

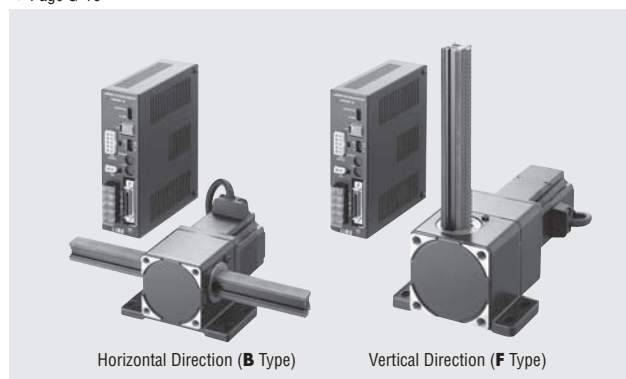
RoHS Compliant Rack and Pinion Systems LAS Series

● Additional Information ●
 Technical reference → Page F-1
 Safety standards → Page G-2

Adopting a rack and pinion mechanism and a closed loop stepping motor α STEP, the **LAS** Series achieves high positioning accuracy and high thrust force. It is a high-speed, high-thrust lineared motor capable of implementing such operations as "push, pull, lift and lower" in limited space.



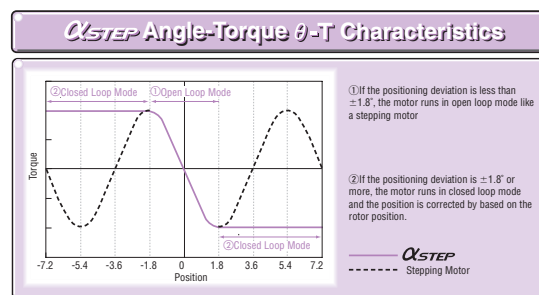
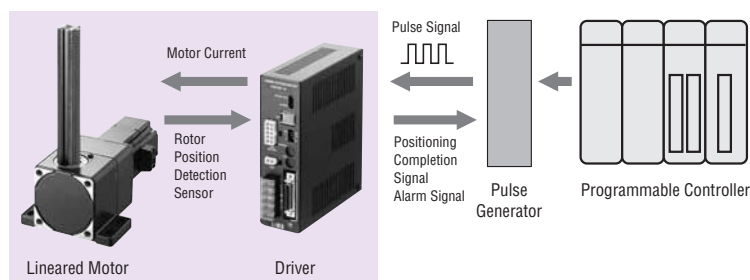
● List of safety standard approved products (Model, Standards, File No., Certification Body)
 → Page G-10



Features

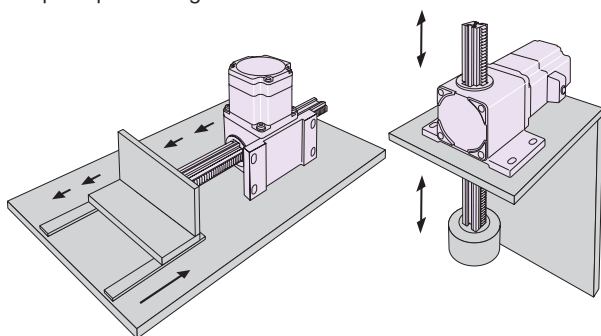
● Adopting α STEP for Greater Reliability

Adopting α STEP, the **LAS** Series can acquire additional information, such as positioning completion signals and alarm signals, to achieve greater reliability.



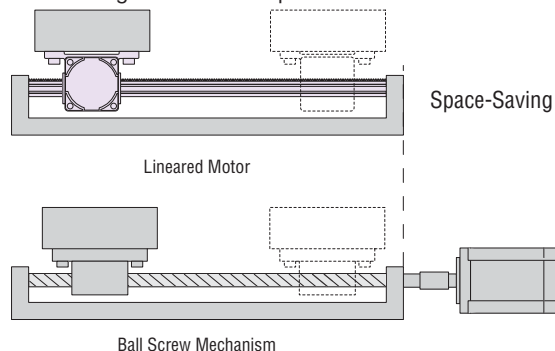
● Horizontal and Vertical Operations at Will

Adopting α STEP as its drive motor, the **LAS** Series can easily meet various linear motion needs, such as speed adjustment and multi-point positioning.



● Space-Saving

The screw holes at both ends of the rack can be affixed to let the actuator travel. This structure allows for effective utilization of limited mounting or installation space.

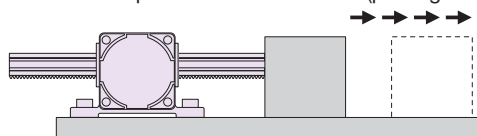


● Ideal for Vertical Operation

Since an alarm signal is output in the event of an overload condition or malfunction, the **LAS** Series can be reliably used in vertical operation. Use of an electromagnetic brake type is recommended for vertical operation.

● Easy Setting of Travel Distance

α STEP enables you to set flexible movement distances by setting the number of pulses for the controller (pulse generator).

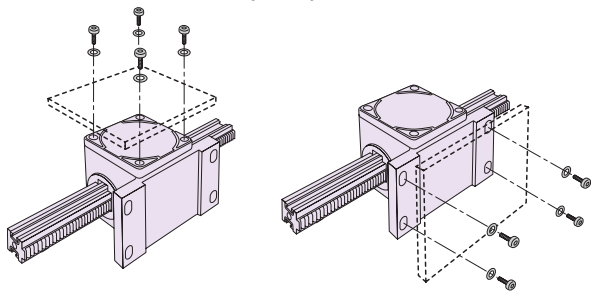


● Rack Specifications of Up to 1000 mm in Length

For greater design flexibility, various rack specifications are available over a range of 100 to 1000 mm in length. Choose the type that better suits your system.

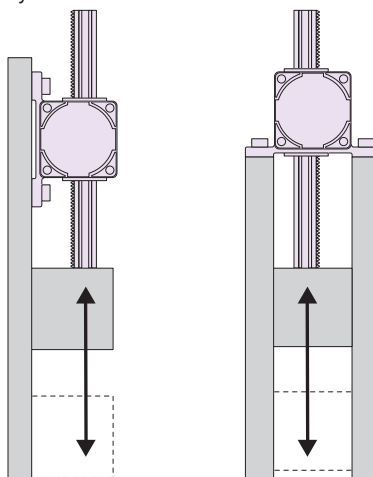
● **Two Installation Directions**

Two mounting surfaces are provided. Choose the installation direction that better suits your system.



● **Flexible Mounting**

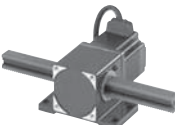
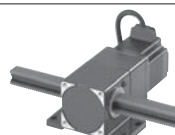
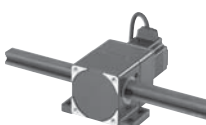
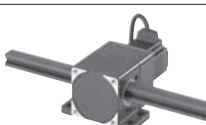
Each model comes in two types – horizontal type and vertical type – to allow for mounting in different directions to meet various limitations on installation. Choose the type that better suits your system.



B Type

F Type

● **Two Lineared Motor Types**

Frame Size	Type	Max. Transportable Mass [kg]	Operating Speed Range [mm/s]	Stroke* [mm]
60 mm	 Standard Type	10	0~500	100~800
	 High Thrust Force Type	30	0~90	
80 mm	 Standard Type	20	0~500	100~1000
	 High Thrust Force Type	100	0~40	

* Strokes can be specified in units of 100 mm.

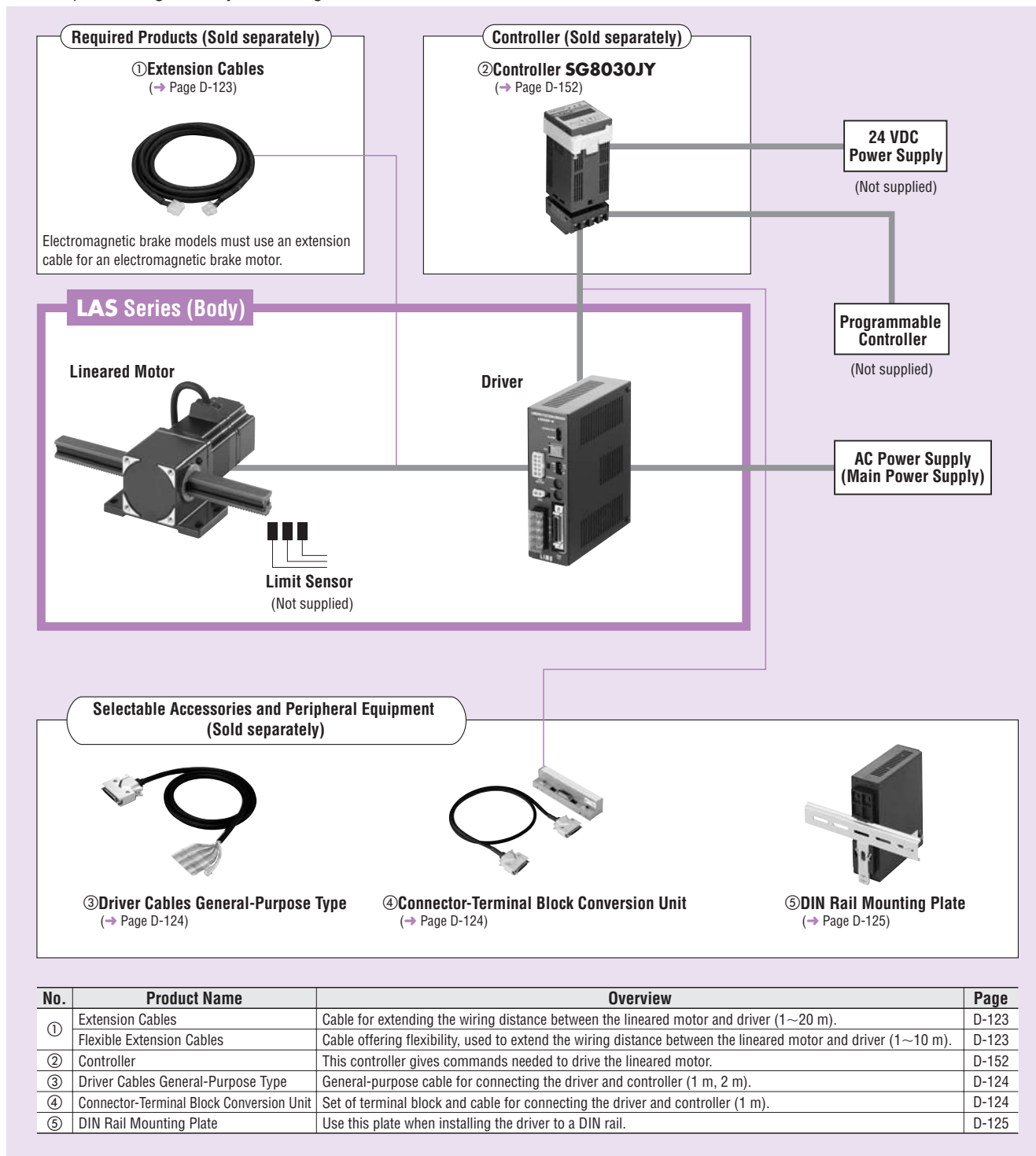
● **RoHS** RoHS-Compliant

The **LAS** Series conforms to the RoHS Directive that prohibits the use of six chemical substances including lead and cadmium.

● **Details of RoHS Directive** → Page G-23

System Configuration

An example of a single-axis system configuration with the **SG8030JY** controller.



Example of System Configuration

(Body)

(Sold separately)

(Sold separately)

LAS Series	Extension Cable (3 m)	+	Controller	DIN Rail Mounting Plate	Connector-Terminal Block Conversion Unit
LAS2B500MW-1	CC03AIPM		SG8030JY-U	PADP01	CC36T1

● The system configuration shown above is an example. Other combinations are available.

