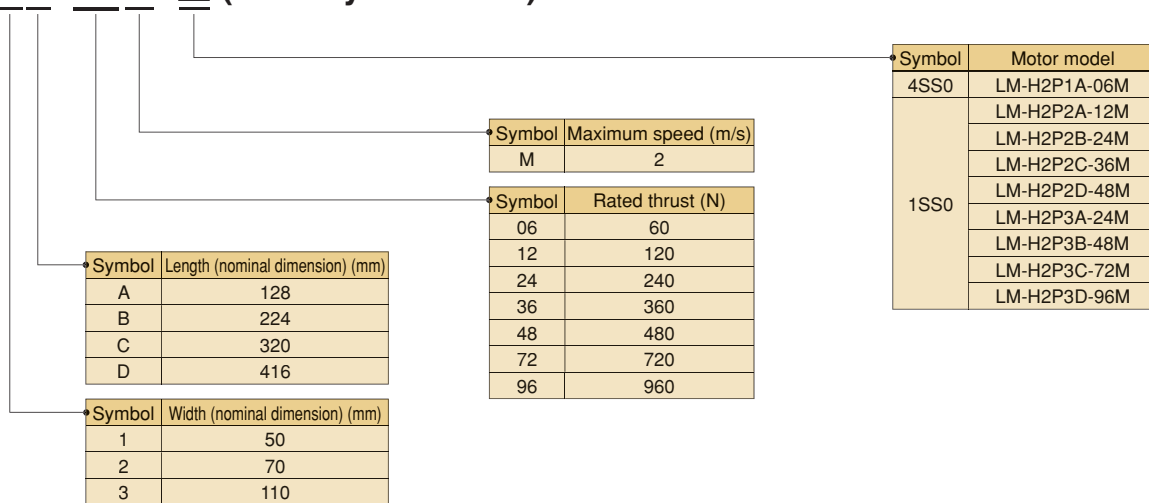
* Capacity selection software (MRZJW3-MOTSZ111E) is available for free download. Contact your local sales office for more details.



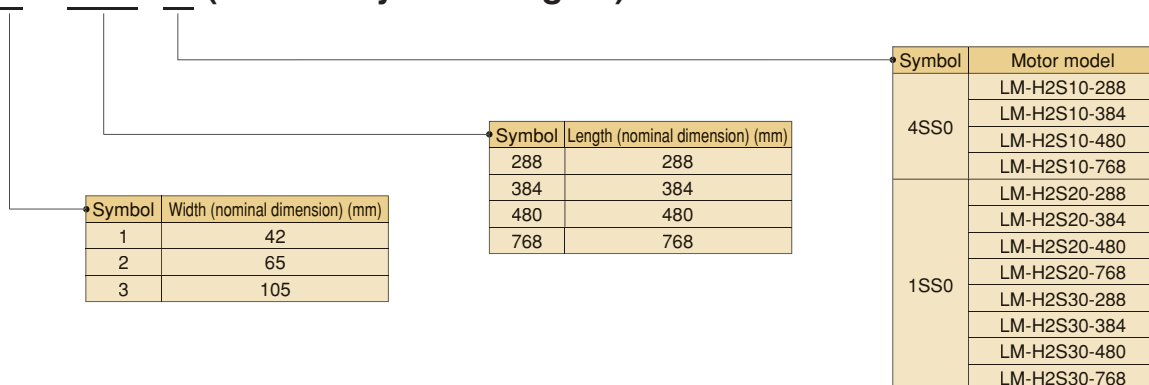
Model designation for linear servo motor

● LM-H2 Series

LM-H2P2B-24M-□ (Primary side: Coil)



LM-H2S20-288-□ (Secondary side: Magnet)





●LM-F Series

LM-FP2B-06M-1SS0 (Primary side: Coil)

Symbol	Length (nominal dimension) (mm)
B	290
D	530
F	770
H	1010

Symbol	Width (nominal dimension) (mm)
2	120
4	200
5	240

Symbol	Maximum speed (m/s)
M	2

Symbol	Rated thrust (N)	
	Natural-cooling	Liquid-cooling
06	300	600
12	600	1200
18	900	1800
24	1200	2400
36	1800	3600
48	2400	4800
60	3000	6000

LM-FS20-480-1SS0 (Secondary side: Magnet)

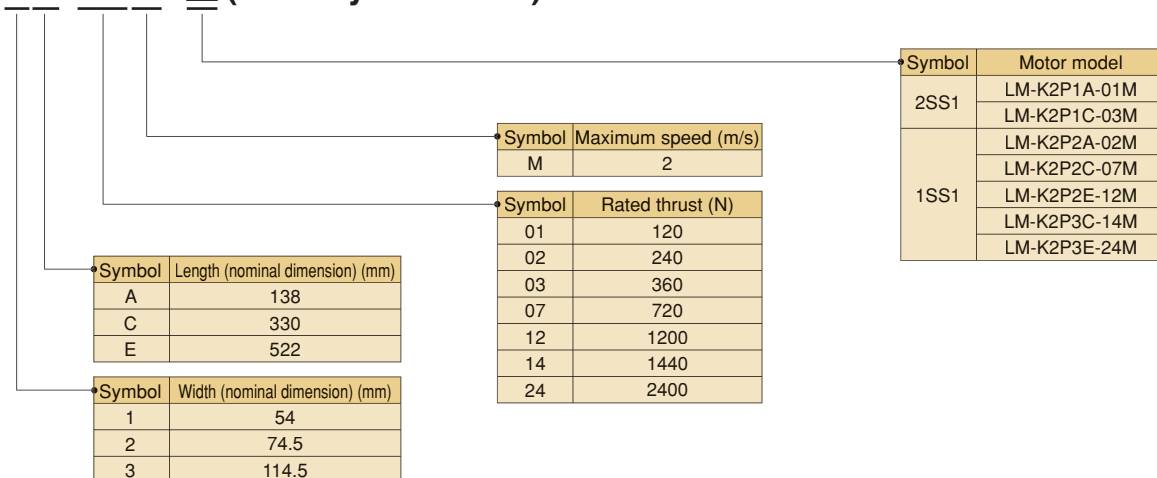
Symbol	Width (nominal dimension) (mm)
2	120
4	200
5	240

Symbol	Length (nominal dimension) (mm)
480	480
576	576

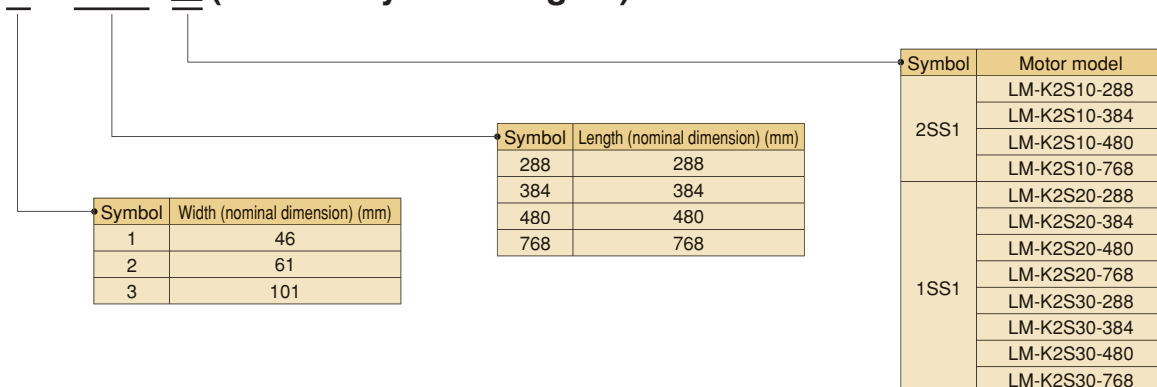
Model designation for linear servo motor

● LM-K2 Series

LM-K2P1A-01M-□ (Primary side: Coil)



LM-K2S10-288-□ (Secondary side: Magnet)





●LM-U2 (medium thrust) Series

LM-U2PAB-05M-□ (Primary side: Coil)

Symbol	Length (nominal dimension) (mm)
B	130
D	250
F	370

Symbol	Width (nominal dimension) (mm)
A	66.5
B	86.5

Symbol	Maximum speed (m/s)
M	2

Symbol	Rated thrust (N)
05	50
07	75
10	100
15	150
22	225

Symbol	Motor model
0SS0	LM-U2PAB-05M
	LM-U2PAD-10M
	LM-U2PAF-15M
1SS0	LM-U2PBB-07M
	LM-U2PBD-15M
	LM-U2PBF-22M

LM-U2SA0-240-□ (Secondary side: Magnet)

Symbol	Width (nominal dimension) (mm)
A	62
B	82

Symbol	Length (nominal dimension) (mm)
240	240
300	300
420	420

Symbol	Motor model
0SS0	LM-U2SA0-240
	LM-U2SA0-300
	LM-U2SA0-420
1SS0	LM-U2SB0-240
	LM-U2SB0-300
	LM-U2SB0-420

●LM-U2 (large thrust) Series

LM-U2P2B-40M-□ (Primary side: Coil)

Symbol	Length (nominal dimension) (mm)
B	286
C	406
D	526

Symbol	Maximum speed (m/s)
M	2

Symbol	Rated thrust (N)
40	400
60	600
80	800

Symbol	Motor model
2SS0	LM-U2P2B-40M
	LM-U2P2C-60M
	LM-U2P2D-80M

LM-U2S20-480-□ (Secondary side: Magnet)

Symbol	Length (nominal dimension) (mm)
300	300
480	480

Symbol	Motor model
2SS0	LM-U2S20-300
	LM-U2S20-480

Model designation for servo amplifier

MR-J3-□□□-RJ004(U□)

Mitsubishi
general-purpose
AC servo amplifier
MELSERVO-J3
Series

Compatible with linear servo motor

Symbol	Power supply
None	3-phase 200VAC
4	3-phase 400VAC

B(N): SSCNET III compatible

Symbol
20
40
60
70
200
350
500
700
11K
15K
22K (Note 1)

Symbol	Compatible linear servo motor
None	LM-H2 series (Note 1) LM-K2 series LM-U2 series (Note 1)
U□	LM-F series * "U□" is necessary.

Notes: 1. MR-J3-□□B-RJ004U□ is also available for LM-H2 and LM-U2 series. Refer to "Combination of linear servo motor and servo amplifier" in the following page for more details.

Notes: 1. Only 22K is compatible with 3-phase 400VAC.

MR-J3W-□B

Mitsubishi
general-purpose
AC servo amplifier
MELSERVO-J3W
Series
(2-axis AC servo
amplifier)

SSCNET III compatible

Symbol
22
44
77
1010



Combinations of linear servo motor and servo amplifier

Linear servo motor		Servo amplifier	
Primary side (coil)	Secondary side (magnet)		
LM-H2 series	LM-H2P1A-06M-4SS0	LM-H2S10-288-4SS0, LM-H2S10-384-4SS0, LM-H2S10-480-4SS0, LM-H2S10-768-4SS0	MR-J3-40B-RJ004 (U500) (Note 3), MR-J3W-44B, MR-J3W-77B (Note 2), MR-J3W-1010B (Note 2)
	LM-H2P2A-12M-1SS0	LM-H2S20-288-1SS0, LM-H2S20-384-1SS0, LM-H2S20-480-1SS0, LM-H2S20-768-1SS0	MR-J3-40B-RJ004 (U501) (Note 3), MR-J3W-44B, MR-J3W-77B (Note 2), MR-J3W-1010B (Note 2)
	LM-H2P2B-24M-1SS0		MR-J3-70B-RJ004 (U502) (Note 3), MR-J3W-77B, MR-J3W-1010B
	LM-H2P2C-36M-1SS0		MR-J3-200BN-RJ004 (U503) (Note 3)
	LM-H2P2D-48M-1SS0		MR-J3-200BN-RJ004 (U504) (Note 3)
	LM-H2P3A-24M-1SS0	LM-H2S30-288-1SS0, LM-H2S30-384-1SS0, LM-H2S30-480-1SS0, LM-H2S30-768-1SS0	MR-J3-70B-RJ004 (U505) (Note 3), MR-J3W-77B, MR-J3W-1010B
	LM-H2P3B-48M-1SS0		MR-J3-200BN-RJ004 (U506) (Note 3)
	LM-H2P3C-72M-1SS0		MR-J3-350B-RJ004 (U507) (Note 3)
	LM-H2P3D-96M-1SS0		MR-J3-500B-RJ004 (U508) (Note 3)
LM-F series	LM-FP2B-06M-1SS0	LM-FS20-480-1SS0, LM-FS20-576-1SS0	MR-J3-200BN-RJ004U518 (for natural-cooling) MR-J3-200BN-RJ004U519 (for liquid-cooling)
	LM-FP2D-12M-1SS0		MR-J3-500B-RJ004U520 (for natural-cooling) MR-J3-500B-RJ004U521 (for liquid-cooling)
	LM-FP2F-18M-1SS0		MR-J3-700B-RJ004U522 (for natural-cooling) MR-J3-700B-RJ004U523 (for liquid-cooling)
	LM-FP4B-12M-1SS0	LM-FS40-480-1SS0, LM-FS40-576-1SS0	MR-J3-500B-RJ004U524 (for natural-cooling) MR-J3-500B-RJ004U525 (for liquid-cooling)
	LM-FP4D-24M-1SS0		MR-J3-700B-RJ004U526 (for natural-cooling) MR-J3-700B-RJ004U527 (for liquid-cooling)
	LM-FP4F-36M-1SS0		MR-J3-11KB-RJ004U528 (for natural-cooling) MR-J3-11KB-RJ004U529 (for liquid-cooling)
	LM-FP4H-48M-1SS0		MR-J3-15KB-RJ004U530 (for natural-cooling) MR-J3-15KB-RJ004U531 (for liquid-cooling)
	LM-FP5H-60M-1SS0		LM-FS50-480-1SS0, LM-FS50-576-1SS0
LM-K2 series	LM-K2P1A-01M-2SS1	LM-K2S10-288-2SS1, LM-K2S10-384-2SS1, LM-K2S10-480-2SS1, LM-K2S10-768-2SS1	MR-J3-40B-RJ004, MR-J3W-44B (Note 1), MR-J3W-77B (Note 1, 2), MR-J3W-1010B (Note 1, 2)
	LM-K2P1C-03M-2SS1		MR-J3-200BN-RJ004
	LM-K2P2A-02M-1SS1	LM-K2S20-288-1SS1, LM-K2S20-384-1SS1, LM-K2S20-480-1SS1, LM-K2S20-768-1SS1	MR-J3-70B-RJ004, MR-J3W-77B (Note 1), MR-J3W-1010B (Note 1)
	LM-K2P2C-07M-1SS1		MR-J3-350B-RJ004
	LM-K2P2E-12M-1SS1		MR-J3-500B-RJ004
	LM-K2P3C-14M-1SS1	LM-K2S30-288-1SS1, LM-K2S30-384-1SS1, LM-K2S30-480-1SS1, LM-K2S30-768-1SS1	MR-J3-350B-RJ004
	LM-K2P3E-24M-1SS1		MR-J3-500B-RJ004
LM-U2 series	LM-U2PAB-05M-0SS0	LM-U2SA0-240-0SS0, LM-U2SA0-300-0SS0, LM-U2SA0-420-0SS0	MR-J3-20B-RJ004 (U512) (Note 3), MR-J3W-22B, MR-J3W-44B
	LM-U2PAD-10M-0SS0		MR-J3-40B-RJ004 (U513) (Note 3), MR-J3W-44B, MR-J3W-77B (Note 2), MR-J3W-1010B (Note 2)
	LM-U2PAF-15M-0SS0		MR-J3-40B-RJ004 (U514) (Note 3), MR-J3W-44B, MR-J3W-77B (Note 2), MR-J3W-1010B (Note 2)
	LM-U2PBB-07M-1SS0	LM-U2SB0-240-1SS0, LM-U2SB0-300-1SS0, LM-U2SB0-420-1SS0	MR-J3-20B-RJ004 (U515) (Note 3), MR-J3W-22B, MR-J3W-44B
	LM-U2PBD-15M-1SS0		MR-J3-60B-RJ004 (U516) (Note 3), MR-J3W-77B, MR-J3W-1010B
	LM-U2PBF-22M-1SS0		MR-J3-70B-RJ004 (U517) (Note 3), MR-J3W-77B, MR-J3W-1010B
	LM-U2P2B-40M-2SS0		MR-J3-200BN-RJ004 (U509) (Note 3)
	LM-U2P2C-60M-2SS0	LM-U2S20-300-2SS0, LM-U2S20-480-2SS0	MR-J3-350B-RJ004 (U510) (Note 3)
	LM-U2P2D-80M-2SS0		MR-J3-500B-RJ004 (U511) (Note 3)

Notes: 1. The servo amplifier with software version B2 or above is compatible.

2. When using this servo amplifier with software version B2 or below, it is required to set parameter No. Po04 to "□□1□". For the servo amplifier with software version B3 or above, setting the parameter is not required.

3. Servo amplifier model that is compatible with LM-H2 and LM-U2 series is MR-J3-□B-RJ004. However, MR-J3-□B-RJ004U□ is also available as before.

4. This servo amplifier is rated 400VAC. 200VAC class is not available.

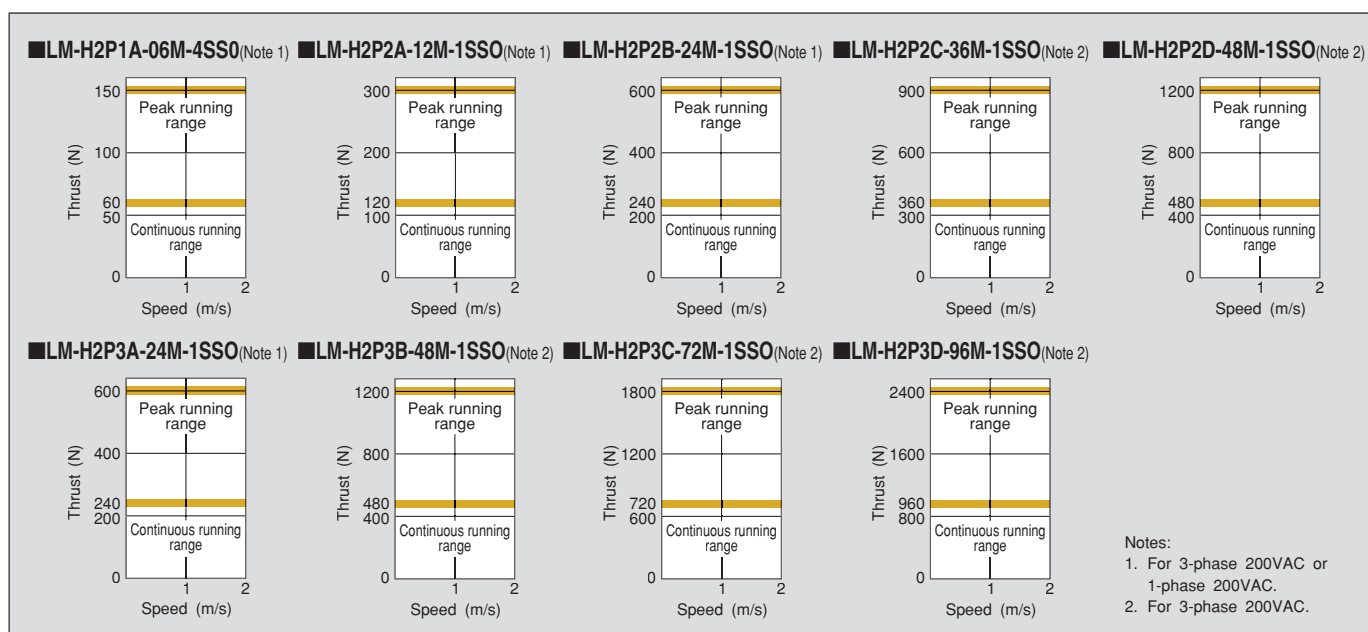
Linear servo motor specifications

●LM-H2 series

Linear servo motor model		LM-H2	P1A-06M-4SS0	P2A-12M-1SS0	P2B-24M-1SS0	P2C-36M-1SS0	P2D-48M-1SS0	P3A-24M-1SS0	P3B-48M-1SS0	P3C-72M-1SS0	P3D-96M-1SS0
Compatible servo amplifier model	MR-J3- (Note1)	40B-RJ004(U500)	40B-RJ004(U501)	70B-RJ004(U502)	200BN-RJ004(U503)	200BN-RJ004(U504)	70B-RJ004(U505)	200BN-RJ004(U506)	350B-RJ004(U507)	500B-RJ004(U508)	
	MR-J3W-	44B/77B (Note 2) / 1010B (Note 2)	44B/77B (Note 2) / 1010B (Note 2)	77B/1010B	—	—	77B/1010B	—	—	—	
Power supply capacity (kVA)		0.9	0.9	1.3	3.5	3.5	1.3	3.5	5.5	7.5	
Cooling method		Natural-cooling									
Thrust	Continuous (N)	60	120	240	360	480	240	480	720	960	
	Maximum (N)	150	300	600	900	1200	600	1200	1800	2400	
Maximum speed (Note 3) (m/s)		2.0									
Magnetic attraction force (N)		500	1000	1900	2700	3500	2000	3700	5300	7000	
Rated current (A)		2.2	2.2	4.3	6.4	8.6	4.6	9.3	14.0	17.7	
Maximum current (A)		7.1	6.4	12.7	19.0	25.2	12.8	26.3	38.0	50.3	
Mass (kg [lb])	Primary side (coil)	0.9 (2.0)	1.4 (3.1)	2.5 (5.6)	3.6 (8.0)	4.7 (11)	2.4 (5.3)	4.3 (9.5)	6.2 (14)	8.1 (18)	
	Secondary side (magnet)	288mm/piece: 0.6 (1.4)	288mm/piece: 1.1 (2.5)				288mm/piece: 3.2 (7.1)				
		384mm/piece: 0.8 (1.8)	384mm/piece: 1.4 (3.1)				384mm/piece: 4.3 (9.5)				
		480mm/piece: 1.0 (2.2)	480mm/piece: 1.8 (4.0)				480mm/piece: 5.3 (12)				
	768mm/piece: 1.6 (3.6)	768mm/piece: 2.9 (6.4)				768mm/piece: 8.5 (19)					
Secondary side model LM-H2		S10-□-4SS0	S20-□-1SS0				S30-□-1SS0				
Recommended load to motor mass ratio		Maximum of 30 times the mass of the linear servo motor's primary side									
Structure		Open (IP rating: IP00)									
Environment	Ambient temperature	0 to 40°C (32 to 104°F) (non freezing), storage: -15 to 70°C (5 to 158°F) (non freezing)									
	Ambient humidity	80% RH maximum (non condensing), storage: 90% RH maximum (non condensing)									
	Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust									
	Vibration	49m/s ² maximum									
	Elevation	1000m or less above sea level									

- Notes: 1. Servo amplifier model that is compatible with LM-H2 series is MR-J3-□-B-RJ004. However, MR-J3-□-B-RJ004U□ is also available as before.
 2. When using this servo amplifier with software version B2 or below, it is required to set parameter No. Po04 to "□□1□". For the servo amplifier with software version B3 or above, setting the parameter is not required.
 3. The linear servo motor's maximum speed or the linear encoder's rated speed, whichever is smaller, is the upper limit value of the linear servo motor's speed.

●LM-H2 series thrust characteristics



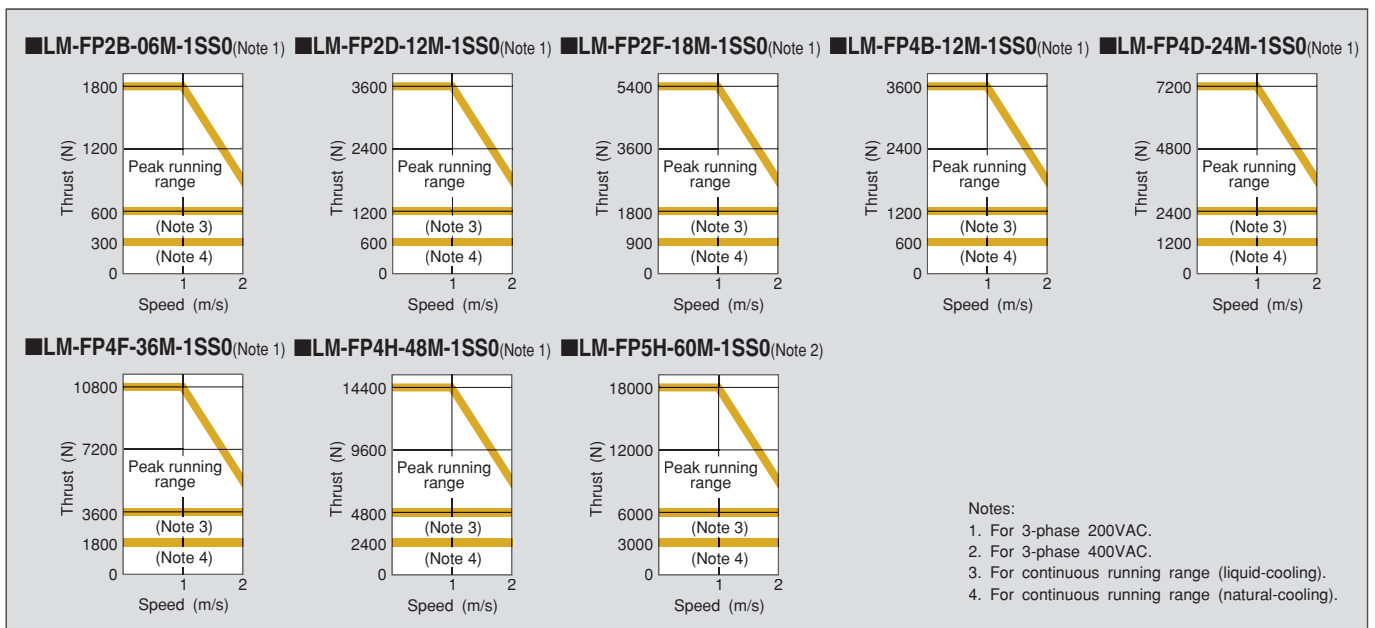


●LM-F series

Linear servo motor model		LM-F	P2B-06M-1SS0	P2D-12M-1SS0	P2F-18M-1SS0	P4B-12M-1SS0	P4D-24M-1SS0	P4F-36M-1SS0	P4H-48M-1SS0	P5H-60M-1SS0 (Note 2)
Compatible servo amplifier model MR-J3-	Natural-cooling	200BN-RJ004U518	500B-RJ004U520	700B-RJ004U522	500B-RJ004U524	700B-RJ004U526	11KB-RJ004U528	15KB-RJ004U530	22KB4-RJ004U532	
	Liquid-cooling	200BN-RJ004U519	500B-RJ004U521	700B-RJ004U523	500B-RJ004U525	700B-RJ004U527	11KB-RJ004U529	15KB-RJ004U531	22KB4-RJ004U533	
Power supply capacity (kVA)		3.5	5.5	10	7.5	18	18	18	22	
Cooling method		Natural-cooling or liquid-cooling								
Thrust	Continuous (Natural-cooling)(N)	300	600	900	600	1200	1800	2400	3000	
	Continuous (Liquid-cooling)(N)	600	1200	1800	1200	2400	3600	4800	6000	
	Maximum (N)	1800	3600	5400	3600	7200	10800	14400	18000	
Maximum speed (Note 1) (m/s)		2.0								
Magnetic attraction force (N)		4500	9000	13500	9000	18000	27000	36000	45000	
Rated current (A)	Natural-cooling	4.0	7.8	12	7.8	15	21	28	22	
	Liquid-cooling	7.8	16	23	17	31	44	59	45	
Maximum current (A)		30	58	87	57	109	159	212	157	
Mass (kg [lb])	Primary side (coil)	9.0 (20)	18 (40)	27 (60)	14 (31)	28 (62)	42 (93)	56 (125)	67 (150)	
	Secondary side (magnet)	480mm/piece: 7.0 (16) 576mm/piece: 9.0 (20)			480mm/piece: 12 (27) 576mm/piece: 15 (33)				480mm/piece: 20 (44) 576mm/piece: 24 (53)	
Secondary side model LM-F		S20-□-1SS0			S40-□-1SS0				S50-□-1SS0	
Recommended load to motor mass ratio		Maximum of 15 times the mass of the linear servo motor's primary side								
Structure		Open (IP rating: IP00)								
Environment	Ambient temperature	0 to 40°C (32 to 104°F) (non freezing), storage: -15 to 70°C (5 to 158°F) (non freezing)								
	Ambient humidity	80% RH maximum (non condensing), storage: 90% RH maximum (non condensing)								
	Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust								
	Vibration	49m/s ² maximum								
	Elevation	1000m or less above sea level								

Notes: 1. The linear servo motor's maximum speed or the linear encoder's rated speed, whichever is smaller, is the upper limit value of the linear servo motor's speed.
2. Use 400VAC rated servo amplifier.

