



Linear Servo Actuator LSA/LSAS Series

First Step Guide Second Edition

Thank you for purchasing our product.

Make sure to read the Safety Guide and detailed Instruction Manual (CD) included with the product in addition to this First Step Guide to ensure correct use.

This Instruction Manual is original.

Warning : Operation of this equipment requires detailed installation and operation instructions which are provided on the CD Manual included in the box this device was packaged in. It should be retained with this device at all times.
A copy of the CD Manual can be requested by contacting your nearest IAI Sales Office listed at the back cover of the Instruction Manual or on the First Step Guide.

- Using or copying all or part of this Instruction Manual without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.

Product Check

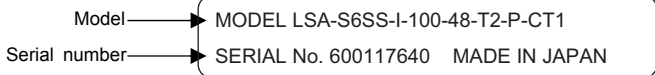
This product is comprised of the following parts if it is of standard configuration.
If you find any fault in the contained model or any missing parts, contact us or our distributor.

1. Parts (The option is excluded.)

No.	Part Name	Model	Remarks
1	Main Body	"How to read the model plate", "How to read the model No."	
Accessories			
2	Motor • Encoder Cable*1		
3	First Step Guide		
4	Instruction Manual (CD)		
5	Safety Guide		

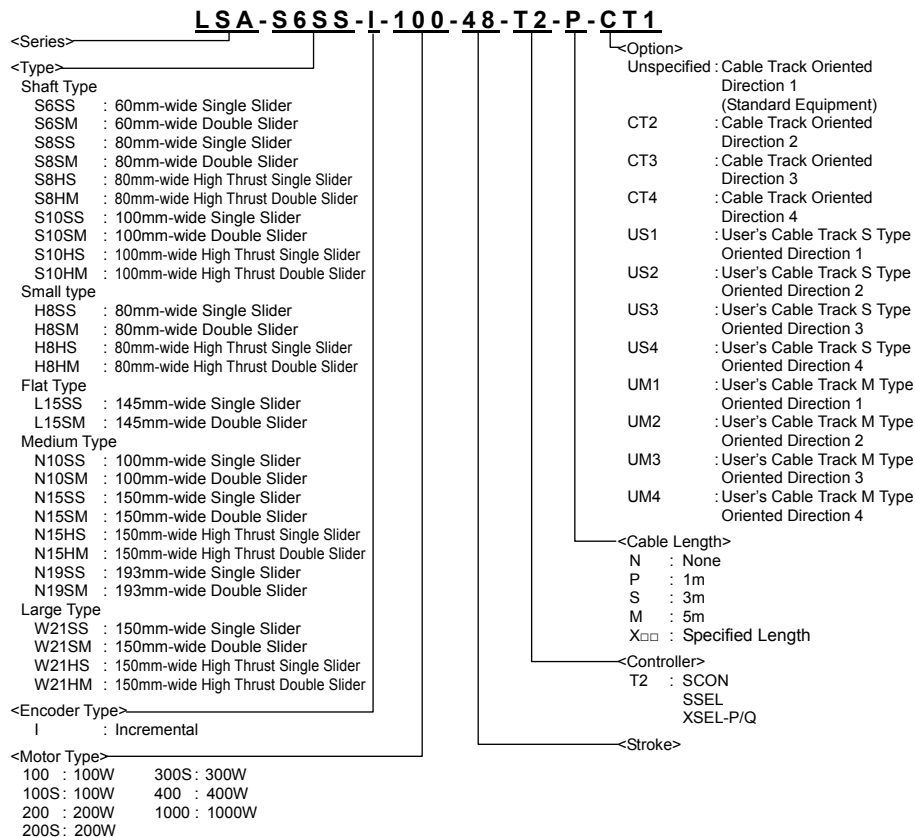
*1 Please refer to the wiring layout for the enclosed motor cable and encoder cable.

