MITSUBISHI ELECTRIC
Changes for the Better

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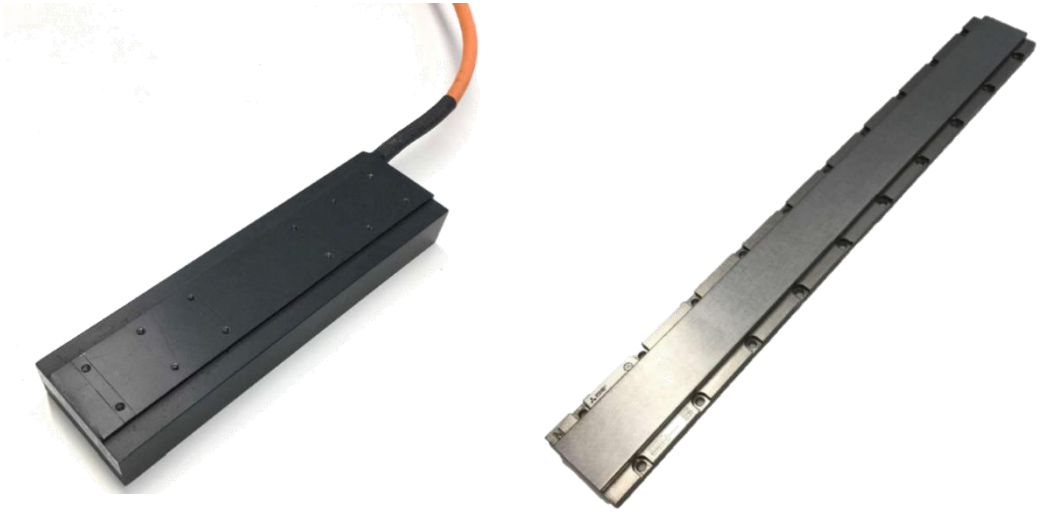
LINEAR SERVO MOTOR
LM-AJ SERIES

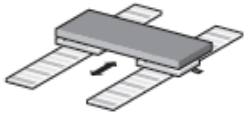


MITSUBISHI ELECTRIC CORPORATION
Nagoya works

BFN-18887-1310-*

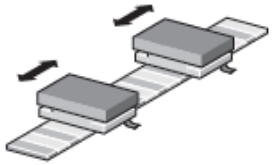
Application Examples

Optimum for a linear drive system which requires a high speed and high accuracy. Easily achieve a tandem configuration or multi-head configuration.



Tandem configuration

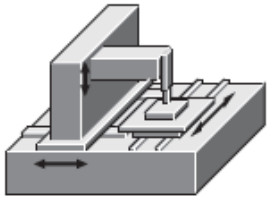
The linear servo motors configured in tandem are suitable for large systems that require highly accurate synchronous operation between two axes.



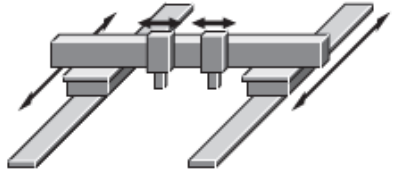
Multi-head configuration

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

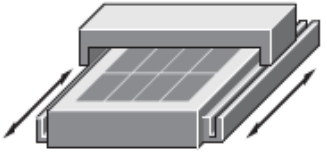
Machine tools XYZ stage



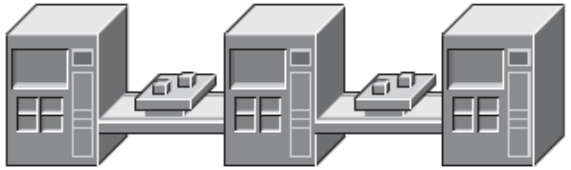
Semiconductor/LCD manufacturing systems
Electrical parts assembling/manufacturing systems



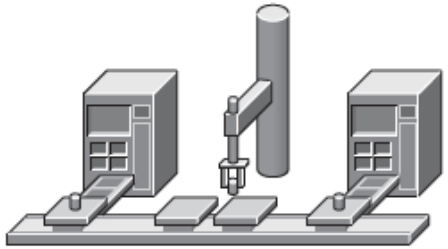
Screen printing systems and large LCD coaters



Material handling systems



Multi-head material handling between machines



Model Designation

LM-AJ series Linear Servo Motors

LM－AJP□□－□□□－JSS0

Symbol	Length (nominal) [mm]
B	96
D	176

Symbol	Width (nominal) [mm]
1	50
2	75
3	100
4	125

Primary side (coil)

Symbol	Continuous thrust [N]
07	68.1
12	117.0
14	136.2
17	174.5
22	223.4
23	234.0
35	348.9
45	446.8

Symbol	Maximum speed [m/s]
M	2.0
N	2.5
R	3.5
S	4.0
T	5.0
K	6.5

LM－AJS□0－□□□－JSS0

Symbol	Width (nominal) [mm]
1	50
2	75
3	100
4	125

Secondary side (magnet)

Symbol	Length (nominal) [mm]
080	80
200	200
400	400

Notes: This section describes what each symbol in a model name indicates. Some combinations of symbols are not available.

Servo Amplifiers

MR－J4－□□□－RJJ051

Symbol	Rated output [kW]
40	0.4
70	0.75

Symbol	Interface
B	SSCNETⅢ/H
A	General-purpose

Product Specifications

Combinations of Linear Servo Motor and Servo Amplifier

	Linear servo motor		Servo amplifier
	Primary side (coil)	Secondary side (magnet)	
LM-AJ series	LM-AJP1B-07K-JSS0	LM-AJS10-080-JSS0 LM-AJS10-200-JSS0 LM-AJS10-400-JSS0	MR-J4-40☐-RJJ051
	LM-AJP1D-14K-JSS0		MR-J4-70☐-RJJ051
	LM-AJP2B-12S-JSS0	LM-AJS20-080-JSS0 LM-AJS20-200-JSS0 LM-AJS20-400-JSS0	MR-J4-40☐-RJJ051
	LM-AJP2D-23T-JSS0		MR-J4-70☐-RJJ051
	LM-AJP3B-17N-JSS0	LM-AJS30-080-JSS0 LM-AJS30-200-JSS0 LM-AJS30-400-JSS0	MR-J4-40☐-RJJ051
	LM-AJP3D-35R-JSS0		MR-J4-70☐-RJJ051
	LM-AJP4B-22M-JSS0	LM-AJS40-080-JSS0 LM-AJS40-200-JSS0 LM-AJS40-400-JSS0	MR-J4-40☐-RJJ051
	LM-AJP4D-45N-JSS0		MR-J4-70☐-RJJ051

Product Specifications (Motor)

LM-AJ Series Specifications

Linear servo motor model	Primary side	LM-AJ	P1B-07K -JSS0	P1D-14K -JSS0	P2B-12S -JSS0	P2D-23T -JSS0	P3B-17N -JSS0	P3D-35R -JSS0	P4B-22M -JSS0	P4D-45N -JSS0
	Secondary side	LM-AJ	S10-080-JSS0 S10-200-JSS0 S10-400-JSS0		S20-080-JSS0 S20-200-JSS0 S20-400-JSS0		S30-080-JSS0 S30-200-JSS0 S30-400-JSS0		S40-080-JSS0 S40-200-JSS0 S40-400-JSS0	
Compatible servo amplifier model		MR-J4-	Refer to "Combinations of Linear Servo Motor and Servo Amplifier" on p.4 in this							
Cooling method			Natural cooling							
Thrust	Continuous (Note 2)	[N]	68.1	136.2	117.0	234.0	174.5	348.9	223.4	446.8
	Maximum	[N]	214.7	429.4	369.0	738.1	550.2	1100.4	704.5	1409.1
Maximum speed (Note 1)		[m/s]	6.5	6.5	4.0	5.0	2.5	3.5	2.0	2.5
Magnetic attraction force (Note 3)		[N]	378.8	757.6	651.1	1302.1	970.7	1941.4	1242.9	2485.9
Rated current		[A]	2.3	4.6	2.3	4.6	2.3	4.6	2.3	4.6
Maximum current		[A]	9.0	18.0	9.0	18.0	9.0	18.0	9.0	18.0
Mass	Primary side (coil)	[kg]	0.6	1.1	0.9	1.7	1.2	2.3	1.5	2.9
	Secondary side (magnet) 80mm	[kg]	0.26		0.40		0.56		0.70	
	Secondary side (magnet) 200mm	[kg]	0.65		1.00		1.40		1.70	
	Secondary side (magnet) 400mm	[kg]	1.30		2.00		2.80		3.50	

Notes:1. The maximum speed of the linear servo motor or the rated speed of the linear encoder, whichever is smaller, is the upper limit of the linear servo motor speed.
2. Use the linear servo motor with 70% or less of the effective load ratio when it is in the servo lock state or in a small reciprocating motion.
3. The magnetic attraction is a reference value, not a specification value.

Product Specifications (Motor)

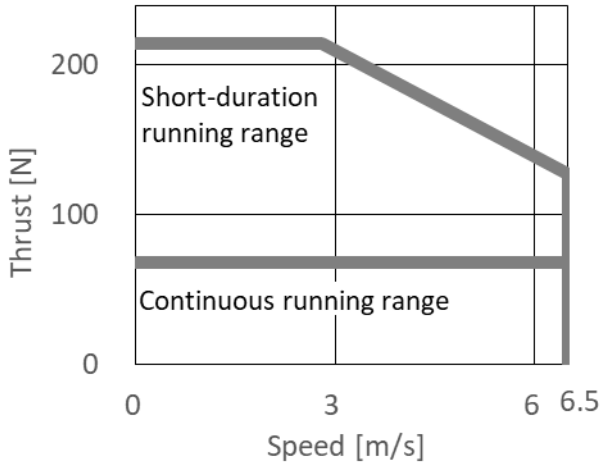
LM-AJ Series Specifications

Temperature protection		Built-in thermal protector
Insulation class		105(A)
Structure		Open (IP rating: IP00)
Compliance with global standards		Electrical and Electronic Products (Chinese RoHS) Compliant
Environment	Ambient temperature	Operation: 0 ° C to 40 ° C (non-freezing), storage: -15 ° C to 70 ° C (non-freezing)
	Ambient humidity	Operation: 10 %RH to 80 %RH (non-condensing) storage: 10 %RH to 90 %RH (non-condensing)
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust
	Altitude	1000 m or less above sea level
	Vibration resistance	49m/s^2

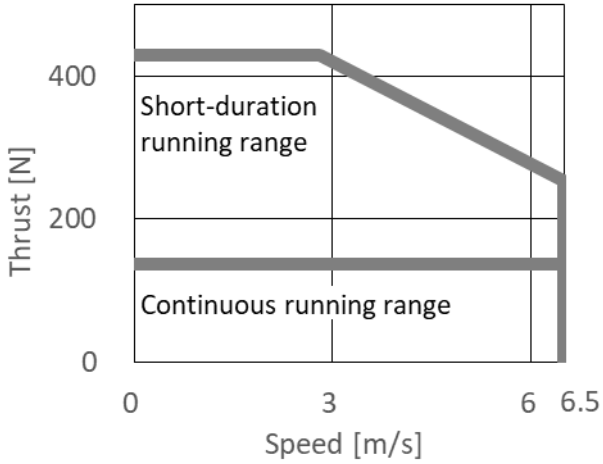
Product Specifications (Motor)

LM-AJ Series Thrust Characteristics

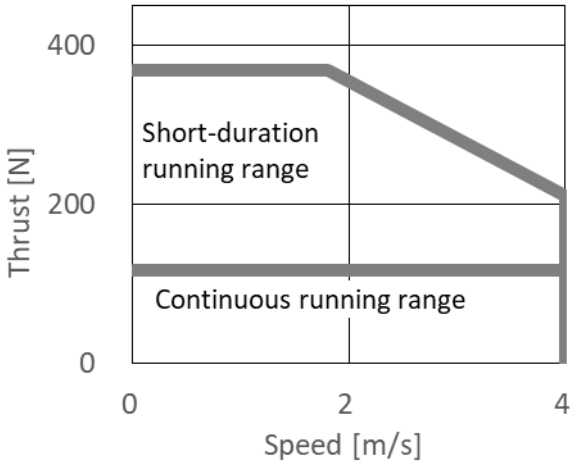
LM-AJP1B-07K-JSS0



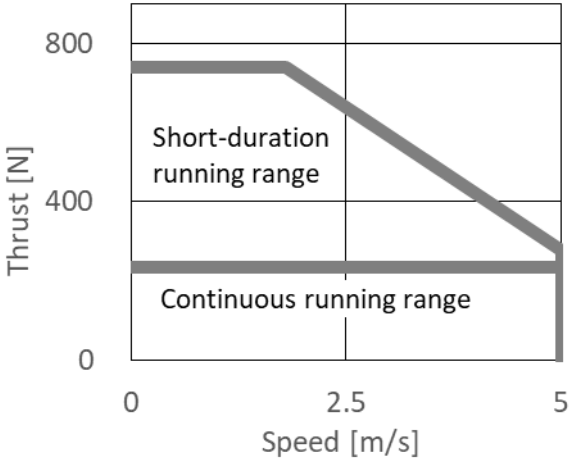
LM-AJP1D-14K-JSS0



LM-AJP2B-12S-JSS0



LM-AJP2D-23T-JSS0

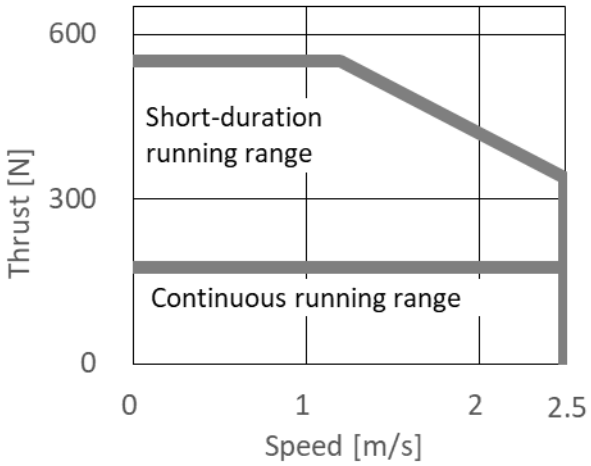


Notes: 1. For 3-phase 200 V AC.
2. Thrust drops when the power supply voltage is below the specified value.