●LM-F series thrust characteristics



Linear servo motor specifications

●LM-K2 series

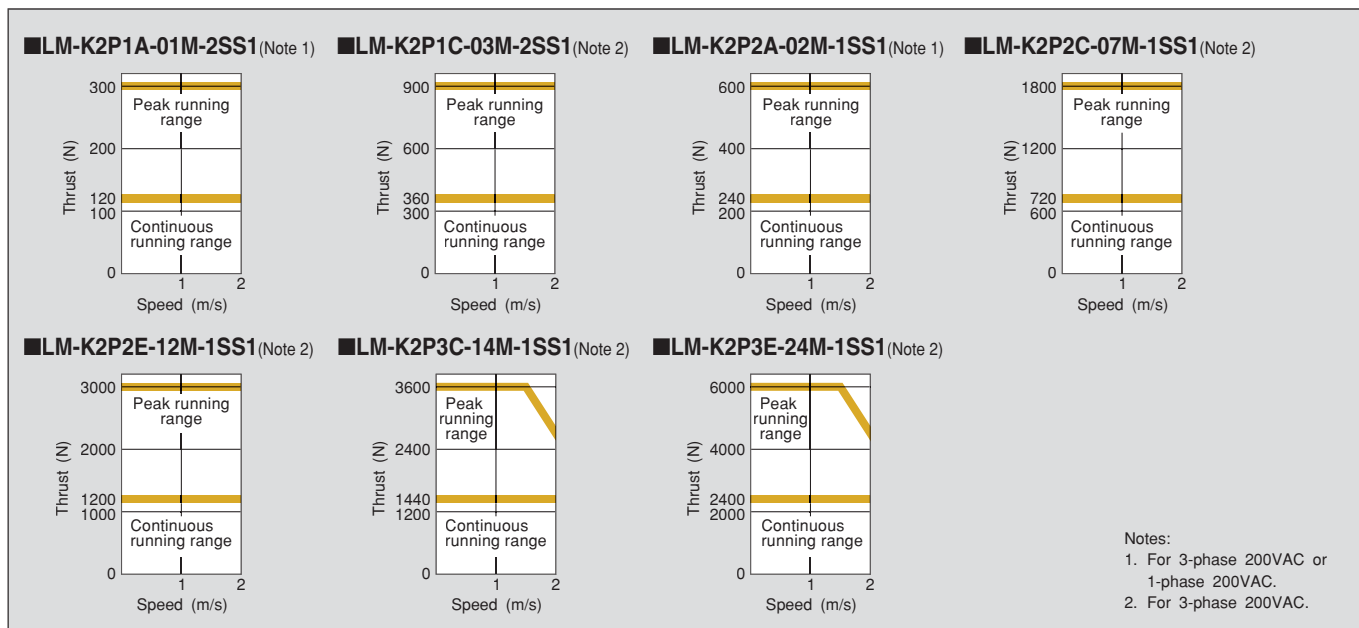
Linear servo motor model		LM-K2	P1A-01M-2SS1	P1C-03M-2SS1	P2A-02M-1SS1	P2C-07M-1SS1	P2E-12M-1SS1	P3C-14M-1SS1	P3E-24M-1SS1
Compatible servo amplifier model	MR-J3-	40B-RJ004	200BN-RJ004	70B-RJ004	350B-RJ004	500B-RJ004	350B-RJ004	500B-RJ004	
	MR-J3W-	44B (Note 1)/ 77B (Note 1, 2)/ 1010B (Note 1, 2)	—	77B (Note 1)/ 1010B (Note 1)	—	—	—	—	
Power supply capacity (kVA)		0.9	3.5	1.3	5.5	7.5	5.5	7.5	
Cooling method		Natural-cooling							
Thrust	Continuous (N)	120	360	240	720	1200	1440	2400	
	Maximum (N)	300	900	600	1800	3000	3600	6000	
Maximum speed (Note 3) (m/s)		2.0							
Magnetic attraction force (N)		0							
Rated current (A)		2.3	6.8	3.7	12	19	15	25	
Maximum current (A)		7.6	23	13	39	65	47	79	
Mass (kg [lb])	Primary side (coil)	2.5 (5.6)	6.5 (15)	4.0 (8.9)	10 (22)	16 (36)	18 (40)	27 (60)	
	Secondary side (magnet)	288mm/piece: 1.5 (3.4)	288mm/piece: 1.9 (4.2)		288mm/piece: 5.5 (13)				
		384mm/piece: 2.0 (4.4)	384mm/piece: 2.5 (5.6)		384mm/piece: 7.3 (16)				
		480mm/piece: 2.5 (5.6)	480mm/piece: 3.2 (7.1)		480mm/piece: 9.2 (21)				
		768mm/piece: 3.9 (8.6)	768mm/piece: 5.0 (11)		768mm/piece: 14.6 (33)				
Secondary side model LM-K2		S10-□-2SS1		S20-□-1SS1		S30-□-1SS1			
Recommended load to motor mass ratio		Maximum of 30 times the mass of the linear servo motor's primary side							
Structure		Open (IP rating: IP00)							
Environment	Ambient temperature	0 to 40°C (32 to 104°F) (non freezing), storage: -15 to 70°C (5 to 158°F) (non freezing)							
	Ambient humidity	80% RH maximum (non condensing), storage: 90% RH maximum (non condensing)							
	Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust							
	Vibration	49m/s ² maximum							
	Elevation	1000m or less above sea level							

Notes: 1. The servo amplifier with software version B2 or above is compatible.

2. When using this servo amplifier with software version B2 or below, it is required to set parameter No. Po04 to "□□1□". For the servo amplifier with software version B3 or above, setting the parameter is not required.

3. The linear servo motor's maximum speed or the linear encoder's rated speed, whichever is smaller, is the upper limit value of the linear servo motor's speed.

●LM-K2 series thrust characteristics



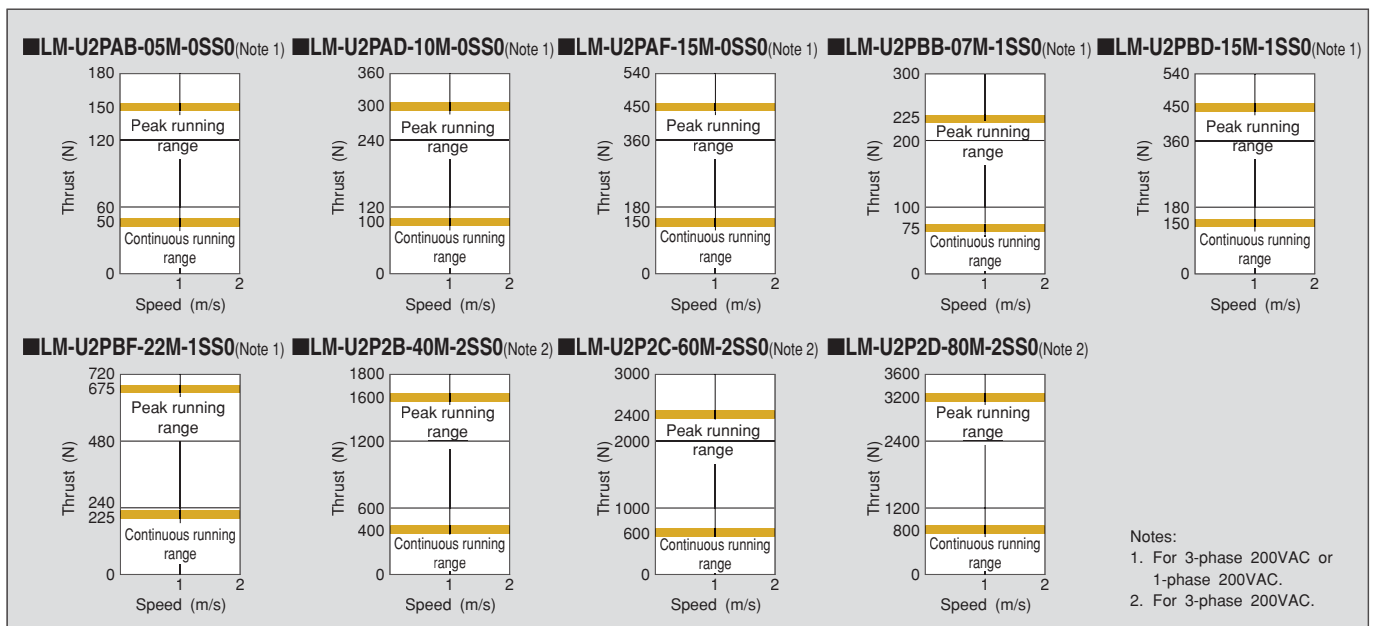


●LM-U2 series

Linear servo motor model		LM-U2	PAB-05M-0SS0	PAD-10M-0SS0	PAF-15M-0SS0	PBB-07M-1SS0	PBD-15M-1SS0	PBF-22M-1SS0	P2B-40M-2SS0	P2C-60M-2SS0	P2D-80M-2SS0
Compatible servo amplifier model	MR-J3- (Note1)		20B-RJ004(U512)	40B-RJ004(U513)	40B-RJ004(U514)	20B-RJ004(U515)	60B-RJ004(U516)	70B-RJ004(U517)	200BN-RJ004(U509)	350B-RJ004(U510)	500B-RJ004(U511)
	MR-J3W-		22B/44B	44B/77B (Note2)/ 1010B (Note2)	44B/77B (Note2)/ 1010B (Note2)		22B/44B	77B/1010B	77B/1010B	—	—
Power supply capacity (kVA)			0.5	0.9	0.9	0.5	1.0	1.3	3.5	5.5	7.5
Cooling method			Natural-cooling								
Thrust	Continuous (N)		50	100	150	75	150	225	400	600	800
	Maximum (N)		150	300	450	225	450	675	1600	2400	3200
Maximum speed (Note 3) (m/s)			2.0								
Magnetic attraction force (N)			0								
Rated current (A)			0.9	1.9	2.7	1.5	3.0	4.6	6.6	9.8	13.1
Maximum current (A)			2.7	5.5	8.3	4.5	8.9	13.7	26.7	40.3	53.7
Mass (kg [lb])	Primary side (coil)		0.3 (0.67)	0.6 (1.4)	0.8 (1.8)	0.4 (0.89)	0.8 (1.8)	1.1 (2.5)	2.9 (6.4)	4.2 (9.3)	5.5 (13)
	Secondary side (magnet)		240mm/piece: 2.0 (4.4) 300mm/piece: 2.5 (5.6) 420mm/piece: 3.5 (7.8)			240mm/piece: 2.6 (5.8) 300mm/piece: 3.2 (7.1) 420mm/piece: 4.5 (10)			300mm/piece: 9.6 (22) 480mm/piece: 15.3 (34)		
Secondary side model LM-U2			SA0-□-0SS0			SB0-□-1SS0			S20-□-2SS0		
Recommended load to motor mass ratio			Maximum of 30 times the mass of the linear servo motor's primary side								
Structure			Open (IP rating: IP00)								
Environment	Ambient temperature		0 to 40°C (32 to 104°F) (non freezing), storage: -15 to 70°C (5 to 158°F) (non freezing)								
	Ambient humidity		80% RH maximum (non condensing), storage: 90% RH maximum (non condensing)								
	Atmosphere		Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust								
	Vibration		49m/s ² maximum								
	Elevation		1000m or less above sea level								

- Notes: 1. Servo amplifier model that is compatible with LM-U2 series is MR-J3-□B-RJ004. However, MR-J3-□B-RJ004U□ is also available as before.
 2. When using this servo amplifier with software version B2 or below, it is required to set parameter No. Po04 to "□□1□". For the servo amplifier with software version B3 or above, setting the parameter is not required.
 3. The linear servo motor's maximum speed or the linear encoder's rated speed, whichever is smaller, is the upper limit value of the linear servo motor's speed.

●LM-U2 series thrust characteristics

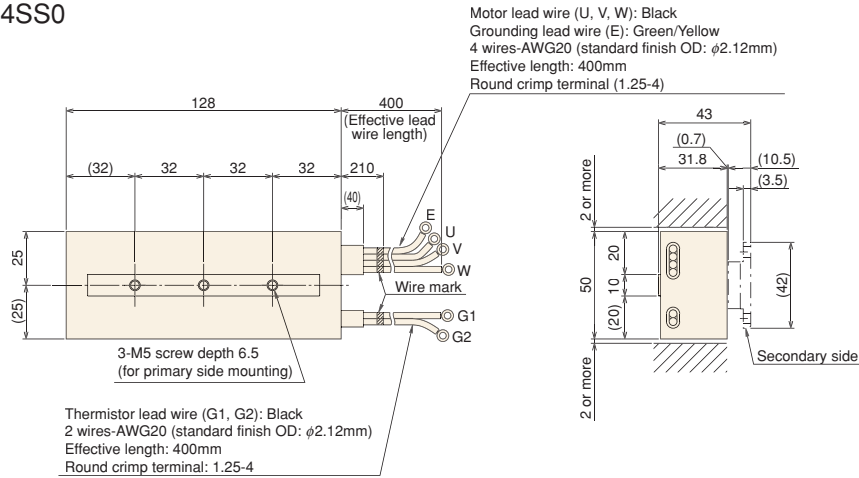


Linear servo motor dimensions

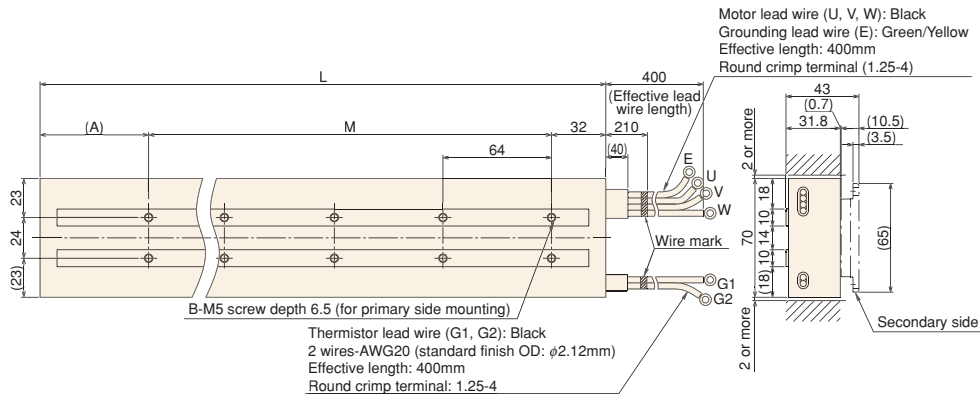
●LM-H2 series: primary side (coil) (Note 1, 2)

(Unit: mm)

●LM-H2P1A-06M-4SS0

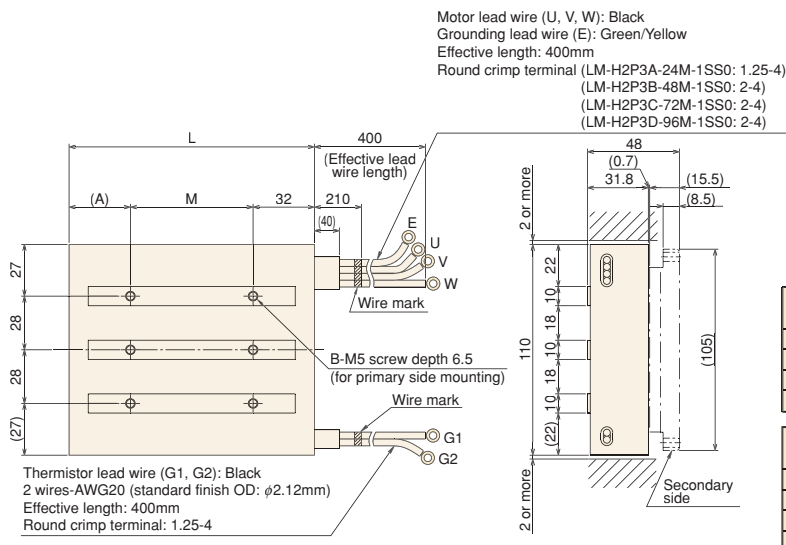


●LM-H2P2A-12M-1SS0 ●LM-H2P2B-24M-1SS0 ●LM-H2P2C-36M-1SS0 ●LM-H2P2D-48M-1SS0



Model	Variable dimensions				Motor/grounding lead wire	
	L	M	A	B	Size	Standard finish OD
LM-H2P2A-12M-1SS0	128	64	32	2X2	AWG20	ϕ 2.12
LM-H2P2B-24M-1SS0	224	2X64 (=128)	64	3X2	AWG16	ϕ 2.7
LM-H2P2C-36M-1SS0	320	4X64 (=256)	32	5X2		
LM-H2P2D-48M-1SS0	416	5X64 (=320)	64	6X2		

●LM-H2P3A-24M-1SS0 ●LM-H2P3B-48M-1SS0 ●LM-H2P3C-72M-1SS0 ●LM-H2P3D-96M-1SS0



Model	Variable dimensions			
	L	M	A	B
LM-H2P3A-24M-1SS0	128	64	32	2X3
LM-H2P3B-48M-1SS0	224	2X64 (=128)	64	3X3
LM-H2P3C-72M-1SS0	320	4X64 (=256)	32	5X3
LM-H2P3D-96M-1SS0	416	5X64 (=320)	64	6X3

Model	Motor/grounding lead wire	
	Size	Standard finish OD
LM-H2P3A-24M-1SS0	AWG20	ϕ 2.12
LM-H2P3B-48M-1SS0		
LM-H2P3C-72M-1SS0	AWG14	ϕ 3.12
LM-H2P3D-96M-1SS0		

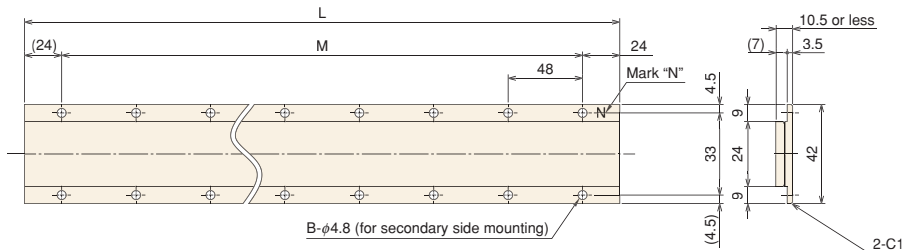
Notes: 1. The motor and thermistor lead wires do not have a long bending life. Fix the wires led from the primary side (coil) to a movable part to prevent the wires from repetitive bending.
 2. Minimum cable bending radius equals to six times the standard finish outer diameter of the cable.



●LM-H2 series: secondary side (magnet)

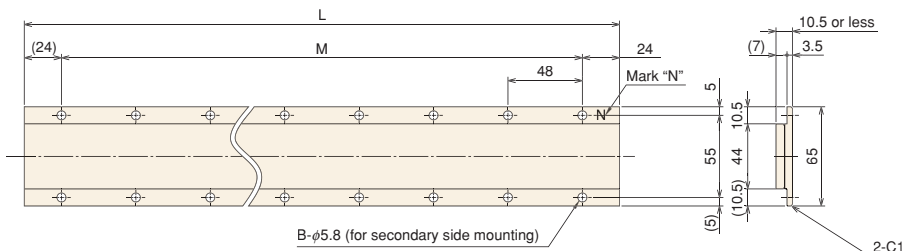
(Unit: mm)

- LM-H2S10-288-4SS0 ●LM-H2S10-384-4SS0 ●LM-H2S10-480-4SS0 ●LM-H2S10-768-4SS0



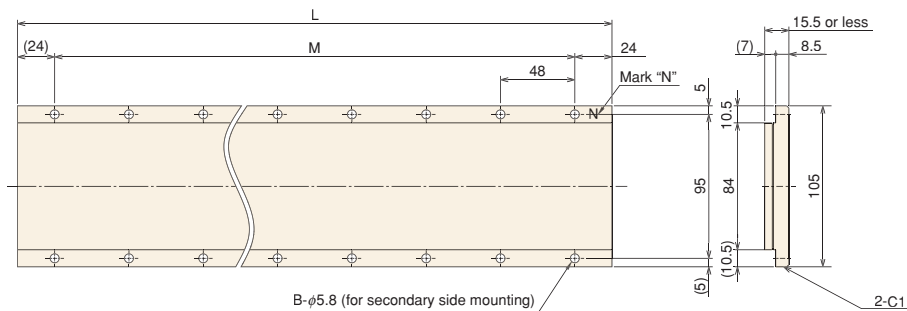
Model	Variable dimensions		
	L	M	B
LM-H2S10-288-4SS0	288	5×48 (=240)	6×2
LM-H2S10-384-4SS0	384	7×48 (=336)	8×2
LM-H2S10-480-4SS0	480	9×48 (=432)	10×2
LM-H2S10-768-4SS0	768	15×48 (=720)	16×2

- LM-H2S20-288-1SS0 ●LM-H2S20-384-1SS0 ●LM-H2S20-480-1SS0 ●LM-H2S20-768-1SS0



Model	Variable dimensions		
	L	M	B
LM-H2S20-288-1SS0	288	5×48 (=240)	6×2
LM-H2S20-384-1SS0	384	7×48 (=336)	8×2
LM-H2S20-480-1SS0	480	9×48 (=432)	10×2
LM-H2S20-768-1SS0	768	15×48 (=720)	16×2

- LM-H2S30-288-1SS0 ●LM-H2S30-384-1SS0 ●LM-H2S30-480-1SS0 ●LM-H2S30-768-1SS0



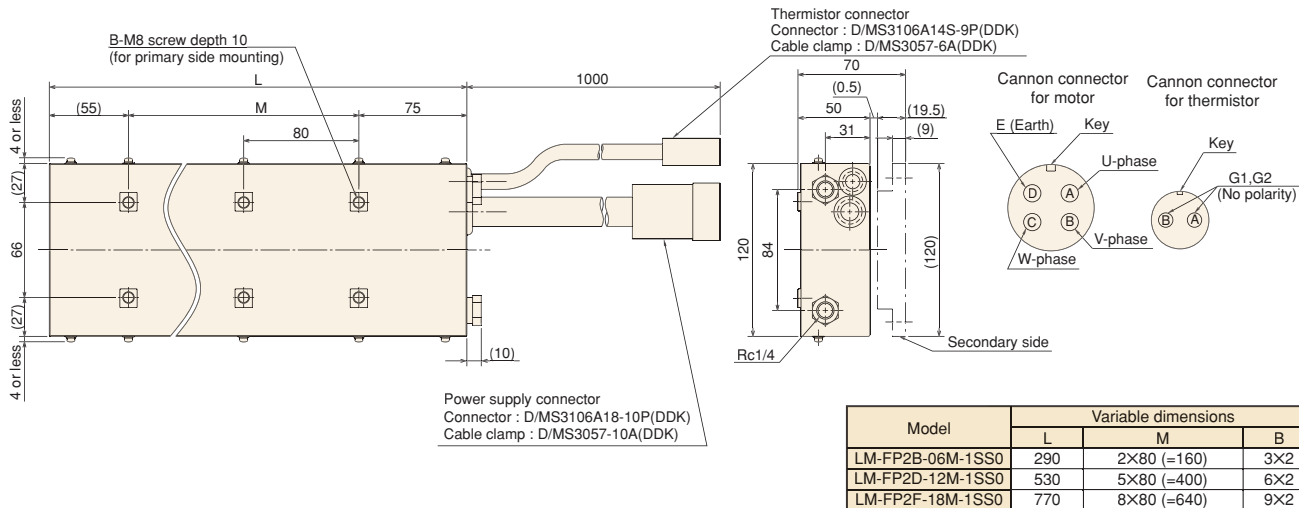
Model	Variable dimensions		
	L	M	B
LM-H2S30-288-1SS0	288	5×48 (=240)	6×2
LM-H2S30-384-1SS0	384	7×48 (=336)	8×2
LM-H2S30-480-1SS0	480	9×48 (=432)	10×2
LM-H2S30-768-1SS0	768	15×48 (=720)	16×2

Linear servo motor dimensions

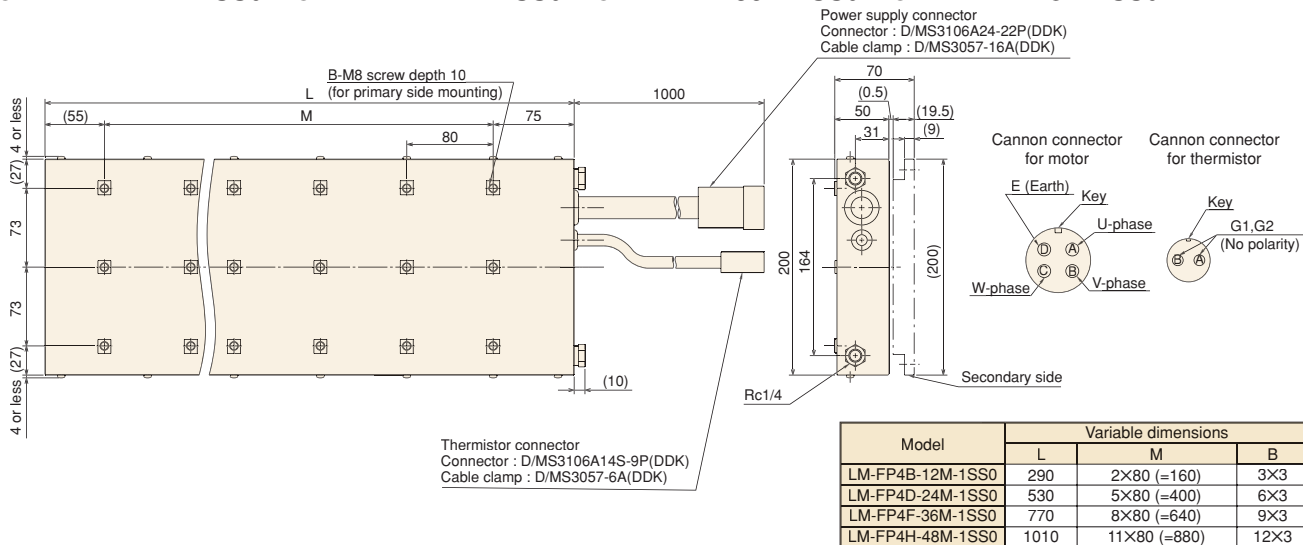
●LM-F series: primary side (coil) (Note 1)

(Unit: mm)