2. How to read the model plate



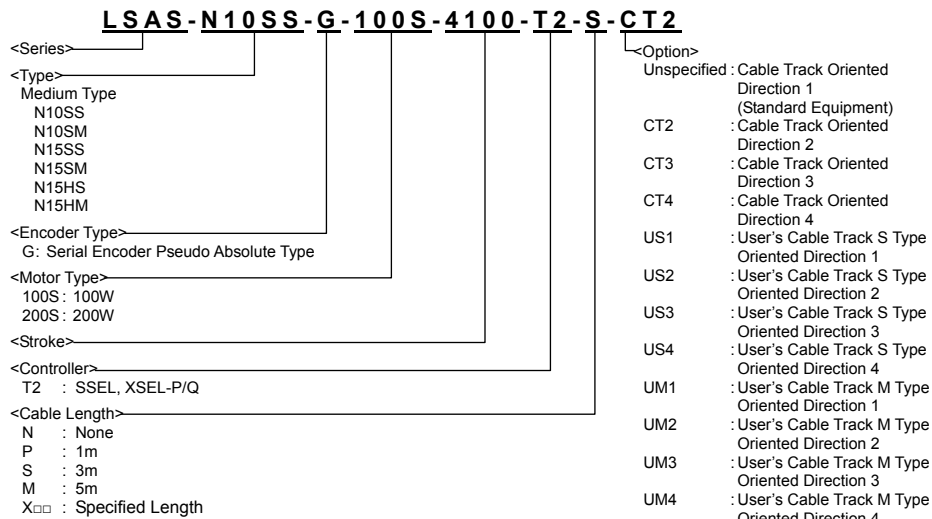
3. How to read the model No.

3.1 LSA



[Refer to the Catalog or Instruction Manual (CD) for specification details.]

3.2 LSAS



[Refer to the Catalog or Instruction Manual (CD) for specification details.]

Precautions in Handling

Warning: Influence of Permanent Magnet
There is a high performance rare earth permanent magnet used in the Linear Servo Actuator.
It may cause an error to the operation of medical devices such as a pacemaker. Do not get closer than 30cm of the product if you use such a device like a pacemaker.

1. Handling of Robot

1.1 Handling of the Packed Product

Unless otherwise specified, the actuator is shipped with each axis packaged separately.

- Do not damage or drop. The package is not supplied with any special treatment that enables it to resist an impact caused by a drop or crash.
- Transport a heavy package with at least more than two operators. Consider an appropriate method for transportation.
- If the shipping box is to be left standing, it should be in a horizontal position. Follow the instruction if there is any for the packaging condition.
- Do not get on the package.
- Do not put any load that may cause a deformation or breakage of the package.

1.2 Handling of Robot without Package

- Do not carry the actuator by holding the cable, or do not move it by pulling the cable.
- Hold the body base when transporting the actuator.
- When carrying the actuator, exercise caution not to bump it against nearby objects or structures.
- Do not give any excessive force to any of the sections in the actuator.

2. Handling of Multi-Axes Type

2.1 Handling of the Packed Product

Multi-axes type will be delivered in a package with an outer case fixed to a wooden base. Sliders are fixed so they would not accidentally move while in transportation. The end of the actuator is also fixed to avoid it swinging by external vibration.

- Do not damage or drop. The package is not supplied with any special treatment that enables it to resist an impact caused by a drop or crash.
- Transport a heavy package with at least more than two operators. Consider an appropriate method for transportation.
- When suspending the package using ropes, pass the ropes from underneath the reinforcement frames at the bottom of the base. When lifting with a forklift, also place the forks underneath the base.
- Do not apply an impact on the package or let it bounce when putting it down.
- Do not get on the package.
- Do not put any load that may cause a deformation or breakage of the package.

2.2 Handling of Robot without Package

- Secure the sliders to prevent sudden movement during transport.
- If any end of the actuator is overhanging, secure it properly to avoid significant movement due to external vibration.
- If the actuator assembly is transported without the ends being secured, do not apply an impact of 0.3G or more.
- In the case that the actuator needs to be carried up with ropes or another method, be sure to use an appropriate cushioning to avoid the robot being deformed or put on an excessive pressure. And also, be sure to keep the robot in a stable and horizontal posture. Utilize the tapped holes on the bottom of the base to attach a tool to suspend the package if necessary.
- Be careful not to apply a load on any of the actuator brackets or covers or on the connector box. Also, avoid the cables being pinched or caused an excessive deformation.

3. Handling of Robot Mounted on Mechanical Equipment (System)

Note the following when the whole mechanical equipment (system) that the actuator is mounted on needs to be transported.

- Secure the sliders to prevent sudden movement during transport.
- If any end of the actuator is overhanging, secure it properly to avoid significant movement due to external vibration.
- If the actuator assembly is transported without the ends being secured, do not apply an impact of 0.3G or more.
- When suspending the mechanical equipment (system) with ropes, avoid applying force to actuator, connector box, etc. Also, avoid the cables being pinched or caused an excessive deformation.

