Electric Actuator

Rod Type **Guide Rod Type**

New

CE

Step Motor (Servo/24 VDC) **Servo Motor** (24 VDC) **Type**

Rod Type *Series LEY*

Size: 16, 25, 32

Long stroke:

Max. 500 mm (LEY32)

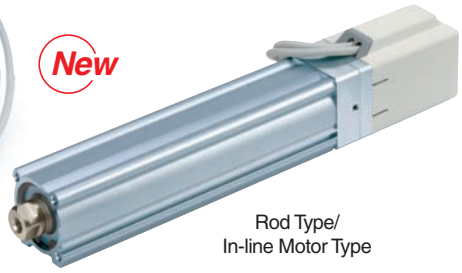
Mounting variations

- Direct mounting: 3 directions, Bracket mounting: 3 types
- Auto switch can be mounted.
- Speed control/Positioning: Max. 64 points
- Either positioning or pushing control can be selected.
  Possible to hold the actuator with the rod pushing to a workpiece, etc.



Rod Type

New



Rod Type/
In-line Motor Type

Guide Rod Type *Series LEYG*

Size: 16, 25, 32

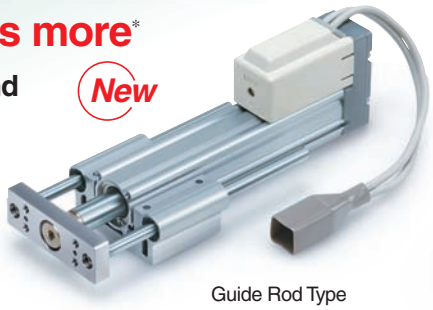
Lateral end load: 5 times more*

* Compared with rod type, size 25 and 100 stroke

Compatible with sliding bearing and ball bushing bearing.
Compatible with moment load and stopper (sliding bearing).

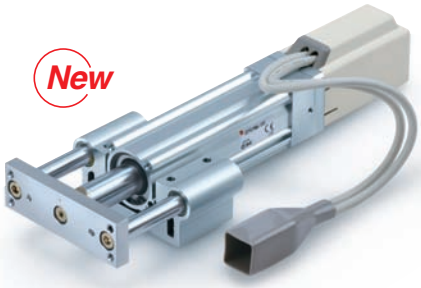
- Speed control/Positioning: Max. 64 points
- Either positioning or pushing control can be selected.
  Possible to hold the actuator with the rod pushing to a workpiece, etc.

New



Guide Rod Type

New



Guide Rod Type/
In-line Motor Type

AC Servo Motor (100/200 W) **Type**

Rod Type *Series LEY*

Size: 25, 32

- High output motor (100/200 W)
- Improved high speed transfer ability
- High acceleration compatible (5,000 mm/s²)
- Pulse input type
- With internal absolute encoder (LECSB specifications)

New



Rod Type

New



Rod Type/
In-line Motor Type

Step Motor (Servo/24 VDC) **Servo Motor** (24 VDC) **Controller**

▶ Step Data Input Type
Series LECP6/LECA6

- 64 positioning points
- Teaching box, controller setting kit input



New

▶ Programless Type
Series LECP1

- 14 positioning points
- Control panel setting



AC Servo Motor Controller

New

▶ AC Servo Motor Controller
Series LECSA/LECSB

- Pulse input type
- Absolute encoder (LECSB)
- Built-in positioning function (LECSA)



Series LEY

SMC

CAT.NAS100-83C

Series LEY

Step Motor (Servo/24 VDC) **Servo Motor** (24 VDC) **Type**

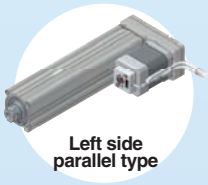
Rod Type *Series LEY* /Size: 16, 25, 32

Intermediate positioning control and pushing control can be achieved.
Highly accurate operation with ball screws.
(Positioning repeatability: ±0.02 mm)

Motor mounting positioncan be selected.

Top mounting type is the standard product.


Right side parallel type

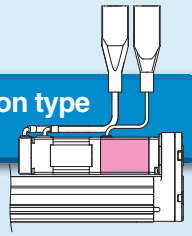

Left side parallel type

New


In-line motor type

Non-magnetizing operation type lock mechanism (Option)

Prevents work pieces from dropping (holding)



Motor cover is available. (Option)



Motor parallel type

Offering 2 types of motor table

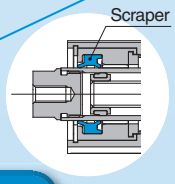
New
- Standard cable
- Robotic cable (Flexible cable)

Manual override adjustment screw

For piston rod manual operation
Adjustment operation possible when power OFF

Scraper

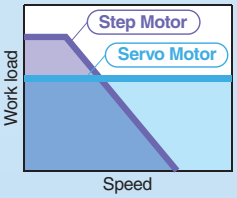
Prevents foreign matter intrusion.


Scraper

Pages 15, 16

2 types of motors can be selected.

- **Step motor (Servo/24 VDC)**
  Ideal for transfer of high load at a low speed and pushing operation
- **Servo motor (24 VDC)**
  Stable at high speed and silent operation



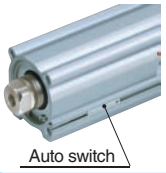
Rod End Brackets


Single knuckle joint
Double knuckle joint
Simple joint

Auto switch groove

For checking the limit and intermediate signal
Applicable to the D-M9□ and D-M9□W (2-color indication)

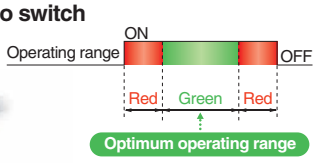
* The auto switches should be ordered separately. Refer to pages 17 and 18 for details.


Auto switch

2-color indication solid state auto switch
Appropriate setting of the mounting position can be performed without mistakes.

A green light lights up at the optimum operating range.

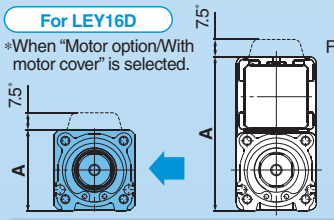




New In-line motor type

Height dimension shortened by up to 49%

For LEY16D
*When "Motor option/With motor cover" is selected.



For LEY16

A Dimension (mm)

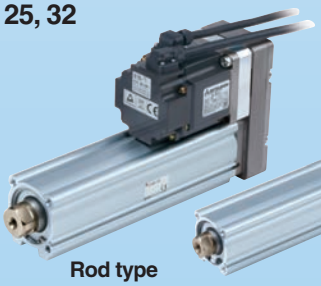
Size	In-line motor	Motor parallel
16	35.5	67.5
25	46.5	92
32	61	118

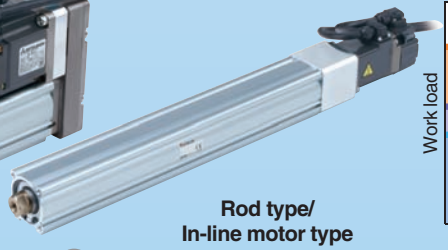


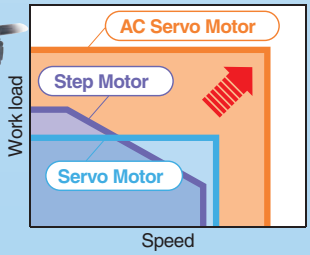
New AC Servo Motor (100/200 W) Type

Rod Type *Series LEY* /Size: 25, 32

- High output motor (100/200 W)
- Improved high speed transfer ability
- High acceleration compatible (5,000 mm/s²)
- Pulse input type
- With internal absolute encoder (LECSB specifications)


Rod type


Rod type/
In-line motor type



SMC

Step Motor (servo/24 VDC) | Servo Motor (24 VDC) Type

New **Guide Rod Type** *Series* ***LEYG*** /Size: 16, 25, 32

Compact integration of guide rods Achieves lateral load resistance and high non-rotating accuracy.

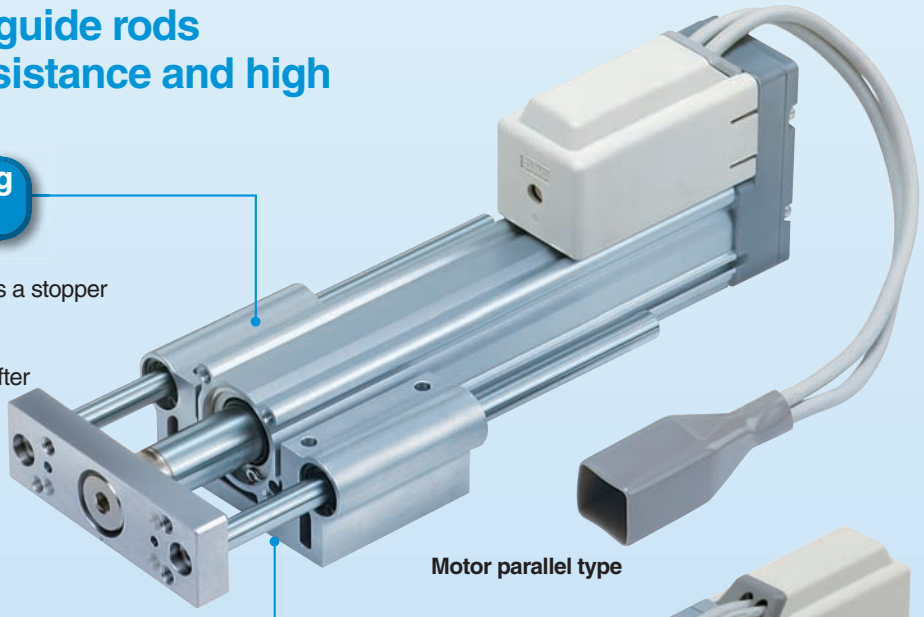
Compatible with sliding bearing and ball bushing bearing

- **Sliding bearing**
  Suitable for lateral load applications such as a stopper where shock is applied
- **Ball bushing bearing**
  Smooth operation suitable for pusher and lifter

Improved rigidity

Lateral end load:
5 times more*

* Compared with rod type, size 25 and 100 stroke

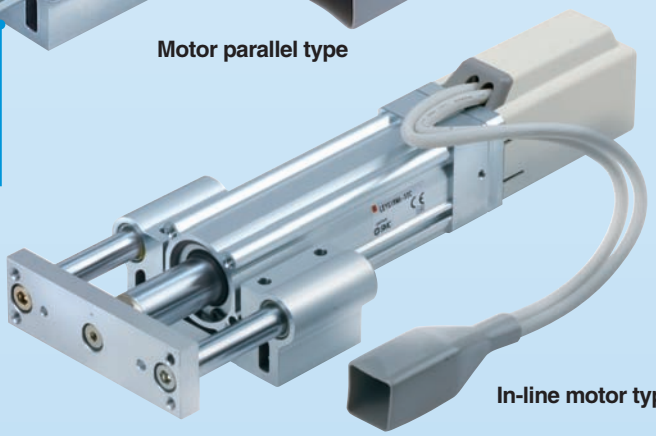


Motor parallel type

Using two guide rods for improved non-rotating accuracy

Bore size (mm)	16	25	32
Sliding bearing	±0.06°	±0.05°	
Ball bushing bearing	±0.07°	±0.06°	

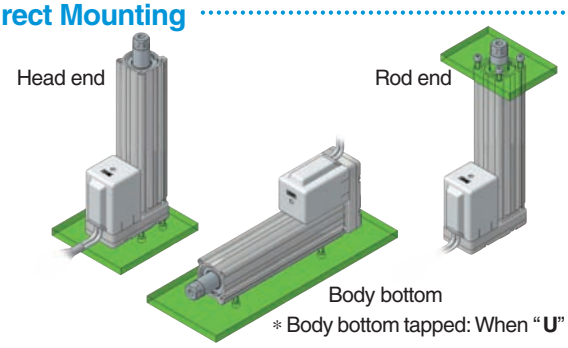
When extending the cylinder (initial value), non-rotating accuracy, without loads and deflection of guide rods, it should be a value no more than the value in the table as a guide.



In-line motor type

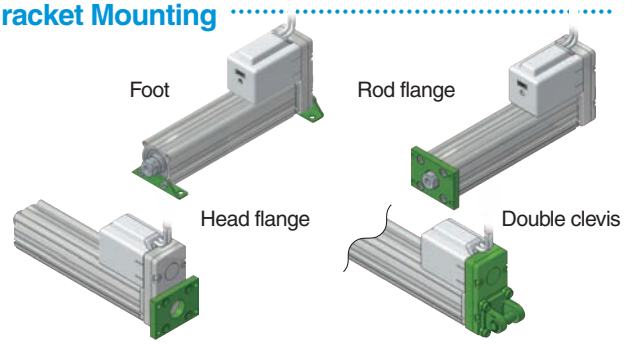
Mounting Variations

Direct Mounting

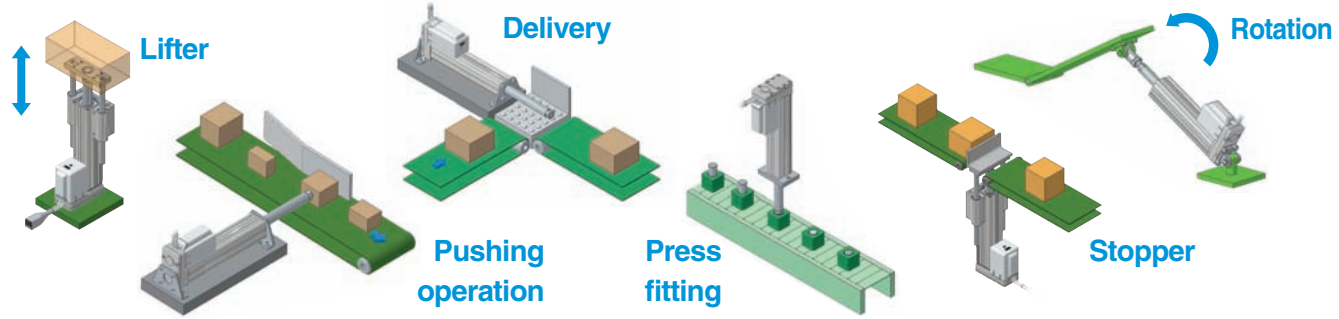


* Body bottom tapped: When "**U**" is selected

Bracket Mounting



Application Examples



Offering 2 Types of Controller

Step Data Input Type Series LECP6/LECA6



Step Motor
(Servo/24 VDC)
LECP6



Servo Motor
(24 VDC)
LECA6

Simple Setting to Use Straight Away

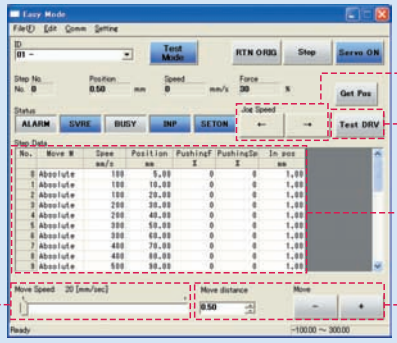
◎Simple Setting Easy Mode

If you want to use it right away, select “Easy Mode.”

<When a PC is used>
Controller setting software

- Step data setting, test operation, move jog and move for the constant rate can be set and operated on one screen.





Move jog

Start testing

Step data setting

Move for the constant rate

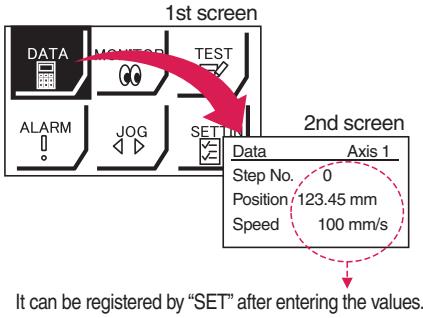
Setting of jog and speed of the constant rate

<When a TB (teaching box) is used>

- The simple screen without scrolling promotes ease of setting and operating.
- Pick up an icon from the first screen and select a function.
- Set up the step data and check the monitor on the second screen.

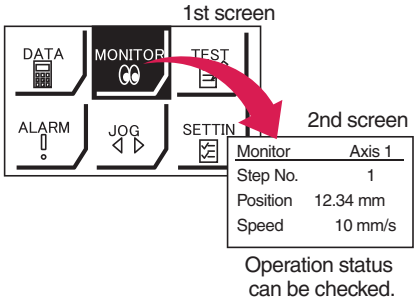


Example of setting the step data



It can be registered by “SET” after entering the values.

Example of checking the monitor



Operation status can be checked.

Teaching box screen

- **Data can be set with position and speed.** (Other conditions are already set.)

Data	Axis 1
Step No.	0
Position	50.00 mm
Speed	200 mm/s



Data	Axis 1
Step No.	1
Position	80.00 mm
Speed	100 mm/s

Programless Type Series LECP1

No programming

Capable of setting up an electric actuator operation without using a PC or teaching box

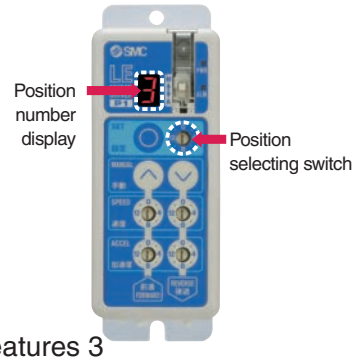


Step Motor
(Servo/24 VDC)
LECP1

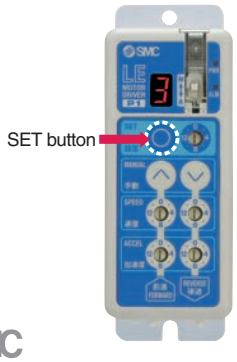
1 Setting position number
Setting a registered number for the stop position
Maximum 14 points

2 Setting a stop position
Moving the actuator to a stop position using FORWARD and REVERSE buttons

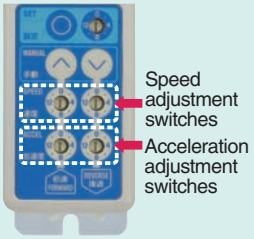
3 Registration
Registering the stop position using SET button







Speed/acceleration
16-level adjustment



SMC

◎Detail Setting Normal Mode

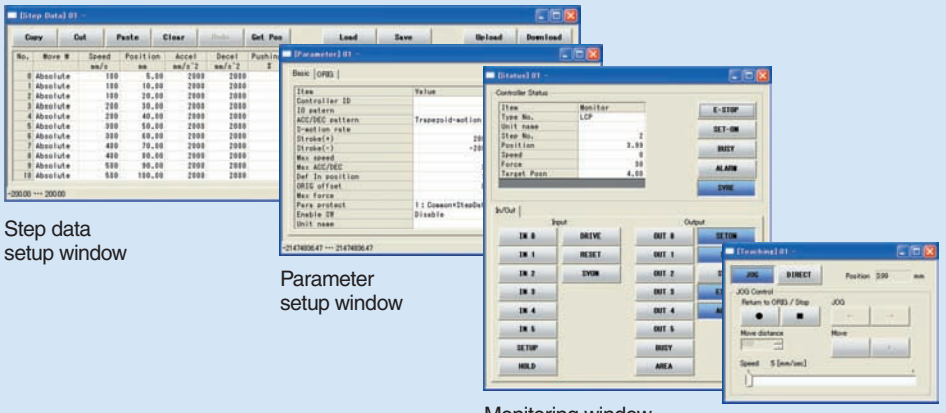
Select normal mode when detail setting is required.

- Step data can be set in detail.
- Signals and terminal status can be monitored.
- Parameters can be set.
- JOG and constant rate movement, return to origin, test operation and testing of compulsory output can be performed.

<When a PC is used> Controller setting software

- Step data setting, parameter setting, monitor, teaching, etc., are indicated in different windows.





Step data setup window

Parameter setup window

Monitoring window

Teaching window

<When a TB (teaching box) is used>

- Multiple step data can be stored in the teaching box, and transferred to the controller.
- Continuous test operation by up to 5 step data.

Teaching box screen

- Each function (step data setting, test, monitor, etc.) can be selected from the main menu.



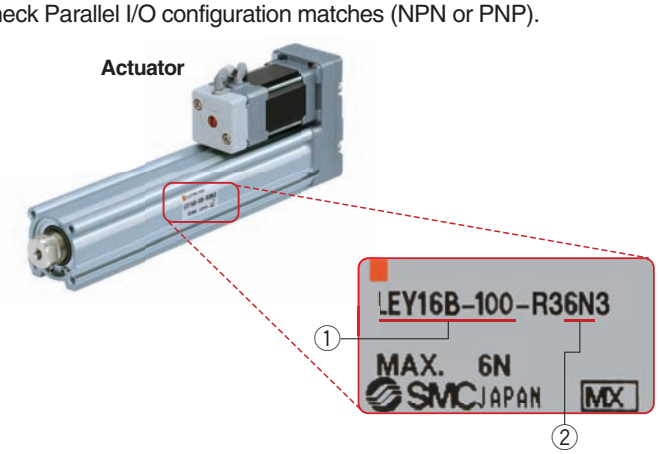
The actuator and controller are provided as a set. (They can be ordered separately.)

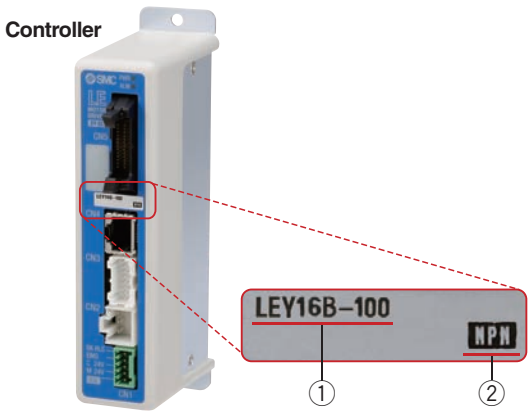
Confirm that the combination of the controller and the actuator is correct.

<Check the following before use.>

① Check that actuator label for model number. This matches the controller.

② Check Parallel I/O configuration matches (NPN or PNP).





Function

Item	Step data input type LECP6/LECA6	Programless type LECP1
Step data and parameter setting	• Input the numerical value from controller setting software (PC) • Input the numerical value from teaching box	• Select using controller operation buttons
Step data "position" setting	• Input the numerical value from controller setting software (PC) • Input the numerical value from teaching box • Direct teaching • JOG teaching	• Direct teaching • JOG teaching
Number of step data	64 points	14 points
Operation command (I/O signal)	Step No. [IN*] input ⇒ [DRIVE] input	Step No. [IN*] input only
Completion signal	[INP] output	[OUT*] output

Setting Items

TB: Teaching box PC: Controller setting software

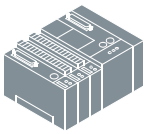
Item		Contents	Step data input type LECP6/LECA6	Easy mode		Normal mode	Programless type LECP1
				TB	PC	TB, PC	
Step data setting (Excerpt)	**Movement MOD**	Selection of "absolute position" and "relative position"	Set at ABS/INC.	×	●	●	Fixed value (ABS)
	Speed	Transfer speed	Set in units of 1 mm/s.	●	●	●	Select from 16-level
	Position	[Position]: Target position [Pushing]: Pushing start position	Set in units of 0.01 mm.	●	●	●	Direct teaching JOG teaching
	Acceleration/Deceleration	Acceleration/deceleration during movement	Set in units of 1 mm/s².	●	●	●	Select from 16-level
	Pushing force	Rate of thrusting force during pushing operation	Set in units of 1%.	●	●	●	Select from 3-level (weak, medium, strong)
	Trigger LV	Target thrusting force during pushing operation	Set in units of 1%.	×	●	●	No setting required (same value as pushing force)
	Pushing speed	Speed during pushing operation	Set in units of 1 mm/s.	×	●	●	Fixed value
	Positioning force	Force during positioning operation	Set to 100%.	×	●	●	Fixed value
	Area output	Conditions for area output signal to turn ON	Set in units of 0.01 mm.	×	●	●	—
	In position	[Position]: Width to the target position [Pushing]: How much it moves during pushing	Set to 0.5 mm or more. (Units: 0.01 mm)	×	●	●	Fixed value
Parameter setting (Excerpt)	**Stroke (+)**	+ side limit of position	Set in units of 0.01 mm.	×	×	●	Fixed value
	Stroke (–)	– side limit of position	Set in units of 0.01 mm.	×	×	●	Fixed value
	ORIG direction	Direction of the return to the original position can be set.	Compatible	×	×	●	Compatible
	ORIG speed	Speed when returning to the original position	Set in units of 1 mm/s.	×	×	●	Fixed value
	ORIG ACC	Acceleration when returning to the original position	Set in units of 1 mm/s².	×	×	●	Fixed value
Test	**JOG**		Continuous operation at the set speed can be tested while the switch is being pressed.	●	●	●	Hold down MANUAL button (⏶⏷) for uniform sending (speed is specified value)
	MOVE		Operation at the set distance and speed from the current position can be tested.	×	●	●	Press MANUAL button (⏶⏷) once for sizing operation (speed, sizing amount are specified values)
	Return to ORIG		Compatible	●	●	●	Compatible
	Test drive	Operation of the specified step data	Compatible	●	●	● (Continuous operation)	Compatible
	Compulsory output	ON/OFF of the output terminal can be tested.	Compatible	×	×	●	—
Monitor	**DRV mon**	Current position, speed, force and the specified step data can be monitored.	Compatible	●	●	●	—
	In/Out mon	Current ON/OFF status of the input and output terminal can be monitored.	Compatible	×	×	●	—
ALM	**Active ALM**	Alarm currently being generated can be confirmed.	Compatible	●	●	●	Compatible (display alarm group)
	ALM Log record	Alarm generated in the past can be confirmed.	Compatible	×	×	●	—
File	**Save/Load**	Step data and parameter can be saved, forwarded and deleted.	Compatible	×	×	●	—
Other	**Language**	Can be changed to Japanese or English.	Compatible	●	●	●	—

System Construction

Supplied by customer

PLC

Power supply for I/O signal 24 VDC



●I/O cable Pages 47, 57

Controller type	Part No.
LECP6/LECA6	**LEC-CN5-□**
LECP1 (Programless)	**LEC-CK4-□**

●Controller



Step data input type
LECP6/LECA6
Page 39



Programless type
LECP1
Page 51

Supplied by customer

Controller power supply 24 VDC

●Power supply connection Pages 42, 56

Controller type	Connection
LECP6/LECA6 (Step data input type)	Power supply plug (accessory)
LECP1 (Programless type)	Power supply cable (1.5m) (accessory)

●Actuator cable Pages 45, 46

Controller type	Standard cable	Robotic cable
LECP6 (Step data input type)	**LE-CP-□-S**	**LE-CP-□**
LECA6 (Step data input type)	—	**LE-CA-□**
LECP1 (Programless type)	**LE-CP-□-S**	**LE-CP-□**

●Controller setting kit (Option) Page 48

Controller setting kit
(Communication cable, conversion unit and USB cable are included.)
Part No.: LEC-W1



Communication cable●
(3 m)



Conversion unit●

●USB cable
(A-mini B type)

PC

Or

●Teaching box (Option) Page 49

Part No.: LEC-T1-3JG□



with 3 m cable

Motor cable (Fixed)●

●Electric actuator

Rod Type Page 5

Series **LEY**



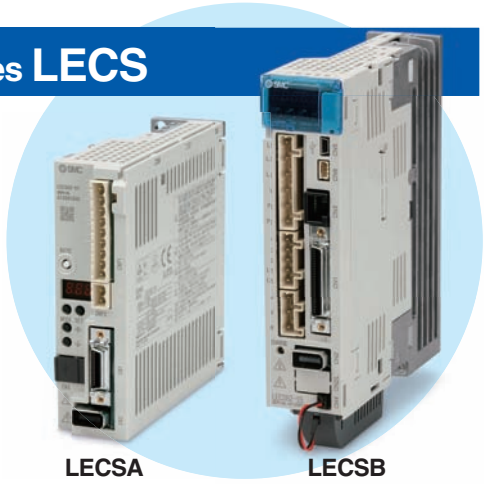
Guide Rod Type Page 25

Series **LEYG**



New AC Servo Motor Controller Series LECS

- Pulse input type motor controller
- Compatible motor capacity: 100 W, 200 W, 400 W
- Compatible encoder : Incremental type
  Absolute type
- Power supply voltage : 100 to 120 VAC (50/60 Hz)
  200 to 230 VAC (50/60 Hz)

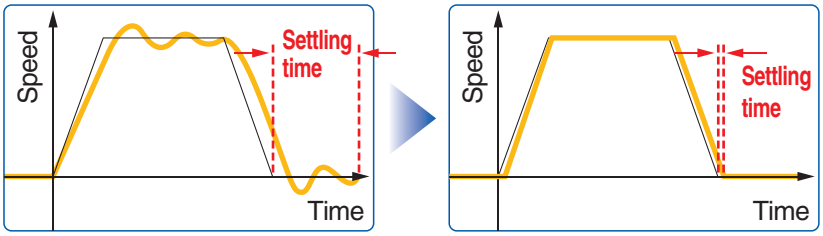


LECSA LECSB

Servo adjustment using auto gain tuning

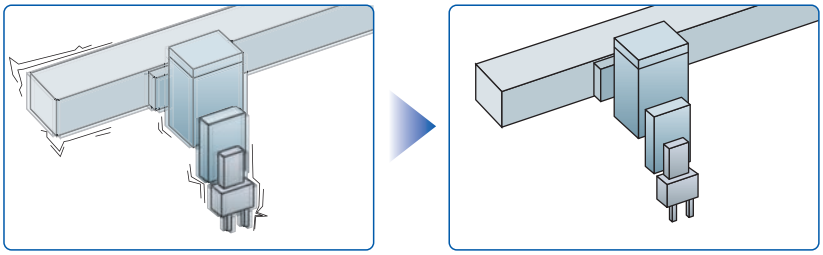
Auto resonant filter function

• Controls the difference in movement between command value and actual movement



Auto damping control function

• Automatically controls machine's low frequency vibrations (up to 100 Hz)



With display setting function

One touch adjustment button

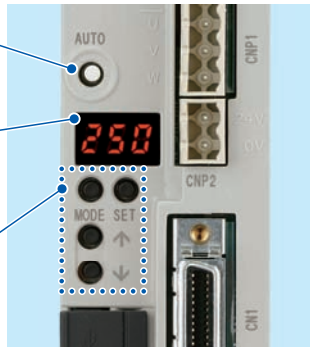
One touch servo adjustment

Display

Display monitor, parameter, alarm

Settings

Control of parameter settings, monitor display etc. using push buttons



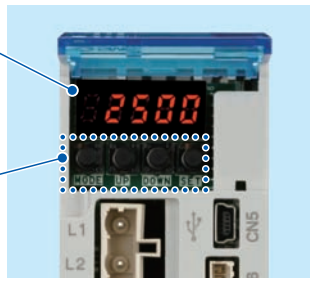
LECSA

Display

Display monitor, parameter, alarm

Settings

Control of parameter settings, monitor display etc. using push buttons



(With the front cover opened)

LECSB

Compatible control mode list (○: recommended setting, △: can be used, x: cannot be used, –: cannot be set)

Controller type	Control mode Note 1)				
	Position control	Speed control Note 2)	Torque control Note 3)	Positioning	
				Point table method	Program method
LECSA (Incremental)	○	△	△	○ 3 points (Max.: 7 points) Note 4)	△ Note 4) Note 5) 4 programs (Max.: 8 programs)
LECSB (Absolute)	○	△	△	–	–
Command method	[Pulse-train]	[ON/OFF signal]			
Operation method	Positioning operation	Setting speed operation	Setting torque operation	Specify point table No. Positioning operation	Specify program No. Positioning operation

Note 1) Control switching mode cannot be used.
Note 2) Make sure that has a limit on the external sensor etc. for avoiding collision with stroke end or workpiece.
Note 3) Can only use for the actuator (Series LEY) compatible with pushing operation.
Note 4) The settings must be changed in order to use various constant settings at maximum when using the point table method and program method. Refer to the "Operation Manual" for required setting changes.
Note 5) To control with the program method, order MR Configurator (setup software) LEC-MR-SETUP221 separately.

System Construction

Incremental encoder compatible Series LECSA

Supplied by customer

Power supply
Single phase 100 to 120 VAC (50/60 Hz)
200 to 230 VAC (50/60 Hz)

Regeneration Page 79
option
Part no.: **LEC-MR-RB-□**

Motor cable Page 79

Standard cable	Robotic cable
LE-CSM-S□□	LE-CSM-R□□

Lock cable Page 79

Standard cable	Robotic cable
LE-CSB-S□□	LE-CSB-R□□

Electric actuator
Rod type Page 58
Series LEY



Encoder cable Page 79

Standard cable	Robotic cable
LE-CSE-S□□	LE-CSE-R□□

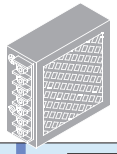
Page 76
Main circuit power supply connector
*Accessory

Controller



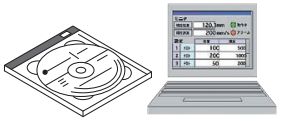
Supplied by customer

Control circuit power supply
24 VDC



Page 75
Control circuit power supply connector
*Accessory

MR Configurator Page 80
Setup software
Part no.: **LEC-MR-SETUP221**



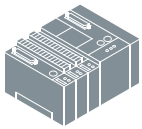
PC

USB cable Page 80
Part no.: **LEC-MR-J3USB**

Page 79
I/O connector
Part no.: **LE-CSNA**

Supplied by customer

PLC
Power supply for I/O signal
24 VDC



Absolute encoder compatible Series LECSB

Supplied by customer

Power supply
Single phase 100 to 120 VAC (50/60 Hz)
200 to 230 VAC (50/60 Hz)
Three phase 200 to 230 VAC (50/60 Hz)

Regeneration Page 79
option
Part no.: **LEC-MR-RB-□**

Motor cable Page 79

Standard cable	Robotic cable
LE-CSM-S□□	LE-CSM-R□□

Lock cable Page 79

Standard cable	Robotic cable
LE-CSB-S□□	LE-CSB-R□□

Electric actuator
Rod type Page 58
Series LEY



Encoder cable Page 79

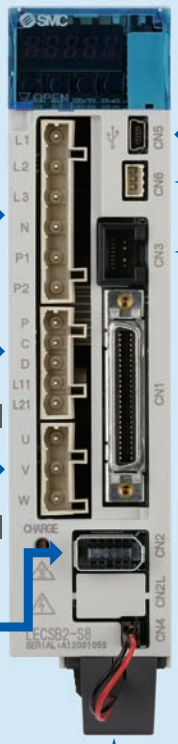
Standard cable	Robotic cable
LE-CSE-S□□	LE-CSE-R□□

Page 76
Main circuit power supply connector
*Accessory

Page 76
Control circuit power supply connector
*Accessory

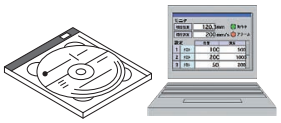
Page 76
Motor connector
*Accessory

Controller



USB cable Page 80
Part no.: **LEC-MR-J3USB**

MR Configurator Page 80
Setup software
Part no.: **LEC-MR-SETUP221**



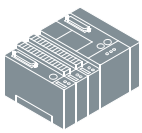
PC

Analog monitor output
RS-422 communication

I/O connector Page 79
Part no.: **LE-CSNB**

Supplied by customer

PLC
Power supply for I/O signal
24 VDC



Battery (included)

SMC Electric Actuators

Rod Type

Step Motor (Servo/24 VDC) | Servo Motor (24 VDC) | AC Servo Motor (100/200 W)



CAT.NAS100-83

Basic Type
Series **LEY**

Size	Stroke
16	30 to 300
25	30 to 400
32	30 to 500



In-line Motor Type
Series **LEY□D**

Size	Stroke
16	30 to 300
25	30 to 400
32	30 to 500



Guide Rod Type
Series **LEYG**

Size	Stroke
16	30 to 200
25	30 to 300
32	30 to 300



In-line Motor Type /Guide Rod Type
Series **LEYG□D**

Size	Stroke
16	30 to 200
25	30 to 300
32	30 to 300



Basic Type
Series **LEY**

Size	Stroke
25	30 to 400
32	30 to 500



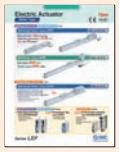
In-line Motor Type
Series **LEY□D**

Size	Stroke
25	30 to 400
32	30 to 500



Slider Type

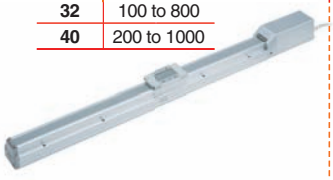
Step Motor (Servo/24 VDC) | Servo Motor (24 VDC) | AC Servo Motor (100/200/400 W)



CAT.NAS100-87

Ball Screw Drive
Series **LEFS**

Size	Stroke
16	100 to 400
25	100 to 600
32	100 to 800
40	200 to 1000



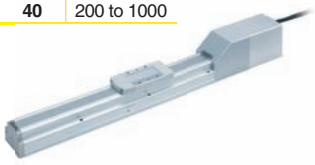
Belt Drive
Series **LEFB**

Size	Stroke
16	300 to 1000
25	300 to 2000
32	300 to 2000



Ball Screw Drive
Series **LEFS**

Size	Stroke
25	100 to 600
32	100 to 800
40	200 to 1000



Rotary Table

Step Motor (Servo/24 VDC)



CAT.NAS100-94

Basic Type
Series **LER**

Size	Rotation angle (°)
10	310, 180, 90
30	320, 180, 90
50	



High Precision Type
Series **LERH**

Size	Rotation angle (°)
10	310, 180, 90
30	320, 180, 90
50	



Slide Table

Step Motor (Servo/24 VDC) | Servo Motor (24 VDC)



CAT.NAS100-78

Basic Type (R Type)
Series **LESH□R**

Size	Stroke
8	50, 75
16	50, 100
25	50, 100, 150



Symmetrical Type (L Type)
Series **LESH□L**

Size	Stroke
8	50, 75
16	50, 100
25	50, 100, 150



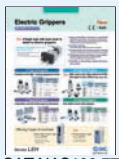
In-line Motor Type (D Type)
Series **LESH□D**

Size	Stroke
8	50, 75
16	50, 100
25	50, 100, 150



Gripper

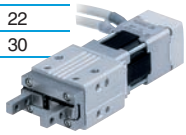
Step Motor (Servo/24 VDC)



CAT.NAS100-77

Z Type (2 Fingers)
Series **LEHZ**

Size	Opening/closing stroke
10	4
16	6
20	10
25	14
32	22
40	30



With Dust Cover
Series **LEHZJ**

Size	Opening/closing stroke
10	4
16	6
20	10
25	14



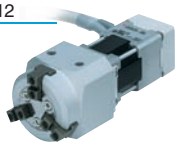
F Type (2 Fingers)
Series **LEHF**

Size	Opening/closing stroke
10	16 (32)
20	24 (48)
32	32 (64)
40	40 (80)



S Type (3 Fingers)
Series **LEHS**

Size	Opening/closing stroke
10	4
20	6
32	8
40	12



Controller

Step Data Input Type For Step Motor
Series **LECP6**



Control motor
Step motor (Servo/24 VDC)

Step Data Input Type For Servo Motor
Series **LECA6**



Control motor
Servo motor (24 VDC)

Programless Type
Series **LECP1**



Control motor
Step motor (Servo/24 VDC)

AC Servo Motor Controller Incremental Type
Series **LECSA**



Control motor
AC servo motor (100/200 VAC)

AC Servo Motor Controller Absolute Type
Series **LECSB**

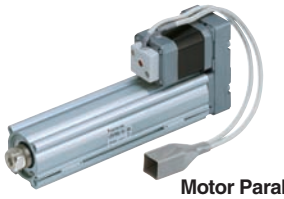


Control motor
AC servo motor (100/200 VAC)

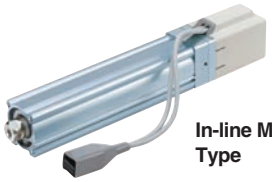
SMC

Series Variations

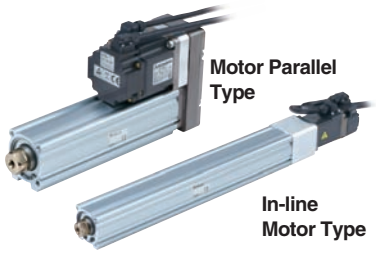
Electric Actuator — Rod Type — Series LEY



Motor Parallel Type



In-line Motor Type



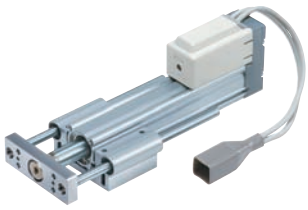
Motor Parallel Type

In-line Motor Type

Specifications	Series	Stroke (mm)	Pushing force (lbf)	Vertical work load (lb)	Speed (mm/s)	Screw lead (mm)	Positioning repeatability (mm)	Controller series	Page
Step motor (Servo/24 VDC)	LEY16□	50 to 300	8.5	4.4	15 to 500	10	±0.02 or less	Series LECP6 / Series LECP1	Page 1
			16.6	8.8	8 to 250	5			
			31.7	17.6	4 to 125	2.5			
	LEY25□	50 to 400	27.4	17.6	18 to 500	12			
			53.5	35.3	9 to 250	6			
			101.6	66.1	5 to 125	3			
	LEY32□	50 to 500	42.5	24.3	24 to 500	16			
			83.2	48.5	12 to 250	8			
			159	97.8	6 to 125	4			
Servo motor (24 VDC)	LEY16□A	50 to 300	6.7	4.4	15 to 500	10		Series LECA6	
			13	8.8	8 to 250	5			
			25	17.6	4 to 125	2.5			
	LEY25□A	50 to 400	7.9	6.6	18 to 500	12			
			16.2	13.2	9 to 250	6			
			29.2	26.5	5 to 125	3			
AC servo motor (100/200 W)	LEY25□S	30 to 400	29.4	17.6	900	12		Series LECSA / Series LECSB	Page 58
			57.3	35.2	450	6			
			109	66.1	225	3			
	LEY32□S	30 to 500	35.2 (44.3)	19.8 (26.5)	1200 (1000)	20 (16)			
			69.2 (86.6)	41.9 (52.9)	600 (500)	10 (8)			
			132.2 (165.5)	81.6 (101.4)	300 (250)	5 (4)			

∗ ( ) indicates value when motor mounting position: straight is selected.

Electric Actuator — Guide Rod Type — Series LEYG



Motor Parallel Type



In-line Motor Type

Specifications	Series	Stroke (mm)	Pushing force (lbf)	Vertical work load (lb)	Speed (mm/s)	Screw lead (mm)	Controller series	Page
Step motor (Servo/24 VDC)	LEYG16□	30 to 200	8.5	3.3	15 to 500	10	Series LECP6 / Series LECP1	Page 19
			16.6	7.7	8 to 250	5		
			31.7	16.5	4 to 125	2.5		
	LEYG25□	30 to 300	27.4	15.4	18 to 500	12		
			53.5	33	9 to 250	6		
			101.6	64	5 to 125	3		
	LEYG32□	30 to 300	42.5	19.8	24 to 500	16		
			83.2	44	12 to 250	8		
			159	90.4	6 to 125	4		
Servo motor (24 VDC)	LEYG16□A	30 to 200	6.7	3.3	15 to 500	10	Series LECA6	
			13	7.7	8 to 250	5		
			25	16.5	4 to 125	2.5		
	LEYG25□A	30 to 300	7.9	4.4	18 to 500	12		
			16.2	11.0	9 to 250	6		
			29.2	24.3	5 to 125	3		

Controller LEC



LECP6



LECA6



Teaching Box



LECP1



LECSA



LECSB

Type	Series	Compatible motor	Power voltage supply	Parallel input/output: Input	Parallel input/output: Output	Number of positioning pattern points	Page
Step data input type	LECP6	Step motor (Servo/24 VDC)	24 VDC ±10%	11 inputs (Photo-coupler isolation)	13 outputs (Photo-coupler isolation)	64	Page 38
	LECA6	Servo motor (24 VDC)					
Programless type	LECP1	Step motor (Servo/24 VDC)	24 VDC ±10%	6 inputs (Photo-coupler isolation)	6 outputs (Photo-coupler isolation)	14	
Pulse input type (For incremental encoder)	LECSA	AC servo motor (100/200 VAC)	100 to 120 VAC (50/60 Hz) 200 to 230 VAC (50/60 Hz)	6 inputs	4 outputs	0 to ±65535 (Pulse command unit)	Page 72
Pulse input type (For absolute encoder)	LECSB			10 inputs	6 outputs	0 to ±10000 (Pulse command unit)	

Model Selection

Step Motor (Servo/24 VDC) | Servo Motor (24 VDC)





Selection Procedure

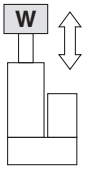
Positioning Control Selection Procedure

Step 1 Confirm the work load – speed. (Vertical transfer) → **Step 2** Confirm the cycle time.

Selection Example

Operating conditions

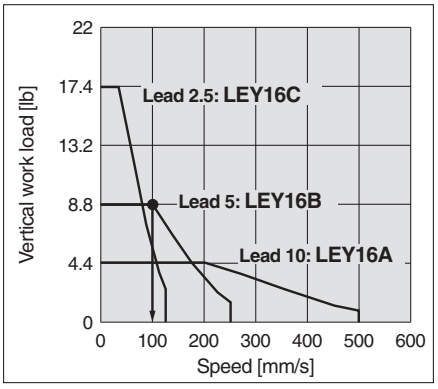
- Workpiece mass: 8.8 lbs [4 kg]
- Speed: 100 [mm/s]
- Acceleration/Deceleration: 3000 [mm/s^2]
- Stroke: 200 [mm]
- Workpiece mounting condition: Vertical upward downward transfer



Step 1 **Confirmation of work load–speed <Speed–Vertical work load graph>**

Select the target model based on the workpiece mass and speed with reference to the <Speed–Vertical work load graph>.
Selection example) The **LEY16B** is temporarily selected based on the graph shown on the right side.

* It is necessary to mount a guide outside the actuator when using for horizontal transfer. When selecting the target model, please refer to the horizontal work load and cautions specified in [Specifications] on page 7.



<Speed–Vertical work load graph> (LEY16/Step motor)

Step 2 **Confirmation of cycle time**

Calculate the cycle time using the following calculation method.

Cycle time:

T can be found from the following equation.

$T = T1 + T2 + T3 + T4$ [s]

- T1:
  Acceleration time and T3: Deceleration time can be obtained by the following equation.

  $T1 = V/a1$ [s] $T3 = V/a2$ [s]

- T2:
  Constant speed time can be found from the following equation.

  $$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} \text{ [s]}$$

- T4:
  Settling time varies depending on the conditions such as motor types, load and in positioning of the step data. Therefore, please calculate the settling time with reference to the following value.

  $T4 = 0.2$ [s]

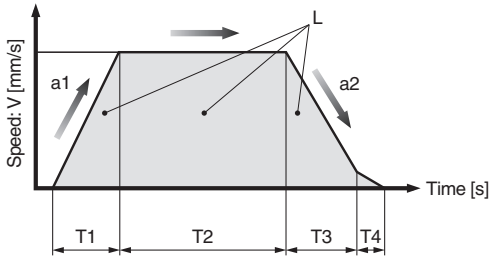
Calculation example)
T1 to T4 can be calculated as follows.

$T1 = V/a1 = 100/3000 = 0.033$ [s], $T3 = V/a2 = 100/3000 = 0.033$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{200 - 0.5 \cdot 100 \cdot (0.033 + 0.033)}{100} = 1.97 \text{ [s]}$$

$T4 = 0.2$ [s]

Therefore, the cycle time can be obtained as follows.
$T = T1 + T2 + T3 + T4 = 0.033 + 1.967 + 0.033 + 0.2 =$ **2.233 [s]**



L : Stroke [mm] ··· (Operating condition)
V : Speed [mm/s] ··· (Operating condition)
a1: Acceleration [mm/s^2] ··· (Operating condition)
a2: Deceleration [mm/s^2] ··· (Operating condition)

T1: Acceleration time [s]
Time until reaching the set speed

T2: Constant speed time [s]
Time while the actuator is operating at a constant speed

T3: Deceleration time [s]
Time from the beginning of the constant speed operation to stop

T4: Settling time [s]
Time until in position is completed

Based on the above calculation result, the LEY16B-200 is selected.

Pushing Control Selection Procedure

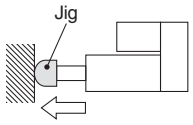
Step 1 Confirm the duty ratio. → **Step 2** Confirm the pushing force. → **Step 3** Confirm the lateral load on the rod end.

∗ The duty ratio is a ratio at the time that can keep being pushed.

Selection Example

Operating Conditions

- Mounting condition: Horizontal (pushing)
- Jig weight: 0.44 lbs [0.2 kg]
- Pushing force: 13.5 lbf [60 N]
- Duty ratio: 20 [%]
- Speed: 100 [mm/s]
- Stroke: 200 [mm]



Step 1 Confirmation of duty ratio <Conversion table of pushing force-duty ratio>

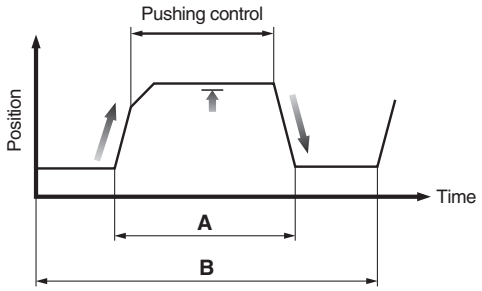
Select the [Pushing force] from the duty ratio with reference to the <Conversion table of pushing force–duty ratio>.

Selection example)
As shown in the below table, the duty ratio is 20 [%], so the set value of pushing force will be 70 [%].

<Conversion table of pushing force–duty ratio> (LEY16/Step motor)

Set value of pushing force [%]	Duty ratio (%)	Continuous pushing time (min.)
40 or less	100	—
50	70	12
70	20	1.3
85	15	0.8

∗ [Set value of pushing force] is one of the step data input to the controller.
∗ [Continuous pushing time] is the time that the actuator can continuously keep pushing.



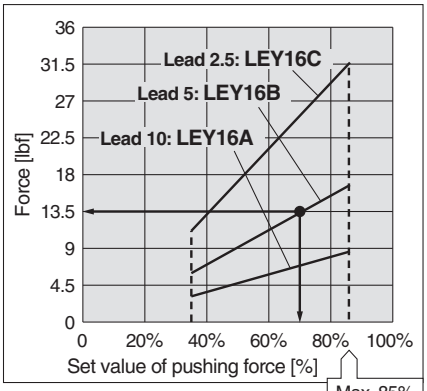
Duty ratio = A/B x 100 [%]

Step 2 Confirmation of pushing force <Force conversion graph>

Select the target model based on the set value of pushing force and pushing force with reference to the (Speed–Vertical work load graph).

Selection example)
Based on the graph shown on the right side,
- Set value of pushing force: 70 [%]
- Pushing force: 60 [N]

Therefore, the **LEY16B** is temporarily selected.



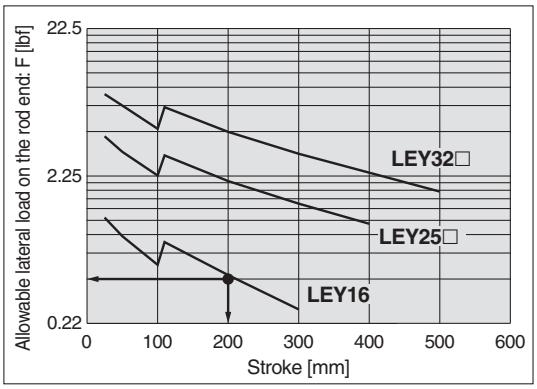
<Force conversion graph> (LEY16/Step motor)

Step 3 Confirmation of the lateral load on the rod end <Graph of allowable lateral load on the rod end>

Confirm the allowable lateral load on the rod end of the actuator: LEY16□, which has been selected temporarily with reference to the <Graph of allowable lateral load on the rod end>.

Selection example)
Based on the graph shown on the right side,
- Jig weight: 0.44 lbs [0.2 kg] ≈ 0.44 lbf [2 N]
- Since the product stroke is 200 [mm], the lateral load is in the allowable range.

Based on the above calculation result, the LEY16B-200 is selected.