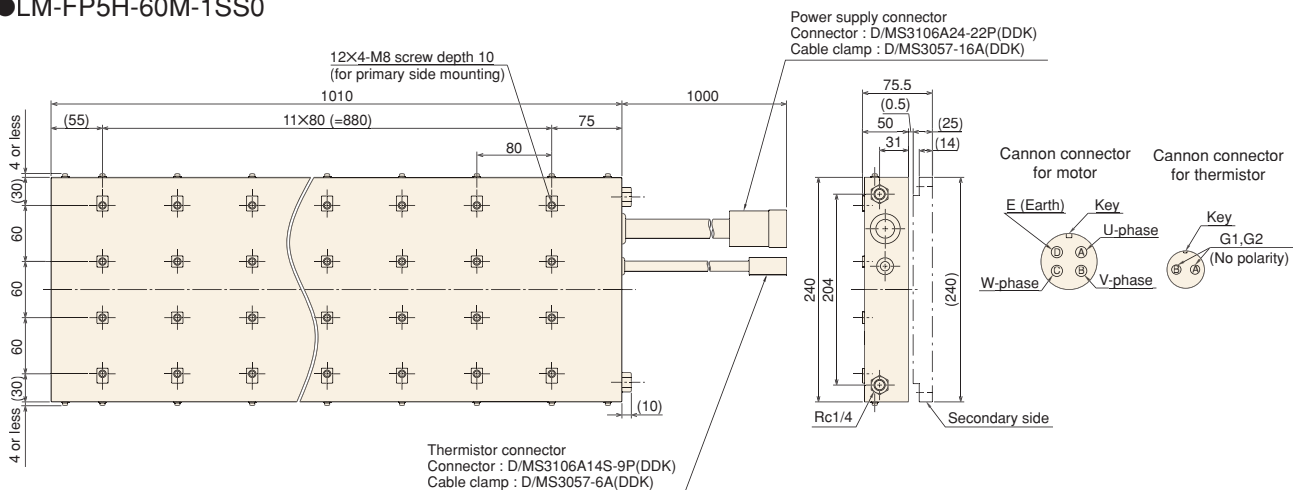
●LM-FP2B-06M-1SS0 ●LM-FP2D-12M-1SS0 ●LM-FP2F-18M-1SS0



●LM-FP4B-12M-1SS0 ●LM-FP4D-24M-1SS0 ●LM-FP4F-36M-1SS0 ●LM-FP4H-48M-1SS0



●LM-FP5H-60M-1SS0

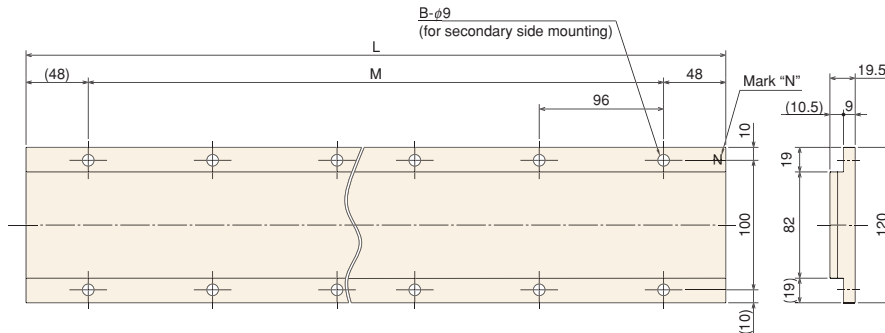




●LM-F series: secondary side (magnet)

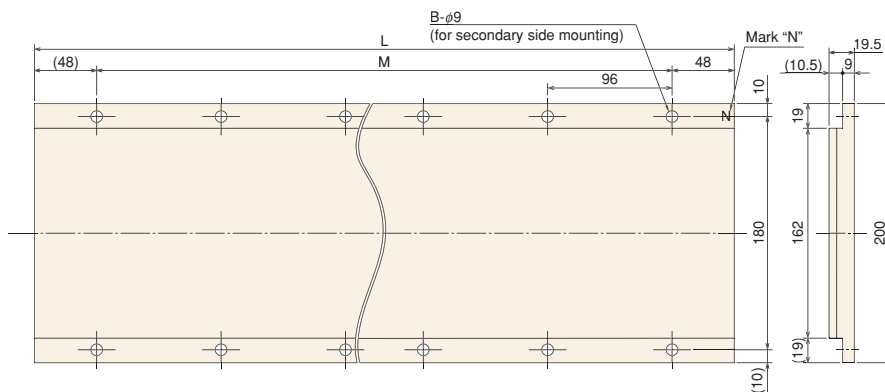
(Unit: mm)

- LM-FS20-480-1SS0 ●LM-FS20-576-1SS0



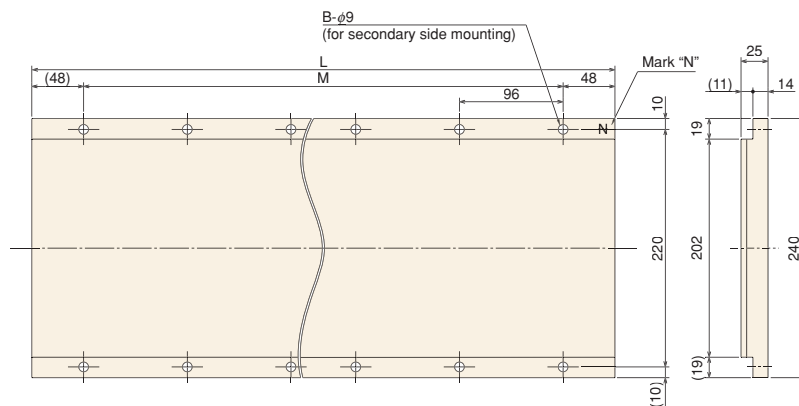
Model	Variable dimensions		
	L	M	B
LM-FS20-480-1SS0	480	4×96 (=384)	5×2
LM-FS20-576-1SS0	576	5×96 (=480)	6×2

- LM-FS40-480-1SS0 ●LM-FS40-576-1SS0



Model	Variable dimensions		
	L	M	B
LM-FS40-480-1SS0	480	4×96 (=384)	5×2
LM-FS40-576-1SS0	576	5×96 (=480)	6×2

- LM-FS50-480-1SS0 ●LM-FS50-576-1SS0



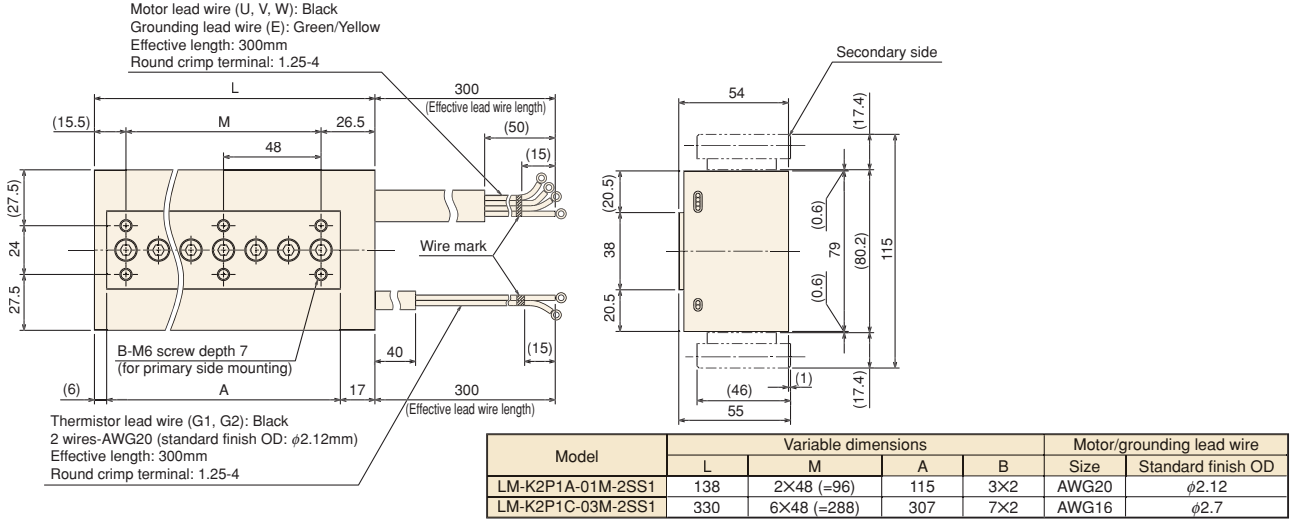
Model	Variable dimensions		
	L	M	B
LM-FS50-480-1SS0	480	4×96 (=384)	5×2
LM-FS50-576-1SS0	576	5×96 (=480)	6×2

Linear servo motor dimensions

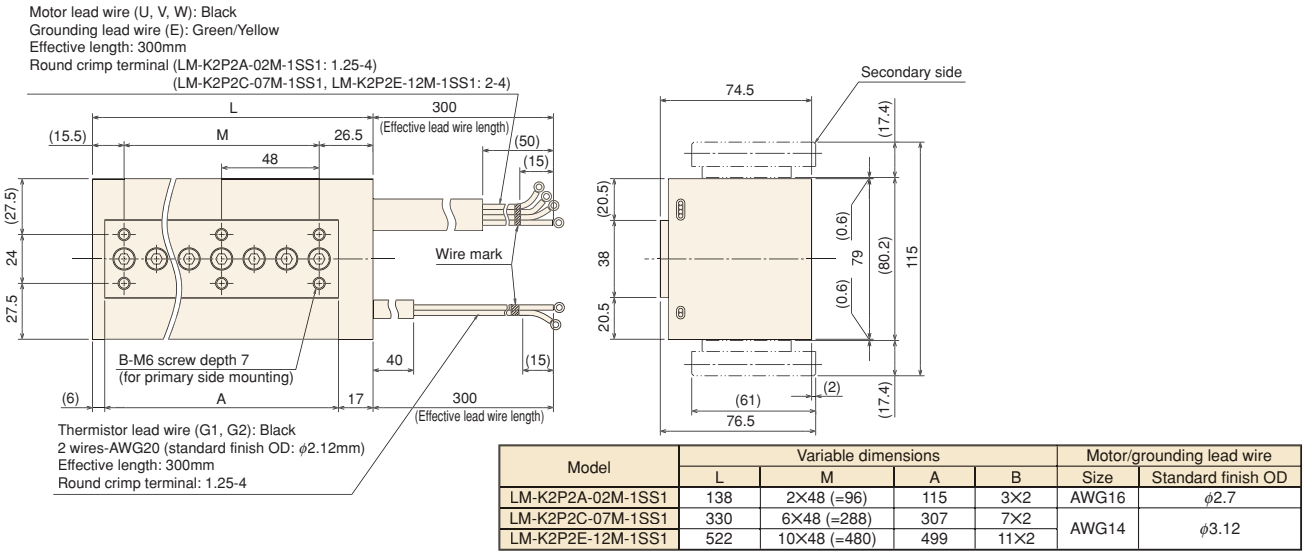
●LM-K2 series: primary side (coil) (Note 1, 2)

(Unit: mm)

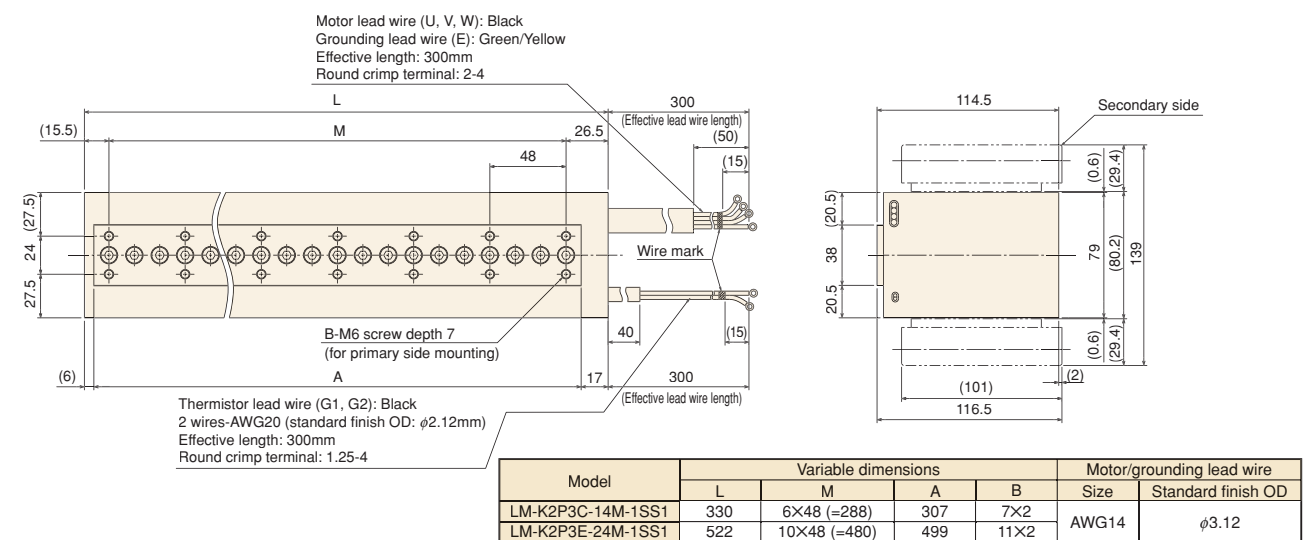
●LM-K2P1A-01M-2SS1 ●LM-K2P1C-03M-2SS1



●LM-K2P2A-02M-1SS1 ●LM-K2P2C-07M-1SS1 ●LM-K2P2E-12M-1SS1



●LM-K2P3C-14M-1SS1 ●LM-K2P3E-24M-1SS1



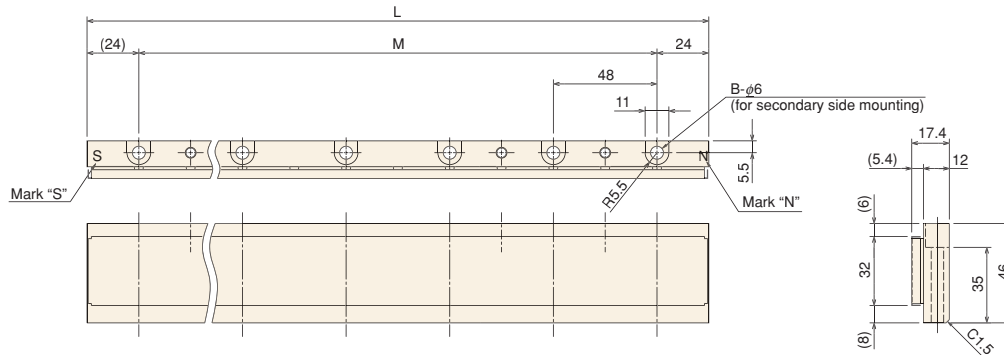
Notes: 1. The motor and thermistor lead wires do not have a long bending life. Fix the wires led from the primary side (coil) to a movable part to prevent the wires from repetitive bending.
 2. Minimum cable bending radius equals to six times the standard finish outer diameter of the cable.



●LM-K2 series: secondary side (magnet)

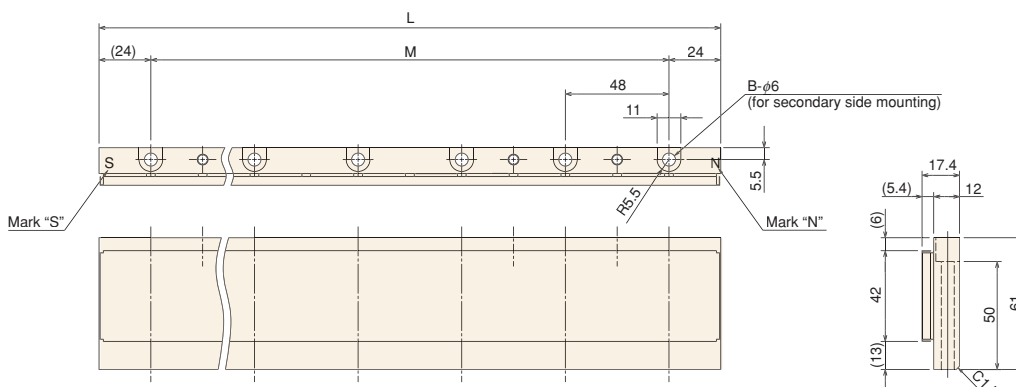
(Unit: mm)

- LM-K2S10-288-2SS1 ●LM-K2S10-384-2SS1 ●LM-K2S10-480-2SS1 ●LM-K2S10-768-2SS1



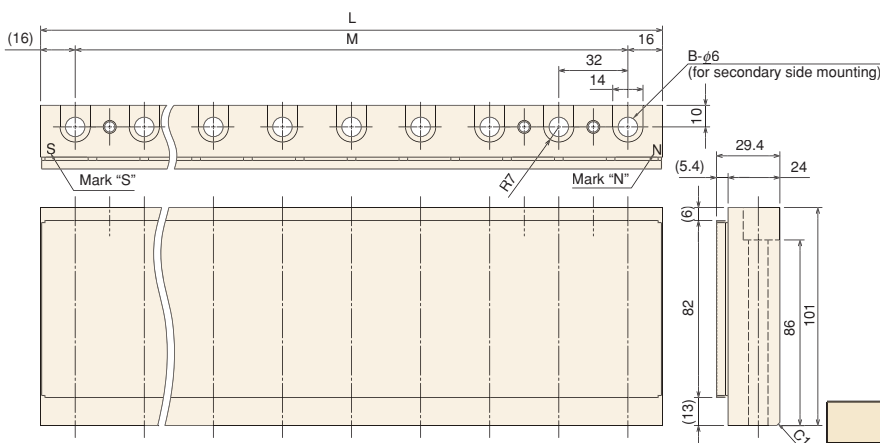
Model	Variable dimensions		
	L	M	B
LM-K2S10-288-2SS1	288	5×48 (=240)	6
LM-K2S10-384-2SS1	384	7×48 (=336)	8
LM-K2S10-480-2SS1	480	9×48 (=432)	10
LM-K2S10-768-2SS1	768	15×48 (=720)	16

- LM-K2S20-288-1SS1 ●LM-K2S20-384-1SS1 ●LM-K2S20-480-1SS1 ●LM-K2S20-768-1SS1



Model	Variable dimensions		
	L	M	B
LM-K2S20-288-1SS1	288	5×48 (=240)	6
LM-K2S20-384-1SS1	384	7×48 (=336)	8
LM-K2S20-480-1SS1	480	9×48 (=432)	10
LM-K2S20-768-1SS1	768	15×48 (=720)	16

- LM-K2S30-288-1SS1 ●LM-K2S30-384-1SS1 ●LM-K2S30-480-1SS1 ●LM-K2S30-768-1SS1



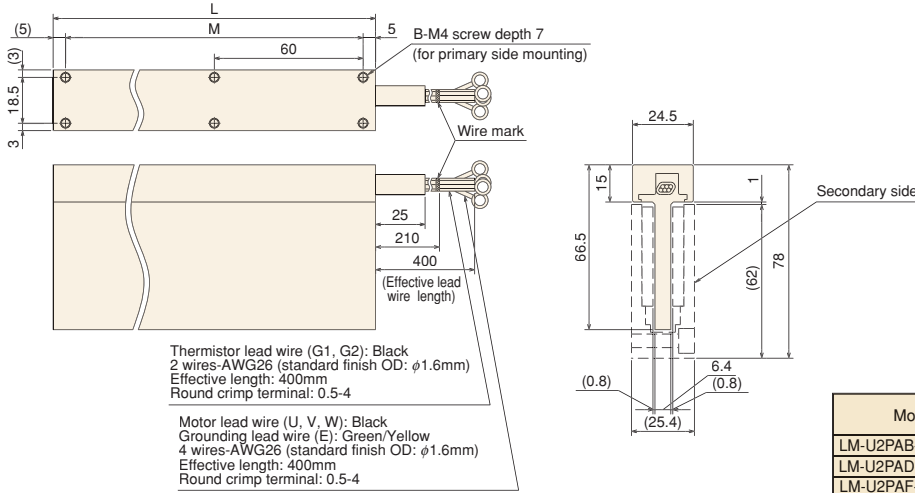
Model	Variable dimensions		
	L	M	B
LM-K2S30-288-1SS1	288	8×32 (=256)	9
LM-K2S30-384-1SS1	384	11×32 (=352)	12
LM-K2S30-480-1SS1	480	14×32 (=448)	15
LM-K2S30-768-1SS1	768	23×32 (=736)	24

Linear servo motor dimensions

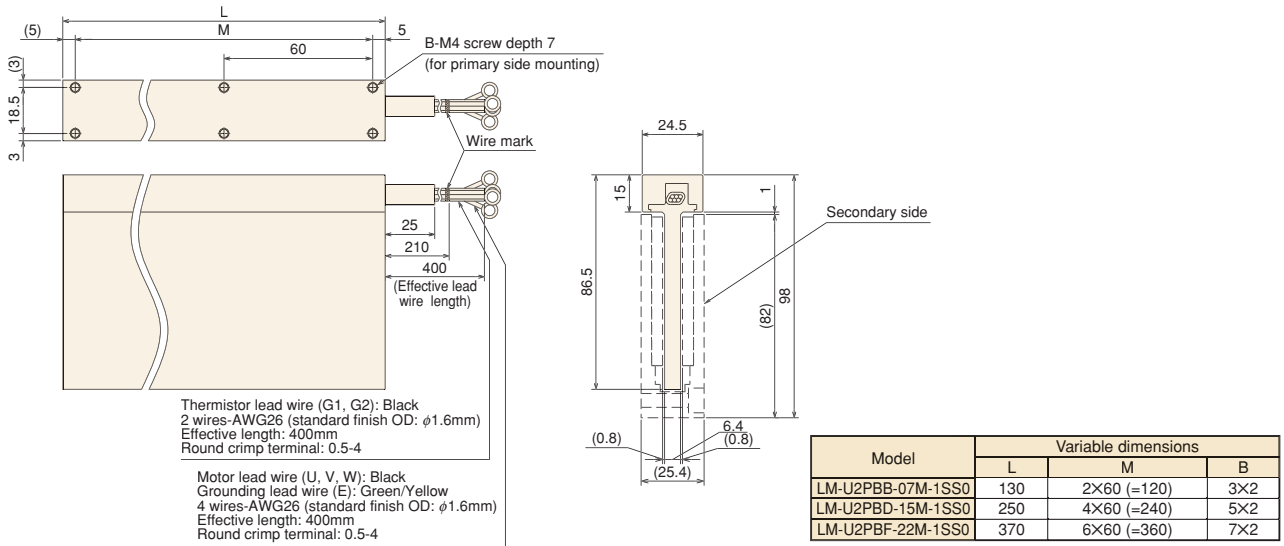
●LM-U2 series: primary side (coil) (Note 1, 2)

(Unit: mm)

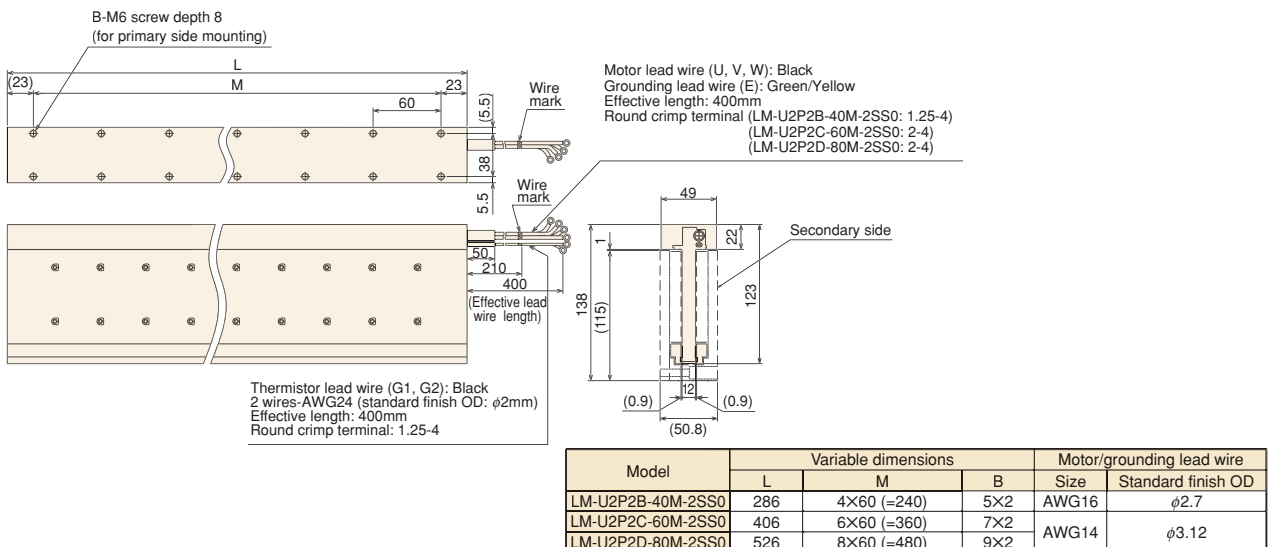
●LM-U2PAB-05M-0SS0 ●LM-U2PAD-10M-0SS0 ●LM-U2PAF-15M-0SS0



●LM-U2PBB-07M-1SS0 ●LM-U2PBD-15M-1SS0 ●LM-U2PBF-22M-1SS0



●LM-U2P2B-40M-2SS0 ●LM-U2P2C-60M-2SS0 ●LM-U2P2D-80M-2SS0



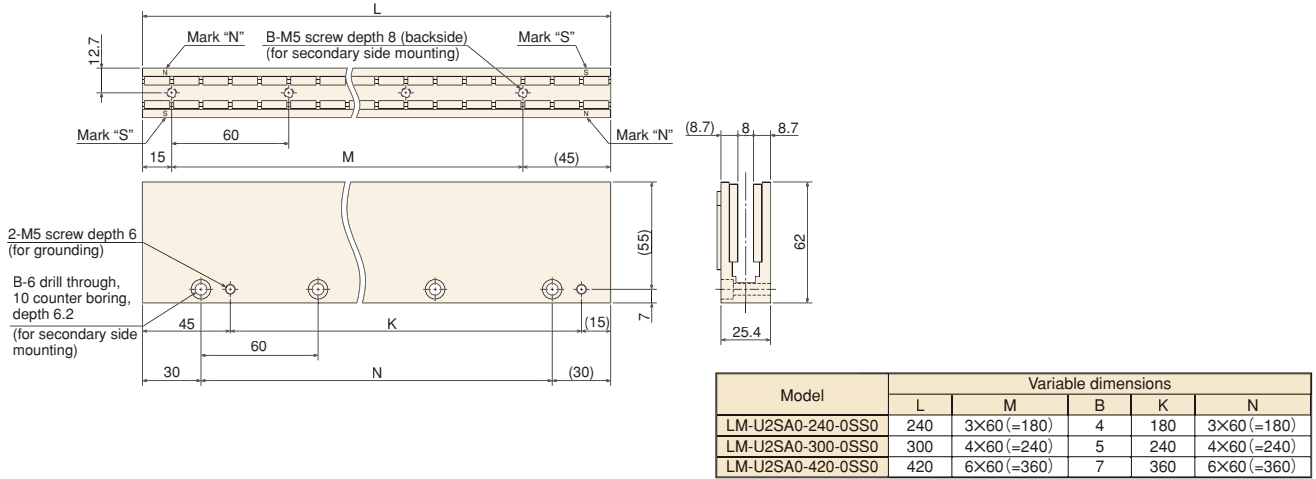
Notes: 1. The motor and thermistor lead wires do not have a long bending life. Fix the wires led from the primary side (coil) to a movable part to prevent the wires from repetitive bending.
 2. Minimum cable bending radius equals to six times the standard finish outer diameter of the cable.