Product Number Code

LAS 2 F 500 M W - 5

- ① ② ③ ④ ⑤ ⑥ ⑦

①	Series	LAS: LAS Series
②	Frame Size	2: 60 mm 4: 80 mm
③	Traveling Direction of Rack	F: The rack travels vertically to the mounting flange. B: The rack travels horizontally to the mounting flange.
④	Maximum Rack Speed	40: 40 mm/s 90: 90 mm/s 500: 500 mm/s
⑤	Electromagnetic Brake	A: Not equipped M: Equipped
⑥	Power Supply Input	W: Single-Phase 100-115 VAC/Single-Phase 200-230 VAC S: Three-Phase 200-230 VAC
⑦	Stroke	1: 100 mm 2: 200 mm 3: 300 mm 4: 400 mm 5: 500 mm 6: 600 mm 7: 700 mm 8: 800 mm 9: 900 mm 10: 1000 mm

Product Line

Standard Type

Single-Phase 100-115 VAC/Single-Phase 200-230 VAC		Three-Phase 200-230 VAC	
Model	Page	Model	Page
LAS2□500AW-1	D-101	LAS2□500AS-1	*
LAS2□500AW-2		LAS2□500AS-2	*
LAS2□500AW-3		LAS2□500AS-3	*
LAS2□500AW-4		LAS2□500AS-4	*
LAS2□500AW-5		LAS2□500AS-5	*
LAS2□500AW-6		LAS2□500AS-6	*
LAS2□500AW-7		LAS2□500AS-7	*
LAS2□500AW-8		LAS2□500AS-8	*
LAS4□500AW-1		LAS4□500AS-1	*
LAS4□500AW-2		LAS4□500AS-2	*
LAS4□500AW-3		LAS4□500AS-3	*
LAS4□500AW-4		LAS4□500AS-4	*
LAS4□500AW-5		LAS4□500AS-5	*
LAS4□500AW-6		LAS4□500AS-6	*
LAS4□500AW-7		LAS4□500AS-7	*
LAS4□500AW-8		LAS4□500AS-8	*
LAS4□500AW-9		LAS4□500AS-9	*
LAS4□500AW-10		LAS4□500AS-10	*

- Enter **F** or **B** (traveling direction of rack) in the box (□) within the model name.
- * For the three-phase 200-230 VAC models, please contact the nearest Oriental Motor sales office.

Standard Type with Electromagnetic Brake

Single-Phase 100-115 VAC/Single-Phase 200-230 VAC		Three-Phase 200-230 VAC	
Model	Page	Model	Page
LAS2□500MW-1	D-101	LAS2□500MS-1	*
LAS2□500MW-2		LAS2□500MS-2	*
LAS2□500MW-3		LAS2□500MS-3	*
LAS2□500MW-4		LAS2□500MS-4	*
LAS2□500MW-5		LAS2□500MS-5	*
LAS2□500MW-6		LAS2□500MS-6	*
LAS2□500MW-7		LAS2□500MS-7	*
LAS2□500MW-8		LAS2□500MS-8	*
LAS4□500MW-1		LAS4□500MS-1	*
LAS4□500MW-2		LAS4□500MS-2	*
LAS4□500MW-3		LAS4□500MS-3	*
LAS4□500MW-4		LAS4□500MS-4	*
LAS4□500MW-5		LAS4□500MS-5	*
LAS4□500MW-6		LAS4□500MS-6	*
LAS4□500MW-7		LAS4□500MS-7	*
LAS4□500MW-8		LAS4□500MS-8	*
LAS4□500MW-9		LAS4□500MS-9	*
LAS4□500MW-10		LAS4□500MS-10	*

- Enter **F** or **B** (traveling direction of rack) in the box (□) within the model name.
- * For the three-phase 200-230 VAC models, please contact the nearest Oriental Motor sales office.

The following items are included in each product.
 Lineared Motor, Surge Suppressor*, Driver, Connector for Input/Output Signal, Operating Manual
 * Only for electromagnetic brake type

● High Thrust Force Type

Single-Phase 100-115 VAC/Single-Phase 200-230 VAC		Three-Phase 200-230 VAC	
Model	Page	Model	Page
LAS2□90AW-1	D-102	LAS2□90AS-1	*
LAS2□90AW-2		LAS2□90AS-2	*
LAS2□90AW-3		LAS2□90AS-3	*
LAS2□90AW-4		LAS2□90AS-4	*
LAS2□90AW-5		LAS2□90AS-5	*
LAS2□90AW-6		LAS2□90AS-6	*
LAS2□90AW-7		LAS2□90AS-7	*
LAS2□90AW-8		LAS2□90AS-8	*
LAS4□40AW-1		LAS4□40AS-1	*
LAS4□40AW-2		LAS4□40AS-2	*
LAS4□40AW-3		LAS4□40AS-3	*
LAS4□40AW-4		LAS4□40AS-4	*
LAS4□40AW-5		LAS4□40AS-5	*
LAS4□40AW-6		LAS4□40AS-6	*
LAS4□40AW-7		LAS4□40AS-7	*
LAS4□40AW-8		LAS4□40AS-8	*
LAS4□40AW-9		LAS4□40AS-9	*
LAS4□40AW-10		LAS4□40AS-10	*

● Enter **F** or **B** (traveling direction of rack) in the box (□) within the model name.

* For the three-phase 200-230 VAC models, please contact the nearest Oriental Motor sales office.

● High Thrust Force Type with Electromagnetic Brake

Single-Phase 100-115 VAC/Single-Phase 200-230 VAC		Three-Phase 200-230 VAC	
Model	Page	Model	Page
LAS2□90MW-1	D-102	LAS2□90MS-1	*
LAS2□90MW-2		LAS2□90MS-2	*
LAS2□90MW-3		LAS2□90MS-3	*
LAS2□90MW-4		LAS2□90MS-4	*
LAS2□90MW-5		LAS2□90MS-5	*
LAS2□90MW-6		LAS2□90MS-6	*
LAS2□90MW-7		LAS2□90MS-7	*
LAS2□90MW-8		LAS2□90MS-8	*
LAS4□40MW-1		LAS4□40MS-1	*
LAS4□40MW-2		LAS4□40MS-2	*
LAS4□40MW-3		LAS4□40MS-3	*
LAS4□40MW-4		LAS4□40MS-4	*
LAS4□40MW-5		LAS4□40MS-5	*
LAS4□40MW-6		LAS4□40MS-6	*
LAS4□40MW-7		LAS4□40MS-7	*
LAS4□40MW-8		LAS4□40MS-8	*
LAS4□40MW-9		LAS4□40MS-9	*
LAS4□40MW-10		LAS4□40MS-10	*

● Enter **F** or **B** (traveling direction of rack) in the box (□) within the model name.

* For the three-phase 200-230 VAC models, please contact the nearest Oriental Motor sales office.

The following items are included in each product.
 Lineared Motor, Surge Suppressor*, Driver, Connector for Input/Output Signal, Operating Manual
 * Only for electromagnetic brake type



Specifications

Lineared Motor

Standard Type **RoHS**

Model	Single-Phase 100-115 VAC Single-Phase 200-230 VAC	Frame Size 60 mm		Frame Size 80 mm	
		LAS2□500AW-□	LAS2□500MW-□	LAS4□500AW-□	LAS4□500MW-□
Motor Type		αSTEP			
Electromagnetic Brake		Not equipped	Equipped	Not equipped	Equipped
Operating Speed Range	mm/s	0~500			
Maximum Transportable Mass	kg	10 (250 mm/s) 7 (500 mm/s)		20 (250 mm/s) 7 (500 mm/s)	
Maximum Acceleration	m/s ²	1			
Maximum Thrust Force*1	N	110 (250 mm/s) 77 (500 mm/s)		220 (250 mm/s) 77 (500 mm/s)	
Maximum Holding Force N	Power ON	110			
	Power OFF	0			
	Electromagnetic Brake	—	110	—	220
Resolution	mm/pulse	19.9948×10 ⁻³		20.0176×10 ⁻³	
Rotor Inertia	J: kg·m ²	405×10 ⁻⁷		564×10 ⁻⁷	
Speed and Position Control Commands		Pulse input			
Stroke		100, 200, 300, 400, 500, 600, 700, 800		100, 200, 300, 400, 500, 600, 700, 800, 900, 1000	
Lineared Motor Mass*2 (): with electromagnetic brake	kg	100: 1.7 (2.0) 200: 1.9 (2.2) 300: 2.1 (2.4) 400: 2.3 (2.6) 500: 2.5 (2.8) 600: 2.7 (3.0) 700: 2.9 (3.2) 800: 3.1 (3.4)		100: 2.8 (3.1) 200: 3.1 (3.4) 300: 3.4 (3.7) 400: 3.6 (3.9) 500: 3.9 (4.2) 600: 4.2 (4.5) 700: 4.5 (4.8) 800: 4.8 (5.1) 900: 5.1 (5.4) 1000: 5.4 (5.7)	
Rack Mass	kg	100: 0.5 200: 0.6 300: 0.8 400: 1.0 500: 1.2 600: 1.4 700: 1.6 800: 1.8		100: 0.7 200: 1.0 300: 1.3 400: 1.5 500: 1.8 600: 2.1 700: 2.4 800: 2.7 900: 3.0 1000: 3.3	

- Enter **F** or **B** (traveling direction of rack) in the box (□) within the model name.
- Enter the stroke in the box (□) within the model name.
- The maximum load mass that can be driven when operating the rack vertically is the maximum transportable mass less the rack mass.
- In addition to the products shown above, the products for three-phase 200-230 VAC are also available. Please contact the nearest Oriental Motor sales office.
- *1 Make sure the sum of thrust force and acceleration thrust force of the load does not exceed the maximum thrust force.
- *2 The lineared motor mass includes the rack mass.

Electromagnetic Brake (Electromagnetic brake type only)

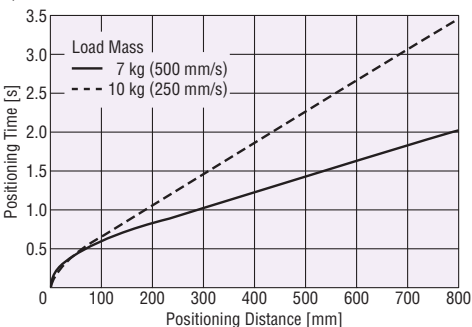
Type	Power off activated type
Power supply voltage	24 VDC±5%
Power supply current	0.25 A
Operation pattern	Power OFF: The brake is activated. Power ON: The brake is released.

Positioning Distance – Positioning Time

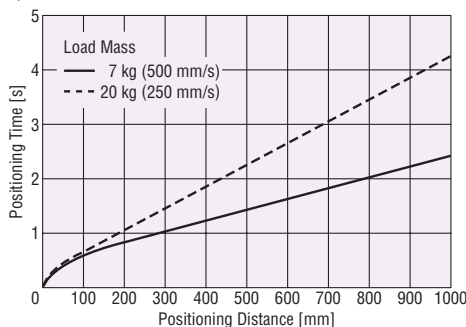
Check the (approximate) positioning time from the positioning distance. The positioning time varies depending on the load mass.

- The starting speed should be 10 mm/s or less.

Frame Size 60 mm

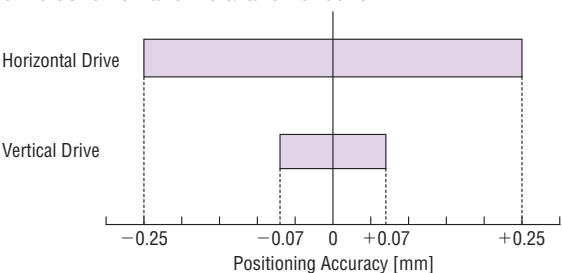


Frame Size 80 mm



Repetitive Positioning Accuracy (Reference value)

The graph below shows measured values with the maximum transportable mass. The specific value varies in accordance with the load, drive condition and installation direction.



Specifications

Lineared Motor

High Thrust Force Type RoHS



		Frame Size 60 mm		Frame Size 80 mm	
Model	Single-Phase 100-115 VAC Single-Phase 200-230 VAC	LAS2□90AW-□	LAS2□90MW-□	LAS4□40AW-□	LAS4□40MW-□
Motor Type		<i>αSTEP</i>			
Electromagnetic Brake		Not equipped	Equipped	Not equipped	Equipped
Operating Speed Range	mm/s	0~90		0~40	
Maximum Transportable Mass	kg	30		100 (20 mm/s) 70 (40 mm/s)	
Maximum Acceleration	m/s ²	0.187		0.074	
Maximum Thrust Force*1	N	306		1008 (20 mm/s) 705 (40 mm/s)	
Maximum Holding Force N	Power ON	306		1008	
	Power OFF	0			
	Electromagnetic Brake	–	306	–	1008
Resolution	mm/pulse	3.7364×10 ⁻³		1.4835×10 ⁻³	
Rotor Inertia	J: kg·m ²	405×10 ⁻⁷	564×10 ⁻⁷	405×10 ⁻⁷	564×10 ⁻⁷
Speed and Position Control Commands		Pulse input			
Stroke		100, 200, 300, 400, 500, 600, 700, 800		100, 200, 300, 400, 500, 600, 700, 800, 900, 1000	
Lineared Motor Mass*2 () : with electromagnetic brake	kg	100: 2.1 (2.4) 200: 2.2 (2.5) 300: 2.4 (2.7) 400: 2.6 (2.9) 500: 2.8 (3.1) 600: 3.0 (3.3) 700: 3.2 (3.5) 800: 3.4 (3.7)		100: 2.8 (3.1) 200: 3.1 (3.4) 300: 3.4 (3.7) 400: 3.6 (3.9) 500: 3.9 (4.2) 600: 4.2 (4.5) 700: 4.5 (4.8) 800: 4.8 (5.1) 900: 5.1 (5.4) 1000: 5.4 (5.7)	
Rack Mass	kg	100: 0.5 200: 0.6 300: 0.8 400: 1.0 500: 1.2 600: 1.4 700: 1.6 800: 1.8		100: 0.7 200: 1.0 300: 1.3 400: 1.5 500: 1.8 600: 2.1 700: 2.4 800: 2.7 900: 3.0 1000: 3.3	

● Enter **F** or **B** (traveling direction of rack) in the box (□) within the model name.