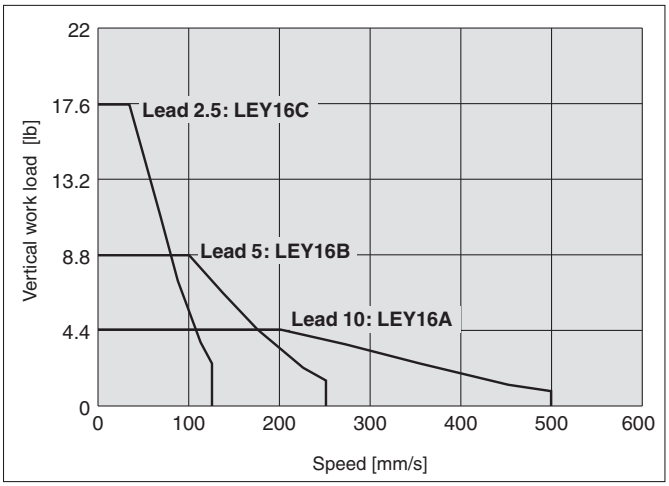


<Graph of allowable lateral load on the rod end>

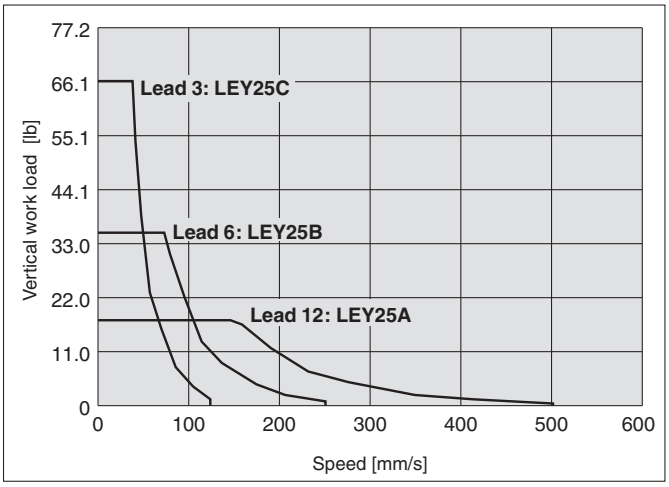
Speed–Vertical Work Load Graph (Guide)

Step Motor (Servo/24 VDC)

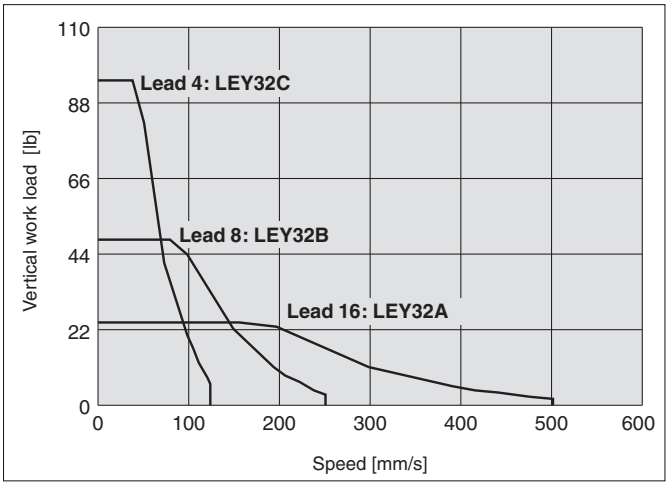
LEY16



LEY25

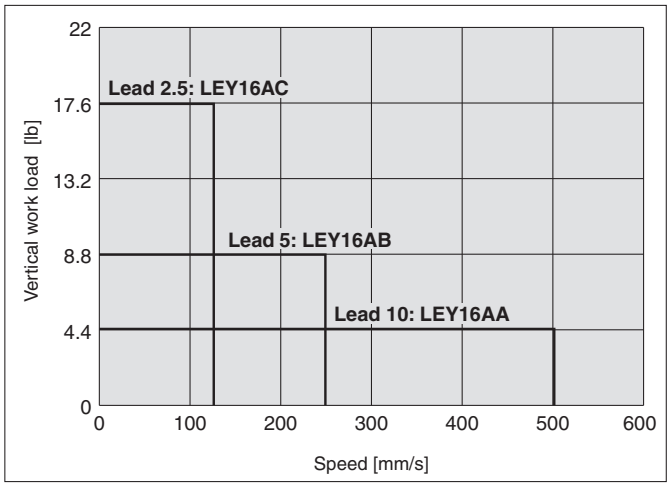


LEY32

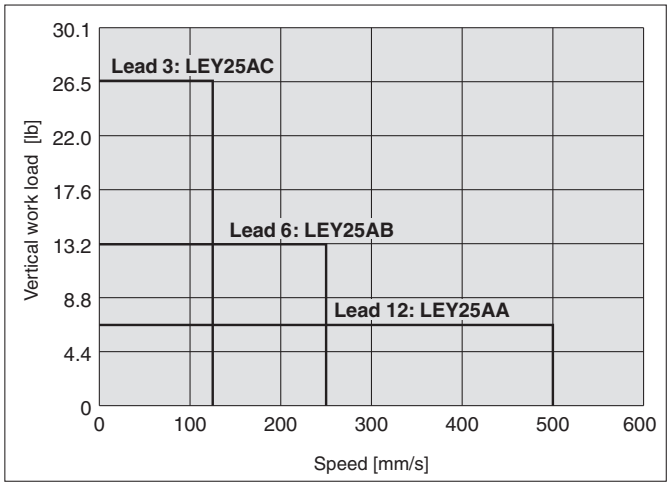


Servo Motor (24 VDC)

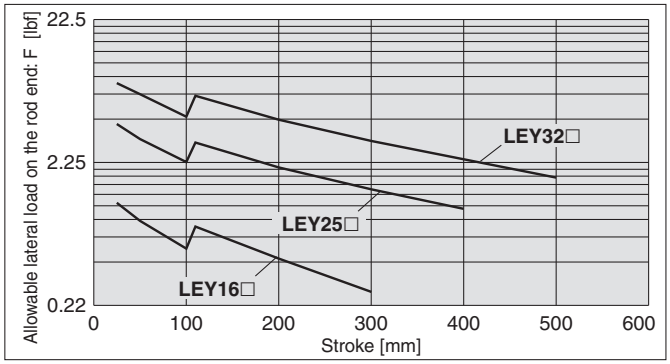
LEY16



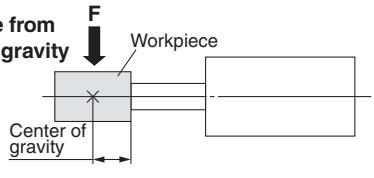
LEY25



Allowable Lateral Load on the Rod End (Guide)



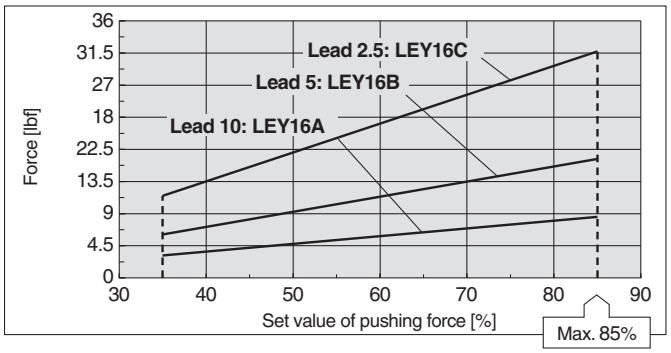
[Stroke]
= [Product stroke] + [Distance from the rod end to the center of gravity of the workpiece]



Force Conversion Graph (Guide)

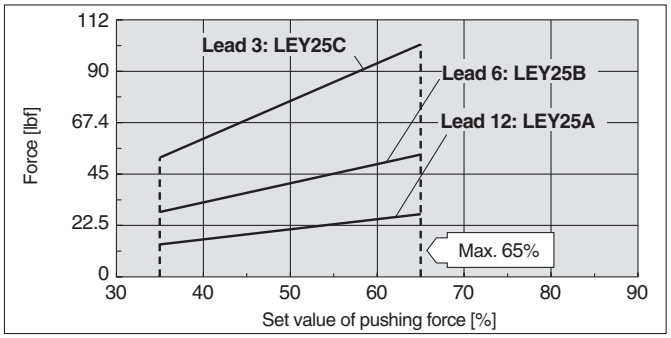
Step Motor (Servo/24 VDC)

LEY16



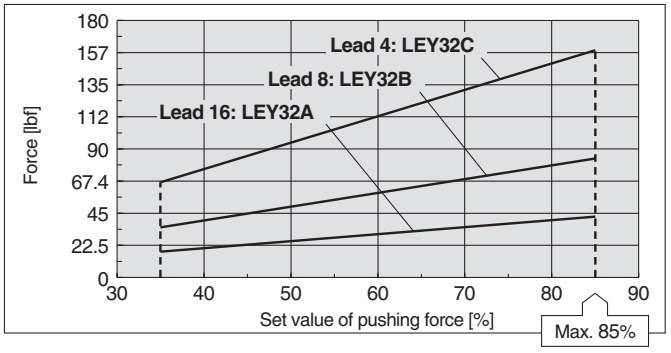
Ambient temperature	Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
77°F (25°C) or less	85 or less	100	—
104°F (40°C)	40 or less	100	—
	50	70	12
	70	20	1.3
	85	15	0.8

LEY25



Ambient temperature	Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
104°F (40°C) or less	65 or less	100	—

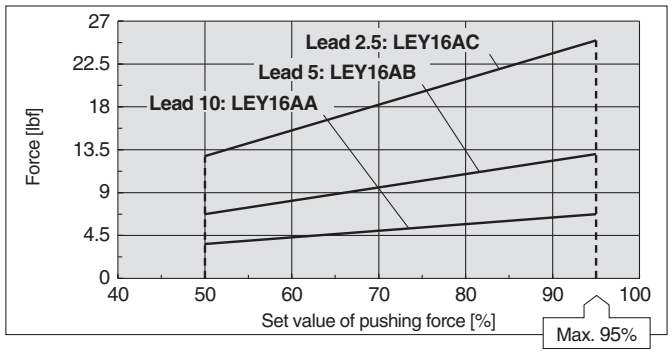
LEY32



Ambient temperature	Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
77°F (25°C) or less	85 or less	100	—
104°F (40°C)	65 or less	100	—
	85	50	15

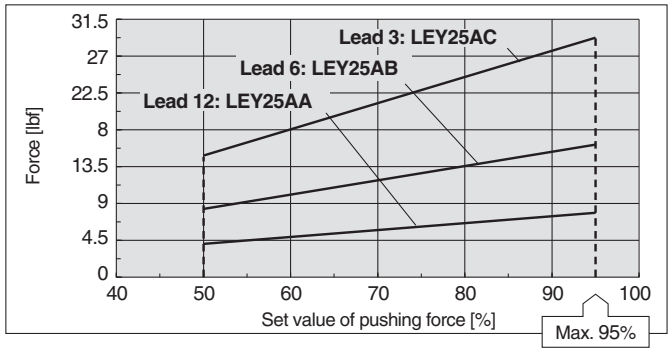
Servo Motor (24 VDC)

LEY16



Ambient temperature	Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
104°F (40°C) or less	95 or less	100	—

LEY25



Ambient temperature	Set value of pushing force [%]	Duty ratio [%]	Continuous pushing time [minute]
104°F (40°C) or less	95 or less	100	—

<Pushing Force and Trigger Level Range> Without Load

Model	Pushing speed [mm/s]	Pushing force (Setting input value)
LEY16□	1 to 4	30% to 85%
	5 to 20	35% to 85%
	21 to 50	60% to 85%
LEY25□	1 to 4	20% to 65%
	5 to 20	35% to 65%
	21 to 35	50% to 65%
LEY32□	1 to 4	20% to 85%
	5 to 20	35% to 85%
	21 to 30	60% to 85%

Model	Pushing speed [mm/s]	Pushing force (Setting input value)
LEY16□A	1 to 4	40% to 95%
	5 to 20	60% to 95%
	21 to 50	80% to 95%
LEY25□A	1 to 4	40% to 95%
	5 to 20	60% to 95%
	21 to 35	80% to 95%

Note) For the vertical load (upward), the pushing force (maximum) must be set as shown below, and the device should be operated with a work load less than that shown below.

Model	LEY16□			LEY25□			LEY32□			LEY16□A			LEY25□A		
Lead	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Work load [lb]	2.2	3.3	6.6	5.5	11	22	9.9	19.8	39.7	2.2	3.3	6.6	2.6	5.5	11
Pushing force	85%			65%			85%			95%			95%		

Electric Actuator/Rod Type

Step Motor (Servo/24 VDC) | Servo Motor (24 VDC)

Series LEY

LEY16, 25, 32

CE

How to Order

LEY 16 ❑ ❑ B – 30 ❑ ❑ ❑ – S 1 6N 1 ❑

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭

❶ Size

16
25
32

❷ Motor mounting position

Nil	Top mounting type
R	Right side parallel type
L	Left side parallel type
D	In-line type

❸ Motor type

Symbol	Type	Size			Compatible controller
		LEY16	LEY25	LEY32	
Nil	Step motor (Servo/24 VDC)	●	●	●	LECP6 LECP1
A	Servo motor Note 1) (24 VDC)	●	●	—	LECA6

❹ Lead [mm]

Symbol	LEY16	LEY25	LEY32
A	10	12	16
B	5	6	8
C	2.5	3	4

❺ Stroke [mm]

30	30
to	to
500	500

∗ Refer to the applicable stroke table.

❻ Motor option∗1

Nil	Without option
C	With motor cover
B	With lock∗2

∗1 When [With lock] is selected, [With motor cover] cannot be selected.

∗2 For 30 stroke or less of size 16 with [Motor mounting position: Top mounting type or right/left side parallel type], when [With lock] is selected, the motor projects through the end of the body.
Select after confirming interface with such as work pieces.

❼ Rod end thread

Nil	Rod end female thread
M	Rod end male thread (1 rod end nut is included.)

⚠ Caution

Note 1) CE-compliant products

① EMC compliance was tested by combining the electric actuator LEY series and the controller LEC series. The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore conformity to the EMC directive cannot be certified for SMC componentsincorporated into the customer's equipment under actual operating conditions. As a result it is necessary for the customer to verify conformity to the EMC directive for the machinery and equipment as a whole.

② For the servo motor (24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 47 for the noise filter set. Refer to the LECA Operation Manual for installation.

∗ **Applicable stroke table**

Model \ Stroke [mm]	30	50	100	150	200	250	300	350	400	450	500	Manufacturable stroke range [mm]
LEY16	●	●	●	●	●	●	●	—	—	—	—	10 to 300
LEY25	●	●	●	●	●	●	●	●	●	—	—	15 to 400
LEY32	●	●	●	●	●	●	●	●	●	●	●	20 to 500

∗ Consult with SMC for the manufacture of intermediate strokes other than those specified on the above.

Refer to pages 17 and 18 for auto switches.

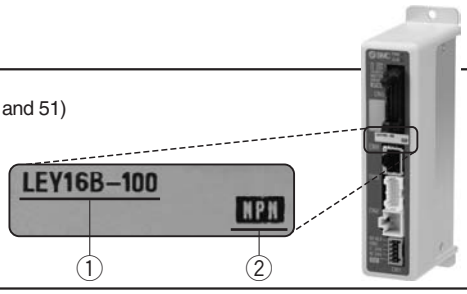
The actuator and controller are sold as a package. (Controller → Pages 39 and 51)

Confirm that the combination of the controller and the actuator is correct.

<Check the following before use.>

① Check that actuator label for model number. This matches the controller.

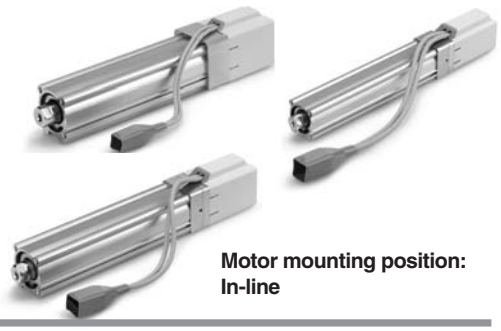
② Check Parallel I/O configuration matches (NPN or PNP).



∗ Refer to the operation manual for using the products. Please download it via our website. http://www.smcworld.com



Motor mounting position: Parallel



Motor mounting position: In-line

❽ Mounting*1

Symbol	Type	Motor mounting position	
		Parallel	In-line
Nil	Ends tapped (Standard)*2	●	●
U	Body bottom tapped	●	●
L	Foot	●	—
F	Rod flange*2	●	●
G	Head flange*2	●*4	—
D	Double clevis*3	●	—

*1. Mounting bracket is shipped together, (but not assembled).
*2. When mounting types are [Rod flange], [Head flange] or [Ends tapped] with horizontal cantilever, use it within the following stroke.
· LEY25: 200 or less
· LEY32: 100 or less
*3. In case of [Double clevis], use the actuator within the following stroke limit.
· LEY16: 100 or less
· LEY25: 200 or less
· LEY32: 200 or less
*4. "G" Head flange is not available for LEY32.

❾ Actuator cable type*1

Nil	Without cable
S	Standard cable*2
R	Robotic cable (Flexible cable)

*1. The standard cable should be used on fixed parts. For using on moving parts, select the robotic cable.
*2. Only available for the motor type "Step motor."

❿ Actuator cable length [m]

Nil	Without cable
1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order (Robotic cable only) Refer to the specifications Note 5) on page 7.

⓫ Controller type*1

Nil	Without controller	
6N	**LECP6/LECA6** (Step data input type)	NPN
6P		PNP
1N	**LECP1***2 (Programless type)	NPN
1P		PNP

*1. For details of controllers and compatible motors, refer to the compatible controllers below.
*2. Only available for the motor type "Step motor."

⓬ I/O cable length [m]

Nil	Without cable
1	1.5*
3	3*
5	5*

* If "Without controller" is selected for controller types, I/O cable is not included. Refer to page 47 (LECP6/LECA6) or page 57 (LECP1) if I/O cable is required.

⓭ Controller mounting

Nil	Screw mounting
D	DIN rail mounting*1, 2

*1. Only available for the controller types "6N" and "6P."
*2. DIN rail is not included. Order it separately.

Compatible controllers

Type	**Step data input type** 	**Step data input type** 	**Programless type** 
Series	**LECP6**	**LECA6**	**LECP1**
Feature(s)	Value input Standard controller		Capable of setting up operation without using a PC or teaching box
Compatible motor	Step motor (Servo/24 VDC)	Servo motor (24 VDC)	Step motor (Servo/24 VDC)
Max. number of step data	64 points		14 points
Power supply voltage	24 VDC		
Reference page	Page 39	Page 39	Page 51

Specifications

Step Motor (Servo/24 VDC)

Model				LEY16			LEY25			LEY32		
Actuator specifications	Stroke [mm] Note 1)			30, 50, 100, 150 200, 250, 300			30, 50, 100, 150, 200 250, 300, 350, 400			30, 50, 100, 150, 200, 250 300, 350, 400, 450, 500		
	Work load [lb] Note 2)	Horizontal	(3000 [mm/s²])	8.8	24.5	44	26.5	66.1	66.1	44	88	88
			(2000 [mm/s²])	13.2	37.5	66	39.7	110	110	66.1	132	132
		Vertical	(3000 [mm/s²])	4.4	8.8	17.6	17.6	35.3	66.1	24.3	48.5	94.8
	Pushing force [N] Note 3) 4) 5)			3.15 to 8.54	6.07 to 16.6	11.5 to 31.7	14.1 to 27.4	28.3 to 53.5	52.2 to 101.6	18 to 42.5	35 to 83.2	66.5 to 159
	Speed [mm/s] Note 5)			15 to 500	8 to 250	4 to 125	18 to 500	9 to 250	5 to 125	24 to 500	12 to 250	6 to 125
	Max. acceleration/deceleration [mm/s²]			3000								
	Pushing speed [mm/s] Note 6)			50 or less			35 or less			30 or less		
	Positioning repeatability [mm]			±0.02								
	Screw lead [mm]			10	5	2.5	12	6	3	16	8	4
	Impact/Vibration resistance [m/s²] Note 7)			50/20								
	Actuation type			Ball screw + Belt (Motor parallel)								
	Guide type			Sliding bushing (Piston rod)								
	Operating temp. range			41 to 104°F (5 to 40°C)								
	Operating humidity range [%RH]			90 or less (No condensation)								
Electric specifications	Motor size			□28			□42			□56.4		
	Motor type			Step motor (Servo/24 VDC)								
	Encoder			Incremental A/B phase (800 pulse/rotation)								
	Rated voltage [V]			24 VDC ±10%								
	Power consumption [W] Note 8)			23			40			50		
	Standby power consumption when operating [W] Note 9)			16			15			48		
	Momentary max. power consumption [W] Note 10)			43			48			104		
	Controller weight			0.33 lbs (0.15 kg) (Screw mounting), 0.37 lbs (0.17 kg) (DIN rail mounting)								
Lock unit specifications	Type Note 10)			Non-magnetizing operation type								
	Holding force lbf [N]			4.5 (20)	8.8 (39)	17.5 (78)	17.5 (78)	35.3 (157)	66 (294)	24.3 (108)	48.6 (216)	94.6 (421)
	Power consumption [W] Note 11)			3.6			5			5		
	Rated voltage [V]			24 VDC ±10%								

Note 1) The intermediate strokes are produced upon receipt of order.

Note 2) Horizontal: The maximum value of the work load for the positioning operation. For the pushing operation, the maximum work load is equal to the "Vertical work load". An external guide is necessary to support the load. The actual work load and transfer speed will depend on the condition of the external guide.

Vertical: Speed is dependent on the work load. Check "Model Selection" on page 1.
The figures shown in ( ) are the maximum acceleration/deceleration values.
Set these values to be 3000 [mm/s²] or less.

Note 3) Pushing force accuracy is ±20% (F.S.).

Note 4) Setting range of "Pushing force" for LEY16 is from 35% to 85%, for LEY25 is from 35% to 65%, and for LEY32 is from 35% to 85%. It is possible that "Pushing force" and "Duty ratio" changes dependent on the set value. Check "Model Selection" on page 2.

Note 5) The speed and force may change depending on the cable length, load and mounting conditions. Furthermore, if the cable length exceeds 5 m then it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)

Note 6) This is the allowable pushing speed. When pushing conveying work please operate at less than the possible vertical load.

Note 7) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)

Note 8) Power consumption (including the controller) is for when the actuator is operating.

Note 9) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation. Except during pushing operation.

Note 10) Momentary max. power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.

Note 11) With lock only

Note 12) For an actuator with lock, add the power consumption for the lock.

Specifications

Servo motor (24 VDC)

Model			LEY16A			LEY25A		
Actuator specifications	Stroke [mm] Note 1)		30, 50, 100, 150 200, 250, 300			30, 50, 100, 150, 200 250, 300, 350, 400		
	Work load [lb] Note 2)	Horizontal (3000 [mm/s²])	0.67	1.35	2.7	1.57	3.37	6.74
		Vertical (3000 [mm/s²])	0.45	0.9	1.8	0.67	1.35	2.7
	Pushing force [lbf] Note 3) 4)		3.6 to 6.74	6.74 to 13.0	12.8 to 25	4.05 to 7.9	8.32 to 16.2	14.8 to 29.2
	Speed [mm/s]		15 to 500	8 to 250	4 to 125	18 to 500	9 to 250	5 to 125
	Max. acceleration/deceleration [mm/s²]		3000					
	Pushing speed [mm/s] Note 5)		50 or less			35 or less		
	Positioning repeatability [mm]		±0.02					
	Screw lead [mm]		10	5	2.5	12	6	3
	Impact/Vibration resistance [m/s²] Note 6)		50/20					
	Actuation type		Ball screw + Belt (Motor parallel)					
	Guide type		Sliding bushing (Piston rod)					
	Operating temp. range		41 to 104°F (5 to 40°C)					
	Operating humidity range [%RH]		90 or less (No condensation)					
Electric specifications	Motor size		□28			□42		
	Motor output [W]		30			36		
	Motor type		Step motor (Servo/24 VDC)					
	Encoder		Incremental A/B (800 pulse/rotation)/Z phase					
	Rated voltage [V]		24 VDC ±10%					
	Power consumption [W] Note 7)		40			86		
	Standby power consumption when operating [W] Note 8)		4 (Horizontal)/6 (Vertical)			4 (Horizontal)/12 (Vertical)		
	Momentary max. power consumption [W] Note 9)		59			96		
	Controller weight		0.33 lbs (0.15 kg) (Screw mounting), 0.37 lbs (0.17 kg) (DIN rail mounting)					
Lock unit specifications	Type Note 10)		Non-magnetizing operation type					
	Holding force lbf [N]		4.5 (20)	8.8 (39)	17.5 (78)	17.5 (78)	35.3 (157)	66.0 (294)
	Power consumption [W] Note 11)		3.6			5		
	Rated voltage [V]		24 VDC ±10%					

Note 1) The intermediate strokes are produced upon receipt of order.

Note 2) Horizontal: The maximum value of the work load for the positioning operation. For the pushing operation, the maximum work load is equal to the "Vertical work load". An external guide is necessary to support the load. The actual work load and transfer speed will depend on the condition of the external guide.
Vertical: Check "Model Selection" on page 1. The figures shown in ( ) are the maximum acceleration/deceleration values.
Set these values to be 3000 [mm/s²] or less.

Note 3) Pushing force accuracy is ±20% (F.S.).

Note 4) Setting range of "Pushing force" for LEY16A is from 50% to 95% and for LEY25A is from 50% to 95%. It is possible that "Pushing force" and "Duty ratio" changes dependent on the set value. Check "Model Selection" on page 2.

Note 5) This is the allowable pushing speed. When pushing conveying work please operate at less than the possible vertical load.

Note 6) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)

Note 7) Power consumption (including the controller) is for when the actuator is operating.

Note 8) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation, except during pushing operation.

Note 9) Momentary max. power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.

Note 10) With lock only

Note 11) For an actuator with lock, add the power consumption for the lock.

Weight

Weight/Motor parallel

Series		LEY16							LEY25									LEY32										
Stroke [mm]		30	50	100	150	200	250	300	30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Product Weight [lb]	Step motor	1.28	1.37	1.61	1.92	2.16	2.40	2.65	2.62	2.75	3.10	3.70	4.10	4.47	4.9	5.20	5.64	4.60	4.85	5.49	6.10	6.99	7.63	8.25	8.88	9.52	10.1	10.9
	Servo motor	1.28	1.37	1.61	1.92	2.16	2.40	2.65	2.50	2.67	3.04	3.61	4.01	4.39	4.8	5.16	5.55	—	—	—	—	—	—	—	—	—	—	—

Weight/In-line motor

Series		LEY16D							LEY25D									LEY32D										
Stroke [mm]		30	50	100	150	200	250	300	30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Product Weight [lb]	Step motor	1.28	1.37	1.61	1.92	2.16	2.40	2.65	2.58	2.73	3.10	3.68	4.08	4.45	4.85	5.22	5.62	4.58	4.83	5.47	6.08	6.97	7.61	8.22	8.86	9.50	10.1	10.8
	Servo motor	1.28	1.37	1.61	1.92	2.16	2.40	2.65	2.49	2.65	3.02	3.59	3.99	4.37	4.76	5.14	5.53	—	—	—	—	—	—	—	—	—	—	—

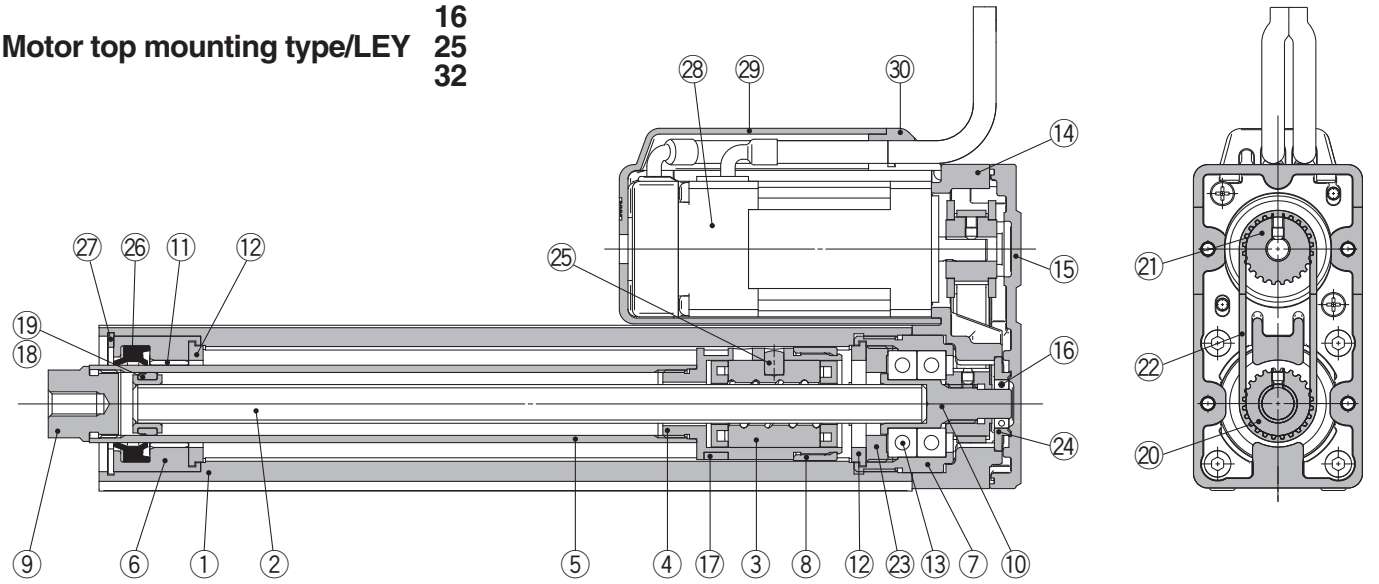
Additional Weight

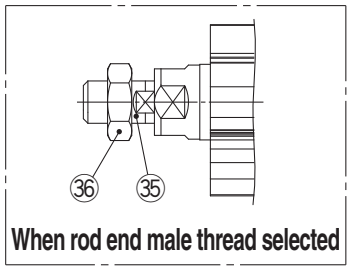
[lb]

Size		16	25	32
Lock		0.26	0.57	1.17
Motor cover		0.04	0.07	0.88
Rod end male thread	Male thread	0.02	0.07	0.07
	Nut	0.02	0.04	0.04
Foot (2 sets including mounting bolts)		0.13	0.18	0.31
Rod flange (including mounting bolts)		0.29	0.37	0.44
Head flange (including mounting bolts)				
Double clevis (including pin, retaining ring and mounting bolts)		0.18	0.35	0.49

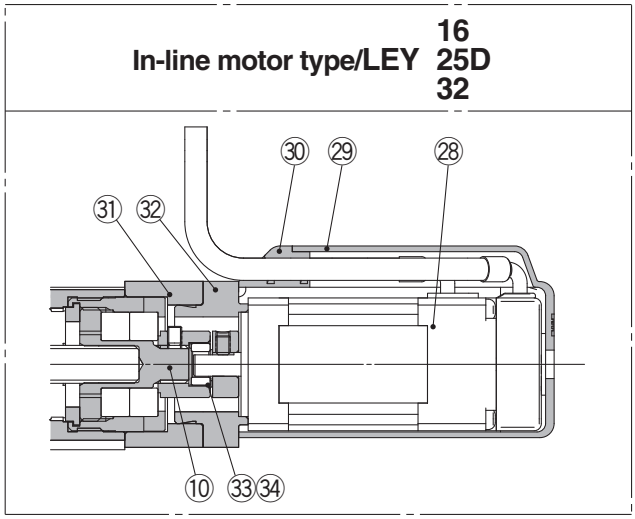
Construction

Motor top mounting type/LEY 16 25 32





In-line motor type/LEY 16 25D 32



Component Parts

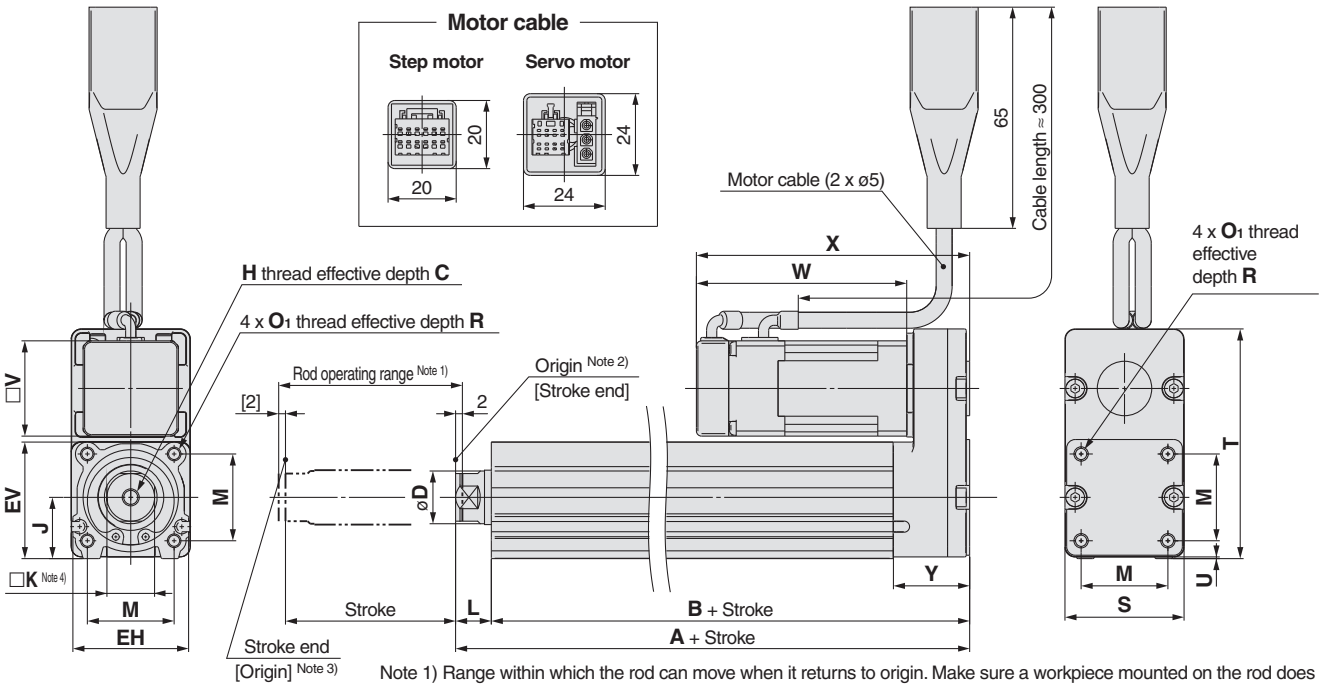
No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Ball screw (shaft)**	Alloy steel	
3	**Ball screw nut**	Resin/Alloy steel	
4	**Piston**	Aluminum alloy	
5	**Piston rod**	Stainless steel	Hard chrome anodized
6	**Rod cover**	Aluminum alloy	
7	**Housing**	Aluminum alloy	
8	**Rotation stopper**	POM	
9	**Socket**	Free cutting carbon steel	Nickel plated
10	**Connected shaft**	Free cutting carbon steel	Nickel plated
11	**Bushing**	Lead bronze cast	
12	**Bumper**	Urethane	
13	**Bearing**	—	
14	**Return box**	Aluminum die-cast	Trivalent chromated
15	**Return plate**	Aluminum die-cast	Trivalent chromated
16	**Bearing**	—	
17	**Magnet**	—	
18	**Wear ring holder**	Stainless steel	Stroke 101 mm or more
19	**Wear ring**	POM	Stroke 101 mm or more
20	**Pulley for screw shaft**	Aluminum alloy	
21	**Pulley for motor**	Aluminum alloy	

No.	Description	Material	Note
22	**Belt**	—	
23	**Bearing stopper**	Aluminum alloy	
24	**Bearing support**	Stainless steel	
25	**Parallel pin**	Stainless steel	
26	**Rod seal**	NBR	
27	**Retaining ring**	Steel for spring	
28	**Motor**	—	
29	**Motor cover**	Synthetic resin	Only “With motor cover”
30	**Grommet**	Synthetic resin	Only “With motor cover”
31	**Motor block**	Aluminum alloy	Anodized
32	**Motor adapter**	Aluminum alloy	Anodized/LEY16, 25 only
33	**Hub**	Aluminum alloy	
34	**Spider**	NBR	
35	**Socket (Male thread)**	Free cutting carbon steel	Nickel plated
36	**Nut**	Alloy steel	

Replacement Parts (Motor parallel only)/Belt

No.	Size	Order no.
22	**16**	LE-D-2-1
	25	LE-D-2-2
	32	LE-D-2-3

Dimensions: Motor Parallel

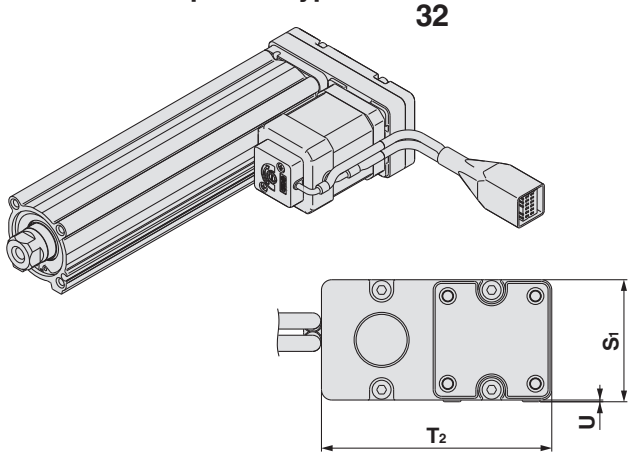


Note 1) Range within which the rod can move when it returns to origin. Make sure a workpiece mounted on the rod does not interfere with the work pieces and facilities around the rod.
Note 2) Position after return to origin.
Note 3) The number in brackets indicates when the direction of return to origin has changed.
Note 4) The direction of rod end width across flats (□K) differs depending on the products.

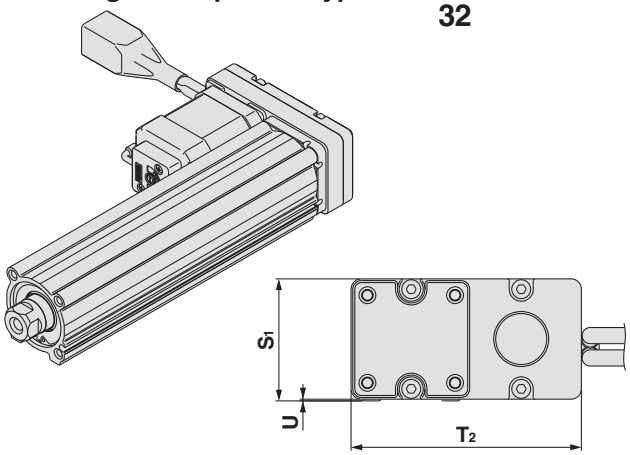
[mm]

Size	Stroke range (mm)	A	B	C	D	EH	EV	H	J	K	L	M	O1	R	S	T	U	V	Step motor W	Step motor X	Servo motor W	Servo motor X	Y
16	10 to 100	101	90.5	10	16	34	34.3	M5 x 0.8	18	14	10.5	25.5	M4 x 0.7	7	35	67.5	0.5	28	61.8	80.3	62.5	81	22.5
	101 to 300	121	110.5																				
25	15 to 100	130.5	116	13	20	44	45.5	M8 x 1.25	24	17	14.5	34	M5 x 0.8	8	46	92	1	42	63.4	85.4	59.6	81.6	26.5
	101 to 400	155.5	141																				
32	20 to 100	148.5	130	13	25	51	56.5	M8 x 1.25	31	22	18.5	40	M6 x 1.0	10	60	118	1	56.4	68.4	95.4	—	—	34
	101 to 500	178.5	160																				

Motor left side parallel type/LEY 16 25 32 L



Motor right side parallel type/LEY 16 25 32 R

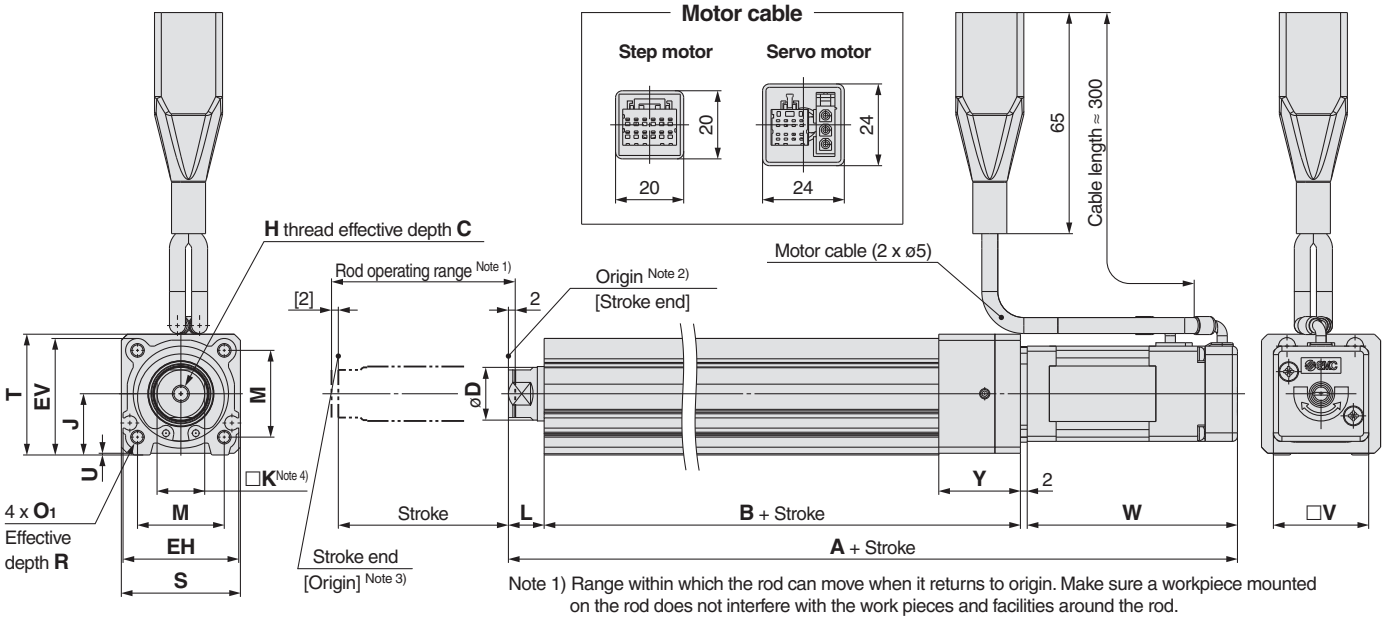


(mm)

Size	S1	T2	U
16	35.5	67	0.5
25	47	91	1
32	61	117	1

Note) When the motor is mounted on the left or right side in parallel, the auto switch groove on the side to which the motor is mounted is hidden.

Dimensions: In-line Motor



Note 1) Range within which the rod can move when it returns to origin. Make sure a workpiece mounted on the rod does not interfere with the work pieces and facilities around the rod.
Note 2) Position after return to origin.
Note 3) The number in brackets indicates when the direction of return to origin has changed.
Note 4) The direction of rod end width across flats (□K) differs depending on the products.

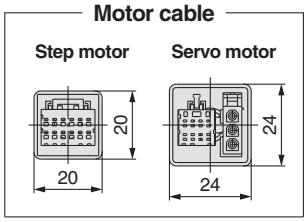
[mm]

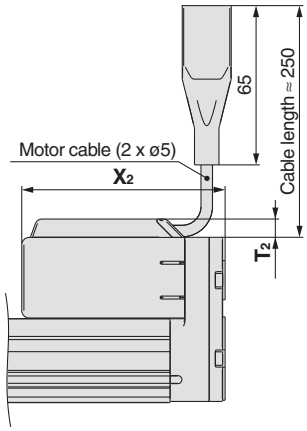
Size	Stroke range (mm)	Step motor	Servo motor	B	C	D	EH	EV	H	J	K	L	M	O1	R	S	T	U
		A																
16	10 to 100	166.3	167	92	10	16	34	34.3	M5 x 0.8	18	14	10.5	25.5	M4 x 0.7	7	35	35.5	0.5
	101 to 300	186.3	187	112														
25	15 to 100	195.4	191.6	115.5	13	20	44	45.5	M8 x 1.25	24	17	14.5	34	M5 x 0.8	8	45	46.5	1.5
	101 to 400	220.4	216.6	140.5														
32	20 to 100	216.9	—	128	13	25	51	56.5	M8 x 1.25	31	22	18.5	40	M6 x 1	10	60	61	1
	101 to 500	246.9	—	158														

Size	Stroke range (mm)	V	Step motor	Servo motor	Y
			W		
16	10 to 100	28	61.8	62.5	24
	101 to 300				
25	15 to 100	42	63.4	59.6	26
	101 to 400				
32	20 to 100	56.4	68.4	—	32
	101 to 500				

Dimensions

Motor parallel
With motor cover/LEY16/25/32 □□A/B/C-□C



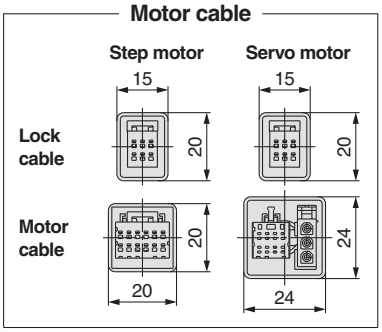


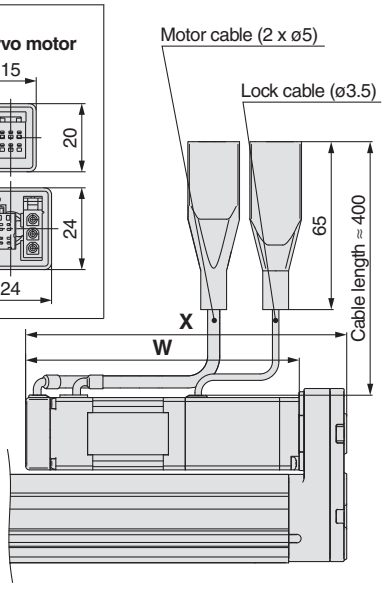
[mm]

Size	T2	X2
16	7.5	83
25	7.5	88.5
32	7.5	98.5

Motor cover material: Synthetic resin

With lock/LEY16/25/32 □□A/B/C-□B

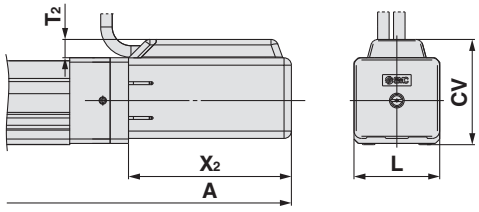




[mm]

Size	Step motor		Servo motor	
	W	X	W	X
16	105.8	124.3	106.5	125
25	103.9	125.9	100.1	122.1
32	111.4	138.4	—	—

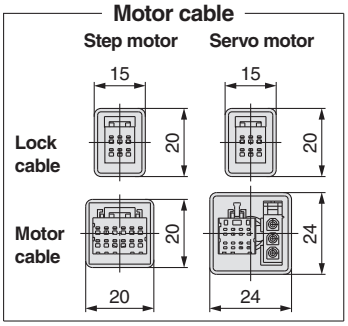
In-line motor
With motor cover/LEY16/25/32 D□A/B/C-□C

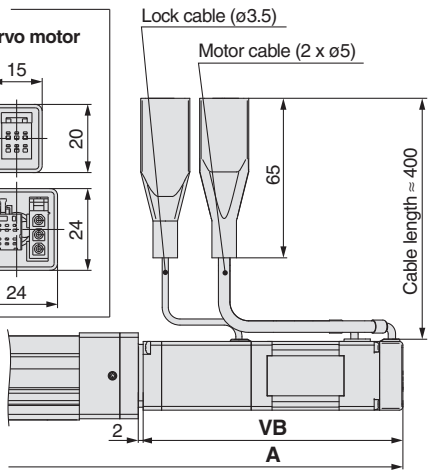


[mm]

Size	Stroke range	A	T2	X2	L	CV
16	100st or less	169	7.5	66.5	35	43
	101st or more, 200st or less	189				
25	100st or less	198.5	7.5	68.5	46	54.5
	101st or more, 300st or less	223.5				
32	100st or less	220	7.5	73.5	60	68.5
	101st or more, 300st or less	250				

With lock/LEY16/25/32 D□A/B/C-□B

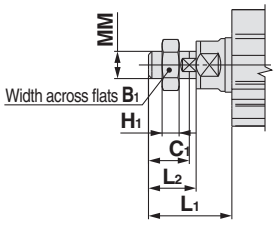




[mm]

Size	Stroke range	Step motor	Servo motor	Step motor	Servo motor
		A		VB	
16	100st or less	210.3	211	105.8	106.5
	101st or more, 200st or less	230.3	231		
25	100st or less	235.9	232.1	103.9	100.1
	101st or more, 300st or less	260.9	257.1		
32	100st or less	259.9	—	111.4	—
	101st or more, 300st or less	289.9	—		

End male thread/LEY16/25/32 □□A/B/C-□□M



* Refer to page 15 for details of the rod end nut and mounting bracket.

Note) Refer to the precautions "Handling" on pages 35 and 36 when mounting end brackets such as knuckle joint or work pieces.

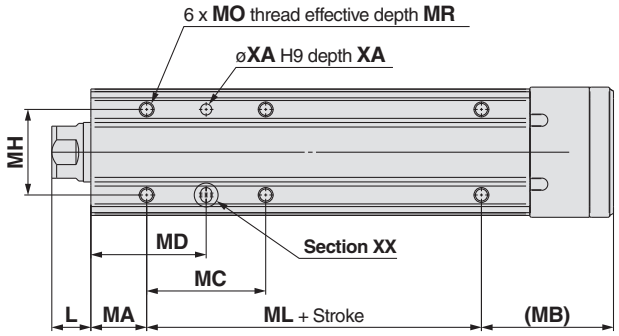
[mm]

Size	B1	C1	H1	L1	L2	MM
16	13	12	5	24.5	14	M8 x 1.25
25	22	20.5	8	38	23.5	M14 x 1.5
32	22	20.5	8	42.0	23.5	M14 x 1.5

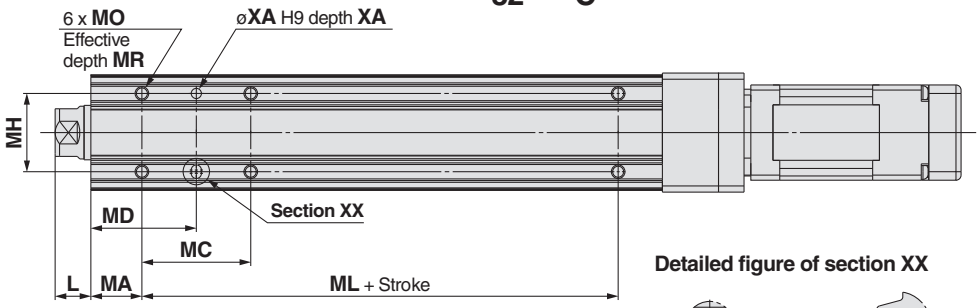
* The L1 measurement is when the unit is in the original position. At this position, 2 mm at the end.

Dimensions

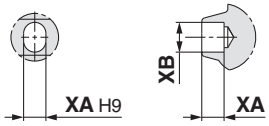
Body bottom tapped/Motor parallel/LEY 16/25/32 □□ A/B/C -□□□U



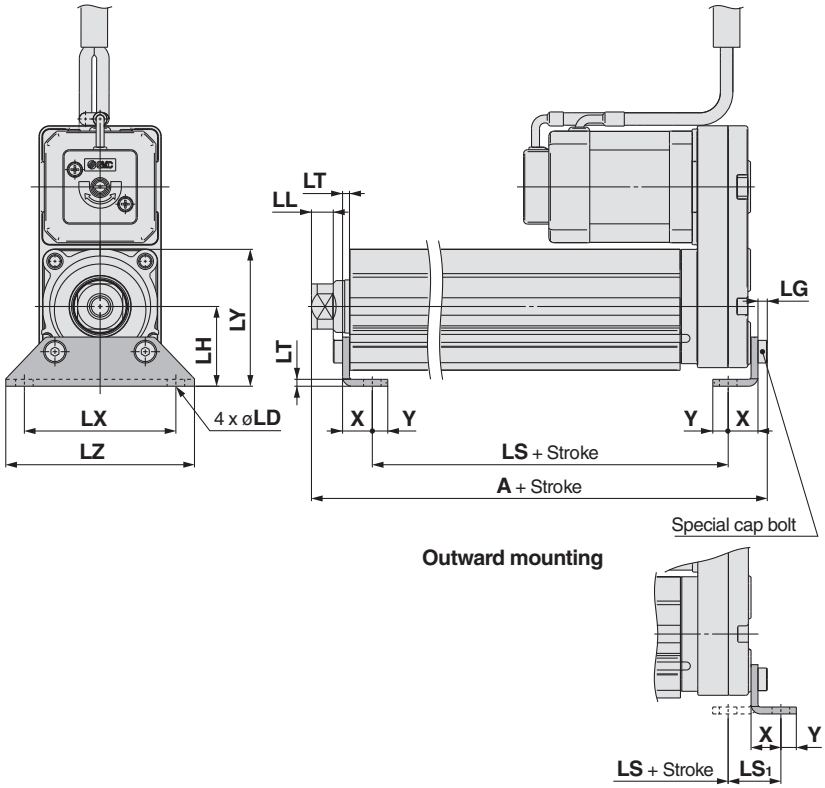
Body bottom tapped/In-line motor/LEY 16/25/32 D□ A/B/C -□□□U



Detailed figure of section XX



Foot/LEY 16/25/32 □□ A/B/C -□□□L



Outward mounting

Body Bottom Tapped

[mm]

Size	Stroke range (mm)	L	MA	MB	MC	MD	MH	ML
16	10 to 39	10.5	15	35.5	17	23.5	23	40
	40 to 100				32	31		
	101 to 300				62	46		60
25	15 to 39	14.5	20	46	24	32	29	50
	40 to 100				42	41		
	101 to 124							75
	125 to 200				59	49.5		
	201 to 400				76	58		
32	20 to 39	18.5	25	55	22	36	30	50
	40 to 100				36	43		
	101 to 124							80
	125 to 200				53	51.5		
	201 to 500				70	60		

Size	Stroke range (mm)	MO	MR	XA	XB
16	10 to 39	M4 x 0.7	5.5	3	4
	40 to 100				
	101 to 300				
25	15 to 39	M5 x 0.8	6.5	4	5
	40 to 100				
	101 to 124				
	125 to 200				
	201 to 400				
32	20 to 39	M6 x 1	8.5	5	6
	40 to 100				
	101 to 124				
	125 to 200				
	201 to 500				

Enclosed parts
- Foot
- Body mounting bolt

Foot

[mm]

Size	Stroke range (mm)	A	LS	LS1	LL	LD	LG
16	10 to 100	106.1	76.5	16.1	5.4	6.6	2.8
	101 to 300	126.1	96.5				
25	15 to 100	136.6	99	19.8	8.4	6.6	3.5
	101 to 400	161.6	124				
32	20 to 100	155.7	114	19.2	11.3	6.6	4
	101 to 500	185.7	144				

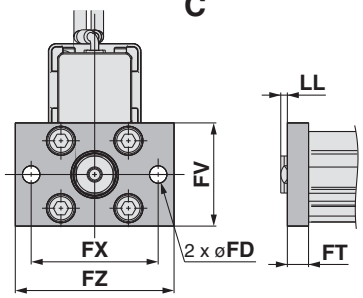
Size	Stroke range (mm)	LH	LT	LX	LY	LZ	X	Y
16	10 to 100	24	2.3	48	40.3	62	9.2	5.8
	101 to 300							
25	15 to 100	30	2.6	57	51.5	71	11.2	5.8
	101 to 400							
32	20 to 100	36	3.2	76	61.5	90	11.2	7
	101 to 500							

Material: Carbon steel (Chromated)

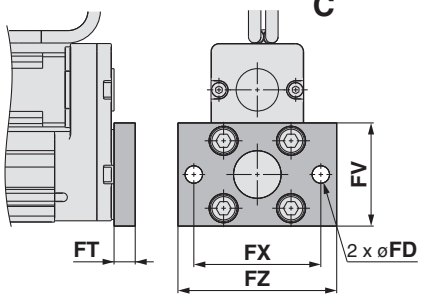
∗ The A measurement is when the unit is in the original position. At this position, 2 mm at the end.

Note) When the motor mounting is the right or left side parallel type, the head side foot should be mounted outwards.