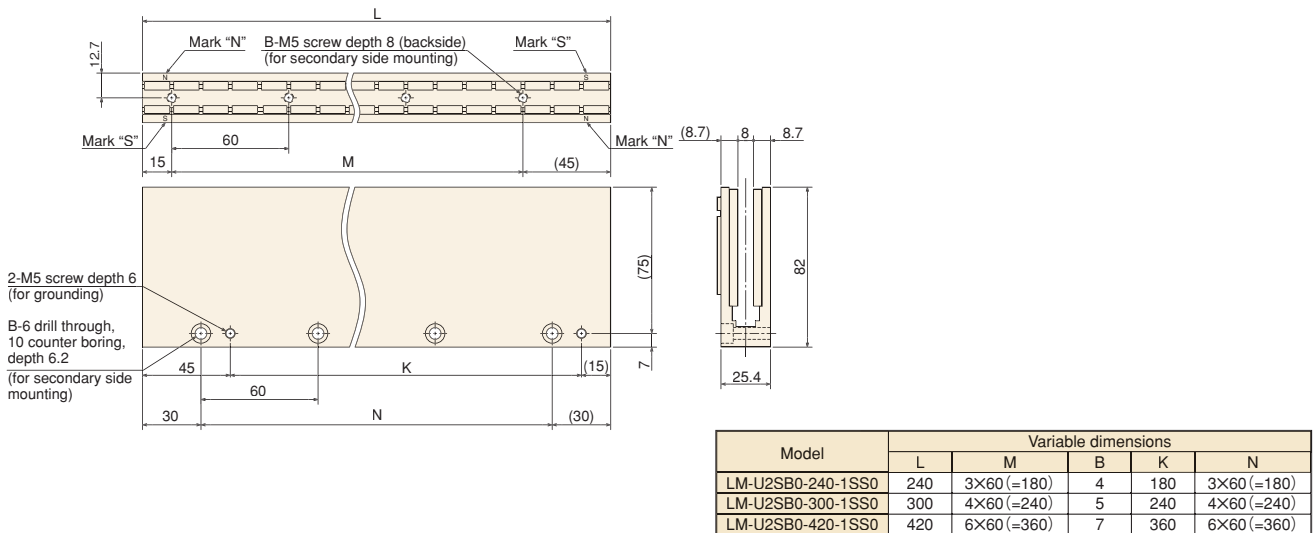
●LM-U2 series: secondary side (magnet)

(Unit: mm)

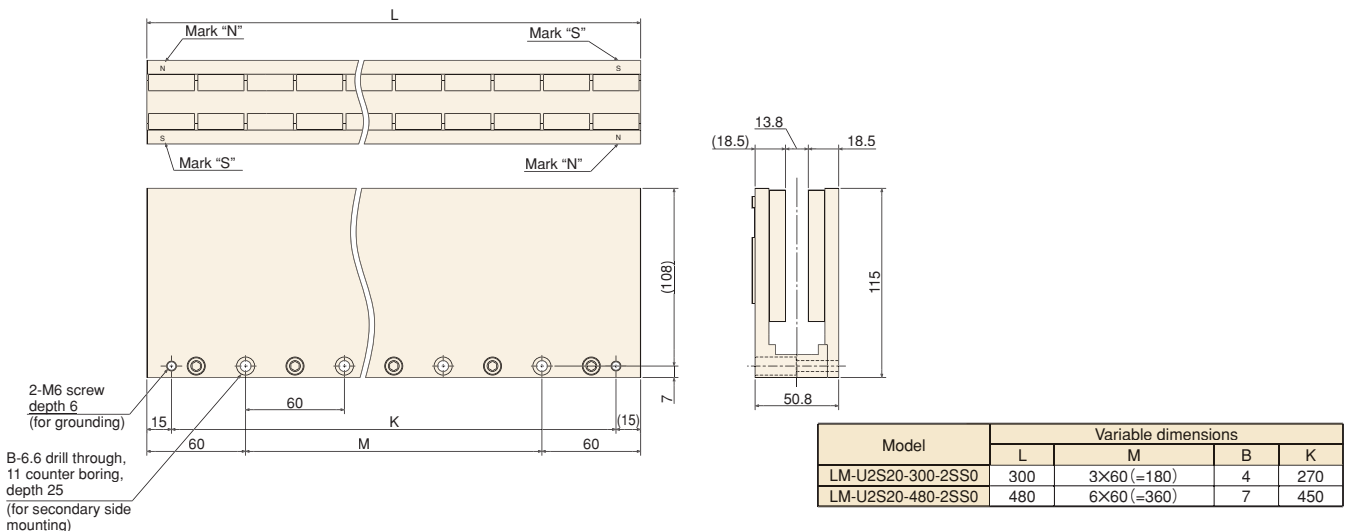
●LM-U2SA0-240-0SS0 ●LM-U2SA0-300-0SS0 ●LM-U2SA0-420-0SS0



●LM-U2SB0-240-1SS0 ●LM-U2SB0-300-1SS0 ●LM-U2SB0-420-1SS0



●LM-U2S20-300-2SS0 ●LM-U2S20-480-2SS0



MR-J3-B-RJ004 servo amplifier specifications

Servo amplifier model (Note 7)	MR-J3-	20B-RJ004(U□)	40B-RJ004(U□)	60B-RJ004(U□)	70B-RJ004(U□)	200BN-RJ004(U□)	350B-RJ004(U□)	500B-RJ004(U□)	700B-RJ004U□	11KB-RJ004U□	15KB-RJ004U□	22KB4-RJ004U□	
Output	Rated voltage	3-phase 170VAC											3-phase 323VAC
	Rated current (A)	1.5	2.8	3.2	5.8	11.0	17.0	28.0	37.0	68.0	87.0	63.0	
Main circuit power supply	Voltage/frequency (Note 1)	3-phase 200 to 230VAC 50/60Hz or 1-phase 200 to 230VAC 50/60Hz				3-phase 200 to 230VAC 50/60Hz						3-phase 380 to 480VAC 50/60Hz	
	Rated current (A)	1.5	2.6	3.2	3.8	10.5	16.0	21.7	28.9	46.0	64.0	47.6	
	Permissible voltage fluctuation	For 3-phase 200 to 230VAC: 3-phase 170 to 253VAC For 1-phase 200 to 230VAC: 1-phase 170 to 253VAC				3-phase 170 to 253VAC						3-phase 323 to 528VAC	
	Permissible frequency fluctuation	±5% maximum											
Control circuit power supply	Voltage/frequency	1-phase 200 to 230VAC 50/60Hz											1-phase 380 to 480VAC 50/60Hz
	Rated current (A)	0.2						0.3				0.2	
	Permissible voltage fluctuation	1-phase 170 to 253VAC											1-phase 323 to 528VAC
	Permissible frequency fluctuation	±5% maximum											
	Power consumption (W)	30						45					
Interface power supply		24VDC ±10% (required current capacity: 0.15A (Note 3))											
Linear encoder interface	Serial interface		Mitsubishi high-speed serial communication										
	Pulse train interface	Input signal	A/B/Z-phase differential input signal										
		Minimum phase difference	200ns										
Tolerable regenerative power of regenerative resistor (Note 4, 5)	Built-in regenerative resistor	10	10	10	20	100	100	130	170	—	—	—	
	External regenerative resistor (standard accessory) (Note 6)	—	—	—	—	—	—	—	—	500 (800)	850 (1300)	850 (1300)	
Control system		Sine-wave PWM control/current control system											
Dynamic brake		Built-in								External option (Note 8)			
Safety features		Overcurrent shutdown, regeneration overvoltage shutdown, overload shutdown (electronic thermal), linear servo motor overheat protection, encoder fault protection, regeneration fault protection, undervoltage/sudden power outage protection, overspeed protection, excess error protection, magnetic pole detection protection, linear servo control fault protection											
Structure		Natural-cooling open (IP rating: IP00)					Fan cooling open (IP rating: IP00)						
Environment	Ambient temperature (Note 2)	0 to 55°C (32 to 131°F) (non freezing), storage: -20 to 65°C (-4 to 149 F) (non freezing)											
	Ambient humidity	90% RH maximum (non condensing), storage: 90% RH maximum (non condensing)											
	Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust											
	Elevation	1000m or less above sea level											
	Vibration	5.9m/s ² or less at 10 to 55Hz (directions of X, Y and Z axes)											
Mass	(kg [lb])	0.8 (1.8)	1.0 (2.2)	1.0 (2.2)	1.4 (3.1)	2.3 (5.1)	2.3 (5.1)	4.6 (10)	6.2 (14)	18 (40)	18 (40)	19 (42)	

- Notes: 1. Rated thrust and speed of a linear servo motor are applicable when the servo amplifier, combined with the linear servo motor, is operated within the specified power supply voltage and frequency. Thrust drops when the power supply voltage is below the specified value. Refer to the section "thrust characteristics" in this catalog for thrust characteristics of each linear servo motor.
2. MR-J3-350B-RJ004(U□) or smaller servo amplifiers can be mounted closely. In this case, operate them at the ambient temperature of 0 to 45°C (32 to 113°F) or at 75% or less of the effective load ratio.
3. 0.15A is the value when all of the input/output points are used. The current capacity can be stepped down according to the number of input/output points in use.
4. Optimal regenerative resistor varies for each system.
5. Refer to the section "Options ● Optional regeneration unit" in this catalog for the tolerable regenerative power (W).
6. The value in () is applicable when the external regenerative resistors, GRZG400-□Ω (standard accessory) are used with cooling fans (2 units of 92 × 92mm, minimum air flow: 1.0m³/min). Note that change in parameter No. PA02 is required.
7. Servo amplifier model that is compatible with LM-F series is MR-J3-□B-RJ004U□. Refer to "Servo amplifier model designation" for more details.
8. Use an optional external dynamic brake with the servo amplifier. Without the external dynamic brake, a linear servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system.



MR-J3W-B (2-axis servo amplifier) specifications

Servo amplifier model		MR-J3W-22B		MR-J3W-44B		MR-J3W-77B		MR-J3W-1010B	
Rated output capacity		A-axis 200W	B-axis 200W	A-axis 400W	B-axis 400W	A-axis 750W	B-axis 750W	A-axis 1kW	B-axis 1kW
Output	Rated voltage	3-phase 170VAC							
	Rated current (A)	1.5	1.5	2.8	2.8	5.8	5.8	6.0	6.0
Main circuit power supply (Note 7)	Voltage/frequency (Note 1)	3-phase 200 to 230VAC 50/60Hz or 1-phase 200 to 230VAC 50/60Hz				3-phase 200 to 230VAC 50/60Hz or 1-phase 200 to 230VAC 50/60Hz (Note 8)		3-phase 200 to 230VAC 50/60Hz	
	Rated current (A)	3.5		6.1		10.4		13.9	
	Permissible voltage fluctuation	For 3-phase 200 to 230VAC: 3-phase 170 to 253VAC For 1-phase 200 to 230VAC: 1-phase 170 to 253VAC				For 3-phase 200 to 230VAC: 3-phase 170 to 253VAC For 1-phase 200 to 230VAC: 1-phase 170 to 253VAC (Note 9)		3-phase 170 to 253VAC	
	Permissible frequency fluctuation	±5% maximum							
Control circuit power supply	Voltage/frequency	1-phase 200 to 230VAC 50/60Hz							
	Rated current (A)	0.4							
	Permissible voltage fluctuation	1-phase 170 to 253VAC							
	Permissible frequency fluctuation	±5% maximum							
	Power consumption (W)	55							
Interface power supply		24VDC ±10% (required current capacity: 0.25A (Note 2))							
Capacitor circuit	Reusable regenerative energy (Note 3) (J)	17		22		46			
	Linear servo motor's mass equivalent to permissible charging amount (Note 4) (kg [lb])	8.5 (19)		11.0 (24.0)		23.0 (51.0)			
Tolerable regenerative power of regenerative resistor (W)	Built-in regenerative resistor	10				100			
Control system		Sine-wave PWM control/current control system							
Dynamic brake		Built-in (Note 5)							
Safety features		Overcurrent shutdown, regeneration overvoltage shutdown, overload shutdown (electronic thermal), linear servo motor overheat protection, encoder fault protection, regeneration fault protection, undervoltage/sudden power outage protection, overspeed protection, excess error protection, magnetic pole detection protection, linear servo control fault protection							
Structure		Natural cooling open (IP rating: IP00)				Fan cooling open (IP rating: IP00)			
Environment	Ambient temperature (Note 6)	0 to 55°C (32 to 131°F) (non freezing), storage: -20 to 65°C (-4 to 149°F) (non freezing)							
	Ambient humidity	90% RH maximum (non condensing), storage: 90% RH maximum (non condensing)							
	Atmosphere	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust							
	Elevation	1000m or less above sea level							
	Vibration	5.9m/s ² or less at 10 to 55Hz (directions of X, Y and Z axes)							
Mass (kg [lb])		1.4 (3.1)				2.3 (5.1)			

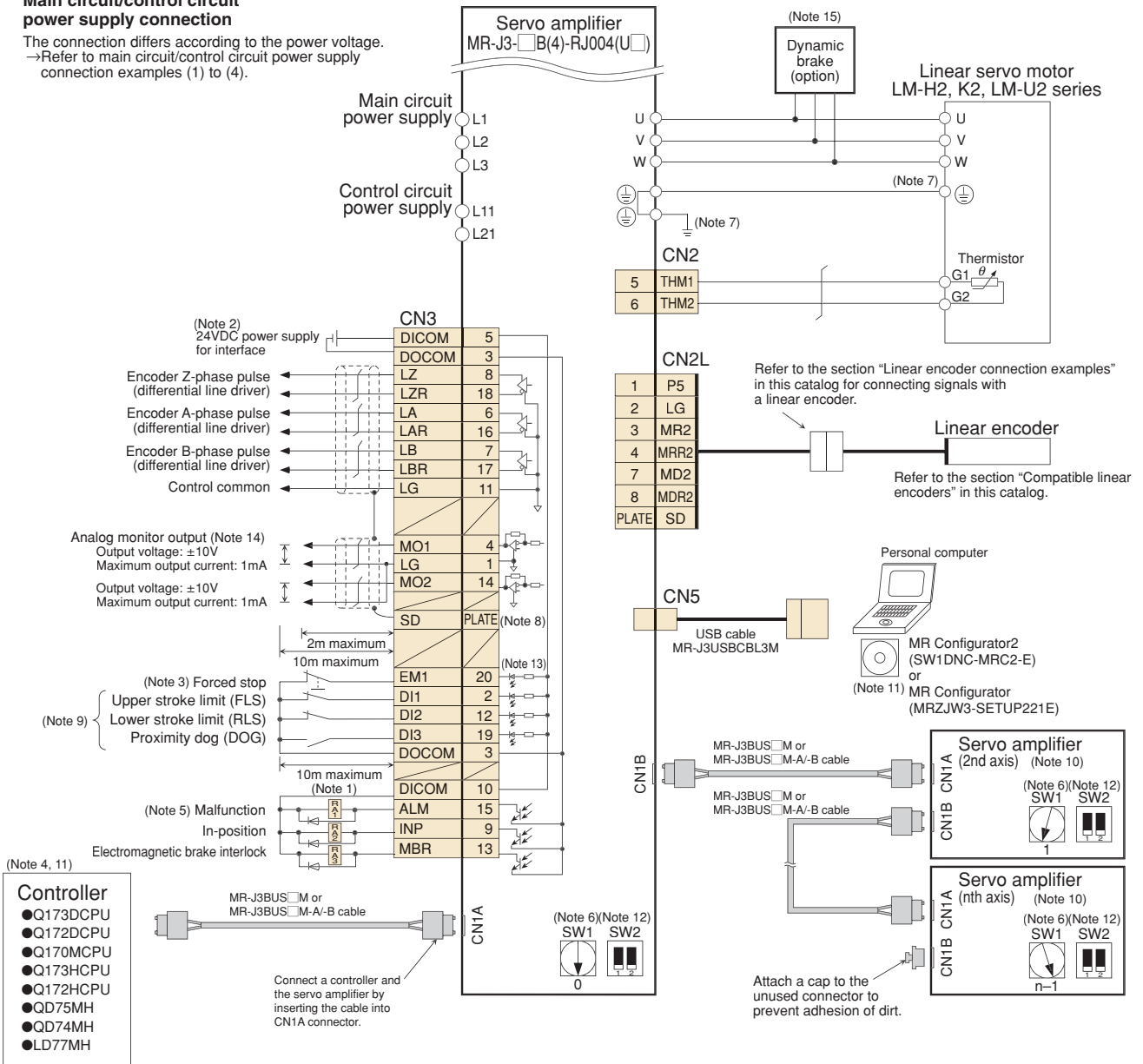
- Notes: 1. Rated thrust and speed of a linear servo motor are applicable when the servo amplifier, combined with the linear servo motors, is operated within the specified power supply voltage and frequency. Thrust drops when the power supply voltage is below the specified value. Refer to the section "thrust characteristics" in this catalog for thrust characteristics of each linear servo motor.
2. 0.25A is the value when all of the input/output points are used. The current capacity can be stepped down according to the number of input/output points in use.
3. "Regenerative energy" is the energy generated when a machine, which has mass equivalent to the permissible charging amount, decelerates from the maximum speed to a stop.
4. Mass of primary side (coil) is included. When two axes are simultaneously decelerated, the permissible charging amount is equivalent to the total masses of both axes. Otherwise, the permissible charging amount is equivalent to the mass of each axis.
5. When using the built-in dynamic brake, refer to "MR-J3W-□B SERVO AMPLIFIER INSTRUCTION MANUAL" for permissible load to motor mass ratio.
6. MR-J3W-□B servo amplifiers can be mounted closely. In the case of MR-J3-44B, however, operate them at 90% or less of the effective load ratio.
7. Refer to the section "Linear servo motor specifications" for power supply capacity. Power supply capacity for this servo amplifier is equivalent to the total power supply capacities of each linear servo motor.
8. This input voltage will be applicable for the servo amplifier manufactured in January 2011 or later. For the servo amplifier manufactured in December 2010 or earlier, the input voltage is 3-phase 200VAC to 230VAC 50/60Hz.
9. This input voltage will be applicable for the servo amplifier manufactured in January 2011 or later. For the servo amplifier manufactured in December 2010 or earlier, the input voltage is 3-phase 170VAC to 253VAC 50/60Hz.

MR-J3-B-RJ004 standard wiring diagram

● Connection example

Main circuit/control circuit power supply connection

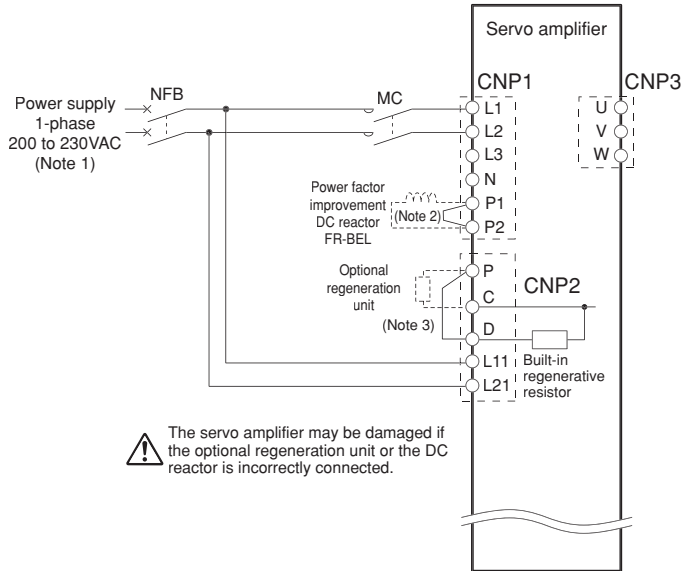
The connection differs according to the power voltage.
→ Refer to main circuit/control circuit power supply connection examples (1) to (4).



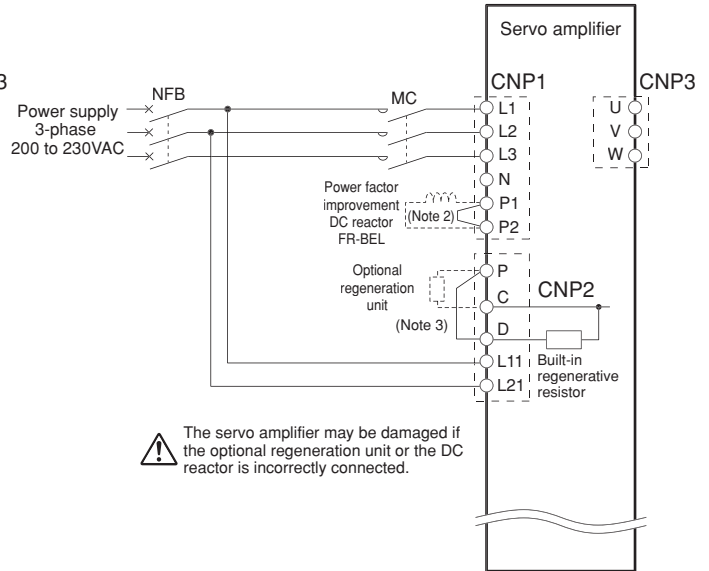


Main/control circuit power supply connection examples for MR-J3-B-RJ004

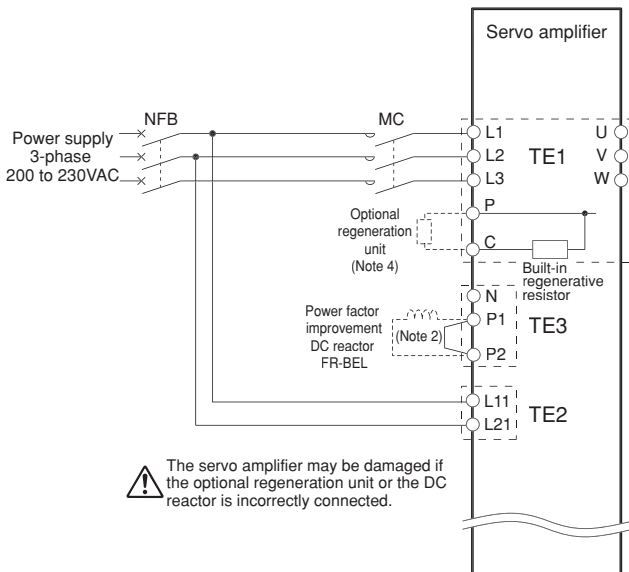
(1) 1-phase 200V



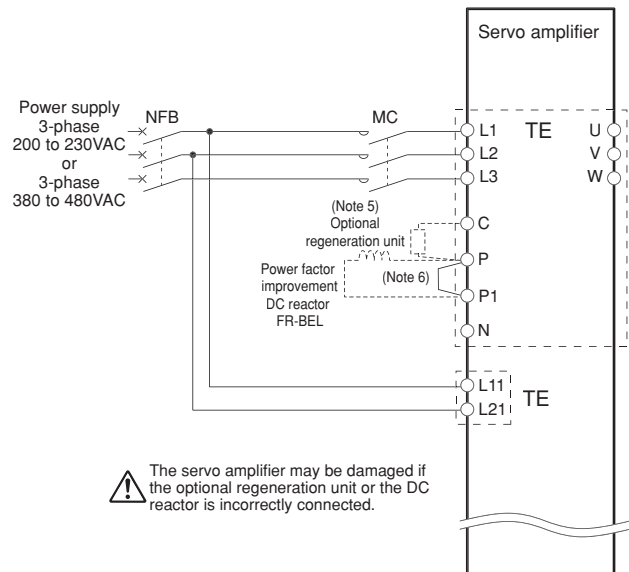
(2) 3-phase 200V 3.5kW or smaller



(3) 3-phase 200V 5kW or 7kW



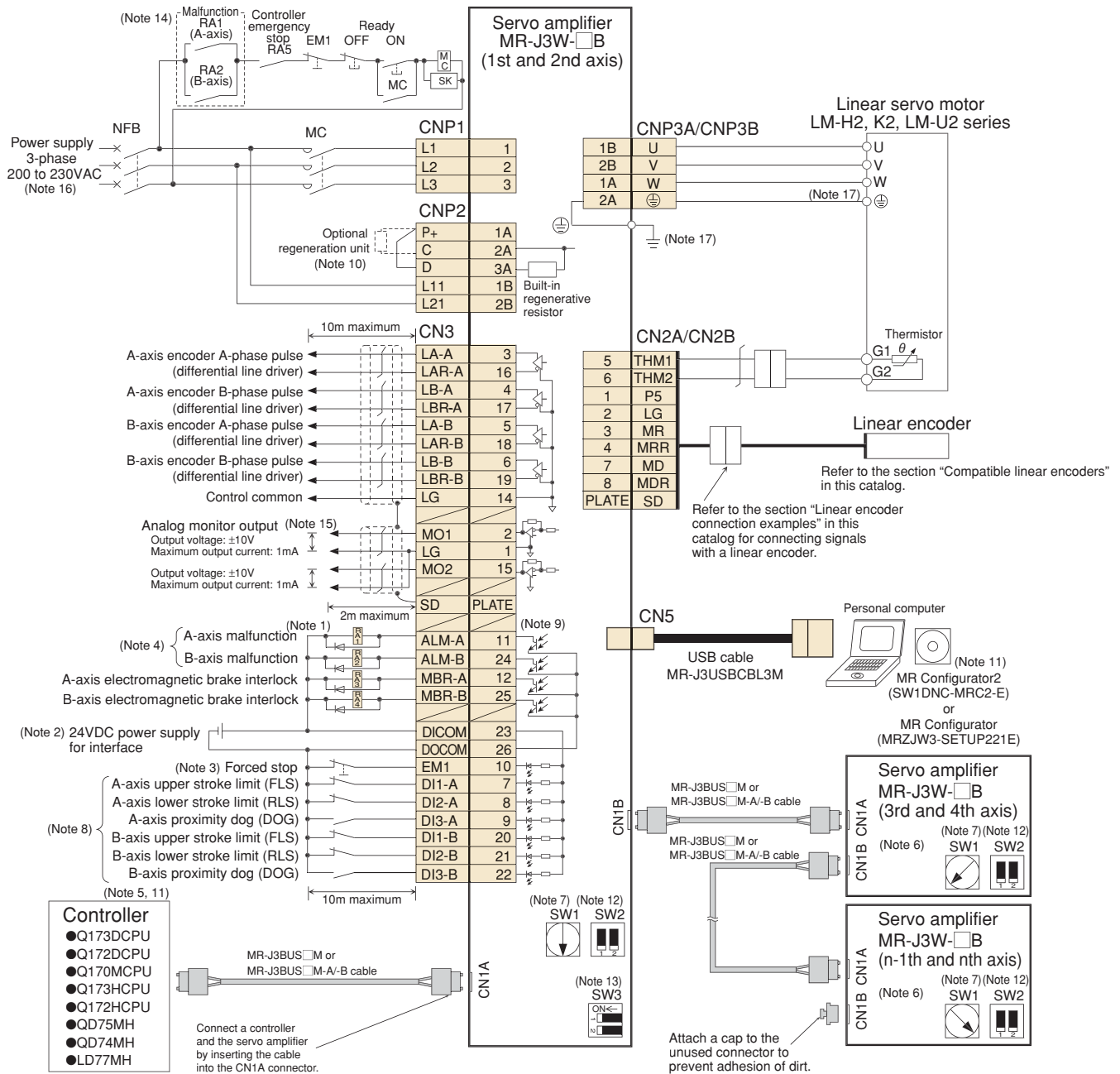
(4) 3-phase 200V 11kW or 15kW,
or 3-phase 400V, 22kW



- Notes: 1. When using a 1-phase 200 to 230VAC (for MR-J3-70B-RJ004(U□) or smaller), connect the power supply to the L1 and L2 terminals. Do not connect anything to L3.
 2. Disconnect P1 and P2 when using the DC reactor.
 3. Disconnect P and D when connecting the optional regeneration unit externally.
 4. Disconnect the wires for the built-in regenerative resistor (P and C) when connecting the optional regeneration unit externally.
 5. 11kW or larger servo amplifiers do not have a built-in regenerative resistor.
 6. Remove the short bar between P and P1 when using the DC reactor.