Installation Environment, Storage Environment

1. Installation Environment

An environment that satisfies the following conditions is required during installation.
It is generally the environment where a worker can work without any protection gear.

- There should be no direct sunlight.
- Any radiant heat from a large heat source such as a heat treatment furnace should not be directed at the machine main body.
- The ambient temperature should be 0 to 40℃.
- The relative humidity should be 85% or less. There should not be dew condensation.
- There should be no corrosive gas or flammable gas.
- There should be no flammable dust or ignitable liquid in the surroundings.
- Oil mist or cutting liquid should not be directed at the machine.
- Chemical liquid should not be splashed on it.
- An impact or vibration should not be transmitted to it.
- There should be no strong electromagnetic waves, ultraviolet rays or radiation.
- The actuator should not be installed where it gets dipped in liquid.
- The working space required for maintenance or inspection should be secured.

2. Storage and Preservation Environment

The storage and preservation environment should comply with the same standards as those for the installation environment. In particular, when the machine is to be stored for a long time, pay close attention to environmental conditions so that no dew condensation forms.

Unless specially specified, moisture absorbency protection is not included in the package when the machine is delivered. In the case that the machine is to be stored in an environment where dew condensation is anticipated, take the condensation preventive measures from outside of the entire package, or directly after opening the package.

For storage temperature, the machine withstands temperatures up to 60°C for a short time, but in the case of the storage period of 1 month or more, control the temperature to 50°C or less.

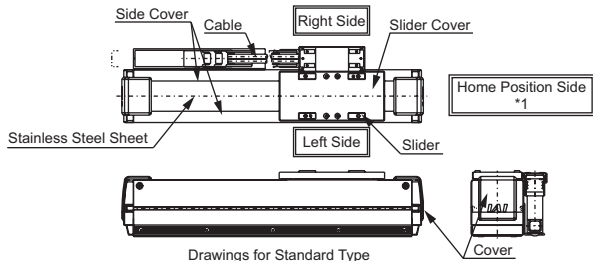
Storage and preservation should be performed in the horizontal condition.

Names of the Parts

1. Shaft Type

[S6SS, S6SM, S8SS, S8SM, S8HS, S8HM, S10SS, S10SM, S10HS, S10HM]

Shown below are the drawings of S6SS, S8SS, S8HS, S10SS and S10HS Single Sliders. The Slider for S6SM, S8SM, S8HM, S10SM and S10HM is a double slider.



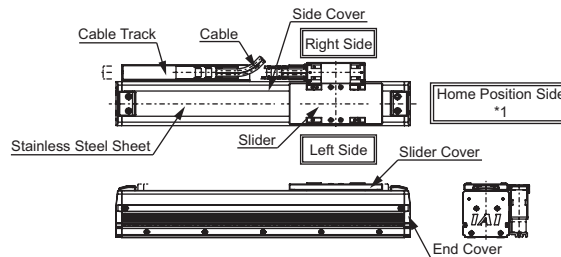
*1 The home position side may differ from shown above as it is oriented to the indicated direction.

Please refer to the Catalog or the Instruction Manual (CD) for the dimensions and profile.

2. Small Type

[H8SS, H8SM, H8HS, H8HM]

Shown below are the drawings of H8SS and H8HS Single Sliders. The Slider for H8SM and H8HM is a double slider.



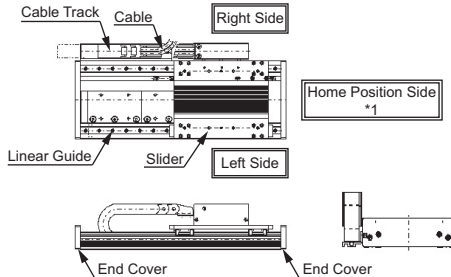
*1 The home position side may differ from shown above as it is oriented to the indicated direction.

Please refer to the Catalog or the Instruction Manual (CD) for the dimensions and profile.

3. Flat Type

[L15SS, L15SM]

Shown below are the drawings of L15SS Single Sliders. The Slider for L15SM is a double slider.



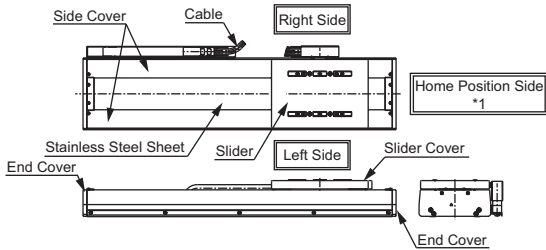
*1 The home position side may differ from shown above as it is oriented to the indicated direction.