Enter the stroke in the box (□) within the model name.

● The maximum load mass that can be driven when operating the rack vertically is the maximum transportable mass less the rack mass.

● In addition to the products shown above, the products for three-phase 200-230 VAC are also available. Please contact the nearest Oriental Motor sales office.

*1 Make sure the sum of thrust force and acceleration thrust force of the load does not exceed the maximum thrust force.

*2 The lineared motor mass includes the rack mass.

Electromagnetic Brake (Electromagnetic brake type only)

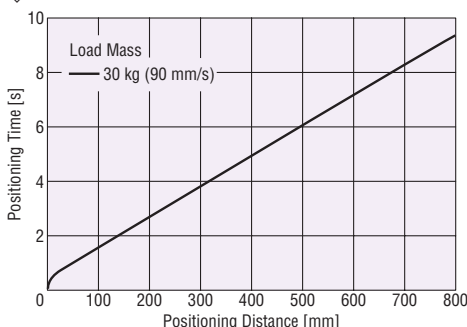
Type	Power off activated type
Power supply voltage	24 VDC±5%
Power supply current	0.25 A
Operation pattern	Power OFF: The brake is activated. Power ON: The brake is released.

Positioning Distance – Positioning Time

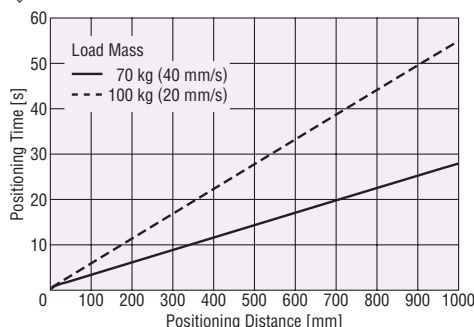
Check the (approximate) positioning time from the positioning distance. The positioning time varies depending on the load mass.

● The starting speed should be 1 mm/s or less.

Frame Size 60 mm

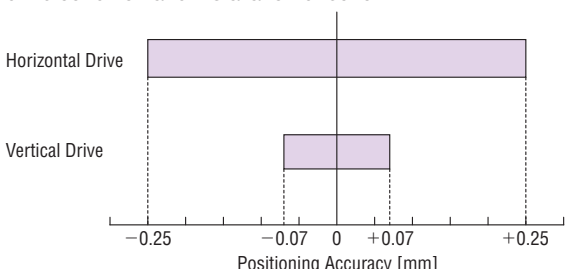


Frame Size 80 mm



Repetitive Positioning Accuracy (Reference value)

The graph below shows measured values with the maximum transportable mass. The specific value varies in accordance with the load, drive condition and installation direction.



Common Specifications

Driver

Model	LSD20A-W	LSD20B-W
Power Supply Input	Voltage	Single-Phase 100-115 VAC/Single-Phase 200-230 VAC
	Frequency	50/60 Hz
	Current	3.2 A (100 VAC), 3.7 A (200 VAC)
Max. Input Pulse Frequency	250 kHz (When the pulse duty is 50%)	
Input Signal	Input Mode	Photocoupler input, Input resistance: 220 Ω, Input current: 7~20 mA
	Pulse (DIR. -A)	Pulse input (DIR. -A direction operation command pulse signal in the 2-pulse input mode) Pulse width 2 μs minimum, rise/fall time 2 μs maximum (Negative logic pulse input)
	Traveling Direction (DIR. -B)	Traveling direction switch input DIR. -B direction operation command pulse signal in the 2-pulse input mode Pulse width 2 μs minimum, rise/fall time 2 μs maximum (Negative logic pulse input)
	Alarm Clear	Input when a protective function has been activated to cancel the alarm.
	All Windings OFF	When in the "photocoupler ON" state, the output current to the lineared motor is cut off. When in the "photocoupler OFF" state, the current is supplied to the lineared motor.
	Resolution Select	When in the "photocoupler ON" state, the resolution is set 10 times of that when the power was turned on. When in the "photocoupler OFF" state, the initial resolution is set that when the power was turned on.
Output Signal	Output Mode	Photocoupler, Open-collector output External use condition: 30 VDC maximum, 15 mA maximum (Positioning completion signal, Alarm signal) Transistor, Open-collector output External use condition: 30 VDC maximum, 15 mA maximum (Timing signal, Feedback pulse signal A-phase/B-phase) Line driver output: Equivalent of 26C31 (Timing signal, Feedback pulse signal A-phase/B-phase)
	Timing	One pulse is output every time the rack travels the value specified in the table below. (Photocoupler: ON) The maximum setting is 500 Hz in the maximum input pulse frequency.
	Alarm	This signal is output when a protective function is activated. (Photocoupler: OFF) The alarm is output (Red LED flashes) and the lineared motor coast to a stop at the same time.
	Positioning Completion	This signal is output when positioning is complete. (Photocoupler: ON) Output when the pulse speed is 500 Hz or less, and the lineared motor is stopped at a position within ±0.05 mm of the specified position.
	A-Phase/B-Phase Pulse Output	This signal is output at the resolution set when the driver's power was turned on. The phase difference between A and B is 90° in electrical angle. Subject to a maximum delay of 1 ms with respect to the actual movement of the lineared motor. Use this function to check the stop position.
Protective Function	Overheat protection, Overload protection, Overvoltage protection, Speed error protection, Overcurrent protection, Overspeed, EEPROM data error, Sensor error, System error	
Mass	0.8 kg	

Movement Distance for TIM. Output Signal

Model	LAS2□90	LAS2□500	LAS4□40	LAS4□500
Movement Distance (mm)	37.364×10^{-3}	199.948×10^{-3}	14.835×10^{-3}	200.176×10^{-3}

- Enter **F** or **B** (traveling direction of rack) in the box (□) within the model name.

General Specifications

This is the value after rated operation under normal ambient temperature and humidity.

Item	Motor	Driver
Insulation Class	Class B (130°C) [Recognized as Class A (105°C) by UL/CSA standards.]	—
Insulation Resistance	100 MΩ or more when 500 VDC megger is applied between the following places: • Case – Windings • Case – Electromagnetic brake windings (Only for electromagnetic brake type)	100 MΩ or more when 500 VDC megger is applied between the following places: • Case – Power supply input terminal • Signal I/O terminal – Power supply input terminal
Dielectric Strength	Sufficient to withstand the following for 1 minute: • Case – Windings 1.5 kV, 50 Hz or 60 Hz • Case – Electromagnetic brake windings 1.0 kV, 50 Hz or 60 Hz (Only for electromagnetic brake type)	Sufficient to withstand the following for 1 minute: • Case – Windings 1.5 kV, 50 Hz or 60 Hz • Signal I/O terminal – Power supply input terminal 3.0 kV, 50 Hz or 60 Hz (Only for electromagnetic brake type)
Ambient Temperature	0~+50°C (non-freezing)	
Ambient Humidity	85% or less (non-condensing)	

- Do not measure insulation resistance or perform the dielectric strength test while the lineared motor and driver are connected.

Permissible Rotating Torque of Rack (moment)

The rotating torque applied to the rack must not exceed the value shown in the table below.

Lineared Motor Model	Permissible Rotating Torque of Rack (moment)
LAS2B (F)	0.3 N·m max.
LAS4B (F)	0.5 N·m max.

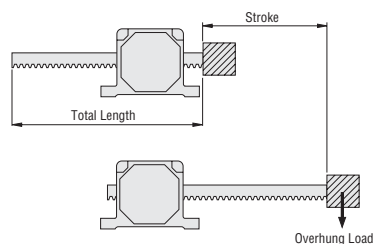
- The rotating torque must not exceed the permissible value at all times. Excessive rotating torque will cause the rack grommet to wear quickly.

- For details of mounting the load, refer to "mounting the load to end of rack."

→ Page D-127

● Maximum Permissible Overhung Load

Stroke [mm]	Overhung Load: N			
	LAS2□90	LAS2□500	LAS4□40	LAS4□500
100	25	25*	120	60*
200	20	20*	90	40*
300	10	10*	70	30*
400	10	10*	60	25*
500	7	7*	50	20*
600	—	—	40	15*
700	—	—	40	10*
800	—	—	25	7*
900	—	—	20	—
1000	—	—	15	—



- Enter **F** or **B** (traveling direction of rack) in the box (□) within the model name.
- * Keep the operating speed to 90 mm/s or below. If the operating speed exceeds 90 mm/s, do not apply any overhung load. An external guide must be provided for use.

■ Dimensions (Unit = mm)

● Standard Type

Lineared Motor Model	Stroke mm	Rack Total Length L mm	Mass (Rack mass included) kg	Rack Mass kg
LAM2□500AW-1	100	229.4±0.4	1.7	0.5
LAM2□500AW-2	200	330.0±0.4	1.9	0.6
LAM2□500AW-3	300	430.4±0.4	2.1	0.8
LAM2□500AW-4	400	531.0±0.4	2.3	1.0
LAM2□500AW-5	500	631.5±0.4	2.5	1.2
LAM2□500AW-6	600	731.4±0.4	2.7	1.4
LAM2□500AW-7	700	829.5±0.4	2.9	1.6
LAM2□500AW-8	800	930.4±0.4	3.1	1.8

- Enter F or B (traveling direction of rack) in the box (□) within the model name.

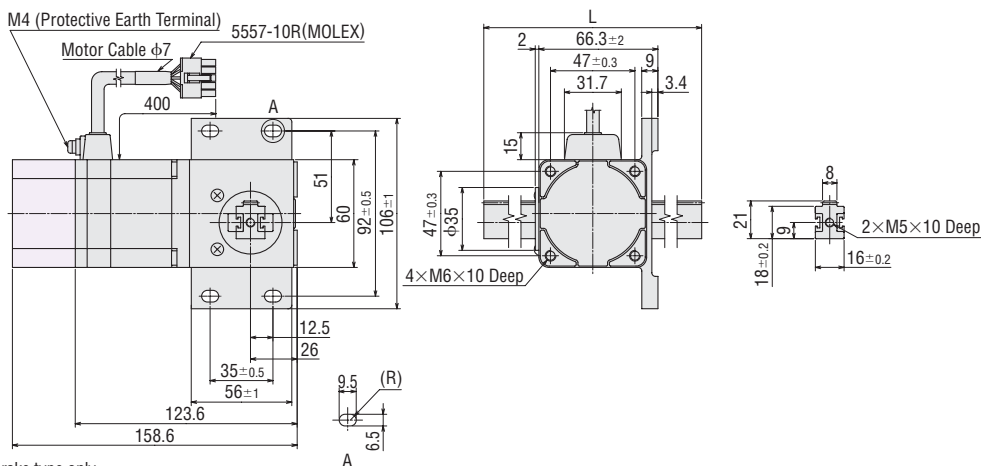
● Standard Type with Electromagnetic Brake

Lineared Motor Model	Stroke mm	Rack Total Length L mm	Mass (Rack mass included) kg	Rack Mass kg
LAM2□500MW-1	100	229.4±0.4	2.0	0.5
LAM2□500MW-2	200	330.0±0.4	2.2	0.6
LAM2□500MW-3	300	430.4±0.4	2.4	0.8
LAM2□500MW-4	400	531.0±0.4	2.6	1.0
LAM2□500MW-5	500	631.5±0.4	2.8	1.2
LAM2□500MW-6	600	731.4±0.4	3.0	1.4
LAM2□500MW-7	700	829.5±0.4	3.2	1.6
LAM2□500MW-8	800	930.4±0.4	3.4	1.8

- Enter F or B (traveling direction of rack) in the box (□) within the model name.