MR-J3W-B standard wiring diagram

● Connection example



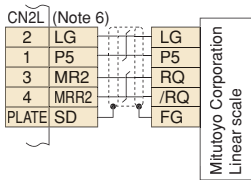
- Notes:
- Do not reverse the diode's direction. Connecting it backwards may cause the servo amplifier to malfunction such that the signals are not output, and the forced stop and other safety circuits are inoperable.
 - Use the power supply 24VDC±10% (required current capacity: 0.25A). 0.25A is the value when all of the input/output points are used. Note that the current capacity can be stepped down according to the number of input/output points in use. Refer to "MR-J3W-B SERVO AMPLIFIER INSTRUCTION MANUAL" for details.
 - The forced stop (EM1) signal is issued for both axes of the servo amplifier. For overall system, apply the emergency stop on the controller side.
 - The malfunction (ALM-A/B) signal (normally closed contact) is conducted to D11 in normal alarm-free condition.
 - For details on the controllers, refer to relevant controller's programming manual or user's manual.
 - Connections for the third and following axes are omitted.
 - Up to 16 axes (n=2 to 16) can be set using the axis selection rotary switch (SW1).
 - Devices can be assigned for DI1, DI2 and DI3 with controller setting. Refer to the controller's instruction manuals for details on setting. These devices can be assigned with the controller, Q173DCPU, Q172DCPU, Q170MPCPU, Q173HPCPU, Q172HPCPU, QD75MH, QD74MH or LD77MH.
 - This is for sink wiring. Source wiring is also possible. Refer to "MR-J3W-B SERVO AMPLIFIER INSTRUCTION MANUAL" for details.
 - When not using an optional regeneration unit, connect P+ and D to use the built-in regenerative resistor. When using an optional regeneration unit, disconnect P+ and D, and then connect the optional regeneration unit to P+ and C.
 - Refer to the section "List of compatible software versions" in this catalog.
 - Test operation select switch (SW2-1) is used to perform test operation mode with MR Configurator2 or MR Configurator. SW2-2 is for manufacturer setting.
 - Servo motor select switch (SW3) is located on the bottom of the servo amplifier. SW3-1 is for A-axis and SW3-2 for B-axis. Set the switch of the axis where a linear servo motor is connected to ON when using the linear servo motor.
 - This connection is for continuing operation with one axis when an alarm occurs on the other axis. To stop the operation of the both axes with an alarm on one axis, connect RA1 and RA2 in series.
 - Output voltage range varies depending on the monitored signal.
 - When using a 1-phase 200VAC to 230VAC, connect the power supply to the L1 and L2 terminals. Do not connect anything to L3. Refer to the section "Servo amplifier specifications" for power supply.
 - For grounding, connect the ground wire to the cabinet's protective earth (PE) terminal via the servo amplifier's protective earth (PE) terminal.



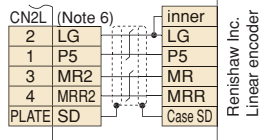
Linear encoder connection examples

●For MR-J3-B-RJ004 (Note 1, 2)

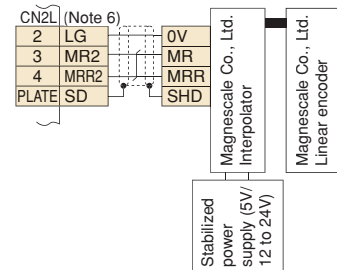
Mitutoyo Corporation Linear scale



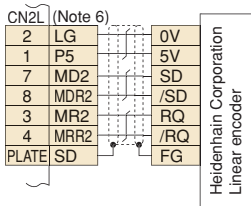
Renishaw Inc. Linear encoder



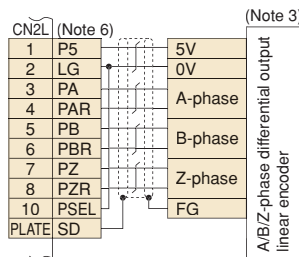
Magnescale Co., Ltd. Linear encoder (Note 4)



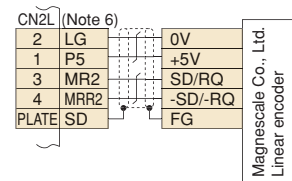
Heidenhain Corporation Linear encoder



A/B/Z-phase differential output Linear encoder

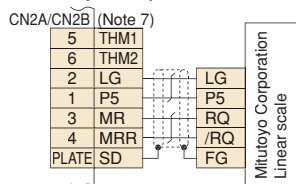


Magnescale Co., Ltd. Linear encoder (Note 4)

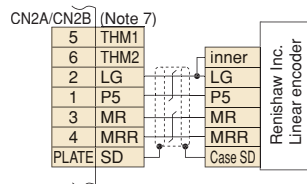


●For MR-J3W-B (Note 1, 5)

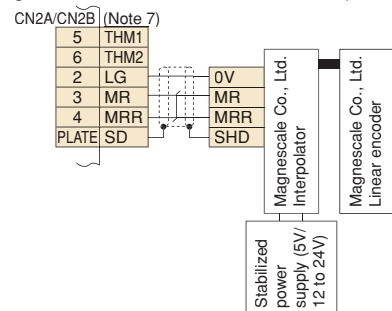
Mitutoyo Corporation Linear scale



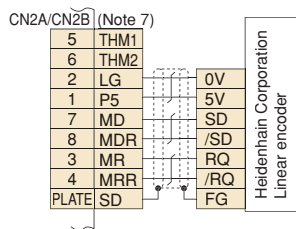
Renishaw Inc. Linear encoder



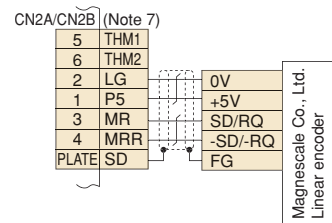
Magnescale Co., Ltd. Linear encoder (Note 4)



Heidenhain Corporation Linear encoder



Magnescale Co., Ltd. Linear encoder (Note 4)



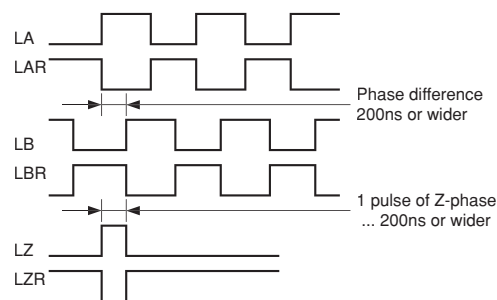
- Notes: 1. When manufacturing the linear encoder connection cable, use an optional connector set (MR-J3CN2).
2. Refer to "MR-J3-□B-RJ004(U□) SERVO AMPLIFIER INSTRUCTION MANUAL" for manufacturing the cable.
3. If the encoder's current consumption exceeds 350mA, supply power from an external source.
4. Former company name: Sony Manufacturing System Corporation (changed since April 2010)
5. Refer to "MR-J3W-□B SERVO AMPLIFIER INSTRUCTION MANUAL" for manufacturing the cable.
6. For the number of the wire pairs for LG and P5, refer to "MR-J3-□B-RJ004(U□) INSTRUCTION MANUAL".
7. For the number of the wire pairs for LG and P5, refer to "MR-J3W-□B SERVO AMPLIFIER INSTRUCTION MANUAL".

Compatible linear encoders

●List of compatible linear encoders (Note 1, 2)

Linear encoder type		Manufacturer	Model (Note 13)	Resolution	Rated speed (Note 3)	Maximum effective measurement length (Note 8)	Communication method	Position detection system
Mitsubishi serial interface compatible	Absolute type	Magnescale Co., Ltd. (Note 12)	SR77	0.05 μ m /0.01 μ m	3.3m/s	2040mm	2-wire type	Absolute
			SR87			3040mm		
		Mitutoyo Corporation	AT343A	0.05 μ m	2.0m/s	3000mm		
			AT543A-SC		2.5m/s	2200mm		
			AT545A-SC	20/4096 (μ m) (Approx. 0.005 μ m)	2.5m/s	2200mm		
			ST741A	0.5 μ m	4.0m/s	6000mm		
			ST742A					
	ST743A							
	ST744A	0.1 μ m						
	Heidenhain Corporation	LC 493M (Note 9)	0.05 μ m /0.01 μ m	3.0m/s	2040mm	4-wire type		
		LC 193M (Note 10)			4240mm			
	Incremental type	Magnescale Co., Ltd. (Note 12)	SR75	0.05 μ m /0.01 μ m	3.3m/s	2040mm	2-wire type	
			SR85			3040mm		
			SL710+PL101-R/RH +MJ830 or MJ831 (Note 4)	0.2 μ m (Note 5)	6.4m/s	100000mm		
Renishaw Inc.		RGH26P	5 μ m	4.0m/s	70000mm	2-wire type		
		RGH26Q	1 μ m	3.2m/s				
		RGH26R	0.5 μ m	1.6m/s				
Heidenhain Corporation		LIDA 485+EIB 392M (Note 11)	20/16384 (μ m) (Approx. 1.22nm)	4.0m/s	30040mm	4-wire type		
	LIDA 487+EIB 392M (Note 11)	6040mm						
A/B/Z-phase differential output type (Note 6)	Incremental type	Not designated	—	Within tolerable resolution range (Note 7)	Depends on linear encoder	Depends on linear encoder	Differential 3-pair type	

- Notes: 1. Consult with the relevant linear encoder manufacturer for details on the linear encoder's working environment and specifications.
2. The linear servo motor generates heat. Take the linear encoder's working environment temperature into consideration when configuring the system.
3. The indicated values are the linear encoder's rated speed when used in combination with the Mitsubishi linear compatible servo amplifier. The values may differ from each manufacturer's specifications. The linear servo motor's maximum speed or the linear encoder's rated speed, whichever is smaller, is the upper limit value of the linear servo motor's speed.
4. SH13 is out of production. Contact Magnescale Co., Ltd. for more details.
5. The resolution varies according to the setting value of the interpolator, MJ830/MJ831 manufactured by Magnescale Co., Ltd. Set the resolution between the minimum resolution and 5 μ m.
6. Output the A-phase, B-phase and Z-phase signals in the differential line driver. The phase difference of A-phase pulse and B-phase pulse, and the width of Z-phase pulse must be 200ns or wider. Home position return is not possible with a linear encoder which is not equipped with a Z-phase.
7. The tolerable resolution range is 0.005 μ m to 5 μ m. Select the linear encoder within this range.
8. The maximum length of Mitsubishi serial interface communication cable is 30m.
9. LC 493M is a replacement for LC 491M. Contact Heidenhain Corporation for more details.
10. LC 193M is a replacement for LC 192M. Contact Heidenhain Corporation for more details.
11. EIB 392M is a replacement for APE 391M. Contact Heidenhain Corporation for more details.
12. Former company name: Sony Manufacturing System Corporation (changed since April 2010)
13. For servo amplifiers' software versions that are compatible with the linear encoders, refer to the section "List of compatible servo amplifier software versions" in this catalog.

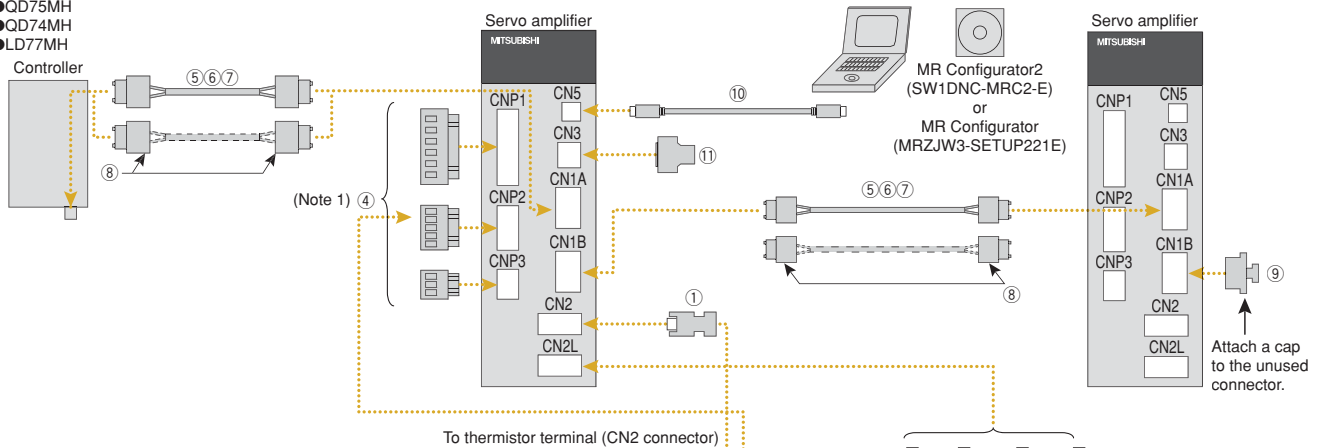




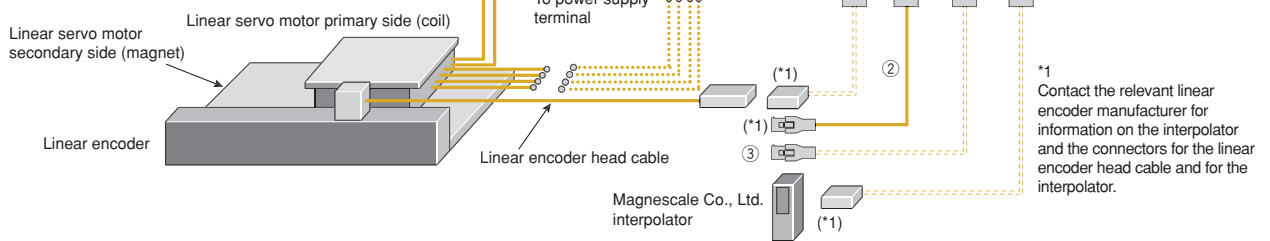
Options

●Cables and connectors for MR-J3-B-RJ004

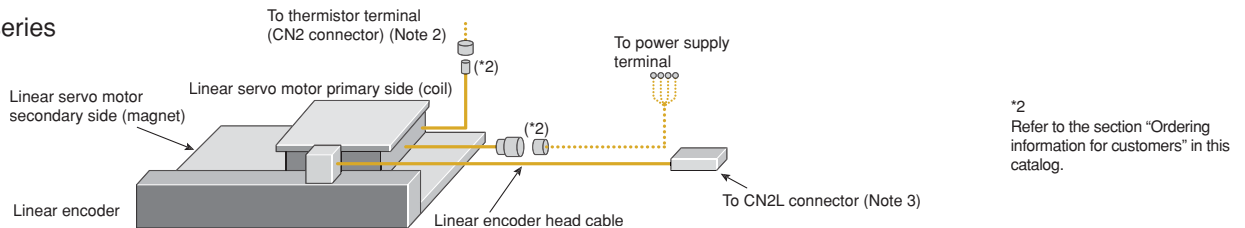
- Q173DCPU
- Q172DCPU
- Q170MCPUCPU
- Q173HCPUCPU
- Q172HCPUCPU
- QD75MH
- QD74MH
- LD77MH



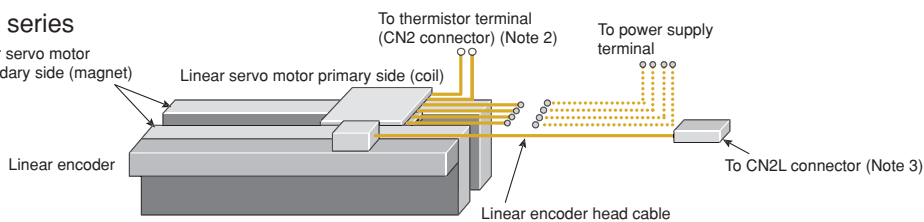
●LM-H2 series



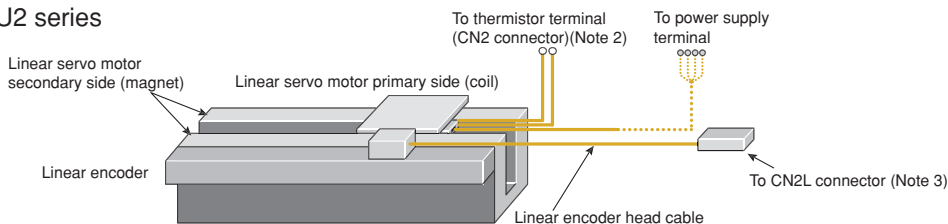
●LM-F series



●LM-K2 series



●LM-U2 series




















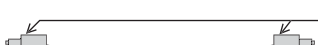


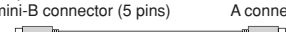

- Notes: 1. This connector set is not required for 200V 5kW or larger servo amplifiers since terminal blocks are mounted.
 2. The connection to the CN2 connector is the same as for the LM-H2 series.
 3. The connection to the CN2L connector is the same as for the LM-H2 series.

*Cautions regarding the linear encoders

- Linear encoder, head cable and encoder cable are not supplied with the linear servo motor. They must be prepared by user.
- Linear encoder and head cable, which are manufactured by the recommended manufacturers, must be used.
- Consult with the relevant manufacturers for details on the linear encoder's working environment and specifications.

Options

●Cables and connectors

Item		Model	IP rating	Description	
For CN2, CN2L	①	CN2 connector set CN2L connector set	MR-J3CN2	IP20 (Note 1)	 Amplifier connector 36210-0100PL (receptacle, 3M) 36310-3200-008 (shell kit, 3M), or 54599-1019 (connector set, Molex)
	②	Encoder cable Connectable to output cable for Mitsutoyo Corporation's scale AT343A, AT543A-SC or AT545A-SC (long bending life cable)	MR-EKCBL□M-H □=cable length 2, 5, 10m	IP20 (Note 1)	Amplifier connector 36210-0100PL (receptacle, 3M) 36310-3200-008 (shell kit, 3M), or 54599-1019 (connector set, Molex) Junction connector (Tyco Electronics) 1-172161-9 (housing) 170359-1 (connector pin) MTI-0002 (cable clamp, TOA ELECTRIC INDUSTRIAL)  Linear encoder
	③	Encoder connector set Connectable to output cable for Mitsutoyo Corporation's scale AT343A, AT543A-SC or AT545A-SC	MR-ECNM	IP20 (Note 1)	 Amplifier connector 36210-0100PL (receptacle, 3M) 36310-3200-008 (shell kit, 3M), or 54599-1019 (connector set, Molex)  Junction connector (Tyco Electronics) 1-172161-9 (housing) 170359-1 (connector pin) MTI-0002 (cable clamp, TOA ELECTRIC INDUSTRIAL) <Applicable cable example> Wire size: 0.3mm ² (AWG22) Completed cable outer diameter: φ8.2mm Crimping tool (91529-1) is required.
For CNP1, CNP2, CNP3	④	For MR-J3-70B-RJ004(U□) or smaller	(Standard accessory: Insertion type)	—	CNP1 connector  54928-0670 (connector) (Molex or an equivalent product) CNP2 connector  54928-0520 (connector) (Molex or an equivalent product) CNP3 connector  54928-0370 (connector) (Molex or an equivalent product) Insertion tool  54932-0000 (Molex or an equivalent product) <Applicable cable example> Wire size: 0.14mm ² (AWG26) to 2.5mm ² (AWG14) Completed cable outer diameter: up to φ3.8mm
		For MR-J3-350B-RJ004(U□)			CNP1 connector  PC 4/ 6-STF-7,62-CRWH (connector) (PHOENIX or an equivalent product) CNP2 connector  54928-0520 (connector) (Molex or an equivalent product) CNP3 connector  PC 4/ 3-STF-7,62-CRWH (connector) (PHOENIX or an equivalent product) Insertion tool  54932-0000 (Molex or an equivalent product) <Applicable cable example> Wire size: 0.2mm ² (AWG24) to 5.5mm ² (AWG10) Completed cable outer diameter: up to φ5mm
		For MR-J3-200BN-RJ004(U□) (Note 7)			CNP1 connector  721-207/026-000 (plug) (WAGO or an equivalent product) CNP2 connector  721-205/026-000 (plug) (WAGO or an equivalent product) CNP3 connector  721-203/026-000 (plug) (WAGO or an equivalent product) Insertion tool  231-131 (WAGO or an equivalent product) <Applicable cable example> Wire size: 0.08mm ² (AWG28) to 2.5mm ² (AWG12) Completed cable outer diameter: up to φ4.1mm
For controller, CN1A, CN1B	⑤	SSCNET III cable (Note 6) (Standard cord for inside cabinet)	MR-J3BUS□M □=cable length 0.15, 0.3, 0.5, 1, 3m	—	 Connector (Japan Aviation Electronics Industry) PF-2D103 (connector)  Connector (Japan Aviation Electronics Industry) CF-2D103-S (connector)  Connector (Japan Aviation Electronics Industry) PF-2D103 (connector)
	⑥	SSCNET III cable (Note 6) (Standard cable for outside cabinet)	MR-J3BUS□M-A □=cable length 5, 10, 20m	—	
	⑦	SSCNET III cable (Note 6) (Long distance cable, long bending life)	MR-J3BUS□M-B □=cable length 30, 40, 50m (Note 3)	—	
	⑧	Connector set for SSCNET III (Note 6)	MR-J3BCN1 (Note 5)	—	
For CN1B	⑨	Connector cap for SSCNET III	(Standard accessory)	—	
For CN5	⑩	Personal computer communication cable USB cable	MR-J3USBCBL3M Cable length 3m	—	Amplifier connector mini-B connector (5 pins) Personal computer connector A connector  Note: This cable cannot be used with the SSCNET III compatible controller.
For CN3	⑪	Input/output signal connector set	MR-CCN1	—	 Amplifier connector (3M or an equivalent product) 10120-3000PE (connector) 10320-52F0-008 (shell kit) (Note 4)







- Notes: 1. The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/linear servo motor. If the IP rating of the servo amplifier/linear servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.
2. This connector set is not required for 5kW or larger servo amplifiers since terminal blocks are mounted.
3. For the ultra-long bending life cables and/or for unlisted lengths which are 20m or shorter (available in the ultra-long bending life cables), contact Mitsubishi Electric System & Service Co., Ltd. FA PRODUCT DIVISION by email: oss-ip@melsc.jp
4. The connector and the shell kit are soldered type. Models for press bonding type are 10120-6000EL (connector) and 10320-3210-000 (shell kit).
5. Special tools are required. Contact your local sales office.
6. Look carefully through the precautions enclosed with the options before use.
7. Contact your local sales office for connectors for MR-J3-200B-RJ004(U□).



Ordering information for customers

To order the following products, contact the manufacturer directly.

When manufacturing a cable with the following connectors, refer to the manufacturer's instruction manuals for wiring and assembling procedures.

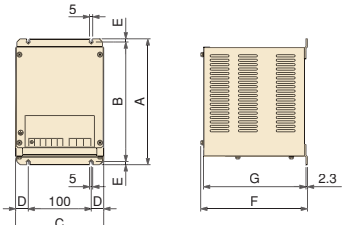
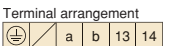
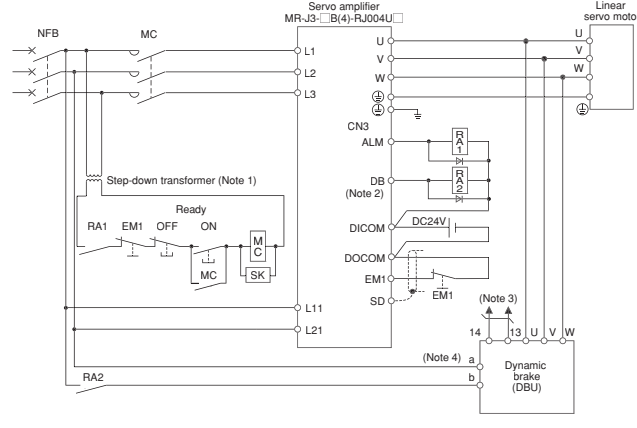
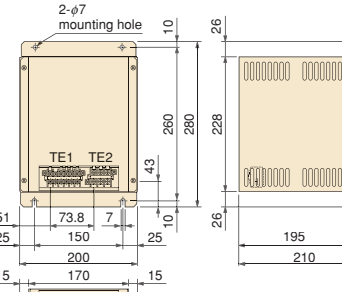
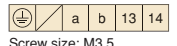

Item	Description
Power supply connector	For LM-FP2B/2D/2F  D/MS3101A18-10S (cable receptacle, DDK)  D/MS3057A-10A (cable clamp, DDK)
	For LM-FP4B/4D/4F/4H/5H  D/MS3101A24-22S (cable receptacle, DDK)  D/MS3057A-16A (cable clamp, DDK)
Thermistor connector	For LM-F series  D/MS3101A14S-9S (cable receptacle, DDK)  D/MS3057A-6A (cable clamp, DDK)

Options

●Dynamic brake (for MR-J3-B-RJ004)

Use an optional external dynamic brake with the 11kW or larger servo amplifier. Without the external dynamic brake, a linear servo motor does not stop immediately at emergency stop and falls in free-run status, causing an accident such as machine collision, etc. Take measures to ensure safety on the entire system.

Model	Servo amplifier	Fig.
DBU-11K	MR-J3-11KB-RJ004U <input type="checkbox"/>	A
DBU-15K	MR-J3-15KB-RJ004U <input type="checkbox"/>	
DBU-22K-4	MR-J3-22KB4-RJ004U <input type="checkbox"/>	B

	External dimensions (Unit: mm)	Connections																														
A	 <p>Terminal arrangement  Screw size: M3.5</p> <p>< Mounting screw size > M4</p> <table border="1"> <thead> <tr> <th>Model</th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> <th>E</th> <th>F</th> <th>G</th> <th>Mass kg (lb)</th> <th>Electrical wire size (mm²)</th> </tr> </thead> <tbody> <tr> <td>DBU-11K</td> <td>200</td> <td>190</td> <td>140</td> <td>20</td> <td>5</td> <td>170</td> <td>163.5</td> <td>2 (4.4)</td> <td>5.5 (AWG10)</td> </tr> <tr> <td>DBU-15K</td> <td>250</td> <td>238</td> <td>150</td> <td>25</td> <td>6</td> <td>235</td> <td>228</td> <td>6 (13)</td> <td>5.5 (AWG10)</td> </tr> </tbody> </table>	Model	A	B	C	D	E	F	G	Mass kg (lb)	Electrical wire size (mm ²)	DBU-11K	200	190	140	20	5	170	163.5	2 (4.4)	5.5 (AWG10)	DBU-15K	250	238	150	25	6	235	228	6 (13)	5.5 (AWG10)	 <p>Servo amplifier MR-J3-□(B4)-RJ004U <input type="checkbox"/></p> <p>Linear servo motor</p> <p>Step-down transformer (Note 1)</p> <p>Dynamic brake (DBU)</p>
Model	A	B	C	D	E	F	G	Mass kg (lb)	Electrical wire size (mm ²)																							
DBU-11K	200	190	140	20	5	170	163.5	2 (4.4)	5.5 (AWG10)																							
DBU-15K	250	238	150	25	6	235	228	6 (13)	5.5 (AWG10)																							
B	 <p>TE1  Screw size: M3.5</p> <p>TE2  Screw size: M4</p> <p>< Mounting screw size > M6</p> <table border="1"> <thead> <tr> <th rowspan="2">Model</th> <th rowspan="2">Mass kg (lb)</th> <th colspan="2">Electrical wire size (mm²)</th> </tr> <tr> <th>U, V, W</th> <th>Other than U, V, W</th> </tr> </thead> <tbody> <tr> <td>DBU-22K-4</td> <td>6.7 (15)</td> <td>5.5 (AWG10)</td> <td>2 (AWG14)</td> </tr> </tbody> </table>	Model	Mass kg (lb)	Electrical wire size (mm ²)		U, V, W	Other than U, V, W	DBU-22K-4	6.7 (15)	5.5 (AWG10)	2 (AWG14)																					
Model	Mass kg (lb)			Electrical wire size (mm ²)																												
		U, V, W	Other than U, V, W																													
DBU-22K-4	6.7 (15)	5.5 (AWG10)	2 (AWG14)																													

Notes: 1. A step-down transformer is required when coil voltage of the magnetic contactor (MC) is 200V class, and the servo amplifier is 400V class.

2. Validate the dynamic brake interlock (DB) signal by parameter No. PD07 to PD09.

3. The terminals 13 and 14 are normally opened outputs. If the dynamic brake is welded, the terminals 13 and 14 will be opened. So, create the external sequence circuit that the servo on (SON) signal does not turn on when the terminals 13 and 14 are opened.

4. When using DBU-22K-4, the power supply must be between 1-phase 380VAC to 463VAC 50/60Hz. Refer to "MR-J3-□B SERVO AMPLIFIER MANUAL" for details.