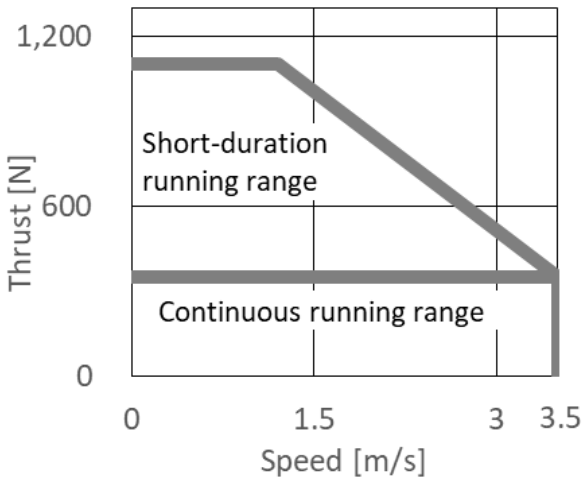
Product Specifications (Motor)

LM-AJ Series Thrust Characteristics

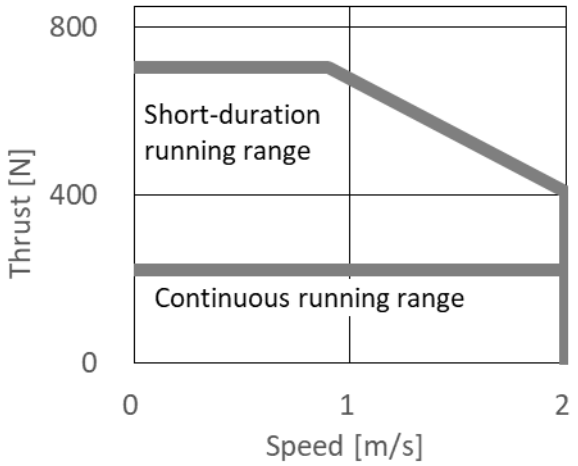
LM-AJP3B-17N-JSS0



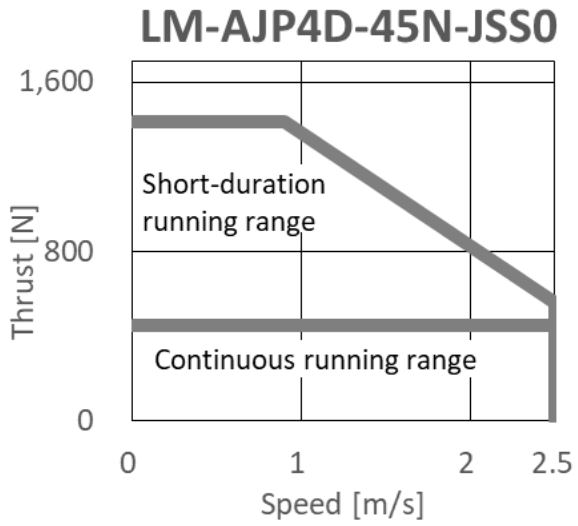
LM-AJP3D-35R-JSS0



LM-AJP4B-22M-JSS0



LM-AJP4D-45N-JSS0

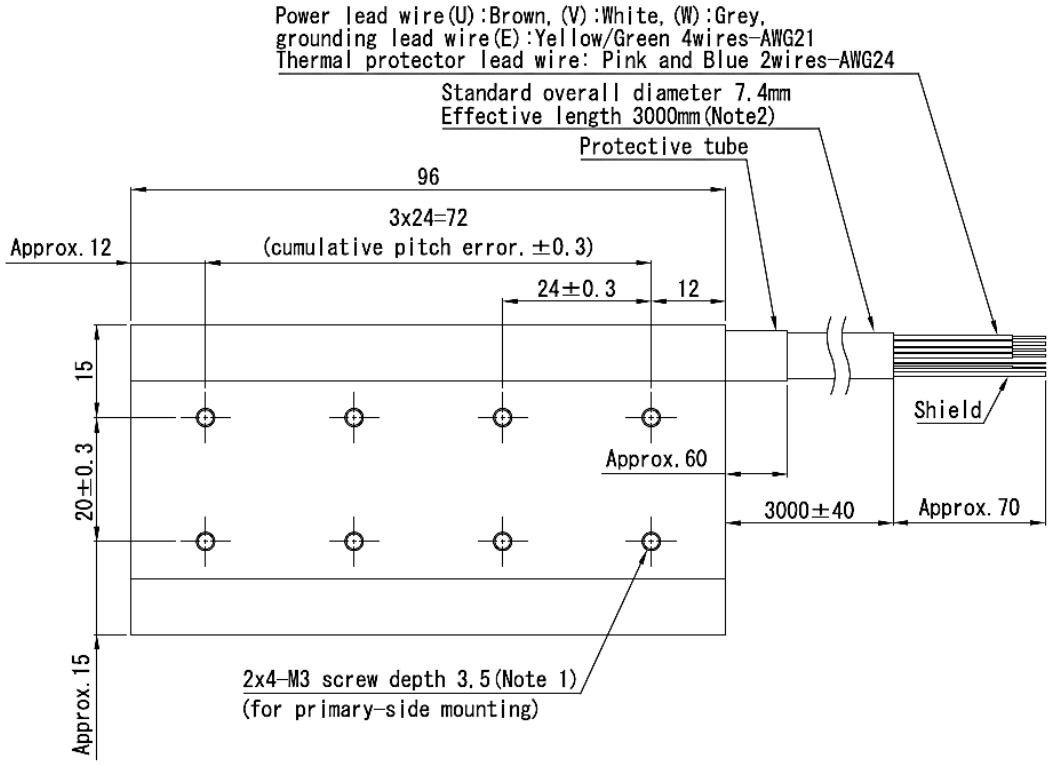


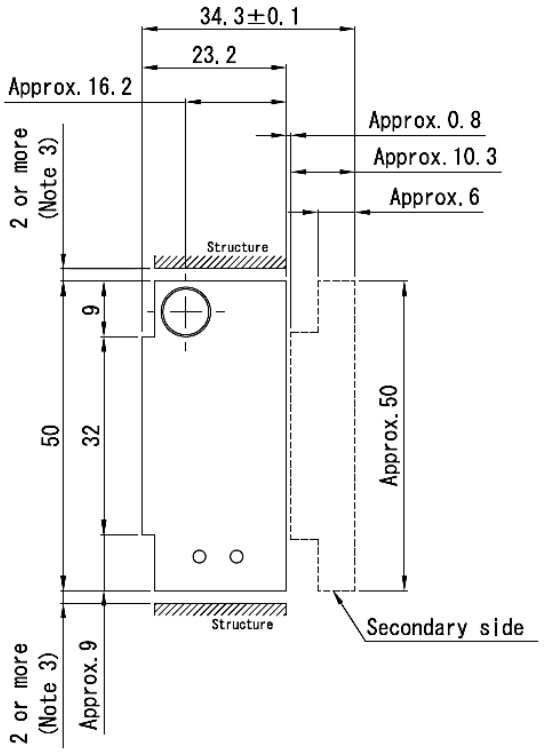
Notes: 1. For 3-phase 200 V AC.
2. Thrust drops when the power supply voltage is below the specified value.

Product Specifications (Motor)

LM-AJ Series Primary Side (Coil) Dimensions

LM-AJP1B-07K-JSS0





[Unit:mm]

Note 1. For mounting, use the hexagonal cap head bolt whose strength must be a high tensile strength steel level of SCM435 for its material, and the lower yield point is 900 N/mm2 or equivalent

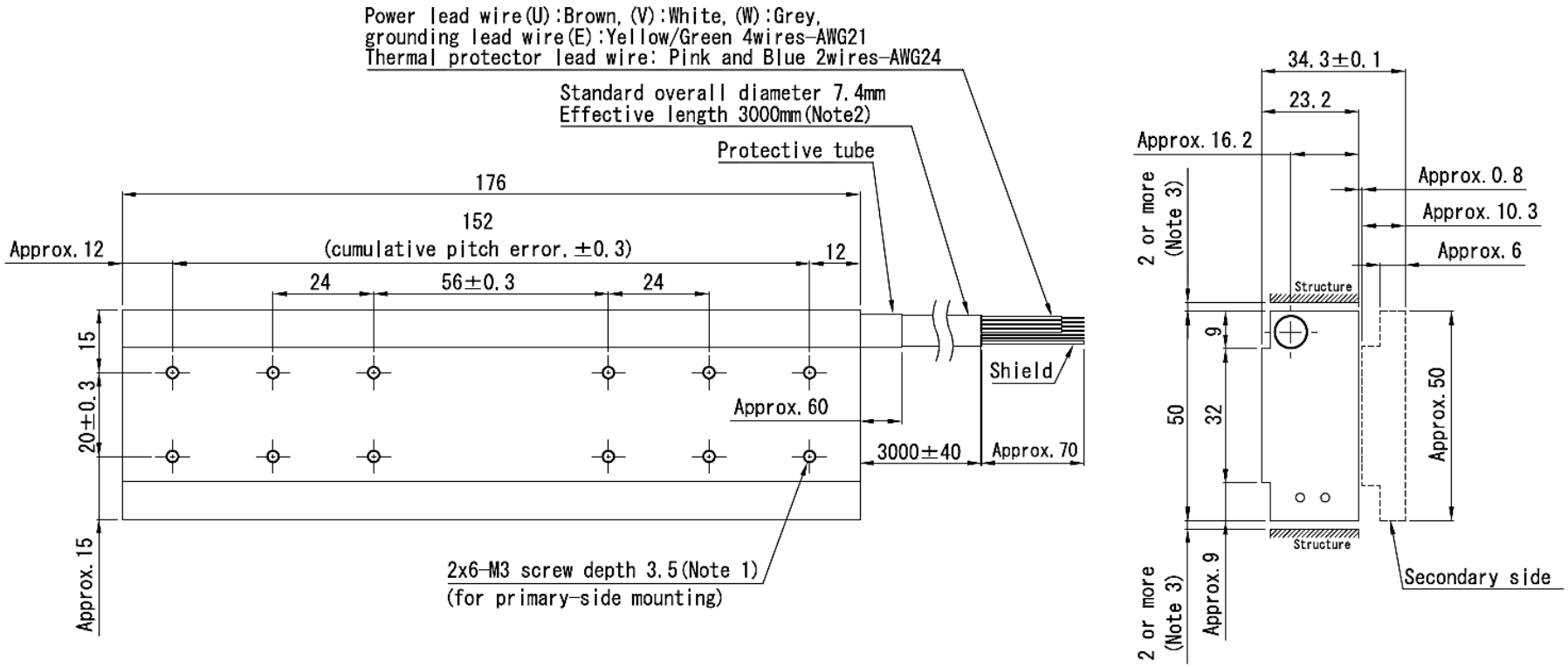
2. The lead wire is for fixed wiring, so securely fix it to the structure. Minimum bending radius of the lead wire is recommended to be ten times or more (reference value) the standard overall diameter of the lead wire .Select the cable used for the moving part considering the speed of linear servo motor and fixing radius.