LAS2F Type

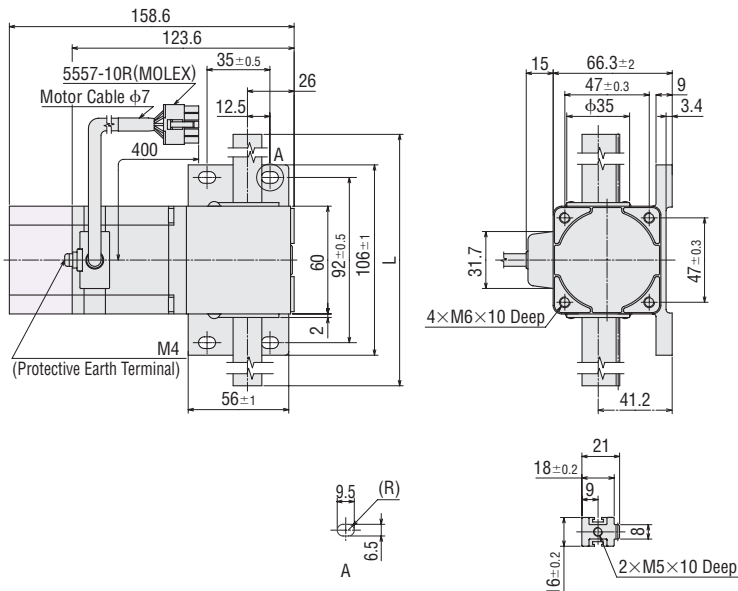
Module 0.892 Pressure angle 20°



The colored area () is for electromagnetic brake type only.

LAS2B Type

Module 0.892 Pressure angle 20°



The colored area () is for electromagnetic brake type only.

● High Thrust Force Type

Lineared Motor Model	Stroke mm	Rack Total Length L mm	Mass (Rack mass included) kg	Rack Mass kg
LAM2□90AW-1	100	229.4±0.4	2.1	0.5
LAM2□90AW-2	200	330.0±0.4	2.2	0.6
LAM2□90AW-3	300	430.4±0.4	2.4	0.8
LAM2□90AW-4	400	531.0±0.4	2.6	1.0
LAM2□90AW-5	500	631.5±0.4	2.8	1.2
LAM2□90AW-6	600	731.4±0.4	3.0	1.4
LAM2□90AW-7	700	829.5±0.4	3.2	1.6
LAM2□90AW-8	800	930.4±0.4	3.4	1.8

● Enter F or B (traveling direction of rack) in the box (□) within the model name.

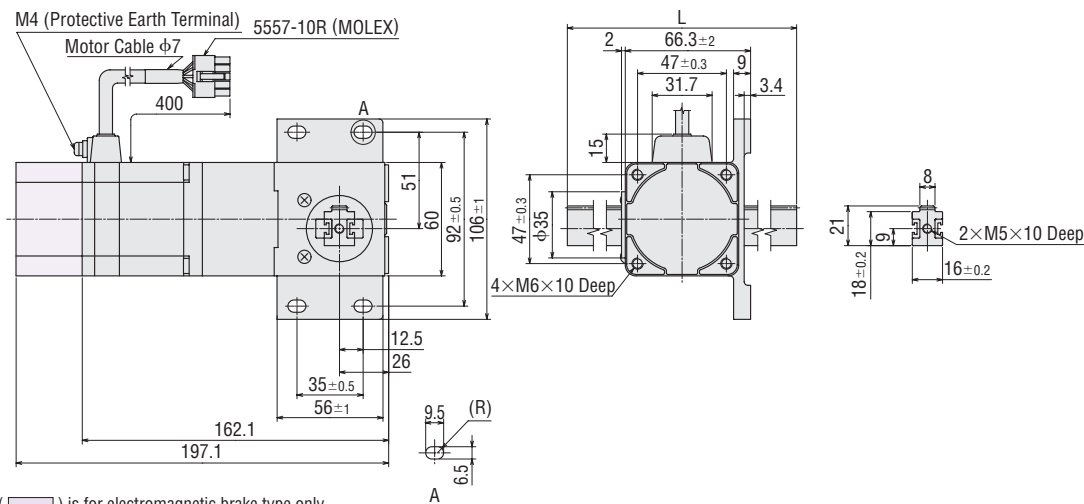
● High Thrust Force Type with Electromagnetic Brake

Lineared Motor Model	Stroke mm	Rack Total Length L mm	Mass (Rack mass included) kg	Rack Mass kg
LAM2□90MW-1	100	229.4±0.4	2.4	0.5
LAM2□90MW-2	200	330.0±0.4	2.5	0.6
LAM2□90MW-3	300	430.4±0.4	2.7	0.8
LAM2□90MW-4	400	531.0±0.4	2.9	1.0
LAM2□90MW-5	500	631.5±0.4	3.1	1.2
LAM2□90MW-6	600	731.4±0.4	3.3	1.4
LAM2□90MW-7	700	829.5±0.4	3.5	1.6
LAM2□90MW-8	800	930.4±0.4	3.7	1.8

● Enter F or B (traveling direction of rack) in the box (□) within the model name.

LAS2F Type

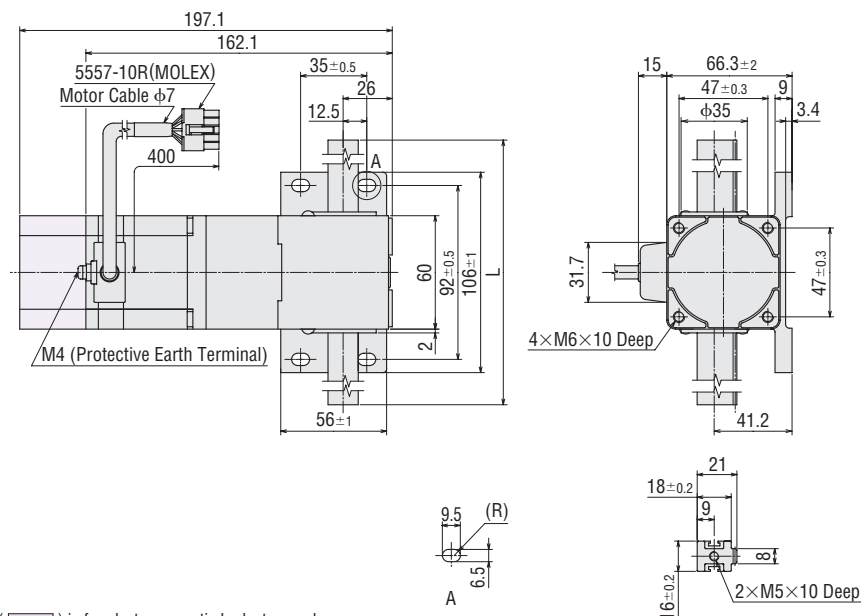
Module 0.892 Pressure angle 20°



The colored area () is for electromagnetic brake type only.

LAS2B Type

Module 0.892 Pressure angle 20°



The colored area () is for electromagnetic brake type only.

● Standard Type

Lineared Motor Model	Stroke mm	Rack Total Length L mm	Mass (Rack mass included) kg	Rack Mass kg
LAM4□500AW-1	100	243.5±0.4	2.8	0.7
LAM4□500AW-2	200	341.6±0.4	3.1	1.0
LAM4□500AW-3	300	443.7±0.4	3.4	1.3
LAM4□500AW-4	400	541.9±0.4	3.6	1.5
LAM4□500AW-5	500	640.1±0.4	3.9	1.8
LAM4□500AW-6	600	742.2±0.4	4.2	2.1
LAM4□500AW-7	700	840.4±0.4	4.5	2.4
LAM4□500AW-8	800	942.5±0.4	4.8	2.7
LAM4□500AW-9	900	1040.7±0.8	5.1	3.0
LAM4□500AW-10	1000	1142.8±0.8	5.4	3.3

● Enter F or B (traveling direction of rack) in the box (□) within the model name.

● High Thrust Force Type

Lineared Motor Model	Stroke mm	Rack Total Length L mm	Mass (Rack mass included) kg	Rack Mass kg
LAM4□40AW-1	100	243.5±0.4	2.8	0.7
LAM4□40AW-2	200	341.6±0.4	3.1	1.0
LAM4□40AW-3	300	443.7±0.4	3.4	1.3
LAM4□40AW-4	400	541.9±0.4	3.6	1.5
LAM4□40AW-5	500	640.1±0.4	3.9	1.8
LAM4□40AW-6	600	742.2±0.4	4.2	2.1
LAM4□40AW-7	700	840.4±0.4	4.5	2.4
LAM4□40AW-8	800	942.5±0.4	4.8	2.7
LAM4□40AW-9	900	1040.7±0.8	5.1	3.0
LAM4□40AW-10	1000	1142.8±0.8	5.4	3.3

● Enter F or B (traveling direction of rack) in the box (□) within the model name.

● Standard Type with Electromagnetic Brake

Lineared Motor Model	Stroke mm	Rack Total Length L mm	Mass (Rack mass included) kg	Rack Mass kg
LAM4□500MW-1	100	243.5±0.4	3.1	0.7
LAM4□500MW-2	200	341.6±0.4	3.4	1.0
LAM4□500MW-3	300	443.7±0.4	3.7	1.3
LAM4□500MW-4	400	541.9±0.4	3.9	1.5
LAM4□500MW-5	500	640.1±0.4	4.2	1.8
LAM4□500MW-6	600	742.2±0.4	4.5	2.1
LAM4□500MW-7	700	840.4±0.4	4.8	2.4
LAM4□500MW-8	800	942.5±0.4	5.1	2.7
LAM4□500MW-9	900	1040.7±0.8	5.4	3.0
LAM4□500MW-10	1000	1142.8±0.8	5.7	3.3

● Enter F or B (traveling direction of rack) in the box (□) within the model name.

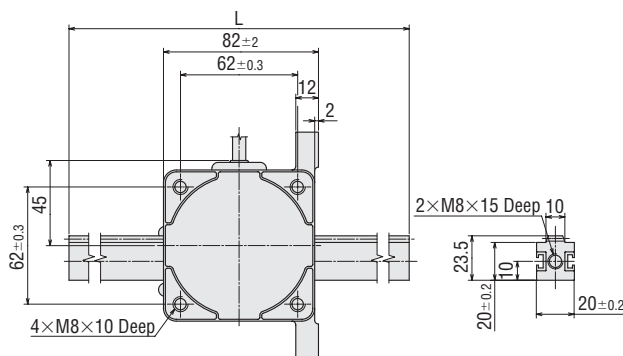
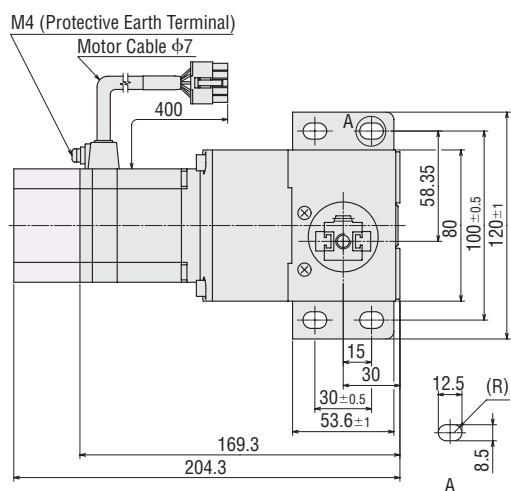
● High Thrust Force Type with Electromagnetic Brake

Lineared Motor Model	Stroke mm	Rack Total Length L mm	Mass (Rack mass included) kg	Rack Mass kg
LAM4□40MW-1	100	243.5±0.4	3.1	0.7
LAM4□40MW-2	200	341.6±0.4	3.4	1.0
LAM4□40MW-3	300	443.7±0.4	3.7	1.3
LAM4□40MW-4	400	541.9±0.4	3.9	1.5
LAM4□40MW-5	500	640.1±0.4	4.2	1.8
LAM4□40MW-6	600	742.2±0.4	4.5	2.1
LAM4□40MW-7	700	840.4±0.4	4.8	2.4
LAM4□40MW-8	800	942.5±0.4	5.1	2.7
LAM4□40MW-9	900	1040.7±0.8	5.4	3.0
LAM4□40MW-10	1000	1142.8±0.8	5.7	3.3

● Enter F or B (traveling direction of rack) in the box (□) within the model name.