Options

●Optional regeneration unit (for MR-J3-B-RJ004)

Servo amplifier	Tolerable regenerative power of built-in regenerative resistor (W)	Tolerable regenerative power of standard accessory (external regenerative resistor) (W) (Note 3)			Tolerable regenerative power of optional regeneration unit (W) (Note 3)									
		GRZG400-			MR-RB									
		1.5Ω×4 (Note 2)	0.9Ω×5 (Note 2)	2Ω×5 (Note 2)	032 [40Ω]	12 [40Ω]	30 [13Ω]	31 [6.7Ω]	32 [40Ω]	50 [13Ω] (Note 1)	51 [6.7Ω] (Note 1)	5E [6Ω] (Note 2)	9P [4.5Ω] (Note 2)	6K-4 [10Ω] (Note 2)
MR-J3-20B-RJ004(U□)	10	-	-	-	30	100	-	-	-	-	-	-	-	-
MR-J3-40B-RJ004(U□)	10	-	-	-	30	100	-	-	-	-	-	-	-	-
MR-J3-60B-RJ004(U□)	10	-	-	-	30	100	-	-	-	-	-	-	-	-
MR-J3-70B-RJ004(U□)	20	-	-	-	30	100	-	-	300	-	-	-	-	-
MR-J3-200BN-RJ004(U□)	100	-	-	-	-	-	300	-	-	500	-	-	-	-
MR-J3-350B-RJ004(U□)	100	-	-	-	-	-	300	-	-	500	-	-	-	-
MR-J3-500B-RJ004(U□)	130	-	-	-	-	-	-	300	-	-	500	-	-	-
MR-J3-700B-RJ004(U□)	170	-	-	-	-	-	-	300	-	-	500	-	-	-
MR-J3-11KB-RJ004(U□)	-	500 (800)	-	-	-	-	-	-	-	-	-	500 (800)	-	-
MR-J3-15KB-RJ004(U□)	-	-	850 (1300)	-	-	-	-	-	-	-	-	-	850 (1300)	-
MR-J3-22KB4-RJ004(U□)	-	-	-	850 (1300)	-	-	-	-	-	-	-	-	-	850 (1300)

Notes: 1. Be sure cool the unit forcibly with a cooling fan (92 × 92mm, minimum air flow: 1.0m³/min). The cooling fan must be prepared by user.

2. The values in () indicate when cooling fans (2 units of 92 × 92mm, minimum air flow: 1.0m³/min) are installed, and parameter No. PA02 is changed.

3. The power values in this table are resistor-generated powers, not rated powers.

*Cautions when connecting the optional regeneration unit

1. The optional regeneration unit causes a temperature rise of 100°C or more relative to the ambient temperature. Fully examine heat dissipation, installation position, wires used, etc. before installing the unit. Use flame-retardant wires or apply flame retardant on wires. Keep the wires clear of the unit.
2. Always use twisted wires, maximum length of 5m, to connect the optional regeneration unit with the servo amplifier.
3. Always use twisted wires for a thermal sensor, and make sure that the sensor does not fail to work properly due to inducted noise.



External dimensions	(Unit: mm)	Connections																													
<p>●MR-RB032, MR-RB12 (200VAC)</p> <p style="text-align: center;"><Terminal arrangement></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>TE1</td></tr> <tr><td>G3</td></tr> <tr><td>G4</td></tr> <tr><td>P</td></tr> <tr><td>C</td></tr> </table> <p style="text-align: center;">Applicable wire size: 0.2mm² (AWG24) to 2.5mm² (AWG12)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Model</th> <th colspan="4">Variable dimensions</th> <th>Mass</th> </tr> <tr> <th></th> <th>LA</th> <th>LB</th> <th>LC</th> <th>LD</th> <th>kg (lb)</th> </tr> </thead> <tbody> <tr> <td>MR-RB032</td> <td>30</td> <td>119</td> <td>99</td> <td>1.6</td> <td>0.5 (1.1)</td> </tr> <tr> <td>MR-RB12</td> <td>40</td> <td>169</td> <td>149</td> <td>2</td> <td>1.1 (2.4)</td> </tr> </tbody> </table>		TE1	G3	G4	P	C	Model	Variable dimensions				Mass		LA	LB	LC	LD	kg (lb)	MR-RB032	30	119	99	1.6	0.5 (1.1)	MR-RB12	40	169	149	2	1.1 (2.4)	
TE1																															
G3																															
G4																															
P																															
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Model	Variable dimensions				Mass																										
	LA	LB	LC	LD	kg (lb)																										
MR-RB032	30	119	99	1.6	0.5 (1.1)																										
MR-RB12	40	169	149	2	1.1 (2.4)																										
<p>●MR-RB30, MR-RB31, MR-RB32 (200VAC)</p> <p style="text-align: center;"><Terminal arrangement></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>P</td></tr> <tr><td>C</td></tr> <tr><td>G3</td></tr> <tr><td>G4</td></tr> </table> <p style="text-align: center;">Terminal screw size: M4</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Model</th> <th>Mass</th> </tr> <tr> <th></th> <th>kg (lb)</th> </tr> </thead> <tbody> <tr> <td>MR-RB30</td> <td rowspan="3">2.9 (6.4)</td> </tr> <tr> <td>MR-RB31</td> </tr> <tr> <td>MR-RB32</td> </tr> </tbody> </table>		P	C	G3	G4	Model	Mass		kg (lb)	MR-RB30	2.9 (6.4)	MR-RB31	MR-RB32	<p>●MR-J3-350B-RJ004(U□) or smaller</p>																	
P																															
C																															
G3																															
G4																															
Model	Mass																														
	kg (lb)																														
MR-RB30	2.9 (6.4)																														
MR-RB31																															
MR-RB32																															
<p>●MR-RB50, MR-RB51 (200VAC)</p> <p style="text-align: center;"><Terminal arrangement></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>P</td></tr> <tr><td>C</td></tr> <tr><td>G3</td></tr> <tr><td>G4</td></tr> </table> <p style="text-align: center;">Terminal screw size: M4</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Model</th> <th>Mass</th> </tr> <tr> <th></th> <th>kg (lb)</th> </tr> </thead> <tbody> <tr> <td>MR-RB50</td> <td rowspan="2">5.6 (12)</td> </tr> <tr> <td>MR-RB51</td> </tr> </tbody> </table>		P	C	G3	G4	Model	Mass		kg (lb)	MR-RB50	5.6 (12)	MR-RB51	<p>●MR-J3-500B-RJ004(U□) ●MR-J3-700B-RJ004U□</p>																		
P																															
C																															
G3																															
G4																															
Model	Mass																														
	kg (lb)																														
MR-RB50	5.6 (12)																														
MR-RB51																															

- Notes: 1. Create a sequence circuit that turns off the magnetic contactor (MC) when abnormal overheating occurs.
 2. When using MR-RB50 or MR-RB51, cool the unit forcibly with a cooling fan (92 × 92mm, minimum air flow: 1.0m³/min). The cooling fan must be prepared by user.
 3. The G3 and G4 terminals are thermal sensor. G3-G4 opens when the regeneration unit overheats abnormally.

Options

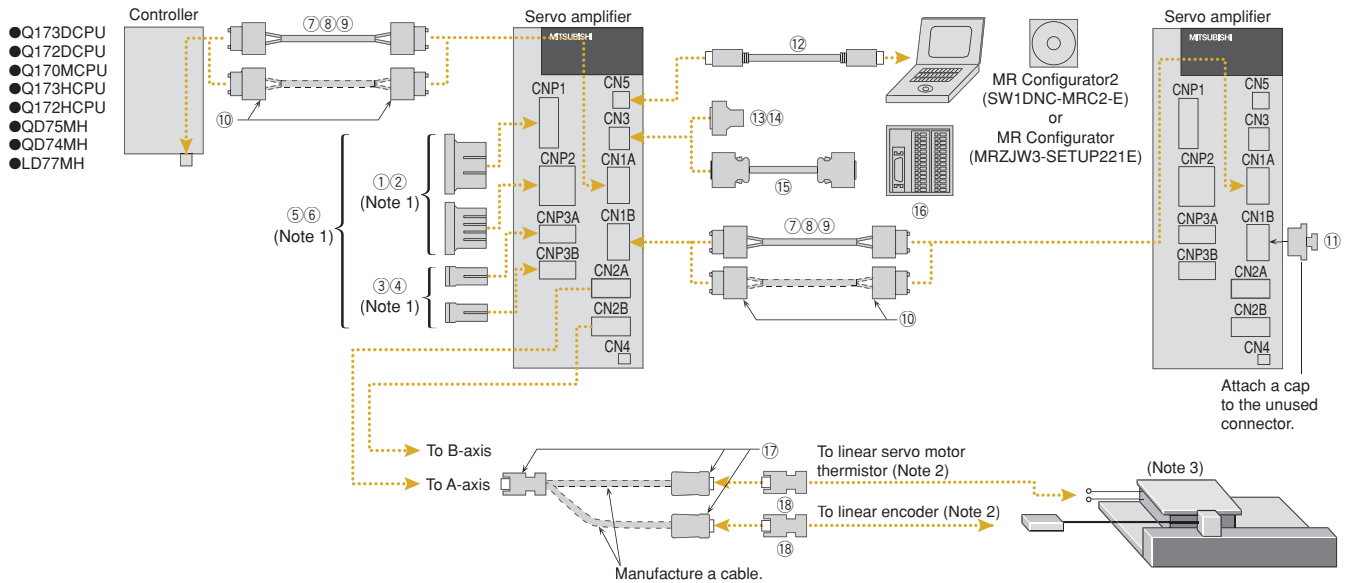
●Optional regeneration unit (for MR-J3-B-RJ004)

External dimensions	Connections																						
<p>Standard accessory (Note 1) ●GRZG400-1.5Ω, GRZG400-0.9Ω (200VAC) ●GRZG400-2Ω (400VAC)</p> <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Model</th> <th>Qty.</th> <th>Tolerable regenerative power (W)</th> <th>With cooling fan (W)</th> <th>Resistance value (Ω)</th> <th>Mass/unit kg (lb)</th> </tr> </thead> <tbody> <tr> <td>GRZG400-1.5Ω</td> <td>4</td> <td>500</td> <td>800</td> <td>6 (1.5Ω × 4)</td> <td rowspan="3">0.8 (1.8)</td> </tr> <tr> <td>GRZG400-0.9Ω</td> <td>5</td> <td>850</td> <td>1300</td> <td>4.5 (0.9Ω × 5)</td> </tr> <tr> <td>GRZG400-2Ω</td> <td>5</td> <td>850</td> <td>1300</td> <td>10 (2Ω × 5)</td> </tr> </tbody> </table>	Model	Qty.	Tolerable regenerative power (W)	With cooling fan (W)	Resistance value (Ω)	Mass/unit kg (lb)	GRZG400-1.5Ω	4	500	800	6 (1.5Ω × 4)	0.8 (1.8)	GRZG400-0.9Ω	5	850	1300	4.5 (0.9Ω × 5)	GRZG400-2Ω	5	850	1300	10 (2Ω × 5)	
Model	Qty.	Tolerable regenerative power (W)	With cooling fan (W)	Resistance value (Ω)	Mass/unit kg (lb)																		
GRZG400-1.5Ω	4	500	800	6 (1.5Ω × 4)	0.8 (1.8)																		
GRZG400-0.9Ω	5	850	1300	4.5 (0.9Ω × 5)																			
GRZG400-2Ω	5	850	1300	10 (2Ω × 5)																			
<p>●MR-RB5E, MR-RB9P (200VAC) (Note 1) ●MR-RB6K-4 (400VAC) (Note 1)</p> <table border="1" style="width:100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th>Model</th> <th>Tolerable regenerative power (W)</th> <th>With cooling fan (W)</th> <th>Description</th> <th>Mass kg (lb)</th> </tr> </thead> <tbody> <tr> <td>MR-RB5E</td> <td>500</td> <td>800</td> <td>GRZG400-1.5Ω × 4</td> <td>10 (22)</td> </tr> <tr> <td>MR-RB9P</td> <td>850</td> <td>1300</td> <td>GRZG400-0.9Ω × 5</td> <td>11 (24)</td> </tr> <tr> <td>MR-RB6K-4</td> <td>850</td> <td>1300</td> <td>GRZG400-2Ω × 5</td> <td>11 (24)</td> </tr> </tbody> </table>	Model	Tolerable regenerative power (W)	With cooling fan (W)	Description	Mass kg (lb)	MR-RB5E	500	800	GRZG400-1.5Ω × 4	10 (22)	MR-RB9P	850	1300	GRZG400-0.9Ω × 5	11 (24)	MR-RB6K-4	850	1300	GRZG400-2Ω × 5	11 (24)			
Model	Tolerable regenerative power (W)	With cooling fan (W)	Description	Mass kg (lb)																			
MR-RB5E	500	800	GRZG400-1.5Ω × 4	10 (22)																			
MR-RB9P	850	1300	GRZG400-0.9Ω × 5	11 (24)																			
MR-RB6K-4	850	1300	GRZG400-2Ω × 5	11 (24)																			

- Notes: 1. To increase the regeneration braking frequency, install cooling fans (2 units of 92 × 92mm, minimum air flow: 1.0m³/min) and change parameter No. PA02. The cooling fans must be prepared by user.
 2. By installing a thermal sensor, create a safety circuit that shuts off the main circuit power supply when abnormal overheating occurs.
 3. The G3 and G4 terminals are thermal sensor. G3-G4 opens when the regeneration unit overheats abnormally.



●Cables and connectors for MR-J3W-B







- Notes: 1. These connector sets are not included with the servo amplifier. Please purchase them separately.
 2. Necessary options vary depending on the linear encoder connected. Refer to "MR-J3W-B SERVO AMPLIFIER INSTRUCTION MANUAL" for details.
 3. Refer to the section "Cables and connectors for MR-J3-B-RJ004" in this catalog for the power supply connection with the linear servo motor.

Item		Model	IP rating	Description	
For CNP1 and CNP2	①	CNP1/CNP2 connector set (Qty: 1pc each)	—		
	②	CNP1/CNP2 connector set (Qty: 10pcs each)	—	CNP1 main circuit power supply connector set (JST Mfg.) J43FSS-03V-KX (receptacle housing) BJ4F-71GF-M3.0 (receptacle contact) <Applicable cable example> Wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Insulated outer diameter: φ2.0mm to φ3.8mm Crimping tool (YRF-1130) is required.	CNP2 control circuit power supply connector set (JST Mfg.) F32FMS-06V-KXY (receptacle housing) BF3F-71GF-P2.0 (receptacle contact) <Applicable cable example> Wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Insulated outer diameter: φ2.4mm to φ3.4mm Crimping tool (YRF-1070) is required.
For CNP3A and CNP3B	③	CNP3A/CNP3B motor power supply connector set (Qty: 1pc) (for thick wires)	—		
	④	CNP3A/CNP3B motor power supply connector set (Qty: 20pcs) (for thick wires)	—	CNP3A/CNP3B motor power supply connector set (JST Mfg.) F35FDC-04V-K (receptacle housing) BF3F-71GF-P2.0 (receptacle contact) <Applicable cable example> Wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Insulated outer diameter: φ2.4mm to φ3.3mm Crimping tool (YRF-1070) is required.	
For CNP1, CNP2, CNP3A and CNP3B	⑤	MR-J3W-B power supply connector set (Set for 1 unit (for 2 axes))	—		
	⑥	MR-J3W-B power supply connector set (Set for 10 units (for 20 axes))	—	These are included in one set for one unit. CNP1 main circuit power supply connector (1pc) (JST Mfg.) 03JFAT-SAGFK-43 Applicable wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) CNP3A/CNP3B motor power supply connector (2pcs) (JST Mfg.) 04JFAT-SAGG-G-KK Applicable wire size: 0.75mm ² (AWG19) to 2.0mm ² (AWG14)	CNP2 control circuit power supply connector (1pc) (JST Mfg.) 06JFAT-SAXYGG-F-KK Applicable wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Optional tool (1pc) (JST Mfg.) J-FAT-OT-EXL

Options

●Cables and connectors for MR-J3W-B

Item		Model	IP rating	Description	
For controller, CN1A and CN1B	⑦ SSCNET III cable (Note 3) (Standard cord for inside cabinet)	MR-J3BUS□M □=cable length: 0.15, 0.3, 0.5, 1, 3m	—	Connector (Japan Aviation Electronics Industry) PF-2D103 (connector)	Connector (Japan Aviation Electronics Industry) PF-2D103 (connector)
	⑧ SSCNET III cable (Note 3) (Standard cable for outside cabinet)	MR-J3BUS□M-A □=cable length: 5, 10, 20m	—		
	⑨ SSCNET III cable (Note 3) (Long distance cable, long bending life)	MR-J3BUS□M-B □=cable length: 30, 40, 50m (Note 1)	—	Connector (Japan Aviation Electronics Industry) CF-2D103-S (connector)	Connector (Japan Aviation Electronics Industry) CF-2D103-S (connector)
	⑩ Connector set for SSCNET III (Note 3)	MR-J3BCN1 (Note 2)	—	Connector (Japan Aviation Electronics Industry) PF-2D103 (connector)	Connector (Japan Aviation Electronics Industry) PF-2D103 (connector)
For CN1B	⑪ Connector cap for SSCNET III	(Standard accessory)	—		
For CN5	⑫ Personal computer communication cable USB cable	MR-J3USBCBL3M Cable length: 3m	—	Amplifier connector mini-B connector (5 pins)	Personal computer connector A connector Note: This cable cannot be used with the SSCNET III compatible controller.
For CN3	⑬ Connector set (for CN3)	MR-J2CMP2 (Qty: 1pc)	—		Amplifier connector (3M or an equivalent product) 10126-3000PE (connector) 10326-52F0-008 (shell kit)
		MR-ECN1 (Qty: 20pcs)			
	⑮ Junction terminal block cable	MR-TBNATBL□M □=cable length: 0.5, 1m	—	Junction terminal block connector (3M or an equivalent product) 10126-6000EL (connector) 10326-3210-000 (shell kit)	Amplifier connector (3M or an equivalent product) 10126-6000EL (connector) 10326-3210-000 (shell kit)
	⑯ Junction terminal block	MR-TB26A	—		
For linear servo motor	⑰ Connector set (for linear encoder and thermistor)	MR-J3THMCN2	—	Junction connector (3M) 36110-3000FD (plug) 36310-F200-008 (shell kit)	Amplifier connector 36210-0100PL (receptacle, 3M), 36310-3200-008 (shell kit, 3M) or 54599-1019 (connector set, Molex)
	⑱ Connector set (for linear encoder and thermistor connection)	MR-J3CN2	—	Linear encoder and thermistor connection connector 36210-0100PL (receptacle, 3M), 36310-3200-008 (shell kit, 3M) or 54599-1019 (connector set, Molex)	

- Notes: 1. For the ultra-long bending life cables and/or for unlisted lengths which are 20m or shorter (available in the ultra-long bending life cables), contact Mitsubishi Electric System & Service Co., Ltd. FA PRODUCT DIVISION by email: oss-ip@melsc.jp
 2. Special tools are required. Contact your local sales office for details.
 3. Look carefully through the precautions enclosed with the options before use.




Ordering information for customers

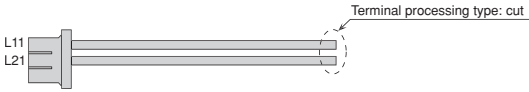
To order the following products, contact the relevant manufacturers directly.

When manufacturing a cable with the following connectors, refer to the relevant manufacturers' instruction manuals for wiring and assembling procedures.

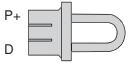
●Main circuit power supply cable (for CNP1)

Model	Description	Wire size
SC-EMP01CBL□M-L □= cable length: 2, 5m (Note 2, 3)	 <p>Mitsubishi Electric System & Service Co., Ltd. (Note 1)</p>	AWG14


●Control circuit power supply cable (for CNP2-B(Y))

Model	Description	Wire size
SC-ECP01CBL□M-L □= cable length: 2, 5m (Note 2, 3)	 <p>Mitsubishi Electric System & Service Co., Ltd. (Note 1)</p>	AWG16

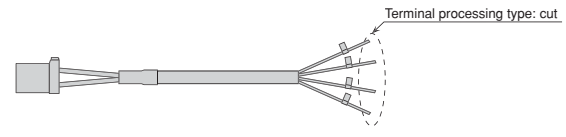
●Built-in regenerative resistor short connector (for CNP2-A(X))

Model	Description	Wire size
SC-ERG02CBL01M-L	 <p>Mitsubishi Electric System & Service Co., Ltd. (Note 1)</p>	AWG14

●Optional regeneration unit cable (for CNP2-A(X))

Model	Description	Wire size
SC-ERG01CBL□M-L □= cable length: 2, 5m (Note 2, 3)	 <p>Mitsubishi Electric System & Service Co., Ltd. (Note 1)</p>	AWG14

●Power supply cable for LM-H2/LM-K2/LM-U2 linear servo motor

Model	Description	Wire size
SC-EPWS2CBL□M-L □= cable length: 2, 5, 10, 20, 30m (Note 2, 3)	 <p>Mitsubishi Electric System & Service Co., Ltd. (Note 1)</p>	AWG18 × 4C (2, 5, 10m)
Standard bending life		AWG16 × 4C (20, 30m)
SC-EPWS2CBL□M-H □= cable length: 2, 5, 10, 20, 30m (Note 2, 3)		AWG19 × 4C (2, 5, 10m)
Long bending life		AWG14 × 4C (20, 30m)


Notes: 1. Contact Mitsubishi Electric System & Service Co., Ltd. FA PRODUCT DIVISION by email: oss-ip@melsc.jp

2. Unlisted lengths are also available per meter: up to 10m for the servo amplifier power supply cable and the motor power supply cable.



3. -H and -L indicate a bending life. -H indicates a long bending life, and -L indicates a standard bending life.

Ordering information for customers



●Servo amplifier main circuit power supply connector (CNP1) *A crimping tool is required.

Model		Description	Applicable wire example
Receptacle housing	Receptacle contact		
J43FSS-03V-KX	BJ4F-71GF-M3.0	 JST Mfg. Co., Ltd.	Wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Insulated outer diameter: φ2.0mm to φ3.8mm Crimping tool (YRF-1130) is required.

●Servo amplifier control circuit power supply connector (CNP2) *A crimping tool is required.

Model		Description	Applicable wire example
Receptacle housing	Receptacle contact		
F32FMS-06V-KXY	BF3F-71GF-P2.0	 JST Mfg. Co., Ltd.	Wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Insulated outer diameter: φ2.4mm to φ3.4mm Crimping tool (YRF-1070) is required.
3-178129-6	917511-2	 Tyco Electronics Corporation	Wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Insulated outer diameter: φ2.2mm to φ2.8mm Crimping tool (91560-1) is required.
	353717-2		Wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Insulated outer diameter: φ3.3mm to φ3.8mm Crimping tool (91561-1) is required.

●Motor power supply connector (CNP3A/CNP3B) *A crimping tool is required.

Model		Description	Applicable wire example
Receptacle housing	Receptacle contact		
F35FDC-04V-K	BF3F-71GF-P2.0	 JST Mfg. Co., Ltd.	Wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Insulated outer diameter: φ2.4mm to φ3.4mm Crimping tool (YRF-1070) is required.
175363-1	917511-2	 Tyco Electronics Corporation	Wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Insulated outer diameter: φ2.2mm to φ2.8mm Crimping tool (91560-1) is required.
	353717-2		Wire size: 1.25mm ² (AWG16) to 2.0mm ² (AWG14) Insulated outer diameter: φ3.3mm to φ3.8mm Crimping tool (91561-1) is required.

Peripheral equipment

●Electrical wires, circuit breakers and magnetic contactors (example of selection for MR-J3-B-RJ004)

The following are examples of wire sizes when 600V polyvinyl chloride insulated wires (IV wires) with a length of 30m are used.

When using LM-F series linear servo motors, be sure to use HIV wires for motor power supply.

Servo amplifier	Circuit breaker	Magnetic contactor (Note 2)	Electrical wire size (mm ²)				
			L1, L2, L3, ⊕	L11, L21	U, V, W, ⊕	P, C	THM1, THM2
MR-J3-20B-RJ004(U□)	30A frame 5A	S-N10	2 (AWG14)	1.25 (AWG16)	1.25 (AWG16)	2 (AWG14)	0.2 (AWG24)
MR-J3-40B-RJ004(U□)	30A frame 10A						
MR-J3-60B-RJ004(U□)	30A frame 15A				2 (AWG14)(Note 3)		
MR-J3-70B-RJ004(U□)							
MR-J3-200BN-RJ004(U□)	30A frame 20A	S-N18					
MR-J3-350B-RJ004(U□)	30A frame 30A	S-N20	3.5 (AWG12)	1.25 (AWG16)	3.5 (AWG12)		
MR-J3-500B-RJ004(U□) (Note 1)	50A frame 50A	S-N35	5.5 (AWG10)		5.5 (AWG10)(Note 3)		
MR-J3-700B-RJ004(U□) (Note 1)	100A frame 75A	S-N50	8 (AWG8)			3.5 (AWG12)	
MR-J3-11KB-RJ004(U□) (Note 1)	100A frame 100A	S-N65	14 (AWG6)		(Note 3)	5.5 (AWG10)	
MR-J3-15KB-RJ004(U□) (Note 1)	225A frame 125A	S-N95	22 (AWG4)				
MR-J3-22KB4-RJ004(U□) (Note 1)	225A frame 125A	S-N65	14 (AWG6)				

Notes: 1. When connecting wires to the terminal screws, be sure to use the screws attached to the terminal blocks.

2. Be sure to use a magnetic contactor (MC) with an operation delay time of 80ms or less. The operation delay time is the time interval between current being applied to the coil until closure of contacts.

3. When using LM-F series linear servo motor, refer to the following examples of HIV wires (U, V, W and ⊕).

The following are examples of HIV wire sizes (for U, V, W and ⊕) for LM-F series.

Linear servo motor	Cooling method	Electrical wire size (mm ²) U, V, W, ⊕
LM-FP2B-06M-1SS0	Natural-cooling	2 (AWG14)
	Liquid-cooling	
LM-FP2D-12M-1SS0	Natural-cooling	3.5 (AWG12)
	Liquid-cooling	
LM-FP2F-18M-1SS0	Natural-cooling	3.5 (AWG12)
	Liquid-cooling	5.5 (AWG10)
LM-FP4B-12M-1SS0	Natural-cooling	5.5 (AWG10)
	Liquid-cooling	
LM-FP4D-24M-1SS0	Natural-cooling	8 (AWG8)
	Liquid-cooling	
LM-FP4F-36M-1SS0	Natural-cooling	5.5 (AWG10)
	Liquid-cooling	14 (AWG6)
LM-FP4H-48M-1SS0	Natural-cooling	8 (AWG8)
	Liquid-cooling	22 (AWG4)
LM-FP5H-60M-1SS0	Natural-cooling	8 (AWG8)
	Liquid-cooling	8 (AWG8)

●Electrical wires, circuit breakers and magnetic contactors (example of selection for MR-J3W-B)

The following are examples of wire sizes when 600V polyvinyl chloride insulated wires (IV wires) with a length of 30m are used.

Servo amplifier	Circuit breaker (Note 1)	Electrical wire size (mm ²)					THM1, THM2
		L1, L2, L3, ⊕	L11, L21	U, V, W, ⊕	P+, C	P+, D	
MR-J3W-22B	S-N10			2 (AWG14)			0.2 (AWG24)
MR-J3W-44B							
MR-J3W-77B							
MR-J3W-1010B	S-N18						

Notes: 1. Be sure to use a magnetic contactor (MC) with an operation delay time of 80ms or less. The operation delay time is the time interval between current being applied to the coil until closure of contacts.