3. Leave 2 mm or more of each side of the clearance between the side face of primary side and the structure.

Product Specifications (Motor)

LM-AJ Series Primary Side (Coil) Dimensions

LM-AJP1D-14K-JSS0



[Unit:mm]

Note 1. For mounting, use the hexagonal cap head bolt whose strength must be a high tensile strength steel level of SCM435 for its material, and the lower yield point is 900 N/mm2 or equivalent

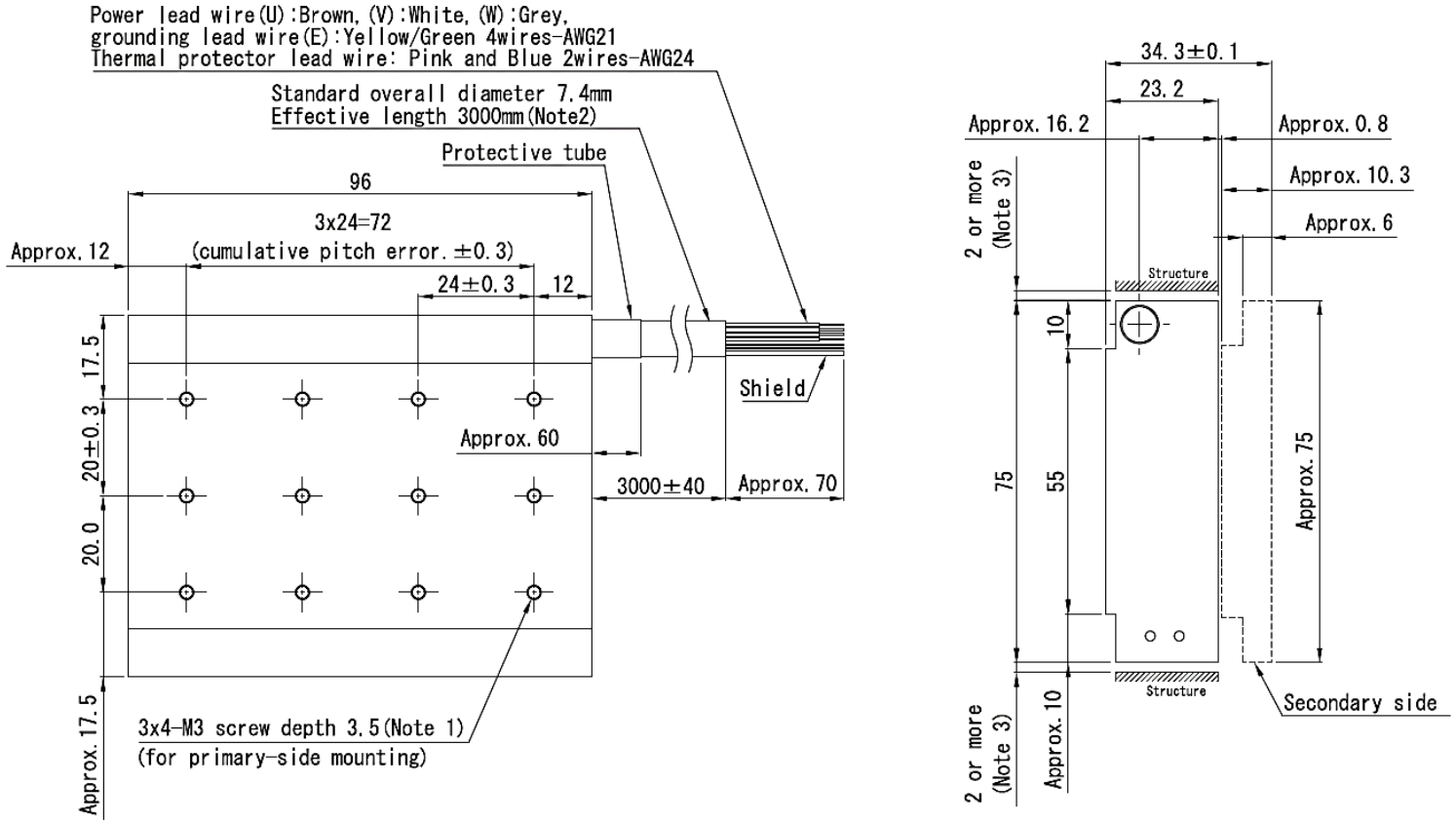
2. The lead wire is for fixed wiring, so securely fix it to the structure. Minimum bending radius of the lead wire is recommended to be ten times or more (reference value) the standard overall diameter of the lead wire .Select the cable used for the moving part considering the speed of linear servo motor and fixing radius.

3. Leave 2 mm or more of each side of the clearance between the side face of primary side and the structure.

Product Specifications (Motor)

LM-AJ Series Primary Side (Coil) Dimensions

LM-AJP2B-12S-JSS0



[Unit:mm]

Note 1. For mounting, use the hexagonal cap head bolt whose strength must be a high tensile strength steel level of SCM435 for its material, and the lower yield point is 900 N/mm2 or equivalent

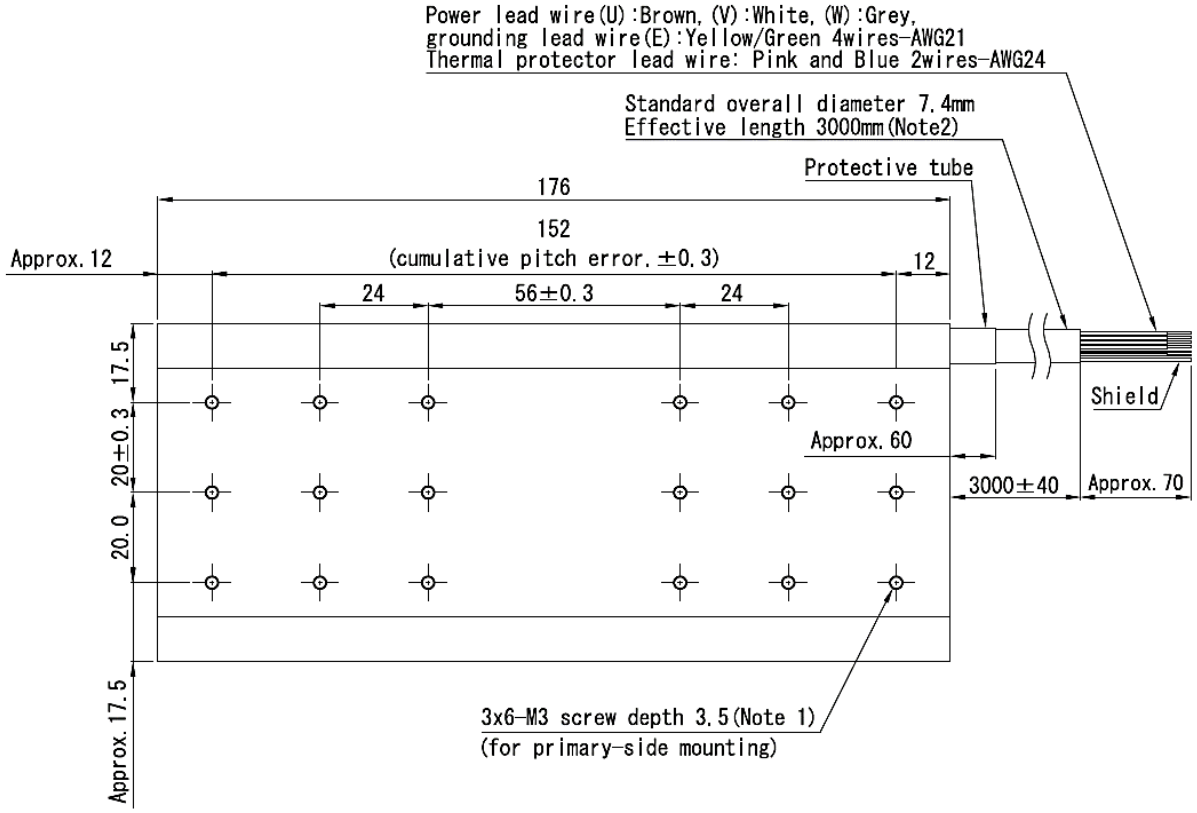
2. The lead wire is for fixed wiring, so securely fix it to the structure. Minimum bending radius of the lead wire is recommended to be ten times or more (reference value) the standard overall diameter of the lead wire .Select the cable used for the moving part considering the speed of linear servo motor and fixing radius.

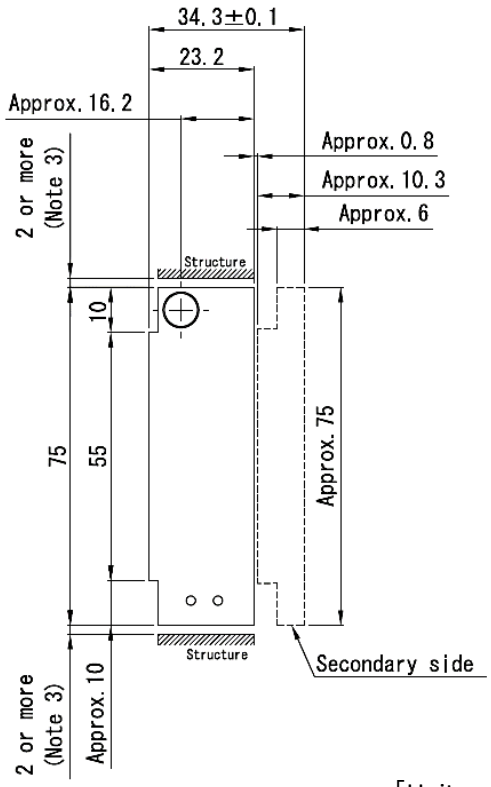
3. Leave 2 mm or more of each side of the clearance between the side face of primary side and the structure.

Product Specifications (Motor)

LM-AJ Series Primary Side (Coil) Dimensions

LM-AJP2D-23T-JSS0





[Unit:mm]

Note 1. For mounting, use the hexagonal cap head bolt whose strength must be a high tensile strength steel level of SCM435 for its material, and the lower yield point is 900 N/mm2 or equivalent

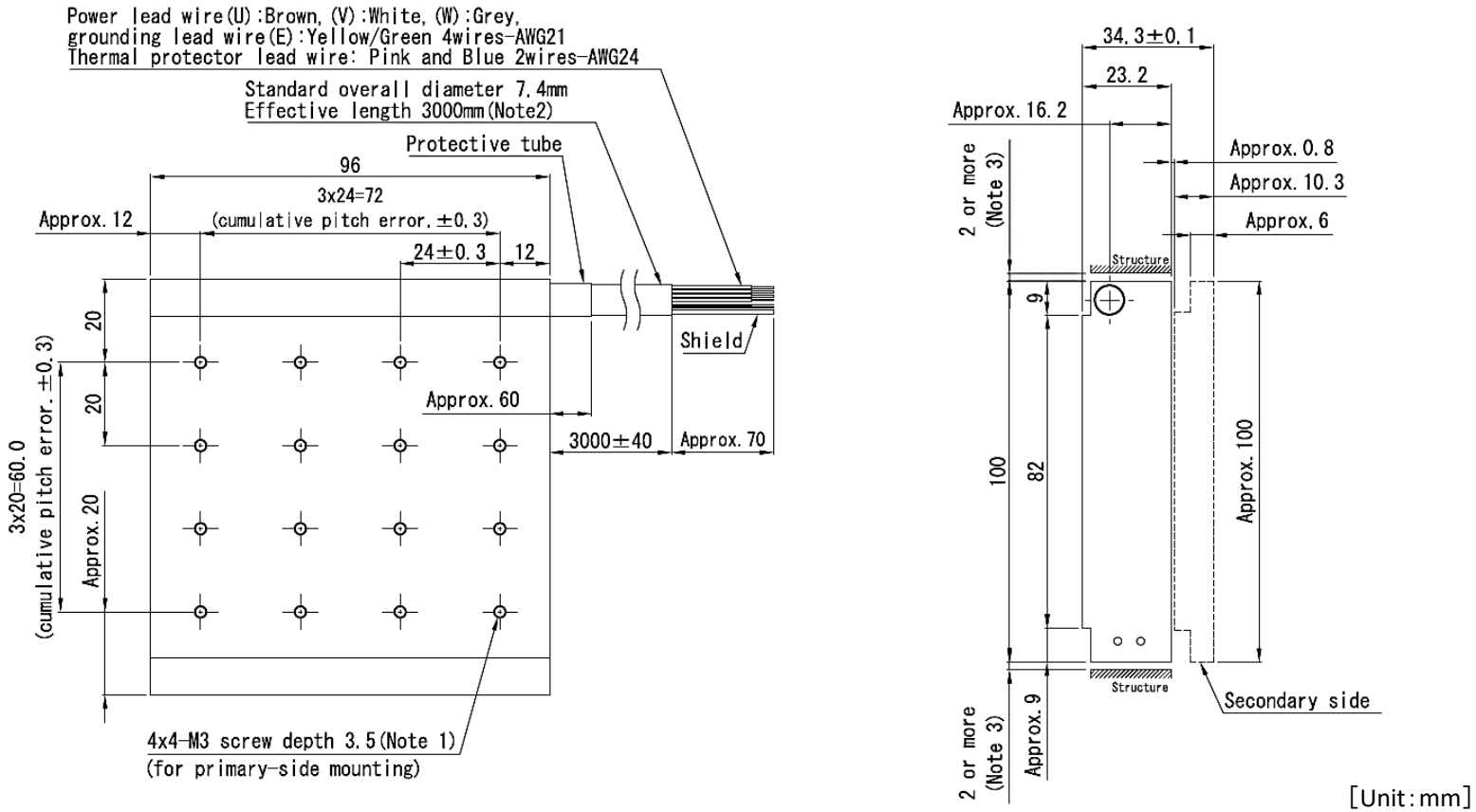
2. The lead wire is for fixed wiring, so securely fix it to the structure. Minimum bending radius of the lead wire is recommended to be ten times or more (reference value) the standard overall diameter of the lead wire .Select the cable used for the moving part considering the speed of linear servo motor and fixing radius.