LAS4F Type

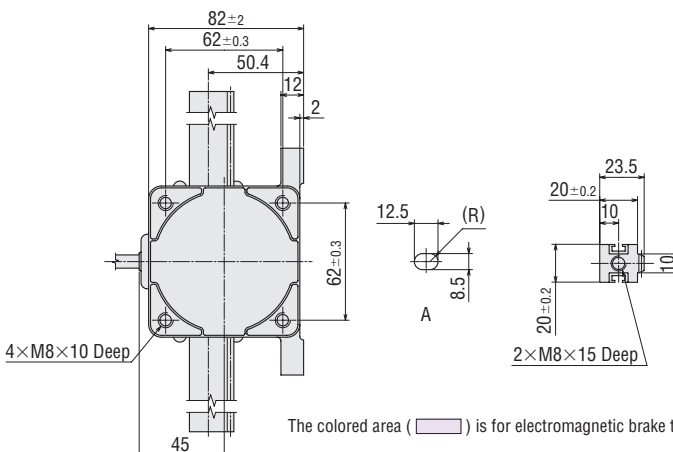
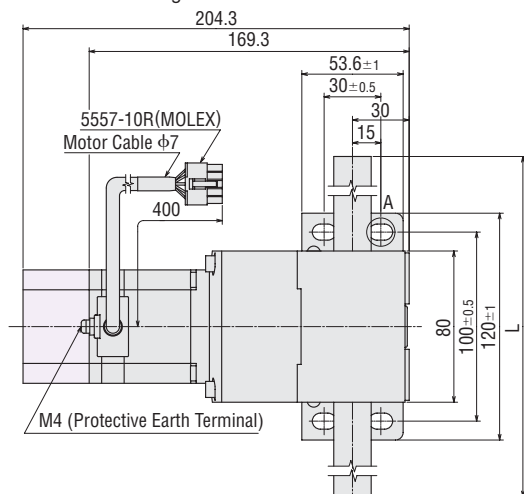
Module 1.25 Pressure angle 20°



The colored area () is for electromagnetic brake type only.

LAS4B Type

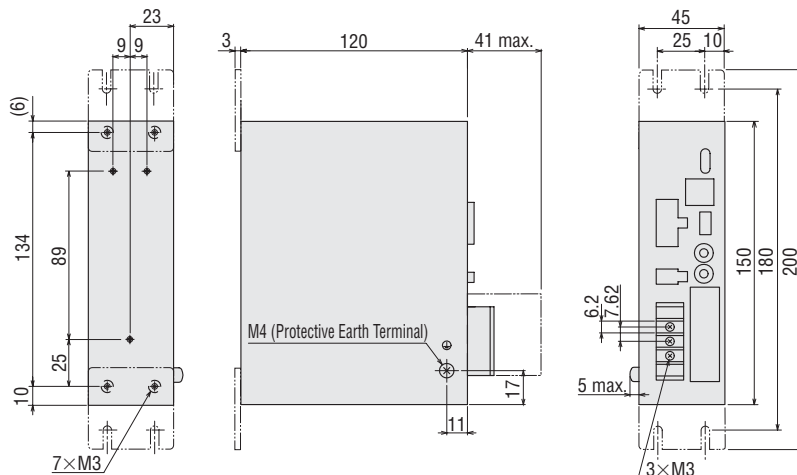
Module 1.25 Pressure angle 20°



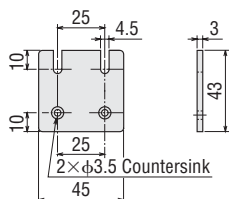
The colored area () is for electromagnetic brake type only.

● Driver

Driver model: LSD20A-W, LSD20B-W
Mass: 0.8 kg



● Mounting Bracket (2 pieces, included)



Control I/O Connector (Included)
Case: 54331-1361 (MOLEX)
Connector: 54306-3619 (MOLEX)

■ List of Lineared Motor and Driver Combinations

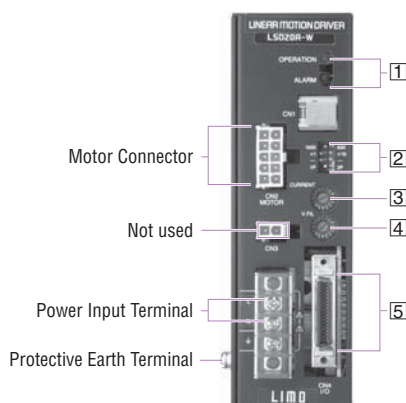
Lineared motor and driver combinations are shown below.

Frame Size	Type	Electromagnetic Brake	Power Supply Input	Model	Lineared Motor Model	Driver Model
60 mm	High thrust force	Not equipped	Single-Phase 100-115 VAC Single-Phase 200-230 VAC	LAS2B90AW- □	LAM2B90AW-□	LSD20A-W
		Equipped		LAS2F90AW- □	LAM2F90AW-□	
	Standard	Not equipped		LAS2B90MW- □	LAM2B90MW-□	
		Equipped		LAS2F90MW- □	LAM2F90MW-□	
		Not equipped		LAS2B500AW- □	LAM2B500AW-□	
		Equipped		LAS2F500AW- □	LAM2F500AW-□	
80 mm	High thrust force	Not equipped		LAS2F500MW- □	LAM2F500MW-□	LSD20B-W
		Equipped		LAS4B40AW- □	LAM4B40AW-□	
		Equipped		LAS4F40AW- □	LAM4F40AW-□	
	Standard	Not equipped		LAS4B40MW- □	LAM4B40MW-□	
		Equipped		LAS4F40MW- □	LAM4F40MW-□	
		Not equipped		LAS4B500AW- □	LAM4B500AW-□	
		Equipped	LAS4F500AW- □	LAM4F500AW-□		
		Not equipped	LAS4B500MW- □	LAM4B500MW-□		
		Equipped	LAS4F500MW- □	LAM4F500MW-□		

● Enter the stroke in the box (□) within the model name.

Connection and Operation

Names and Functions of Driver Parts



1 Signal Monitor Displays

◇ LED Indicators

Indication	Color	Function	Activation Conditions
OPERATION	Green	Power supply indication	Lights when power is on.
ALARM	Red	Alarm indication	Blinks when protective functions are activated.

◇ Alarm

Blink Count	Function	Activation Conditions
1	Overheat	The temperature of the driver's internal heat sink rises to approximately 85°C.
2	Overload	The lineared motor is operated continuously over five seconds under a load exceeding the maximum torque.
3	Overvoltage	The primary voltage of the driver's inverter exceeds the permissible value.
4	Speed error	The lineared motor cannot accurately follow at the indicated pulse speed.
5	Overcurrent	An excessive current has flowed through the inverter power element inside the driver.
6	Overspeed	The rack speed is 800 mm/s minimum (high thrust force type: 288 mm/s on LAS2 or 62 mm/s on LAS4)
7	EEPROM data error	The control parameter has been damaged.
8	Sensor error	The power supply turns on when the motor cable is not connected to the driver.
Lights (No blinking)	System error	The driver has fatal error.

2 Function Select Switches

Indication	Switch Name	Function
1000/500 X1/X10	Resolution select switch	This function is for selecting the resolution. (Refer to the resolution values shown in the table below.)
1P/2P	Pulse input mode switch	The settings of this switch are compatible with the following two types of pulse input modes: "1P" for the 1-pulse input mode "2P" for the 2-pulse input mode

Notes:

- Always turn the power off before switching resolution or pulse input, and turn it on again after you have made the change.
- If the resolution select switch is set to "×10," it cannot control the resolution selected by the input terminals. It will always be "×10."

Resolution Values

Unit: mm/step

Resolution Select Switch	Standard Type		High Thrust Force Type	
	LAS2 <input type="checkbox"/> 500	LAS4 <input type="checkbox"/> 500	LAS2 <input type="checkbox"/> 90	LAS4 <input type="checkbox"/> 40
[1000] [X1]	9.9974×10^{-3}	10.0088×10^{-3}	1.8682×10^{-3}	0.7418×10^{-3}
[1000] [X10]	9.9974×10^{-4}	10.0088×10^{-4}	1.8682×10^{-4}	0.7418×10^{-4}
[500] [X1]	19.9948×10^{-3}	20.0176×10^{-3}	3.7364×10^{-3}	1.4835×10^{-3}
[500] [X10]	19.9948×10^{-4}	20.0176×10^{-4}	3.7364×10^{-4}	1.4835×10^{-4}

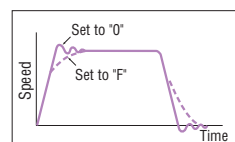
- Enter **F** or **B** (traveling direction of rack) in the box within the model name.

3 Current Adjustment Switch

Indication	Switch Name	Function
CURRENT	Current adjustment switch	The lineared motor running current can be lowered to suppress temperature rise in the lineared motor and driver, or lower operating current in order to allow a margin for product specifications. (Selectable from 16 settings)

4 Velocity Filter Adjustment Switch

Indication	Switch Name	Function
V.FIL	Velocity filter adjustment switch	This switch is used to make adjustments when a smooth start-stop or smooth motion at low speed is required. (Selectable from 16 settings)



5 Input/Output Signals

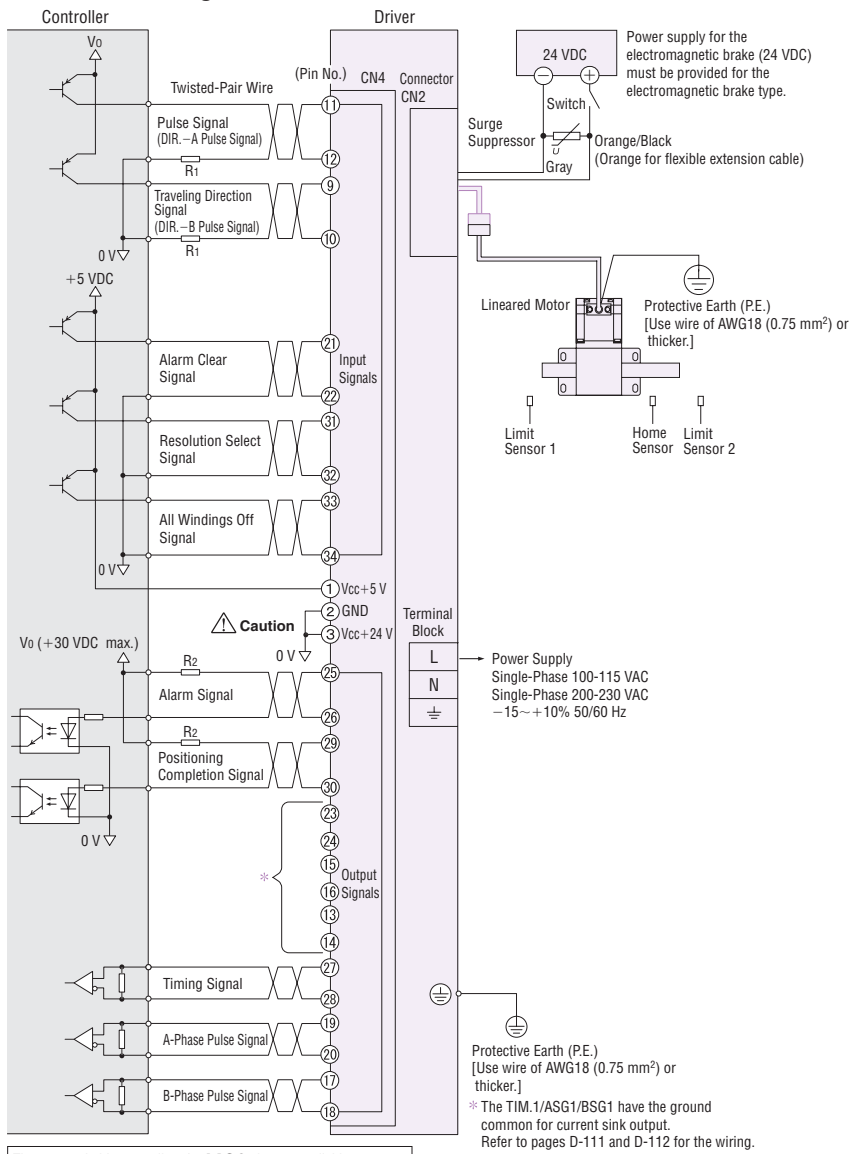
Indication	Input/Output	Pin No.	Signal	Signal Name		
External power input		1	Vcc +5 V	Power supply for signal control		
		2	GND			
		3	Vcc +24 V	Short-circuit with 2-Pin		
Input signal		9	DIR (DIR. - B)	Traveling direction (DIR. - B pulse)*		
		10	DIR (DIR. - B)			
		11	PLS (DIR. - A)	Pulse (DIR. - A pulse)*		
		12	PLS (DIR. - A)			
Output signal	CN4	13	BSG1	B-phase pulse output (Open-collector)		
		14	GND			
		15	ASG1	A-phase pulse output (Open-collector)		
		16	GND			
		17	BSG2	B-phase pulse output (Line driver)		
		18	BSG2			
		19	ASG2	A-phase pulse output (Line driver)		
		20	ASG2			
Input signal		21	ACL	Alarm clear		
		22	ACL			
Output signal		23	TIM.1	Timing (Open-collector)		
		24	GND			
		25	ALARM	Alarm		
		26	ALARM			
		27	TIM.2	Timing (Line driver)		
		28	TIM.2			
		29	END	Positioning completion		
		30	END			
		Input signal		31	X10	Resolution select
				32	X10	
33	C.OFF			All windings off		
34	C.OFF					

- For details, refer to description of input/output signals (→ Page D-110).