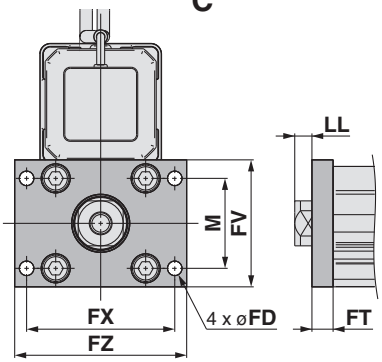
Rod flange/LEY16□□B-□□□F



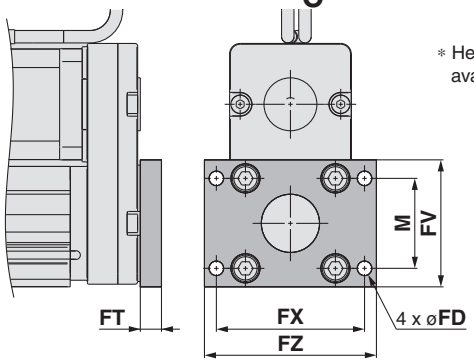
Head flange/LEY16□□B-□□□G



Rod flange/LEY25/32□□B-□□□F



Head flange/LEY25□□B-□□□G



∗ Head flange is not available for LEY32.

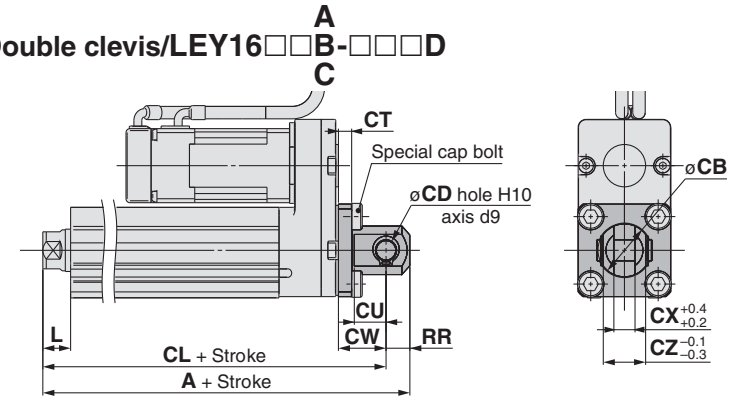
Enclosed parts
- Flange
- Body mounting bolt

Rod/Head Flange [mm]

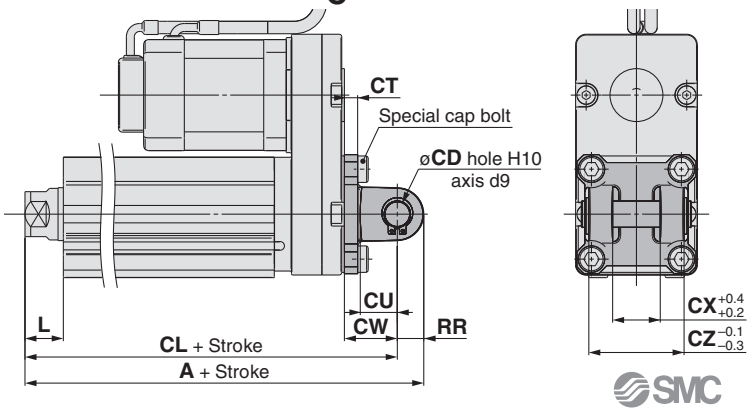
Size	FD	FT	FV	FX	FZ	LL	M
16	6.6	8	39	48	60	2.5	—
25	5.5	8	48	56	65	6.5	34
32	5.5	8	54	62	72	10.5	40

Material: Carbon steel (Nickel plated)

Double clevis/LEY16□□B-□□□D



Double clevis/LEY25/32□□B-□□□D



Enclosed parts
- Double clevis
- Body mounting bolt
- Clevis pin
- Retaining ring

∗ Refer to page 15 for details of the rod end nut and mounting bracket.

Double Clevis [mm]

Size	Stroke range (mm)	A	CL	CB	CD	CT
16	10 to 100	128	119	20	8	5
25	10 to 100	160.5	150.5	—	10	5
	101 to 200	185.5	175.5			
32	10 to 100	180.5	170.5	—	10	6
	101 to 200	210.5	200.5			

Size	Stroke range (mm)	CU	CW	CX	CZ	L	RR
16	10 to 100	12	18	8	16	10.5	9
25	10 to 100	14	20	18	36	14.5	10
	101 to 200						
32	10 to 100	14	22	18	36	18.5	10
	101 to 200						

Material: Cast iron (Painted)
∗ The A and CL measurements are when the unit is in the original position. At this position, 2 mm at the end.

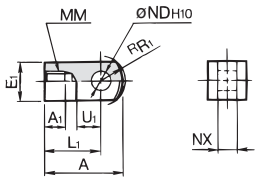
Accessory Mounting Brackets

Accessory Brackets/Support Brackets

Single Knuckle Joint

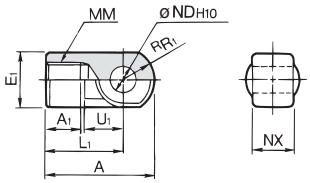
∗ If a knuckle joint is used, select the body option [end male thread].

I-G02



Material: Carbon steel
Surface treatment: Nickel plated

I-G04



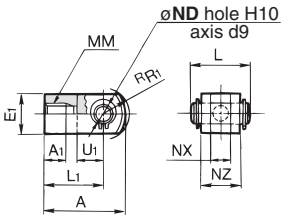
Material: Cast iron
Surface treatment: Nickel plated

[mm]

Part no.	Applicable size	A	A_1	E_1	L_1	MM	R_1	U_1	ND_{H10}	NX
I-G02	**16**	34	8.5	□16	25	M8 x 1.25	10.3	11.5	$8^{+0.058}_{0}$	$8^{-0.2}_{-0.4}$
I-G04	**25, 32**	42	14	ø22	30	M14 x 1.5	12	14	$10^{+0.058}_{0}$	$18^{-0.3}_{-0.5}$

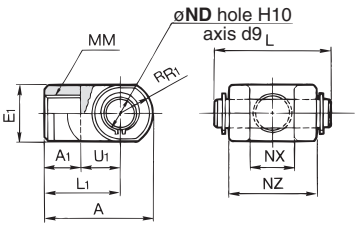
Double Knuckle Joint

Y-G02



Material: Carbon steel
Surface treatment: Nickel plated

Y-G04



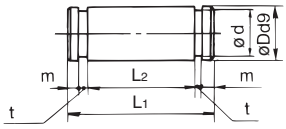
Material: Cast iron
Surface treatment: Nickel plated

∗ Knuckle pin and retaining ring are included.

[mm]

Part no.	Applicable size	A	A_1	E_1	L_1	MM	R_1	U_1	ND_{H10}	NX	NZ	L	Applicable pin part no.
Y-G02	**16**	34	8.5	□16	25	M8 x 1.25	10.3	11.5	$8^{+0.058}_{0}$	$8^{+0.4}_{+0.2}$	16	21	**IY-G02**
Y-G04	**25, 32**	42	16	ø22	30	M14 x 1.5	12	14	$10^{+0.058}_{0}$	$18^{+0.5}_{+0.3}$	36	41.6	**IY-G04**

Knuckle Pin (Common with double clevis pin)

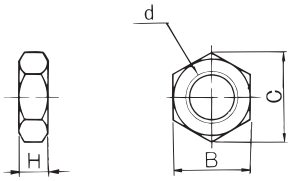


Material: Carbon steel

[mm]

Part no.	Applicable size	Dd9	L_1	L_2	d	m	t	Retaining ring
IY-G02	**16**	$8^{-0.040}_{-0.076}$	21	16.2	7.6	1.5	0.9	Type C retaining ring 8
IY-G04	**25, 32**	$10^{-0.040}_{-0.076}$	41.6	36.2	9.6	1.55	1.15	Type C retaining ring 10

Rod End Nut



Material: Carbon steel (Nickel plated)

[mm]

Part no.	Applicable size	d	H	B	C
NT-02	**16**	M8 x 1.25	5	13	15.0
NT-04	**25, 32**	M14 x 1.5	8	22	25.4

Mounting Bracket/Part No.

Applicable size	Foot	Flange	Double clevis
16	LEY-L016	LEY-F016	LEY-D016
25	LEY-L025	LEY-F025	LEY-D025
32	LEY-L032	LEY-F032	LEY-D032

∗ When ordering foot brackets, order 2 brackets for one cylinder.
∗ The following parts will be included with each type of bracket.
Foot: Body mounting bolt
Flange: Body mounting bolt
Double clevis: Clevis pin, Type C retaining ring for axis, Body mounting bolt

Simple Joint Brackets

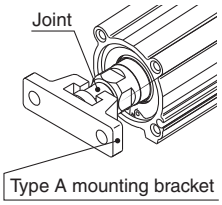
∗ The joint is not included in type A and type B mounting brackets. Therefore, it must be ordered separately.

Joint and Mounting Bracket (Type A/B)/Part No.

Joint **LEY-U025**

Applicable size

025	25, 32



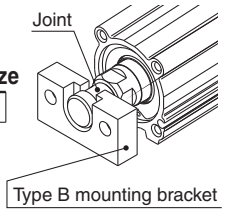
Mounting bracket **YA-03**

Applicable size

03	25, 32

Mounting bracket

YA	Type A mounting bracket
YB	Type B mounting bracket



Allowable Eccentricity [mm]

Applicable size	25	32
Eccentricity tolerance	±1	
Backlash	0.5	

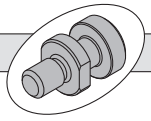
<How to Order>
- The joint is not included in type A and type B mounting brackets. Therefore, it must be ordered separately.

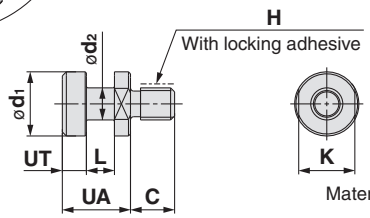
Example) Order no.
- Joint LEY-U025
- Type A mounting bracket YA-03

Joint and Mounting Bracket (Type A/B)/Part No.

Applicable size	Joint part no.	Applicable mounting bracket part no.	
		Type A mounting bracket	Type B mounting bracket
25, 32	LEY-U025	YA-03	YB-03

Joint

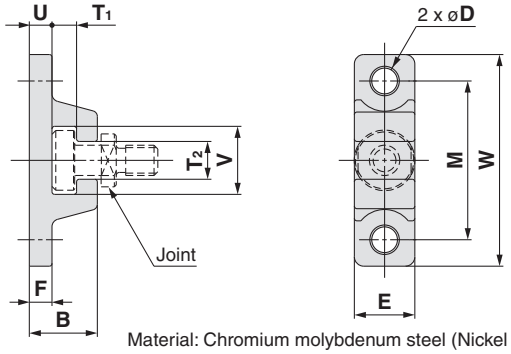




Material: Stainless steel
[mm]

Part no.	Applicable size	UA	C	d1	d2	H	K	L	UT	Weight oz. (g)
LEY-U025	**25, 32**	17	11	16	8	M8 x 1.25	14	7	6	0.78 (22)

Type A Mounting Bracket

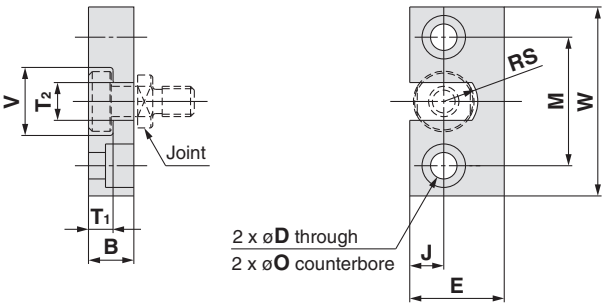


Material: Chromium molybdenum steel (Nickel plated)
[mm]

Part no.	Applicable size	B	D	E	F	M	T1	T2
YA-03	**25, 32**	18	6.8	16	6	42	6.5	10

Part no.	Applicable size	U	V	W	Weight (g)
YA-03	**25, 32**	6	18	56	55

Type B Mounting Bracket



Material: Stainless steel
[mm]

Part no.	Applicable size	B	D	E	J	M	øO
YB-03	**25, 32**	12	7	25	9	34	11.5 depth 7.5

Part no.	Applicable size	T1	T2	V	W	RS	Weight oz. (g)
YB-03	**25, 32**	6.5	10	18	50	9	2.82 (80)

Floating Joints (Refer to Best Pneumatics No. 2 for details.)

● For Male Thread/JA



● For Male Thread/JS (Stainless steel)

- **Stainless steel 304 (Appearance)**
- **Dust cover**
  Fluororubber/Silicone rubber



Applicable size	Thread size
16	M8 x 1.25
25, 32	M14 x 1.5

● For Female Thread/JB



Applicable size	Thread size
16	M5 x 0.8
25, 32	M8 x 1.25

Solid State Auto Switch/Direct Mounting Style
D-M9N(V)/D-M9P(V)/D-M9B(V)

Grommet

- **2-wire load current is reduced (2.5 to 40 mA).**
- **Flexibility is 1.5 times greater than the conventional model (SMC comparison).**
- **Using flexible cable as standard.**



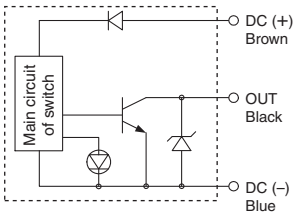
⚠Caution

Precautions

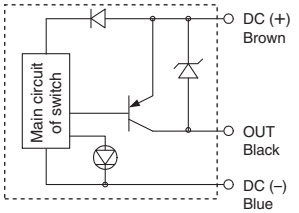
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

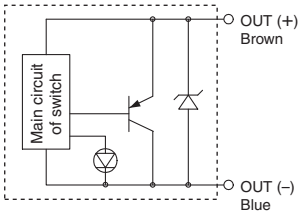
D-M9N(V)



D-M9P(V)



D-M9B(V)



Auto Switch Specifications

Refer to SMC website for the details of the products conforming to the international standards.

PLC: Programmable Logic Controller

D-M9□, D-M9□V (With indicator light)						
Auto switch model	D-M9N	D-M9NV	D-M9P	D-M9PV	D-M9B	D-M9BV
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)				4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Red LED lights up when turned ON.					
Standards	CE marking					

● Lead wires — Oilproof flexible heavy-duty vinyl cord: ø2.7 x 3.2 ellipse, 0.15 mm², 2 cores (D-M9B(V)), 3 cores (D-M9N(V)/D-M9P(V))

Note) Refer to Best Pneumatics No. 2 for solid state auto switch common specifications.

Weight

[g]

Auto switch model		D-M9N(V)	D-M9P(V)	D-M9B(V)
Lead wire length (m)	0.5	8	8	7
	1	14	14	13
	3	41	41	38
	5	68	68	63

How to Order

D-M9 N □ □

- **Series**
- **Wiring/Output type**

N	3-wire NPN
P	3-wire PNP
B	2-wire

- **Electrical entry**

Nil	In-line
V	Perpendicular

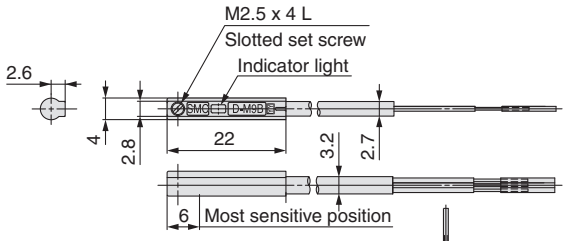
- **Lead wire length**

Nil	0.5 m
M	1 m
L	3 m
Z	5 m

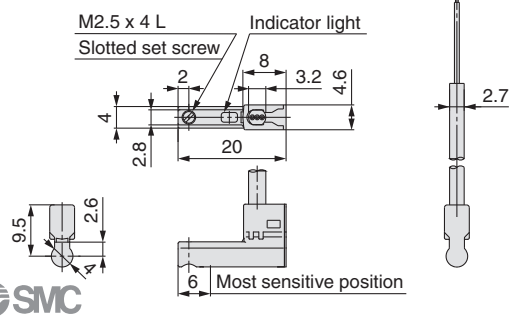
Dimensions

[mm]

D-M9□



D-M9□V



2-Color Indication Type Solid State Auto Switch /Direct Mounting Style

D-M9NW(V)/D-M9PW(V)/D-M9BW(V)

CE RoHS

Grommet

- **2-wire load current is reduced (2.5 to 40 mA).**
- **Flexibility is 1.5 times greater than the conventional model (SMC comparison).**
- **Using flexible cable as standard.**
- **The optimum operating range can be determined by the color of the light. (Red → Green ← Red)**



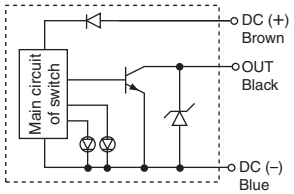
⚠Caution

Precautions

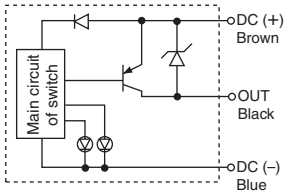
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

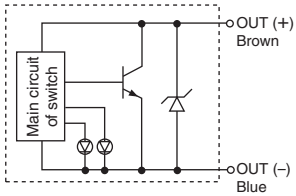
D-M9NW(V)



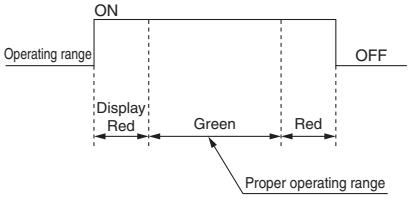
D-M9PW(V)



D-M9BW(V)



Indicator light/Indication method



Auto Switch Specifications

Refer to SMC website for the details of the products conforming to the international standards.

PLC: Programmable Logic Controller

D-M9□W, D-M9□WV (With indicator light)						
Auto switch model	D-M9NW	D-M9NWV	D-M9PW	D-M9PWV	D-M9BW	D-M9BWV
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)				4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Operating range ····· Red LED lights up. Optimum operating range ····· Green LED lights up.					
Standards	CE marking					

● Lead wires — Oilproof flexible heavy-duty vinyl cord: ø2.7 x 3.2 ellipse, 0.15 mm², 2 cores (D-M9BW(V)), 3 cores (D-M9NW(V), D-M9PW(V))

Note) Refer to Best Pneumatics No. 2 for solid state auto switch common specifications.

Weight

[g]

Auto switch model		D-M9NW(V)	D-M9PW(V)	D-M9BW(V)
Lead wire length (m)	0.5	8	8	7
	1	14	14	13
	3	41	41	38
	5	68	68	63

How to Order

D-M9 N W V L

Series

Wiring/Output type

N	3-wire NPN
P	3-wire PNP
B	2-wire

Electrical entry

Nil	In-line
V	Perpendicular

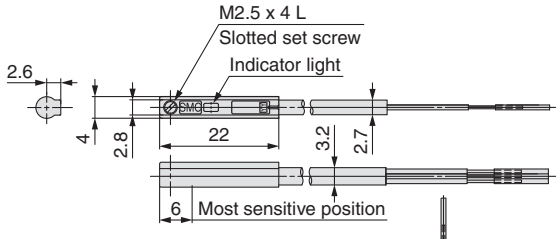
Lead wire length

Nil	0.5 m
M	1 m
L	3 m
Z	5 m

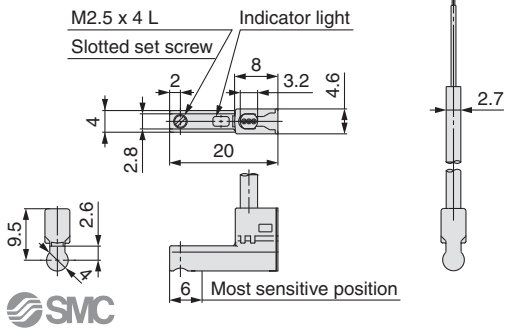
Dimensions

[mm]

D-M9□W



D-M9□WV



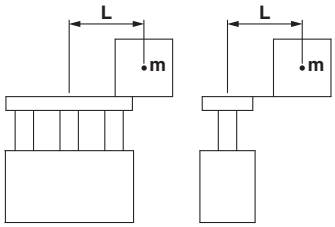
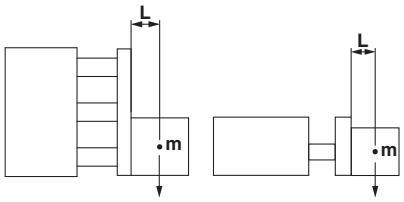
Step Motor (Servo/24 VDC) Servo Motor (24 VDC)





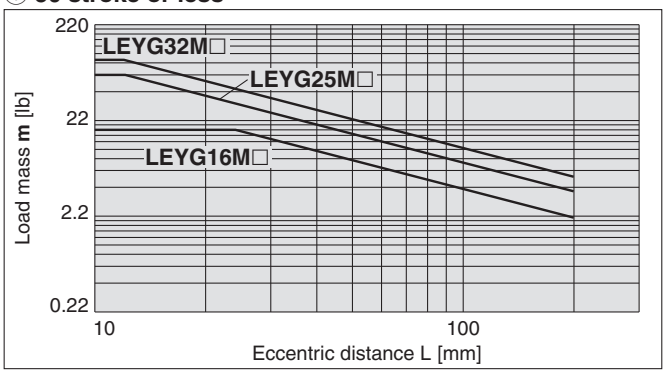
Moment Load Graph

Selection conditions

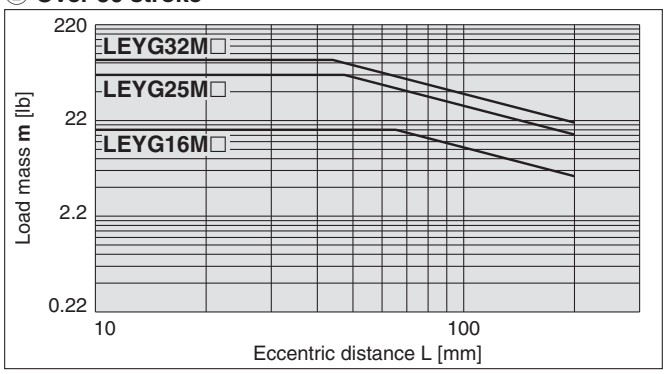
	Vertical	Horizontal	
Mounting position			
Max. speed [mm/s]	200 or less	200 or less	400
Graph (sliding bearing type)	①, ②	⑤, ⑥	—
Graph (ball bushing bearing type)	③, ④	⑦, ⑧	⑨, ⑩

Vertical Mounting, Sliding Bearing

① **50 stroke or less**



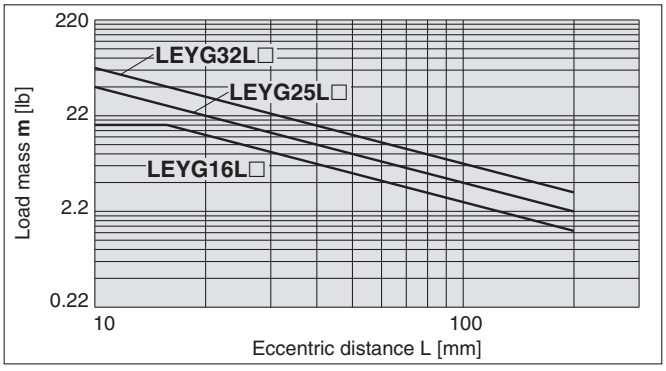
② **Over 50 stroke**



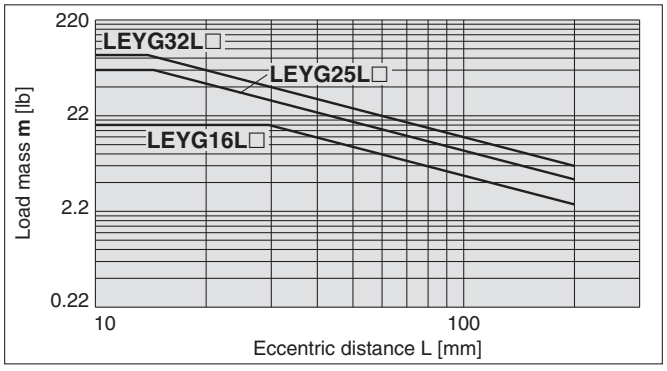
∗ The limit of vertical load mass varies depending on “lead” and “speed”.
Check “Speed–Vertical Work Load Graph” on page 21.

Vertical Mounting, Ball Bushing Bearing

③ **30 stroke or less**



④ **Over 30 stroke**



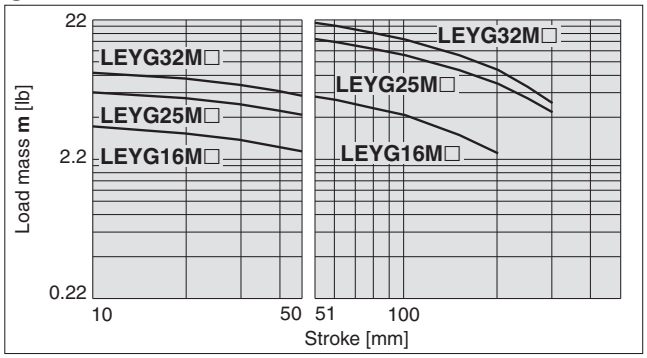
∗ The limit of vertical load mass varies depending on “lead” and “speed”.

* Check “Speed–Vertical Work Load Graph” on page 21.

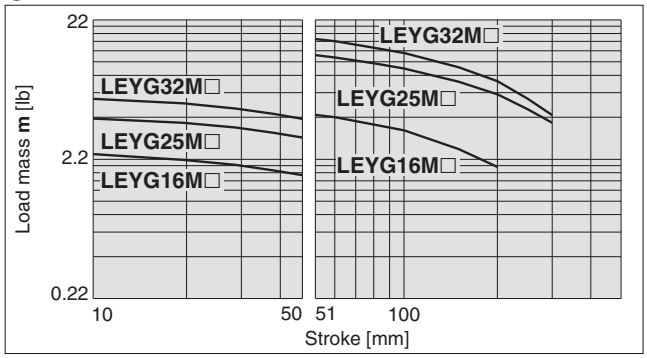
Moment Load Graph

Horizontal Mounting, Sliding Bearing

⑤ **L = 50 mm**



⑥ **L = 100 mm**



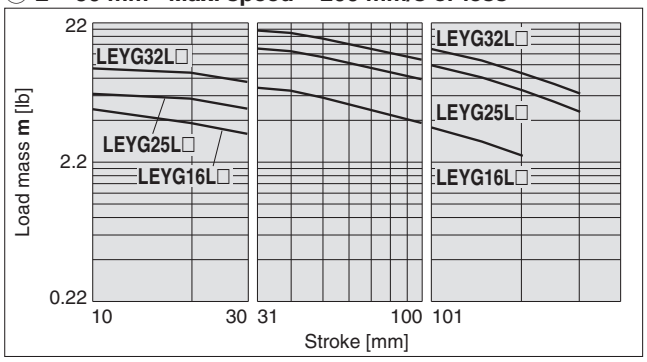
∗ Set the speed to less than or equal to the values shown below.

Motor type	LEYG□M□A	LEYG□M□B	LEYG□M□C
Step motor (Servo/24 VDC)	200 mm/s	125 mm/s	75 mm/s
Servo motor (24 VDC)	200 mm/s	200 mm/s	125 mm/s

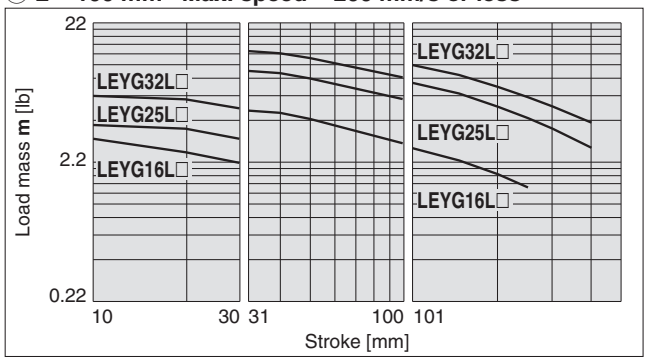
∗ For the specifications below, operate the system at the "load mass" shown in the graph x 80%.
• LEYG25MAA/Servo motor (24 VDC), Lead 12

Horizontal Mounting, Ball Bushing Bearing

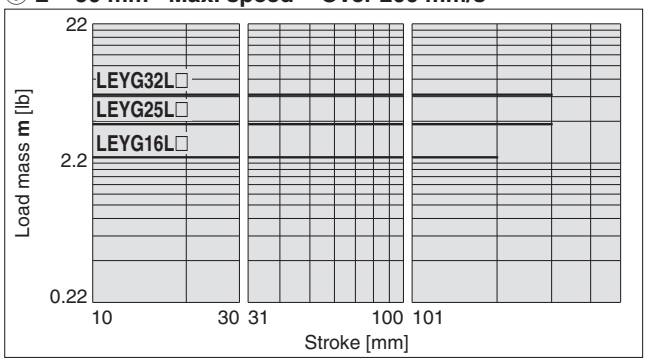
⑦ **L = 50 mm Max. speed = 200 mm/s or less**



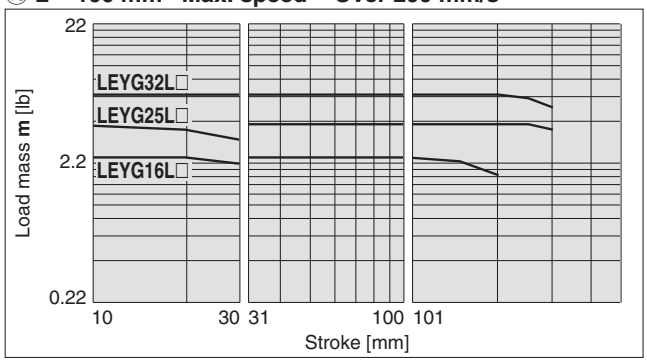
⑧ **L = 100 mm Max. speed = 200 mm/s or less**



⑨ **L = 50 mm Max. speed = Over 200 mm/s**

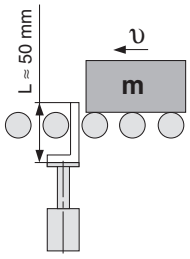


⑩ **L = 100 mm Max. speed = Over 200 mm/s**



Operating Range when Used as Stopper

LEYG□M (Sliding bearing)



⚠Caution

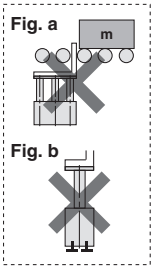
Handling Precautions

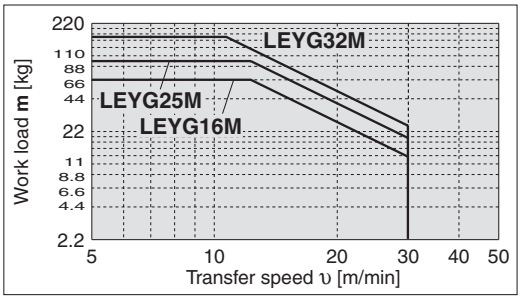
Note 1) When using as a stopper, select a model with 30 stroke or less.

Note 2) LEYG□L (ball bushing bearing) cannot be used as a stopper.

Note 3) Work collision in series with guide rod cannot be permitted (**Fig. a**).

Note 4) The body should not be mounted on the end. It must be mounted on the top or bottom (**Fig. b**).

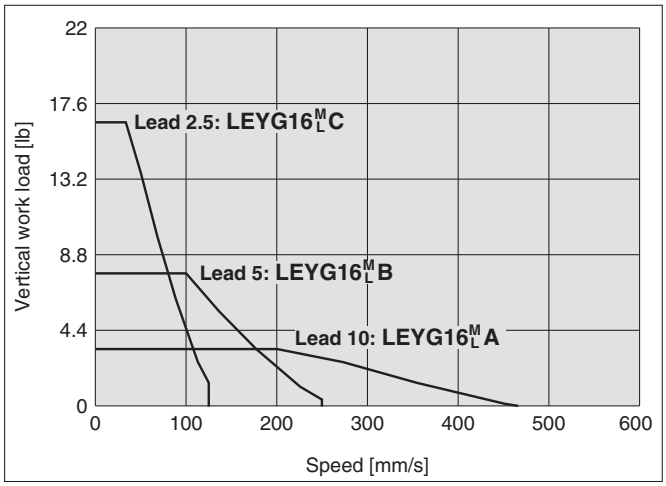




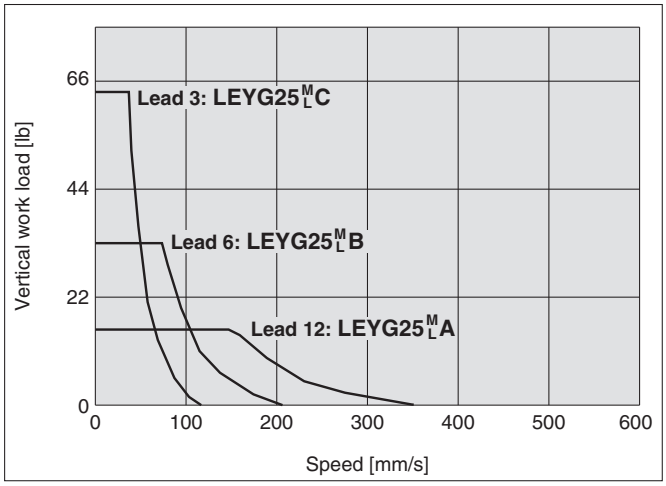
Speed–Vertical Work Load Graph

Step Motor (Servo/24 VDC)

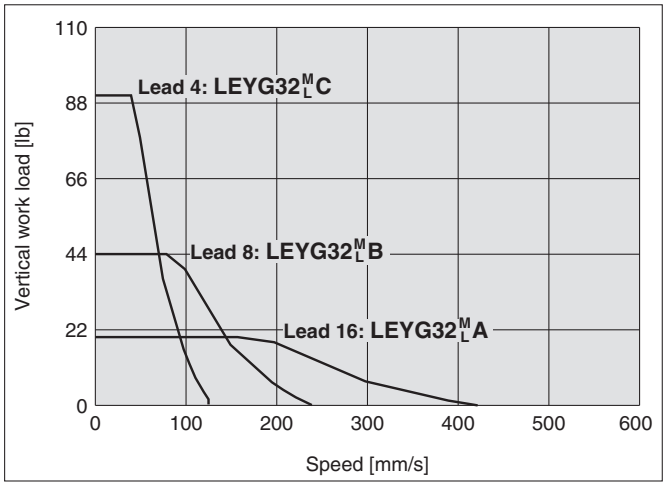
LEYG16$^{M}_{L}$ □



LEYG25$^{M}_{L}$ □

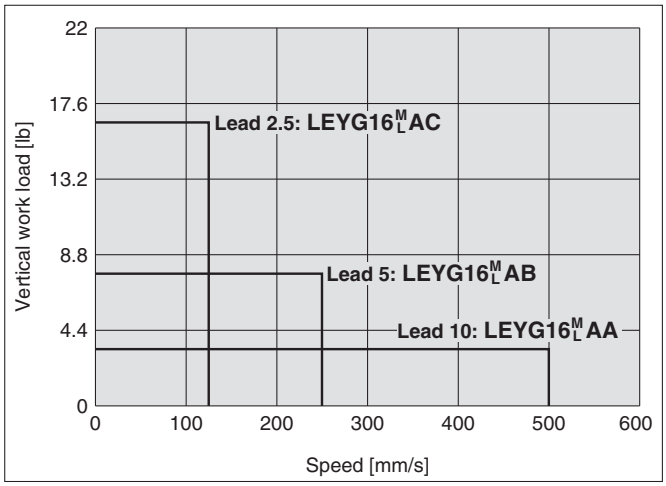


LEYG32$^{M}_{L}$ □

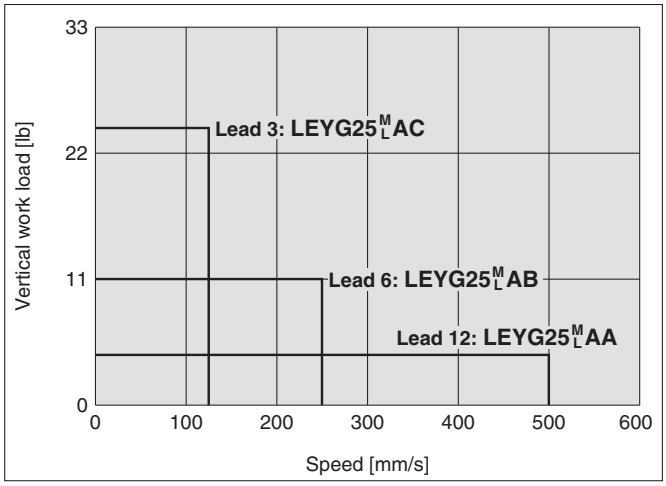


Servo Motor (24 VDC)

LEYG16$^{M}_{L}$A□



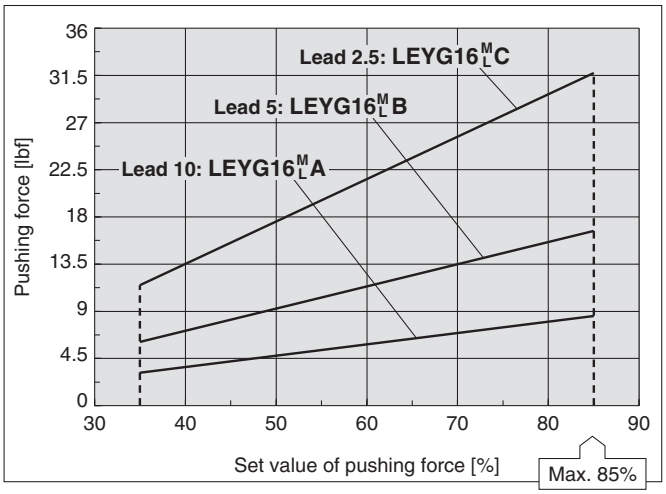
LEYG25$^{M}_{L}$A□



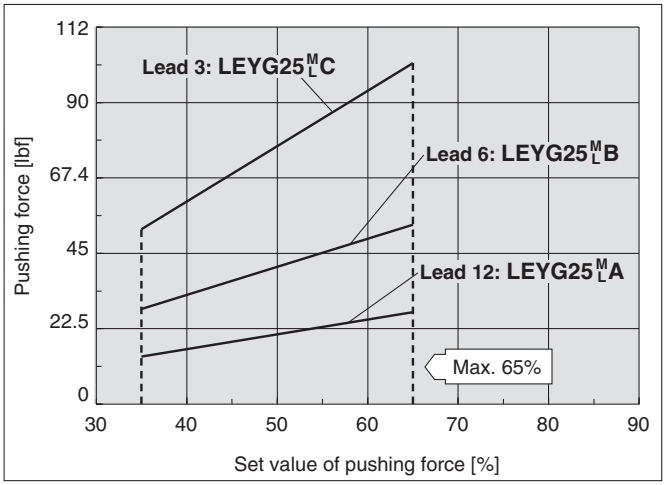
Force Conversion Graph

Step Motor (Servo/24 VDC)

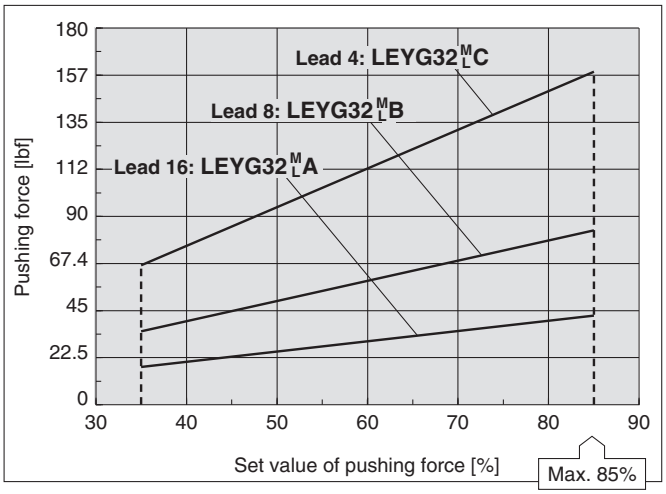
LEYG16$^{M}_{L}$ □



LEYG25$^{M}_{L}$ □

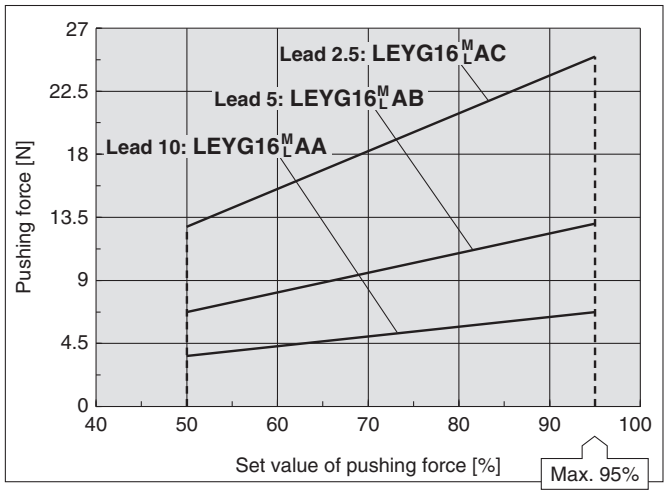


LEYG32$^{M}_{L}$ □

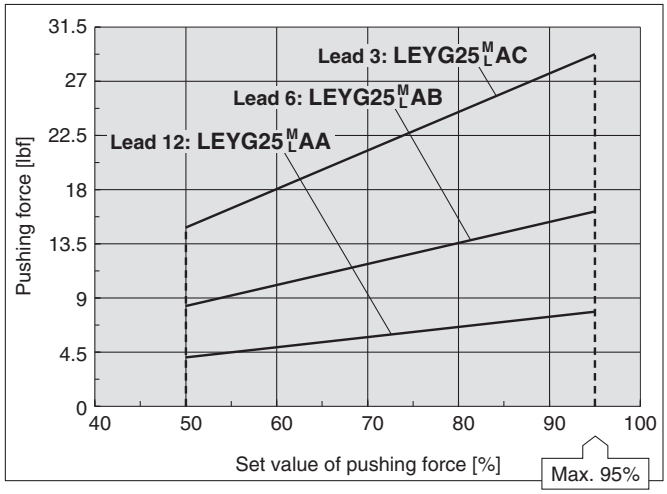


Servo Motor (24 VDC)

LEYG16$^{M}_{L}$A□



LEYG25$^{M}_{L}$A□



<Pushing Force and Trigger Level Range> Without Load

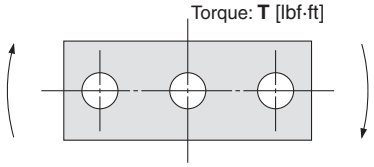
Model	Pushing speed [mm/s]	Pushing force (Setting input value)
LEYG16$^{M}_{L}$□	1 to 4	30% to 85%
	5 to 20	35% to 85%
	21 to 50	60% to 85%
LEYG25$^{M}_{L}$□	1 to 4	20% to 65%
	5 to 20	35% to 65%
	21 to 35	50% to 65%
LEYG32$^{M}_{L}$□	1 to 4	20% to 85%
	5 to 20	35% to 85%
	21 to 30	60% to 85%

Model	Pushing speed [mm/s]	Pushing force (Setting input value)
LEYG16$^{M}_{L}$□A	1 to 4	40% to 95%
	5 to 20	60% to 95%
	21 to 50	80% to 95%
LEYG25$^{M}_{L}$□A	1 to 4	40% to 95%
	5 to 20	60% to 95%
	21 to 35	80% to 95%

Note) For the vertical load (upward), the pushing force (maximum) must be set as shown below, and the device should be operated with a work load less than that shown below.

Model	LEYG16$^{M}_{L}$□			LEYG25$^{M}_{L}$□			LEYG32$^{M}_{L}$□			LEYG16$^{M}_{L}$□A			LEYG25$^{M}_{L}$□A		
Lead	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Work load [lb]	1.1	2.5	5.5	3.5	8.8	19.8	5.5	15.4	35.2	1.1	2.5	5.5	1.1	3.3	8.8
Pushing force	85%			65%			85%			95%			95%		

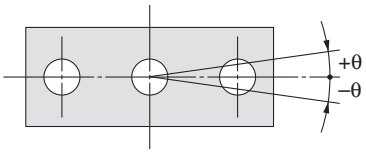
Allowable Rotational Torque of Plate



T [lbf·ft]

Model	Stroke [mm]				
	30	50	100	200	300
LEYG16M	0.52	0.42	0.77	0.41	—
LEYG16L	0.60	1.09	0.72	0.42	—
LEYG25M	1.15	0.95	2.58	1.61	1.00
LEYG25L	1.12	2.63	1.82	1.51	1.06
LEYG32M	1.88	1.54	3.98	2.40	1.39
LEYG32L	2.07	4.25	2.99	2.38	1.71

Non-rotating Accuracy of Plate



Size	Non-rotating accuracy θ	
	LEYG□M	**LEYG□L**
16	±0.06°	±0.07°
25	±0.05°	±0.06°
32		

Electric Actuator/Guide Rod Type

Step Motor (Servo/24 VDC) | Servo Motor (24 VDC)

Series LEYG

LEYG16, 25, 32

CE

How to Order

LEYG 16 M ☐ ☐ B – 50 ☐ ☐ – S 1 6N 1 ☐

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭

❶ Size

16
25
32

❷ Bearing type

M	Sliding bearing
L	Ball bushing bearing

❸ Motor mounting position

Nil	Top mounting type
D	In-line type

❹ Motor type

Symbol	Type	Size			Compatible controller
		LEYG16	LEYG25	LEYG32	
Nil	Step motor (Servo/24 VDC)	●	●	●	LECP6 LECP1
A	Servo motor Note 1) (24 VDC)	●	●	—	LECA6

❺ Lead [mm]

Symbol	LEYG16	LEYG25	LEYG32
A	10	12	16
B	5	6	8
C	2.5	3	4

❻ Stroke [mm]

30	30
to	to
300	300

∗ Refer to the applicable stroke table.

❼ Motor option∗1

Nil	Without option
C	With motor cover
B	With lock∗2

∗1 When [With lock] is selected, [With motor cover] cannot be selected.

∗2 For 30 stroke or less of size 16 with [Motor mounting position: Top mounting type or right/left side parallel type], when [With lock] is selected, the motor projects through the end of the body.
Select after confirming interface with such as work pieces.

❽ Guide option

Nil	Without guide
F	With grease holding function

∗ Only available for size 25 and 32 slide bearings. (Refer to "Construction" on page 29.)

❾ Actuator cable type∗1

Nil	Without cable
S	Standard cable∗2
R	Robotic cable (Flexible cable)

∗1 The standard cable should be used on fixed parts. For using on moving parts, select the robotic cable.

∗2 Only available for the motor type "Step motor."

⚠ Caution

Note 1) CE-compliant products

① EMC compliance was tested by combining the electric actuator LEYG series and the controller LEC series. The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore conformity to the EMC directive cannot be certified for SMC components incorporated into the customer's equipment under actual operating conditions. As a result it is necessary for the customer to verify conformity to the EMC directive for the machinery and equipment as a whole.

② For the servo motor (24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 47 for the noise filter set. Refer to the LECA Operation Manual for installation.

∗ **Applicable stroke table**

Model \ Stroke [mm]	30	50	100	150	200	250	300	Manufacturable stroke range [mm]
LEYG16	●	●	●	●	●	—	—	10 to 200
LEYG25	●	●	●	●	●	●	●	15 to 300
LEYG32	●	●	●	●	●	●	●	20 to 300

∗ Consult with SMC for the manufacture of intermediate strokes other than those specified on the above.

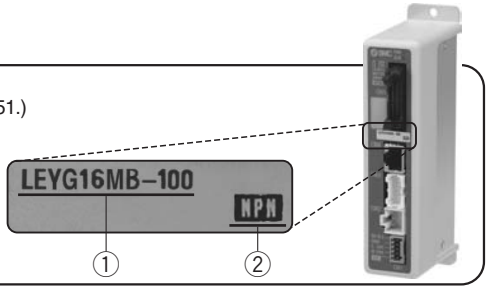
The actuator and controller are sold as a package. (Controller → Pages 39 and 51.)

Confirm that the combination of the controller and the actuator is correct.

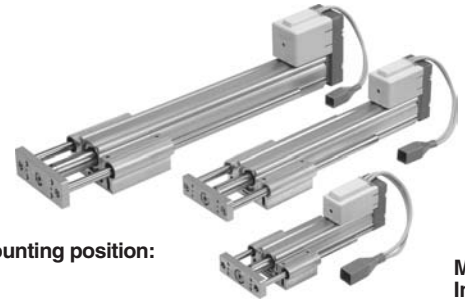
<Check the following before use.>

① Check that actuator label for model number. This matches the controller.

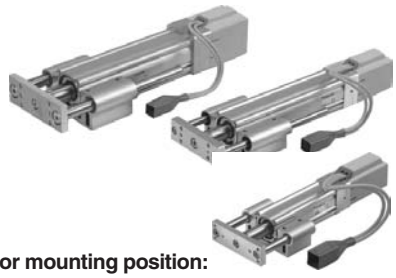
② Check Parallel I/O configuration matches (NPN or PNP).



∗ Refer to the operation manual for using the products. Please download it via our website. http://www.smcworld.com



Motor mounting position:
Parallel



Motor mounting position:
In-line

⑩ Actuator cable length [m]

Nil	Without cable
1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order (Robotic cable only)
Refer to the specifications Note 5) on page 27.

⑪ Controller type*1

Nil	Without cable	
6N	**LECP6/LECA6** (Step data input type)	NPN
6P		PNP
1N	**LECP1***2 (Programless type)	NPN
1P		PNP

*1 For details of controllers and compatible motors, refer to the compatible controllers below.
*2 Only available for the motor type "Step motor."

⑫ I/O cable length [m]

Nil	Without cable
1	1.5*
3	3*
5	5*

* If "Without controller" is selected for controller types, I/O cable is not included. Refer to page 47 (LECP6/LECA6) or page 57 (LECP1) if I/O cable is required.

⑬ Controller mounting

Nil	Screw mounting
D	DIN rail mounting*1, 2

*1 Only available for the controller types "6N" and "6P."
*2 DIN rail is not included. Order it separately.

Compatible controllers

Type	Step data input type 	Step data input type 	Programless type 
Series	**LECP6**	**LECA6**	**LECP1**
Feature(s)	Value input Standard controller		Capable of setting up operation without using a PC or teaching box
Compatible motor	Step motor (Servo/24 VDC)	Servo motor (24 VDC)	Step motor (Servo/24 VDC)
Max. number of step data	64 points		14 points
Power supply voltage	24 VDC		
Reference page	Page 39	Page 39	Page 51

Specifications

Step Motor (Servo/24 VDC)

Model				LEYG16 M/L			LEYG25 M/L			LEYG32 M/L		
Actuator specifications	Stroke [mm] Note 1)			30, 50, 100, 150, 200			30, 50, 100, 150, 200, 250, 300			30, 50, 100, 150, 200, 250, 300		
	Note 2) Work load [lb]	Horizontal	Acceleration/Deceleration at 3000 [mm/s²]	8.8	24.3	44.0	26.5	66.1	66.1	44.0	88.2	88.2
			Acceleration/Deceleration at 2000 [mm/s²]	13.2	37.5	66.1	39.7	110	110	66.1	132.2	132
		Vertical	Acceleration/Deceleration at 3000 [mm/s²]	3.3	7.7	16.5	15.4	33.0	63.9	19.8	44.0	90.4
	Pushing force [lbf] Note 3) 4) 5)			3.15 to 8.54	6.07 to 16.6	11.5 to 31.7	14.2 to 27.4	28.3 to 53.5	52.2 to 101.6	18 to 42.5	35.1 to 83.2	66.5 to 158.9
	Speed [mm/s] Note 5)			15 to 500	8 to 250	4 to 125	18 to 500	9 to 250	5 to 125	24 to 500	12 to 250	6 to 125
	Max. acceleration/deceleration [mm/s²]			3000								
	Pushing speed [mm/s] Note 6)			50 or less			35 or less					
	Positioning repeatability [mm]			±0.02						30 or less		
	Screw lead [mm]			10	5	2.5	12	6	3	16	8	4
	Impact/Vibration resistance [m/s²] Note 7)			50/20								
	Actuation type			Ball screw + Belt (Motor parallel)								
	Guide type			Sliding bearing (LEYG□M), Ball bushing bearing (LEYG□L)								
	Operating temp. range			41 to 104°F (5 to 40°C)								
	Operating humidity range [%RH]			90 or less (No condensation)								
Electric specifications	Motor size			□28			□42			□56.4		
	Motor type			Step motor (Servo/24 VDC)								
	Encoder			Incremental A/B phase (800 pulse/rotation)								
	Rated voltage [V]			24 VDC ±10%								
	Power consumption [W] Note 8)			23			40			50		
	Standby power consumption when operating [W] Note 9)			16			15			48		
	Momentary max. power consumption [W] Note 10)			43			48			104		
	Controller weight lb [kg]			0.33 (0.15) (Screw mounting), 0.37 (0.17) (DIN rail mounting)								
Lock unit specifications	Type Note 11)			Non-magnetizing operation type								
	Holding force [lbf]			4.5	8.77	17.5	17.5	35.3	66.1	24.3	48.6	94.6
	Power consumption [W] Note 12)			3.6			5			5		
	Rated voltage [V]			24 VDC ±10%								

Note 1) The intermediate strokes are produced upon receipt of order.

Note 2) Horizontal: The maximum value of the work load for the positioning operation. For the pushing operation, the maximum work load is equal to the "Vertical work load". An external guide is necessary to support the load. The actual work load and transfer speed will depend on the condition of the external guide.
Vertical: Speed is dependent on the work load. Check "Model Selection" on page 1.

Set acceleration/deceleration values to be 3000 [mm/s²] or less.

Note 3) Pushing force accuracy is ±20% (F.S.).

Note 4) Setting range of "Pushing force" for LEYG16 is from 35% to 85%, for LEYG25 is from 35% to 65%, and for LEYG32 is from 35% to 85%. It is possible that "Pushing force" and "Duty ratio" changes dependent on the set value. Check "Model Selection" on page 2.

Note 5) The speed and force may change depending on the cable length, load and mounting conditions. Furthermore, if the cable length exceeds 5 m then it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)

Note 6) Pushing speed is the allowable speed for the pushing operation.

Note 7) Impact resistance: No malfunction occurred when it was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)

Note 8) Power consumption (including the controller) is for when the actuator is operating.

Note 9) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation, except during pushing operation.

Note 10) Momentary max. power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.

Note 11) With lock only

Note 12) For an actuator with lock, add the power consumption for the lock.