3. Leave 2 mm or more of each side of the clearance between the side face of primary side and the structure.

Product Specifications (Motor)

LM-AJ Series Primary Side (Coil) Dimensions

LM-AJP3B-17N-JSS0



[Unit:mm]

Note 1. For mounting, use the hexagonal cap head bolt whose strength must be a high tensile strength steel level of SCM435 for its material, and the lower yield point is 900 N/mm2 or equivalent

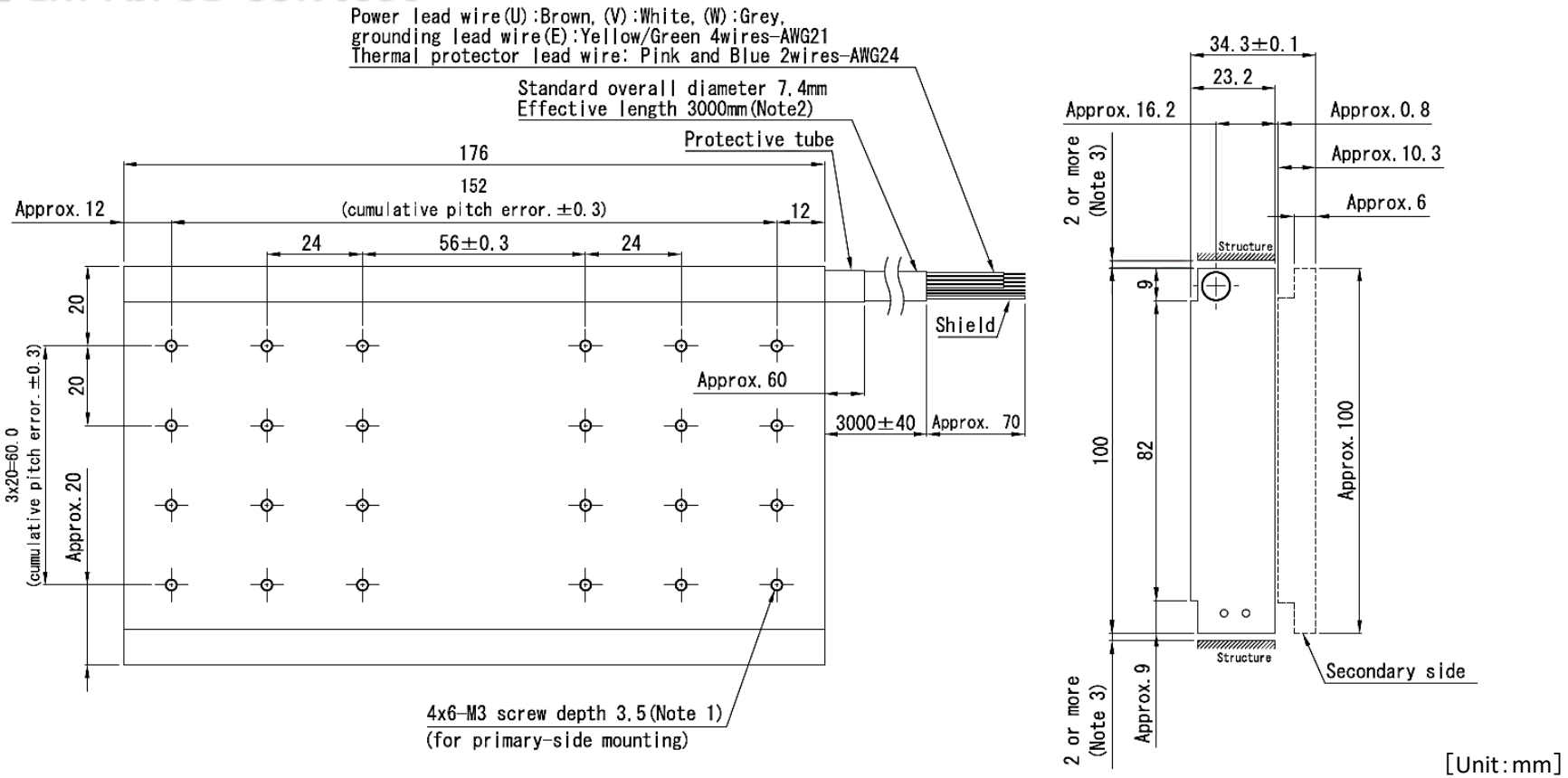
2. The lead wire is for fixed wiring, so securely fix it to the structure. Minimum bending radius of the lead wire is recommended to be ten times or more (reference value) the standard overall diameter of the lead wire .Select the cable used for the moving part considering the speed of linear servo motor and fixing radius.

3. Leave 2 mm or more of each side of the clearance between the side face of primary side and the structure.

Product Specifications (Motor)

LM-AJ Series Primary Side (Coil) Dimensions

LM-AJP3D-35R-JSS0



[Unit:mm]

Note 1. For mounting, use the hexagonal cap head bolt whose strength must be a high tensile strength steel level of SCM435 for its material, and the lower yield point is 900 N/mm2 or equivalent

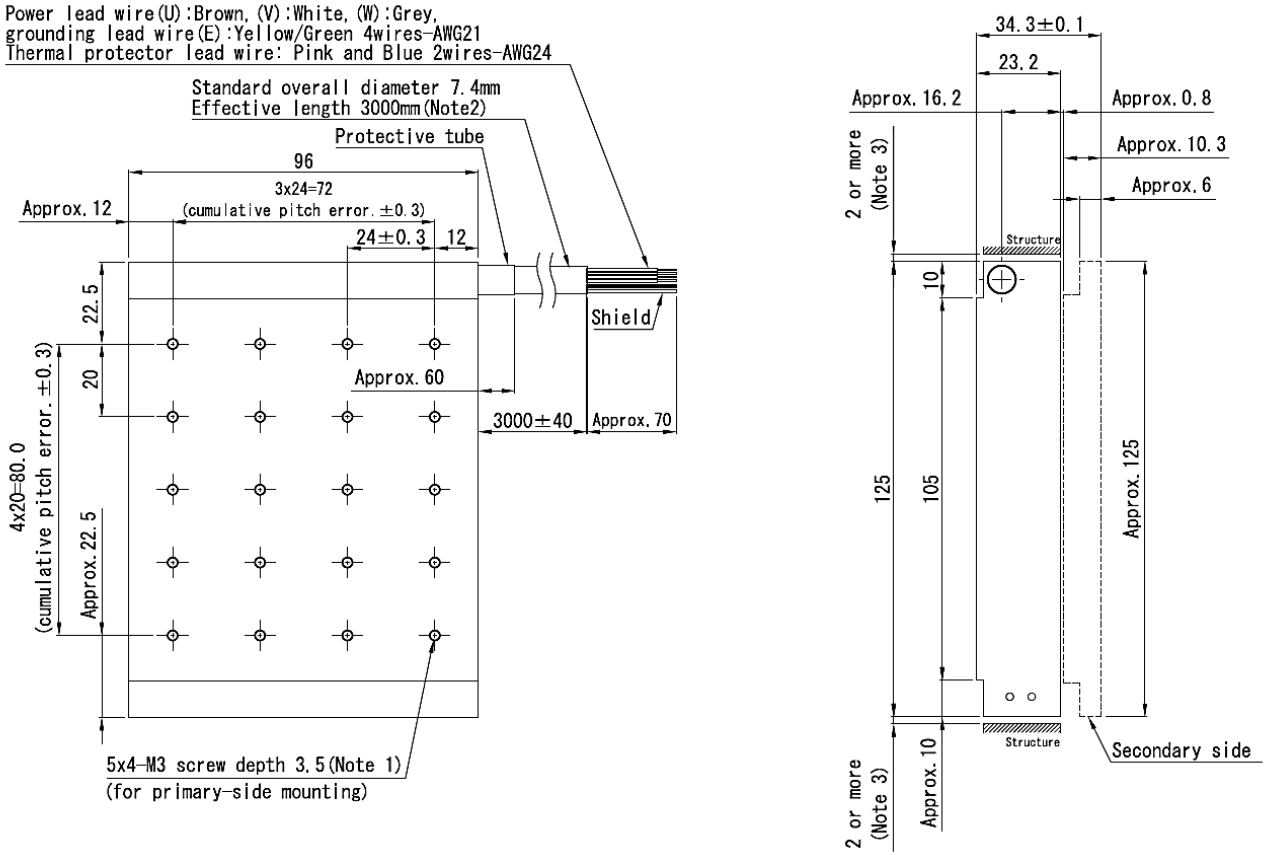
2. The lead wire is for fixed wiring, so securely fix it to the structure. Minimum bending radius of the lead wire is recommended to be ten times or more (reference value) the standard overall diameter of the lead wire .Select the cable used for the moving part considering the speed of linear servo motor and fixing radius.

3. Leave 2 mm or more of each side of the clearance between the side face of primary side and the structure.

Product Specifications (Motor)

LM-AJ Series Primary Side (Coil) Dimensions

LM-AJP4B-22M-JSS0



[Unit:mm]

Note 1. For mounting, use the hexagonal cap head bolt whose strength must be a high tensile strength steel level of SCM435 for its material, and the lower yield point is 900 N/mm2 or equivalent

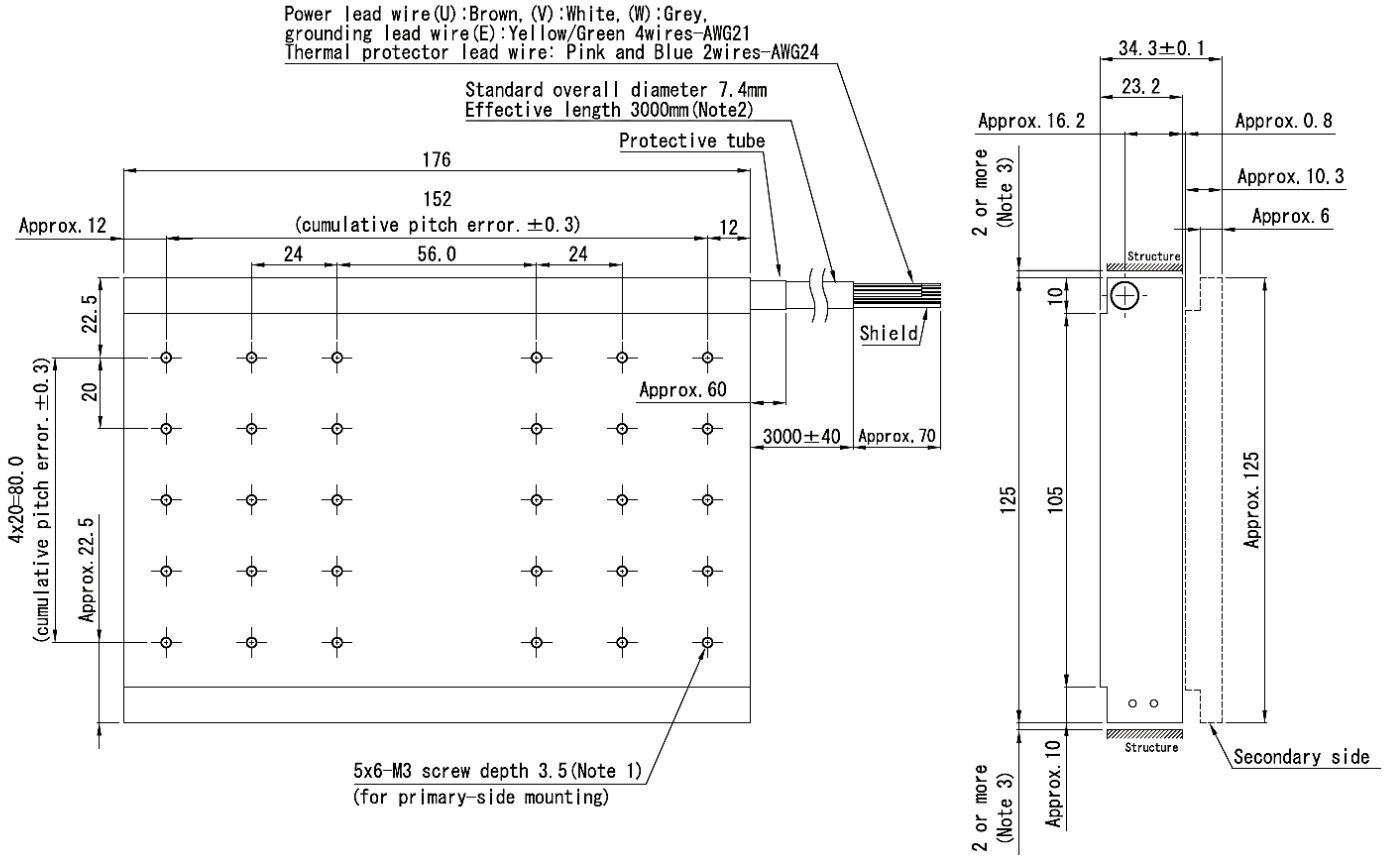
2. The lead wire is for fixed wiring, so securely fix it to the structure. Minimum bending radius of the lead wire is recommended to be ten times or more (reference value) the standard overall diameter of the lead wire .Select the cable used for the moving part considering the speed of linear servo motor and fixing radius.

3. Leave 2 mm or more of each side of the clearance between the side face of primary side and the structure.

Product Specifications (Motor)

LM-AJ Series Primary Side (Coil) Dimensions

LM-AJP4D-45N-JSS0



[Unit:mm]

Note 1. For mounting, use the hexagonal cap head bolt whose strength must be a high tensile strength steel level of SCM435 for its material, and the lower yield point is 900 N/mm2 or equivalent

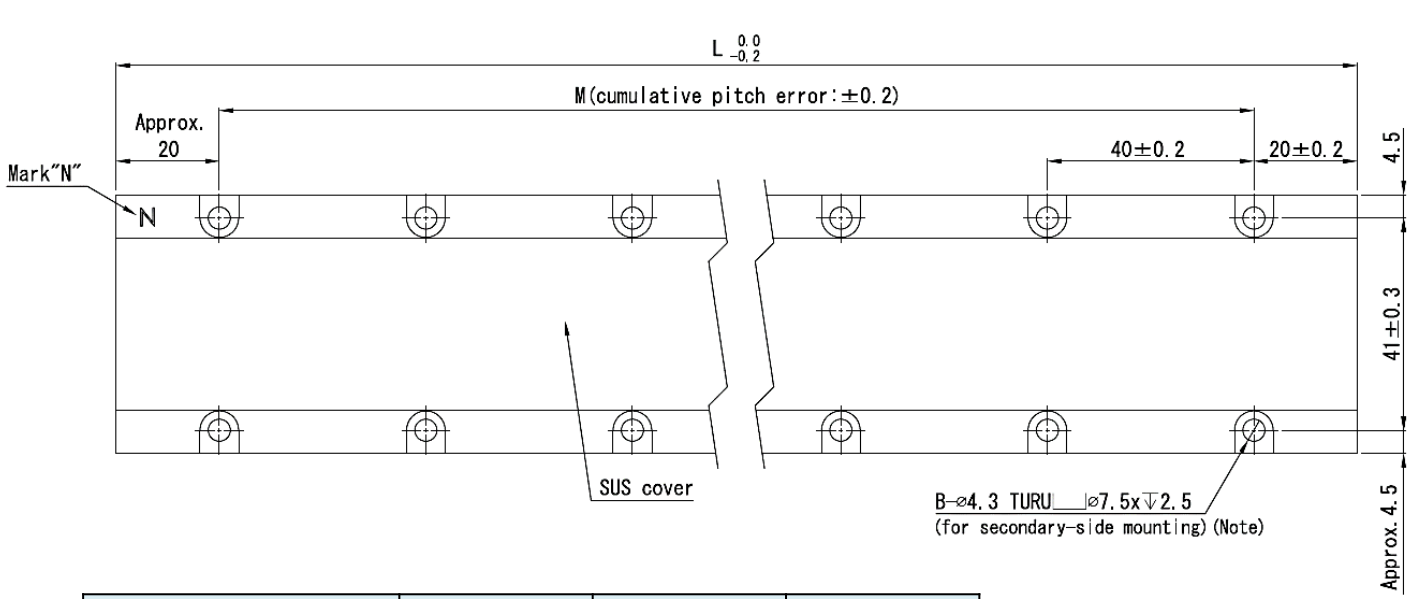
2. The lead wire is for fixed wiring, so securely fix it to the structure. Minimum bending radius of the lead wire is recommended to be ten times or more (reference value) the standard overall diameter of the lead wire .Select the cable used for the moving part considering the speed of linear servo motor and fixing radius.