* The factory setting is the 1-pulse input mode.

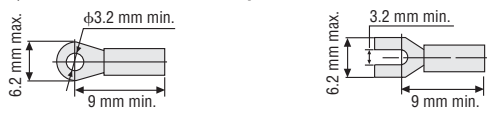
Signal names in parentheses represent the setting in 2-pulse input mode.

● Connection Diagrams



The most suitable controllers for LAS Series are available.
Controller **SG8030JY** → Page D-152

◇ Recommended Crimp Terminals



● Crimp terminals are not included. They must be purchased separately.

◇ Pulse (DIR.-A) and Traveling Direction (DIR.-B) Signal Connections

● Use 5 VDC input for the pulse input signal and traveling direction input signal. If the V₀ voltage exceeds 5 VDC, connect an external resistor R₁.
Example) If the V₀ voltage is 24 VDC, connect a resistor (R₁) of 1.5 to 2.2 kΩ and 0.5 W or more.

◇ Output Signal Connection

● Keep V₀ 30 VDC, 15 mA maximum. If the current exceeds 15 mA, connect an external resistor R₂.

◇ Notes on Wiring

- Use multi-core, twisted-pair shielded wires of AWG28 (0.08 mm²) or thicker for the control I/O signal line (CN4), and keep wiring as short as possible (within 2 m).
- Note that as the length of the pulse signal line increases, the maximum transmission frequency decreases. **Technical reference** → Page F-57
- When it is necessary to have a connection more than 0.4 m between lineared motor and driver, an extension cable or flexible extension cable (sold separately) must be used. Electromagnetic brake models must use an extension cable or flexible extension cable for electromagnetic brake.

⚠ Caution

● Connect 5 VDC power supply for "Timing" output signal and "Pulse" output signal. Pin No. ③ of the CN4 should be grounded.
Description of input/output signals → Page D-110

◇ Power Supply

Use a power supply that can supply sufficient input current. When power supply capacity is insufficient, a decrease in lineared motor output can cause the following malfunction:
● Lineared motor does not operate properly (insufficient thrust force).

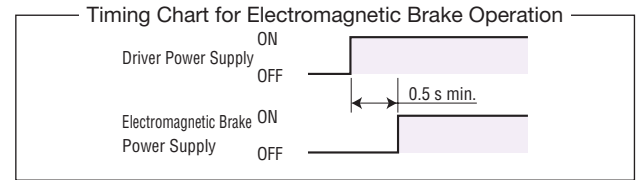
- Use the following cable for the power line.
Single-phase 100-115 VAC: 3-core cable [AWG18 (0.75 mm²) min.]
Single-phase 200-230 VAC: 3-core cable [AWG18 (0.75 mm²) min.]
- Provide a minimum distance of 300 mm between the control I/O signal lines and power lines (power supply, lineared motor and large-current circuits). Do not run the control I/O signal lines in the same duct as power lines or bundle them with power lines.
- To ground the driver, lead the ground conductor from the protective earth terminal (M4) with a wire of AWG18 (0.75 mm²) or thicker and connect the ground conductor to provide a common ground point.

◇ Connecting the Electromagnetic Brake and Power Supply

Connect the electromagnetic brake to the power supply using a cable of AWG24 (0.2 mm²) or thicker. The power supply input to the electromagnetic brake is 24 VDC ±5% 0.3 A minimum and therefore must be independent of the driver's power supply for signal control.

Note:

● The electromagnetic brake wire (60 mm) is linked to the connector on the driver connection side of extension cable for electromagnetic brake motor (sold separately). Be sure to use the extension cable or flexible extension cable. Connect the orange/black spiral lead wire (orange for flexible extension cable) to +24 V, and the gray lead wire to the ground (GND).



● Description of Input/Output Signals

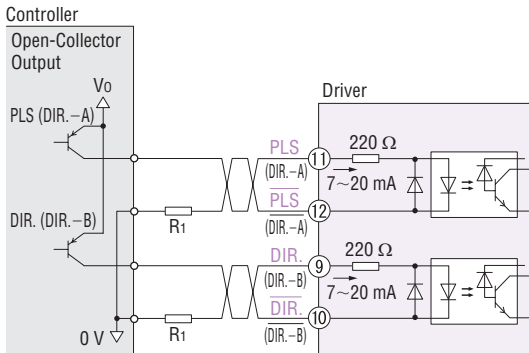
Indication of Input/Output Signal "ON" "OFF"

Input (output) "ON" indicates that the current is sent into the photocoupler (transistor) inside the driver. Input (output) "OFF" indicates that the current is not sent into the photocoupler (transistor) inside the driver. The input/output remains "OFF" if nothing is connected.

Photocoupler OFF ON

PLS (DIR.-A), DIR. (DIR.-B) Input Signal

◇ Input Circuit and Sample Connection

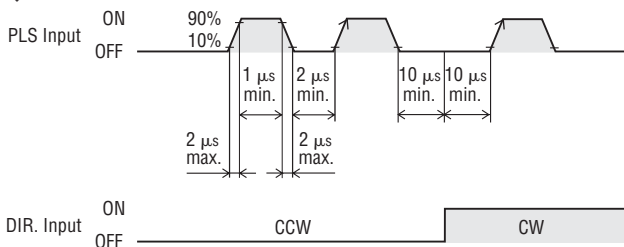


● The colored characters indicate signals under the 1-pulse input mode, while the black characters indicate signals under the 2-pulse input mode.

Note:

● The external resistor is not needed when Vo is 5 VDC. When the voltage exceeds 5 VDC, connect the external resistor R1 to keep input current at 20 mA or less. When a voltage exceeding 5 VDC is applied without the external resistor, the internal components may be damaged.

◇ Pulse Waveform Characteristics



● For pulse signals, use pulse waveforms like those shown in the figure above.

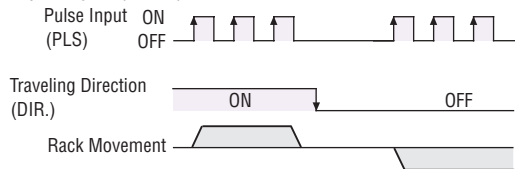
◇ Pulse Input Mode

● 1-Pulse Input Mode

The 1-pulse input mode uses "Pulse" (PLS) and "Traveling Direction" (DIR.) signals. When the traveling direction (DIR.) signal is set to "ON," the rack moves in the DIR.-A direction. When the traveling direction (DIR.) signal is set to "OFF," the motor moves in the DIR.-B direction.

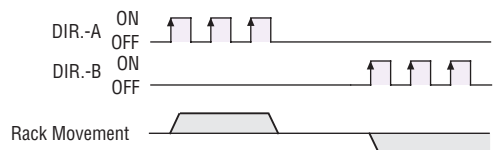
Note:

● The factory setting is 1-pulse input mode.

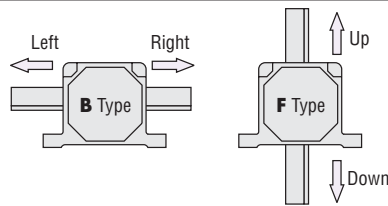


● 2-Pulse Input Mode

The 2-pulse input mode uses "DIR.-A" and "DIR.-B" pulse signals. When a "DIR.-A" pulse is input, the rack of the lineared motor moves in the DIR.-A direction. When a "DIR.-B" pulse is input, the rack of the lineared motor moves in the DIR.-B direction.

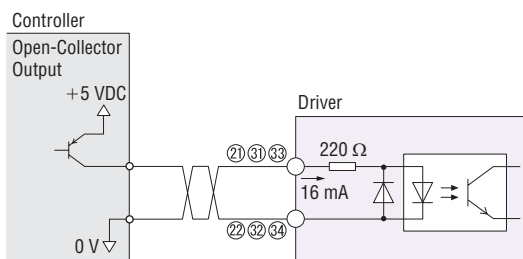


Pulse Input	Traveling Direction Signal	Traveling Direction of Rack	
DIR.-A	ON	B Type: Left	F Type: Down
DIR.-B	OFF	B Type: Right	F Type: Up



All Windings Off (C.OFF) Input Signal/Resolution Select (X10) Input Signal/Alarm Clear (ACL) Input Signal

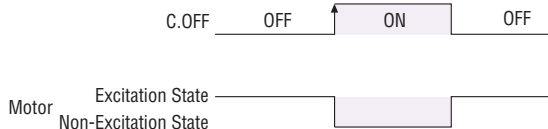
◇ Input Circuit and Sample Connection



◇ All Windings Off (C.OFF) Input Signal

Pin No. ③③, ③④

This controller power supply offers 5 VDC. Inputting the "All Windings Off" (C.OFF) signal puts the lineared motor in a non-excitation (free) state. It is used when moving the lineared motor rack externally or when positioning manually. This signal clears the deviation counter.



◇ Resolution Select (X10) Input Signal

Pin no. ③①, ③②

This controller power supply offers 5 VDC. Inputting this signal when [1000] [×1] or [500] [×1] is selected as resolution via the function select switch will increase the resolution ten times.

Note:

● If the resolution select switch is set to "×10," it cannot control the resolution selected by the input terminals. It will always be "×10."

◇ Alarm Clear (ACL) Input Signal

Pin no. ②①, ②②

This controller power supply offers 5 VDC. This signal is used for canceling the alarm without turning off power to the driver when a protective function has been activated.

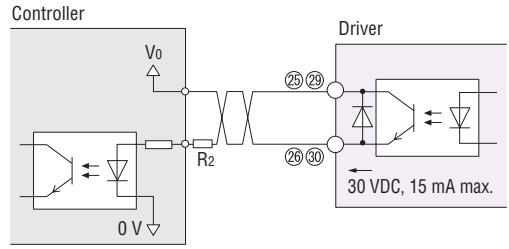
Note:

● The following alarm cannot be cleared. To cancel the alarm, first resolve the cause of malfunction and check for safety, and then turn power on again.

- Overcurrent · EEPROM data error · System error

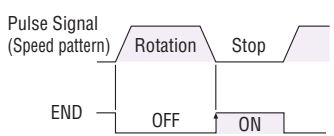
Positioning Completion (END) Output Signal/ Alarm (ALARM) Output Signal

◇ Output Circuit and Sample Connection



◇ Positioning Completion (END) Output Signal

Pin no. 29, 30
Keep V_0 30 VDC, 15 mA maximum. This signal is output at the photocoupler ON state when positioning is completed. This signal is output when the rotor position is within the movement distance shown below from the command position, approximately 2 ms after the pulse input stops.



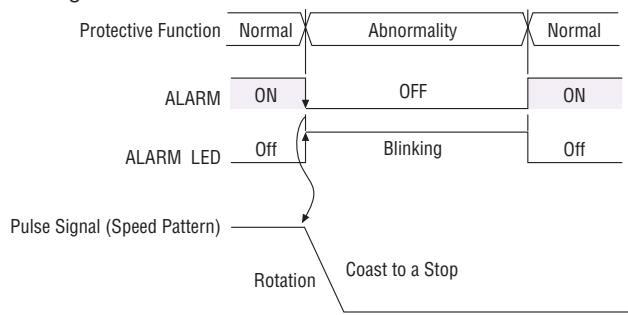
Movement Distance for END

Model	Movement Distance (mm)
LAS2 □ 90	$\pm 9.341 \times 10^{-3}$
LAS2 □ 500	$\pm 49.987 \times 10^{-3}$
LAS4 □ 40	$\pm 3.709 \times 10^{-3}$
LAS4 □ 500	$\pm 50.044 \times 10^{-3}$

- Enter **F** or **B** (traveling direction of rack) in the box (□) within the model name.
- Note:**
- The END signal blinks during operation with a pulse input frequency of 500 Hz or less.