Please refer to the Catalog or the Instruction Manual (CD) for the dimensions and profile.

4. Medium Type

[N10SS, N10SM, N15SS, N15SM, N15HS, N15HM, N19SS, N19SM]

Shown below are the drawings of N10SS, N15SS, N15HS and N19SS Single Sliders. The Slider for N10SM, N15SM, N15HM and N19SM is a double slider.



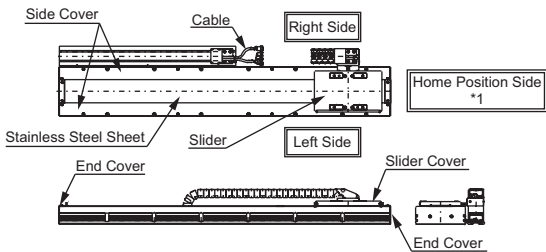
*1 The home position side may differ from shown above as it is oriented to the indicated direction.

Please refer to the Catalog or the Instruction Manual (CD) for the dimensions and profile.

5. Large Type

[W21SS, W21SM, W21HS, W21HM]

Shown below are the drawings of W21SS and W21HS Single Sliders. The Slider for W21SM and W21HM is a double slider.



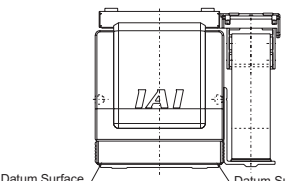
*1 The home position side may differ from shown above as it is oriented to the indicated direction.

Please refer to the Catalog or the Instruction Manual (CD) for the dimensions and profile.

Attachment

Refer to the Instruction Manual (CD) for the attachments of the actuator and loads.

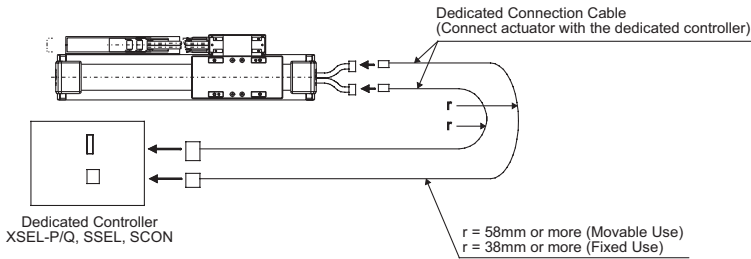
[Precautions for Attachments]

No.	Item	Precautions
1	Installation	<ul style="list-style-type: none">The unit cannot be mounted vertically or on the ceiling.Flat Type L15, Medium Type N10, N15, N19 or Large Type W21 cannot be mounted horizontally oriented on the wall.
2	Attachment Surface	<ul style="list-style-type: none">The base has to have a structure with sufficient rigidity to prevent oscillation.The side and the bottom surfaces of the base of the slider type actuator are the datums for the slider actuator. If accuracy for its run is required, use these surfaces as a datums of the installation. <div><p>Pictures for standard Type Example Shaft Type</p></div> <ul style="list-style-type: none">The actuator mounting surface and other surfaces that are used as a datum should be flat enough with an accuracy of machining or equivalent treatment, and the flatness of the mounting surface needs to be $\pm 0.05\text{mm/m}$ or less.Secure the space where maintenance work can be performed.
3	Bolts to be used	<ul style="list-style-type: none">For the bolts to be used, a high-tensile bolt complying with ISO-10.9 or more is recommended.If using the tapped holes, use screws with the thread length dimension being less than the effective depth of the holes.In case the tapped hole is a through hole, be careful so the screw tip does not exceed the surface of the tapped hole.For the actuator mounting, use a bolt with the dimension of its effective mating length to the tapped hole size as stated below. If tapped hole in steel → thread length same as nominal diameter If tapped hole in aluminum → thread length 2 times longer than nominal diameter
4	Tightening Torque	<ul style="list-style-type: none">Please follow the specification values stated in the Instruction Manual (CD) for the tightening torque. Failure to do so may cause an operation problem.
5	Load Moment and Overhung length	<ul style="list-style-type: none">Please follow the specification values stated in the Instruction Manual (CD) for the load moment and the overhung length. Failure to do so may cause abnormal vibration or noise, and also may remarkably shorten the product life.