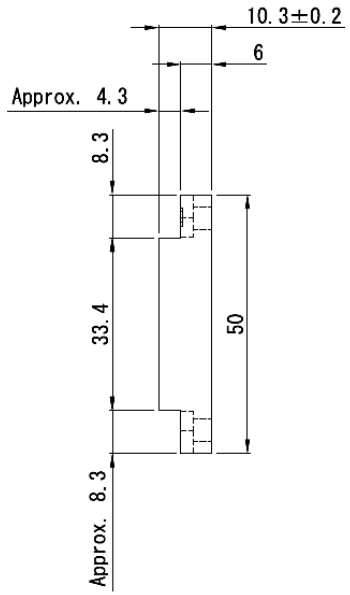
3. Leave 2 mm or more of each side of the clearance between the side face of primary side and the structure.

Product Specifications (Motor)

LM-AJ Series Secondary Side (Magnet) Dimensions

LM-AJS10-□-JSS0





	L	M	B
LM-AJS10-080-JSS0	80	40	2×2
LM-AJS10-200-JSS0	200	160	2×5
LM-AJS10-400-JSS0	400	360	2×10

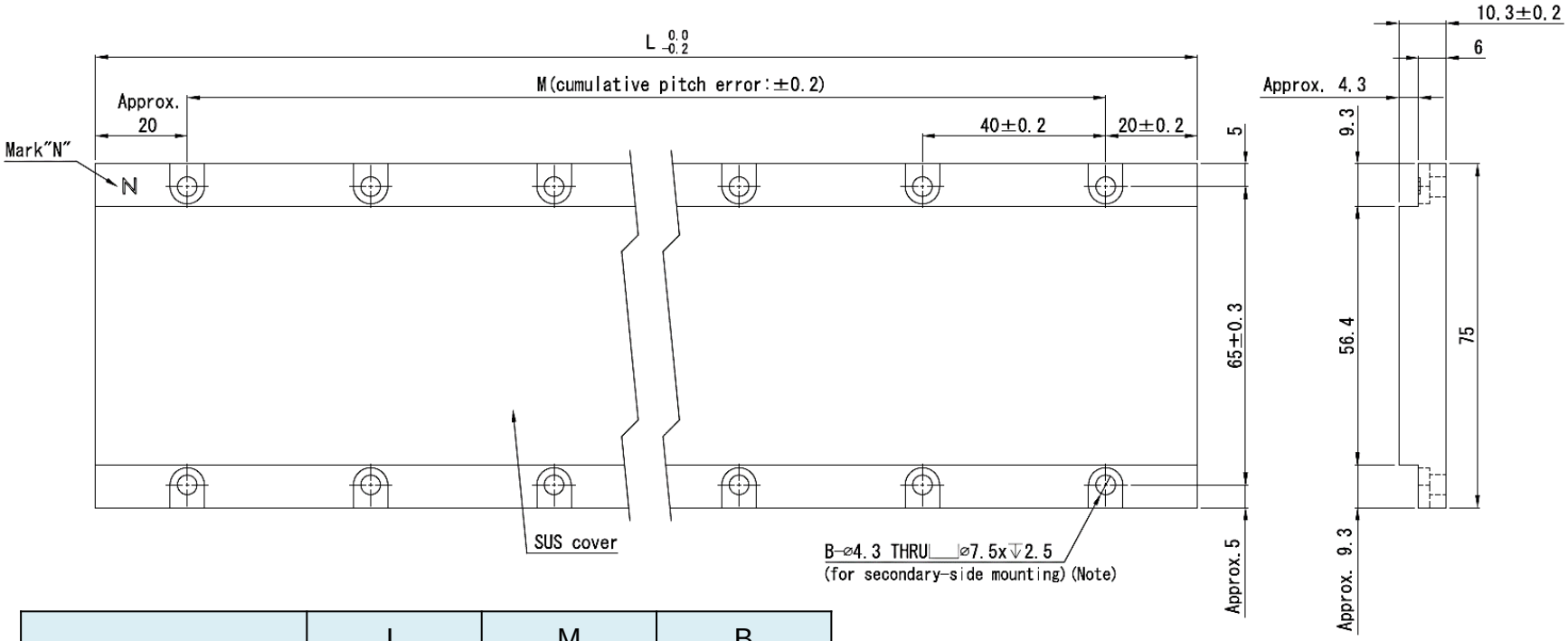
[Unit:mm]

Note. For mounting ,use the hexagonal cap head bolt whose screw head height is 4.3mm or less.

Product Specifications (Motor)

LM-AJ Series Secondary Side (Magnet) Dimensions

LM-AJS20-□-JSS0



	L	M	B
LM-AJS20-080-JSS0	80	40	2×2
LM-AJS20-200-JSS0	200	160	2×5
LM-AJS20-400-JSS0	400	360	2×10

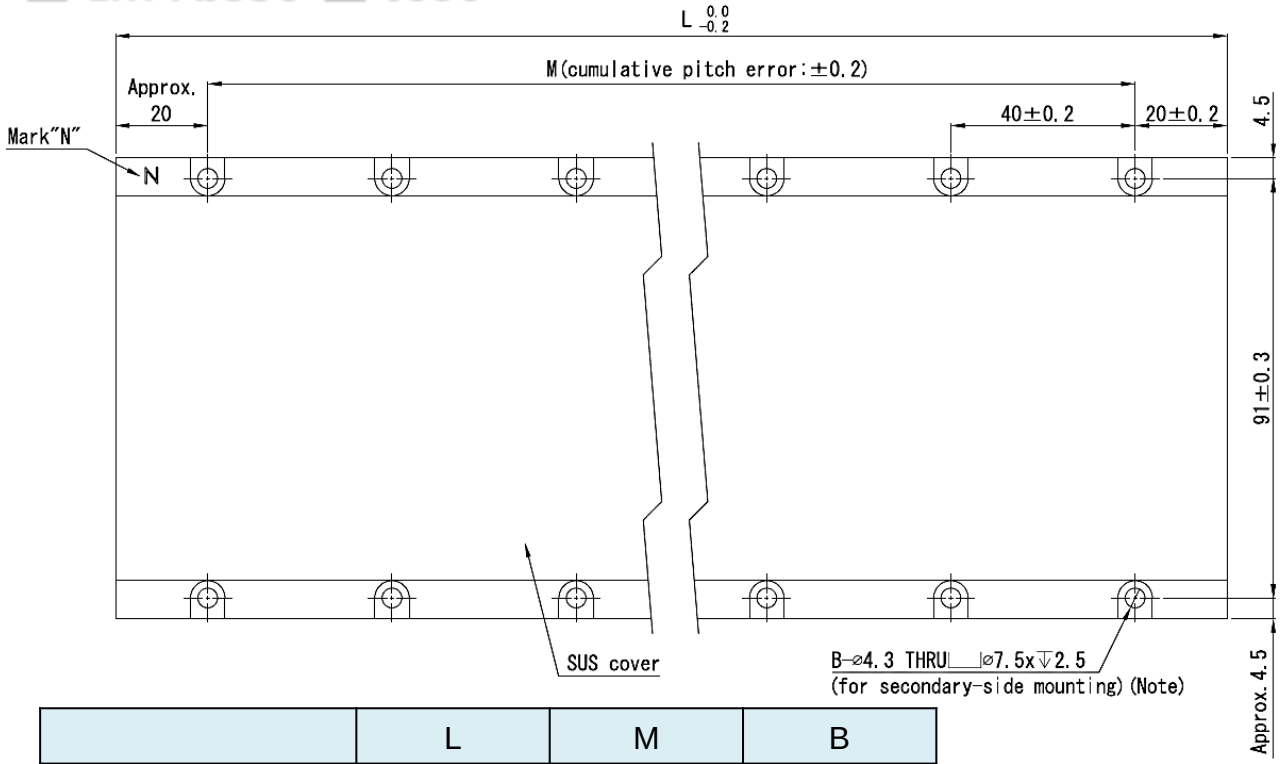
[Unit:mm]

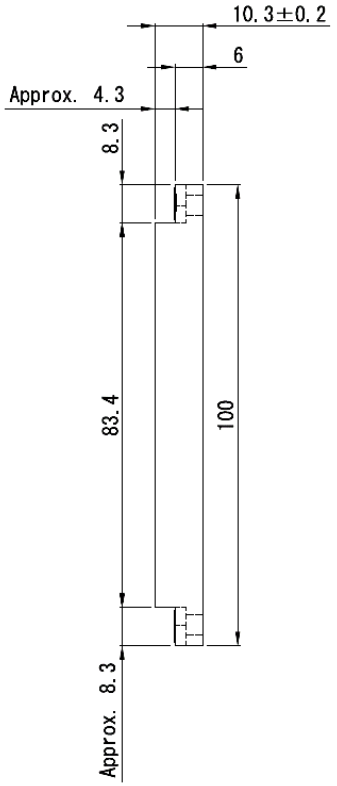
Note. For mounting ,use the hexagonal cap head bolt whose screw head height is 4.3mm or less.

Product Specifications (Motor)

LM-AJ Series Secondary Side (Magnet) Dimensions

LM-AJS30-□-JSS0





	L	M	B
LM-AJS30-080-JSS0	80	40	2×2
LM-AJS30-200-JSS0	200	160	2×5
LM-AJS30-400-JSS0	400	360	2×10

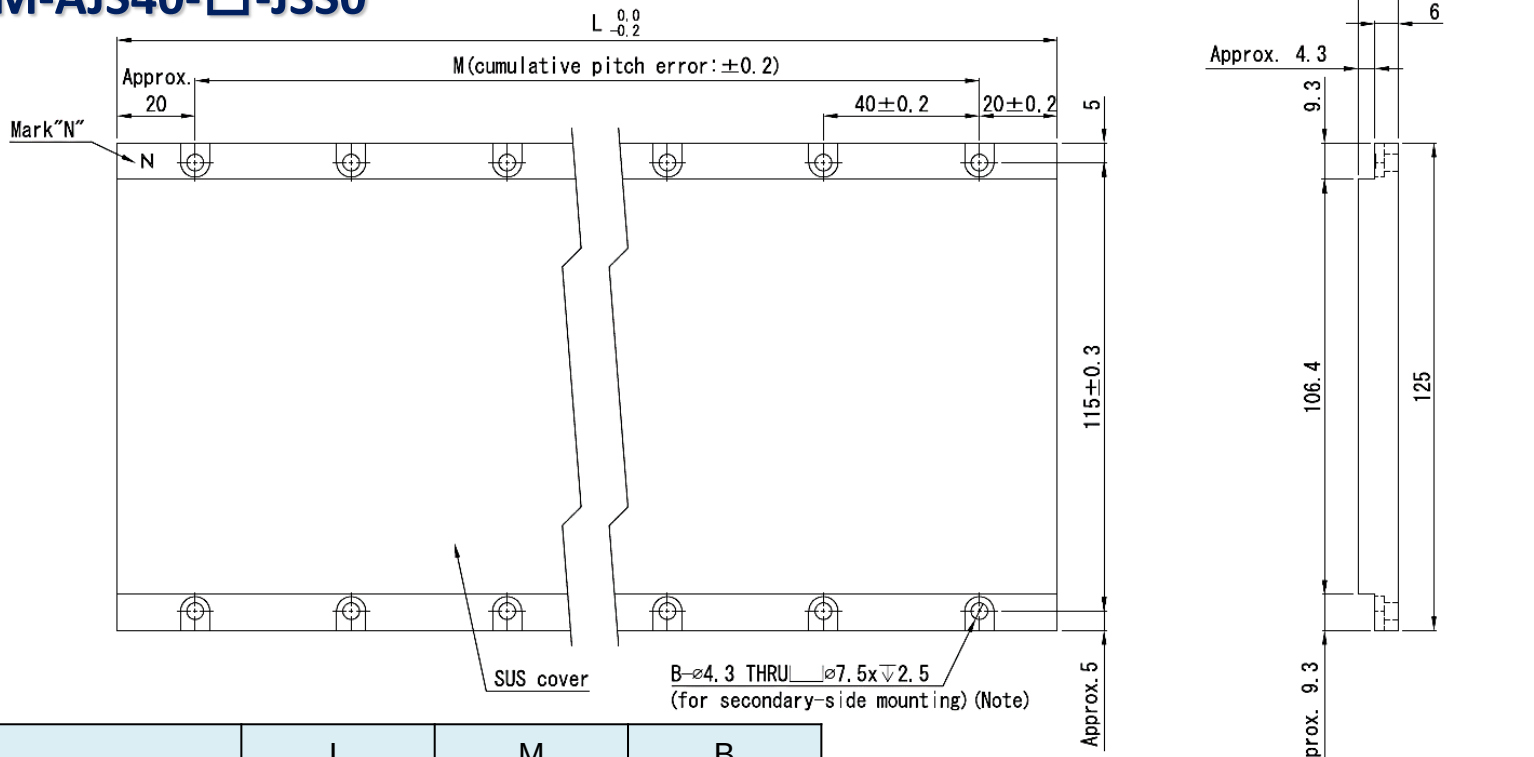
[Unit:mm]

Note. For mounting ,use the hexagonal cap head bolt whose screw head height is 4.3mm or less.