Specifications

Servo Motor (24 VDC)

Model				LEYG16$^{M}_{L}$A			LEYG25$^{M}_{L}$A		
Actuator specifications	Stroke [mm] Note 1)			30, 50, 100, 150, 200			30, 50, 100, 150 200, 250, 300		
	Work load [lb] Note 2)	Horizontal	Acceleration/Deceleration at 3000 [mm/s²]	6.6	13.2	26.5	15.4	33.0	66.1
		Vertical	Acceleration/Deceleration at 3000 [mm/s²]	3.3	7.7	16.5	4.4	11.0	24.3
	Pushing force [lbf] Note 3) 4)			3.6 to 6.74	6.74 to 13.0	12.8 to 25.0	4.04 to 7.87	8.32 to 16.2	14.8 to 29.2
	Speed [mm/s]			15 to 500	8 to 250	4 to 125	18 to 500	9 to 250	5 to 125
	Max. acceleration/deceleration [mm/s²]			3000					
	Pushing speed [mm/s] Note 5)								
	Positioning repeatability [mm]			50 or less		±0.02	35 or less		
	Screw lead [mm]			10	5	2.5	12	6	3
	Impact/Vibration resistance [m/s²] Note 6)			50/20					
	Actuation type			Ball screw + Belt (Motor parallel)					
	Guide type			Sliding bearing (LEYG□M), Ball bushing bearing (LEYG□L)					
	Operating temp. range			41 to 104°F (5 to 40°C)					
	Operating humidity range [%]			90 RH or less (No condenstation)					
Electric specifications	Motor size			□28			□42		
	Motor output [W]			30			36		
	Motor type			Servo motor (24 VDC)					
	Encoder			Incremental A/B (800 pulse/rotation)/Z phase					
	Rated voltage [V]			24 VDC ±10%					
	Power consumption [W] Note 7)			40			86		
	Standby power consumption when operating [W] Note 8)			4 (Horizontal)/6 (Vertical)			4 (Horizontal)/12 (Vertical)		
	Momentary max. power consumption [W] Note 9)			59			96		
	Controller weight lb [kg]			0.33 (0.15) (Screw mounting), 0.37 (0.17) (DIN rail mounting)					
Lock unit specifications	Type Note 10)			Non-magnetizing operation type					
	Holding force [lbf]			4.5	8.77	17.5	17.5	35.3	66.1
	Power consumption [W] Note 11)			3.6			5		
	Rated voltage [V]			24 VDC ±10%					

Note 1) Strokes shown in ( ) and the intermediate strokes are produced upon receipt of order.
Note 2) Horizontal: The maximum value of the work load for the positioning operation. For the pushing operation, the maximum work load is equal to the "Vertical work load". The external guide is necessary to support the load. The actual work load and transfer speed will depend on the condition of the external guide.
Vertical: Check "Model Selection" on page 1.
Set acceleration/deceleration values to be 3000 [mm/s²] or less.
Note 3) Pushing force accuracy is ±20% (F.S.).
Note 4) Setting range of "Pushing force" for LEYG16A is from 50% to 95% and for LEYG25A is from 50% to 95%. It is possible that "Pushing force" and "Duty ratio" changes dependent on the set value. Check "Model Selection" on page 2.
Note 5) Pushing speed is the allowable speed for the pushing operation.
Note 6) Impact resistance: No malfunction occurred when it was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Note 7) Power consumption (including the controller) is for when the actuator is operating.
Note 8) Standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation, except during pushing operation.
Note 9) Momentary max. power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.
Note 10) With lock only
Note 11) For an actuator with lock, add the power consump- tion for the lock.

Weight

Weight/Motor parallel

Model		LEYG16M					LEYG25M							LEYG32M						
Stroke [mm]		30	50	100	150	200	30	50	100	150	200	250	300	30	50	100	150	200	250	300
Product weight [lb]	Step motor	1.83	2.14	2.65	3.28	3.66	3.68	4.10	4.80	5.73	6.48	7.23	7.80	6.42	6.99	8.20	9.44	10.9	12.0	13.0
	Servo motor	1.83	2.14	2.65	3.28	3.66	3.59	4.01	4.72	5.64	6.39	7.14	7.72	—	—	—	—	—	—	—

Model		LEYG16L					LEYG25L							LEYG32L						
Stroke [mm]		30	50	100	150	200	30	50	100	150	200	250	300	30	50	100	150	200	250	300
Product weight [lb]	Step motor	1.85	2.14	2.51	3.15	3.48	3.70	4.17	4.63	5.64	6.22	6.92	7.45	6.42	7.01	7.87	9.08	10.3	11.4	12.3
	Servo motor	1.85	2.14	2.51	3.15	3.48	3.62	4.08	4.61	5.55	6.13	6.83	7.36	—	—	—	—	—	—	—

Weight/In-line motor

Model		LEYG16M					LEYG25M							LEYG32M						
Stroke [mm]		30	50	100	150	200	30	50	100	150	200	250	300	30	50	100	150	200	250	300
Product weight [lb]	Step motor	1.83	2.14	2.65	3.28	3.66	3.66	4.08	4.78	5.71	6.46	7.21	7.80	6.39	6.97	8.18	9.41	10.9	11.8	12.9
	Servo motor	1.83	2.14	2.65	3.28	3.66	3.57	3.99	4.70	5.62	6.37	7.12	7.69	—	—	—	—	—	—	—

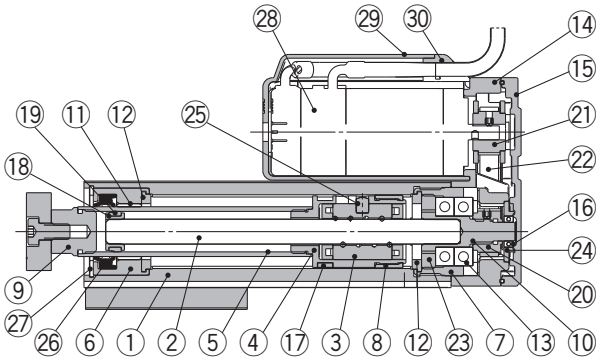
Model		LEYG16L					LEYG25L							LEYG32L						
Stroke [mm]		30	50	100	150	200	30	50	100	150	200	250	300	30	50	100	150	200	250	300
Product weight [lb]	Step motor	1.85	2.14	2.65	3.15	3.48	3.68	4.14	4.67	5.62	6.19	6.90	7.43	6.39	6.99	7.85	9.06	10.3	11.4	12.2
	Servo motor	1.85	2.14	2.65	3.15	3.48	3.59	4.06	4.59	5.53	6.11	6.81	7.34	—	—	—	—	—	—	—

Additional Weight

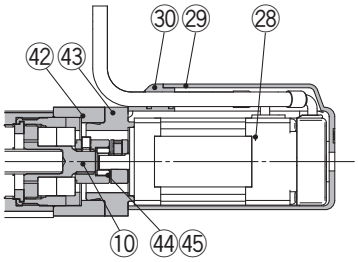
(lb)

Size	16	25	32
Lock	0.12	0.26	0.53
Motor cover	0.02	0.03	0.04

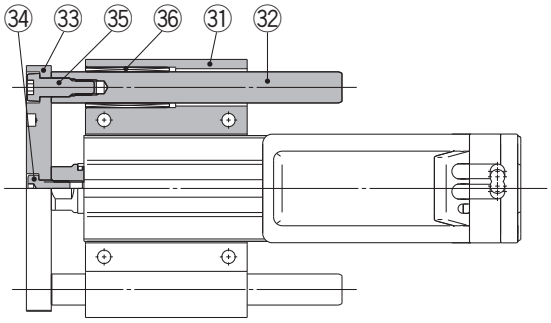
Construction



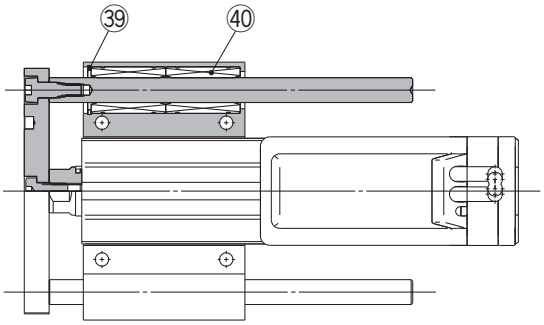
For in-line motor



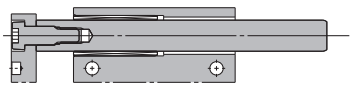
LEYG□M



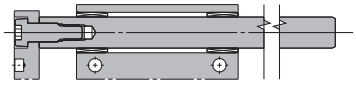
LEYG□L



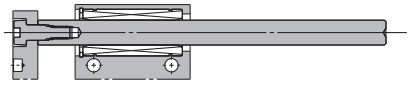
LEYG$^{16}_{25}_{32}$M: 50st or less



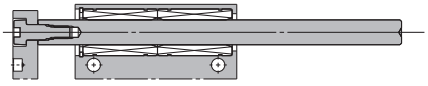
LEYG$^{16}_{25}_{32}$M: Over 50st



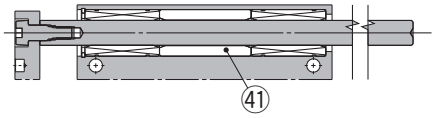
LEYG16L: 30st or less
LEYG$^{25}_{32}$L: 100st or less



LEYG16L: Over 30st, 100st or less

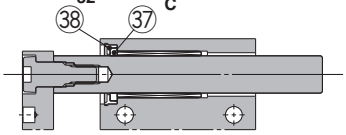


LEYG$^{16}_{25}_{32}$L: Over 100st



When selecting the "grease holding function"

LEYG$^{25}_{32}$M□□$^{A}_{B}_{C}$-□□F: 50st or less



LEYG$^{25}_{32}$M□□$^{A}_{B}_{C}$-□□F: Over 50st



Note) Felt material is inserted to hold grease at the sliding part of the slide bearing. This lengthens the life of the sliding part, but does not guarantee it permanently.

Replacement Parts/Belt

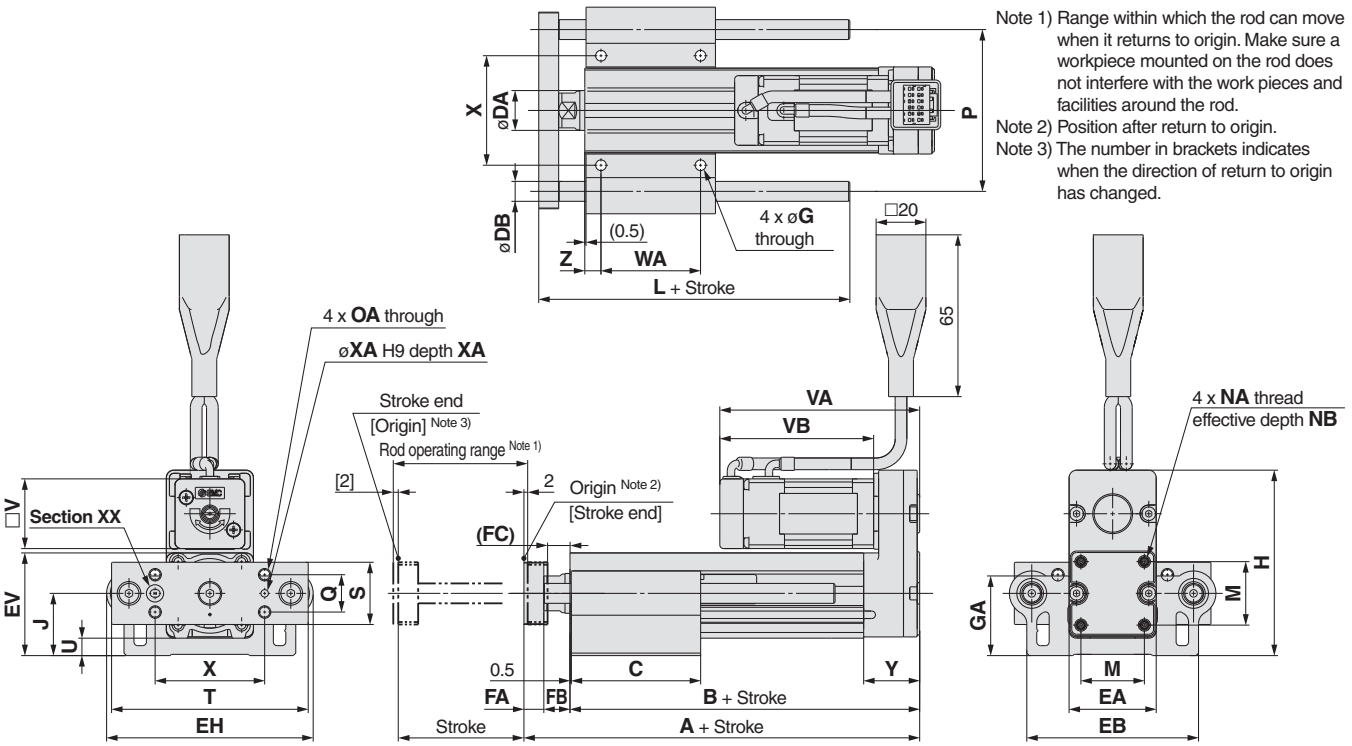
No.	Size	Order no.
22	16	LE-D-2-1
	25	LE-D-2-2
	32	LE-D-2-3

Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Ball screw (shaft)**	Alloy steel	
3	**Ball screw nut**	Resin/Alloy steel	
4	**Piston**	Aluminum alloy	
5	**Piston rod**	Stainless steel	Hard chrome anodized
6	**Rod cover**	Aluminum alloy	
7	**Housing**	Aluminum alloy	
8	**Rotation stopper**	POM	
9	**Socket**	Free cutting carbon steel	Nickel plated
10	**Connected shaft**	Free cutting carbon steel	Nickel plated
11	**Bushing**	Lead bronze cast	
12	**Bumper**	Urethane	
13	**Bearing**	—	
14	**Return box**	Aluminum die-cast	Trivalent chromated
15	**Return plate**	Aluminum die-cast	Trivalent chromated
16	**Bearing**	—	
17	**Magnet**	—	
18	**Wear ring holder**	Stainless steel	Stroke 101 mm or more
19	**Wear ring**	POM	Stroke 101 mm or more
20	**Pulley for screw shaft**	Aluminum alloy	
21	**Pulley for motor**	Aluminum alloy	
22	**Belt**	—	
23	**Bearing stopper**	Aluminum alloy	

No.	Description	Description	Note
24	**Bearing support**	Stainless steel	
25	**Parallel pin**	Stainless steel	
26	**Rod seal**	NBR	
27	**Retaining ring**	Steel for spring	Phosphate coated
28	**Motor**	—	
29	**Motor cover**	Synthetic resin	
30	**Grommet**	Synthetic resin	
31	**Guide attachment**	Aluminum alloy	Anodized
32	**Guide rod**	Carbon steel	
33	**Plate**	Aluminum alloy	Anodized
34	**Plate mounting bolt**	Carbon steel	Nickel plated
35	**Guide bolt**	Carbon steel	Nickel plated
36	**Sliding bearing**	—	
37	**Felt**	Felt	
38	**Holder**	Resin	
39	**Retaining ring**	Steel for spring	Phosphate coated
40	**Ball bushing**	—	
41	**Spacer**	Aluminum alloy	Chromated
42	**Motor block**	Aluminum alloy	Anodized
43	**Motor adapter**	Aluminum alloy	Anodized/LEY16, 25 only
44	**Hub**	Aluminum alloy	
45	**Spider**	NBR	

Dimensions: Motor Parallel

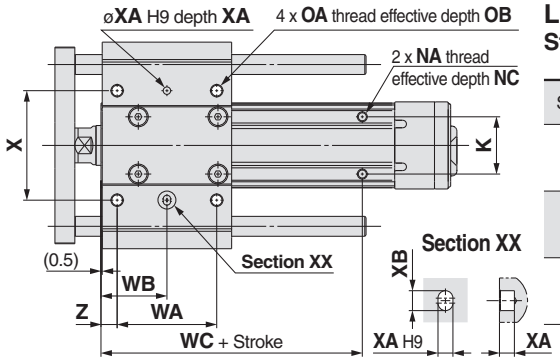


Note 1) Range within which the rod can move when it returns to origin. Make sure a workpiece mounted on the rod does not interfere with the work pieces and facilities around the rod.
Note 2) Position after return to origin.
Note 3) The number in brackets indicates when the direction of return to origin has changed.

LEYG□L (Ball Bushing Bearing)
Standard Stroke: 50, 100, 200

[mm]

Size	Stroke range	L	DB
16	90st or less	75	8
	91st or more, 200st or less	105	
25	114st or less	91	10
	115st or more, 190st or less	115	
	191st or more, 300st or less	133	
32	114st or less	97.5	13
	115st or more, 190st or less	116.5	
	191st or more, 300st or less	134	



LEYG□M (Sliding Bearing)
Standard Stroke: 30, 50, 100

[mm]

Size	Stroke range	L	DB
16	64st or less	51.5	10
	65st or more, 90st or less	74.5	
	91st or more, 200st or less	105	
25	59st or less	67.5	12
	60st or more, 185st or less	100.5	
	186st or more, 300st or less	138	
32	54st or less	74	16
	55st or more, 180st or less	107	
	181st or more, 300st or less	144	

LEYG□M, LEYG□L Common

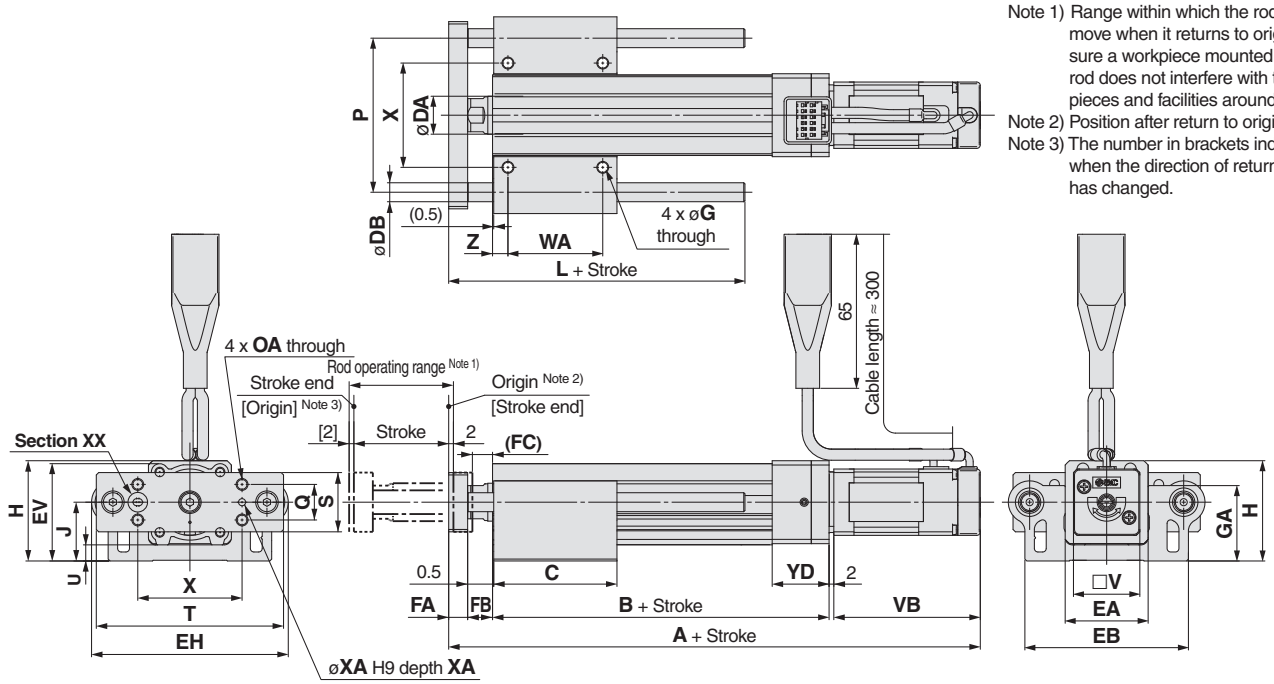
[mm]

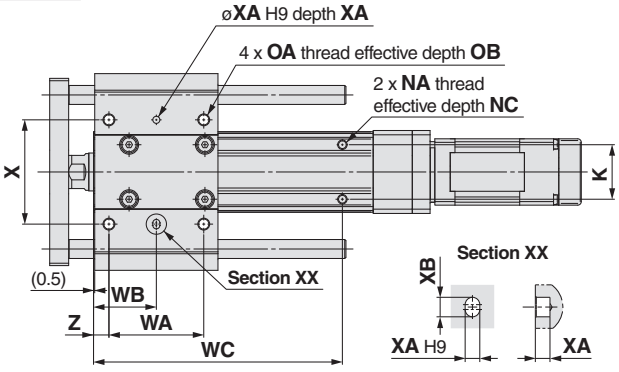
Size	Stroke range	A	B	C	DA	EA	EB	EH	EV	FA	FB	FC	G	GA	H	J	K	M	NA	NB	NC
16	39st or less	109	90.5	37	16	35	69	83	41.3	8	10.5	8.5	4.3	32	74.5	25	23	25.5	M4 x 0.7	7	5.5
	40st or more, 100st or less			52																	
	101st or more, 200st or less	129	110.5	82																	
25	39st or less	141.5	116	50	20	46	85	103	52.5	11	14.5	12.5	5.4	40.5	99	31	29	34	M5 x 0.8	8	6.5
	40st or more, 100st or less			67.5																	
	101st or more, 124st or less	166.5	141																		
	125st or more, 200st or less			84.5																	
	201st or more, 300st or less			102																	
32	39st or less	160.5	130	55	25	60	101	123	64	12	18.5	16.5	5.4	50.5	125.5	38.5	30	40	M6 x 1.0	10	8.5
	40st or more, 100st or less			68																	
	101st or more, 124st or less	190.5	160																		
	125st or more, 200st or less			85																	
	201st or more, 300st or less			102																	

Size	Stroke range	OA	OB	P	Q	S	T	U	V	Step motor VA	Step motor VB	Servo motor VA	Servo motor VB	WA	WB	WC	X	XA	XB	Y	Z
16	39st or less	M5 x 0.8	10	65	15	25	79	7	28	80.3	61.8	81	62.5	25	19	55	44	3	4	22.5	6.5
	40st or more, 100st or less													40	26.5						
	101st or more, 200st or less													70	41.5	75					
25	39st or less	M6 x 1.0	12	80	18	30	95	7	42	85.4	63.4	81.6	59.6	35	26	70	54	4	5	26.5	8.5
	40st or more, 100st or less													50	33.5						
	101st or more, 124st or less															95					
	125st or more, 200st or less													70	43.5						
	201st or more, 300st or less													85	51						
32	39st or less	M6 x 1.0	12	95	28	40	117	7.5	56.4	95.4	68.4	—	—	40	28.5	75	64	5	6	34	8.5
	40st or more, 100st or less													50	33.5						
	101st or more, 124st or less															105					
	125st or more, 200st or less													70	43.5						
	201st or more, 300st or less													85	51						

Dimensions: In-line Motor

Note 1) Range within which the rod can move when it returns to origin. Make sure a workpiece mounted on the rod does not interfere with the work pieces and facilities around the rod.
Note 2) Position after return to origin.
Note 3) The number in brackets indicates when the direction of return to origin has changed.





LEYG□L (Ball Bushing Bearing) Standard Stroke: 50, 100, 200

[mm]

Size	Stroke range	L	DB
16	90st or less	75	8
	91st or more, 200st or less	105	
25	114st or less	91	10
	115st or more, 190st or less	115	
	191st or more, 300st or less	133	
32	114st or less	97.5	13
	115st or more, 190st or less	116.5	
	191st or more, 300st or less	134	

LEYG□M (Sliding Bearing) Standard Stroke: 30, 50, 100

[mm]

Size	Stroke range	L	DB
16	64st or less	51.5	10
	65st or more, 90st or less	74.5	
	91st or more, 200st or less	105	
25	59st or less	67.5	12
	60st or more, 185st or less	100.5	
	186st or more, 300st or less	138	
32	54st or less	74	16
	55st or more, 180st or less	107	
	181st or more, 300st or less	144	

LEYG□M, LEYG□L Common

[mm]

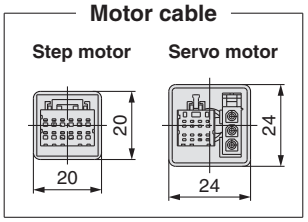
Size	Stroke range	Step motor A	Servo motor A	B	C	DA	EA	EB	EH	EV	FA	FB	FC	G	GA	H	J	K	NA	NC
16	39st or less	174.3	175	92	37	16	35	69	83	41.3	8	10.5	8.5	4.3	32	42.5	25	23	M4 x 0.7	5.5
	40st or more, 100st or less				52															
	101st or more, 200st or less	194.3	195	112	82															
25	39st or less	206.4	202.6	115.5	50	20	45	85	103	52.5	11	14.5	12.5	5.4	40.5	53.5	31	29	M5 x 0.8	6.5
	40st or more, 100st or less				67.5															
	101st or more, 124st or less	231.4	227.6	140.5																
	125st or more, 200st or less				84.5															
	201st or more, 300st or less				102															
32	39st or less	228.9	—	128	55	25	60	101	123	64	12	18.5	16.5	5.4	50.5	68.5	38.5	30	M6 x 1.0	8.5
	40st or more, 100st or less				68															
	101st or more, 124st or less	258.9	—	158																
	125st or more, 200st or less				85															
	201st or more, 300st or less				102															

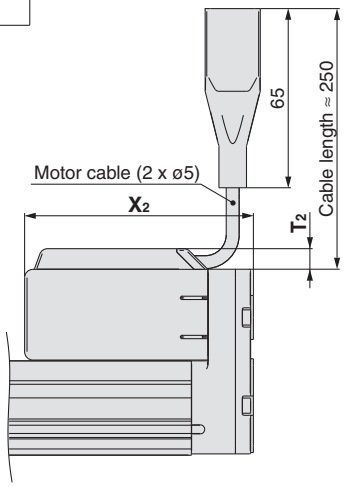
Size	Stroke range	OA	OB	P	Q	S	T	U	V	Step motor VB	Servo motor VB	WA	WB	WC	X	XA	XB	YD	Z
16	39st or less	M5 x 0.8	10	65	15	25	79	7	28	61.8	62.5	25	19	55	44	3	4	24	6.5
	40st or more, 100st or less											40	26.5						
	101st or more, 200st or less											70	41.5	75					
25	39st or less	M6 x 1.0	12	80	18	30	95	7	42	63.4	59.6	35	26	70	54	4	5	26	8.5
	40st or more, 100st or less											50	33.5						
	101st or more, 124st or less													95					
	125st or more, 200st or less											70	43.5						
	201st or more, 300st or less											85	51						
32	39st or less	M6 x 1.0	12	95	28	40	117	7.5	56.4	68.4	—	40	28.5	75	64	5	6	32	8.5
	40st or more, 100st or less											50	33.5						
	101st or more, 124st or less													105					
	125st or more, 200st or less											70	43.5						
	201st or more, 300st or less											85	51						

Dimensions

Motor parallel

With motor cover/LEYG25$^{16}_{32}$□□B$^{A}_{C}$-□C



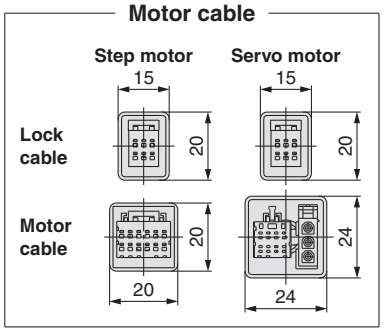


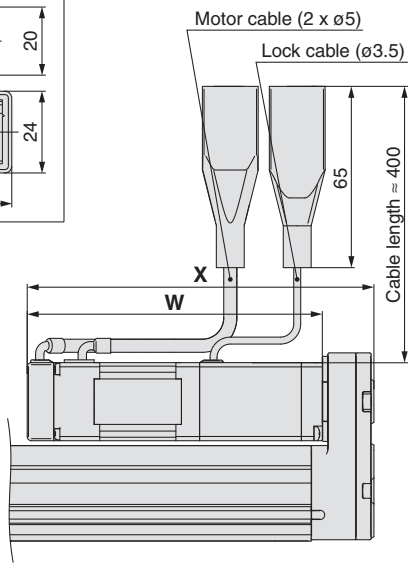
[mm]

Size	T2	X2
16	7.5	83
25	7.5	88.5
32	7.5	98.5

Motor cover material: Synthetic resin

With lock/LEYG25$^{16}_{32}$□□B$^{A}_{C}$-□B



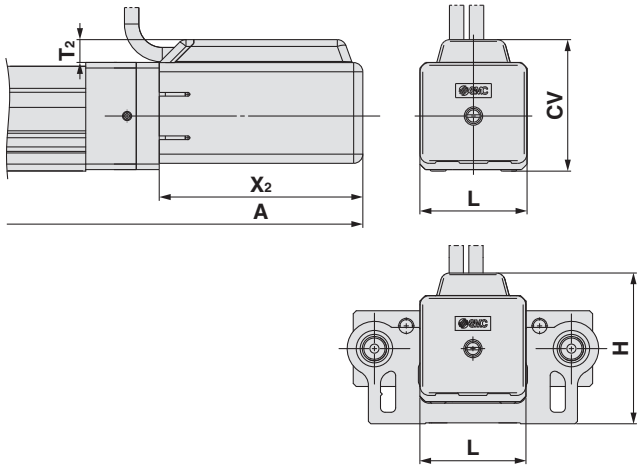


[mm]

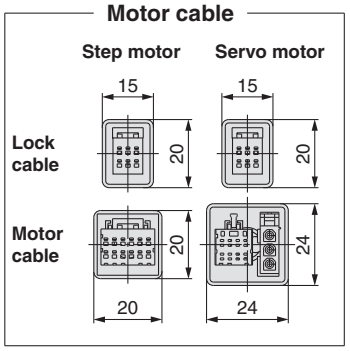
Size	Step motor		Servo motor	
	W	X	W	X
16	105.8	124.3	106.5	125
25	103.9	125.9	100.1	122.1
32	111.4	138.4	—	—

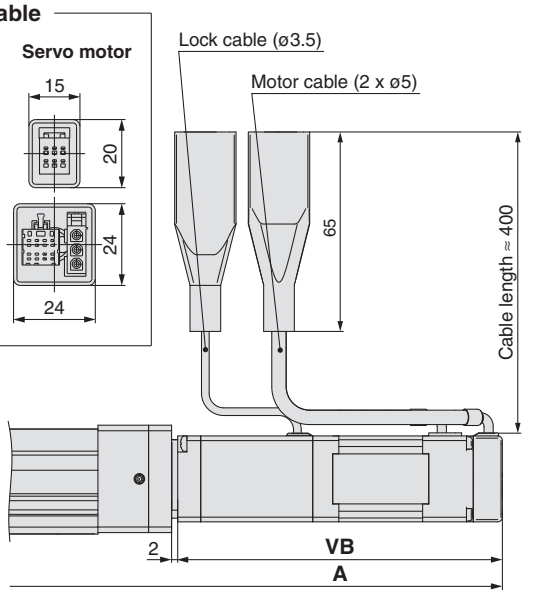
In-line motor

With motor cover/LEYG25$^{16}_{32}$□D□B$^{A}_{C}$-□C



With lock/LEYG25$^{16}_{32}$□D□B$^{A}_{C}$-□B





[mm]

Size	Stroke range	A	T2	X2	L	H	CV
16	100st or less	177	7.5	66.5	35	50	43
	101st or more, 200st or less	197					
25	100st or less	209.5	7.5	68.5	46	61.5	54.5
	101st or more, 300st or less	234.5					
32	100st or less	232	7.5	73.5	60	76	68.5
	101st or more, 300st or less	262					

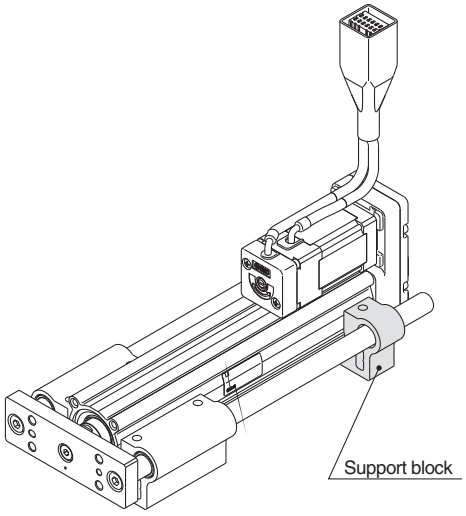
[mm]

Size	Stroke range	A		VB	
		Step motor	Servo motor	Step motor	Servo motor
16	100st or less	218.3	219	105.8	106.5
	101st or more, 200st or less	238.3	239		
25	100st or less	246.9	243.1	103.9	100.1
	101st or more, 300st or less	271.9	268.1		
32	100st or less	271.9	—	111.4	—
	101st or more, 300st or less	301.9	—		

Support Block

● Guide for support block application

When the stroke exceeds 100 mm and the lateral load is applied, the body will be bent based on the load. Mounting the support block is recommended. (Please order separately from the models shown below.)

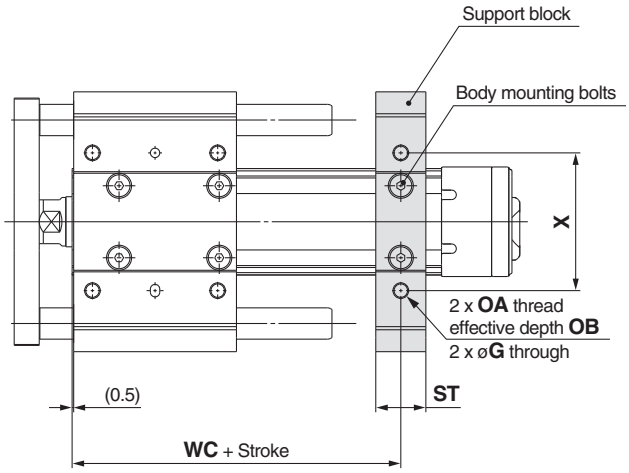


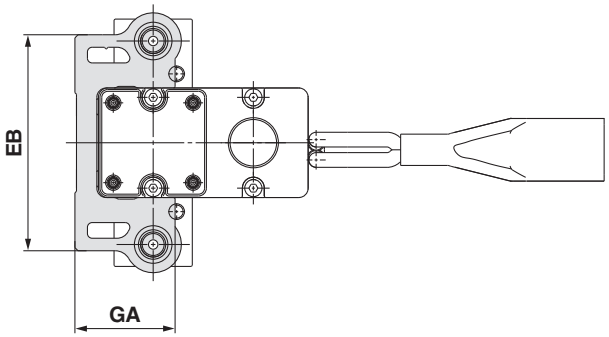
Support Block Model

LEYG-S016

● **Size**

016	For size 16
025	For size 25
032	For size 32





⚠Caution

Do not install the body using only a support block.
The support block should be used only for support.

[mm]

Size	Model	Stroke range	EB	G	GA	OA	OB	ST	WC	X
16	**LEYG-S016**	100st or less	69	4.3	32	M5 x 0.8	10	16	55	44
		101st or more, 200st or less							75	
25	**LEYG-S025**	100st or less	85	5.4	40.5	M6 x 1.0	12	20	70	54
		101st or more, 300st or less							95	
32	**LEYG-S032**	100st or less	101	5.4	50.5	M6 x 1.0	12	22	75	64
		101st or more, 300st or less							105	

∗ Two body mounting bolts are included with the support block.

Design/Selection

⚠ Warning

1. Do not apply a load in excess of the operating limit.

A product should be selected based on the maximum load and allowable moment. If the product is used outside of the operating limit, eccentric load applied to the guide will become excessive and have adverse effects such as creating play on the sliding parts of the piston rod, degraded accuracy, operation and shortened product life.

2. Do not use the product in applications where excessive external force or impact force is applied to it.

It may cause failure.

3. When using as a stopper, select [Series LEYG] "Sliding bearing".

4. When using as a stopper, fix the main body using guide attachment (either "Top mounting" or "Bottom mounting").

If the end of actuator is used to fix the main body (ends mounting), it will have adverse effects such as operation and shortened product life.

Handling

⚠ Caution

1. INP output signal

1) Positioning operation
When the product comes within the set range by step data [In position], the INP output signal will be turned on.
Initial value: Set to [0.50] or higher.

2) Pushing operation
When the effective force exceeds step data [Trigger LV], the INP output signal will be turned on.
Set the [Pushing force] and [Trigger LV] within the limitation range.

a) To ensure that the actuator pushes the workpiece with the set [Pushing force], it is recommended that the [Trigger LV] is set to the same value as the [Pushing force].

b) When the [Trigger LV] and [pushing force] are set to be less than the lower limit of the limitation range, there is a possibility that the INP output signal will be switched on from the pushing operation start position.

Handling

⚠ Caution

<Pushing Force and Trigger Level Range> Without load/With lateral load on rod end

Model	Pushing speed [mm/s]	Pushing force (Setting input value)
LEY□16□	1 to 4	30% to 85%
	5 to 20	35% to 85%
	21 to 50	60% to 85%
LEY□25□	1 to 4	20% to 65%
	5 to 20	35% to 65%
	21 to 35	50% to 65%
LEY□32□	1 to 4	20% to 85%
	5 to 20	35% to 85%
	21 to 30	60% to 85%

Model	Pushing speed [mm/s]	Pushing force (Setting input value)
LEY□16□A	1 to 4	40% to 95%
	5 to 20	60% to 95%
	21 to 50	80% to 95%
LEY□25□A	1 to 4	40% to 95%
	5 to 20	60% to 95%
	21 to 35	80% to 95%

∗ For the vertical load (upward), the pushing force (maximum) must be set as shown below, and the device should be operated with a work load less than that shown below.

Model	LEY16□			LEY25□			LEY32□			LEY16□A			LEY25□A		
Lead	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Work load [lb]	2.2	3.3	6.6	5.5	11	22	9.9	19.8	39.7	2.2	3.3	6.6	2.65	5.5	11
Pushing force	85%			65%			85%			95%			95%		

Model	LEYG16$^{M}_{L}$□			LEYG25$^{M}_{L}$□			LEYG32$^{M}_{L}$□			LEYG16$^{M}_{L}$□A			LEYG25$^{M}_{L}$□A		
Lead	A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
Work load [lb]	1.1	2.2	5.5	3.3	8.8	19.8	5.5	15.4	35.3	1.1	2.2	5.5	1.1	3.3	8.8
Pushing force	85%			65%			85%			95%			95%		

2. When the pushing operation is used, be sure to set to [Pushing operation].

Also, do not hit the workpiece in positioning operation or in the range of positioning operation. It may malfunction.

3. Driving speed when pushing operating should be set within specification range.

It may damage and malfunction.

4. Use at initial set positioning force (LEY16□/25□/32□: 100%, LEY16A□: 150%, LEY25A□: 200%)

When used at value smaller than initially set up value, tact becomes uneven and an alarm may sound.

5. Actual speed of the product can be changed by load.

When selecting a product, check the catalog for the instructions regarding model selection and specifications.

6. Do not apply a load, impact or resistance in addition to a transferred load during returning to the original position.

Otherwise, the origin can be displaced since it is based on detected motor torque.

Handling

⚠Caution

7. In pushing operation, set the product to a position of at least 2 mm away from a workpiece. (This position is referred to as a pushing start position.)

If the product is set to the same position as a workpiece, the following alarm and unstable operation can occur.

a. "Posn failed" alarm is generated.
The product cannot reach a pushing start position due to the deviation of work pieces in width.

b. "Pushing ALM" alarm is generated.
The product is pushed back from a pushing start position after starting to push.

8. Do not let anything come in contact and damage piston rod friction area.

Piston rod and guide rod are manufactured with precise tolerance so even a small deformation may malfunction.

9. Connect it so that the impact and load should not be applied when an external guide is provided.

Use a freely moving connector (such as a floating joint).

10. Do not operate body itself by the piston rod fixing.

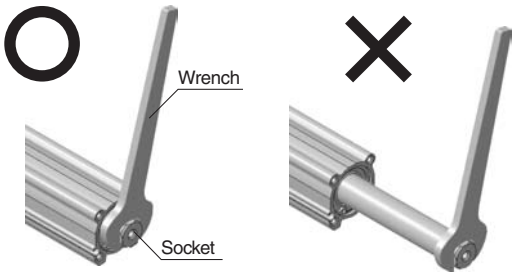
An excessive load joins the piston rod, and it causes defective operation and the longevity decrease.

11. Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod.

If rotational torque is applied, the non-rotating guide will deform, thus affecting the non-rotating accuracy.
Refer to the table below for the approximate values of the allowable range of rotational torque.

Allowable rotational torque (lbf·ft) or less	LEY16□	LEY25□	LEY32
	0.59	0.81	1.03

To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes. Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



12. When applying rotational torque to the end of the plate, use within the allowable range. [Series LEYG]

Guide rod and bushing will deform and cause the abnormal reaction of the space of a guide and an increase of the sliding resistance, etc.

13. When pushing operating, operate within duty ratio range.

The duty ratio is a ratio at the time that can keep being pushed.

· Step motor (Servo/24 VDC) 77°F = 25°C, 104°F = 40°C

LEY16□

Pushing force [%]	Ambient temperature: 25°C or less		Ambient temperature: 40°C	
	Duty ratio [%]	Continuous pushing time [min.]	Duty ratio [%]	Continuous pushing time [min.]
40 or less	100	—	100	—
50			70	12
70			20	1.3
85			15	0.8

LEY25□

Pushing force [%]	Ambient temperature: 25°C or less		Ambient temperature: 40°C	
	Duty ratio [%]	Continuous pushing time [min.]	Duty ratio [%]	Continuous pushing time [min.]
65 or less	100	—	100	—

LEY32□

Pushing force [%]	Ambient temperature: 25°C or less		Ambient temperature: 40°C	
	Duty ratio [%]	Continuous pushing time [min.]	Duty ratio [%]	Continuous pushing time [min.]
65 or less	100	—	100	—
85			50	15

· Servo motor (24 VDC) 77°F = 25°C, 104°F = 40°C

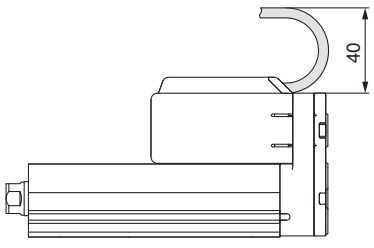
LEY16A□

Pushing force [%]	Ambient temperature: 25°C or less		Ambient temperature: 40°C	
	Duty ratio [%]	Continuous pushing time [min.]	Duty ratio [%]	Continuous pushing time [min.]
95 or less	100	—	100	—

LEY25A□

Pushing force [%]	Ambient temperature: 25°C or less		Ambient temperature: 40°C	
	Duty ratio [%]	Continuous pushing time [min.]	Duty ratio [%]	Continuous pushing time [min.]
95 or less	100	—	100	—

14. When mounting the main body, keep the bend in the cable at 40 mm or more.



15. Fix 'End socket' square part of the piston rod with a wrench etc. to prevent the piston rod from rotating. Tighten the screws properly with adequate torque within the specified torque range when mounting a workpiece or jig, etc.

It causes the abnormal reaction of an auto switch, the space of an internal guide, and an increase of the sliding resistance, etc.

Handling

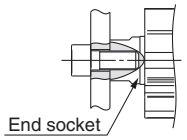
⚠Caution

16. When mounting the workpiece and body use screws with adequate length and tighten them with adequate torque within the specified torque range.

Tightening the screws with a higher torque than recommended may malfunction, whilst the tightening with a lower torque can cause the displacement of the mounting position or in extreme conditions the actuator could become detached from its mounting position.

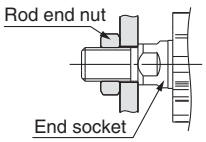
<Series LEY>

Workpiece fixed/Rod end female thread

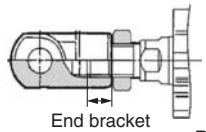


Model	Bolt	Max. tightening torque (lbf·ft)	Max. screw-in depth (mm)	End socket width across flats (mm)
LEY16	M5 x 0.8	2.21	10	14
LEY25	M8 x 1.25	9.21	13	17
LEY32	M8 x 1.25	9.21	13	22

Workpiece fixed/Rod end male thread (When "Rod end male thread" is selected.)



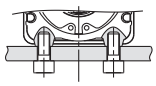
Model	Thread size	Max. tightening torque (lbf·ft)	Effective depth of thread length (mm)	End socket width across flats (mm)
LEY16	M8 x 1.25	9.21	12	14
LEY25	M14 x 1.5	47.9	20.5	17
LEY32	M14 x 1.5	47.9	20.5	22



Model	Rod end nut		End bracket screw-in depth (mm)
	Width across flats (mm)	Length (mm)	
LEY16	13	5	5 or more
LEY25	22	8	8 or more
LEY32	22	8	8 or more

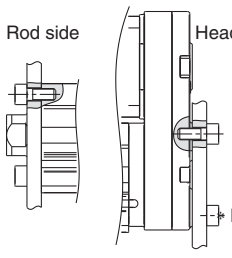
∗ Rod end nuts are included.

Body fixed/Body bottom tapped style (When "Body bottom tapped" is selected.)



Model	Bolt	Max. tightening torque (lbf·ft)	Max. screw-in depth (mm)
LEY16	M4 x 0.7	1.1	5.5
LEY25	M5 x 0.8	2.2	6.5
LEY32	M6 x 1.0	3.8	8.8

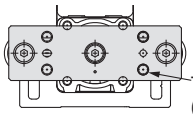
Body fixed/Rod side/Head side tapped style



Model	Bolt	Max. tightening torque (lbf·ft)	Max. screw-in depth (mm)
LEY16	M4 x 0.7	1.1	7
LEY25	M5 x 0.8	2.2	8
LEY32	M6 x 1.0	3.8	10

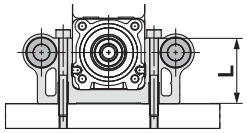
<Series LEYG>

Workpiece fixed/Plate tapped style



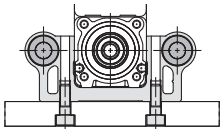
Model	Bolt	Max. tightening torque (lbf·ft)	Max. screw-in depth (mm)
LEYG16$^{M}_{L}$	M5 x 0.8	2.2	8
LEYG25$^{M}_{L}$	M6 x 1.0	3.8	11
LEYG32$^{M}_{L}$	M6 x 1.0	3.8	12

Body fixed/Top mounting



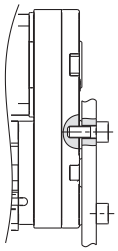
Model	Bolt	Max. tightening torque (lbf·ft)	Length: L (mm)
LEYG16$^{M}_{L}$	M4 x 0.7	1.1	32
LEYG25$^{M}_{L}$	M5 x 0.8	2.2	40.5
LEYG32$^{M}_{L}$	M5 x 0.8	2.2	50.5

Body fixed/Bottom mounting



Model	Bolt	Max. tightening torque (lbf·ft)	Max. screw-in depth (mm)
LEYG16$^{M}_{L}$	M5 x 0.8	2.2	10
LEYG25$^{M}_{L}$	M6 x 1.0	3.8	12
LEYG32$^{M}_{L}$	M6 x 1.0	3.8	12

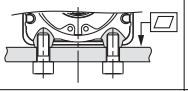
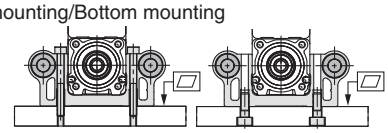
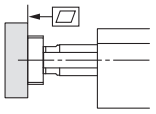
Body fixed/Head side tapped style



Model	Bolt	Max. tightening torque (lbf·ft)	Max. screw-in depth (mm)
LEYG16$^{M}_{L}$	M4 x 0.7	1.1	7
LEYG25$^{M}_{L}$	M5 x 0.8	2.2	8
LEYG32$^{M}_{L}$	M6 x 1.0	3.8	10

17. When mounting the main body and workpiece, fix within the following flatness range.

Poor parallelism of the workpiece mounted on th e body, base and other parts may increase sliding resistance.

Model	Mounting position	Flatness
LEY□	Body/Body bottom 	0.1 mm or less
LEYG□	Top mounting/Bottom mounting 	0.05 mm or less
	Workpiece/Plate mounting 	0.05 mm or less

Maintenance

⚠Warning

1. Cut the power supply during maintenance and replacement of the product.

• Maintenance frequency

Perform maintenance according to the below table.

Frequency	Appearance check	Check belt
Inspection before daily operation	○	—
Inspection every 6 months /250 km/5 million cycles∗	○	○

∗ Select whichever comes sooner.

• Items for visual appearance check

1. Loose set screws, Abnormal dirt
2. Check of flaw and cable joint
3. Vibration, Noise

• Approximate schedule for belt replacement

It is recommended that the belt be replaced after 2 years or after following actuator movement distance.

Model	Distance	Model	Distance	Model	Distance
LEY16□A	2,000 km	**LEY25□A**	2,500 km	**LEY32A**	4,000 km
LEY16□B	1,000 km	**LEY25□B**	1,200 km	**LEY32B**	2,000 km
LEY16□C	500 km	**LEY25□C**	600 km	**LEY32C**	1,000 km

• Items for belt check

Stop operation immediately and replace the belt when belt appear to be below. Further, ensure your operating environment and conditions satisfy the requirements specified for the product.

a. Tooth shape canvas is worn out

Canvas fiber becomes fuzzy. Rubber is removed and the fiber becomes whitish. Lines of fibers become unclear.

b. Peeling off or wearing of the side of the belt

Belt corner becomes round and frayed thread sticks out.

c. Belt partially cut

Belt is partially cut. Foreign matter caught in teeth other than cut part causes flaw.

d. Vertical line of belt teeth

Flaw which is made when the belt runs on the flange.

e. Rubber back of the belt is softened and sticky

f. Crack on the back of the belt

Controller

Step Data Input Type ····· **Page 39**



Step Motor
(Servo/24 VDC)

Series LECP6



Servo Motor
(24 VDC)

Series LECA6

Programless Type ····· **Page 51**



Step Motor
(Servo/24 VDC)

Series LECP1

SMC

Controller (Step Data Input Type)
Step Motor (Servo/24 VDC)
Series LECP6
Servo Motor (24 VDC)
Series LECA6



How to Order

⚠Caution

Note 1) CE-compliant products

① EMC compliance was tested by combining the electric actuator LEY series and the controller LEC series. The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore conformity to the EMC directive cannot be certified for SMC components incorporated into the customer's equipment under actual operating conditions. As a result it is necessary for the customer to verify conformity to the EMC directive for the machinery and equipment as a whole.

② For the LECA6 series (servo motor controller), EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to page 47 for the noise filter set. Refer to the LECA Operation Manual for installation.

LE C P 6 N □ □ – □

Controller

Compatible motor

P	Step motor (Servo/24 VDC)
A	Servo motor (24 VDC) Note 1)

Number of step data (Points)

6	64

Parallel I/O type

N	NPN
P	PNP

I/O cable length [m]

Nil	Without cable
1	1.5
3	3
5	5

Option

Nil	Screw mounting
D Note 2)	DIN rail mounting

Note 2) DIN rail is not included. Order it separately.

Actuator part number

(Except cable specifications and actuator options)
Example: Enter [LEY16B-100] for
LEY16B-100B-R16N1

∗ When controller equipped type (-□6N□/-□6P□) is selected when ordering the LE series, you do not need to order this controller.

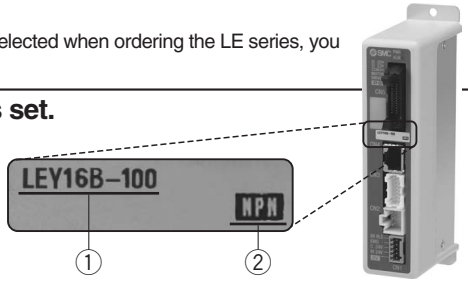
The controller is sold as single unit after the compatible actuator is set.

Confirm that the combination of the controller and the actuator is correct.

<Check the following before use.>

① Check that actuator label for model number. This matches the controller.

② Check Parallel I/O configuration matches (NPN or PNP).



∗ Refer to the operation manual for using the products. Please download it via our website. http://www.smcworld.com

Specifications

Basic Specifications

Item	LECP6	LECA6
Compatible motor	Step motor (Servo/24 VDC)	Servo motor (24 VDC)
Power supply Note 1)	Power voltage: 24 VDC ±10% Current consumption: 3 A (Peak 5 A) Note 2) [Including motor drive power, control power, stop, lock release]	Power voltage: 24 VDC ±10% Current consumption: 3 A (Peak 10 A) Note 2) [Including motor drive power, control power, stop, lock release]
Parallel input	11 inputs (Photo-coupler isolation)	
Parallel output	13 outputs (Photo-coupler isolation)	
Compatible encoder	Incremental A/B phase (800 pulse/rotation)	Incremental A/B/Z phase (800 pulse/rotation)
Serial communication	RS485 (Modbus protocol compliant)	
Memory	EEPROM	
LED indicator	LED (Green/Red) one of each	
Lock control	Forced-lock release terminal Note 3)	
Cable length [m]	I/O cable: 5 or less Actuator cable: 20 or less	
Cooling system	Natural air cooling	
Operating temperature range	32 to 104°F (0 to 40°C) (No freezing)	
Operating humidity range [%RH]	90 or less (No condensation)	
Storage temperature range	14 to 140 °F (–10 to 60°C) (No freezing)	
Storage humidity range [%RH]	90 or less (No condensation)	
Insulation resistance [MΩ]	Between the housing (radiation fin) and SG terminal 50 (500 VDC)	
Weight	5.29 oz. (150 g) (Screw mounting) 6 oz. (170 g) (DIN rail mounting)	

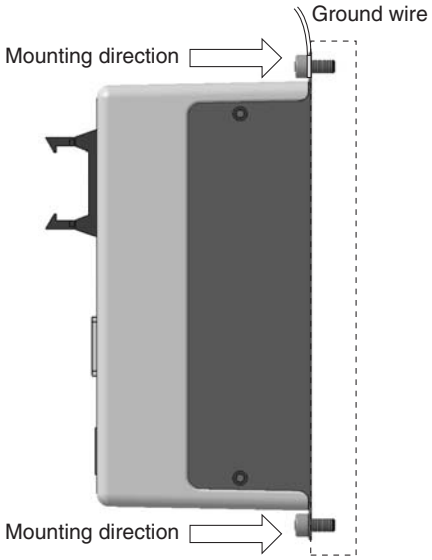
Note 1) Do not use the power supply of "inrush current prevention type" for the controller power supply.

Note 2) The power consumption changes depending on the actuator model. Refer to the specifications of actuator for more details.