●Circuit breakers (example of selection for MR-J3W-B)

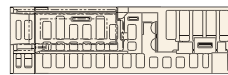
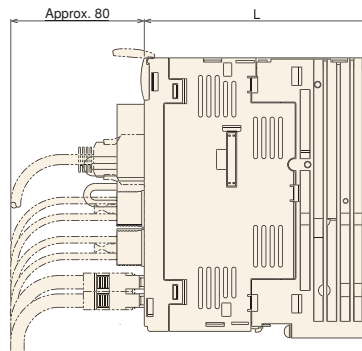
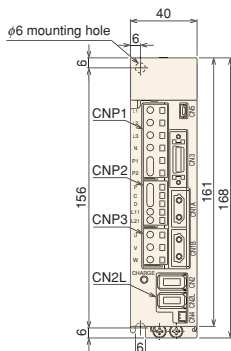
Circuit breakers	Total continuous thrust of linear servo motors
30A frame 10A	120N or less
30A frame 15A	Over 120N to 240N
30A frame 20A	Over 240N to 480N



Servo amplifier dimensions

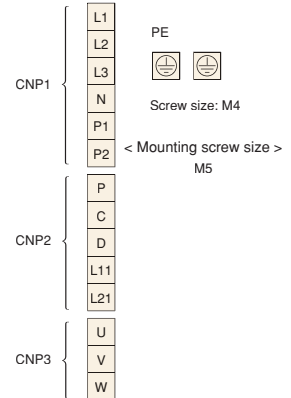
●MR-J3-20B-RJ004(U□), 40B-RJ004(U□), 60B-RJ004(U□) (Note 1)

(Unit: mm)

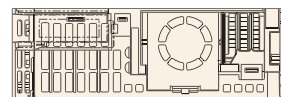
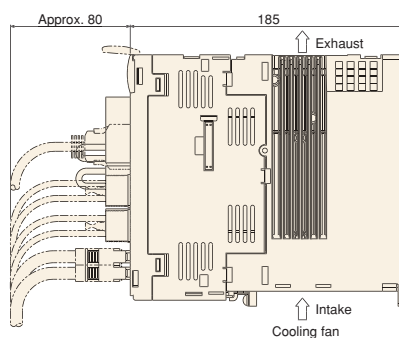
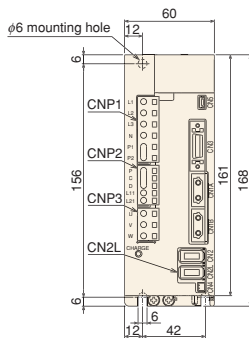


Model	Variable dimension L
MR-J3-20B-RJ004(U□)	135
MR-J3-40B-RJ004(U□)	170
MR-J3-60B-RJ004(U□)	170

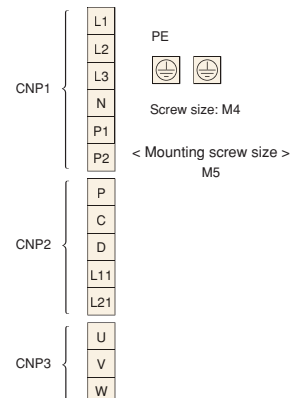
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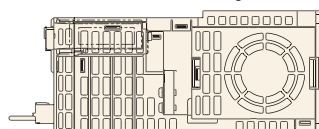
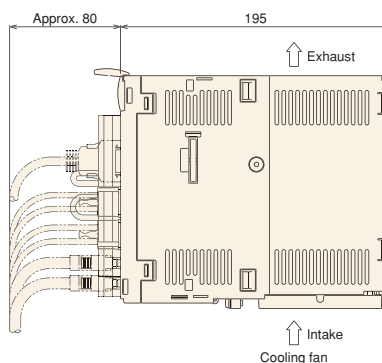
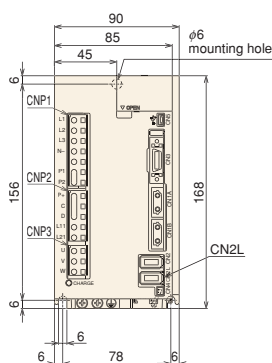
●MR-J3-70B-RJ004(U□) (Note 1)



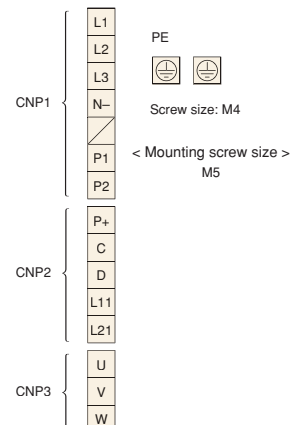
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●MR-J3-200BN-RJ004(U□) (Note 1, 2)



< Terminal arrangement >



* The dimensions are applicable for the servo amplifier manufactured on August 2010 or later. The previous model is also available. Contact your local sales office for more details.

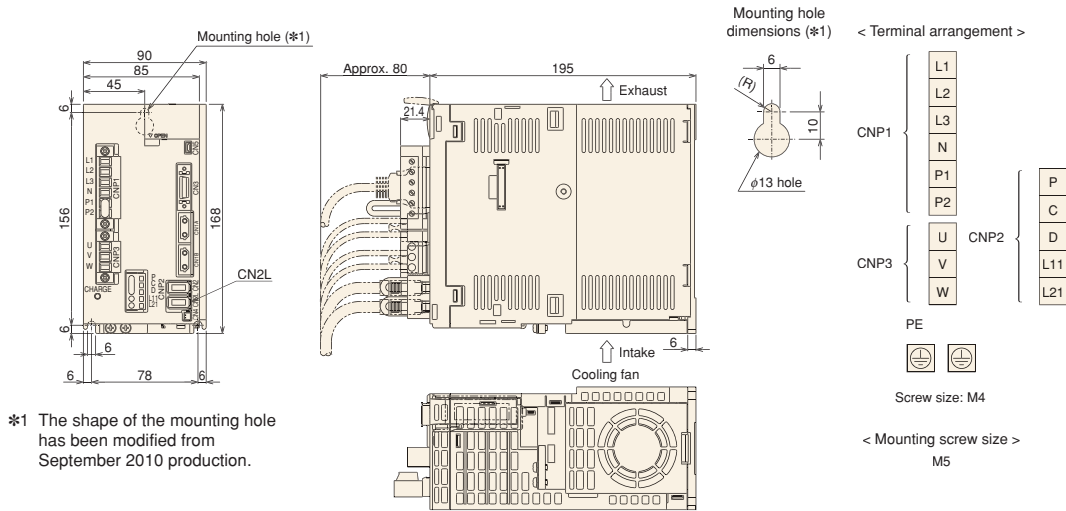
Notes: 1. The connectors CNP1, CNP2 and CNP3 (insertion type) are supplied with the servo amplifier.

2. Servo amplifier model that is compatible with LM-F series is MR-J3-□B-RJ004U□. Refer to the section "Servo amplifier model designation" for more details.

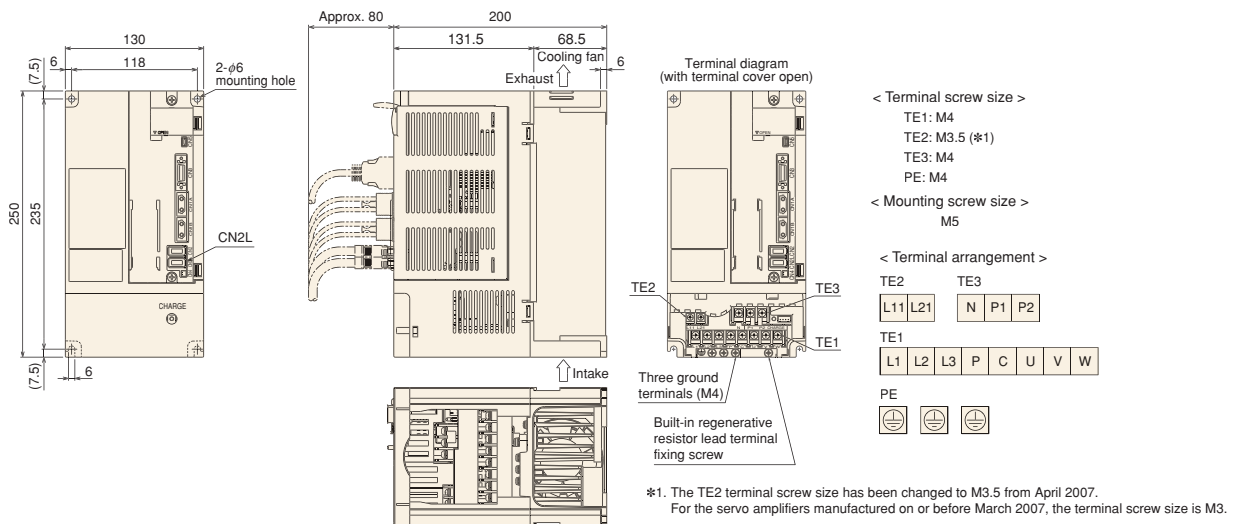
Servo amplifier dimensions

●MR-J3-350B-RJ004(U□) (Note 1)

(Unit: mm)



●MR-J3-500B-RJ004(U□) (Note 2)

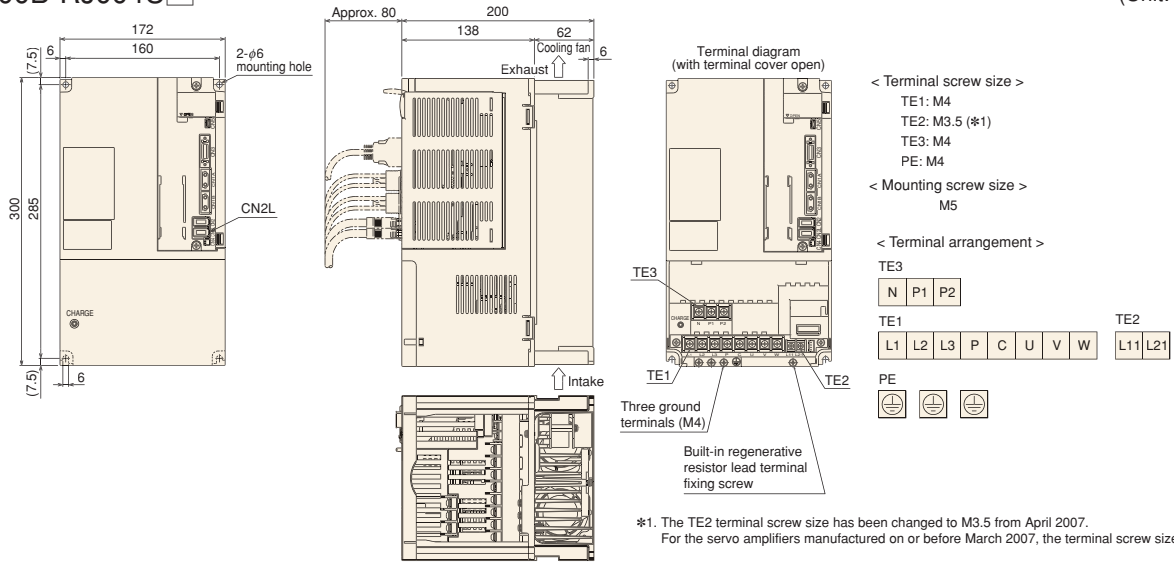


- Notes: 1. The connectors CNP1, CNP2 and CNP3 (insertion type) are supplied with the servo amplifier.
 2. Servo amplifier model that is compatible with LM-F series is MR-J3-□B-RJ004U□. Refer to the section "Servo amplifier model designation" for more details.

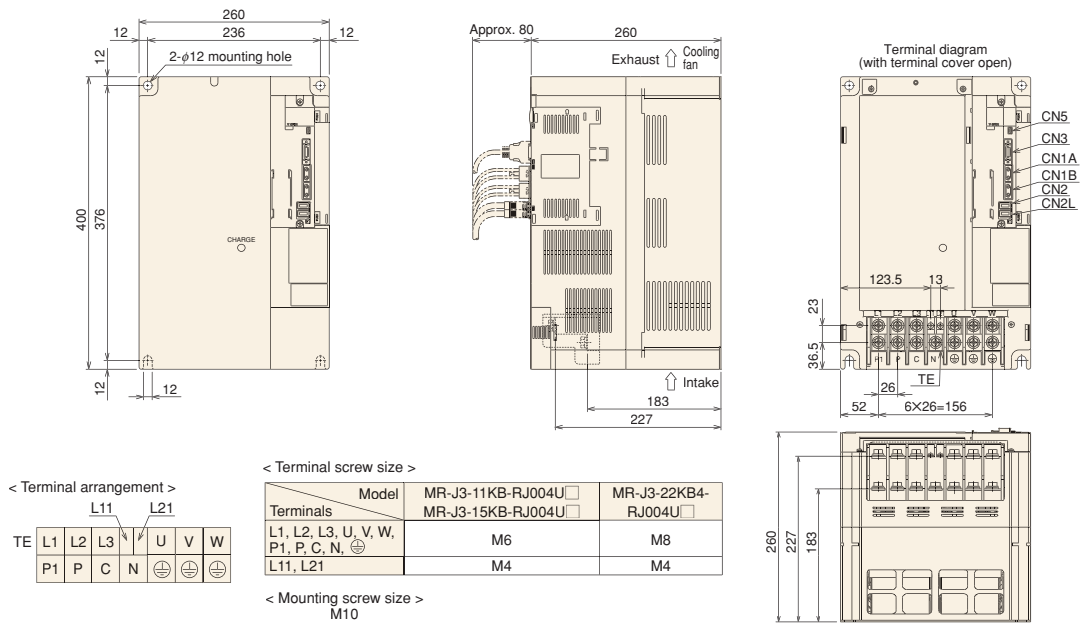


●MR-J3-700B-RJ004U□

(Unit: mm)



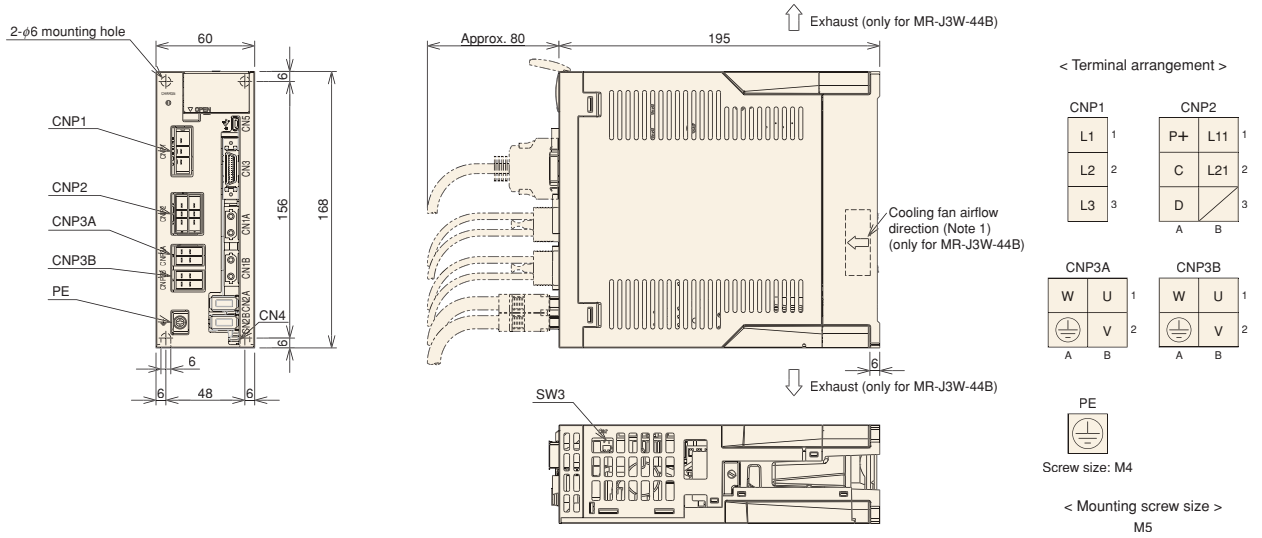
●MR-J3-11KB-RJ004U□, 15KB-RJ004U□, 22KB4-RJ004U□



Servo amplifier dimensions

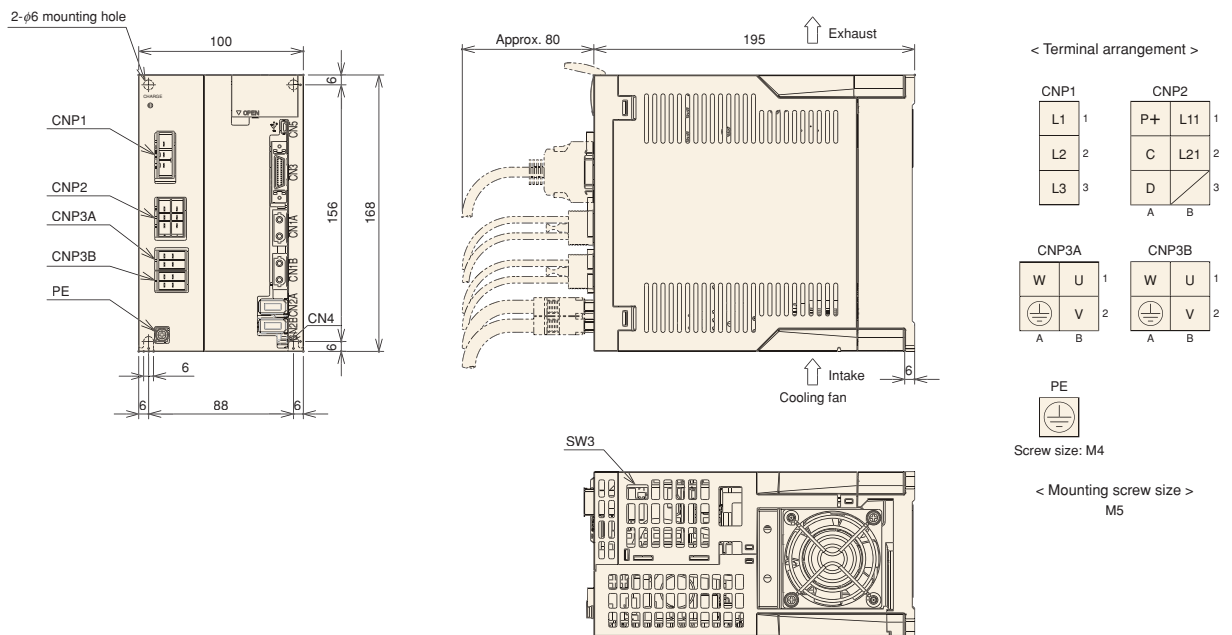
●MR-J3W-22B, MR-J3W-44B

(Unit: mm)



Notes: 1. Not necessary to open an air hole for the cooling fan on a cabinet.

●MR-J3W-77B, MR-J3W-1010B





Product list

Item	Model	Description	
Servo amplifier MR-J3-B-RJ004 (Note 1, 2, 3)	MR-J3-20B-RJ004(U□)	Main circuit power supply: 3-phase or 1-phase 200VAC to 230VAC	
	MR-J3-40B-RJ004(U□)		
	MR-J3-60B-RJ004(U□)		
	MR-J3-70B-RJ004(U□)		
	MR-J3-200BN-RJ004(U□)	Main circuit power supply: 3-phase 200VAC to 230VAC	
	MR-J3-350B-RJ004(U□)		
	MR-J3-500B-RJ004(U□)		
	MR-J3-700B-RJ004(U□)		
	MR-J3-11KB-RJ004(U□)		
MR-J3-15KB-RJ004(U□)	Main circuit power supply: 3-phase 380VAC to 480VAC		
MR-J3-22KB4-RJ004(U□)			
Servo amplifier MR-J3W-B	MR-J3W-22B	Main circuit power supply: 3-phase or 1-phase 200VAC to 230VAC (Note 4)	
	MR-J3W-44B		
	MR-J3W-77B		
	MR-J3W-1010B	Main circuit power supply: 3-phase 200VAC to 230VAC	
Connector set	MR-CCN1	Connector set for CN3 connector of MR-J3-B-RJ004	
	MR-J3CN2	Connector set for CN2 or CN2L of MR-J3-B-RJ004, or Connector set for MR-J3W-B (for linear encoder and thermistor connection)	
	MR-J2CMP2	Connector set for CN3 of MR-J3W-B (1pc)	
	MR-ECN1	Connector set for CN3 of MR-J3W-B (20pcs)	
	MR-J3THMCN2	Connector set for CN2A/CN2B connector of MR-J3W-B (for linear encoder and thermistor)	
Encoder cable	MR-EKCBL2M-H	2m	Connectable to output cables for the linear scales manufactured by Mitutoyo Corporation
	MR-EKCBL5M-H	5m	
	MR-EKCBL10M-H	10m	
Encoder connector set (for junction)	MR-ECNM	Junction connector (1pc) and Servo amplifier connector (1pc)	
MR-J3W-B servo amplifier Power supply connector set	MR-J3WCNP12-DM	CNP1/CNP2 connector set (1pc for each connector)	
	MR-J3WCNP12-DM-10P	CNP1/CNP2 connector set (10pcs for each connector)	
MR-J3W-B servo amplifier Motor power supply connector set	MR-J3WCNP3-D2L	CNP3A/CNP3B motor power supply connector set (for thick wires) (1pc)	
	MR-J3WCNP3-D2L-20P	CNP3A/CNP3B motor power supply connector set (for thick wires) (20pcs)	
MR-J3W-B servo amplifier Power supply connector set (Set for 1 unit (for 2 axes))	MR-J3WCNP123-SP	CNP1 connector (1pc), CNP2 connector (1pc), CNP3A/CNP3B connectors (2pcs) and optional tool (1pc)	
MR-J3W-B servo amplifier Power supply connector set (Set for 10 units (for 20 axes))	MR-J3WCNP123-SP-10P	CNP1 connector (10pcs), CNP2 connector (10pcs), CNP3A/CNP3B connectors (20pcs) and optional tool (10pcs)	
SSCNET III cable (Standard cord for inside cabinet)	MR-J3BUS015M	0.15m	Fiber-optic cable (Standard life cable)
	MR-J3BUS03M	0.3m	
	MR-J3BUS05M	0.5m	
	MR-J3BUS1M	1m	
	MR-J3BUS3M	3m	
SSCNET III cable (Standard cable for outside cabinet)	MR-J3BUS5M-A	5m	Fiber-optic cable (Long bending life)
	MR-J3BUS10M-A	10m	
	MR-J3BUS20M-A	20m	
SSCNET III cable (Long distance cable)	MR-J3BUS30M-B	30m	Fiber-optic cable (Long bending life)
	MR-J3BUS40M-B	40m	
	MR-J3BUS50M-B	50m	
Connector set for SSCNET III	MR-J3BCN1	-	
Junction terminal block	MR-TB26A	For MR-J3W-B	
Junction terminal block cable (for MR-TB26A)	MR-TBNATBL05M	0.5m	For CN3 connector of MR-J3W-B
	MR-TBNATBL1M	1m	
Personal computer communication cable (USB cable)	MR-J3USBCBL3M	3m	For CN5 connector of MR-J3-B-RJ004 or MR-J3W-B

Notes: 1. Servo amplifier model that is compatible with LM-F series is MR-J3-□B(4)-RJ004U□.

2. Servo amplifier model that is compatible with LM-H2 and LM-U2 series is MR-J3-□B-RJ004. However, MR-J3-□B-RJ004U□ is also available as before.

3. Servo amplifier model that is compatible with LM-K2 series is MR-J3-□B-RJ004.

4. For MR-J3W-77B, this input voltage will be applicable for the servo amplifier manufactured in January 2011 or later. For the servo amplifier manufactured in December 2010 or earlier, the input voltage is 3-phase 200VAC to 230VAC.

5. Contact your local sales office for the prices and the specifications.

Product list

Item	Model	Description
Linear servo motor LM-H2 series Primary side (coil)	LM-H2P1A-06M-4SS0	Continuous thrust: 60N, Maximum thrust: 150N
	LM-H2P2A-12M-1SS0	Continuous thrust: 120N, Maximum thrust: 300N
	LM-H2P2B-24M-1SS0	Continuous thrust: 240N, Maximum thrust: 600N
	LM-H2P2C-36M-1SS0	Continuous thrust: 360N, Maximum thrust: 900N
	LM-H2P2D-48M-1SS0	Continuous thrust: 480N, Maximum thrust: 1200N
	LM-H2P3A-24M-1SS0	Continuous thrust: 240N, Maximum thrust: 600N
	LM-H2P3B-48M-1SS0	Continuous thrust: 480N, Maximum thrust: 1200N
	LM-H2P3C-72M-1SS0	Continuous thrust: 720N, Maximum thrust: 1800N
LM-H2P3D-96M-1SS0	Continuous thrust: 960N, Maximum thrust: 2400N	
Linear servo motor LM-H2 series Secondary side (magnet)	LM-H2S10-288-4SS0	Length: 288mm
	LM-H2S10-384-4SS0	Length: 384mm
	LM-H2S10-480-4SS0	Length: 480mm
	LM-H2S10-768-4SS0	Length: 768mm
	LM-H2S20-288-1SS0	Length: 288mm
	LM-H2S20-384-1SS0	Length: 384mm
	LM-H2S20-480-1SS0	Length: 480mm
	LM-H2S20-768-1SS0	Length: 768mm
	LM-H2S30-288-1SS0	Length: 288mm
	LM-H2S30-384-1SS0	Length: 384mm
LM-H2S30-480-1SS0	Length: 480mm	
LM-H2S30-768-1SS0	Length: 768mm	
Linear servo motor LM-F series Primary side (coil)	LM-FP2B-06M-1SS0	Continuous thrust: 300N (natural-cooling)/600N (liquid-cooling), Maximum thrust: 1800N
	LM-FP2D-12M-1SS0	Continuous thrust: 600N (natural-cooling)/1200N (liquid-cooling), Maximum thrust: 3600N
	LM-FP2F-18M-1SS0	Continuous thrust: 900N (natural-cooling)/1800N (liquid-cooling), Maximum thrust: 5400N
	LM-FP4B-12M-1SS0	Continuous thrust: 600N (natural-cooling)/1200N (liquid-cooling), Maximum thrust: 3600N
	LM-FP4D-24M-1SS0	Continuous thrust: 1200N (natural-cooling)/2400N (liquid-cooling), Maximum thrust: 7200N
	LM-FP4F-36M-1SS0	Continuous thrust: 1800N (natural-cooling)/3600N (liquid-cooling), Maximum thrust: 10800N
	LM-FP4H-48M-1SS0	Continuous thrust: 2400N (natural-cooling)/4800N (liquid-cooling), Maximum thrust: 14400N
LM-FP5H-60M-1SS0	Continuous thrust: 3000N (natural-cooling)/6000N (liquid-cooling), Maximum thrust: 18000N	
Linear servo motor LM-F series Secondary side (magnet)	LM-FS20-480-1SS0	Length: 480mm
	LM-FS20-576-1SS0	Length: 576mm
	LM-FS40-480-1SS0	Length: 480mm
	LM-FS40-576-1SS0	Length: 576mm
	LM-FS50-480-1SS0	Length: 480mm
LM-FS50-576-1SS0	Length: 576mm	
Linear servo motor LM-K2 series Primary side (coil)	LM-K2P1A-01M-2SS1	Continuous thrust: 120N, Maximum thrust: 300N
	LM-K2P1C-03M-2SS1	Continuous thrust: 360N, Maximum thrust: 900N
	LM-K2P2A-02M-1SS1	Continuous thrust: 240N, Maximum thrust: 600N
	LM-K2P2C-07M-1SS1	Continuous thrust: 720N, Maximum thrust: 1800N
	LM-K2P2E-12M-1SS1	Continuous thrust: 1200N, Maximum thrust: 3000N
	LM-K2P3C-14M-1SS1	Continuous thrust: 1440N, Maximum thrust: 3600N
	LM-K2P3E-24M-1SS1	Continuous thrust: 2400N, Maximum thrust: 6000N
Linear servo motor LM-K2 series Secondary side (magnet)	LM-K2S10-288-2SS1	Length: 288mm
	LM-K2S10-384-2SS1	Length: 384mm
	LM-K2S10-480-2SS1	Length: 480mm
	LM-K2S10-768-2SS1	Length: 768mm
	LM-K2S20-288-1SS1	Length: 288mm
	LM-K2S20-384-1SS1	Length: 384mm
	LM-K2S20-480-1SS1	Length: 480mm
	LM-K2S20-768-1SS1	Length: 768mm
	LM-K2S30-288-1SS1	Length: 288mm
	LM-K2S30-384-1SS1	Length: 384mm
LM-K2S30-480-1SS1	Length: 480mm	
LM-K2S30-768-1SS1	Length: 768mm	

Notes: 1. Contact your local sales office for the prices and the specifications.