Product Specifications (Motor)

LM-AJ Series Secondary Side (Magnet) Dimensions

LM-AJS40-□-JSS0



	L	M	B
LM-AJS40-080-JSS0	80	40	2×2
LM-AJS40-200-JSS0	200	160	2×5
LM-AJS40-400-JSS0	400	360	2×10

[Unit:mm]

Note. For mounting ,use the hexagonal cap head bolt whose screw head height is 4.3mm or less.

Product Specifications (Amplifier)

MR-J4-☐-RJJ051 Specifications

Servo amplifier model MR-J4-			40☐-RJJ051		70☐-RJJ051	
			A	B	A	B
Output	Rated voltage		3-phase 170 V AC			
	Rated current	[A]	2.8		5.8	
Main circuit power supply input	Voltage/frequency (Note 1)	AC input	3-phase or 1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz			
		DC input (Note 4)	283 V DC to 340 V DC			
	Rated current (Note 2)	[A]	2.6		3.8	
	Permissible voltage fluctuation	AC input	3-phase or 1-phase 170 V AC to 264 V AC			
		DC input (Note 4)	241 V DC to 374 V DC			
	Permissible frequency fluctuation		±5% maximum			
Control circuit power supply input	Voltage/frequency	AC input	1-phase 200 V AC to 240 V AC, 50 Hz/60 Hz			
		DC input (Note 4)	283 V DC to 340 V DC			
	Rated current	[A]	0.2			
	Permissible voltage fluctuation	AC input	1-phase 170 V AC to 264 V AC			
		DC input (Note 4)	241 V DC to 374 V DC			
	Permissible frequency fluctuation		±5% maximum			
	Power consumption	[W]	30			
Interface power supply			24 V DC ±10% (required current capacity: 0.3 A (including CN8 connector signals))			
Control method			Sine-wave PWM control/current control method			
Permissible regenerative power	Built-in regenerative resistor	[W]	10		20	
Dynamic brake			Built-in			

Product Specifications (Amplifier)

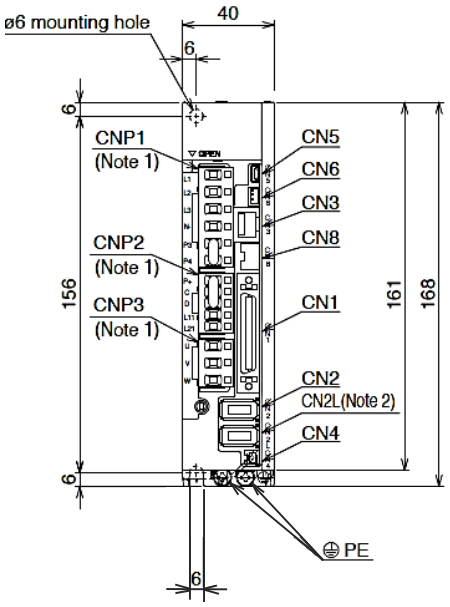
MR-J4-☐-RJJ051 Specifications

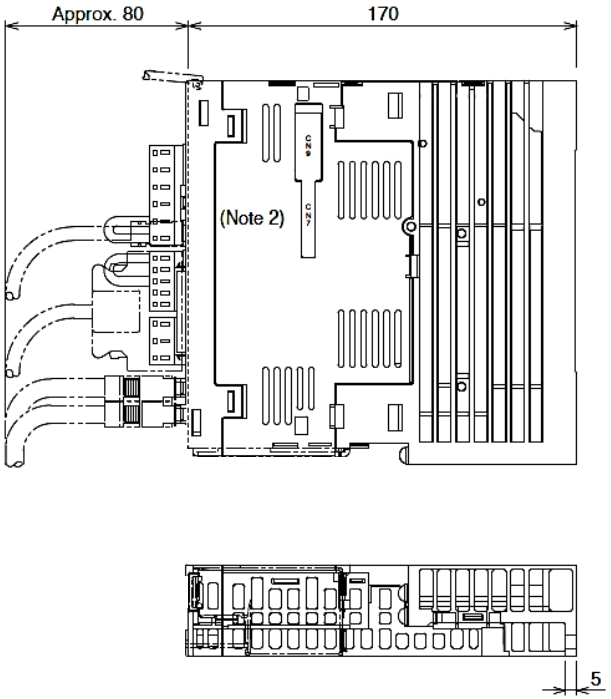
Servo amplifier model MR-J4-		40☐-RJJ051		70☐-RJJ051	
		A	B	A	B
Communication function		USB：Connect a personal computer (MR Configurator2 compatible)			
Load-side encoder Interface		Mitsubishi Electric high-speed serial communication, A/B/Z-phase differential input signal			
Servo functions		Advanced vibration suppression control II, adaptive filter II, robust filter, auto tuning, one-touch tuning, tough drive function, drive recorder function, tightening & press-fit control, machine diagnosis function, power monitoring function			
Protective functions		Overcurrent shut-off, regenerative overvoltage shut-off, overload shut-off (electronic thermal), servo motor overheat protection, encoder error protection, regenerative error protection, under voltage protection, instantaneous power failure protection, over speed protection, error excessive protection, magnetic pole detection protection, linear servo control fault protection			
Environment	Ambient	Operation: 0 ° C to 55 ° C (non-freezing), storage: -20 ° C to 65 ° C (non-freezing)			
	Ambient humidity	Operation/storage: 5 %RH to 90 %RH (non-condensing)			
	Ambience	Indoors (no direct sunlight); no corrosive gas, inflammable gas, oil mist or dust			
	Altitude	2000 m or less above sea level(Note 3)			
	Vibration resistance	5.9 m/s2 at 10 Hz to 55 Hz (directions of X, Y, and Z axes)			

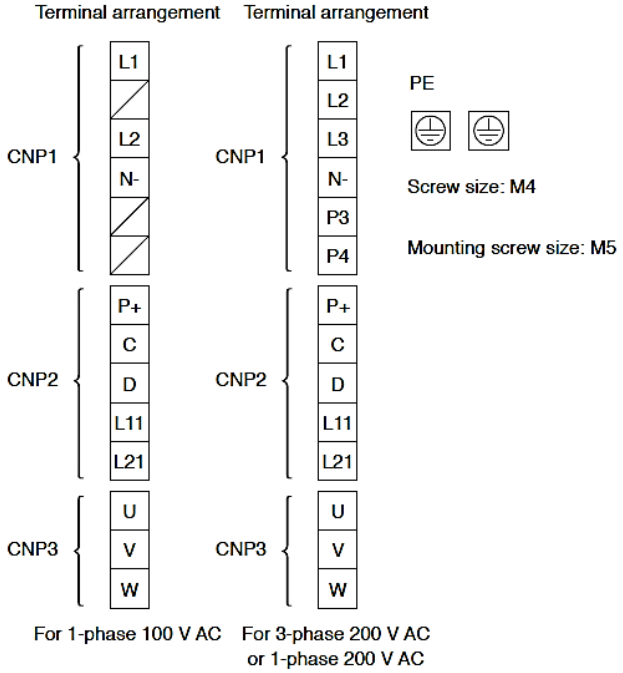
Notes: 1. Rated output and speed of a rotary servo motor and a direct drive motor; and continuous thrust and maximum speed of a linear servo motor are applicable when the servo amplifier is operated within the specified power supply voltage and frequency.
2. This value is applicable when a 3-phase power supply is used.
3. Refer to "MR-J4-_B_(-RJ) Servo Amplifier Instruction Manual" for the restrictions when using the servo amplifiers at altitude exceeding 1000 m and up to 2000 m above sea level.
4. For a connection example of power supply circuit with DC input, refer to “MR-J4-_B_-(RJ) Servo Amplifier Instruction Manual” or "MR-J4-_A_-(RJ) Servo Amplifier Instruction Manual".

Product Specifications (Amplifier)

MR-J4-40A-RJJ051 Dimensions





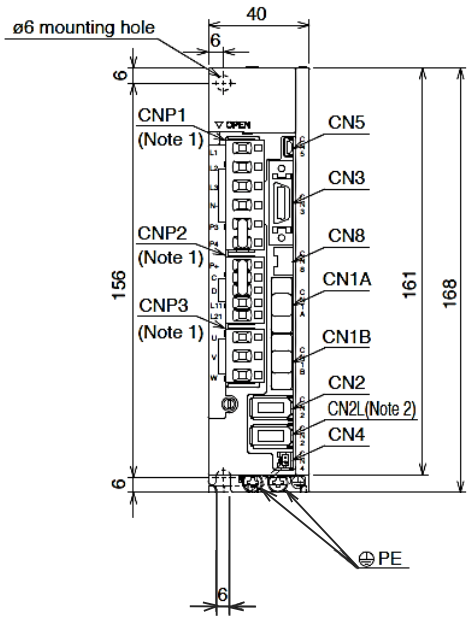


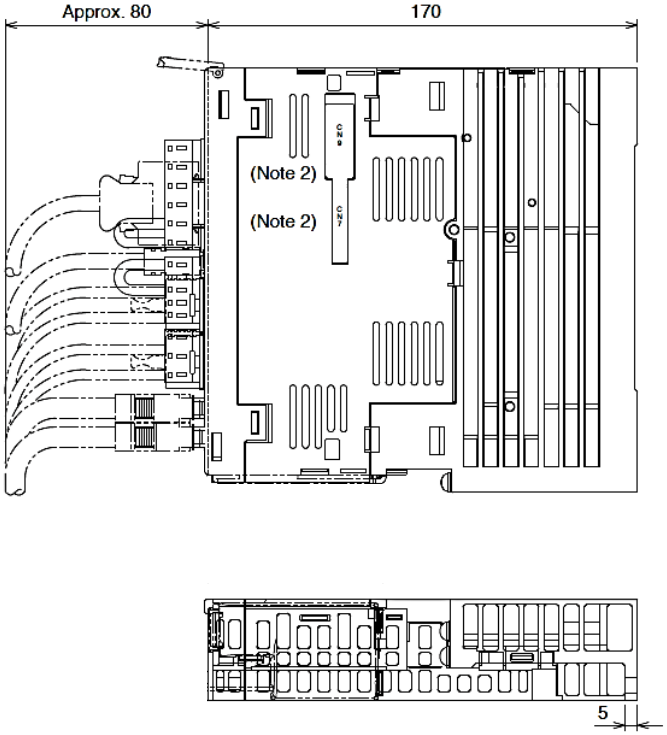
[Unit : mm]

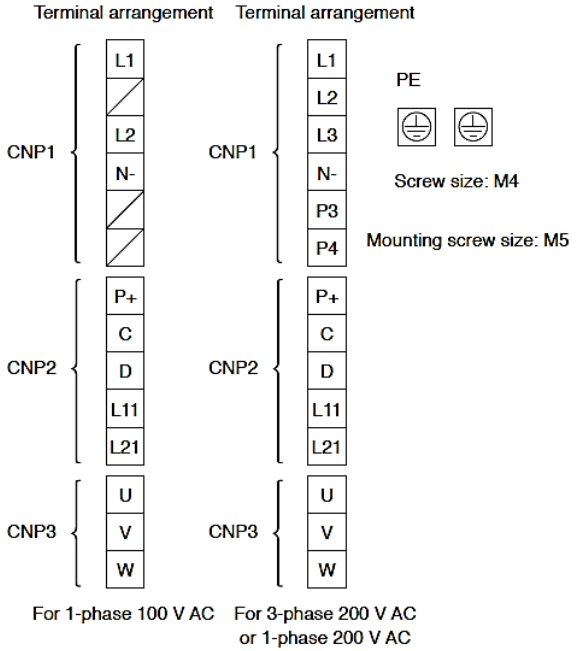
Notes: 1. CNP1, CNP2 and CNP3 connectors are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-A servo amplifier.
CN9 connector is available for use with MR-J4-A-RJ servo amplifiers manufactured in November 2014 or later.