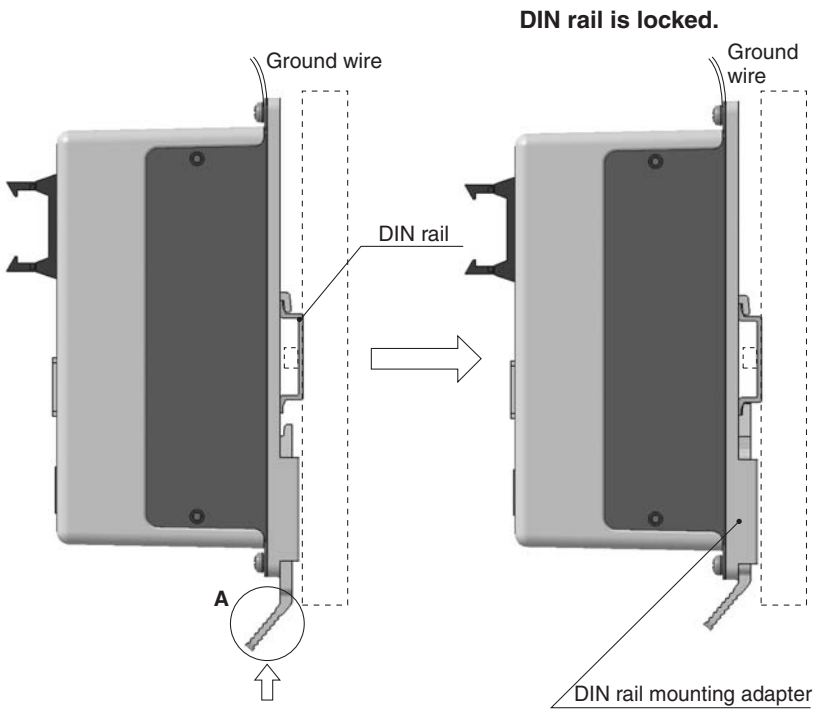
Note 3) Applicable to non-magnetizing lock.

How to Mount

a) Screw mounting (LEC□6□□-□)
(Installation with two M4 screws)



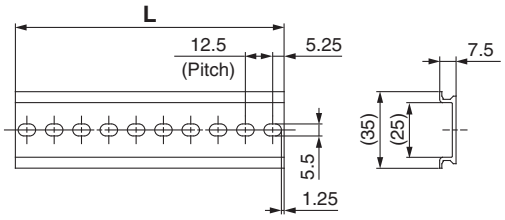
b) DIN rail mounting (LEC□6□□D-□)
(Installation with the DIN rail)



Hook the controller on the DIN rail and press the lever of section **A** in the arrow direction to lock it.

DIN rail
AXT100-DR-□

∗ For □, enter a number from the "No." line in the table below.
Refer to the dimensions on page 41 for the mounting dimensions.



L Dimension [mm]

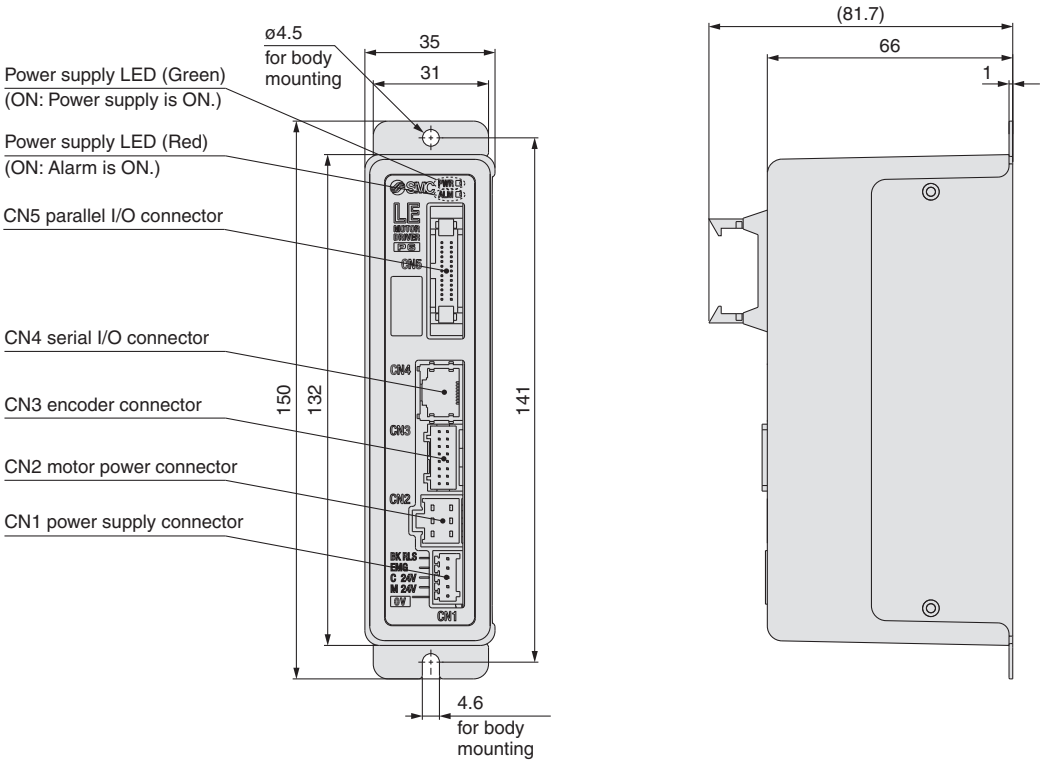
No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
L	23	35.5	48	60.5	73	85.5	98	110.5	123	135.5	148	160.5	173	185.5	198	210.5	223	235.5	248	260.5
No.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
L	273	285.5	298	310.5	323	335.5	348	360.5	373	385.5	398	410.5	423	435.5	448	460.5	473	485.5	498	510.5

DIN rail mounting adapter
LEC-D0 (with 2 mounting screws)

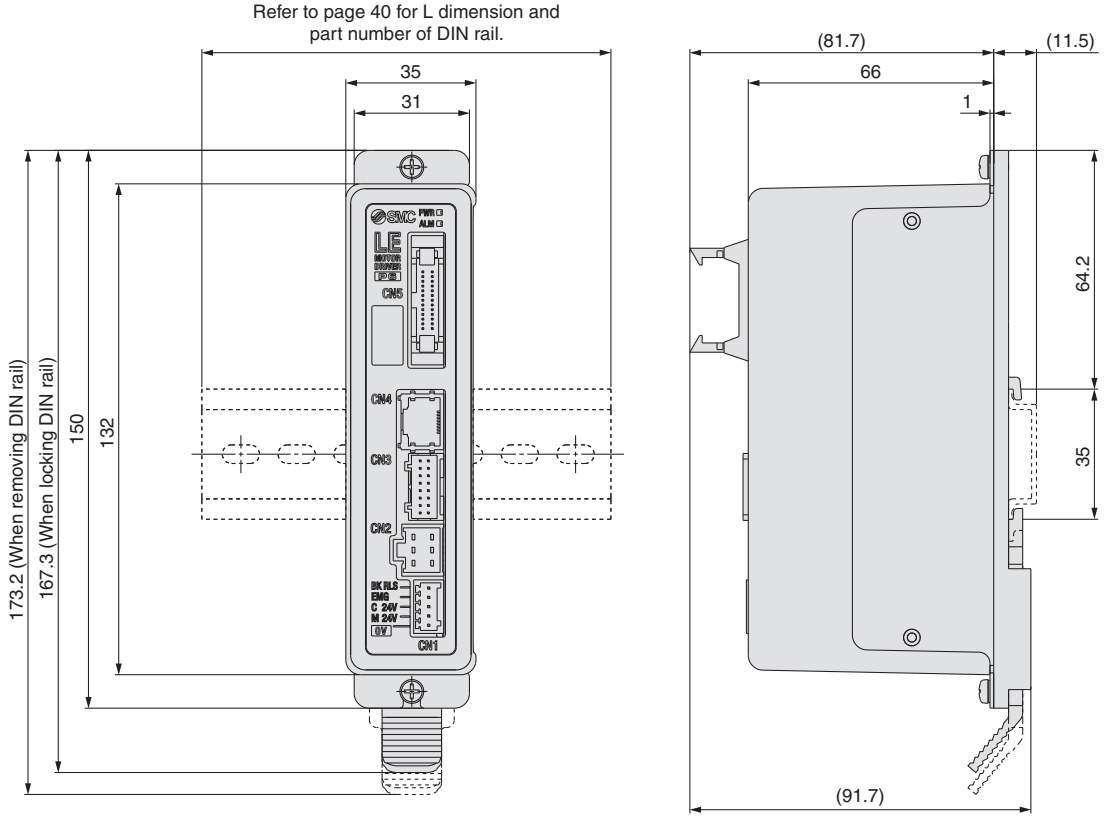
This should be used when the DIN rail mounting adapter is mounted onto the screw mounting type controller afterwards.

Dimensions

a) Screw mounting (LEC□6□□-□)



b) DIN rail mounting (LEC□6□□D-□)



Note) When two or more controllers are used, keep the interval between them 10 mm or more (when the LEY25, 32 are used).

Wiring Example 1

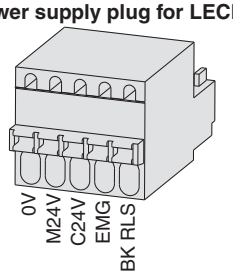
Power Supply Connector: CN1

∗ Power supply plug is an accessory.

CN1 Power Supply Connector Terminal for LECP6 (PHOENIX CONTACT FK-MC0.5/5-ST-2.5)

Terminal name	Function	Function details
0V	Common supply (–)	M24V terminal/C24V terminal/EMG terminal/BK RLS terminal are common (–).
M24V	Motor power supply (+)	This is the motor power supply (+) that is supplied to the controller.
C24V	Control power supply (+)	This is the control power supply (+) that is supplied to the controller.
EMG	Stop (+)	This is the input (+) that releases the stop.
BK RLS	Lock release (+)	This is the input (+) that releases the lock.

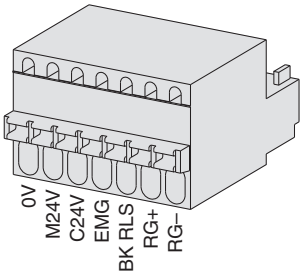
Power supply plug for LECP6



CN1 Power Supply Connector Terminal for LECA6 (PHOENIX CONTACT FK-MC0.5/7-ST-2.5)

Terminal name	Function	Function details
0V	Common supply (–)	M24V terminal/C24V terminal/EMG terminal/BK RLS terminal are common (–).
M24V	Motor power supply (+)	This is the motor power supply (+) that is supplied to the controller.
C24V	Control power supply (+)	This is the control power supply (+) that is supplied to the controller.
EMG	Stop (+)	This is the input (+) that releases the stop.
BK RLS	Lock release (+)	This is the input (+) that releases the lock.
RG+	Regenerative output 1	These are the regenerative output terminals for external connection. (It is not necessary to connect them in the combination with standard specification LE series.)
RG–	Regenerative output 2	

Power supply plug for LECA6



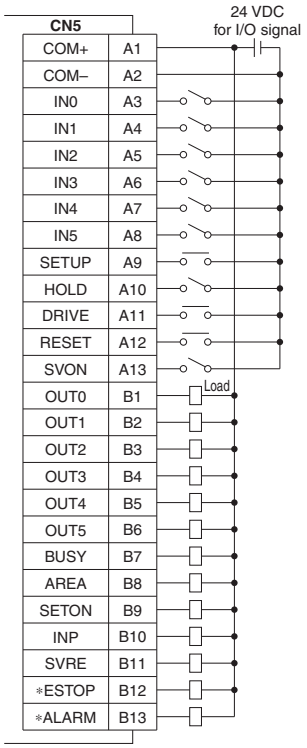
Wiring Example 2

Parallel I/O Connector: CN5

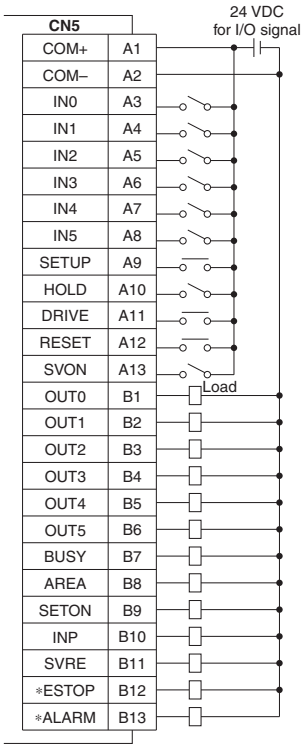
∗ When you connect a PLC, etc., to the CN5 parallel I/O connector, please use the I/O cable (LEC-CN5-□).
∗ The wiring should be changed depending on the type of the parallel I/O (NPN or PNP). Please wire referring to the following diagram.

Wiring diagram

LEC□6N□□-□ (NPN)



LEC□6P□□-□ (PNP)



Input Signal

Name	Contents
COM +	Connects the power supply 24 V for input/output signal
COM –	Connects the power supply 0 V for input/output signal
IN0 to IN5	Step data specified Bit No. (Input is instructed in the combination of IN0 to 5.)
SETUP	Instruction to return to the original position
HOLD	Operation is temporarily stopped.
DRIVE	Instruction to drive
RESET	Alarm reset and operation interruption
SVON	Servo ON instruction

Output Signal

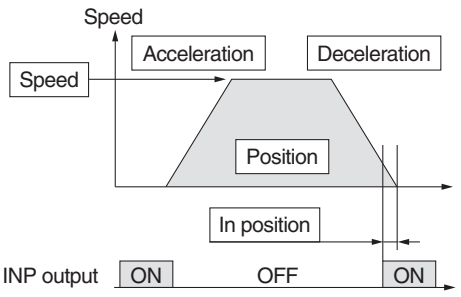
Name	Contents
OUT0 to OUT5	Outputs the step data No. during operation
BUSY	Outputs when the actuator is moving
AREA	Outputs within the step data area output setting range
SETON	Outputs when returning to the original position
INP	Outputs when target position or target force is reached (Turns on when the positioning or pushing is completed.)
SVRE	Outputs when servo is on
∗ESTOP Note)	Not output when EMG stop is instructed
∗ALARM Note)	Not output when alarm is generated

Note) These signals are output when the power supply of the controller is ON. (N.C.)

Step Data Setting

1. Step data setting for positioning

In this setting, the actuator moves toward and stops at the target position. The following diagram shows the setting items and operation. The setting items and set values for this operation are stated below.



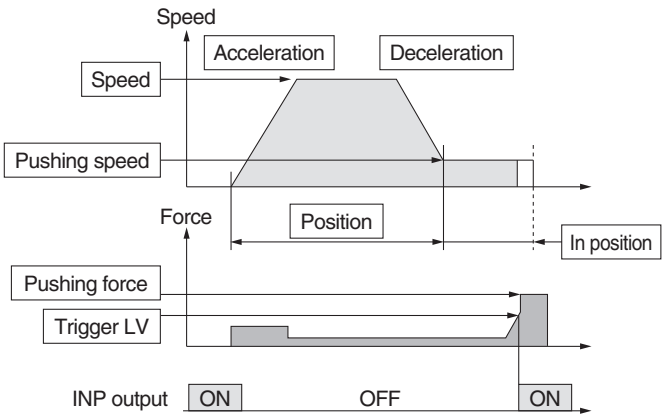
◎: Need to be set.
○: Need to be adjusted as required.
—: Setting is not required.

Step Data (Positioning)

Necessity	Item	Description
◎	Movement MOD	When the absolute position is required, set Absolute. When the relative position is required, set Relative.
◎	Speed	Transfer speed to the target position
◎	Position	Target position
○	Acceleration	Parameter which defines how rapidly the actuator reaches the speed set. The higher the set value, the faster it reaches the speed set.
○	Deceleration	Parameter which defines how rapidly the actuator comes to stop. The higher the set value, the quicker it stops.
◎	Pushing force	Set 0. (If values 1 to 100 are set, the operation will be changed to the pushing operation.)
—	Trigger LV	Setting is not required.
—	Pushing speed	Setting is not required.
○	Positioning force	Max. torque during the positioning operation (No specific change is required.)
○	Area 1, Area 2	Condition that turns on the AREA output signal.
○	In position	Condition that turns on the INP output signal. When the actuator enters the range of [in position], the INP output signal turns on. (It is unnecessary to change this from the initial value.) When it is necessary to output the arrival signal before the operation is completed, make the value larger.

2. Step data setting for pushing

The actuator moves toward the pushing start position, and when it reaches that position, it starts pushing with less than the set force. The following diagram shows the setting items and operation. The setting items and set values for this operation are stated below.



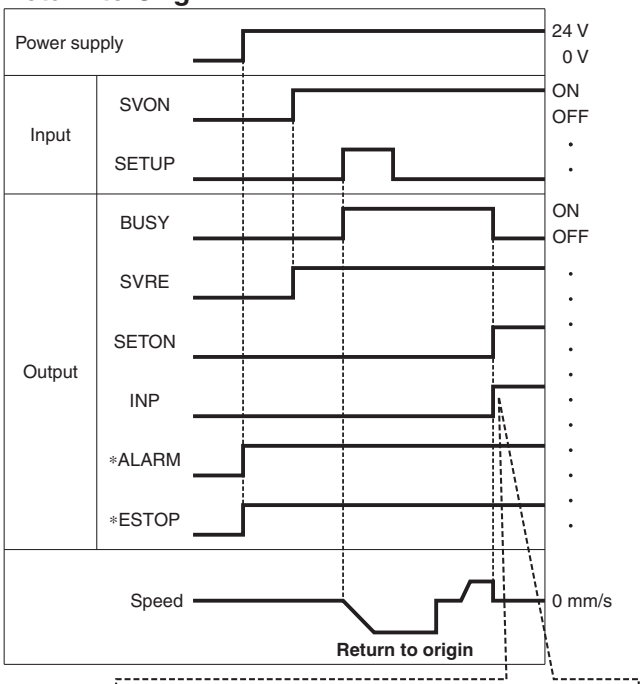
◎: Need to be set.
○: Need to be adjusted as required.

Step Data (Pushing)

Necessity	Item	Description
◎	Movement MOD	When the absolute position is required, set Absolute. When the relative position is required, set Relative.
◎	Speed	Transfer speed to the pushing start position
◎	Position	Pushing start position
○	Acceleration	Parameter which defines how rapidly the actuator reaches the speed set. The higher the set value, the faster it reaches the speed set.
○	Deceleration	Parameter which defines how rapidly the actuator comes to stop. The higher the set value, the quicker it stops.
◎	Pushing force	Pushing force ratio is defined. The setting range differs depending on the electric actuator type. Refer to the operation manual for the electric actuator.
◎	Trigger LV	Condition that turns on the INP output signal. The INP output signal is turned on when the generated force exceeds the value. Threshold level should be less than the pushing force.
○	Pushing speed	Pushing speed When the speed is set fast, the electric actuator and work pieces might be damaged due to the impact when they hit the end, so this set value should be smaller. Refer to the operation manual of the electric actuator.
○	Positioning force	Max. torque during the positioning operation (No specific change is required.)
○	Area 1, Area 2	Condition that turns on the AREA output signal.
◎	In position	Transfer distance during pushing. If the transferred distance exceeds the setting, it stops even if it is not pushing. If the transfer distance is exceeded, the INP output signal will not be turned on.

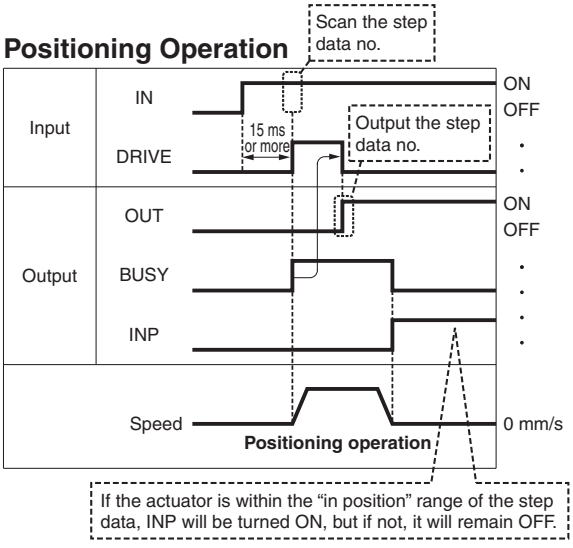
Signal Timing

Return to Origin



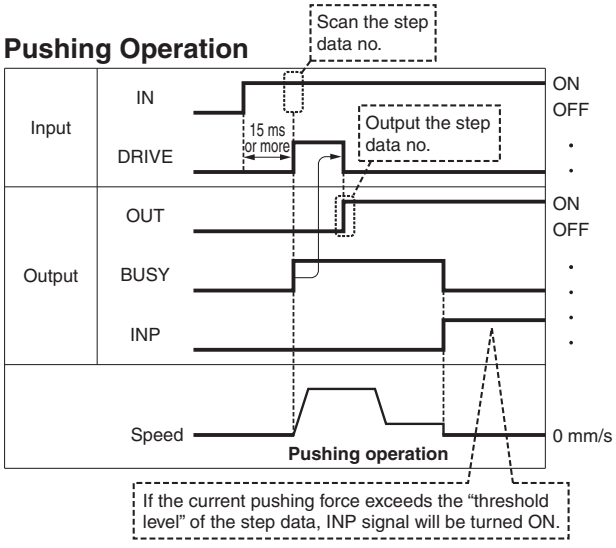
∗ "∗ALARM" and "∗ESTOP" are expressed as negative-logic circuit.

Positioning Operation

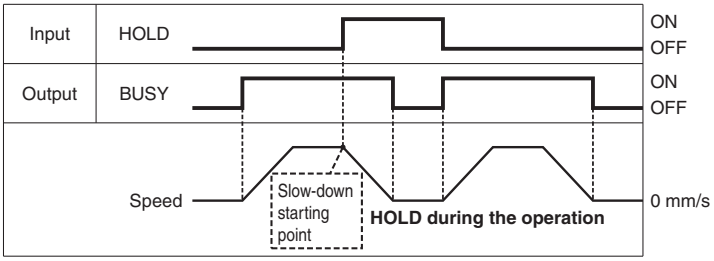


∗ "OUT" is output when "DRIVE" is changed from ON to OFF.
(When power supply is applied, "DRIVE" or "RESET" is turned ON or "∗ESTOP" is turned OFF, all of the "OUT" outputs are turned OFF.)

Pushing Operation

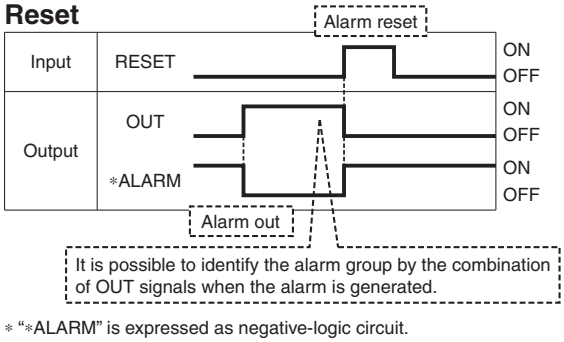


HOLD



∗ When the actuator is in the positioning range in the pushing operation, it does not stop even if HOLD signal is input.

Reset



∗ "∗ALARM" is expressed as negative-logic circuit.

Options: Actuator Cable

[Robotic cable for step motor (Servo/24 VDC), standard cable]

LE – CP – 1 – ☐

Cable length (L)[m]

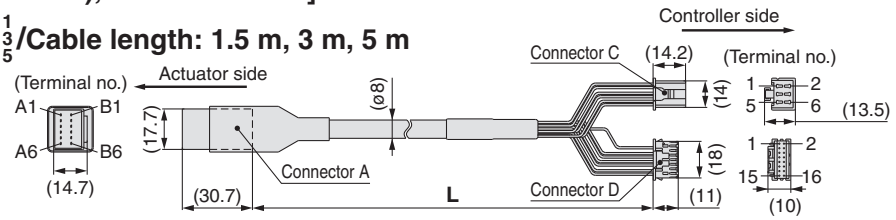
1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order (Robotic cable only)

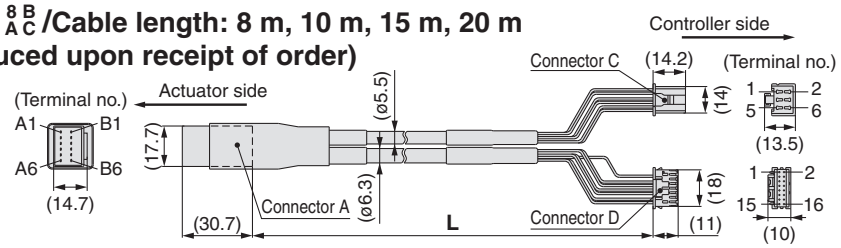
Cable type

Nil	Robotic cable (Flexible cable)
S	Standard cable

LE-CP-$^{1}_{3}$$_{5}$/Cable length: 1.5 m, 3 m, 5 m



LE-CP-$^{8}_{A}$$^{B}_{C}$/Cable length: 8 m, 10 m, 15 m, 20 m
(* Produced upon receipt of order)



Circuit	Connector A terminal no.
A	B-1
$\overline{A}$	A-1
B	B-2
$\overline{B}$	A-2
COM-A/COM	B-3
COM-B/–	A-3
Vcc	B-4
GND	A-4
$\overline{A}$	B-5
A	A-5
$\overline{B}$	B-6
B	A-6

Shield

Cable color	Connector C terminal no.
Brown	2
Red	1
Orange	6
Yellow	5
Green	3
Blue	4

Cable color	Connector D terminal no.
Brown	12
Black	13
Red	7
Black	6
Orange	9
Black	8
—	3

[Robotic cable with lock and sensor for step motor (Servo/24 VDC), standard cable]

LE – CP – 1 – B – ☐

Cable length (L)[m]

1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

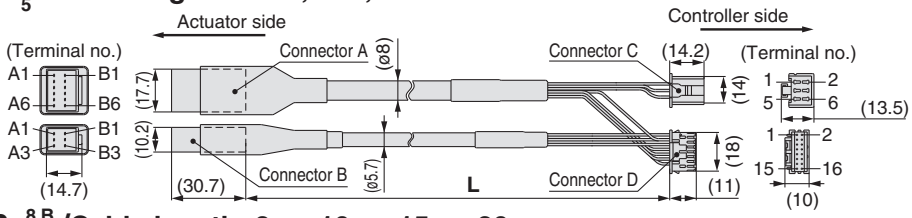
* Produced upon receipt of order (Robotic cable only)

With lock and sensor

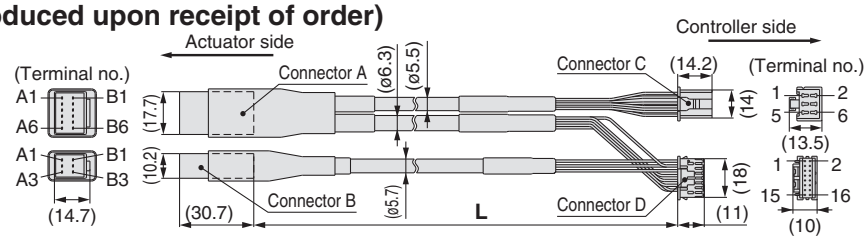
Cable type

Nil	Robotic cable (Flexible cable)
S	Standard cable

LE-CP-$^{1}_{3}$$_{5}$/Cable length: 1.5 m, 3 m, 5 m



LE-CP-$^{8}_{A}$$^{B}_{C}$/Cable length: 8 m, 10 m, 15 m, 20 m
(* Produced upon receipt of order)



Circuit	Connector A terminal no.
A	B-1
$\overline{A}$	A-1
B	B-2
$\overline{B}$	A-2
COM-A/COM	B-3
COM-B/–	A-3
Vcc	B-4
GND	A-4
$\overline{A}$	B-5
A	A-5
$\overline{B}$	B-6
B	A-6

Shield

Cable color	Connector C terminal no.
Brown	2
Red	1
Orange	6
Yellow	5
Green	3
Blue	4

Cable color	Connector D terminal no.
Brown	12
Black	13
Red	7
Black	6
Orange	9
Black	8
—	3

Circuit	Connector B terminal no.
Lock (+)	B-1
Lock (–)	A-1
Sensor (+) Note)	B-3
Sensor (–) Note)	A-3

Red	4
Black	5
Brown	1
Blue	2

Note) This is not used for the LEY series.

[Robotic cable for servo motor (24 VDC)]

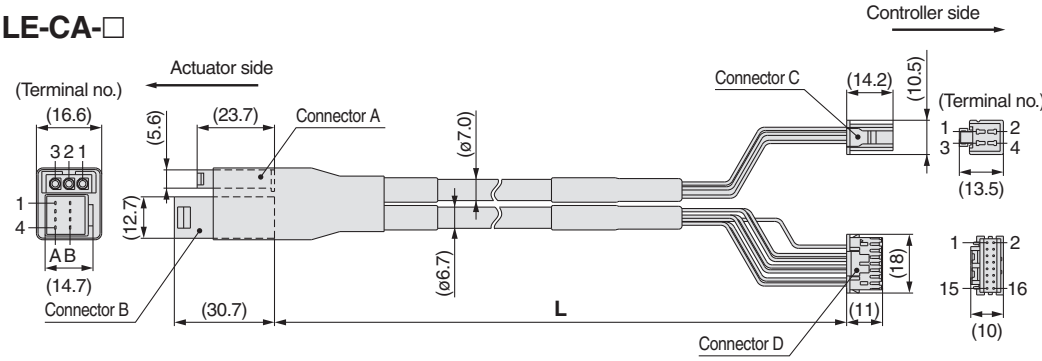
LE – CA – 1

Cable length (L)[m]

1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order

LE-CA-□



Circuit	Connector A terminal no.	Cable color	Connector C terminal no.
U	1	Red	1
V	2	White	2
W	3	Black	3

Circuit	Connector B terminal no.	Cable color	Connector D terminal no.
Vcc	B-1	Brown	12
GND	A-1	Black	13
$\overline{A}$	B-2	Red	7
A	A-2	Black	6
$\overline{B}$	B-3	Orange	9
B	A-3	Black	8
$\overline{Z}$	B-4	Yellow	11
Z	A-4	Black	10
		—	3

Shield

Connection of shield material

[Robotic cable with lock and sensor for servo motor (24 VDC)]

LE – CA – 1 – B

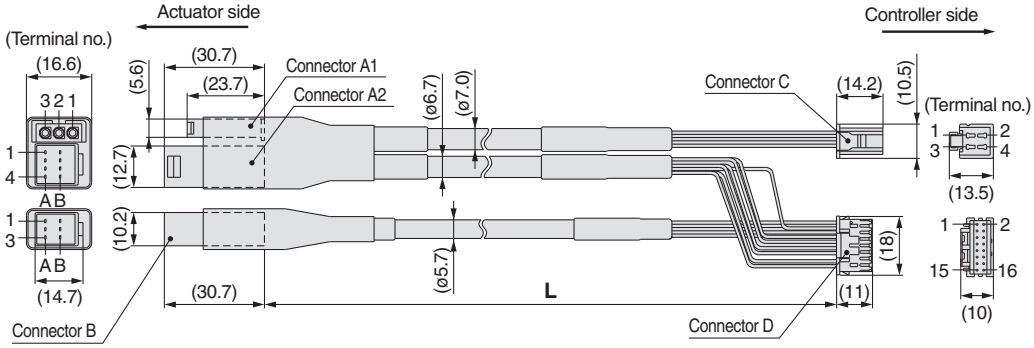
Cable length (L)[m]

1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order

With lock and sensor

LE-CA-□-B



Circuit	Connector A1 terminal no.	Cable color	Connector C terminal no.
U	1	Red	1
V	2	White	2
W	3	Black	3

Circuit	Connector A2 terminal no.	Cable color	Connector D terminal no.
Vcc	B-1	Brown	12
GND	A-1	Black	13
$\overline{A}$	B-2	Red	7
A	A-2	Black	6
$\overline{B}$	B-3	Orange	9
B	A-3	Black	8
$\overline{Z}$	B-4	Yellow	11
Z	A-4	Black	10
		—	3

Shield

Connection of shield material

Circuit	Connector B terminal no.		
Lock (+)	B-1	Red	4
Lock (–)	A-1	Black	5
Sensor (+) Note)	B-3	Brown	1
Sensor (–) Note)	A-3	Black	2

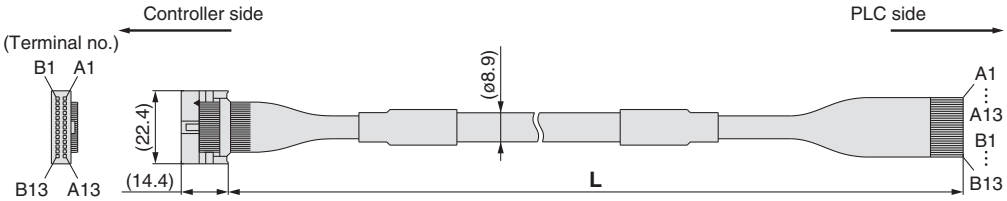
Note) This is not used for the LEY series.

Option: I/O Cable

LEC − CN5 − 1

Cable length (L) [m]

1	1.5
3	3
5	5



Connector pin No.	Insulation color	Dot mark	Dot color
A1	Light brown	■	Black
A2	Light brown	■	Red
A3	Yellow	■	Black
A4	Yellow	■	Red
A5	Light green	■	Black
A6	Light green	■	Red
A7	Gray	■	Black
A8	Gray	■	Red
A9	White	■	Black
A10	White	■	Red
A11	Light brown	■ ■	Black
A12	Light brown	■ ■	Red
A13	Yellow	■ ■	Black

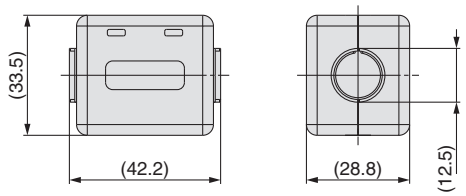
Connector pin No.	Insulation color	Dot mark	Dot color
B1	Yellow	■ ■	Red
B2	Light green	■ ■	Black
B3	Light green	■ ■	Red
B4	Gray	■ ■	Black
B5	Gray	■ ■	Red
B6	White	■ ■	Black
B7	White	■ ■	Red
B8	Light brown	■ ■ ■	Black
B9	Light brown	■ ■ ■	Red
B10	Yellow	■ ■ ■	Black
B11	Yellow	■ ■ ■	Red
B12	Light green	■ ■ ■	Black
B13	Light green	■ ■ ■	Red
—	Shield		

∗ Conductor size: AWG28

Option: Noise Filter Set for Servo Motor (24 VDC)

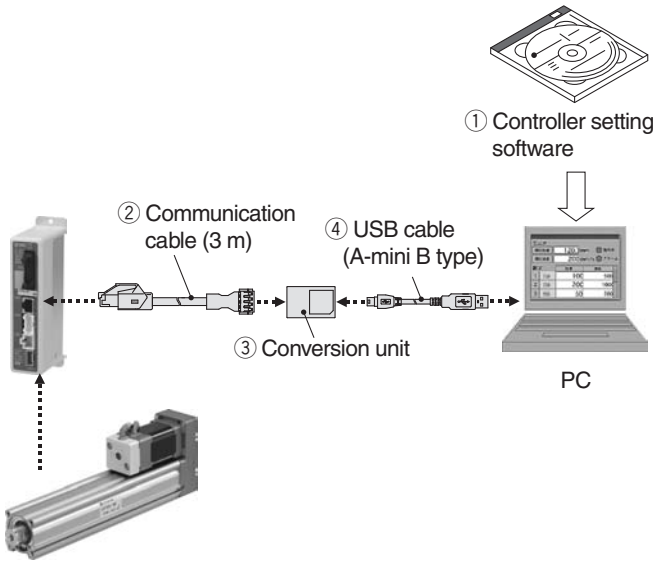
LEC − NFA

Contents of the set: 2 noise filters (Produced by WURTH ELEKT RONIK: 74271222)



∗ Refer to the LECA6 series Operation Manual for installation.

Controller Setting Kit/LEC-W1



How to Order

LEC – W1

Controller setting kit
(Japanese and English are available.)

Contents

① **Controller setting software (CD-ROM)**
② **Communication cable**
(Cable between the controller and the conversion unit)
③ **Conversion unit**
④ **USB cable**
(Cable between the PC and the conversion unit)

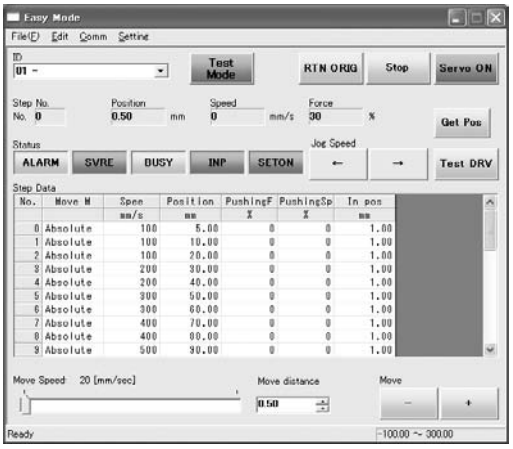
Hardware Requirements

PC/AT compatible machine installed with Windows XP and equipped with USB1.1 or USB2.0 ports.

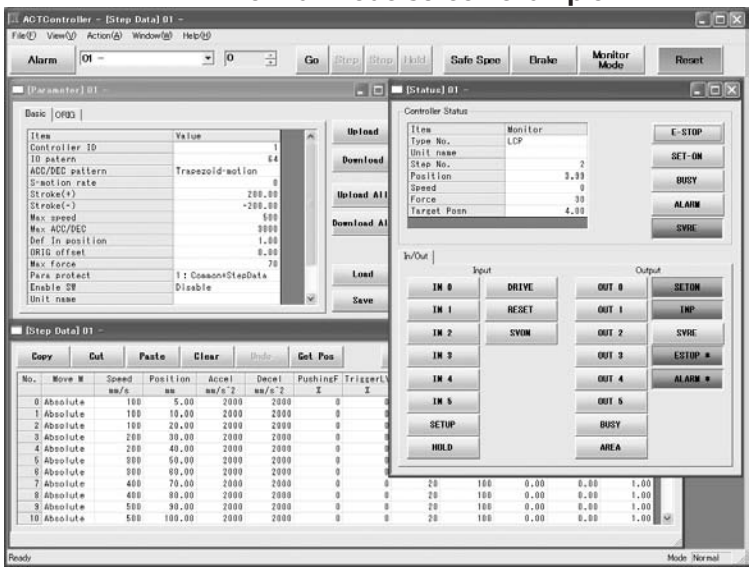
∗ Windows® and Windows XP® are registered trademarks of Microsoft Corporation.

Screen Example

Easy mode screen example



Normal mode screen example



Easy operation and simple setting

- Allowing to set and display actuator step data such as position, speed, force, etc.
- Setting of step data and testing of the drive can be performed on the same page.
- Can be used to jog and move at a constant rate.

Detail setting

- Step data can be set in detail.
- Signals and terminal status can be monitored.
- Parameters can be set.
- JOG and constant rate movement, return to origin, test operationand testing of compulsory output can be performed.

Series LEC
Teaching Box/LEC-T1



How to Order

LEC – T1 – 3 J G

Teaching box

Cable length [m]

3	3

Initial language

J	Japanese
E	English

Stop switch

G	Equipped with stop switch

Enable switch

Nil	None
S	Equipped with enable switch

∗ Interlock switch for jog test function

Standard functions
- **Chinese character display**
- **Stop switch is provided.**

Option
- **Enable switch is provided.**

Specifications

Item	Description
Switch	Stop switch, Enable switch (Option)
Cable length [m]	3
Enclosure	IP64 (Except connector)
Operating temperature range	41 to 122°F (5 to 50°C)
Operating humidity range [%RH]	90 or less (No condensation)
Weight	12.3 oz. (350 g) (Except cable)

Note) CE-compliance
The EMC compliance of the teaching box was tested with the LECP6 series step motor controller (servo/24 VDC) and an applicable actuator.

Easy Mode

Function	Description
Step data	• Setting of step data
Jog	• Jog operation • Return to origin
Test	• 1 step operation • Return to origin
Monitor	• Display of axis and step data No. • Display of two items selected from Position, Speed, Force.
Alarm	• Display of active alarm • Alarm reset
TB setting	• Reconnection of axis • Setting of easy/normal mode • Setting step data and selection of items from easy mode monitor

Menu Operations Flowchart

Menu
- Data
- Monitor
- Jog
- Test
- Alarm
- TB setting

Data
Step data No.
Setting of two items selected below
(Position, Speed, Force, Acceleration, Deceleration)

Monitor
Display of step No.
Display of two items selected below
(Position, Speed, Force)

Jog
Return to origin
Jog operation

Test
1 step operation

Alarm
Display of active alarm
Alarm reset

TB setting
Reconnect
Easy/Normal
Set item

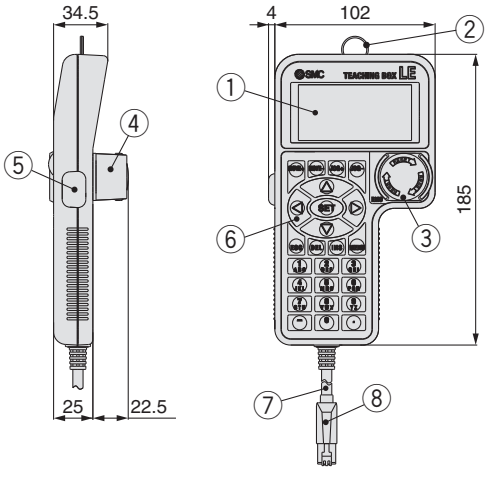
Normal Mode

Function	Description
Step data	• Step data setting
Parameter	• Parameters setting
Test	• Jog operation/Constant rate movement • Return to origin • Test drive (Specify a maximum of 5 step data and operate.) • Compulsory output (Compulsory signal output, Compulsory terminal output)
Monitor	• Drive monitor • Output signal monitor • Input signal monitor • Output terminal monitor • Input terminal monitor
Alarm	• Active alarm display (Alarm reset) • Alarm log record display
File	• Data saving Save the step data and parameters of the controller which is being used for communication (it is possible to save four files, with one set of step data and parameters defined as one file) . • Load to controller Loads the data which is saved in the teaching box to the controller which is being used for communication. • Delete the saved data.
TB setting	• Display setting (Easy/Normal mode) • Language setting (Japanese/English) • Backlight setting • LCD contrast setting • Beep sound setting • Max. connection axis • Distance unit (mm/inch)
Reconnect	• Reconnection of axis

Menu Operations Flowchart

- **Menu**: Step data / Parameter / Monitor / Test / Alarm / File / TB setting / Reconnect
- **Step data**: Step data No. / Movement MOD / Speed / Position / Acceleration / Deceleration / Pushing force / Trigger LV / Pushing speed / Positioning force / Area 1, 2 / In position
- **Parameter**: Basic / ORIG
  - **Basic setting**
  - **ORIG setting**
- **Monitor**: Drive / Output signal / Input signal / Output terminal / Input terminal
  - **DRV monitor**: Position, Speed, Torque / Step No. / Last step No.
  - **Output signal monitor**
  - **Input signal monitor**
  - **Output terminal monitor**
  - **Input terminal monitor**
- **Test**: JOG/MOVE / Return to ORIG / Test drive / Compulsory output
- **Alarm**: Active ALM / ALM Log record
  - **Active ALM**: Active alarm display / Alarm reset
  - **ALM Log record display**: Log entry display
- **File**: Data saving / Load to controller / File deletion
- **TB setting**: Easy/Normal / Language / Backlight / LCD contrast / Beep / Max. connection axis / Password / Distance unit
- **Reconnect**

Dimensions



No.	Description	Function
1	**LCD**	A screen of liquid crystal display (with backlight)
2	**Ring**	A ring for hanging the teaching box
3	**Stop switch**	When switch is pushed in, the switch locks and stops. The lock is released when it is turned to the right.
4	**Stop switch guard**	A guard for the stop switch
5	**Enable switch (Option)**	Prevents unintentional operation (unexpected operation) of the jog test function. Other functions such as data change are not covered.
6	**Key switch**	Switch for each input
7	**Cable**	Length: 3 meters
8	**Connector**	A connector connected to CN4 of the controller

Programless Controller

Series LECP1



How to Order

LE C P 1 N 1 – LEY16B-100

Controller

Compatible motor

P	Step motor (Servo/24 VDC)

Number of step data (Points)

1	14 (Programless)

Parallel I/O type

N	NPN
P	PNP

I/O cable length [m]

Nil	Without cable
1	1.5
3	3
5	5

Actuator part number

(Except cable specifications and actuator options)
Example: Enter [LEY16B-100] for LEY16B-100B-R16N1

∗ **When placing an order for the controller with an actuator, this part number is not necessary.**

The controller is sold as single unit after the compatible actuator is set.

Confirm that the combination of the controller and the actuator is correct.

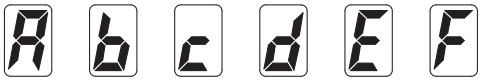
∗ Refer to the operation manual for using the products. Please download it via our website. http://www.smcworld.com

Specifications

Basic Specifications

Item	LECP1
Compatible motor	Step motor (Servo/24 VDC)
Power supply Note 1)	Power supply voltage: 24 VDC ±10% Max. current consumption: 3A (Peak 5A) Note 2) [Including the motor drive power, control power supply, stop, lock release]
Parallel input	6 inputs (Photo-coupler isolation)
Parallel output	6 outputs (Photo-coupler isolation)
Stop points	14 points (Position number 1 to 14(E))
Compatible encoder	Incremental A/B phase (800 pulse/rotation)
Serial communication	RS485 (Modbus protocol compliant)
Memory	EEPROM
LED indicator	LED (Green/Red) one of each
7-segment LED display Note 3)	1 digit, 7-segment display (red) Figures are expressed in hexadecimal (“10” to “15” in decimal number are expressed as “A” to “F”)
Lock control	Forced-lock release terminal Note 4)
Cable length [m]	I/O cable: 5 or less Actuator cable: 20 or less
Cooling system	Natural air cooling
Operating temperature range	32 to 104°F (0 to 40°C) (No freezing)
Operating humidity range [%RH]	90 or less (No condensation)
Storage temperature range	14 to 140°F (–10 to 60°C) (No freezing)
Storage humidity range [%RH]	90 or less (No condensation)
Insulation resistance [MΩ]	Between the housing (radiation fin) and SG terminal 50 (500 VDC)
Weight	4.59 oz. (130 g)

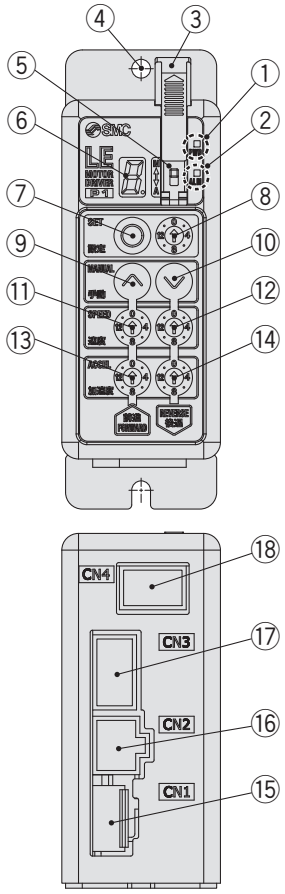
Note 1) Do not use the power supply of “inrush current prevention type” for the controller input power supply.
Note 2) The power consumption changes depending on the actuator model. Refer to the each actuator’s operation manual etc. for details.
Note 3) “10” to “15” in decimal number are displayed as follows in the 7-segment LED.



Decimal display	10	11	12	13	14	15
Hexadecimal display	A	b	c	d	E	F

Note 4) Applicable to non-magnetizing lock.

Details of The Controller



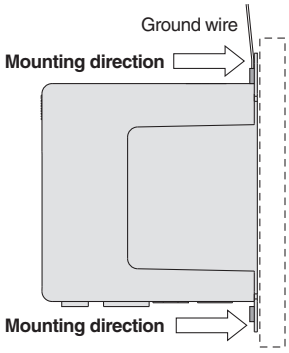
No.	Display	Description	Details
①	**PWR**	Power supply LED	Power supply ON/servo ON :Green turns on Power supply ON/servo OFF :Green flashes
②	**ALM**	Alarm LED	With alarm : Red turns on Parameter setting : Red flashes
③	—	Cover	Change and protection of the mode SW (Close the cover after changing SW)
④	—	FG	Frame ground (Tighten the bolt with the nut when mounting the controller. Connect the ground wire.)
⑤	—	Mode swith	Switch the mode between manual and auto.
⑥	—	7-segment LED	Stop position, the value set by ⑧ and alarm information are displayed.
⑦	**SET**	Set button	Decide the settings or drive operation in Manual mode.
⑧	—	Position selecting switch	Assign the position to drive (1 to 14), and the origin position (15).
⑨	**MANUAL**	Manual forward button	Perform forward jog and inching.
⑩		Manual reverse button	Perform reverse jog and inching.
⑪	**SPEED**	Forward speed switch	16 forward speeds are available.
⑫		Reverse speed switch	16 reverse speeds are available.
⑬	**ACCEL**	Forward acceleration switch	16 forward acceleration steps are available.
⑭		Reverse acceleration switch	16 reverse acceleration steps are available.
⑮	**CN1**	Power supply connector	Connect the power supply cable.
⑯	**CN2**	Motor connector	Connect the motor connector.
⑰	**CN3**	Encoder connector	Connect the encoder connector.
⑱	**CN4**	I/O connector	Connect I/O cable.

How to Mount

Controller mounting shown below.

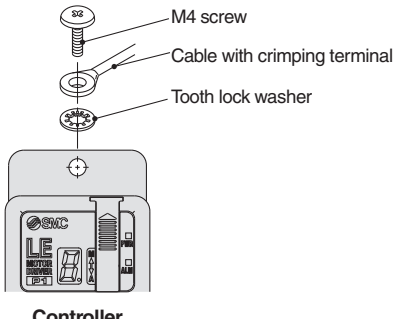
1. Mounting screw (LECP1□□-□)

(Installation with two M4 screws)



2. Grounding

Tighten the bolt with the nut when mounting the ground wire as shown below.



Controller

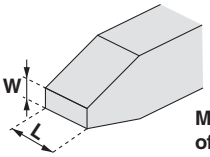
⚠Caution

- M4 screws, cable with crimping terminal and tooth lock washer are not included. Be sure to carry out grounding earth in order to ensure the noise tolerance.
- Use a watchmaker's screwdriver of the size shown below when changing position switch ⑧ and the set value of the speed/accele ration switch ⑪ to ⑭.

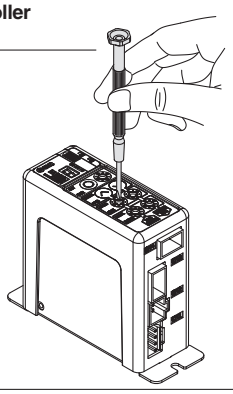
Size

End width **L** :2.0 to 2.4 [mm]

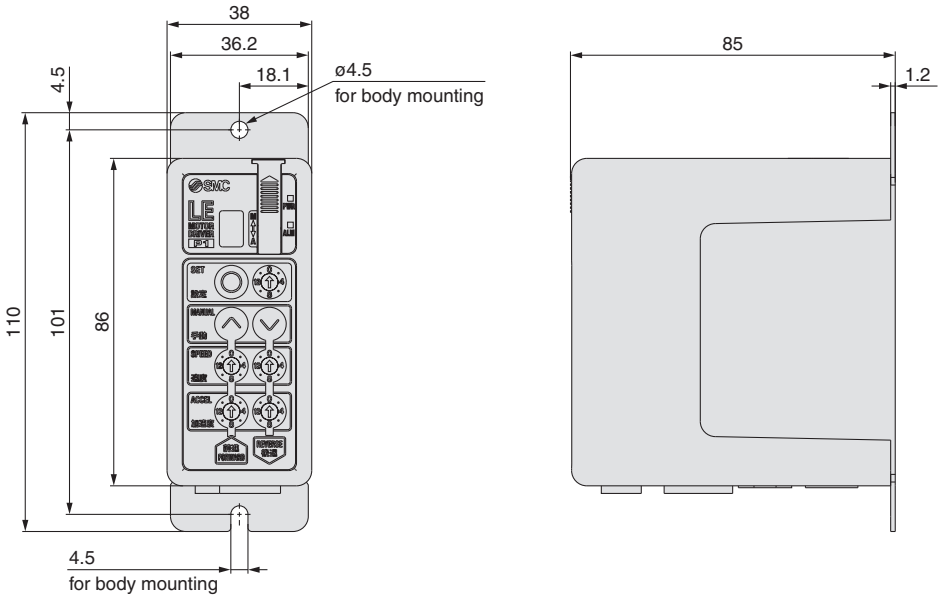
End thickness **W** :0.5 to 0.6 [mm]

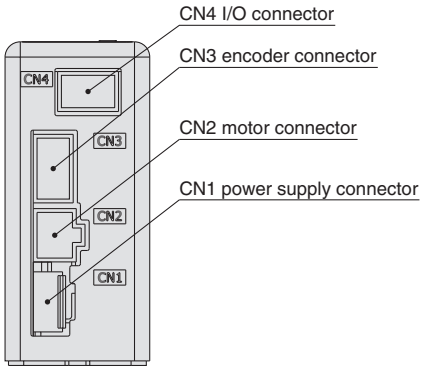


Magnified view of the end of the screwdriver



Dimensions


38
36.2
18.1
ø4.5
for body mounting
4.5
110
101
86
4.5
for body mounting
85
1.2


CN4 I/O connector
CN3 encoder connector
CN2 motor connector
CN1 power supply connector
CN4
CN3
CN2
CN1

Wiring Example 1

Power Supply Connector: CN1

* When you connect a CN1 power supply connector, please use the power supply cable (LEC-CK1-1).
* Power supply cable (LEC-CK1-1) is an accessory.

CN1 Power Supply Connector Terminal for LECP1

Terminal name	Cable color	Function	Function details
0V	Blue	Common supply (–)	M24V terminal/C24V terminal/BK RLS terminal are common (–).
M24V	White	Motor power supply (+)	This is the motor power supply (+) that is supplied to the controller.
C24V	Brown	Control power supply (+)	This is the control power supply (+) that is supplied to the controller.
BK RLS	Black	Lock release (+)	This is the input (+) that releases the lock.