◇ Alarm (ALARM) Output Signal

Pin No. 25, 26
Keep V_0 30 VDC, 15 mA maximum. The photocoupler turns OFF when the driver's protective functions has been activated. When an abnormality such as an overload or over current is detected, the "Alarm" signal will be output, the ALARM indicator blinks, and the lineared motor coast to a stop (non-excitation state). To clear the alarm, first resolve the cause and check for safety, and then input an "Alarm Clear" (ACL) signal or reset power. Once power has been turned off, wait at least 10 seconds before turning it on again.

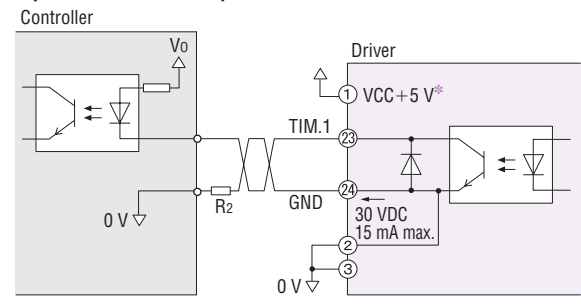


- Note:**
- The "Alarm" output uses positive logic (normal close), all other outputs use negative logic (normal open).

Timing Output Signal (TIM.1, TIM.2)/A-Phase and B-Phase Pulse Output Signal (ASG1/BSG1, ASG2/BSG2)

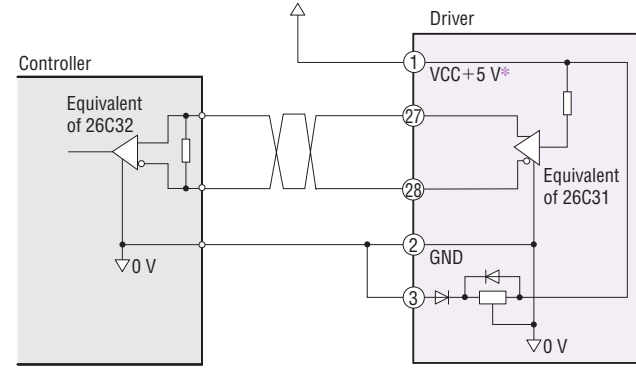
◇ Output Circuit and Sample Connection

Open-Collector Output



- *Power supply for "Timing" output signal should be connected to 5 VDC.
- Keep V_0 30 VDC, 15 mA maximum.

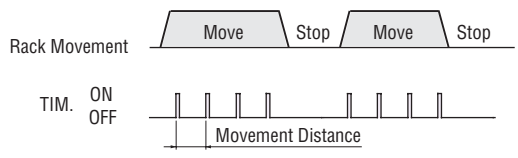
Line Driver Output



- *Power supply for "Timing" output signal should be connected to 5 VDC.

◇ Timing (TIM.1, TIM.2) Output Signal

Pin no. 23, 24, 27, 28
When the "Timing" signal is output, the transistor turns ON (For the line driver output which is TIM.2, the output signal is ON). This signal can be used to detect the home position with greater precision. The relationship of rack movement and output signal is shown below.



Movement Distance for TIM. Output Signal

Model	Movement Distance (mm)
LAS2 □ 90	37.364×10^{-3}
LAS2 □ 500	199.948×10^{-3}
LAS4 □ 40	14.835×10^{-3}
LAS4 □ 500	200.176×10^{-3}

- Enter **F** or **B** (traveling direction of rack) in the box (□) within the model name.
- Notes:**
- A precise "Timing" signal output cannot be obtained when the speed of the pulse input frequency is over 500 Hz.
- Connect the "Timing" output signal to 5 VDC.

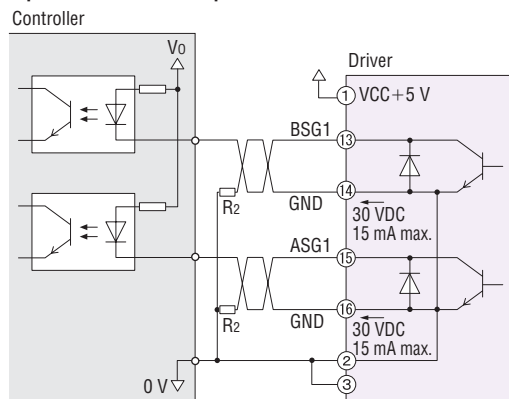
◇ **A-Phase and B-Phase Pulse Output Signal (ASG1/BSG1, ASG2/BSG2) Pin No. 13~20**

A counter or similar device can be connected to monitor the position of the rack. The number of pulses per rotation is the same as the motor resolution at the time of power-on.

[Example: Resolution select switch: "1000" "X1" → the number of output pulses per rotation: 1000]

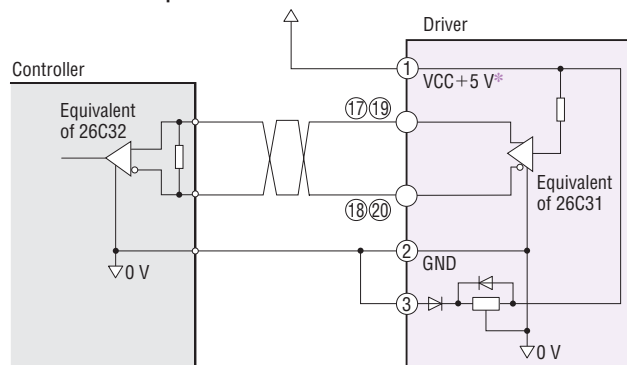
The phase difference between A and B is 90° in electrical angle.

Open-Collector Output



Keep V₀ 30 VDC, 15 mA maximum.

Line Driver Output

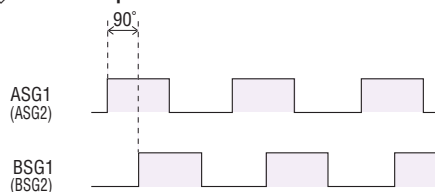


* Power supply for "A-Phase and B-Phase" pulse output signal should be connected to 5 VDC.

Notes:

- The pulse output accuracy is, regardless of the resolution, within ±0.36° of the motor shaft (repetition accuracy: within ±0.09°).
- 5 VDC power supply is required to use the pulse output signal. Pulse output is subject to a maximum delay of 1 ms with respect to the actual movement of the lineared motor. Use pulse output to check the stop position.

◇ **Pulse Output Waveform Characteristics**



Pulse Input

ASG1 output: Pulses corresponding to the lineared motor operation are output.

BSG1 output: This output is used to determine the traveling direction of rack. The phase difference between ASG1 and BSG1 is 90°. The traveling direction of rack can be determined from the BSG1 output level at the rise of the ASG1 output.

Rack and Pinion Systems Accessories (Sold separately)

For LAS Series

Motor Cables (RoHS)

Various cables that are useful for connecting motors and drivers are available.

Extension Cables/

Extension Cables for Electromagnetic Brake Motor

Extension cable for extending the wiring distance between the lineared motor and driver.



Product Line

Extension Cables

Model	Length L (m)
CC01AIP	1
CC02AIP	2
CC03AIP	3
CC05AIP	5
CC07AIP	7
CC10AIP	10
CC15AIP	15
CC20AIP	20

Extension Cables for Electromagnetic Brake Motor

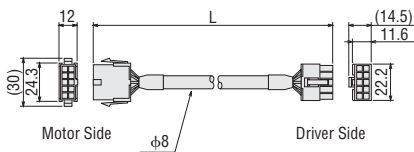
Model	Length L (m)
CC01AIPM	1
CC02AIPM	2
CC03AIPM	3
CC05AIPM	5
CC07AIPM	7
CC10AIPM	10
CC15AIPM	15
CC20AIPM	20

Note:

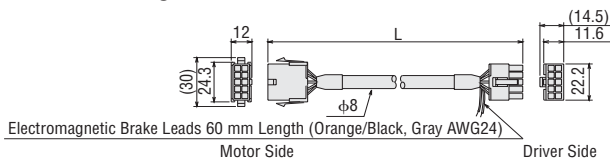
- Electromagnetic brake models must use an extension cable for an electromagnetic brake motor.

Dimensions (Unit = mm)

◇ For Standard Model



◇ For Electromagnetic Brake Model



Flexible Extension Cables/

Flexible Extension Cables for Electromagnetic Brake Motor

Flexible extension cable for connecting a lineared motor and driver. Use flexible extension cable in application where the motor is installed on a moving section and the cable is bent and flexed.



Product Line

Flexible Extension Cables

Model	Length L (m)
CC01SAR	1
CC02SAR	2
CC03SAR	3
CC05SAR	5
CC07SAR	7
CC10SAR	10

Flexible Extension Cables for Electromagnetic Brake Motor

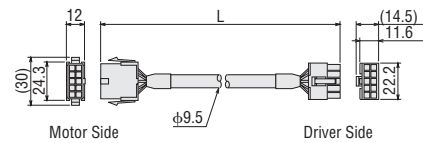
Model	Length L (m)
CC01SARM2	1
CC02SARM2	2
CC03SARM2	3
CC05SARM2	5
CC07SARM2	7
CC10SARM2	10

Note:

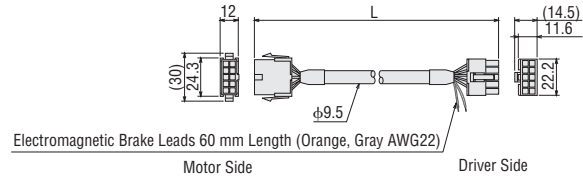
- Electromagnetic brake models must use an extension cable for an electromagnetic brake motor.

Dimensions (Unit = mm)

◇ For Standard Model

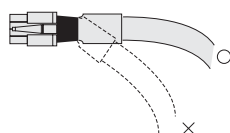


◇ For Electromagnetic Brake Model

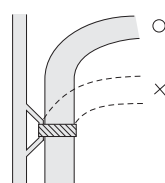


Notes on Use of a Flexible Extension Cable

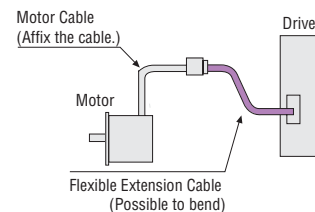
- ① Do not allow the cable to bend at the cable connector.



- ② Keep the bending radius to 60 mm or more.



- ③ The motor cable is not a flexible cable. If the motor cable is to be bent, bend it at the flexible extension cable.



Driver Cables (RoHS)

This is a shielded cable useful for connecting a driver and controller.

Driver Cables General-Purpose Type

This is a shielded cable equipped with, at one end of the cable, the half-pitch connector that snaps into the driver.

Notes:

- Note that as the length of the pulse signal line between the driver and controller increases, the maximum transmission frequency decreases. **Technical reference** → Page F-57
- Install a connector that matches the controller you are using to the other end of the cable.

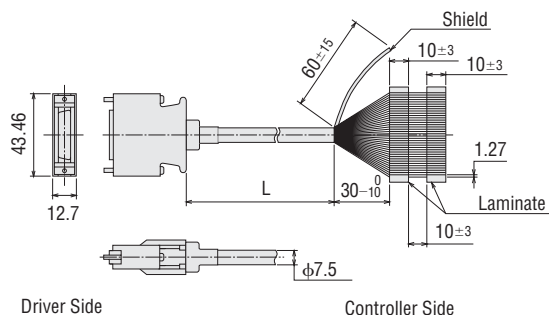
Product Line

Model	Length L (m)
CC36D1-1	1
CC36D2-1	2



Dimensions (Unit = mm)

Conductor: AWG28 (0.08 mm²)



Connector-Terminal Block Conversion Unit (RoHS)

A conversion unit that connects a driver to a host controller using a terminal block.

- With a signal name plate for easy, one-glance identification of driver signal names
- DIN-rail mountable
- Cable length: 1 m

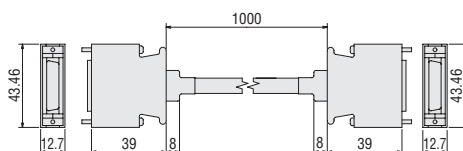
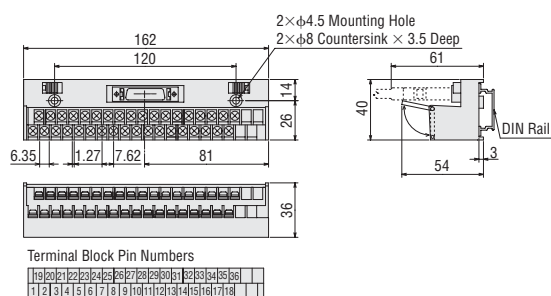
Product Line

Model	Length L (m)
CC36T1	1

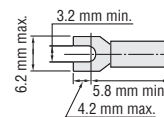


Dimensions (Unit = mm)

CC36T1



- Recommended Crimp Terminal
 - Terminal screw size: M3
 - Tightening torque: 1.2 N·m
 - Applicable minimum lead wire: AWG22 (0.3 mm²)



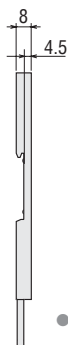
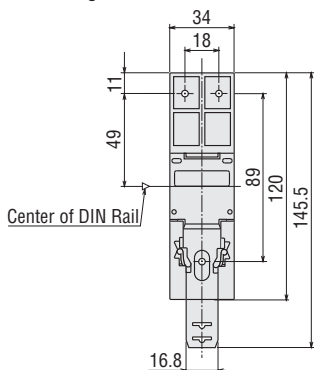
DIN Rail Mounting Plate (RoHS)

This plate is used to install the driver to a DIN rail. Mounting screws are included.