Product Specifications (Amplifier)

MR-J4-40B-RJJ051 Dimensions





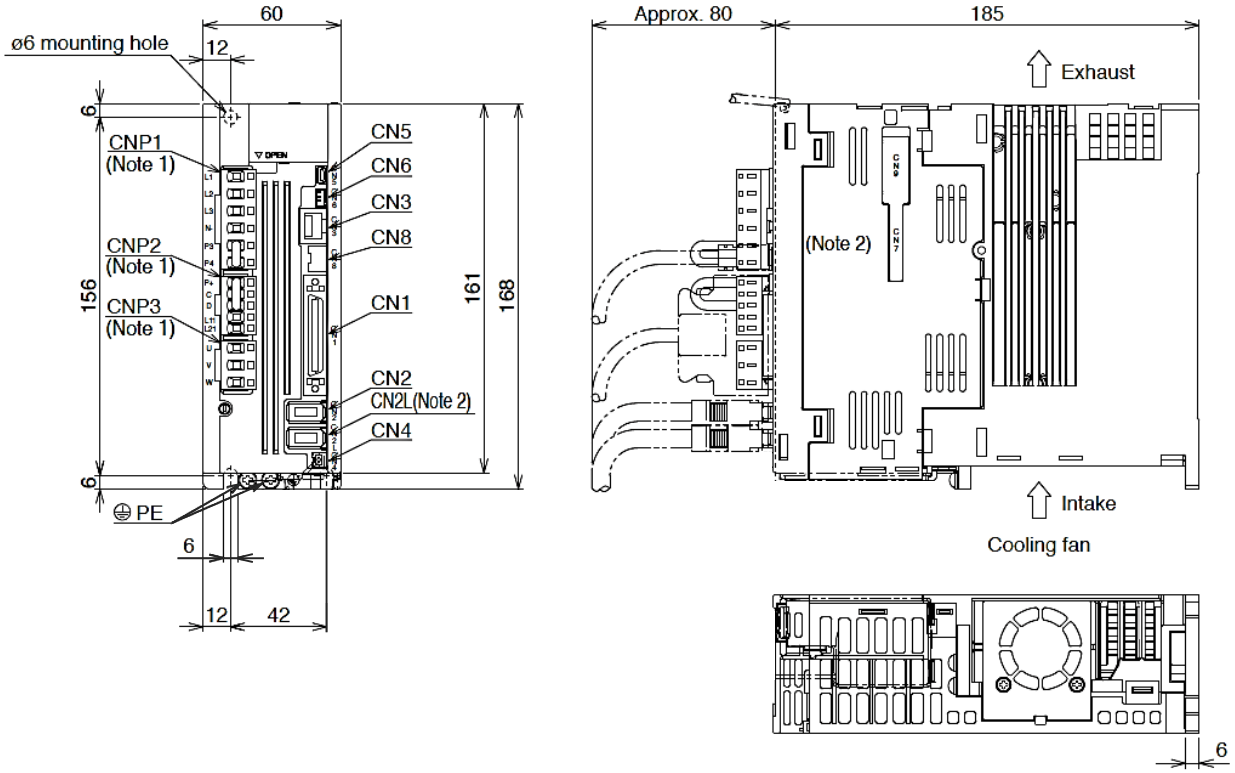


[Unit : mm]

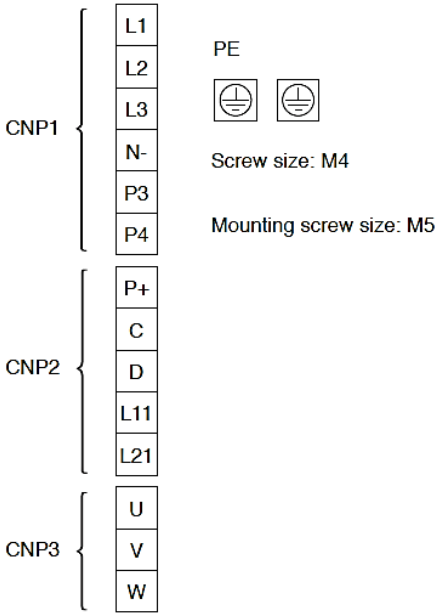
Notes: 1. CNP1, CNP2 and CNP3 connectors are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-B servo amplifier.

Product Specifications (Amplifier)

MR-J4-70A-RJJ051 Dimensions



Terminal arrangement

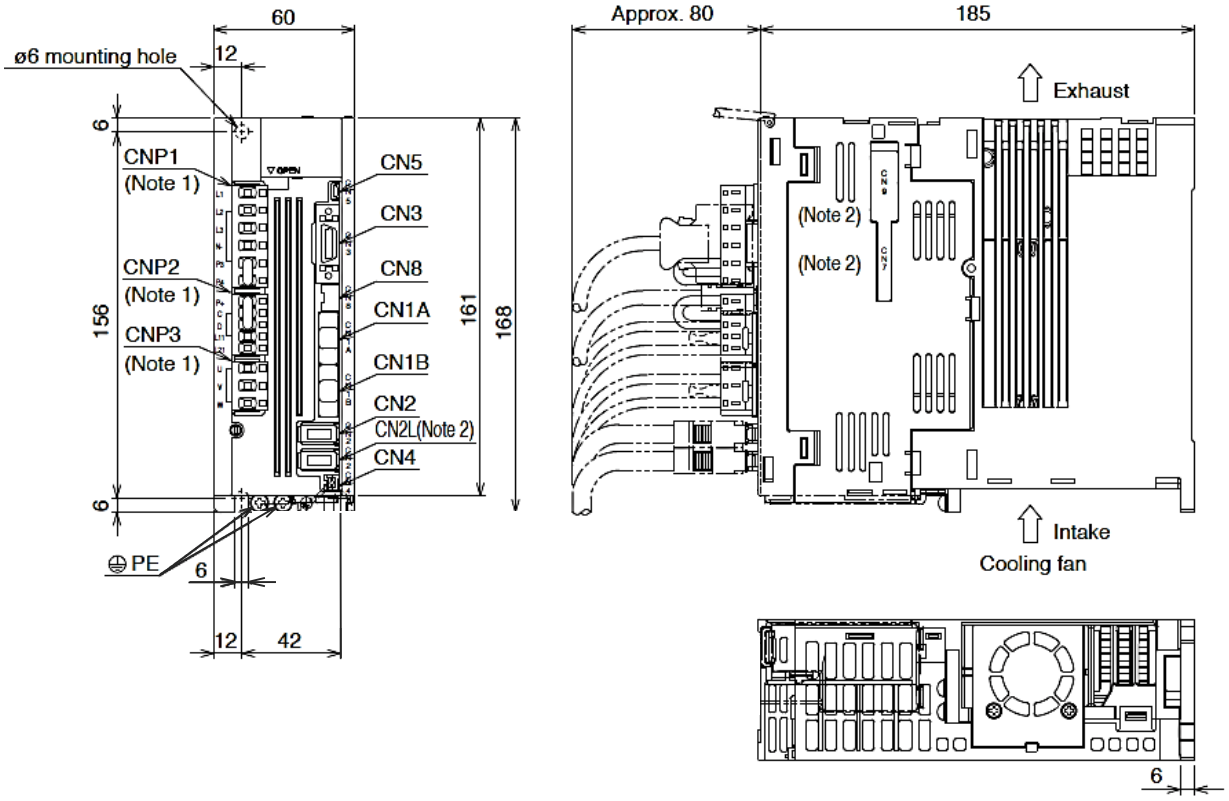


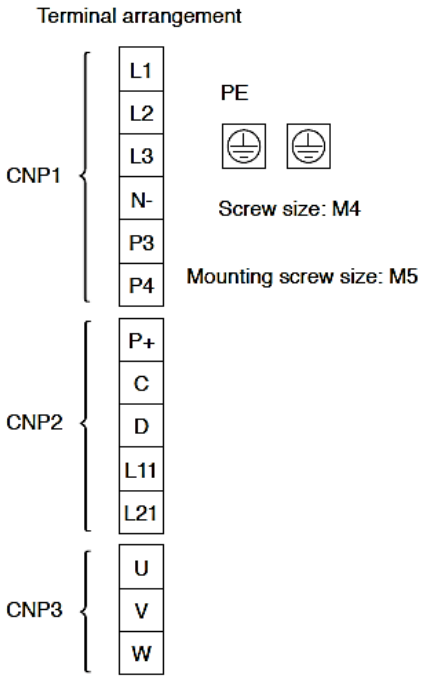
[Unit : mm]

Notes: 1. CNP1, CNP2 and CNP3 connectors are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-A servo amplifier.
CN9 connector is available for use with MR-J4-A-RJ servo amplifiers manufactured in November 2014 or later.

Product Specifications (Amplifier)

MR-J4-70B-RJJ051 Dimensions



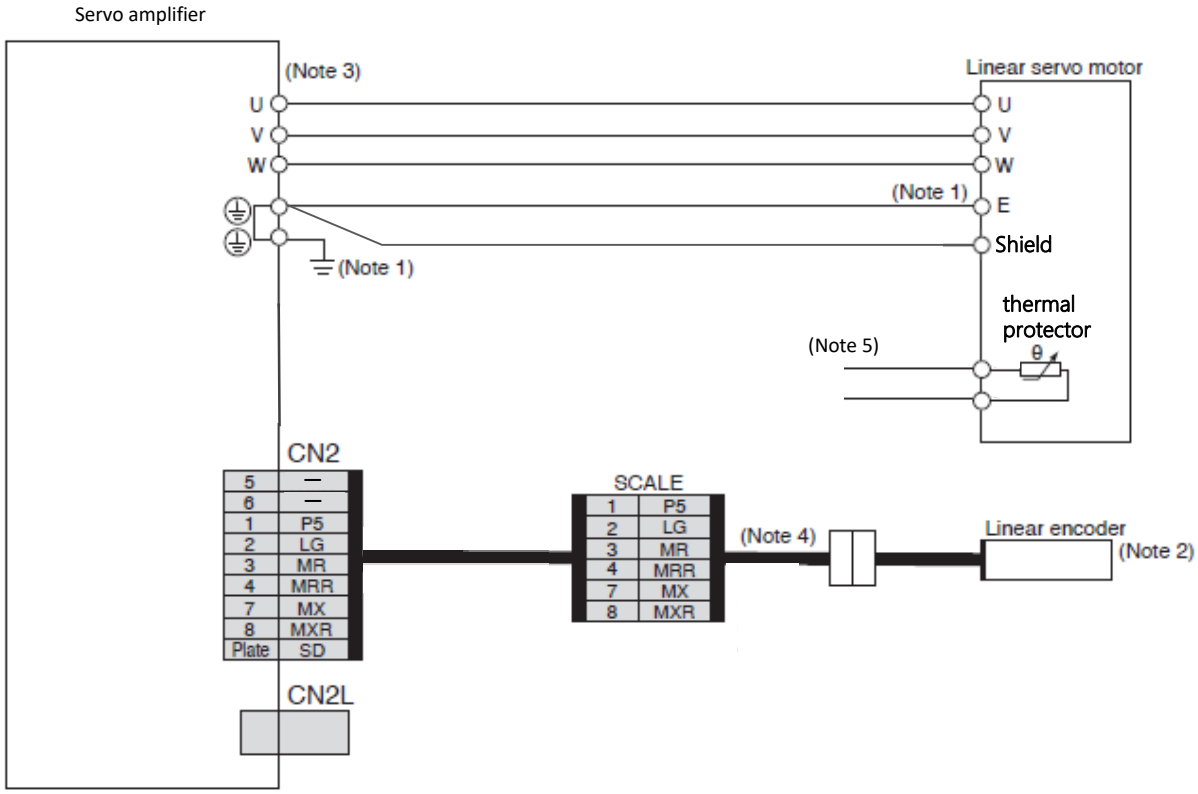


[Unit : mm]

Notes: 1. CNP1, CNP2 and CNP3 connectors are supplied with the servo amplifier.
2. CN2L, CN7, and CN9 connectors are not available for MR-J4-B servo amplifier.

Wiring Diagram

Connecting a serial linear encoder

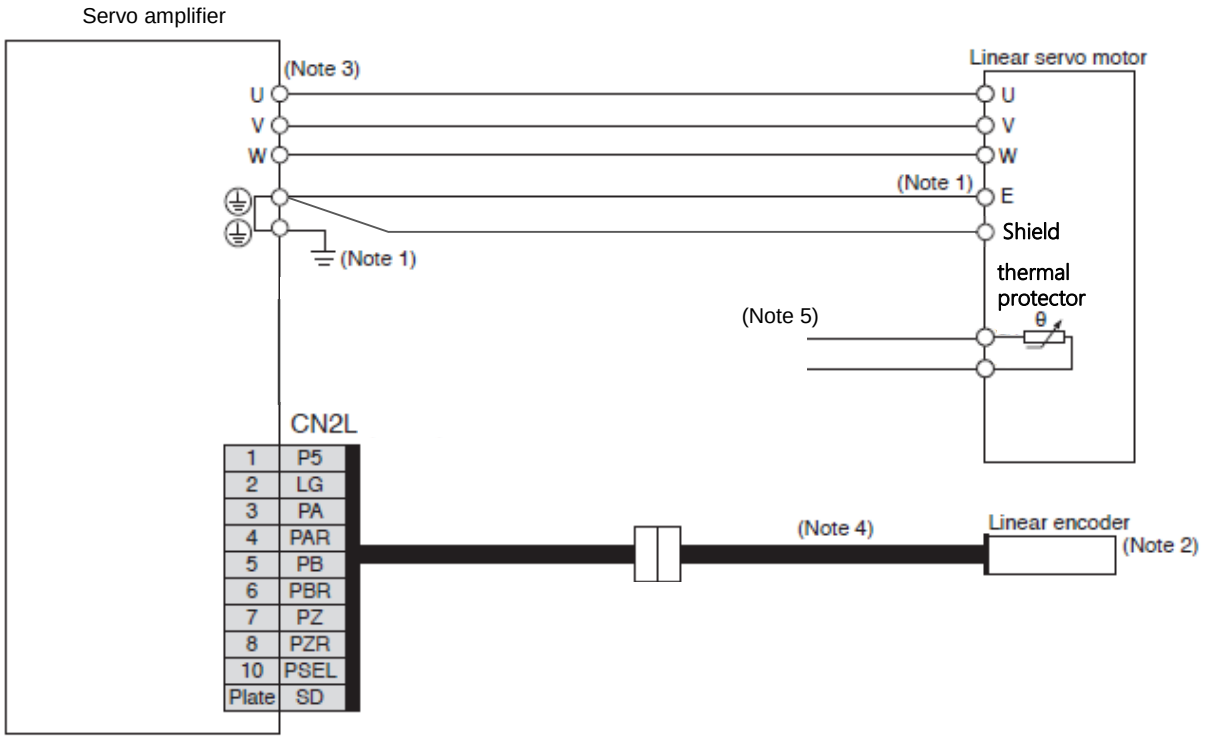


Notes: 1. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
2. For linear encoders, refer to "List of Linear Encoders" on p.30 in this document.
3. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
4. Necessary encoder cables vary depending on the linear encoder. Refer to relevant Instruction Manual.
5. Connect a thermal protector to the controller, and configure a circuit to shut down the main circuit of the servo amplifier at when it is opened by overheating.