Power supply cable for LECP1 (LEC-CK1-1)

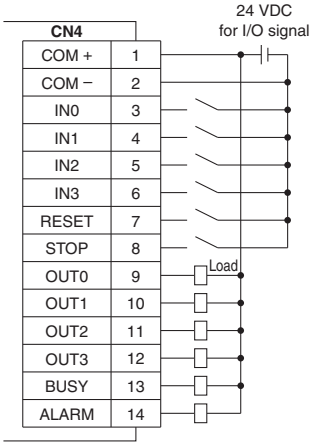


Wiring Example 2

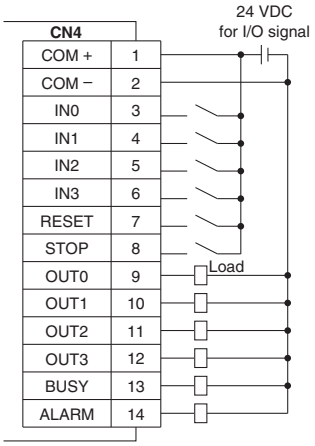
Parallel I/O Connector: CN4

* When you connect a PLC, etc., to the CN4 parallel I/O connector, please use the I/O cable (LEC-CK4-□).
* The wiring should be changed depending on the type of the parallel I/O (NPN or PNP). Please wire referring to the following diagram.

■NPN



■PNP



Input Signal

Name	Contents
COM+	Connects the power supply 24 V for input/output signal
COM–	Connects the power supply 0 V for input/output signal
IN0 to IN3	• Instruction to drive (input as a combination of IN0 to IN3) • Instruction to return to the origin position (IN0 to IN3 all ON simultaneously) Example - (instruction to drive for position no. 5) IN3: OFF, IN2: ON, IN1: OFF, IN0: ON
RESET	Alarm reset and operation interruption During operation : deceleration stop from position at which signal is input (servo ON maintained) While alarm is active : alarm reset
STOP	Instruction to stop (after maximum deceleration stop, servo OFF)

Output Signal

Name	Contents
OUT0 to OUT3	Turns on when the positioning or pushing is completed. (Output is instructed in the combination of OUT0 to 3.) Example - (operation complete for position no. 3) OUT3: OFF, OUT2: OFF, OUT1: ON, OUT0: ON
BUSY	Outputs when the actuator is moving
*ALARM Note)	Not output when alarm is active or servo OFF

Note) These signals are output when the power supply of the controller is ON. (N.C.)

Input Signal [IN0 - IN3] Position Number Chart ○: OFF ●: ON

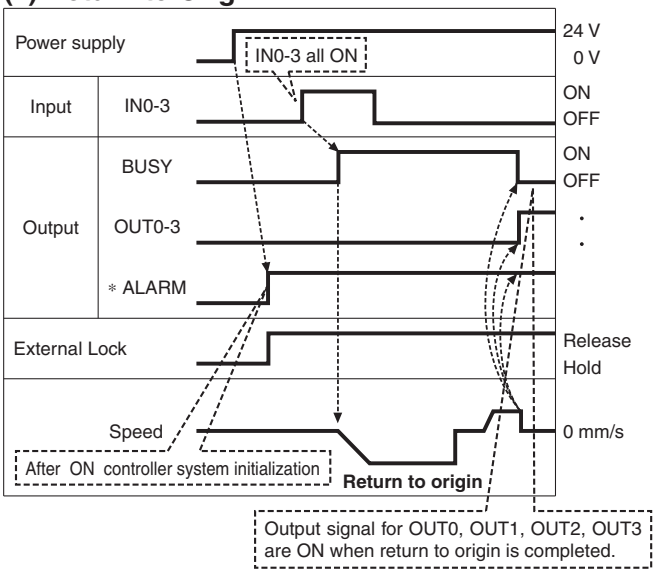
Position number	IN3	IN2	IN1	IN0
1	○	○	○	●
2	○	○	●	○
3	○	○	●	●
4	○	●	○	○
5	○	●	○	●
6	○	●	●	○
7	○	●	●	●
8	●	○	○	○
9	●	○	○	●
10 (A)	●	○	●	○
11 (B)	●	○	●	●
12 (C)	●	●	○	○
13 (D)	●	●	○	●
14 (E)	●	●	●	○
Retun to origin	●	●	●	●

Output Signal [OUT0 - OUT3] Position Number Chart ○: OFF ●: ON

Position number	OUT3	OUT2	OUT1	OUT0
1	○	○	○	●
2	○	○	●	○
3	○	○	●	●
4	○	●	○	○
5	○	●	○	●
6	○	●	●	○
7	○	●	●	●
8	●	○	○	○
9	●	○	○	●
10 (A)	●	○	●	○
11 (B)	●	○	●	●
12 (C)	●	●	○	○
13 (D)	●	●	○	●
14 (E)	●	●	●	○
Retun to origin	●	●	●	●

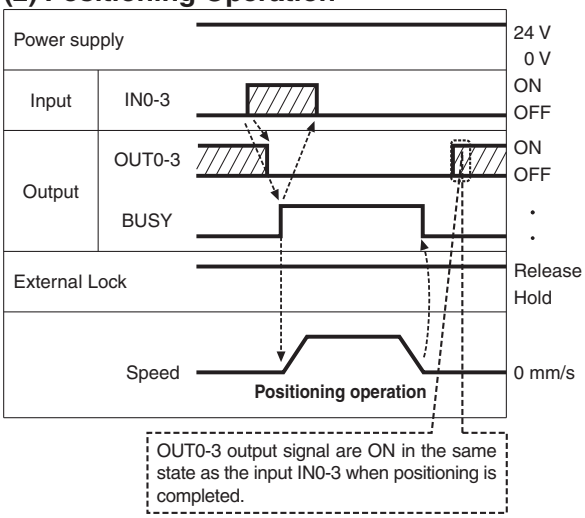
Signal Timing

(1) Return to Origin

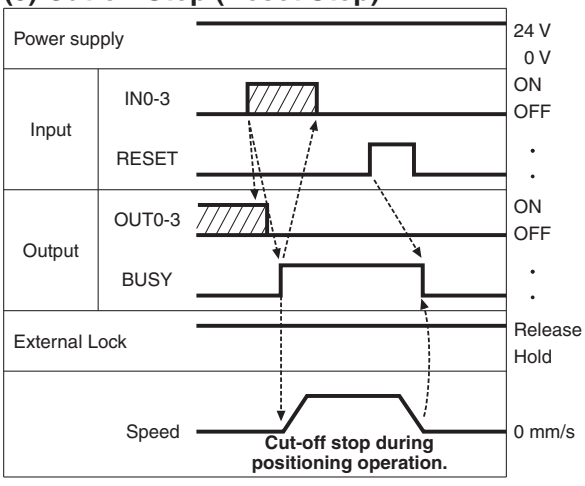


∗ "∗ALARM" is expressed as negative-logic circuit.

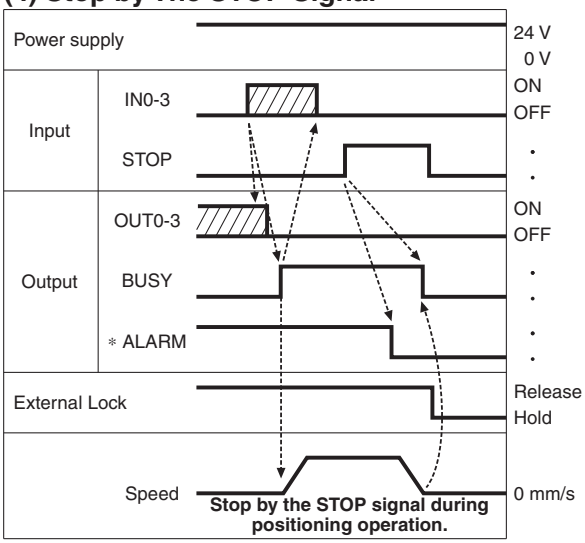
(2) Positioning Operation



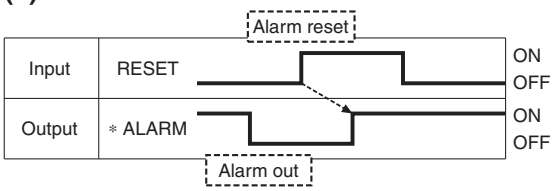
(3) Cut-off Stop (Reset Stop)



(4) Stop by The STOP Signal



(5) Alarm Reset



∗ "∗ALARM" is expressed as negative-logic circuit.

Options: Actuator Cable

[Robotic cable for step motor (Servo/24 VDC), standard cable]

LE – CP – 1 – ☐

Cable length (L)[m]

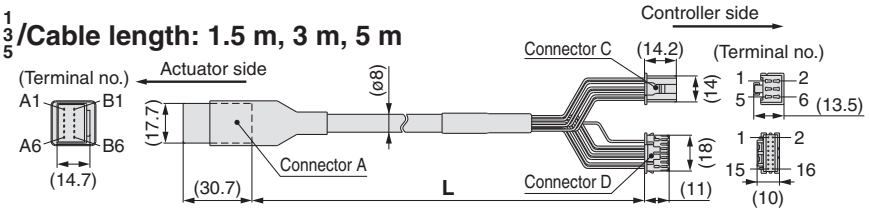
1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

* Produced upon receipt of order (Robotic cable only)

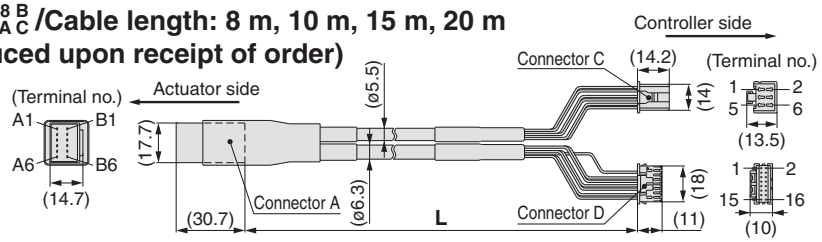
Cable type

Nil	Robotic cable (Flexible cable)
S	Standard cable

LE-CP-$\begin{smallmatrix}1\\3\\5\end{smallmatrix}$/Cable length: 1.5 m, 3 m, 5 m



LE-CP-$\begin{smallmatrix}8\\A\end{smallmatrix}\begin{smallmatrix}B\\C\end{smallmatrix}$/Cable length: 8 m, 10 m, 15 m, 20 m
(* Produced upon receipt of order)



Circuit	Connector A terminal no.
A	B-1
$\overline{A}$	A-1
B	B-2
$\overline{B}$	A-2
COM-A/COM	B-3
COM-B/–	A-3
Vcc	B-4
GND	A-4
$\overline{A}$	B-5
A	A-5
$\overline{B}$	B-6
B	A-6

Shield

Cable color	Connector C terminal no.
Brown	2
Red	1
Orange	6
Yellow	5
Green	3
Blue	4

Cable color	Connector D terminal no.
Brown	12
Black	13
Red	7
Black	6
Orange	9
Black	8
—	3

[Robotic cable with lock and sensor for step motor (Servo/24 VDC), standard cable]

LE – CP – 1 – B – ☐

Cable length (L)[m]

1	1.5
3	3
5	5
8	8*
A	10*
B	15*
C	20*

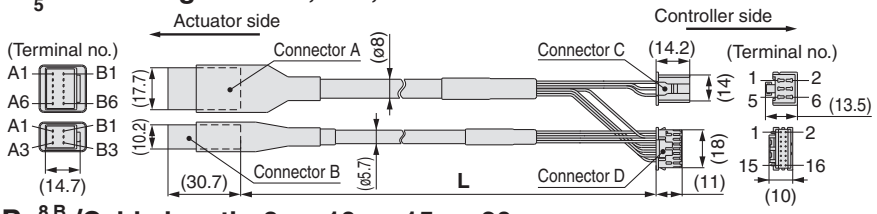
* Produced upon receipt of order (Robotic cable only)

With lock and sensor

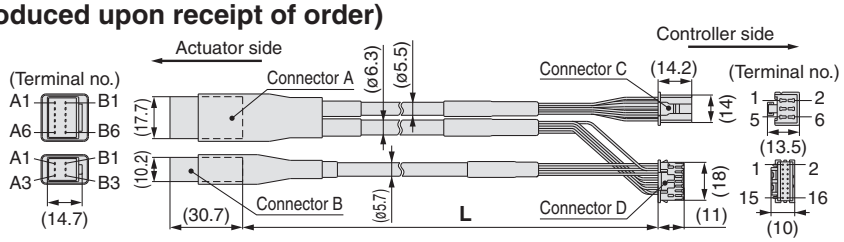
Cable type

Nil	Robotic cable (Flexible cable)
S	Standard cable

LE-CP-$\begin{smallmatrix}1\\3\\5\end{smallmatrix}$/Cable length: 1.5 m, 3 m, 5 m



LE-CP-$\begin{smallmatrix}8\\A\end{smallmatrix}\begin{smallmatrix}B\\C\end{smallmatrix}$/Cable length: 8 m, 10 m, 15 m, 20 m
(* Produced upon receipt of order)



Circuit	Connector A terminal no.
A	B-1
$\overline{A}$	A-1
B	B-2
$\overline{B}$	A-2
COM-A/COM	B-3
COM-B/–	A-3
Vcc	B-4
GND	A-4
$\overline{A}$	B-5
A	A-5
$\overline{B}$	B-6
B	A-6

Shield

Cable color	Connector C terminal no.
Brown	2
Red	1
Orange	6
Yellow	5
Green	3
Blue	4

Cable color	Connector D terminal no.
Brown	12
Black	13
Red	7
Black	6
Orange	9
Black	8
—	3

Circuit	Connector B terminal no.
Lock (+)	B-1
Lock (–)	A-1
Sensor (+) Note)	B-3
Sensor (–) Note)	A-3

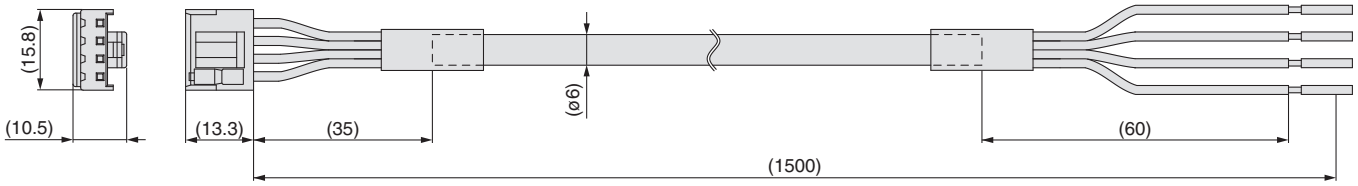
Red	4
Black	5
Brown	1
Blue	2

Note) This is not used for the LEY series.

Options

[Power supply cable]

LEC − CK1 − 1



Terminal name	Covered color	Function
0V	Blue	Common supply (–)
M24V	White	Motor power supply (+)
C24V	Brown	Control power supply (+)
BK RLS	Black	Lock release (+)

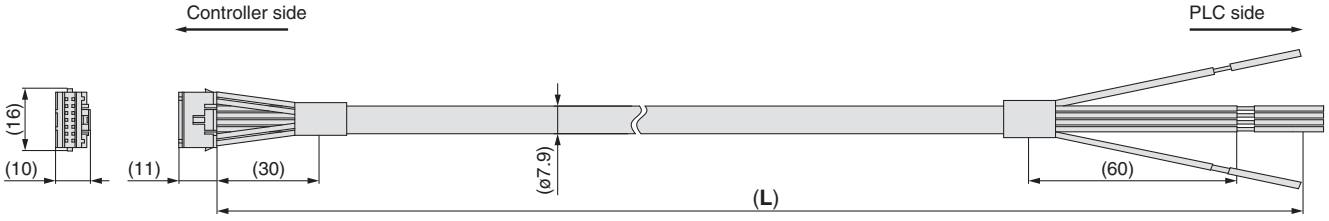
∗ Conductor size: AWG20

[I/O cable]

LEC − CK4 − □

Cable length (L)[m]

1	1.5
3	3
5	5



Terminal no.	Insulation color	Dot mark	Dot color	Function
1	Light brown	■	Black	COM +
2	Light brown	■	Red	COM −
3	Yellow	■	Black	OUT0
4	Yellow	■	Red	OUT1
5	Light green	■	Black	OUT2
6	Light green	■	Red	OUT3
7	Gray	■	Black	BUSY
8	Gray	■	Red	ALARM
9	White	■	Black	IN0
10	White	■	Red	IN1
11	Light brown	■ ■	Black	IN2
12	Light brown	■ ■	Red	IN3
13	Yellow	■ ■	Black	RESET
14	Yellow	■ ■	Red	STOP

∗ Conductor size: AWG26

∗ Parallel I/O signal is valid in auto mode. While the test function operates at manual mode, only the output is valid.

Model Selection

AC Servo Motor (100/200 W)



Selection Procedure

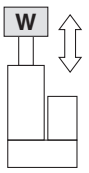
Positioning Control Selection Procedure

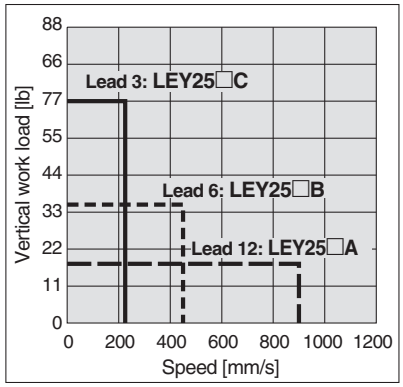
Step 1 Confirm the work load – speed. (Vertical transfer) → **Step 2** Confirm the cycle time.

Selection Example

Operating conditions

- Workpiece mass: 35.3 lbs (16 kg) • Speed: 300 [mm/s]
- Acceleration/Deceleration: 5000 [mm/s²]
- Stroke: 300 [mm]
- Workpiece mounting condition: Vertical upward downward transfer





<Speed–Vertical work load graph> (LEY25□)

Step 1 **Confirmation of work load–speed <Speed–Vertical work load graph>**

Select the target model based on the workpiece mass and speed with reference to the <Speed–Vertical work load graph>.
Selection example) The **LEY25B** is temporarily selected based on the graph shown on the right side.

* It is necessary to mount a guide outside the actuator when using for horizontal transfer. When selecting the target model, please refer to the horizontal work load and cautions specified in [Specifications] on page 63.

Step 2 **Confirmation of cycle time**

Calculate the cycle time using the following calculation method.

Cycle time:
T can be found from the following equation.

$T = T1 + T2 + T3 + T4$ [s]

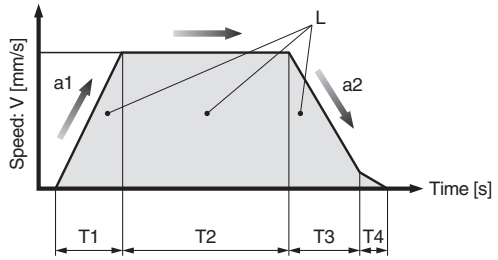
- T1:
  Acceleration time and T3: Deceleration time can be obtained by the following equation.
  $T1 = V/a1$ [s] $T3 = V/a2$ [s]
- T2:
  Constant speed time can be found from the following equation.
  $$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} \text{ [s]}$$
- T4:
  Settling time varies depending on the conditions such as motor types, load and in positioning of the step data. Therefore, please calculate the settling time with reference to the following value.
  $T4 = 0.05$ [s]

Calculation example)
T1 to T4 can be calculated as follows.
$T1 = V/a1 = 300/5000 = 0.06$ [s], $T3 = V/a2 = 300/5000 = 0.06$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{300 - 0.5 \cdot 300 \cdot (0.06 + 0.06)}{300} = 0.94 \text{ [s]}$$

$T4 = 0.05$ [s]

Therefore, the cycle time can be obtained as follows.
$T = T1 + T2 + T3 + T4 = 0.06 + 0.94 + 0.06 + 0.05 =$ **1.11 [s]**



L : Stroke [mm] ··· (Operating condition)
V : Speed [mm/s] ··· (Operating condition)
a1: Acceleration [mm/s²] ··· (Operating condition)
a2: Deceleration [mm/s²] ··· (Operating condition)

T1: Acceleration time [s]
Time until reaching the set speed
T2: Constant speed time [s]
Time while the actuator is operating at a constant speed
T3: Deceleration time [s]
Time from the beginning of the constant speed operation to stop
T4: Settling time [s]
Time until in position is completed

Based on the above calculation result, the LEY25B-300 is selected.

Selection Procedure

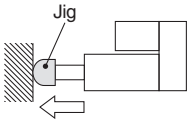
Pushing Control Selection Procedure

Step 1 Confirm the pushing force. → **Step 2** Confirm the lateral load on the rod end.

Selection Example

Operating conditions

- Mounting condition: Horizontal (pushing)
- Jig weight: 1.1 lbs (0.5 kg)
- Pushing force: 45 lbf (200 N)
- Speed: 100 [mm/s]
- Stroke: 300 [mm]



Step 1 **Confirmation of pushing force <Force conversion graph>**

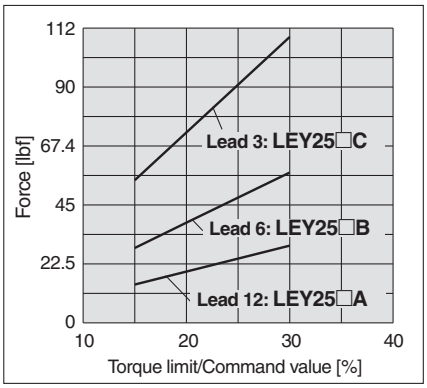
Select the target model based on the set value of pushing force and pushing force with reference to the <Force conversion graph>.

Selection example)

Based on the graph shown on the right side,

- Set value of pushing force: 24 [%]
- Pushing force: 45 lbf (200 N)

Therefore, the **LEY25B** is temporarily selected.



<Force conversion graph>
(LEY25□)

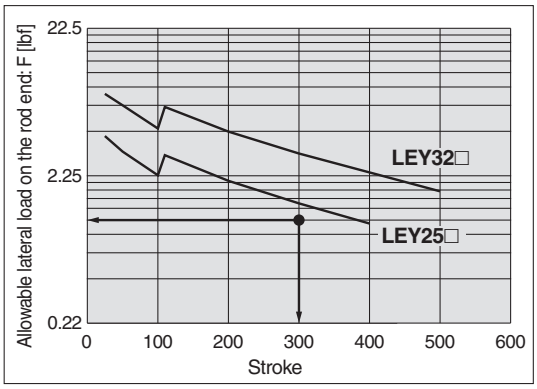
Step 2 **Confirmation of the lateral load on the rod end**
<Graph of allowable lateral load on the rod end>

Confirm the allowable lateral load on the rod end of the actuator: LEY16□, which has been selected temporarily with reference to the <Graph of allowable lateral load on the rod end>.

Selection example)

Based on the graph shown on the right side,

- Jig weight: 0.55 lbs (0.2 kg) ≈ 0.45 lbf (2 N)
- Since the product stroke is 200 [mm], the lateral load is in the allowable range.

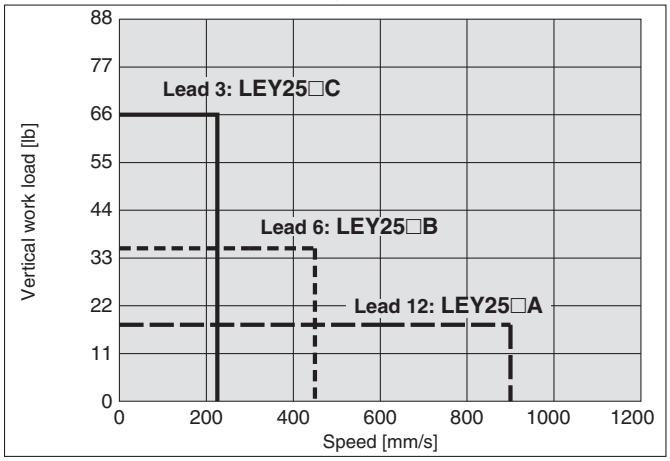


<Graph of allowable lateral load on the rod end>

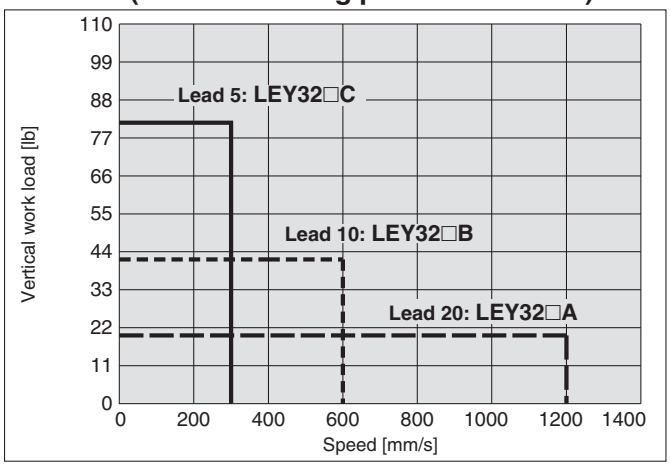
Based on the above calculation result, the LEY25B-300 is selected.

Speed–Vertical Work Load Graph

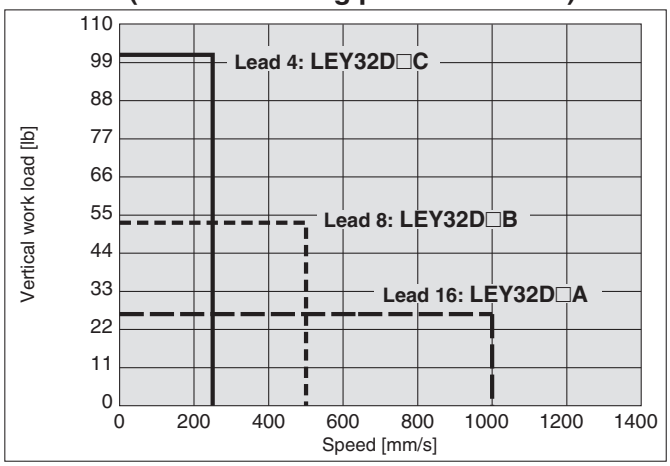
LEY25□ (Motor mounting position: Parallel/In-line)



LEY32□ (Motor mounting position: Parallel)



LEY32D (Motor mounting position: In-line)



∗ When transferring load mass vertically, "Regeneration option" is required under the work load conditions shown below. Order "Regeneration option" separately.

Required Conditions for "Regeneration Option"

Model	LEY25S$^{2}_{6}$/LEY25DS$^{2}_{6}$			LEY32S$^{3}_{7}$ (Parallel)			LEY32DS$^{3}_{7}$ (In-line)		
Lead	A	B	C	A	B	C	A	B	C
Vertical work load (lb)	17.6	35.3	66.1	19.8	41.9	81.6	26.5	52.9	101.4
Vertical work load conditions (lb)	Required Note)			Not required		44 or more	Not required	44 or more	

Note) For vertical transfer, "Regeneration option" is required regardless of load mass.

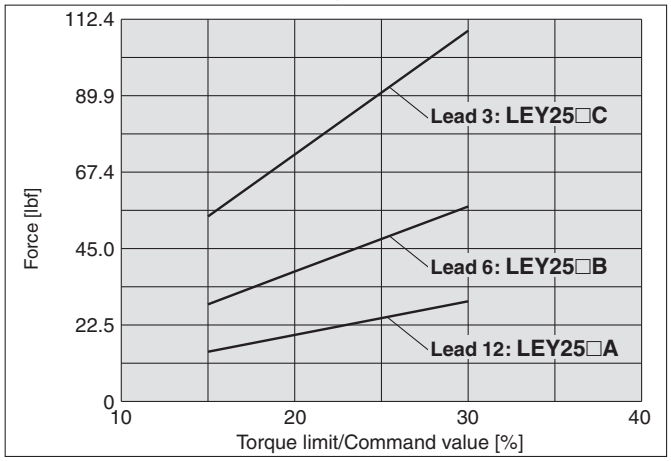
Allowable Stroke Speed

[mm/s]

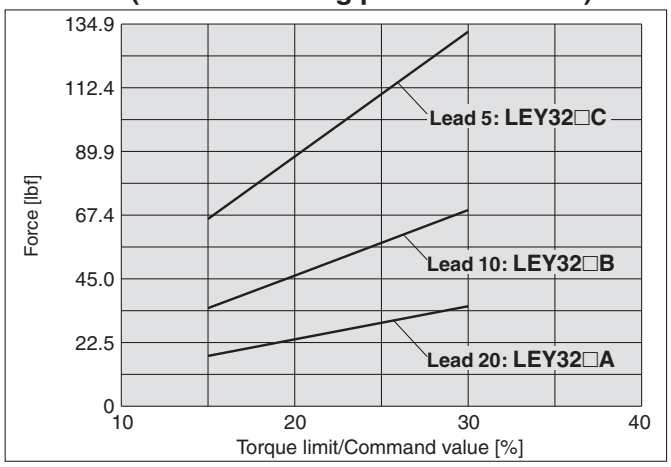
Model	AC servo motor	Lead		Stroke [mm]										
		Symbol	[mm]	30	50	100	150	200	250	300	350	400	450	500
LEY25□ (Motor mounting position: Parallel/In-line)	100 W /□40	**A**	12	900							600			
		B	6	450							300			
		C	3	225							150			
		(Motor rotation speed)		(4500 rpm)							(3000 rpm)			
LEY32□ (Motor mounting position: Parallel)	200 W /□60	**A**	20	1200									800	
		B	10	600									400	
		C	5	300									200	
		(Motor rotation speed)		(3600 rpm)									(2400 rpm)	
LEY32D (Motor mounting position: In-line)	200 W /□60	**A**	16	1000									640	
		B	8	500									320	
		C	4	250									160	
		(Motor rotation speed)		(3750 rpm)									(2400 rpm)	

Force Conversion Graph

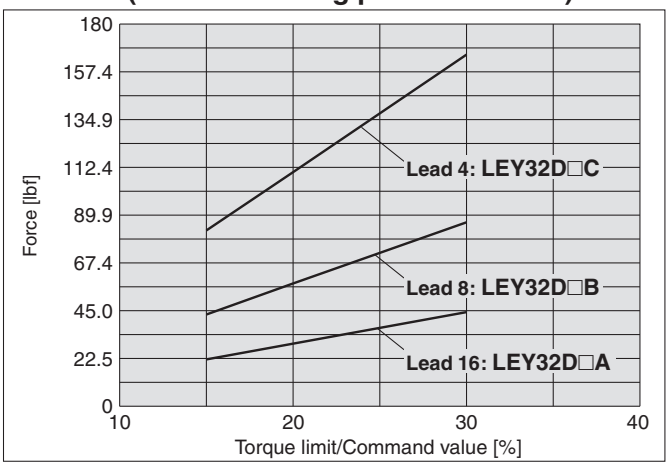
LEY25□ (Motor mounting position: Parallel/In-line)



LEY32□ (Motor mounting position: Parallel)

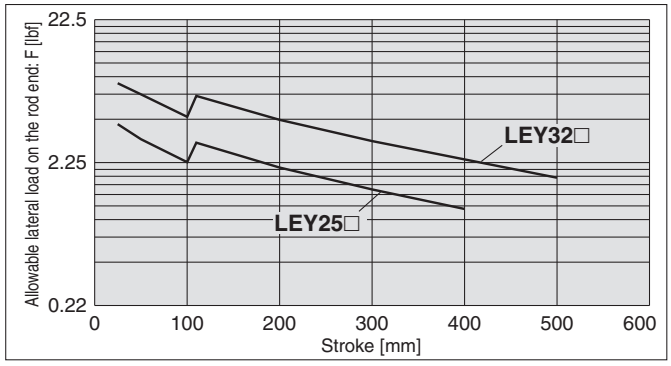


LEY32D (Motor mounting position: In-line)

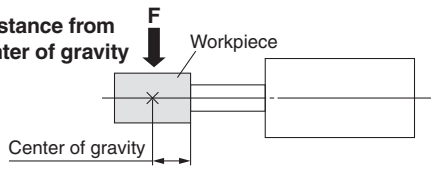


∗1 Motor type: When limiting torque with incremental encoder, parameter No. PC12/the value of internal torque command should be set 30% or less.
∗2 Motor type: When limiting torque with absolute encoder, parameter No. PC13/the value of analog torque maximum output command should be set 30% or less.

Allowable Lateral Load on the Rod End (Guide)



[Stroke]
= [Product stroke] + [Distance from the rod end to the center of gravity of the workpiece]

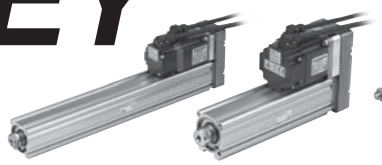


Electric Actuator/Rod Type

AC Servo Motor (100/200 W)

Series LEY

LEY25, 32



Motor mounting position: Parallel



Motor mounting position: In-line

How to Order

LEY 25 ❶ S2 ❸ B ❹ – 100 ❺ ❻ ❼ ❽ – S ❾ 2 ❿ A1 ⓫ ⓬

❶ Size

25
32

❷ Motor mounting position

Nil	Top mounting type
R	Right side parallel type
L	Left side parallel type
D	In-line type

❸ Motor type

Symbol	Type	Output [W]	Actuator size	Compatible controllers
S2*	AC servo motor (Incremental encoder)	100	25	LECSA□-S1
S3		200	32	LECSA□-S3
S6*	AC servo motor (Absolute encoder)	100	25	LECSB□-S5
S7		200	32	LECSB□-S6

* Motor types: For S2 and S6 only, the compatible controller part number suffix. will be S1 and S5.

❹ Lead [mm]

Symbol	LEY25	LEY32 Note 1)
A	12	16(20)
B	6	8(10)
C	3	4(5)

Note 1) The value in ( ) is size 32 when selecting [Motor mounting position: Top mounting type or right/left side parallel type]. (Equivalent lead including pulley ratio [1.25:1])

* **Applicable stroke table**

Model \ Stroke (mm)	30	50	100	150	200	250	300	350	400	450	500	Manufacturable stroke range
LEY25	●	●	●	●	●	●	●	●	●	—	—	15 to 400
LEY32	●	●	●	●	●	●	●	●	●	●	●	20 to 500

Note) Consult with SMC for the manufacture of intermediate strokes.

Compatible controllers

Type	Pulse input type (For incremental encoder)	Pulse input type (For absolute encoder)
Series	LECSA1, LECSA2	LECSB1, LECSB2
Feature(s)	• 17-bit incremental encoder compatible • Positioning function (Max.7 inputs) • Servo adjustment switch	• 18-bit absolute encoder compatible • With RS422 communication port (compatible with Mitsubishi Electric's touch panel) • Analog input for speed and torque command
Compatible motor	AC servo motor (Incremental encoder) S2, S3	AC servo motor (Adsolute encoder) S6, S7
Power supply voltage	100 to 120 VAC (50/60 Hz) 200 to 230 VAC (50/60 Hz)	100 to 120 VAC (50/60 Hz) 200 to 230 VAC (50/60 Hz)
Reference page	Page 73	Page 73

❺ Stroke [mm]

30	30
to	to
500	500

* Refer to the table below for details.

❻ Motor option

Nil	Without option
B	With lock Note 2)

Note 2) For 30 stroke or less of size 25 with [Motor mounting position: Top mounting type or right/left side parallel type], when [With lock] is selected, the motor projects through the end of the body. Select after confirming interface with such as work pieces.

❼ Rod end thread

Nil	Rod end female thread
M	Rod end male thread (1 rod end nut is included.)

❽ Mounting

Nil	Ends tapped (Standard)
U	Body bottom tapped
L	Foot
F	Rod flange
G	Head flange
D	Double clevis

* When motor mounting position [In-line type] is selected, [Foot], [Head flange] or [Double clevis] cannot be selected.
* Mounting bracket is shipped together, (but not assembled).
* When mounting styles are [Rod flange], [Head flange] or [Ends tapped] with horizontal cantilever, use it within the following stroke.
  · LEY25: 200 or less · LEY32: 100 or less
* In case of [Double clevis], use the actuator within the following stroke limit.
  · LEY25: 200 or less · LEY32: 200 or less
* "G" Head flange is not available for LEY32.

❾ Actuator cable type Note 3)

Nil	Without cable
S	Standard cable
R	Robot cable (Flexible cable)

Note 3) Motor cable and encoder cable are included. (Lock cable is also included if motor option "With lock" is selected.)

❿ Cable length Note 4) [m]

Nil	Without cable
2	2
5	5
A	10

Note 4) Common to encoder/motor/lock cable

⓫ Controller type

	Compatible controllers	Power supply voltage
Nil	Without controller	
A1	LECSA1	100 V to 120 V
A2	LECSA2	200 V to 230 V
B1	LECSB1	100 V to 120 V
B2	LECSB2	200 V to 230 V

⓬ I/O connector

Nil	Without connector
H	With connector

Specifications

Model				LEY25S$^{2}_{6}$(Parallel)/LEY25DS$^{2}_{6}$(In-line)			LEY32S$^{3}_{7}$ (Parallel)			LEY32DS$^{3}_{7}$ (In-line)		
Actuator specifications	Stroke [mm] Note 1)			30, 50, 100, 150, 200, 250, 300, 350, 400			30, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500			30, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500		
	Work load [lb]	Horizontal Note 2)		39.7	110	110	66.1	132.3	132.3	66.1	132.3	132.3
		Vertical		17.6	35.3	66.1	19.8	41.9	81.6	26.5	52.9	101.4
	Pushing force [lbf] Note 3) (Set value: 15 to 30%)			14.6 to 29.4	28.6 to 57.3	54.4 to 109	17.8 to 35.3	34.6 to 69.2	66.8 to 132.2	22.0 to 44.3	43.2 to 86.6	82.7 to 165.5
	Max. speed Note 4) [mm/s]	Stroke range	to 300	900	450	225	1200	600	300	1000	500	250
			305 to 400	600	300	150						
			405 to 500	—	—	—	800	400	200	640	320	160
	Pushing speed [mm/s] Note 5)			35 or less			30 or less			30 or less		
	Max. acceleration/deceleration [mm/s^2]			5,000			5,000					
	Positioning repeatability [mm]			±0.02			±0.02					
	Lead [mm] (including pulley ratio)			12	6	3	20	10	5	16	8	4
	Impact/Vibration resistance [m/s^2] Note 6)			50/20			50/20					
	Actuation type			Ball screw + Belt [1:1]/Ball screw			Ball screw + Belt [1.25:1]			Ball screw		
	Guide type			Sliding bushing (Piston rod)			Sliding bushing (Piston rod)					
	Operating temp. range			41 to 101°F (5 to 40°C)			41 to 101°F (5 to 40°C)					
	Operating humidity range [%RH]			90 or less (No condensation)			90 or less (No condensation)					
Electric specifications	Motor size			100 W/□40			200 W/□60					
	Motor type			AC servo motor (100/200 VAC)			AC servo motor (100/200 VAC)					
	Encoder			Motor type S2, S3: Incremental 17-bit encoder (Resolution: 131072 p/rev) Motor type S6, S7: Absolute 18-bit encoder (Resolution: 262144 p/rev)								
Lock unit specifications	Type Note 7)			Non-magnetizing operation type								
	Holding force [lbf]			29.4	57.3	109	35.3	69.2	132.3	44.3	86.6	165.5
	Power consumption [W] at 68°F (20°C) Note 8)			6.3			7.9			7.9		
	Rated voltage [V]			24 VDC $^{0}_{-10\%}$								

Note 1) Consult with SMC for the manu facture of intermediate strokes other than those specified on the above.
Note 2) This is the maximum value for the horizontal work load (outside guide required). Actual work load depends on outside guide conditions. Please confirm using actual device.
Note 3) The force setting range for "Pushing operation" with the torque control mode etc. Set it referring to "Force Conversion Graph" on page 61.
Note 4) The allowable speed will change depending on the stroke.
Note 5) The allowable collision speed for "Pushing operation" with the torque control mode etc.
Note 6) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Note 7) Only when motor option "With lock" is selected.
Note 8) For an actuator with lock, add the power consumption for the lock.

Weight

Product Weight

(lb)

Series		LEY25S□ (Motor mounting position: Parallel)									LEY32S□ (Motor mounting position: Parallel)										
Stroke [mm]		30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Motor type	Incremental encoder	2.89	3.04	3.42	3.99	4.19	4.76	5.16	5.53	5.90	5.34	5.58	6.22	7.25	7.87	8.49	9.13	9.74	10.4	11.0	11.6
	Absolute encoder	3.02	3.17	3.55	4.12	4.52	4.89	5.29	5.67	6.06	5.20	5.45	6.08	7.12	7.74	8.36	8.99	9.61	10.2	10.8	11.5

Series		LEY25DS□ (Motor mounting position: In-line)									LEY32DS□ (Motor mounting position: In-line)										
Stroke [mm]		30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Motor type	Incremental encoder	2.95	3.11	3.48	4.06	4.45	4.88	5.22	5.60	6.0	5.38	5.62	6.26	7.3	7.91	8.53	9.17	9.79	10.4	11.0	11.6
	Absolute encoder	3.09	3.24	3.62	4.19	4.59	4.96	5.36	5.73	6.13	5.25	5.49	6.13	7.17	7.78	8.40	9.04	9.66	10.3	10.9	11.5

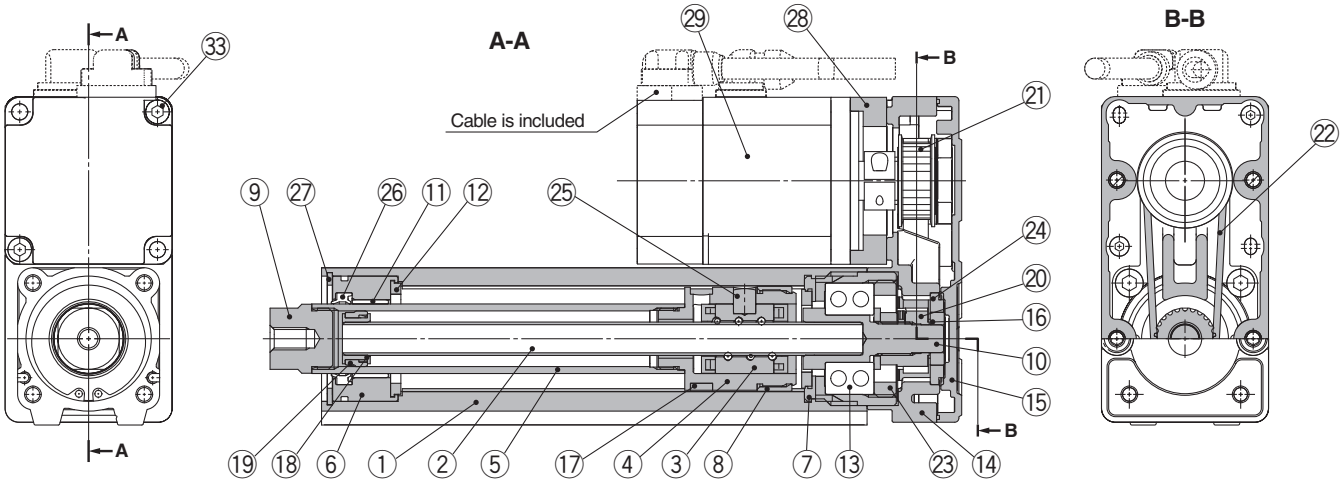
Additional Weight

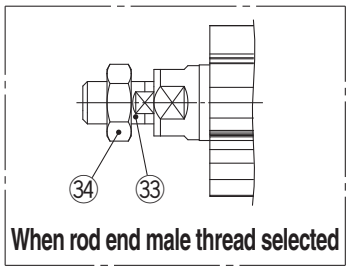
(lb)

Size		25	32
Lock	Incremental encoder	0.44	0.88
	Absolute encoder	0.66	1.46
Rod end male thread	Male thread	0.06	0.06
	Nut	0.04	0.04
Foot (2 sets including mounting bolts)		0.18	0.31
Rod flange (including mounting bolts)		0.37	0.44
Head flange (including mounting bolts)			
Double clevis (including pin, retaining ring and mounting bolts)		0.35	0.49

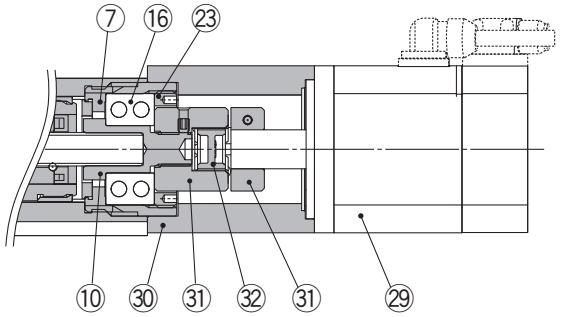
Construction

Motor top mounting type/LEY $^{25}_{32}$





In-line motor type/LEY $^{25}_{32}$D



Component Parts

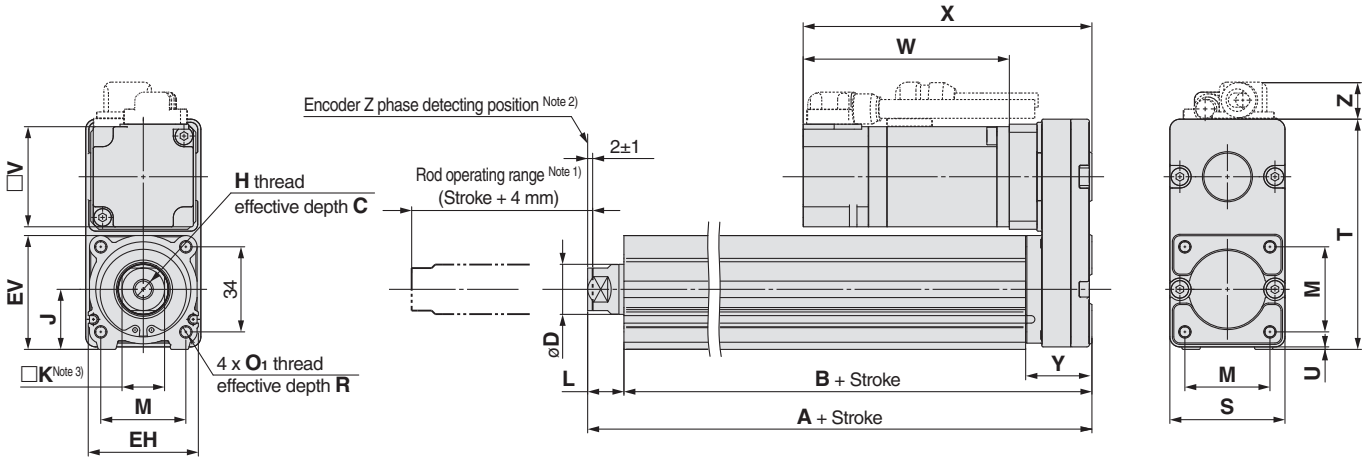
No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Ball screw shaft**	Alloy steel	
3	**Ball screw nut**	Resin/Alloy steel	
4	**Piston**	Aluminum alloy	
5	**Piston rod**	Stainless steel	Hard chrome anodized
6	**Rod cover**	Aluminum alloy	
7	**Housing**	Aluminum alloy	
8	**Rotation stopper**	POM	
9	**Socket**	Free cutting carbon steel	Nickel plated
10	**Connected shaft**	Free cutting carbon steel	Nickel plated
11	**Bushing**	Lead bronze cast	
12	**Bumper**	Urethane	
13	**Bearing**	—	
14	**Return box**	Aluminum die-cast	Coating
15	**Return plate**	Aluminum die-cast	Coating
16	**Bearing**	—	
17	**Magnet**	—	
18	**Wear ring holder**	Stainless steel	Stroke 101 mm or more
19	**Wear ring**	POM	Stroke 101 mm or more
20	**Pulley for screw shaft**	Aluminum alloy	

No.	Description	Material	Note
21	**Pulley for motor**	Aluminum alloy	
22	**Belt**	—	
23	**Bearing stopper**	Aluminum alloy	
24	**Bearing support**	Stainless steel	
25	**Parallel pin**	Stainless steel	
26	**Rod seal**	NBR	
27	**Retaining ring**	Steel for spring	
28	**Motor adapter**	Aluminum alloy	Coating
29	**Motor**	—	
30	**Motor block**	Aluminum alloy	Coating
31	**Hub**	Aluminum alloy	
32	**Spider**	Urethane	
33	**Socket (Male thread)**	Free cutting carbon steel	Nickel plated
34	**Nut**	Alloy steel	Zinc chromated

Replacement Parts (Motor parallel only)/Belt

No.	Size	Order no.
22	**25**	LE-D-2-2
	32	LE-D-2-4

Dimensions: Motor Parallel



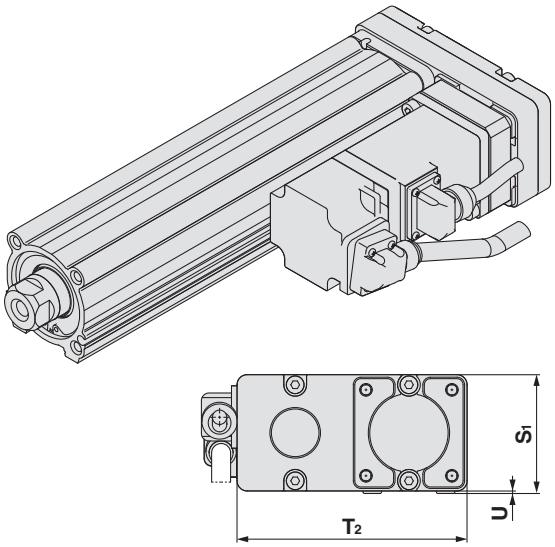
Note 1) Range within which the rod can move when it returns to origin. Make sure a workpiece mounted on the rod does not interfere with the work pieces and facilities around the rod.
Note 2) The Z phase first detecting position from the stroke end of the motor side.
Note 3) The direction of rod end width across flats (□K) differs depending on the products.

[mm]

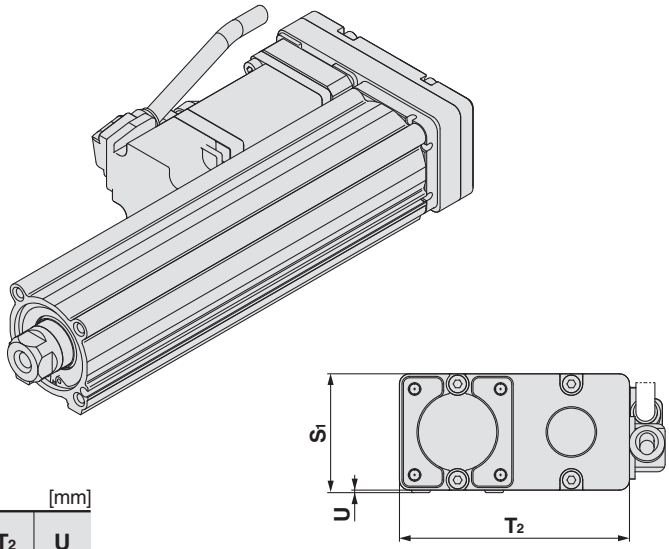
Size	Stroke range (mm)	A	B	C	D	EH	EV	H	J	K	L	M	O_1	R	S
25	15 to 100	130.5	116	13	20	44	45.5	M8 x 1.25	24	17	14.5	34	M5 x 0.8	8	46
	105 to 400	155.5	141												
32	20 to 100	148.5	130	13	25	51	56.5	M8 x 1.25	31	22	18.5	40	M6 x 1.0	10	60
	105 to 500	178.5	160												

Size	Stroke range (mm)	T	U	Y	V	Incremental encoder						Absolute encoder					
						Without lock			With lock			Without lock			With lock		
						W	X	Z	W	X	Z	W	X	Z	W	X	Z
25	15 to 100	92	1	26.5	40	87	120	14.1	123.9	156.9	15.8	82.4	115.4	14.1	123.5	156.5	15.8
	105 to 400																
32	20 to 100	118	1	34	60	88.2	128.2	17.1	116.8	156.8	17.1	76.6	116.6	17.1	116.1	156.1	17.1
	105 to 500																

Motor left side parallel type/LEY $\frac{25}{32}$L



Motor right side parallel type/LEY $\frac{25}{32}$R

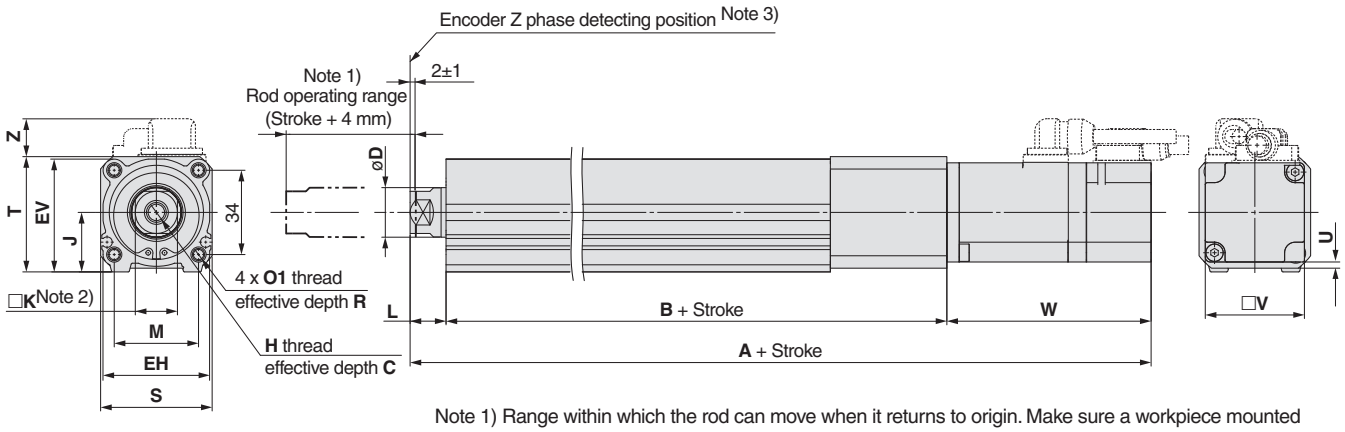


[mm]

Size	S_1	T_2	U
25	47	91	1
32	61	117	1

Note) When the motor is mounted on the left or right side in parallel, the auto switch groove on the side to which the motor is mounted is hidden.

Dimensions: In-line Motor



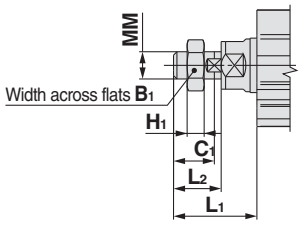
Note 1) Range within which the rod can move when it returns to origin. Make sure a workpiece mounted on the rod does not interfere with the work pieces and facilities around the rod.
Note 2) The direction of rod end width across flats (□K) differs depending on the products.
Note 3) The Z phase first detecting position from the stroke end of the motor side.