Wiring

For the controller, only the dedicated controller manufactured by our company can be used. Using other controllers may cause a problem such as burning the product, ignition or generating heat. Use the dedicated cable enclosed in the package when connecting the actuator and the controller.

[Connection to the XSEL-P/Q, SSEL, SCON controller]



(Models Except for Large Type W21)

[LSA]

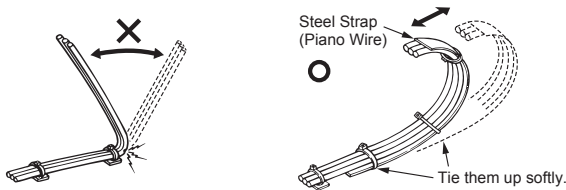
- Motor Cable CB-X-MA***
 - Encoder Cable CB-X3-PA***
- (Large Type W21)
- Motor Cable CB-XMC-MA***
 - Encoder Cable CB-X2-PLA***
- *** shows the cable length.
The max. length should be 30m.
Example) 080=8m

[LSAS]

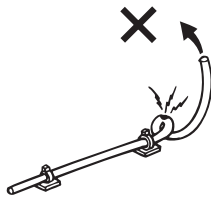
- Motor Cable CB-X-MA***
- Encoder Cable CB-X1-PA***

[Prohibited Items in the Cable Processing]

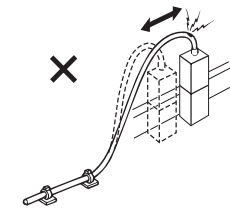
- Do not pull or bend forcibly the cable so as not to give any extra load or tension to the cable.
- Do not process the cable for extension or shortening by means of cutting out, combination or connecting with another cable.
- Do not let the cable flex at a single point.



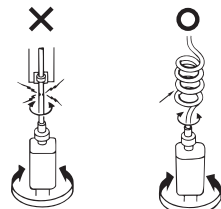
- Do not let the cable bend, kink or twist.



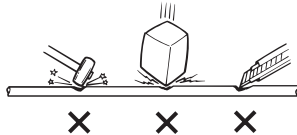
- Do not pull the cable with a strong force.



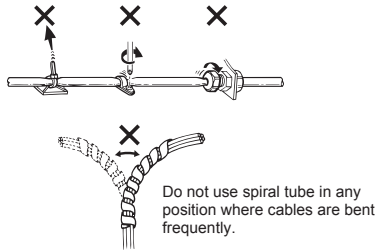
- Do not let the cable receive a turning force at a single point.



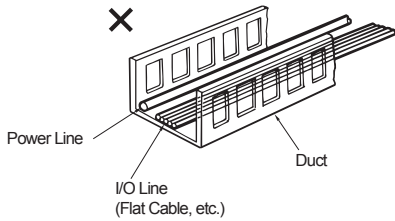
- Do not pinch, drop a heavy object onto or cut the cable.



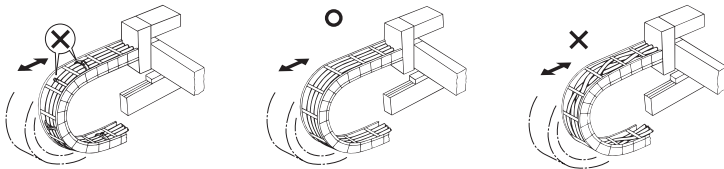
- When fixing the cable, provide a moderate slack and do not tension it too tight.



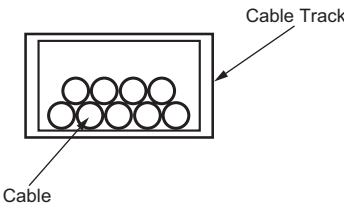
- Separate the I/O line, communication line and power line from each other. Arrange so that such lines are independently routed in the duct.



- Take care of the following items using the cable carrier.
- Arrange the wiring so that there is no entanglement or kink of the cables in the cable carrier or flexible tube, and do not bind the cables so that the cables are relatively free. (Do not bend it at an angle of 90° or less)



- The cable track capacity for cables to put in should be 60% or less to prevent cables from breaking. (Cable heat is not considered.)



⚠ Caution:

- When the cable is connected or disconnected, make sure to turn off the power to the controller. When the cable is connected or disconnected with the controller power turned ON, it might cause a malfunction of the actuator and result in a serious injury or damage to the machinery.
- When the connector connection is not correct, it would be dangerous because of a malfunction of the actuator. Make sure to confirm that the connector is connected correctly.



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Manual No.: ME3698-2A