6. For connections other than this one, refer to the J4 Catalog and Technical Data.

Wiring Diagram

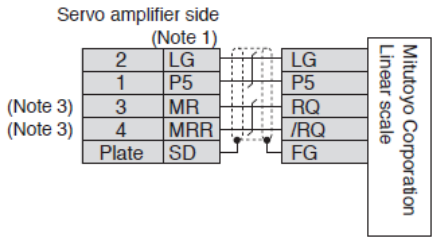
Connecting an A/B/Z-phase differential output linear encoder

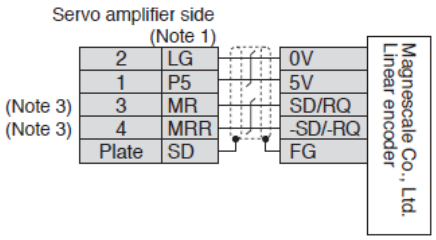


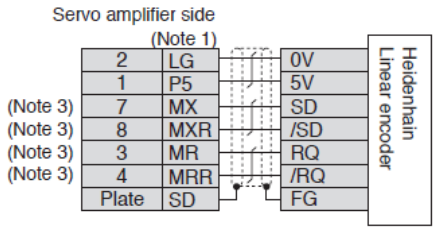
Notes: 1. Connect the grounding wire to the cabinet protective earth (PE) terminal via the servo amplifier protective earth (PE) terminal for grounding.
2. For linear encoders, refer to "List of Linear Encoders" on p.30 in this document.
3. Connector or terminal varies depending on the servo amplifier capacities. Refer to the dimensions of the relevant servo amplifier in this catalog for details.
4. Necessary encoder cables vary depending on the linear encoder. Refer to relevant Instruction Manual.
5Connect a thermal protector to the controller, and configure a circuit to shut down the main circuit of the servo amplifier at when it is opened by overheating.
6. For connections other than this one, refer to the J4 Catalog and Technical Data.

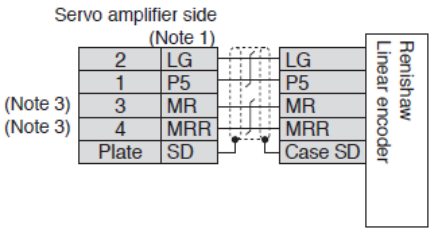
Wiring Diagram

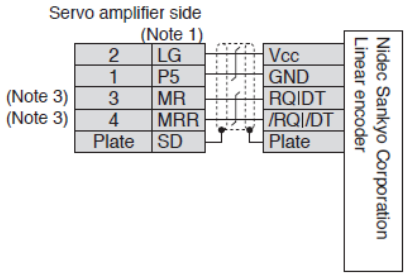
Linear encoder Connection Example

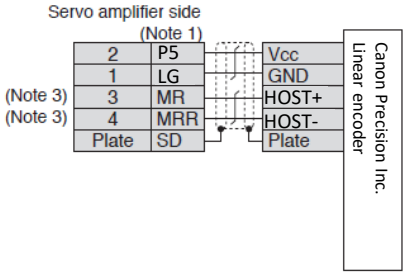


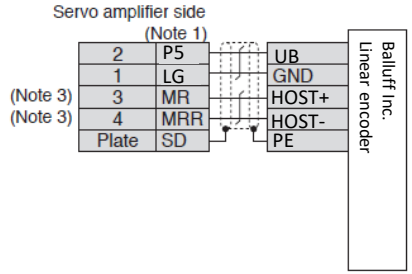


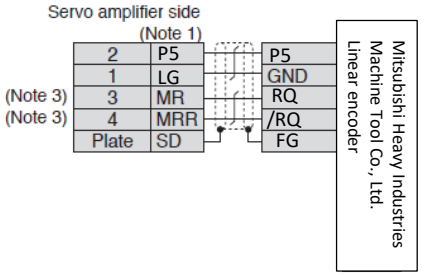


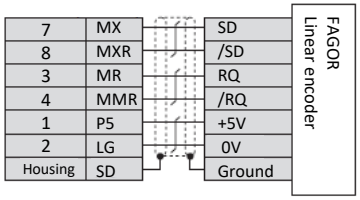


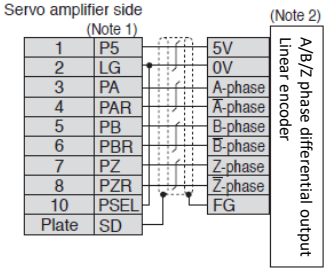












Notes: 1. For the number of the wire pairs for LG and P5, refer to "Linear Encoder Instruction Manual."
2. If the encoder's current consumption exceeds 350 mA, supply power from an external source.
3. For CN2L connector, the signals of 3-pin, 4-pin, 7-pin, and 8-pin are as follows:
3-pin: MR2 . 4-pin: MRR2 , 7-pin: MX2 , 8-pin: MXR2
4. For connections other than this one, refer to the J4 Catalog and Technical Data.

Linear Encoders

List of Linear Encoders

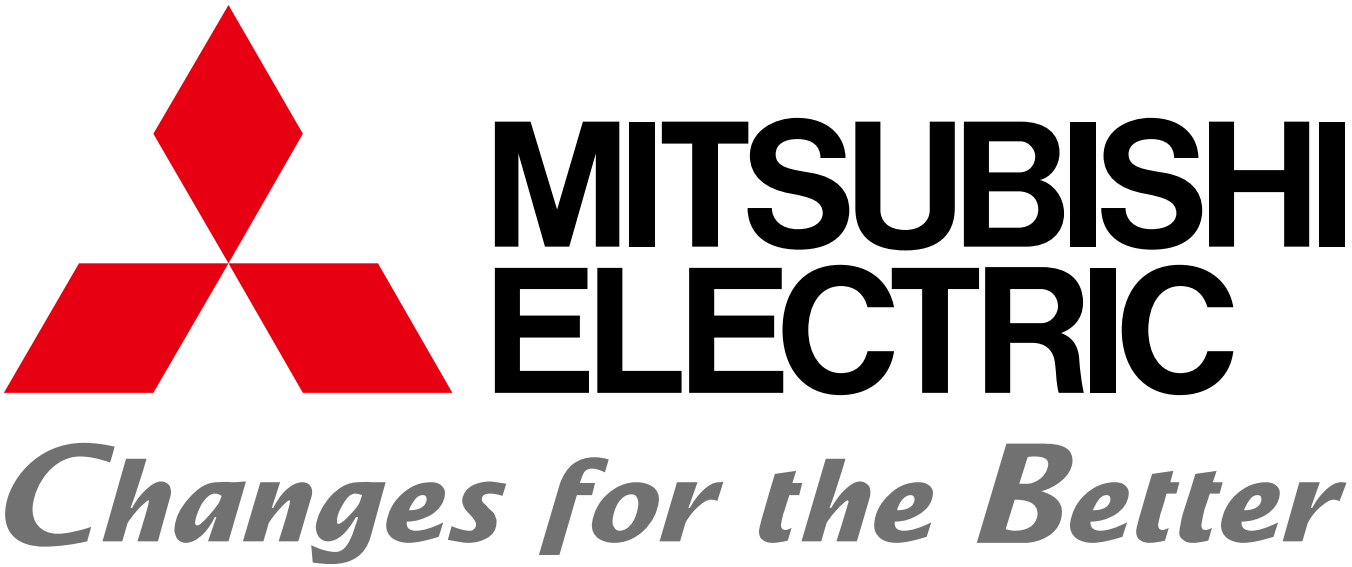
Linear encoder type		Manufacturer	Model	Resolution (Note 5)	Rated speed (Note 1)	Maximum effective measurement length (Note 2)	Communication method
Mitsubishi Electric serial interface compatible	Absolute type	Magnescale Co., Ltd.	SR77	0.05 μm/0.01 μm	3.3 m/s	2040 mm	Two-wire type
			SR87			3040 mm	
			SR27A	0.01 μm	3.3 m/s	2040 mm	Two-wire type/ Four-wire type
			SR67A			3640 mm	
		Mitutoyo Corporation	AT343A	0.05 μm	2.0 m/s	3000 mm	Two-wire type
			AT543A-SC		2.5 m/s	2200 mm	
			AT545A-SC	20μm /4096 (Approx. 0.005 μm)	2.5 m/s	2200 mm	
			ST741A	0.5 μm	4.0 m/s	6000 mm	
			ST742A				
			ST743A	0.1 μm			
			ST744A				
			ST748A				
			ST1341A	0.01 μm	4.0 m/s	12000 mm	
			ST1342A	0.001 μm		4200 mm	
		Renishaw	RESOLUTE RL40M	1 nm/50 nm	4.0 m/s	10000 mm	Two-wire type
			EVOLUTE EL40M	50 nm/100 nm/ 500 nm	4.0 m/s	3020 mm	
		Heidenhain	LC 495M	0.001 μm/ 0.01 μm	3.0 m/s	2040 mm	Four-wire type
			LC 195M			4240 mm	
			LIC 4193M	0.005 μm / 0.01 μm	4.0 m/s	2040 mm	Two-wire type/ Four-wire type
			LIC 4195M			28440 mm	
			LIC 4197M			6040 mm	
			LIC 4199M			1020 mm	
			LIC 2197M	0.05 μm / 0.1 μm	4.0 m/s	6020 mm	
			LIC 2199M			6020 mm	
		RSF Elektronik	MC15M	0.05 μm / 0.1 μm	4.0 m/s	3020 mm	
		Nidec Sankyo Corporation	PSLH206	0.1 μm	5 m/s	960 mm	Two-wire type
		Canon Precision Inc.	PH03-16E00	0.0625 μm	5 m/s	380 mm	
		Balluff Inc.	BML series	1 μ m	5 m/s	48000 mm	
		FAGOR	GAM Series	0.05 μm	2.0 m/s	30000 mm	Four-wire type
				0.01 μm	3.0 m/s		

Linear Encoders

List of Linear Encoders

Linear encoder type		Manufacturer	Model	Resolution (Note 5)	Rated speed (Note 1)	Maximum effective measurement length (Note 2)	Communication method
Mitsubishi Electric serial interface compatible	Incremental type	Magnescale Co., Ltd.	SR75	0.05 µm/0.01 µm	3.3 m/s	2040 mm	Two-wire type
			SR85			3040 mm	
			SL710 + PL101-RM/RHM	0.1 µm	4.0 m/s	100000 mm	
			SQ10 + PQ10 + MQ10	0.1 µm / 0.05 µm	10.0 m/s	3800 mm	Two-wire type/ Four-wire type
		Heidenhain	LIDA 483 + EIB 392M (/16384)	20 µm/16384 (Approx. 1.22 nm)	4.0 m/s	3040 mm	Four-wire type
			LIDA 485 + EIB 392M (/16384)			30040 mm	
			LIDA 487 + EIB 392M (/16384)			6040 mm	
			LIDA 489 + EIB 392M (/16384)			1020 mm	
			LIDA 287 + EIB 392M (/16384)	200 µm/16384 (Approx. 1.22 nm)		10000 mm	
			LIDA 289 + EIB 392M (/16384)				
			LIF 481 + EIB 392M (/4096)	4 µm/4096 (Approx. 0.977 nm)	1.2 m/s	1020 mm	
			LIP 581 + EIB 392M (/4096)			1440 mm	
		Nidec Sankyo Corporation	PSLH041	0.1 µm	5.0 m/s	2400 mm	Two-wire type
		Mitsubishi Heavy Industries Machine Tool Co., Ltd.	MPLIN	0.1 µm /1 µm	5 m/s	2000 mm	
		Canon Precision	PH03-16120	0.0625 µm	5 m/s	580 mm	
A/B/Z-phase differential output type (Note 4)		Not designated	-	0.001 µm to 5 µm (Note 3)	Depends on the linear encoder	Depends on the linear encoder	A/B/Z-phase differential output method

Notes: 1. The values indicate the rated speed of a linear encoder combined with the MR-J4 servo amplifiers. The values may differ from those of the manufacturer specifications.
2. The values indicate the manufacturer specification values. The maximum encoder cable length between the linear encoder and the servo amplifier is 30 m.
3 . Select a linear encoder within this tolerable resolution.
4. To use an A/B/Z-phase differential output type linear encoder, use the MR-J4-_A_-RJJ051/MR-J4-_B_-RJJ051.
5. There is a limitation in settable encoder resolution, depending on the magnetic pole pitch in a linear motor or an actuator.
Use a linear encoder having a resolution that satisfies the following formula.
4,096＜ (Magnetic pole pitch / Encoder resolution) ＜67,108,864
When using an encoder with a resolution of 5 nm (0.005 µm) or less, please Check about the magnetic pole pitch, then confirm if it can be used in the system.
e.g.) When using an encoder with a resolution of 1 nm, a linear motor/actuator with the maximum magnetic pole pitch of approximately 67.1 mm can be used.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