[mm]

Size	Stroke range (mm)	C	D	EH	EV	H	J	K	L	M	O_1	R	S	T	U
25	15 to 100	13	20	44	45.5	M8 x 1.25	24	17	14.5	34	M5 x 0.8	8	45	46.5	1.5
	105 to 400														
32	20 to 100	13	25	51	56.5	M8 x 1.25	31	22	18.5	40	M6 x 1.0	10	60	61	1
	105 to 500														

Size	Stroke range (mm)	B	V	Incremental encoder						Absolute encoder					
				Without lock			With lock			Without lock			With lock		
				A	W	Z	A	W	Z	A	W	Z	A	W	Z
25	15 to 100	136.5	40	238	87	14.6	274.9	123.9	16.3	233.4	82.4	14.6	274.5	123.5	16.3
	105 to 400	161.5		263			299.9			258.4			304.5		
32	20 to 100	156	60	262.7	88.2	17.1	291.3	116.8	17.1	251.1	76.6	17.1	290.6	116.1	17.1
	105 to 500	186		292.7			321.3			281.1			320.6		

End male thread/LEY $\begin{matrix}25\\32\end{matrix}$□□$\begin{matrix}A\\B\\C\end{matrix}$-□□M



∗ Refer to page 70 for details of the rod end nut and mounting bracket.
Note) Refer to the precautions "Handling" on page 69 when mounting end brackets such as knuckle joint or work pieces.

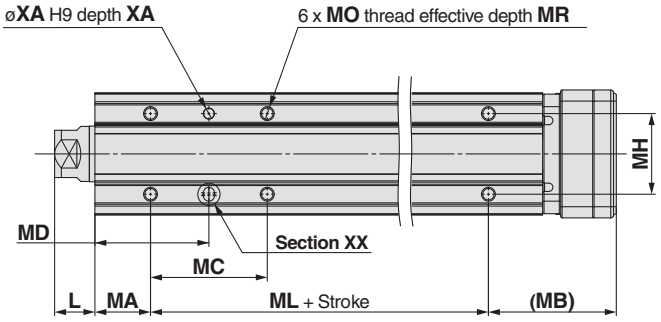
[mm]

Size	B_1	C_1	H_1	L_1	L_2	MM
25	22	20.5	8	38	23.5	M14 x 1.5
32	22	20.5	8	42.0	23.5	M14 x 1.5

∗ The L_1 measurement is when the unit is in the original position. At this position, 2 mm at the end.

Dimensions

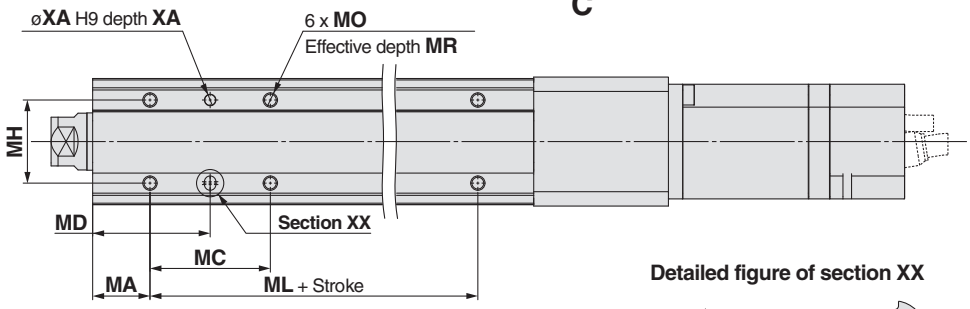
Body bottom tapped/Motor parallel/LEY 25/32 □□ A/B/C -□□□U



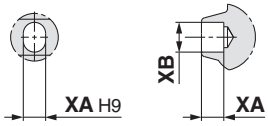
Body Bottom Tapped [mm]

Size	Stroke range (mm)	L	MA	MB	MC	MD	MH	ML
25	15 to 39	14.5	20	46	24	32	29	50
	40 to 100				42	41		
	101 to 124							75
	125 to 200				59	49.5		
	201 to 400				76	58		
32	20 to 39	18.5	25	55	22	36	30	50
	40 to 100				36	43		
	101 to 124							80
	125 to 200				53	51.5		
	201 to 500				70	60		

Body bottom tapped/In-line motor/LEY 25/32 D□ A/B/C -□□□U



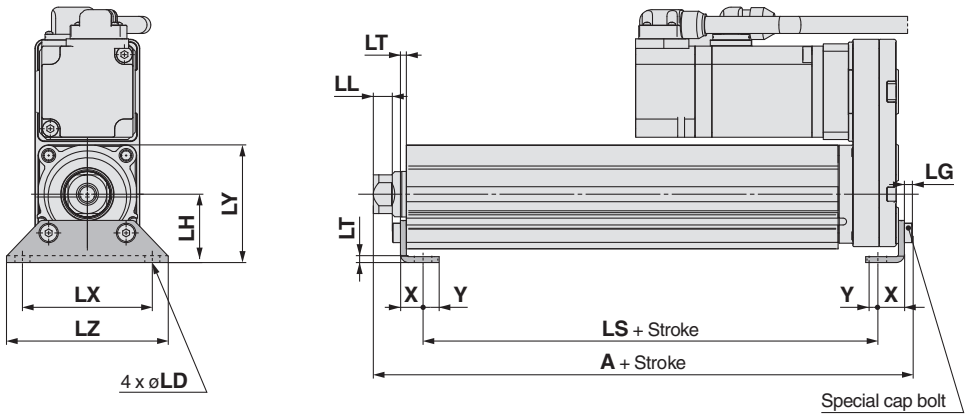
Detailed figure of section XX



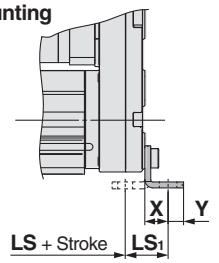
Size	Stroke range (mm)	MO	MR	XA	XB
25	15 to 39	M5 x 0.8	6.5	4	5
	40 to 100				
	101 to 124				
	125 to 200				
	201 to 400				
32	20 to 39	M6 x 1	8.5	5	6
	40 to 100				
	101 to 124				
	125 to 200				
	201 to 500				

Foot/LEY 25/32 □□ A/B/C -□□□L

Enclosed parts
- Foot
- Body mounting bolt



Outward mounting



Foot [mm]

Size	Stroke range (mm)	A	LS	LS1	LL	LD	LG	LH	LT	LX	LY	LZ	X	Y
25	15 to 100	136.6	99	19.8	8.4	6.6	3.5	30	2.6	57	51.5	71	11.2	5.8
	101 to 400	161.6	124											
32	20 to 100	155.7	114	19.2	11.3	6.6	4	36	3.2	76	61.5	90	11.2	7
	101 to 500	185.7	144											

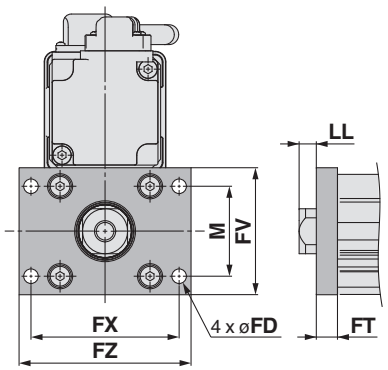
Material: Carbon steel (Chromated)

∗ The A measurement is when the unit is in the Z phase first detecting position. At this position, 2 mm at the end.

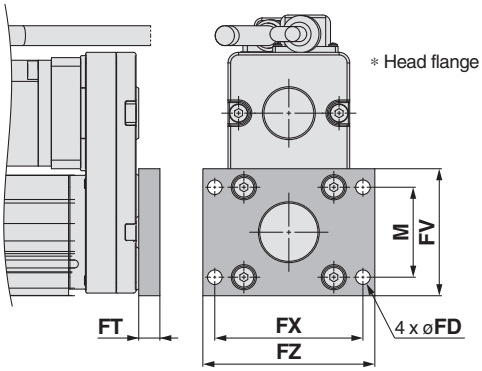
Note) When the motor mounting is the right or left side parallel type, the head side foot should be mounted outwards.

Dimensions

Rod flange/LEY $\begin{matrix}25\\32\end{matrix}$ $\begin{matrix}A\\B\\C\end{matrix}$ -□□□F



Head flange/LEY25□□ $\begin{matrix}A\\B\\C\end{matrix}$ -□□□G



∗ Head flange is not available for LEY32.

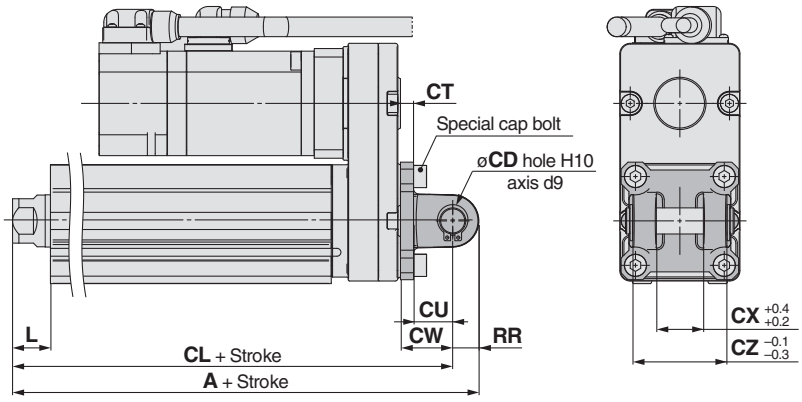
Enclosed parts
- Flange
- Body mounting bolt

Rod/Head Flange [mm]

Size	FD	FT	FV	FX	FZ	LL	M
25	5.5	8	48	56	65	6.5	34
32	5.5	8	54	62	72	10.5	40

Material: Carbon steel (Nickel plated)

Double clevis/LEY $\begin{matrix}25\\32\end{matrix}$ $\begin{matrix}A\\B\\C\end{matrix}$ -□□□D



Enclosed parts
- Double clevis
- Body mounting bolt
- Clevis pin
- Retaining ring

∗ Refer to page 70 for details of the rod end nut and mounting bracket.

Double Clevis [mm]

size	Stroke range (mm)	A	CL	CD	CT
25	10 to 100	160.5	150.5	10	5
	101 to 200	185.5	175.5		
32	10 to 100	180.5	170.5	10	6
	101 to 200	210.5	200.5		

size	Stroke range (mm)	CU	CW	CX	CZ	L	RR
25	10 to 100	14	20	18	36	14.5	10
	101 to 200						
32	10 to 100	14	22	18	36	18.5	10
	101 to 200						

Material: Cast iron (Painted)

∗ The A and CL measurements are when the unit is in the Z phase first detecting position. At this position, 2 mm at the end.

Series LEY
Electric Actuator/Specific Product Precautions 1

Be sure to read before handling. Refer to back cover for Safety Instructions and the Operation Manual for Electric Actuator Precautions. Please download it via our website. http://www.smcworld.com

Design/Selection

⚠ Warning

1. Do not apply a load in excess of the operating limit.

A product should be selected based on the maximum load and allowable moment. If the product is used outside of the operating limit, eccentric load applied to the guide will become excessive and have adverse effects such as creating play on the sliding parts of the piston rod, degraded accuracy, operation and shortened product life.

2. Do not use the product in applications where excessive external force or impact force is applied to it.

It may cause failure.

3. Do not use as a stopper.

Handling

⚠ Caution

1. When the pushing operation is used, be sure to set to "Torque control mode" and keep the pushing speed within the speed specified for each series.

For "Position control mode", "Speed control mode" and "Positioning mode", do not hit the workpiece and stroke end. The lead screw, bearing and internal stopper may damage and malfunction.

2. When operating with "Torque control mode", the value of internal torque command (LECSA) or analog torque maximum output command (LECSB) should be set 30% or less.

It may damage and malfunction.

3. The initial value of forward/reverse rotation torque limit is set at 100% (3 times the motor rated torque.)

It will be the maximum torque (limit value) for "Position control mode", "Speed control mode" and "Positioning mode". The acceleration during operation may decrease if using at a smaller value than the initial value, so please set the value after confirming with the actual device.

4. The maximum speed of this actuator will differ depending on the product stroke.

When selecting a product, refer to the catalog for "Model Selection" before using.

5. Do not apply a load, impact or resistance in addition to a transferred load during returning to the original position.

Otherwise, the origin can be displaced.

6. Do not let anything come in contact and damage piston rod friction area.

Piston rod and guide rod are manufactured with precise tolerance so even a small deformation may malfunction.

7. Connect it so that the impact and load should not be applied when an external guide is provided.

Use a freely moving connector (such as a floating joint).

Handling

⚠ Caution

8. Do not operate body itself by the piston rod fixing.

An excessive load joins the piston rod, and it causes defective operation and the longevity decrease.

9. When an actuator is operated while it is fixed at one end and free at the other end (basic style, flange style), bending moment may be applied to the actuator by vibration generated at the stroke end and it can damage the actuator. In such a case, use a mounting bracket to suppress the vibration of the actuator body or decrease the speed until the actuator body does not vibrate at the stroke end.

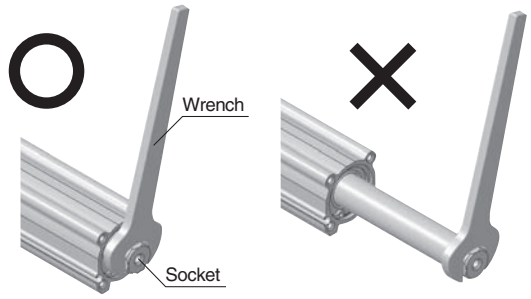
Also, install a mounting bracket when moving the actuator body or mounting a long stroke actuator horizontally with one end fixed in place.

10. Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod.

If rotational torque is applied, the non-rotating guide will deform, thus affecting the non-rotating accuracy.
Refer to the table below for the approximate values of the allowable range of rotational torque.

Allowable rotational torque lbf·ft [N·m] or less	LEY25□	LEY32
	0.81 (1.1)	1.03 (1.4)

To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes. Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.



Electric Actuator/Specific Product Precautions 2

Be sure to read before handling. Refer to back cover for Safety Instructions and the Operation Manual for Electric Actuator Precautions. Please download it via our website. http://www.smcworld.com

Mounting

⚠Caution

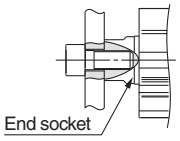
1. Fix 'End socket' square part of the piston rod with a wrench etc. to prevent the piston rod from rotating. Tighten the screws properly with adequate torque within the specified torque range when mounting a workpiece or jig, etc.

It causes the abnormal reaction of an auto switch, the space of an internal guide, and an increase of the sliding resistance, etc.

2. When mounting the workpiece and body use screws with adequate length and tighten them with adequate torque within the specified torque range.

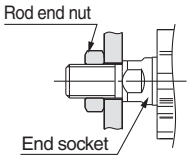
Tightening the screws with a higher torque than recommended may malfunction, whilst the tightening with a lower torque can cause the displacement of the mounting position.

Workpiece fixed/Rod end female thread

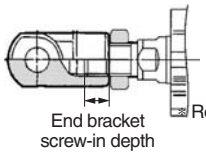


Model	Bolt	Max. tightening torque lbf·ft	Max. screw-in depth (mm)	End socket widthacross flats (mm)
LEY25	M8 x 1.25	9.22	13	17
LEY32	M8 x 1.25	9.22	13	22

Workpiece fixed/Rod end male thread (When "Rod end male thread" is selected.)



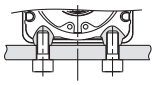
Model	Thread size	Max. tightening torque lbf·ft	Effective depth of thread length (mm)	End socket width across flats (mm)
LEY25	M14 x 1.5	47.9	20.5	17
LEY32	M14 x 1.5	47.9	20.5	22



Model	Rod end nut		End bracket screw-in depth (mm)
	Width across flats (mm)	Length (mm)	
LEY25	22	8	8 or more
LEY32	22	8	8 or more

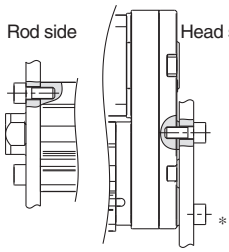
Rod end nuts are included.

Body fixed/Body bottom tapped style (When "Body bottom tapped" is selected.)



Model	Bolt	Max. tightening torque lbf·ft	Max. screw-in depth (mm)
LEY25	M5 x 0.8	2.21	6.5
LEY32	M6 x 1.0	3.84	8.8

Body fixed/Rod side/Head side tapped style

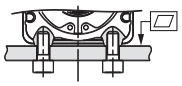


Model	Bolt	Max. tightening torque lbf·ft	Max. screw-in depth (mm)
LEY25	M5 x 0.8	2.21	8
LEY32	M6 x 1.0	3.84	10

∗ Excluding LEY□D

3. When mounting the main body and workpiece, fix within the following flatness range.

Poor parallelism of the workpiece mounted on the body, base and other parts may increase sliding resistance.

Model	Mounting position		Flatness
LEY□	Body/Body bottom		0.1 mm or less

Maintenance

⚠Warning

1. Cut the power supply during maintenance and replacement of the product.

• Maintenance frequency

Perform maintenance according to the below table.

Frequency	Appearance check	Check belt
Inspection before daily operation	○	—
Inspection every 6 months/250 km/5 million cycles∗	○	○

∗ Select whichever comes sooner.

• Items for visual appearance check

1. Loose set screws, Abnormal dirt
2. Check of flaw and cable joint
3. Vibration, Noise

• Items for belt check

Stop operation immediately and replace the belt when belt appear to be below. Further, ensure your operating environment and conditions satisfy the requirements specified for the product.

a. Tooth shape canvas is worn out

Canvas fiber becomes fuzzy. Rubber is removed and the fiber becomes whitish. Lines of fibers become unclear.

b. Peeling off or wearing of the side of the belt

Belt corner becomes round and frayed thread sticks out.

c. Belt partially cut

Belt is partially cut. Foreign matter caught in teeth other than cut part causes flaw.

d. Vertical line of belt teeth

Flaw which is made when the belt runs on the flange.

e. Rubber back of the belt is softened and sticky

f. Crack on the back of the belt

AC Servo Motor Controller (Pulse Input Type)



Incremental Type

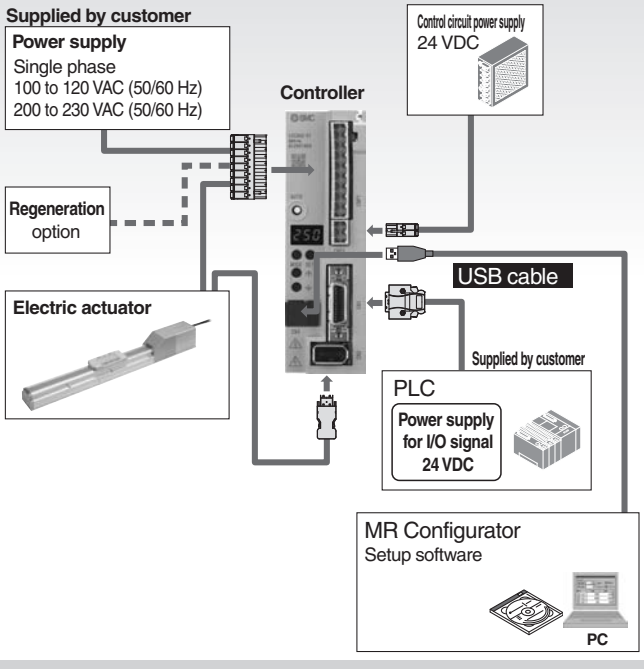
Series LECSA



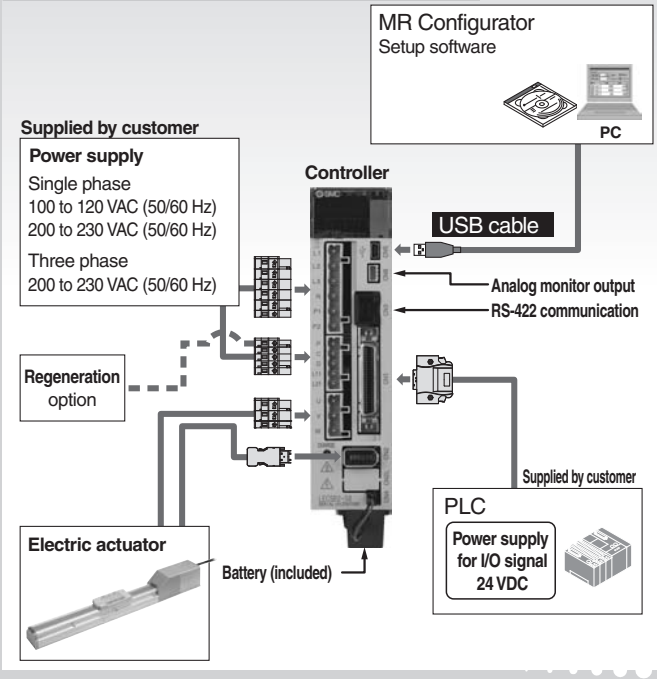
Absolute Type

Series LECSB

Incremental encoder compatible *Series LECSA*



Absolute encoder compatible *Series LECSB*



AC Servo Motor Controller (Pulse Input Type)

Incremental Type
Series LECSA

Absolute Type
Series LECSB



LECSA LECSB

How to Order

LECS A 1 – S1

Controller type

A	Pulse input type (For incremental encoder)
B	Pulse input type (For absolute encoder)

Power supply voltage

1	100 to 120 VAC, 50/60 Hz
2	200 to 230 VAC, 50/60 Hz

Motor type

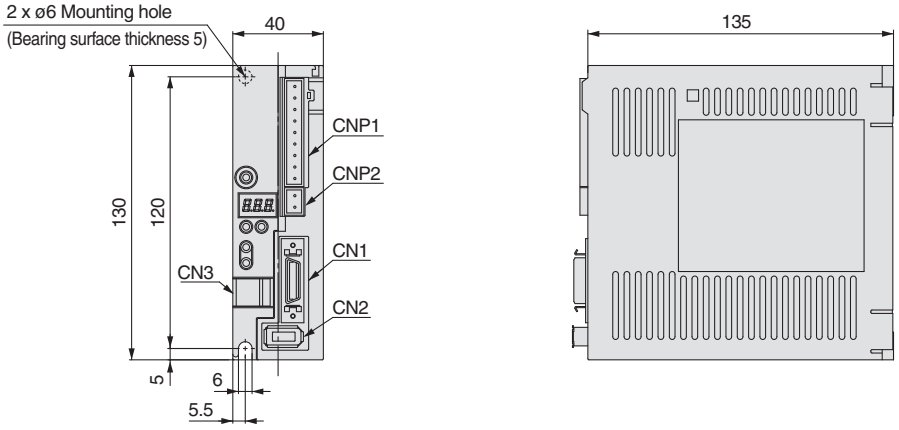
Symbol	Type	Capacity	Encoder
S1	AC servo motor (S2)	100 W	Incremental
S3	AC servo motor (S3)	200 W	
S5	AC servo motor (S6)	100 W	Absolute
S7	AC servo motor (S7)	200 W	

Part no. list Select controller type and compatible motor from the combinations in the table below.

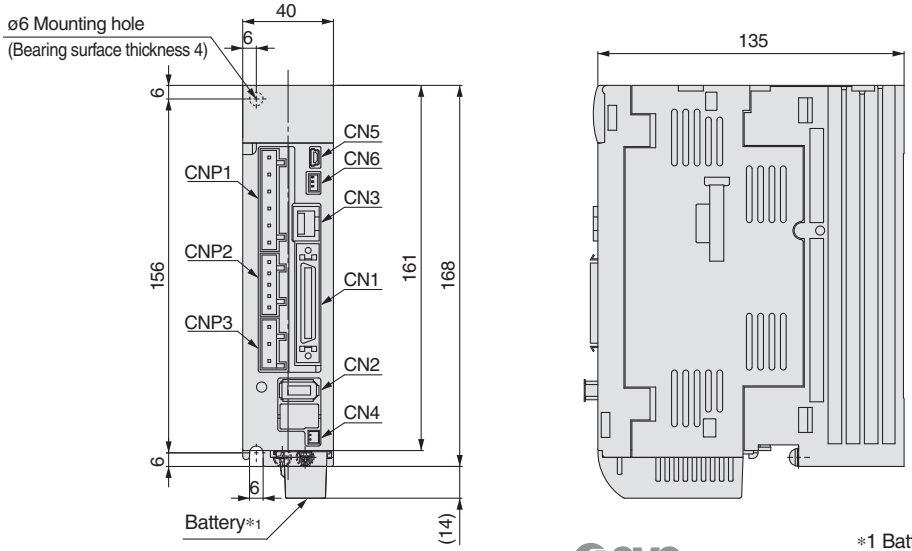
Controller part no.	Controller type	Motor type	Power supply voltage
LECSA1-S1	Pulse input type (For incremental encoder)	AC servo motor (S2)	100 to 120 VAC 50/60 Hz
LECSA1-S3		AC servo motor (S3)	
LECSA2-S1		AC servo motor (S2)	200 to 230 VAC 50/60 Hz
LECSA2-S3		AC servo motor (S3)	
LECSB1-S5	Pulse input type (For absolute encoder)	AC servo motor (S6)	100 to 120 VAC 50/60 Hz
LECSB1-S7		AC servo motor (S7)	
LECSB2-S5		AC servo motor (S6)	200 to 230 VAC 50/60 Hz
LECSB2-S7		AC servo motor (S7)	

Dimensions

LECSA□



LECSB□



*1 Battery included.

SMC

Specifications

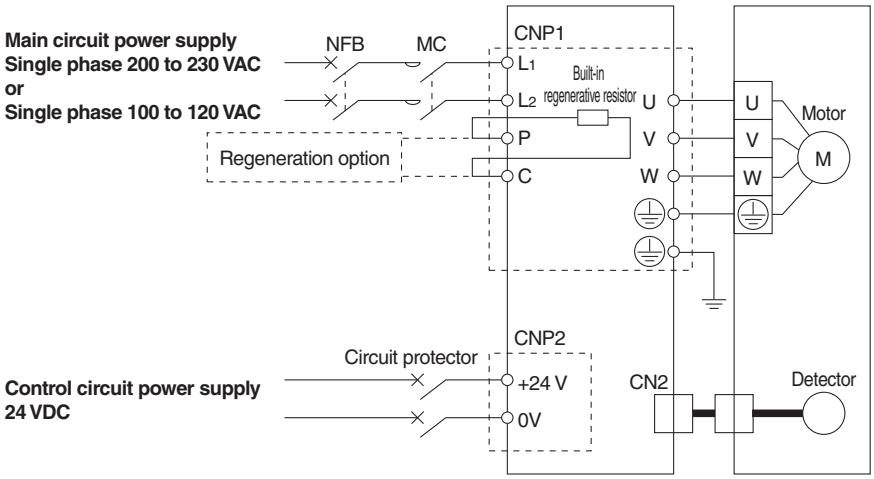
Model		LECSA1-S1	LECSA1-S3	LECSA2-S1	LECSA2-S3
Compatible motor capacity [W]		100	200	100	200
Compatible encoder		Incremental 17-bit encoder (Resolution: 131072 p/rev)			
Main power supply	**Power voltage [V]**	Single phase 100 to 120 VAC (50/60 Hz)		Single phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage range [V]	Single phase 85 to 132 VAC		Single phase 170 to 253 VAC	
	Rated voltage [A]	3.0	5.0	1.5	2.4
Control power supply	**Control power supply voltage [V]**	24 VDC			
	Allowable voltage range for control power supply [V]	21.6 to 26.4 VDC			
	Rated voltage [A]	0.5			
Parallel input		6 inputs			
Parallel output		4 outputs			
Max. input pulse frequency [pps]		1 M (when differential receiver), 200 k (when open collector)			
Function	**Positioning completion width setting range [pulse]**	0 to ±65535 (Pulse command unit)			
	Error excessive	±3 rotations			
	Torque limit	Parameter setting			
	Communication	USB communication			
Operating temperature range		32 to 104°F (0 to 40°C) (No freezing)			
Operating humidity range [%RH]		90 or less (No condensation)			
Storage temperature range		–4 to 140°F (–20 to 65°C) (No freezing)			
Storage humidity range [%RH]		90 or less (No condensation)			
Insulation resistance [MΩ]		Between case and SG: 10 (500 VDC)			
Weight		1.32 lbs (600 g)			

Model		LECSB1-S5	LECSB1-S7	LECSB2-S5	LECSB2-S7
Compatible motor capacity [W]		100	200	100	200
Compatible encoder		Absolute 18-bit encoder (Resolution: 262144 p/rev)			
Main power supply	**Power voltage [V]**	Single phase 100 to 120 VAC (50/60 Hz)		Three phase 200 to 230 VAC (50/60 Hz) Single phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage range [V]	Single phase 85 to 132 VAC		Three phase 170 to 253 VAC Single phase 170 to 253 VAC	
	Rated voltage [A]	3.0	5.0	0.9	1.5
Control power supply	**Control power supply voltage [V]**	Single phase 100 to 120 VAC (50/60 Hz)		Single phase 200 to 230 VAC (50/60 Hz)	
	Allowable voltage range for control power supply [V]	Single phase 85 to 132 VAC		Single phase 170 to 253 VAC	
	Rated voltage [A]	0.4		0.2	
Parallel input		10 inputs			
Parallel output		6 outputs			
Max. input pulse frequency [pps]		1 M (when differential receiver), 200 k (when open collector)			
Function	**Positioning completion width setting range [pulse]**	0 to ±10000 (Pulse command unit)			
	Error excessive	±3 rotations			
	Torque limit	Parameter setup or external analog input setup (0 to 10 VDC)			
	Communication	USB communication, RS422 communication*1			
Operating temperature range		32 to 104°F (0 to 40°C) (No freezing)			
Operating humidity range [%RH]		90 or less (No condensation)			
Storage temperature range		– 4 to 149°F (–20 to 65°C) (No freezing)			
Storage humidity range [%RH]		90 or less (No condensation)			
Insulation resistance [MΩ]		Between case and SG: 10 (500 VDC)			
Weight		1.76 lbs (800 g)			

*1 USB communication and RS422 communication cannot be performed at the same time.

Power Supply Wiring Example: LECSA

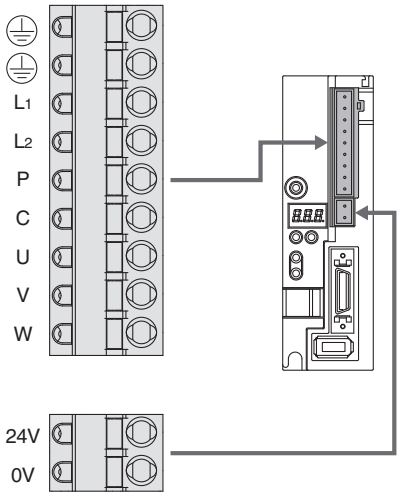
LECSA□-□



Main Circuit Power Supply Connector: CNP1

*Accessory

Terminal name	Function	Function details
⏚	Protective earth (PE)	Should be grounded via servo motor's earth terminal and control panel's protective earth (PE) after connecting them.
L1	Main circuit power supply	Connect the main circuit power supply. LECSA1: Single phase 100 to 120 VAC, 50/60 Hz LECSA2: Single phase 200 to 230 VAC, 50/60 Hz
L2		
P	Regeneration option	Terminal to connect regeneration option LECSA□-S1: No need for connection LECSA□-S3, S4: Connected at time of shipping. * If regeneration option is required for "Model Selection", connect to this terminal.
C		
U	Servo motor power (U)	Connect to motor cable (U, V, W)
V	Servo motor power (V)	
W	Servo motor power (W)	



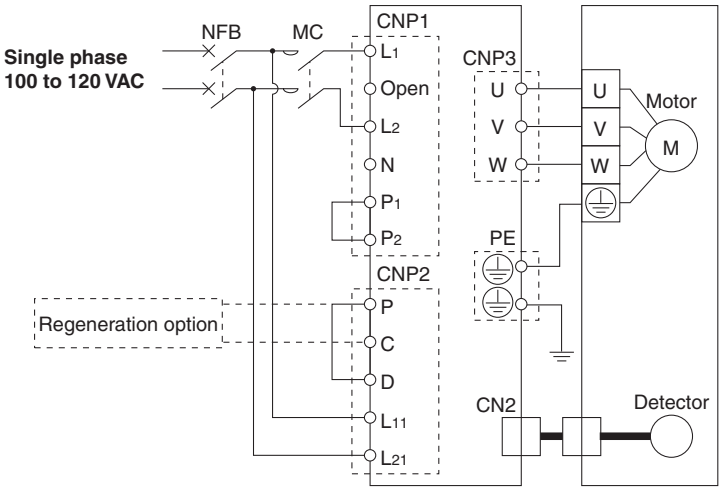
Control Circuit Power Supply Connector: CNP2

*Accessory

Terminal name	Function	Function details
24V	Control circuit power supply (24V)	24V side of the control circuit power supply (24 VDC) which supplies the controller.
0V	Control circuit power supply (0V)	0V side of the control circuit power supply (24 VDC) which supplies the controller.

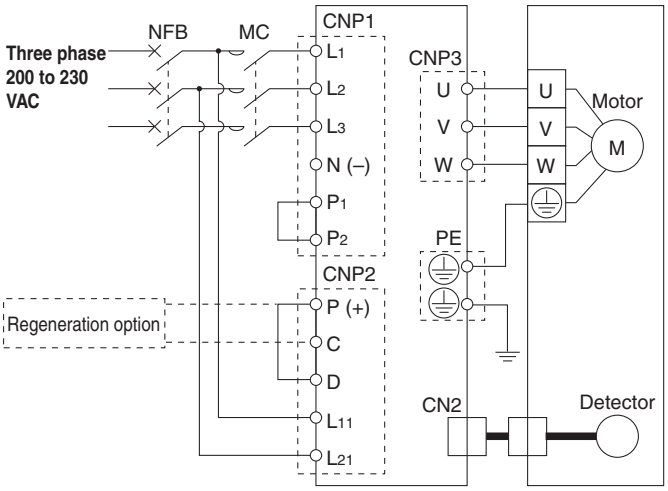
Power Supply Wiring Example: LECSB

LECSB1-□

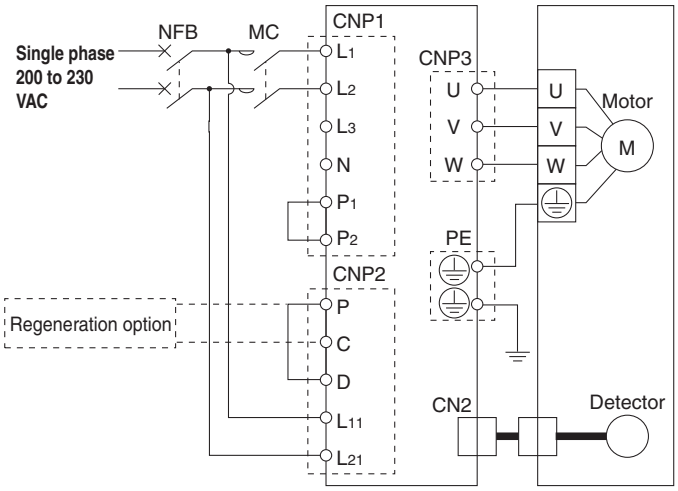


LECSB2-□

For three phase 200 VAC



For single phase 200 VAC



Note) For single phase 200 to 230 VAC, power supply should be connected to L_1 and L_2 terminals, with nothing connected to L_3.

Main Circuit Power Supply Connector: CNP1

∗Accessory

Terminal name	Function	Function details
L_1	Main circuit power supply	Connect the main circuit power supply. LECSB1: Single phase 100 to 120 VAC, 50/60 Hz Connection terminal: L_1,L_2 LECSB2: Single phase 200 to 230 VAC, 50/60 Hz Connection terminal: L_1,L_2 Three phase 200 to 230 VAC, 50/60 Hz Connection terminal: L_1,L_2,L_3
L_2		
L_3		
N	Regeneration converter	Do not connect.
P_1	DC reactor	Connect between P_1 and P_2. (Connected at time of shipping.)
P_2		

Control Circuit Power Supply Connector: CNP2

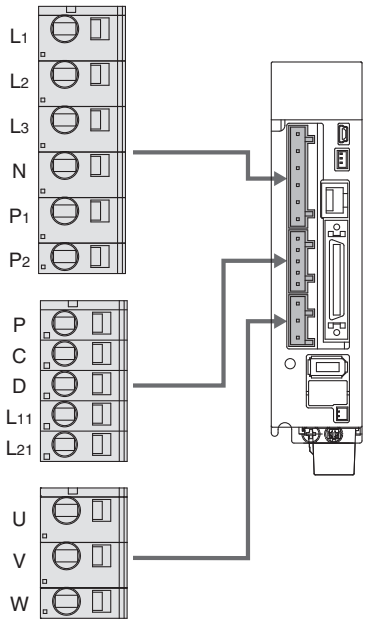
∗Accessory

Terminal name	Function	Function details
P	Regeneration option	Connect between P and D. (Connected at time of shipping.) ∗ If regeneration option is required for "Model Selection", connect to this terminal.
C		
D		
L_{11}	Control circuit power supply (24 V)	24V side of the control circuit power supply (24 VDC) which supplies the controller.
L_{21}	Control circuit power supply (0 V)	0V side of the control circuit power supply (24 VDC) which supplies the controller.

Motor Connector: CNP3

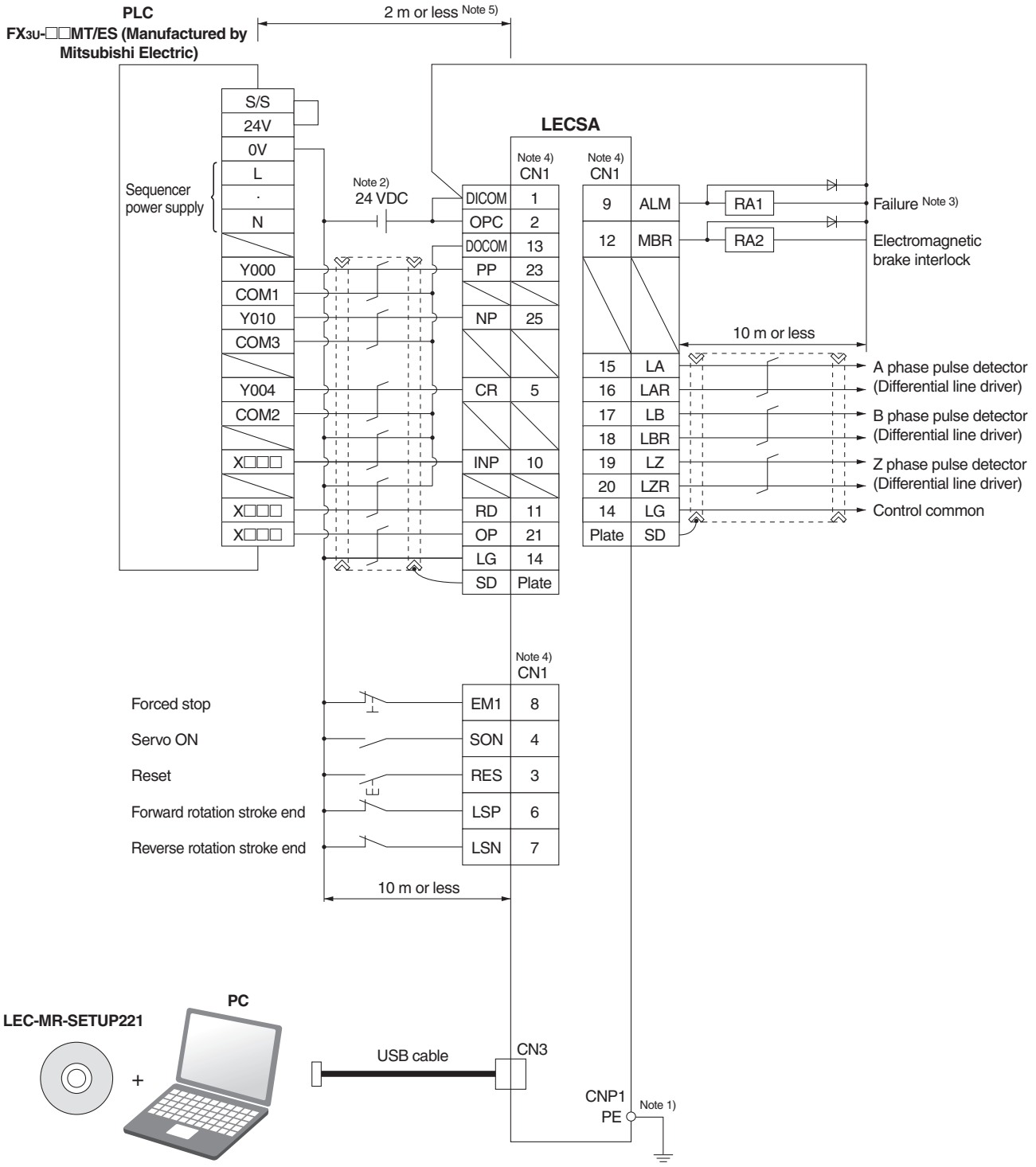
∗Accessory

Terminal name	Function	Function details
U	Servo motor power (U)	Connect to motor cable (U, V, W)
V	Servo motor power (V)	
W	Servo motor power (W)	



Control Signal Wiring Example: LECSA

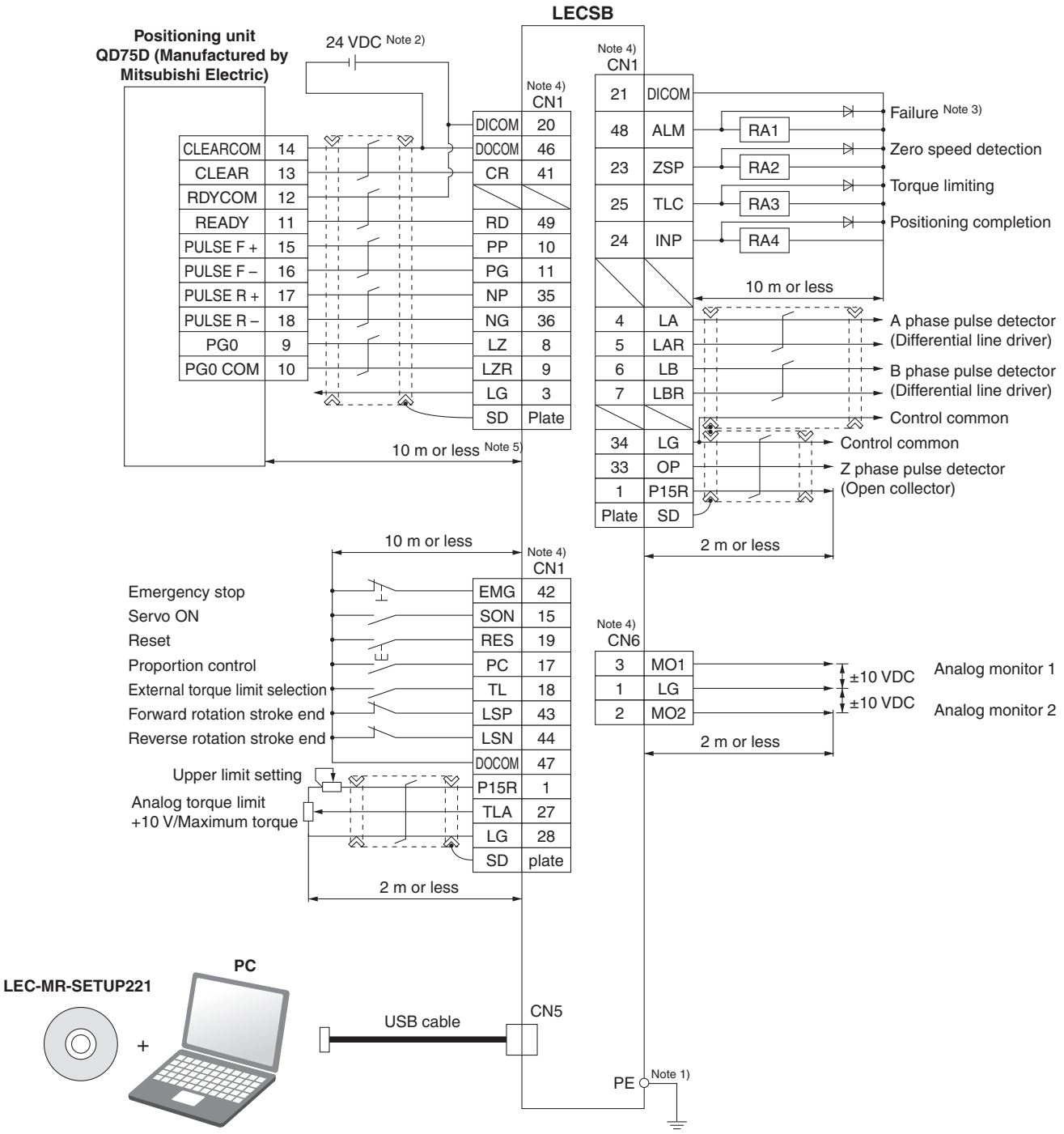
LECSA□-□



Note 1) For preventing electric shock, be sure to connect the main circuit power supply connector for the servo amplifier (CNP1)'s protective earth (PE) terminal to the control panel's protective earth (PE).
Note 2) For interface use, supply 24 VDC ±10% 200 mA using an external source. 200 mA is the value when all I/O command signals are used and reducing the number of inputs/outputs can decrease current capacity. Refer to "Operation Manual" for required current for interface.
Note 3) The failure (ALM) is ON during normal conditions. When it is OFF (alarm occurs), stop the sequencer signal using the sequence program.
Note 4) The same name signals are connected inside the servo amplifier.
Note 5) For command pulse input with an open collector method. When a positioning unit loaded with a differential line driver method is used, it is 10 m or less.

Control Signal Wiring Example: LECSB

LECSB□-□



Note 1) For preventing electric shock, be sure to connect the servo amplifier's protective earth (PE) terminal to the control panel's protective earth (PE).
Note 2) For interface use, supply 24 VDC ±10% 300 mA using an external source.
Note 3) The failure (ALM) is ON during normal conditions. When it is OFF (alarm occurs), stop the sequencer signal using the sequence program.
Note 4) The same name signals are connected inside the servo amplifier.
Note 5) For command pulse input with a differential line driver method. For open collector method, it is 2 m or less.

Options

Motor cable, Lock cable, Encoder cable

LE − CS M − S 5 A

Motor type

S	AC servo motor

Direction of connector

A	Axis side
B	Counter axis side

Cable contents

M	Motor cable
B	Lock cable
E	Encoder cable

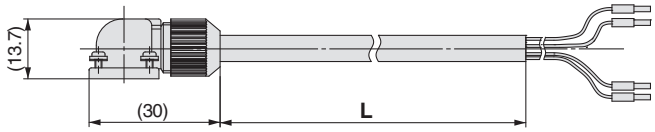
Cable length (L)[m]

2	2
5	5
A	10

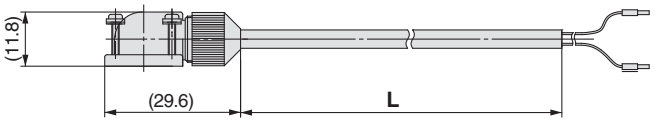
Cable type

S	Standard cable
R	Robotic cable

LE-CSM-□□: Motor cable



LE-CSB-□□: Lock cable



LE-CSE-□□: Encoder cable



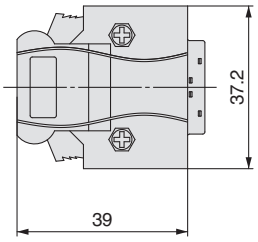
I/O connector

LE − C SNA

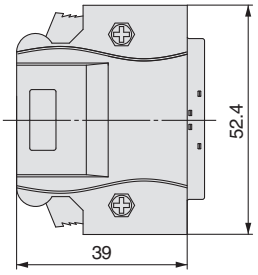
Controller type

SNA	I/O connector (**LECSA**□)
SNB	I/O connector (**LECSB**□)

LE-CSNA



LE-CSNB



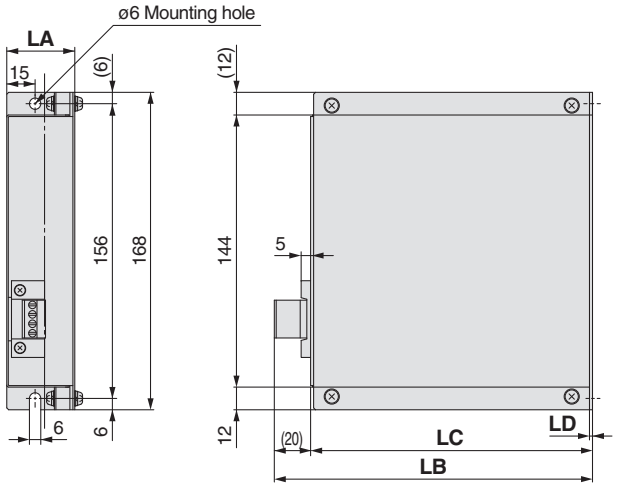
Regeneration option

LEC − MR − RB − □

Regeneration option type

032	Allowable regeneration power 30 W
12	Allowable regeneration power 100 W

∗ Confirm regeneration option to be used in "Model Selection".



Dimensions [mm]

Model	LA	LB	LC	LD
LEC-MR-RB-032	30	119	99	1.6
LEC-MR-RB-12	40	169	149	2

Options

MR Configurator (setup software Japanese version)

LEC − MR − SETUP221

∗ MRZJW3-SETUP221 manufactured by Mitsubishi Electric.
Refer to Mitsubishi Electric's website for operating environment and update information.

Compatible PC

When using MR Configurator (setup software), use an IBM PC/AT compatible PC that meets the following operating conditions.

Hardware Requirements

Equipment		MR Configurator (setup software) **LEC-MR-SETUP221**
Note 1) Note 2) Note 3) PC	OS	Windows®98, Windows®Me, Windows®2000 Professional, Windows®XP Professional/Home Edition, Windows Vista® Home Basic/Home Premium, Business/Ultimate/Enterprise Windows®7 Starter/Home Premium/Professional/ Ultimate/Enterprise IBM PC/AT compatible PC (Japanese version)
	Available HD space	130 MB or more
	Communication interface	Use USB port
Display		Resolution 1024 x 768 or more Must be capable of high color (16 bits) display. The connectable with the above PC
Keyboard		The connectable with the above PC
Mouse		The connectable with the above PC
Printer		The connectable with the above PC
Communication cable		LEC-MR-J3USB

Note 1) Windows, Windows Vista, Windows 7 are registered trademarks of Microsoft Corporation in the United States and/or other countries.
Note 2) This software may not run correctly depending on the PC that you are using.
Note 3) Not compatible with 64-bit Windows® XP and 64-bit Windows Vista®.

USB cable (3 m) for setup software

LEC − MR − J3USB

Battery

LEC − MR − J3BAT

Series LECSA/LECSB
Specific Product Precautions 1

Be sure to read before handling. Refer to back cover for Safety Instructions and the Operation Manual for Electric Actuator Precautions. Please download it via our website. http://www.smcworld.com

Design/Selection

⚠Warning

1. Be sure to apply the specified voltage.
Otherwise, malfunction and breakage may be caused. If the applied voltage is lower than the specified, it is possible that the load cannot be moved due to an internal voltage drop of the controller. Please check the operating voltage before use.

2. Do not operate the product beyond the specifications.
Otherwise, a fire, malfunction or actuator damage can result. Please check the specifications before use.

3. Install an emergency stop circuit outside of the enclosure.
Please install an emergency stop outside of the enclosure so that it can stop the system operation immediately and intercept the power supply.

4. In order to prevent damage due to the breakdown and the malfunction of the controller and its peripheral devices, a backup system should be established previously by giving a multiple-layered structure or a fail-safe design to the equipment, etc.

5. If a danger against the personnel is expected due to an abnormal heat generation, smoking, ignition, etc., of the controller and its peripheral devices, cut off the power supply for the product and the system immediately.

Handling

⚠Warning

1. Do not touch the inside of the controller and its peripheral devices.
It may cause an electric shock or damage to the controller.

2. Do not perform the operation or setting of the product with wet hands.
It may cause an electric shock.

3. Product with damage or the one lacking of any components should not be used.
It may cause an electric shock, fire, or injury.

4. Use only the specified combination between the electric actuator and controller.
It may cause damage to the actuator or the controller.

5. Be careful not to be caught or hit by the workpiece while the actuator is moving.
It may cause an injury.

6. Do not connect the power supply or power on the product before confirming the area to which the workpiece moves is safe.
The movement of the workpiece may cause an accident.

7. Do not touch the product when it is energized and for some time after power has been disconnected, as it is very hot.
It may lead to a burn due to the high temperature.

8. Check the voltage using a tester for more than 5 minutes after power-off in case of installation, wiring and maintenance.
It may cause an electric shock, fire, or injury.

Handling

⚠Warning

9. Static electricity may cause malfunction or brea k the controller. Do not touch the controller while power is supplied.
When touching the controller for maintenance, take sufficient measures to eliminate static electricity.

10. Do not use the product in an area where dust, powder dust, water, chemicals or oil is in the air.
It will cause failure or malfunction.

11. Do not use the product in an area where a magnetic field is generated.
It will cause failure or malfunction.

12. Do not install the product in the environment of flammable gas, explosive gas and corrosive gas.
It could lead to fire, explosion and corrosion.

13. Radiant heat from strong heat supplies such as a furnace, direct sunlight, etc., should not be applied to the product.
It will cause failure of the controller or its peripheral devices.

14. Do not use the product in an environment subject to a temperature cycle.
It will cause failure of the controller or its peripheral devices.

15. Do not use the product in a place where surges are generated.
When there are units that generate a large amount of surge around the product (e.g., solenoid type lifters, high frequency induction furnaces, motors, etc.), this may cause deterioration or damage to the product's internal circuit. Avoid supplies of surg e generation and crossed lines.

16. Do not install the product in an environment under the effect of vibrations and impacts.
It will cause failure or malfunction.

17. When a surge generating load such as a relay or solenoid valve is directly driven, use a product that incorporates a surge absorption element.

Installation

⚠Warning

1. Install the controller and its peripheral devices on a fireproof material.
A direct installation on or near a flammable material may cause fire.

2. Do not install the product in a place subject to vibrations and impacts.
It will cause failure or malfunction.

3. The controller should be affixed verticallyto a vertical wall.
Do not cover the controller's exhaust opening.

4. Install the controller and its peripheral devices on a flat surface.
If the mounting surface is distorted or not flat, an unacceptable force may be added to the housing, etc., to cause troubles.