● Model: **PADPO1**

● Dimensions (Unit = mm)

Mass: 20 g



● Mounting Screw: M3
Length: 8 mm
3 included



DIN Rail Mounting Plate

For LS Linear Heads

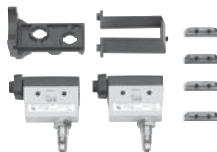
Limit Switch Set (RoHS)

These dedicated limit switches can be installed easily in **LS** linear heads.

With the limit switches, reciprocating operation can be performed easily.

Each set consists of two limit switches, four dogs, limit-switch mounting brackets and covers.

● Model: **PARP-MS**



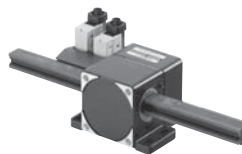
● Specifications

Rated Voltage	Motor Load	Inductive Load
125 VAC	2.5 A	10 A
250 VAC	1.4 A	10 A
125 VDC	0.05 A	0.05 A

● Permissible operation frequency: 20 times/minute

● Life : At least 500000 times

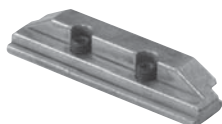
● Linear head with limit switches



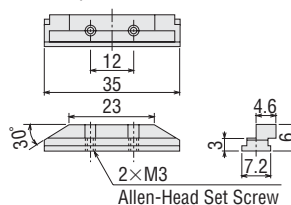
Dog (RoHS)

Use extra dogs if the dogs included with the limit switch set are not enough to implement the required multiple-point stop operation etc.

● Model: **LXDT-4** (4 included)



● Dimensions (Unit = mm)

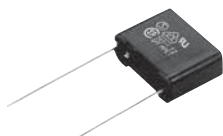


CR Circuit for Surge Suppression (RoHS)

This circuit is used to absorb surge voltage and protect the relay contacts.

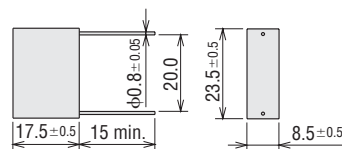
● Model: **EPCR1201-2**

250 VAC (120 Ω, 0.1 μF)



● Dimensions (Unit = mm)

Mass: 5 g



Rack and Pinion Systems Installation

Linear Head and Lineared Motor Installation

Installation Direction of Linear Head and Lineared Motor

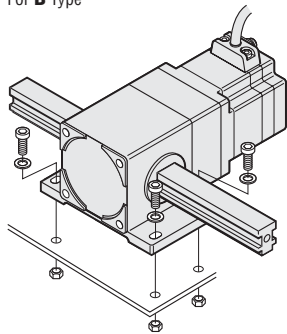
There are no restrictions on the installation direction of linear head and lineared motor.

Mounting Method

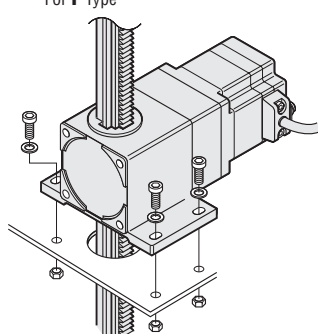
- Secure the linear head or lineared motor firmly on a metal plate.
- Make a mounting hole or tapped hole on the mounting plate.
- For **F** type (vertical stroke), make an additional hole for the rack.
- Using the 4 mounting holes on the mounting surface of linear head or lineared motor, secure the linear head or lineared motor with 4 screws so that there is no gap between the linear head or lineared motor and the metal plate. (Mounting screws are not included.)

Installing with Mounting Flange

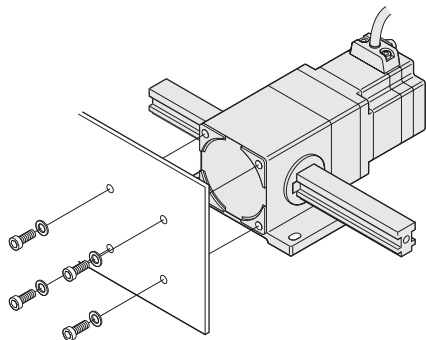
For **B** Type



For **F** Type



Installing with Front Mounting Holes



Installation Conditions

Linear heads, lineared motors and drivers are designed and manufactured to be mounted in a machine.

Make sure the installation location meets the following conditions as well-ventilated space with easy access for inspection.

- Inside an enclosure installed indoors (with ventilation holes provided)
- Ambient temperature: $-10 \sim +50^{\circ}\text{C}$ (non-freezing)
 - (**LS** Linear Head),
 - $0 \sim +50^{\circ}\text{C}$ (non-freezing)
 - (**LAS** Series)
- Ambient humidity: 85% or less (non-condensing)
- Not exposed to an explosive atmosphere, toxic gases (sulfurized gases etc.) or liquid
- Not exposed to direct sunlight
- Not exposed to significant amounts of dust or iron powder
- Not directly exposed to water or oil
- Not exposed to air having high salt content
- Not exposed to continuous vibration or excessive impact
- Not subjected to significant electromagnetic noise caused by welding machines, power equipment, etc.
- Not exposed to radioactive materials, magnetic field or vacuum conditions

Precautions in Handling

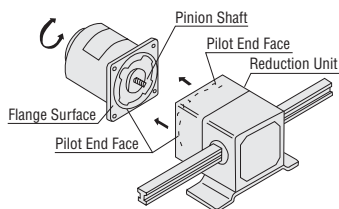
Rack Lubrication

A lubricating agent is necessary to prevent friction when the rack passes through the rack grommet. The surface of the rack and any gears that mesh with the pinion should always be kept lubricated. Since the rack case is filled with a lubrication agent, there is no need to lubricate the rack case. However, ensure that the surface of the rack or gear teeth do not become dry, as operating in this condition will shorten the product's life. When a rack is used vertically, or under high ambient temperature, the separated grease may drip. If the drip is a problem, take measures such as putting a saucer under the rack.

Precautions for Installation

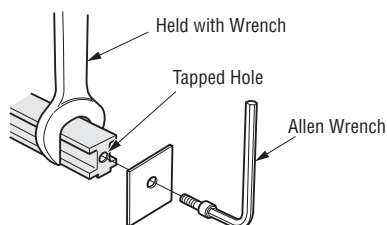
Connecting Linear Heads to Motors

As the figure below shows, a linear head is combined with a motor using the pilots on each unit as guides. The linear head should be moved gently from side to side without forcing the pinion shaft against the gear of linear head. Please note that an attempting to put a motor and linear head together by force can result in damage to the tooth surface, causing strange noise.



Mounting the Load to End of Rack

When mounting the load using the tapped hole on the end of the rack, hold the flat face of the rack rather than the toothed surface with a wrench while tightening the screw so that a rotational force is not applied to the rack. Note that the installation of the load with a rotational force applied to the rack can result in damage to the product.



Precautions for Operation

Do Not Hit to Stop the Rack

Despite differences in control methods, rack and pinion systems are all moved by controlling motor.

Do not hit to stop the operation at the end of the rack. Using like this, the motor will apply not only excessive torque but also an inertial shock to the rack-and-pinion section, as a result, the gear will be damaged.

Do Not Exceed the Maximum Transportable Mass

The maximum transportable mass of each product is determined. Generally, the lower the motor's basic speed, the greater the maximum transportable mass becomes. If a load greater than this value is applied, or rack movement is locked for a long time, it is likely to result in damage to the rack-and-pinion section.

Use an Electromagnetic Brake Model for Vertical Operation

Use an electromagnetic brake model that can hold the load for vertical operation. The electromagnetic brakes that can be combined with linear heads, are power off activated type that are engaged in the event of a power failure and generate large holding force.

The combination of a reversible motor has a certain amount of holding force, but the brake force is limited and unsuitable for load holding at vertical operation.

Following electromagnetic brake models are available.

- LAS** Series with electromagnetic brake
- LS** linear head and motor with electromagnetic brake

For the **LAS** Series, when the driver's protective function has been activated, the current to the lineared motor is cut off to stop the motor. Make sure you provide a sequence for your controller to cut the power to the electromagnetic brake and hold the rack when the alarm output is detected.

Connecting for LAS Series with Electromagnetic Brake

Be sure to use extension cables for electromagnetic brake motor (accessory) when connecting lineared motor with electromagnetic brake and driver. If you connect the motor cable directly to the driver, the electromagnetic brake will not be activated.

The electromagnetic brake operates with the turning on/off of the DC power supply. Connect the electromagnetic brake leads from the extension cable while ensuring the correct polarity, and be sure to connect surge suppressor included to protect switch contact and suppress noise.

Driver Installation

● Mounting Direction and Method

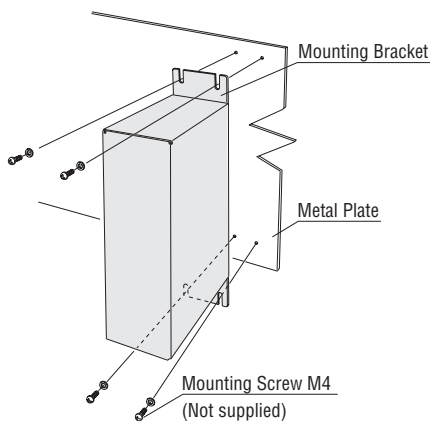
Box Type

◇ Installing Using the Mounting Bracket

1. Install a mounting bracket at the back of the driver using screws included.
2. Install the driver using the mounting holes of mounting bracket so that there is no gap between the driver and the metal plate.

Applicable Product:

LAS Series



Notes:

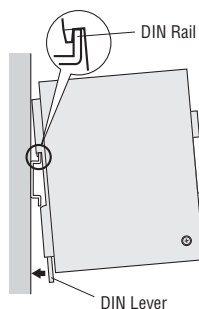
- Firmly install on a metal plate that has good heat conductivity, such as iron or aluminum of 2 mm or more in thickness.
- To directly install the driver without using the mounting bracket included, pay particular attention to the length of the screws used for the mounting holes.

◇ Installing in a DIN Rail [Using a DIN rail mounting plate (Sold separately)]

Pull the DIN lever down, hook the top of the DIN rail mounting plate to the DIN rail, and press it down until the DIN lever is locked into place.

Applicable Product:

LAS Series



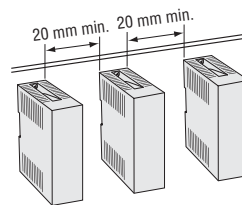
Notes:

- Use a DIN rail with a rail width of 35 mm and an end plate.
- The DIN rail and end plate are not included with the driver. Those must be purchased separately.

◇ Installation Clearances

When using multiple driver, driver temperature rise will cause ambient temperature to rise. At least 20 mm must be allowed between driver units and at least 25 mm between drivers and other equipment or structures.

Install a forced-air cooling fan if ambient temperature exceed 50°C.



● Installation Conditions

Install the driver in a location that meets the following conditions, or the product may be damaged.

- Indoors (This product is designed and manufactured to be installed within another device.)
- Ambient temperature: 0~+50°C (non-freezing) (**LAS series**)
- Ambient humidity: 85% or less (non-condensing)
- Not exposed to explosive, flammable or corrosive gases
- Not exposed to direct sunlight
- Not exposed to dust
- Not directly exposed to water or oil
- A place where heat can escape easily
- Not exposed to continuous vibration or excessive impact

Notes:

- When installing the driver in an enclosed space such as a control box, or somewhere close to a heat-radiating object, vent holes should be used to prevent the driver from overheating.
- Do not install the driver in a location where a source of vibration will cause the driver to vibrate.
- In situations where drivers are located close to a large noise source such as high frequency welding machines or large electromagnetic switches, take steps to prevent noise interference, either by inserting noise filters or connecting the driver to a separate circuit.
- Take care that pieces of conductive material (filings, pins, pieces of wire, etc.) do not enter the drivers.