Item	Model	Description
Linear servo motor LM-U2 series Primary side (coil)	LM-U2PAB-05M-0SS0	Continuous thrust: 50N, Maximum thrust: 150N
	LM-U2PAD-10M-0SS0	Continuous thrust: 100N, Maximum thrust: 300N
	LM-U2PAF-15M-0SS0	Continuous thrust: 150N, Maximum thrust: 450N
	LM-U2PBB-07M-1SS0	Continuous thrust: 75N, Maximum thrust: 225N
	LM-U2PBD-15M-1SS0	Continuous thrust: 150N, Maximum thrust: 450N
	LM-U2PBF-22M-1SS0	Continuous thrust: 225N, Maximum thrust: 675N
	LM-U2P2B-40M-2SS0	Continuous thrust: 400N, Maximum thrust: 1600N
	LM-U2P2C-60M-2SS0	Continuous thrust: 600N, Maximum thrust: 2400N
LM-U2P2D-80M-2SS0	Continuous thrust: 800N, Maximum thrust: 3200N	
Linear servo motor LM-U2 series Secondary side (magnet)	LM-U2SA0-240-0SS0	Length: 240mm
	LM-U2SA0-300-0SS0	Length: 300mm
	LM-U2SA0-420-0SS0	Length: 420mm
	LM-U2SB0-240-1SS0	Length: 240mm
	LM-U2SB0-300-1SS0	Length: 300mm
	LM-U2SB0-420-1SS0	Length: 420mm
	LM-U2S20-300-2SS0	Length: 300mm
LM-U2S20-480-2SS0	Length: 480mm	
Optional regeneration unit	MR-RB032	Tolerable regenerative power: 30W, Resistance value: 40Ω
	MR-RB12	Tolerable regenerative power: 100W, Resistance value: 40Ω
	MR-RB14	Tolerable regenerative power: 100W, Resistance value: 26Ω
	MR-RB30	Tolerable regenerative power: 300W, Resistance value: 13Ω
	MR-RB31	Tolerable regenerative power: 300W, Resistance value: 6.7Ω
	MR-RB32	Tolerable regenerative power: 300W, Resistance value: 40Ω
	MR-RB34	Tolerable regenerative power: 300W, Resistance value: 26Ω
	MR-RB3B	Tolerable regenerative power: 300W, Resistance value: 20Ω
	MR-RB50	Tolerable regenerative power: 500W, Resistance value: 13Ω
	MR-RB51	Tolerable regenerative power: 500W, Resistance value: 6.7Ω
	MR-RB5E	Tolerable regenerative power: 500W, (800W with cooling fans), Resistance value: 6Ω
	MR-RB9P	Tolerable regenerative power: 850W, (1300W with cooling fans), Resistance value: 4.5Ω
MR-RB6K-4	Tolerable regenerative power: 850W, (1300W with cooling fans), Resistance value: 10Ω, For 400V	
Dynamic brake	DBU-11K	For MR-J3-11KB-RJ004U□
	DBU-15K	For MR-J3-15KB-RJ004U□
	DBU-22K-4	For MR-J3-22KB4-RJ004U□
MR Configurator2 (Setup software)	SW1DNC-MRC2-E	Servo setup software for installing on a personal computer (Note 1)
MR Configurator (Setup software)	MRZJW3-SETUP221E	Servo setup software for installing on a personal computer (Note 1)

Notes: 1. Refer to the section "List of compatible software versions".
2. Contact your local sales office for the prices and the specifications.

List of compatible software versions

Software	Compatible software version
MR Configurator2 (SW1DNC-MRC2-E)	Any version
MR Configurator (MRZJW3-SETUP221E)	MR-J3-20B-RJ004(U□) to 700B-RJ004U□: B1 or above MR-J3-11KB-RJ004U□ to 22KB4-RJ004U□: C0 or above MR-J3W-B: C3 or above LM-F series (LM-FP2D-12M, LM-FP2F-18M, LM-FP4F-36M, LM-FP4H-48M, LM-FP5H-60M): C3 or above LM-K2 series: will be compatible with C4 or above LM-U2 series (LM-U2PBD-15M): C3 or above * Note that software version C0 or above is compatible with Q173DCPU/Q172DCPU, C2 or above with Q170MCP, B0 or above with Q173HCPU/Q172HCPU, and C1 or above with MT Works2.
Motion controller engineering environment MELSOFT MT Works2 (SW1DNC-MTW2-E)	Any version
Integrated start-up support software MT Developer (SW6RNC-GSVPROE/-GSVSETE)	00N or above * Note that 00Q or above is compatible with Q173DCPU/Q172DCPU.
Q173DCPU/Q172DCPU OS software (SW8DNC-SV□□Q□/SW7DNC-SV□□Q□)	Any version
Q170MCP OS software (SW8DNC-SV13□□/-SV22□□)	Any version
Q173HCPU/Q172HCPU OS software (SW6RN-SV□□Q□/SW5RN-SV□□Q□)	SV13/SV22: 00D or above SV43: Not compatible SV54: Any version
QD75MH	Product information 080320000000000-B or above
QD74MH	Any version
LD77MH	Any version

List of compatible servo amplifier software versions

Servo amplifiers with the listed software version or above are compatible with the following linear encoders.

Manufacturer	Model	Compatible software versions	
		MR-J3-B-RJ004	MR-J3W-B
Magnescale Co., Ltd.	SR77	B0	A1
	SR87	B0	A1
	SR75	A0	A1
	SR85	A0	A1
	SL710	A0	A1
Mitutoyo Corporation	AT343A	A0	A1
	AT543A-SC	A0	A1
	AT545A-SC	A4	A1
	ST741A	A0	A1
	ST742A	A0	A1
	ST743A	A1	A1
	ST744A	A1	A1
Heidenhain Corporation	LC 493M	B0	A1
	LC 193M	B0	A1
	LIDA 485	B0	A1
	LIDA 487	B0	A1
Renishaw Inc.	RGH26P	A0	A1
	RGH26Q	A0	A1
	RGH26R	A0	A1



MEMO

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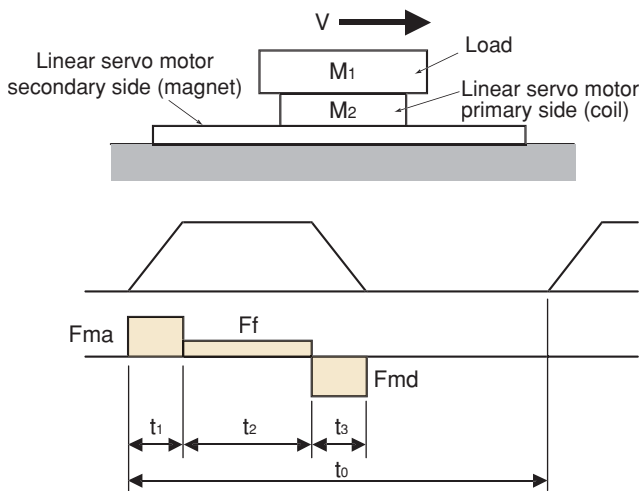
Selecting linear servo motor

- Linear servo motor must be selected according to the purpose of the application.
Select the optimal linear servo motor after completely understanding the characteristics of the guides, the linear encoders and the linear servo motors.
- Maximum velocity
The maximum velocity of the linear servo motor is 2m/s.
Note that the maximum velocity may not be able to reach 2m/s, depending on the selected linear encoder.

Selecting motors

- Continuous effective load thrust and necessary maximum thrust during acceleration or deceleration should be calculated from the machine data and the operation patterns. Then, a suitable linear servo motor can be selected.
In this catalog, the linear servo motor is selected according to linear acceleration/deceleration operation patterns.

■Configurations



- M1 : Load mass (kg)
- M2 : Linear servo motor primary side (coil) mass (kg)
- a : Acceleration (m/s²)
- Ff : Resistive force (N)
(including friction, unbalance and cable chain)
- V : Maximum velocity (m/s)
- t₀ : 1 cycle time (s)
- t₁ : Acceleration time (s)
- t₂ : Constant velocity time (s)
- t₃ : Deceleration time (s)
- η : Mechanical efficiency
- μ : Coefficient of friction

■Selecting procedures

1. Method of selecting linear servo motor (theoretical value)

- Select a linear servo motor
From the linear servo motor series that is suitable for your application or machine, tentatively select a linear servo motor which makes the mass ratio of the load to the primary side (coil) equal to 30 or less. (Note 1)

$$30 \text{ times} \geq M_1 / M_2 \text{ (Note 1)}$$

- Calculate necessary thrust

(1) Resistive force

$$M = M_1 + M_2 \text{ (kg)}$$

$$F_f = \mu \cdot (M \cdot 9.8 + \text{magnetic attraction force (N)}) \text{ (when considering only friction)}$$

(2) Thrust during acceleration and deceleration

$$F_{ma} = M \cdot a + F_f \text{ (N)}$$

$$F_{md} = -M \cdot a + F_f \text{ (N)}$$

(3) Continuous effective load thrust

$$F_{rms} = \sqrt{(F_{ma}^2 \cdot t_1 + F_f^2 \cdot t_2 + F_{md}^2 \cdot t_3) / t_0}$$

- Qualify the selected linear servo motor

$$F_{rms} / \eta \leq \text{Rated thrust [n] of the linear servo motor}$$

$$F_{ma} / \eta \leq \text{Maximum thrust [n] of the linear servo motor}$$

If the above conditions are not satisfied, select one rank larger capacity linear servo motor and recalculate.

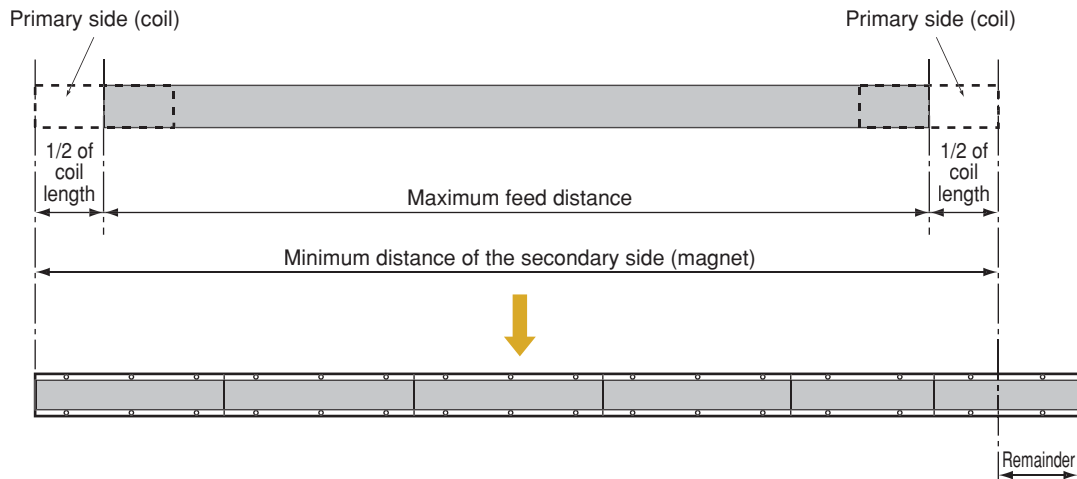
Notes: 1. The ratio of 30 times is applicable for LM-H2, LM-K2 and LM-U2 series.
When using LM-F series, tentatively select a linear servo motor which has a ratio of 15 times or less.



2. Determining the number of secondary side (magnet) blocks

The number of the secondary side (magnet) blocks is determined according to the total distance calculated from the following equation:

$$(\text{Total length of aligned secondary side (magnet)}) \geq (\text{maximum feed distance}) + (\text{Length of the primary side (coil)})$$



Note: When aligning two or more secondary sides (magnets), cumulative tolerance of the mounting hole must be within $\pm 0.2\text{mm}$. Therefore, spaces may exist between each secondary side (magnet) block.

3. Selecting optional regeneration unit

The following table shows the energy charged into the capacitor of the servo amplifier and the inverse efficiency of the linear servo motor.

The energy consumed by regenerative resistor is calculated as follows:

$$\text{Regenerative energy } P(W) = (-Fmd \cdot t_3 \cdot (\text{speed}/2) \cdot (\text{inverse efficiency}/100) - \text{Capacitor charging}) / t$$

Select a suitable optional regeneration unit as necessary to keep the consumed regenerative energy below the regeneration power shown in the following table:

Servo amplifier MR-J3- (Note 3)	Capacitor charging (J)	Inverse efficiency (%)	Tolerable regenerative power (W)											
			Built-in regenerative resistor	External regenerative resistor (standard accessory)	Optional regeneration unit									
					MR-RB									
					032 [40Ω]	12 [40Ω]	30 [13Ω]	31 [6.7Ω]	32 [40Ω]	50 [13Ω] (Note 1)	51 [6.7Ω] (Note 1)	5E [6Ω] (Note 2)	9P [4.5Ω] (Note 2)	6K-4 [10Ω] (Note 2)
20B-RJ004(U□)	9	70	10	—	30	100	—	—	—	—	—	—	—	—
40B-RJ004(U□)	11	85	10	—	30	100	—	—	—	—	—	—	—	—
60B-RJ004(U□)	11	85	10	—	30	100	—	—	—	—	—	—	—	—
70B-RJ004(U□)	18	80	20	—	30	100	—	—	300	—	—	—	—	—
200BN-RJ004(U□)	40	85	100	—	—	—	300	—	—	500	—	—	—	—
350B-RJ004(U□)	40	85	100	—	—	—	300	—	—	500	—	—	—	—
500B-RJ004(U□)	45	90	130	—	—	—	300	—	—	500	—	—	—	—
700B-RJ004(U□)	70	90	170	—	—	—	300	—	—	500	—	—	—	—
11KB-RJ004(U□)	120	90	—	500 (800)	—	—	—	—	—	—	—	500 (800)	—	—
15KB-RJ004(U□)	170	90	—	850 (1300)	—	—	—	—	—	—	—	—	850 (1300)	—
22KB4-RJ004(U□)	250	90	—	850 (1300)	—	—	—	—	—	—	—	—	—	850 (1300)

Notes: 1. Be sure to cool the unit forcibly with a cooling fan (92 × 92mm, minimum air flow: 1.0m³/min). The cooling fan must be prepared by user.
2. The values in () indicate when cooling fans (2 units of 92 × 92mm, minimum air flow: 1.0m³/min) are installed, and parameter No. PA02 is changed.
3. For selecting an optional regeneration unit for MR-J3W-B servo amplifier, refer to "MR-J3W-□B SERVO AMPLIFIER INSTRUCTION MANUAL".

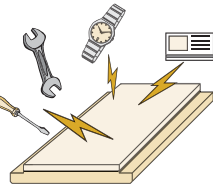
To ensure safe use

- To use the products given in this catalog properly, always read the “Installation Guide” and “MR-J3-□B-RJ004U□ INSTRUCTION MANUAL” before starting to use them.

Cautions concerning use

Handling linear servo

- The linear servo system uses a powerful magnet on the secondary side. Magnetic force is inversely proportional to the square of the distance from the magnetic material. Therefore, the magnetic force will be drastically stronger as closer to the magnetic material. Persons installing as well as operating the linear servo motor must be fully cautious when handling the machine. Persons with pacemakers or other medical devices must keep away from the machine.
- Do not carry products that may malfunction or fail due to the magnetic force such as watches, cell phones and calculators, and avoid wearing metals such as earrings or necklaces when handling the machine.
- Place a sign such as “CAUTION! POWERFUL MAGNET” to give warning against the machine.
- Use non-magnetic tools when installing or working near the linear servo motor.
e.g., Explosion-proof beryllium copper alloy safety tools: bealon (NGK Insulators, Ltd.)
- The permanent magnet on the secondary side generates a force to attract magnetic objects. Use caution to prevent your hands from being caught. Take extra caution especially when installing the primary side (coil) after installing the secondary side (magnet).
- Measures must be taken to prevent magnetic powder or magnetic pieces from being attracted to the permanent magnet on the secondary side.
- Replace the linear servo motor when it is damaged.
- Do not touch the linear servo motor with wet hands.



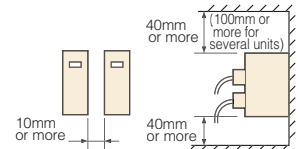
Installation

- Combinations of the linear servo motor and servo amplifier are predetermined. Confirm the models of the linear servo motor and servo amplifier to be used before installation.
- Use the linear servo motor in the designated environment.
- Do not drop or apply strong impact on the servo amplifier and the linear servo motor as they are precision devices and may be damaged from such stress or shock.
- Avoid installation in an environment in which oil mist, dust, etc. are in the air. When using in such an environment, enclose the servo amplifier in a sealed cabinet.
- Do not use where the linear servo motor may be constantly subject to cutting fluid or lubricant, or where dew could condense because of oil mist, overcooling or excessive humidity. These may cause the linear servo motor's insulation to deteriorate.
- The linear servo motor is rated IP00. Provide measures to prevent dust and oil, etc., as necessary.

- Mount the servo amplifier and linear servo motor on non-combustible material. Mounting them directly on or near flammable material may result in fires.

- Mount the servo amplifier vertically on a wall.
- Do not block intake and exhaust areas of the servo amplifier. Doing so may cause the servo amplifier to malfunction.

- When installing several servo amplifiers in a row in a sealed cabinet, leave 10mm or more open between each servo amplifier. The MR-J3-350B-RJ004(U□) or smaller servo amplifier can be installed closely. In this case, keep the ambient temperature within 0°C to 45°C (32°F to 113°F), or use them with 75% or less of the effective load rate.



- When using one servo amplifier, always leave 40mm or more open in the upward and downward directions. To ensure the life and reliability, keep space as open as possible toward the top plate so that heat does not build up.

Take special care, especially when installing several servo amplifiers in a row.

- The optional regeneration unit becomes hot (a temperature rise of 100°C or more) with frequent use. Do not install within flammable objects or objects subject to thermal deformation. Take care to ensure that electrical wires do not come into contact with the unit.
 - Do not get on or place heavy objects on the linear servo motor. There is a risk of injury.
 - Do not modify the linear servo motor.
 - The magnetic pole cannot be detected when mounted on a vertical axis, so do not use the linear servo motor for a vertical axis applications.
 - Provide a mechanism that can withstand high speeds and high acceleration/deceleration.
 - To enable high-accuracy positioning, ensure the machine's rigidity, and keep the machine's resonance point at a high level.
 - Securely fix the linear servo motor onto the machine. Insufficient fixing may cause the linear servo motor to dislocate during operation.
 - Install electrical and mechanical stoppers at the stroke end.
 - Install your system so that the center of gravity of the moving section comes directly above the center of the primary side (coil).
 - If the linear encoder is improperly mounted, an alarm or a positioning deviation may occur. In this case, refer to the following general inspection of the linear encoder to verify the mounting state.
 - General inspection of linear encoder
 - (a) Verify that the gap between the linear encoder's head and linear encoder is appropriate.
 - (b) Check for any rolling or yawing (looseness) on the linear encoder head.
 - (c) Check for contaminations and scratches on the linear encoder's head and scale surface.
 - (d) Verify that vibration and temperature are within the specified range.
 - (e) Verify that the speed does not exceed the tolerable range due to overshooting.
- Note: Contact the relevant linear encoder manufacturers for more details.



Grounding

- Securely ground to prevent electric shocks and to stabilize the potential in the control circuit.
- To ground the linear servo motor and servo amplifier at one point, connect the grounding terminals of each unit, and ground from the servo amplifier side.
- Faults such as a deviation in position may occur if the grounding is insufficient.

Wiring

- When a commercial power supply is applied to the servo amplifier's output terminals (U, V, W), the servo amplifier will be damaged. Before switching the power on, perform thorough wiring and sequence checks to ensure that there are no wiring errors, etc.
- When a commercial power supply is applied to the linear servo motor's input terminals (U, V, W), the linear servo motor will be damaged. Connect the linear servo motor to the servo amplifier's output terminals (U, V, W).
- Match the phase of the linear servo motor's input terminals (U, V, W) to the servo amplifier's output terminals (U, V, W) before connecting. If they do not match, the linear servo motor cannot be controlled.
- The power cables, etc., protruding from the primary side (coil) cannot withstand bending operation for long periods of time. Fix these cables to the moving section, etc., so that they do not bend.
- Do not apply excessive tension on the fiber-optic cable when cabling.
- The minimum bending radius of the fiber-optic cable is 25mm for MR- J3BUS□M and 50mm for MR-J3BUS□M-A/-B. If using these cables under the minimum bending radius, performance cannot be guaranteed.
- If the ends of the fiber-optic cable are dirty, the light will be obstructed, resulting malfunctions. Always clean the ends if dirty.
- Do not tighten the fiber-optic cable with cable ties, etc.
- Do not directly look at the light when the fiber-optic cable is not connected.
- Carefully consider the cable clamping method, and make sure that bending stress and the stress of the cable's own weight are not applied on the cable connection section.

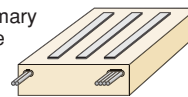
Operation

- When a magnetic contactor (MC) is installed on the servo amplifier's primary side, do not perform frequent starts and stops with the MC. Doing so may cause the servo amplifier to malfunction.
- When an error occurs, the servo amplifier's safety features activate, halting output, and the dynamic brake instantly stops the linear servo motor.
- Validate the stroke end signals (LSP, LSN) in position control or speed control mode. The linear servo motor will not start if the signals are invalid.
- If the servo amplifier's safety features activate, turn the power OFF immediately. Remove the cause before turning the power ON again. If operation is continued without removing the cause of the error, the linear servo motor may malfunction and result in injury or damage.
- Do not use a servo amplifier or linear servo motor which is damaged or has missing parts.
- Do not touch the linear servo motor during or after operation until it has had sufficient time to cool. The linear servo motor can be very hot, and severe burns may result from touching the motor.

Disposal of linear servo motor

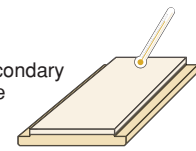
- Dispose the primary side as industrial waste.
- Demagnetize the secondary side with a heat over 300°C (572°F) and dispose as industrial waste. If not possible to demagnetize, return the secondary side to us in an appropriate package.
- Do not leave the product unattended.

Primary side



Dispose as industrial waste.

Secondary side



Dispose as industrial waste after demagnetizing with a heat over 300°C (572°F).

Warranty

1. Warranty period and coverage

We will repair any failure or defect hereinafter referred to as “failure” in our FA equipment hereinafter referred to as the “Product” arisen during warranty period at no charge due to causes for which we are responsible through the distributor from which you purchased the Product or our service provider. However, we will charge the actual cost of dispatching our engineer for an on-site repair work on request by customer in Japan or overseas countries. We are not responsible for any on-site readjustment and/or trial run that may be required after a defective unit is repaired or replaced.

[Term]

The term of warranty for Product is twelve (12) months after your purchase or delivery of the Product to a place designated by you or eighteen (18) months from the date of manufacture whichever comes first (“Warranty Period”). Warranty period for repaired Product cannot exceed beyond the original warranty period before any repair work.

[Limitations]

- (1) You are requested to conduct an initial failure diagnosis by yourself, as a general rule. It can also be carried out by us or our service company upon your request and the actual cost will be charged. However, it will not be charged if we are responsible for the cause of the failure.
- (2) This limited warranty applies only when the condition, method, environment, etc. of use are in compliance with the terms and conditions and instructions that are set forth in the instruction manual and user manual for the Product and the caution label affixed to the Product.
- (3) Even during the term of warranty, the repair cost will be charged on you in the following cases;
 - (i) a failure caused by your improper storing or handling, carelessness or negligence, etc., and a failure caused by your hardware or software problem
 - (ii) a failure caused by any alteration, etc. to the Product made on your side without our approval
 - (iii) a failure which may be regarded as avoidable, if your equipment in which the Product is incorporated is equipped with a safety device required by applicable laws and has any function or structure considered to be indispensable according to a common sense in the industry
 - (iv) a failure which may be regarded as avoidable if consumable parts designated in the instruction manual, etc. are duly maintained and replaced
 - (v) any replacement of consumable parts (battery, fan, smoothing capacitor, etc.)
 - (vi) a failure caused by external factors such as inevitable accidents, including without limitation fire and abnormal fluctuation of voltage, and acts of God, including without limitation earthquake, lightning and natural disasters
 - (vii) a failure generated by an unforeseeable cause with a scientific technology that was not available at the time of the shipment of the Product from our company
 - (viii) any other failures which we are not responsible for or which you acknowledge we are not responsible for

2. Term of warranty after the stop of production

- (1) We may accept the repair at charge for another seven (7) years after the production of the product is discontinued. The announcement of the stop of production for each model can be seen in our Sales and Service, etc.
- (2) Please note that the Product (including its spare parts) cannot be ordered after its stop of production.

3. Service in overseas countries

Our regional FA Center in overseas countries will accept the repair work of the Product. However, the terms and conditions of the repair work may differ depending on each FA Center. Please ask your local FA Center for details.

4. Exclusion of responsibility for compensation against loss of opportunity, secondary loss, etc.

Whether under or after the term of warranty, we assume no responsibility for any damages arisen from causes for which we are not responsible, any losses of opportunity and/or profit incurred by you due to a failure of the Product, any damages, secondary damages or compensation for accidents arisen under a specific circumstance that are foreseen or unforeseen by our company, any damages to products other than the Product, and also compensation for any replacement work, readjustment, start-up test run of local machines and the Product and any other operations conducted by you.

5. Change of Product specifications

Specifications listed in our catalogs, manuals or technical documents may be changed without notice.

6. Application and use of the Product

- (1) For the use of our General-Purpose AC Servo, its applications should be those that may not result in a serious damage even if any failure or malfunction occurs in General-Purpose AC Servo, and a backup or fail-safe function should operate on an external system to General-Purpose AC Servo when any failure or malfunction occurs.
- (2) Our General-Purpose AC Servo is designed and manufactured as a general purpose product for use at general industries. Therefore, applications substantially influential on the public interest for such as atomic power plants and other power plants of electric power companies, and also which require a special quality assurance system, including applications for railway companies and government or public offices are not recommended, and we assume no responsibility for any failure caused by these applications when used.

In addition, applications which may be substantially influential to human lives or properties for such as airlines, medical treatments, railway service, incineration and fuel systems, man-operated material handling equipment, entertainment machines, safety machines, etc. are not recommended, and we assume no responsibility for any failure caused by these applications when used.

We will review the acceptability of the abovementioned applications, if you agree not to require a specific quality for a specific application. Please contact us for consultation.



Global FA Centers



- Shanghai**
FA Center

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Shanghai Intelligence Fortune Leisure Plaza
Huang Pu district, Shanghai 200003, China
Tel: 86-21-6121-2460 Fax: 86-21-6121-2424
- Beijing**
FA Center

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- Tianjin**
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- Guangzhou**
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MITSUBISHI ELECTRIC AUTOMATION (HONG KONG) LTD.
(FA DIVISION)
10th Floor, Manulife Tower, 169 Electric Road,
North Point, Hong Kong
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- Taiwan**
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SETSUYO ENTERPRISE CO., LTD.
6F No.105 Wu Kung 3rd RD, Wu-Ku Hsiang,
Taipei Hsien, Taiwan
Tel: 886-2-2299-2499 Fax: 886-2-2299-2509
- Korean**
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- ASEAN**
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307 Alexandra Road #05-01/02
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MITSUBISHI ELECTRIC ASIA PVT. LTD. GURGAON BRANCH
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- North American**
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500 Corporate Woods Parkway, Vernon Hills, IL 60061, USA
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Sao Paulo-SP Brazil
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- European**
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- Central and Eastern Europe**
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MITSUBISHI ELECTRIC AUTOMATION EUROPE B.V.
CZECH BRANCH
Radlická 714/113a, 15800 Praha 5, Czech Republic
Tel: 420-251-551-470 Fax: 420-251-551-471
- UK**
FA Center

MITSUBISHI ELECTRIC EUROPE B.V. UK BRANCH
(Customer Technology Centre)
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- Russian**
FA Center

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 **Safety Warning**

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

 **mitsubishi electric corporation**
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