Specific Product Precautions 2

Be sure to read before handling. Refer to back cover for Safety Instructions and the Operation Manual for Electric Actuator Precautions. Please download it via our website. http://www.smcworld.com

Power Supply

⚠Caution

1. **Use a power supply that has low noise between lines and between power and ground.**
   In cases where noise is high, an isolation transformer should be used.
2. **To prevent surges from lightning, an appropriate measure should be taken. Ground the surge absorber for lightning separately from the grounding of the controller and its peripheral devices.**

Wiring

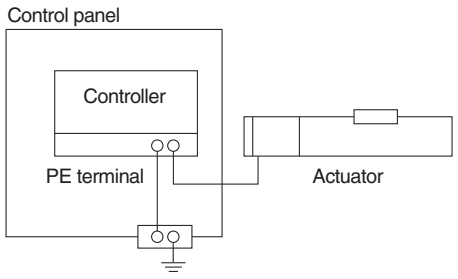
⚠Warning

1. **The controller will be damaged if a commercial power supply (100V/200V) is added to the controller's servo motor power (U, V, W). Be sure to check wiring such as wiring mistakes when the power supply is turned on.**
2. **Connect the ends of the U, V, W wires from the motor cable correctly to the phases (U, V, W) of the servo motor power.**
   If these wires do not match up, it is unable to control the servo motor.

Grounding

⚠Warning

1. **Be sure to carry out grounding in order to ensure the noise tolerance.**
   For grounding actuator, connect the copper wire of the actuator to the controller's protective earth (PE) terminal and connect the copper wire of the controller to the earth via the control panel's protective earth (PE) terminal. Do not connect them directly to the control panel's protective earth (PE) terminal.



2. **In the unlikely event that malfunction is caused by ground, please disconnect the unit from ground.**

Maintenance

⚠Warning

1. **Perform a maintenance check periodically.**
   Confirm wiring and screws are not loose.
   Loose screws or wires may cause unintentional malfunction.
2. **Conduct an appropriate functional inspection after completing the maintenance.**
   At times where the equipment or machinery does not operate properly, conduct an emergency stop of the system. Otherwise, an unexpected malfunction may occur and it will become impossible to secure the safety. Conduct a test of the emergency stop in order to confirm the safety of the equipment.
3. **Do not disassemble, modify or repair the controller and its peripheral devices.**
4. **Do not put anything conductive or flammable inside of the controller.**
   It may cause a fire.
5. **Do not conduct an insulation resistance test and withstand voltage test on this product.**
6. **Ensure sufficient space for maintenance activities.**
   Design the system that allows required space for maintenance.

⚠ Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potentia l hazard with the labels of **"Caution," "Warning"** or **"Danger."** They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots - Safety.
etc.

⚠ Warning

1. **The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
   Since the product specified here is use d under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
2. **Only personnel with appropriate training should operate machinery and equipment.**
   The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
3. **Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
   1. The inspection and maintenance of machinery/equipment should only be performed after measures to preven t falling or runaway of the driven objects have been confirmed.
   2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
   3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
4. **Contact SMC beforehand and take special consideration of safety measures if th e product is to be used in any of the following conditions.**
   1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
   2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
   3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
   4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ Caution

1. **The product is provided for use in manufacturing industries.**
   The product herein described is basically provided for peaceful use in manufacturing industries.
   If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
   If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*2)
   Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
   This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

Revision history

Edition C
* Addition of in-line motor type, LEY□D series
* Addition of guide rod type, LEYG series
* Addition of in-line motor type/guide rod type, LEYG□D series
* Addition of programless controller, LECP1 series
* Addition of standard cable to actuator cable type
* Addition of AC servo motor (100/200 W) type, LEY□□S series
* Addition of AC servo motor controller, LECSA/LECSB series
* Number of pages from 40 to 96

PY

⚠ Safety Instructions | Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

SMC Corporation of America
10100 SMC Blvd., Noblesville, IN 46060
www.smcusa.com
SMC Pneumatics (Canada) Ltd.
www.smcpneumatics.ca

(800) SMC.SMC1 (762-7621)
e-mail: sales@smcusa.com
For International inquires: www.smcworld.com

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SMC Corporation of America/www.smcusa.com
SMC Pneumatics (Canada) Ltd./www.smcpneumatics.ca
(800) SMC.SMC1 (762-7621)
e-mail: sales@smcusa.com
For International inquires: www.smcworld.com
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12-E586
QZ-2.5M-RRD

SMC Information

Electric Actuator/Rod Type
Series LEY

AC Servo Motor (400 W) | **Size: 63**

RoHS

● Added size 63 to the LEY series!

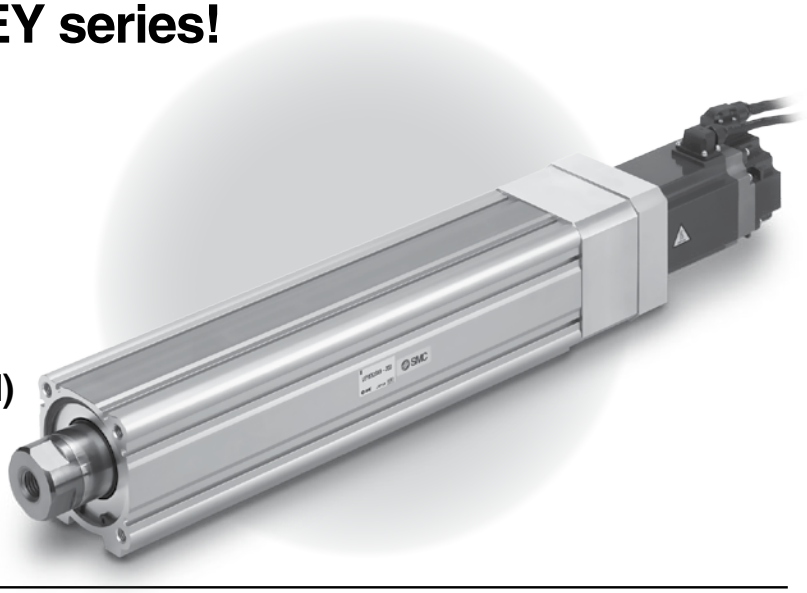
◎ **Work load** Horizontal **80 kg**
Vertical **72 kg**

◎ **High output motor: 400 W**

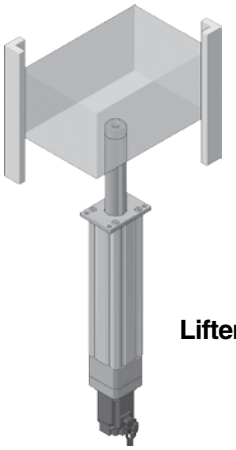
◎ **Max. speed: 1000 mm/s**
∗ 500 stroke

◎ **Max. pushing force: 429 lbf (1910 N)**

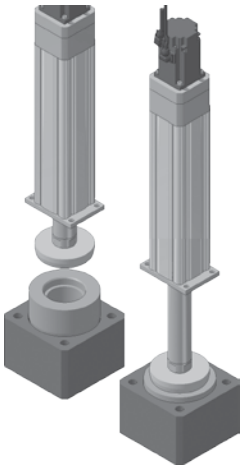
◎ **Added dust/drip proof specification (IP65 equivalent)**



Applications



Lifter



Press fitting

Offering 4 types of AC servo motor driver

Incremental Type

Pulse input type/
Positioning type
Series LECSA



Absolute Type

Pulse input type
Series LECSB



CC-Link
direct input type
Series LECSC

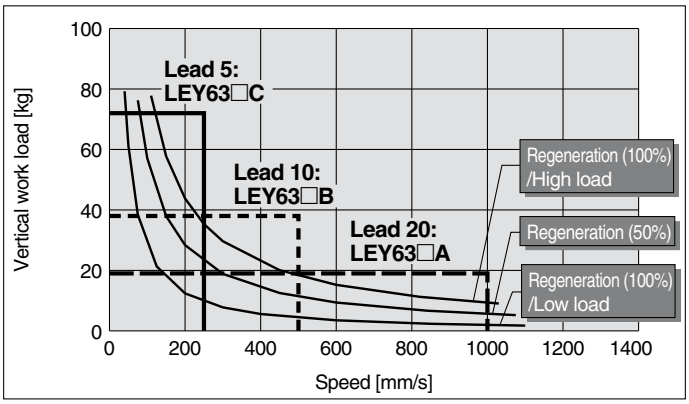


SSCNET III type
Series LECSS

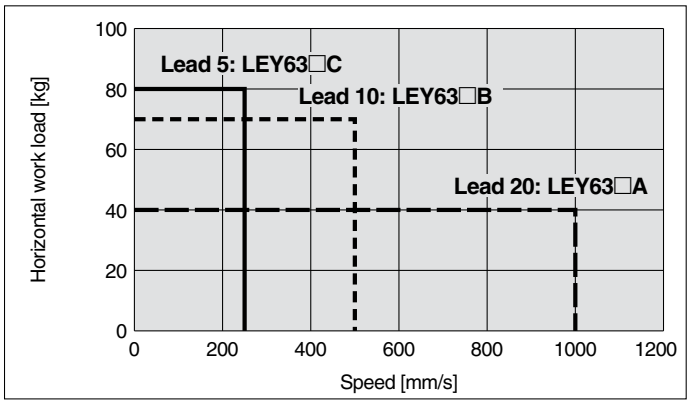


Speed–Work Load Graph

Vertical transfer
LEY63□



Horizontal transfer
LEY63□



Required conditions for "Regeneration option"

∗ Regeneration option required when using product above "Regeneration" line in graph. (Order separately)

[How to read the graph]
Required conditions changes depending on operating conditions.
"Regeneration (50%)": Duty ratio 50% or more
"Regeneration (100%)": Duty ratio 100%

"Regeneration Option" Models

Size	Regenerative conditions	Vertical transfer	Horizontal transfer
LEY63□	Regeneration (50%)	LEC-MR-RB-032	Not required
	Regeneration (100%)/Low load	LEC-MR-RB-032	
	Regeneration (100%)/High load	LEC-MR-RB-12	

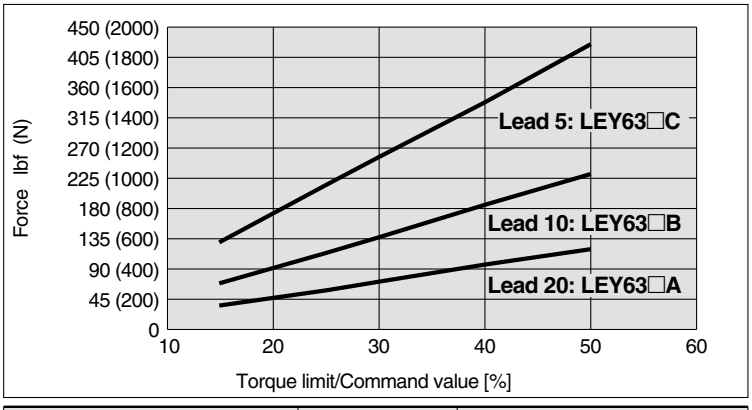
Allowable Stroke Speed

[mm/s]

Model	AC servo motor	Lead		Stroke [mm]							
		Symbol	[mm]	100	200	300	400	500	600	700	800
LEY63□	400 W/□60	A	20	1000					800	600	500
		B	10	500					400	300	250
		C	5	250					200	150	125
		(Motor rotation speed)		(3000 rpm)					(2400 rpm)	(1800 rpm)	(1500 rpm)

Force Conversion Graph

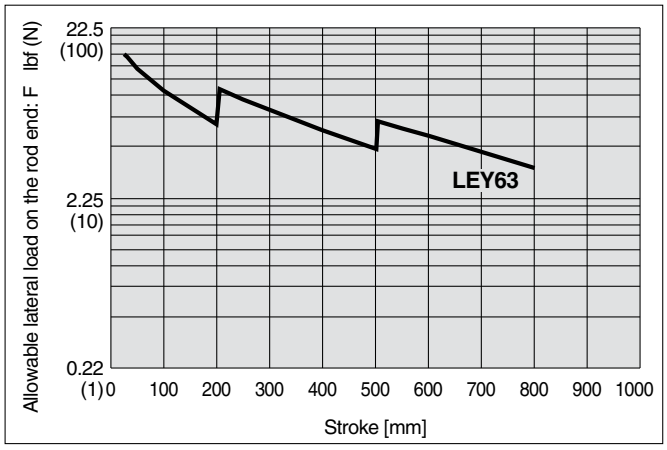
LEY63□ (Motor mounting position: In-line)



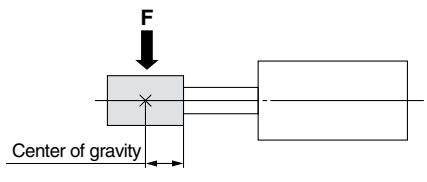
Torque limit/Command value [%]	Duty ratio [%]	Continuous pushing time [minutes]
25 or less	100	—
30	100 (60)	— (1.5)
40	50 (30)	1.5 (0.5)
50	30 (20)	0.5 (0.16)

∗1 The values in ( ) are for a closely-mounted driver.
∗2 Motor type: When limiting torque with incremental encoder, parameter No. PC12/the value of the internal torque command should be set 50% or less.
∗3 Motor type: When limiting torque with absolute encoder, parameter No. PC13/the value of the maximum output command for analog torque should be set 50% or less.

Graph of Allowable Lateral Load on The Rod End



[Stroke] = [Product stroke] + [Center of gravity]



Electric Actuator/Rod Type

Series LEY

LEY63

How to Order

LEY 63 D S4 B – 200 – S 2 A2

Size

63

Motor mounting position

D	In-line

Lead [mm]

Symbol	LEY63
A	20
B	10
C	5

Stroke [mm]

100	100
to	to
800	800

Dust/Drip proof

Nil	IP5x (Dust proof specification)
P	IP65 (Dust/Drip proof specification)/ With vent hole tap

* When using the dust/drip proof (IP65), correctly mount the fitting and tubing to the vent hole tap, and then place the end of the tubing in an area not exposed to dust or water.
* The fitting and tubing should be provided separately by the customer. Select [Applicable tubing O.D.: ø4 or more, Connection thread: Rc1/8].

Motor option

Nil	Without lock
B	With lock

Motor type

Symbol	Type	Output [W]	Actuator size	Compatible drivers
S4	AC servo motor (Incremental encoder)	400	63	LECSA2-S4
S8	AC servo motor (Absolute encoder)	400	63	LECSB2-S8 LECSC2-S8 LECSS2-S8

Rod end thread

Nil	Rod end female thread
M	Rod end male thread (1 rod end nut is included.)

Mounting *1

Symbol	Type	Motor mounting position
		In-line
Nil	Ends tapped (Standard) *2	●
U	Body bottom tapped	●
F	Rod flange	●

*1 Mounting bracket is included, (but not assembled).
*2 For horizontal cantilever mounting with the ends tapped and rod flange, use the actuator within the following stroke range.
• LEY63: 100 or less

Cable type Note 1)

Nil	Without cable
S	Standard cable
R	Robotic cable (Flexible cable)

Note 1) The motor and encoder cables are included.
(The lock cable is included when the motor with lock option is selected.)

Cable length Note 2) **[m]**

Nil	Without cable
2	2
5	5
A	10

Note 2) The length of the encoder, motor and lock cables are the same.

I/O connector

Nil	Without connector
H	With connector

Driver type

	Compatible drivers	Power supply voltage
Nil	Without driver	
A2	LECSA2/Pulse input type (Incremental encoder)	200 V to 230 V
B2	LECSB2/Pulse input type (Absolute encoder)	200 V to 230 V
C2	LECSC2/CC-Link (Absolute encoder)	200 V to 230 V
S2	LECSS2/SSCNET III (Absolute encoder)	200 V to 230 V

* Applicable stroke table

Model \ Stroke (mm)	100	200	300	400	500	600	700	800	Manufacturable stroke range
LEY63	●	●	●	●	●	●	●	●	50 to 800

Note) Consult with SMC for the manufacture of intermediate strokes.

Specifications

Model				LEY63DS$^{4}_{8}$□		
Actuator specifications	Stroke [mm] Note 1)			100, 200, 300, 400, 500, 600, 700, 800		
	Work load [kg]		Horizontal Note 2)	40	70	80
			Vertical	19	38	72
	Pushing force [N]/Set value Note 3) : 15 to 50% Note 4)			156 to 521	304 to 1,012	573 to 1,910
	Max. speed [mm/s] Note 5)	Stroke range	Up to 500	1000	500	250
			505 to 600	800	400	200
			605 to 700	600	300	150
			705 to 800	500	250	125
	Pushing speed [mm/s] Note 6)			30 or less		
	Max. acceleration/deceleration [mm/s^2]			5,000		
	Positioning repeatability [mm]			±0.02		
	Screw lead [mm] (including pulley ratio)			20	10	5
	Impact/Vibration resistance [m/s^2] Note 7)			50/20		
	Actuation type			Ball screw + Belt [1:1]/Ball screw		
	Guide type			Sliding bushing (Piston rod)		
	Operating temprature range °F (°C)			41 to 104 (5 to 40)		
	Operating humidity range [%RH]			90 or less (No condensation)		
	Required conditions for regeneration option Note 8) [kg]		Horizontal	Not required	Not required	Not required
			Vertical	2 or more	5 or more	12 or more
Electric specifications	Motor output/Size			400 W/□60		
	Motor type			AC servo motor (200 VAC)		
	Encoder			Motor type S4: Incremental 17-bit encoder (Resolution: 131072 p/rev) Motor type S8: Absolute 18-bit encoder (Resolution: 262144 p/rev)		
Lock unit specifications	Type Note 9)			Non-magnetizing lock		
	Holding force lbf (N)			70.3 (313)	136 (607)	258 (1,146)
	Power consumption [W] at 68°F (20°C) Note 10)			7.9		
	Rated voltage [V]			24 VDC $^{0}_{-10\%}$		

Note 1) Consult with SMC for the manufacture of strokes other than those shown above.
Note 2) The maximum value of the horizontal work load. An external guide is necessary to support the load. The actual work load changes according to the condition of the external guide. Please confirm using actual device.
Note 3) Set values for the driver.
Note 4) The force setting range for the pushing operation with the torque control mode, etc. The pushing force and the duty ratio change according to the set value.
Set it with reference to "Force Conversion Graph" on page 2.
Note 5) The allowable speed changes according to the stroke.
Note 6) The allowable collision speed for the pushing operation with the torque control mode, etc.
Note 7) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Note 8) The work load conditions which require "Regeneration option" when operating at the maximum speed (Duty ratio: 100%).
Note 9) Only when motor option "With lock" is selected.
Note 10) For an actuator with lock, add the power consumption for the lock.

Weight

Product Weight

[kg]

Series		LEY63DS□□							
Stroke [mm]		100	200	300	400	500	600	700	800
Motor type	Incremental encoder	5.6	6.7	8.4	9.6	10.7	12.4	13.5	14.7
	Absolute encoder	5.7	6.8	8.5	9.7	10.8	12.5	13.6	14.8

(1Kg = 2.2 lbs)

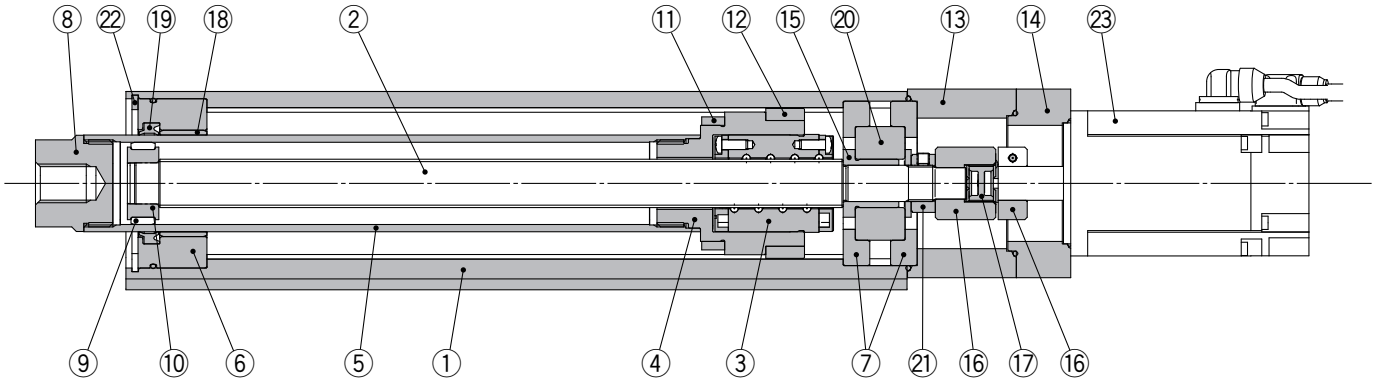
Additional Weight

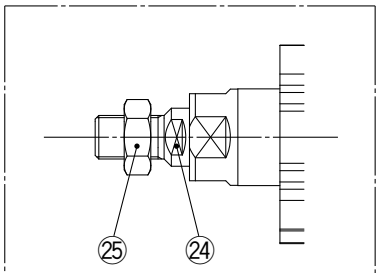
[kg]

Size		63
Lock	Incremental encoder	0.4
	Absolute encoder	0.6
Rod end male thread	Male thread	0.12
	Nut	0.04
Rod flange (including mounting bolts)		0.51

Construction

Motor mounting position: In-line/LEY63





When rod end male thread selected

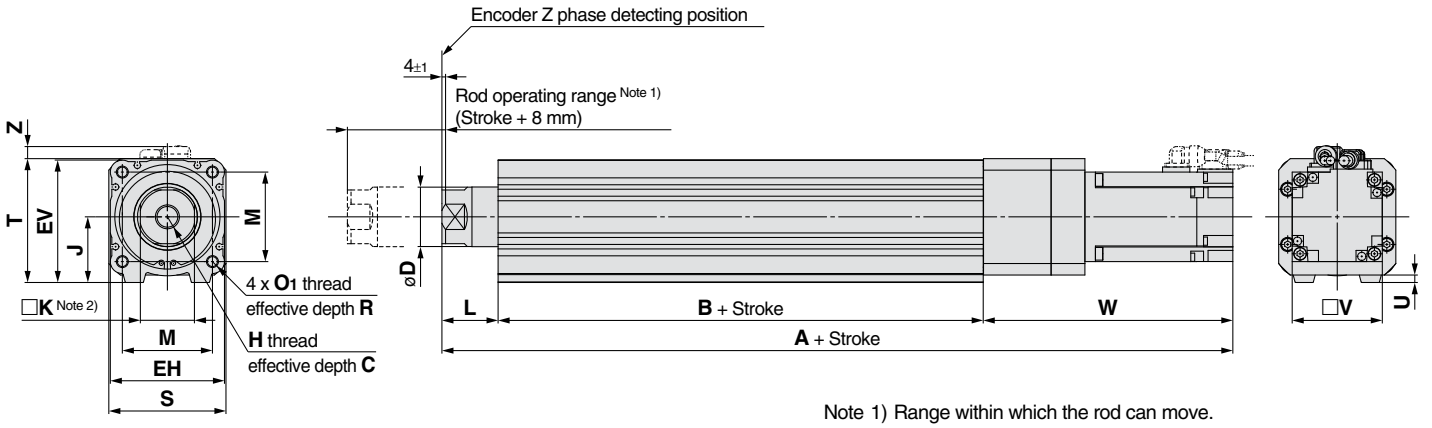
Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Ball screw shaft**	Alloy steel	
3	**Ball screw nut**	Resin/Alloy steel	
4	**Piston**	Aluminum alloy	
5	**Piston rod**	Stainless steel	Hard chrome anodized
6	**Rod cover**	Aluminum alloy	
7	**Bearing holder**	Aluminum alloy	
8	**Socket**	Free cutting carbon steel	Nickel plated
9	**Wear ring**	Resin	
10	**Wear ring holder**	Stainless steel	
11	**Magnet**	—	
12	**Rotation stopper**	Resin	
13	**Motor block**	Aluminum alloy	Coating

No.	Description	Material	Note
14	**Motor adapter**	Aluminum alloy	Coating
15	**Spacer A**	Stainless steel	
16	**Hub**	Aluminum alloy	
17	**Spider**	Urethane	
18	**Bushing**	Lead bronze cast	
19	**Seal**	NBR	
20	**Bearing**	—	
21	**Lock nut**	Alloy steel	Hard chrome anodized
22	**Retaining ring**	Steel for spring	
23	**Motor**	—	
24	**Socket (Male thread)**	Free cutting carbon steel	Nickel plated
25	**Nut**	Alloy steel	Trivalent chromated

Dimensions: In-line Motor Type

LEY63D□



Note 1) Range within which the rod can move.
Make sure a workpiece mounted on the rod does not interfere with the workpieces and facilities around the rod.

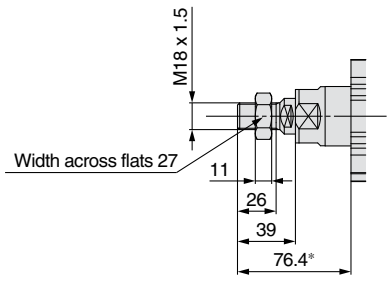
Note 2) The direction of rod end width across flats (□K) differs depending on the products.

[mm]

Size	Stroke range [mm]	C	D	EH	EV	H	J	K	L	M	O1	R	S	T	U
63	Up to 200	21	40	76	82	M16 x 2	44	36	37.4	60	M8 x 1.25	16	78	83	5
	205 to 500														
	505 to 800														

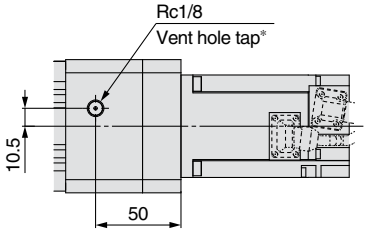
Size	Stroke range [mm]	B	V	Incremental encoder						Absolute encoder					
				Without lock			With lock			Without lock			With lock		
				A	W	Z	A	W	Z	A	W	Z	A	W	Z
63	Up to 200	190.7	60	338.3	110.2	8.1	366.9	138.8	8.1	326.6	98.5	8.1	366.1	138	8.1
	205 to 500	225.7		373.3			401.9			361.6			401.1		
	505 to 800	260.7		408.3			436.9			396.6			436.1		

Rod end male thread/LEY63□□□-□□M



* The measurement 76.4 is when the unit is in the encoder Z phase detecting position. At this position, 4 mm at the end.

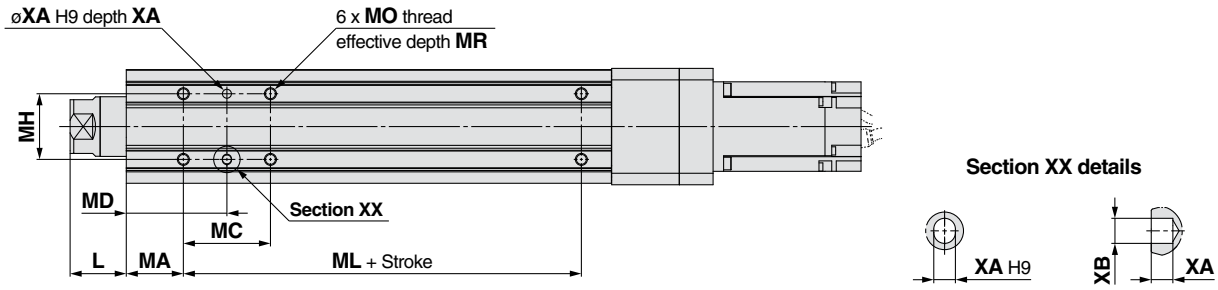
IP65 (Dust/Drip proof specification)/LEY63D□□-□P



* When using the dust/drip proof (IP65), correctly mount the fitting and tubing to the vent hole tap, and then place the end of the tubing in an area not exposed to dust or water. The fitting and tubing should be provided separately by the customer. Select [Applicable tubing O.D.: ø4 or more, Connection thread: Rc1/8].

Dimensions: In-line Motor Type

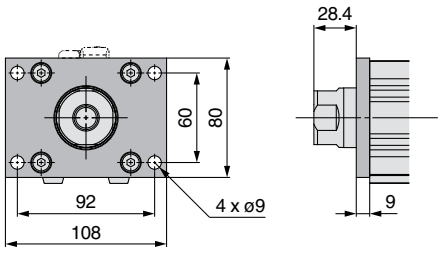
Body bottom tapped/LEY63□□□-□□U



[mm]

Size	Stroke range [mm]	L	MA	MC	MD	MH	ML	MO	MR	XA	XB
63	20 to 74	37.4	38	24	50	44	65	M8 x 1.25	10	6	7
	75 to 124			45	60.5						
	125 to 200			58	67						
	201 to 500			86	81		100				
	501 to 800						135				

Rod flange/LEY63□□□-□□F



Included parts
- Flange
- Body mounting bolts

Material: Carbon steel (Nickel plated)

SMC Information

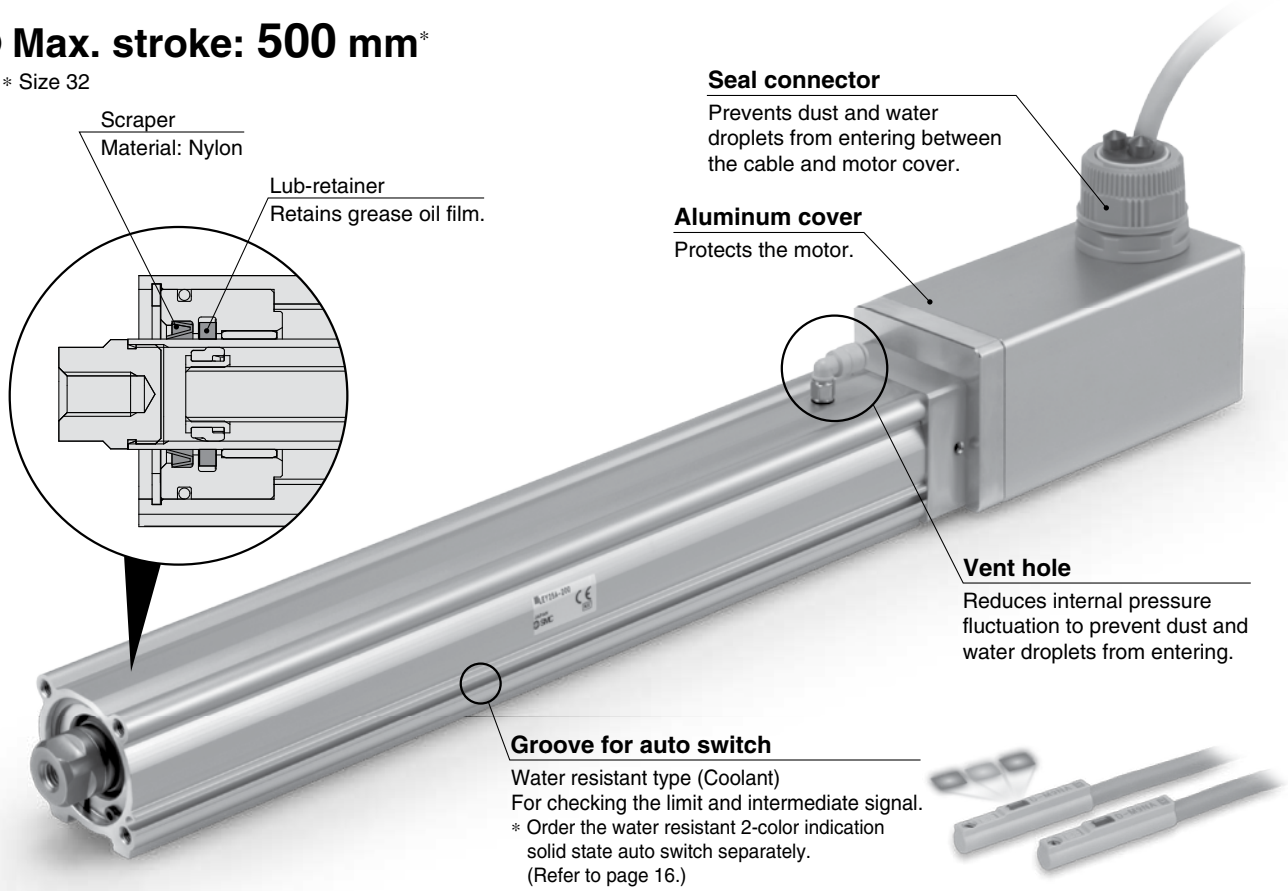
SMC Corporation of America/www.smcusa.com
SMC Pneumatics (Canada) Ltd./www.smcpneumatics.ca
(**800) SMC.SMC1 (762-7621)**
e-mail: sales@smcusa.com
For International inquires: www.smcworld.com
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11-E581 QZ-2.5M-RRD

Electric Actuator/Rod Type

Series LEY-X5 Dust/Drip Proof Specifications

- **Enclosure: IP65**
- **Max. stroke: 500 mm***

* Size 32

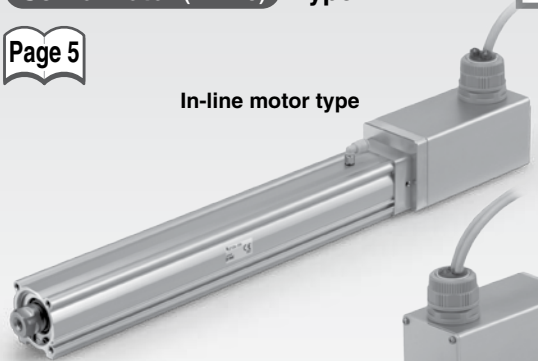


Step Motor (Servo/24 VDC) **Type**
Servo Motor (24 VDC) **Type**

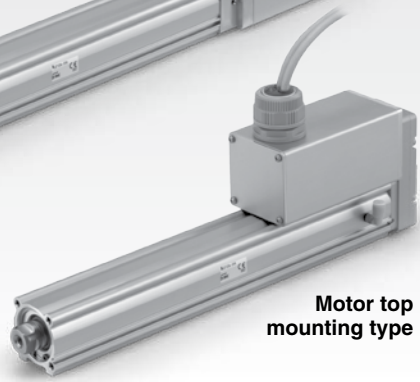
Size
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Page 5

In-line motor type



Motor top mounting type



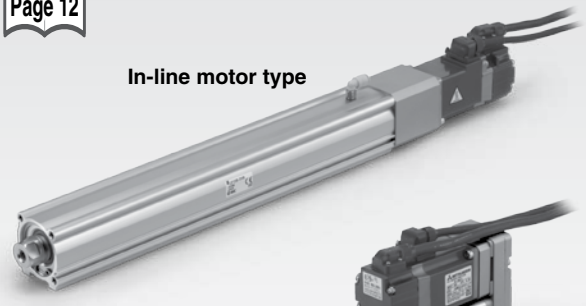
AC Servo Motor (100/200 W) **Type**

* Not applicable to UL.

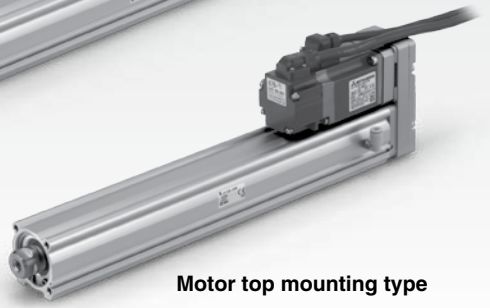
Size
25, 32

Page 12

In-line motor type



Motor top mounting type



Controller

Controller

Step data input type
For step motor
Series LECP6



Control motor
Step motor (Servo/24 VDC)

Step data input type
For servo motor
Series LECA6



Control motor
Servo motor (24 VDC)

Programless type
Series LECP1



Control motor
Step motor (Servo/24 VDC)

Pulse input type
Series LECPA



Control motor
Step motor (Servo/24 VDC)

Controller

Fieldbus-compatible gateway (GW) unit
Series LEC-G









Applicable Fieldbus protocols	CC-Link V2	DeviceNet™	PROFIBUS®	EtherNet/IP™
Max. number of connectable controllers	12	8	5	12

Driver

AC Servo Motor Driver

Pulse input type/
Positioning type
Series LECSA



Control motor
AC servo motor (100/200 WAC)

Pulse input type
Series LECSB



Control motor
AC servo motor (100/200 WAC)

CC-Link direct input type
Series LECSC



Control motor
AC servo motor (100/200 WAC)

SSCNET III type
Series LECSS



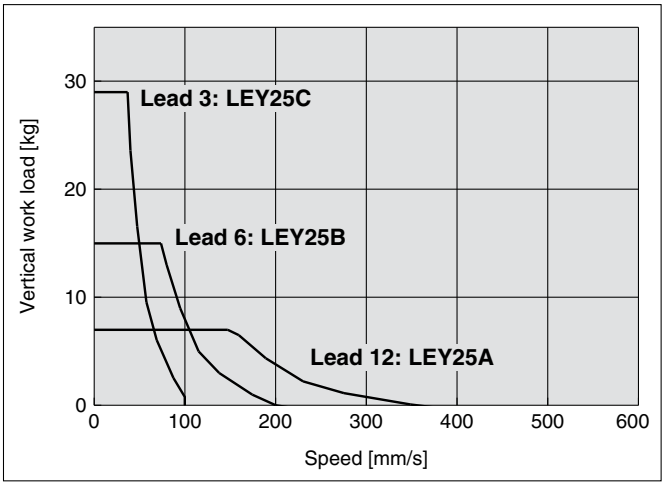
Control motor
AC servo motor (100/200 WAC)

Model Selection

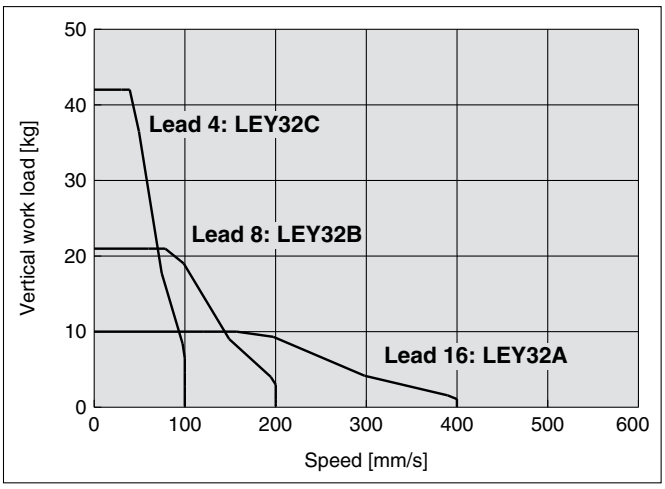
Speed–Vertical Work Load Graph

Step Motor (Servo/24 VDC)

LEY25□

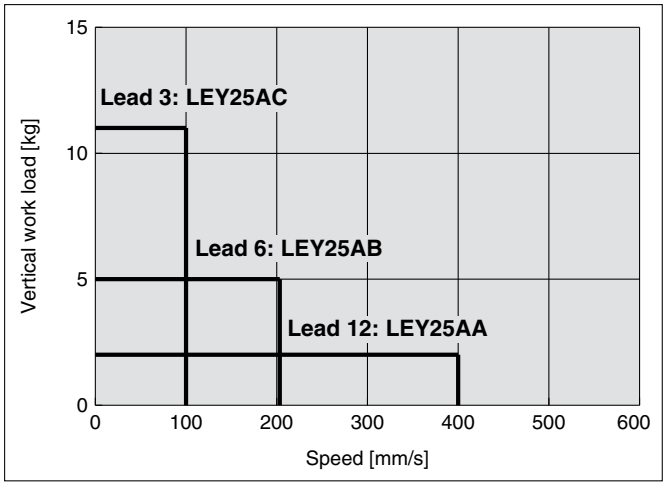


LEY32□

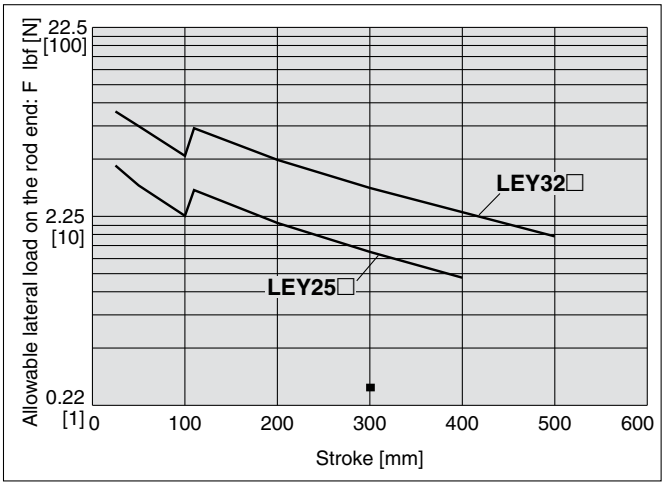


Servo Motor (24 VDC)

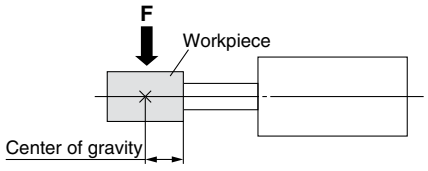
LEY25A□



Graph of Allowable Lateral Load on The Rod End (Guide)



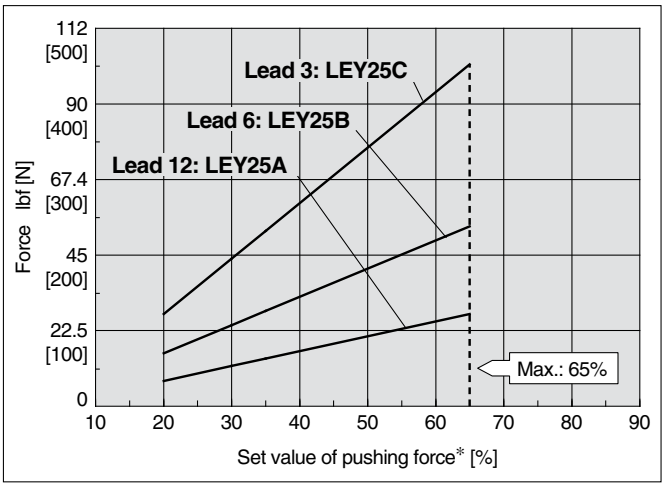
[Stroke] = [Product stroke] + [Distance from the rod end to the center of gravity of the workpiece]



Force Conversion Graph

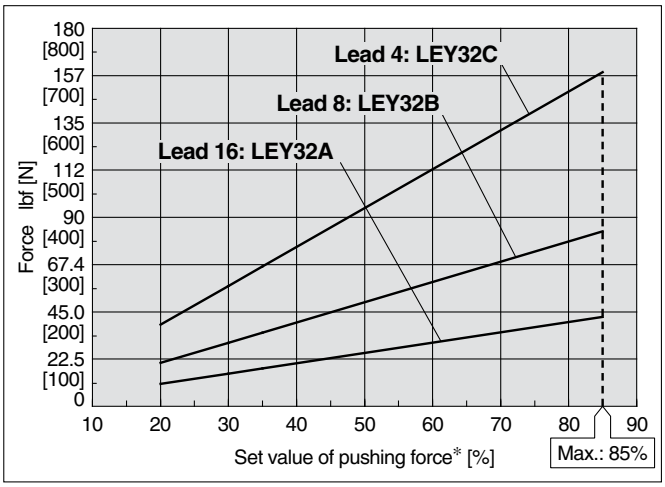
Step Motor (Servo/24 VDC)

LEY25



Ambient temperature	Set value of pushing force* [%]	Duty ratio [%]	Continuous pushing time [minutes]
104°F (40°C) or less	65 or less	100	—

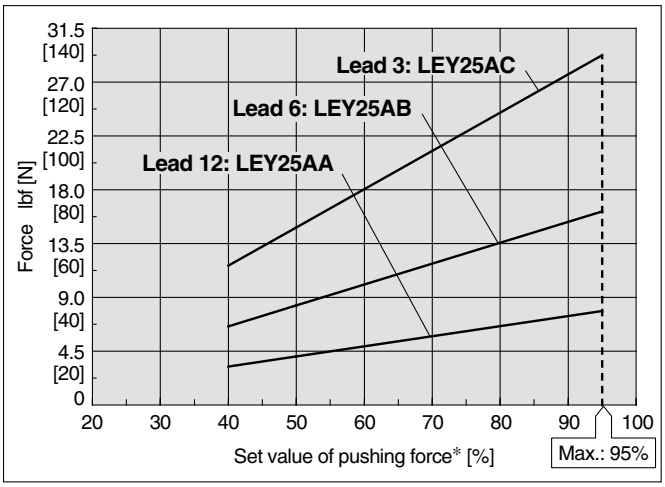
LEY32



Ambient temperature	Set value of pushing force* [%]	Duty ratio [%]	Continuous pushing time [minutes]
77°F (25°C) or less	85 or less	100	—
104°F (40°C)	65 or less	100	—
	85	50	15

Servo Motor (24 VDC)

LEY25



Ambient temperature	Set value of pushing force* [%]	Duty ratio [%]	Continuous pushing time [minutes]
104°F (40°C) or less	95 or less	100	—

<Pushing Force and Trigger Level Range> Without Load

Model	Pushing speed [mm/s]	Pushing force (Setting input value)
LEY25□	1 to 4	20% to 65%
	5 to 20	35% to 65%
	21 to 35	50% to 65%
LEY32□	1 to 4	20% to 85%
	5 to 20	35% to 85%
	21 to 30	60% to 85%

Model	Pushing speed [mm/s]	Pushing force (Setting input value)
LEY25□A	1 to 4	40% to 95%
	5 to 20	60% to 95%
	21 to 35	80% to 95%

Note) For the vertical load (upward), the pushing force (maximum) must be set as shown below, and the device should be operated with a work load less than that shown below.

Model	LEY25□			LEY32□			LEY25□A		
Lead	A	B	C	A	B	C	A	B	C
Work load [kg]	2.5	5	10	4.5	9	18	1.2	2.5	5
Pushing force	65%			85%			95%		

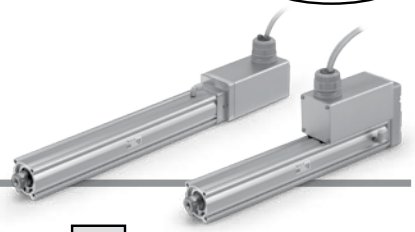
* Set values for the controller.

Electric Actuator/Rod Type

Step Motor (Servo/24 VDC) | Servo Motor (24 VDC)

Series LEY-X5

LEY25, 32



How to Order

LEY 25 D ☐ B – 50 ☐ ☐ ☐ – R 1 6N 1 ☐ – X5

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬ ⓭

● Dust/Drip proof specifications

❶ Size

25	
32	

❷ Motor mounting position

Nil	Top mounting type
D	In-line type

❸ Motor type

Symbol	Motor type	Size 25	Size 32	Compatible controllers
Nil	Step motor (Servo/24 VDC)	●	●	LECP6 LECP1 LECPA
A	Servo motor (24 VDC)	●	—	LECP6

❹ Lead [mm]

Symbol	LEY25	LEY32
A	12	16
B	6	8
C	3	4

❺ Stroke [mm]

30	30
to	to
500	500

∗ Refer to the applicable stroke table.

❻ Motor option

Nil	Without lock
B	With lock

❼ Rod end thread

Nil	Rod end female thread
M	Rod end male thread (1 rod end nut is included.)

❽ Mounting

Symbol	Type	Motor mounting position: Top mounting	Motor mounting position: In-line
Nil	Ends tapped (Standard)	●	●
U	Body bottom tapped	●	●
L	Foot	●	—
F	Rod flange	●	●
G	Head flange	●∗	—

∗ Head flange is not available for the LEY32.

❾ Actuator cable type

R	Robotic cable (Flexible cable)

∗ Cable is shipped assembled.

❿ Actuator cable length [m]

1	1.5	A	10
3	3	B	15
5	5	C	20
8	8		

⓫ Controller type

Nil	Without controller	
6N	LECP6/LECA6 (Step data input type)	NPN
6P		PNP
1N∗	LECP1 (Programless type)	NPN
1P∗		PNP
AN∗	LECPA (Pulse input type)	NPN
AP∗		PNP

∗ Only available for the motor type “Step motor.”

⓬ I/O cable length [m]

Nil	Without cable
1	1.5
3	3
5	5

⓭ Controller mounting

Nil	Screw mounting
D	DIN rail mounting∗

∗ DIN rail is not included. Order it separately.

Applicable stroke table

	30	50	100	150	200	250	300	350	400	450	500
LEY25	●	●	●	●	●	●	●	●	●	—	—
LEY32	●	●	●	●	●	●	●	●	●	●	●

∗ Refer to page 16 for auto switches.
∗ Refer to the LEY series catalog (CAT.ES100-83) for controller models.
∗ “-X5” is not added to an actuator model with a controller part number suffix.
Example) “LEY25DB-100” for the LEY25DB-100BMU-P16NID-X5

⚠ Caution

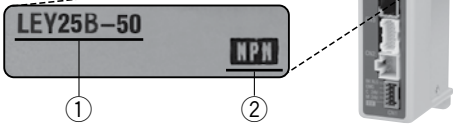
Note 1) CE-compliant products
① EMC compliance was tested by combining the electric actuator LEY series and the controller LEC series. The EMC depends on the configuration of the customer’s control panel and the relationship with other electrical equipment and wiring. Therefore conformity to the EMC directive cannot be certified for SMC components incorporated into the customer’s equipment under actual operating conditions. As a result it is necessary for the customer to verify conformity to the EMC directive for the machinery and equipment as a whole.
② For the servo motor (24 VDC) specification, EMC compliance was tested by installing a noise filter set (LEC-NFA). Refer to the LEY series catalog (CAT.ES100-83) for the noise filter set. Refer to the LECA Operation Manual for installation.
Note 2) UL-compliant products
When conformity to UL is required, the electric actuator and driver should be used with a UL1310 Class 2 power supply.

The actuator and controller are sold as a package.

Confirm that the combination of the controller and the actuator is correct.

<Check the following before use.>

① Check that actuator label for model number. This matches the controller.
② Check Parallel I/O configuration matches (NPN or PNP).



∗ Refer to the operation manual for using the products. Please download it via our website, http://www.smcworld.com

Specifications

Step Motor (Servo/24 VDC)

Model				LEY25			LEY32		
Actuator specifications	Stroke [mm]			30, 50, 100, 150, 200 250, 300, 350, 400			30, 50, 100, 150, 200 250, 300, 350, 400, 450, 500		
	Work load Note 1) [kg]	Horizontal	(3000 [mm/s²])	12	30	30	20	40	40
			(2000 [mm/s²])	18	50	50	30	60	60
		Vertical	(3000 [mm/s²])	7	15	29	10	21	42
	Pushing force lbf [N] Note 2) Note 3) Note 4)			14.2 to 27.4 [63 to 122]	28.3 to 53.5 [126 to 238]	52.2 to 101.6 [232 to 452]	18.0 to 42.5 [80 to 189]	35.1 to 83.2 [156 to 370]	66.5 to 158.9 [296 to 707]
	Speed [mm/s] Note 4)			18 to 400	9 to 200	5 to 100	24 to 400	12 to 200	6 to 100
	Max. acceleration/deceleration [mm/s²]			3,000					
	Pushing speed [mm/s] Note 5)			35 or less			30 or less		
	Positioning repeatability [mm]			±0.02			8		
	Screw lead [mm]			12	6	3	16		4
	Impact/Vibration resistance [m/s²] Note 6)			50/20					
	Actuation type			Ball screw + Belt (LEY□) Ball screw (LEY□D)					
	Guide type			Sliding bushing (Piston rod)					
	Enclosure			IP65					
	Operating temperature range			41 to 104°F (5 to 40°C)					
	Operating humidity range [%RH]			90 or less (No condensation)					
Electric specifications	Motor size			□42			□56.4		
	Motor type			Step motor (Servo/24 VDC)					
	Encoder			Incremental A/B phase (800 pulse/rotation)					
	Rated voltage [V]			24 VDC ±10%					
	Power consumption [W] Note 7)			40			50		
	Standby power consumption when operating [W] Note 8)			15			48		
	Max. instantaneous power consumption [W] Note 9)			48			104		
	Controller weight [kg]			0.15 (Screw mounting), 0.17 (DIN rail mounting)					
Lock unit specifications	Type Note 10)			Non-magnetizing lock					
	Holding force lbf [N]			17.5 [78]	35.3 [157]	66.1 [294]	24.3 [108]	48.6 [216]	94.6 [421]
	Power consumption [W] Note 11)			5			5		
	Rated voltage [V]			24 VDC ±10%					

Note 1) Horizontal: The maximum value of the work load. An external guide is necessary to support the load. The actual work load and transfer speed change according to the condition of the external guide.

Vertical: Speed changes according to the work load. Check “Model Selection” on page 3.

The values shown in ( ) are the maximum acceleration/deceleration. Set these values to be 3000 [mm/s²] or less.

Note 2) Pushing force accuracy is ±20% (F.S.).

Note 3) The pushing force values for LEY25□ is 35% to 65% and for LEY32□ is 35% to 85%. The pushing force values change according to the duty ratio and pushing speed. Check “Model Selection” on page 4.

Note 4) The speed and force may change depending on the cable length, load and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m. (At 15 m: Reduced by up to 20%)

Note 5) The allowable speed for pushing operation. When push conveying a workpiece, operate at the vertical work load or less.

Note 6) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)

Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)

Note 7) The power consumption (including the controller) is for when the actuator is operating.

Note 8) The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation. Except during the pushing operation.

Note 9) The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.

Note 10) With lock only

Note 11) For an actuator with lock, add the power consumption for the lock.

Specifications

Servo Motor (24 VDC)

	Model			LEY25A		
Actuator specifications	Stroke [mm]			30, 50, 100, 150, 200 250, 300, 350, 400		
	Work load [kg] Note 1)	Horizontal	(3000 [mm/s²])	7	15	30
		Vertical	(3000 [mm/s²])	2	5	11
	Pushing force lbf [N] Note 2) Note 3)			4.0 to 7.9 [18 to 35]	8.3 to 16.2 [37 to 72]	14.8 to 29.2 (66 to 130)
	Speed [mm/s]			18 to 400	9 to 200	5 to 100
	Max. acceleration/deceleration [mm/s²]			3,000		
	Pushing speed [mm/s] Note 4)			35 or less		
	Positioning repeatability [mm]			±0.02		
	Screw lead [mm]			12	6	3
	Impact/Vibration resistance [m/s²] Note 5)			50/20		
	Actuation type			Ball screw + Belt (LEY□) Ball screw (LEY□D)		
	Guide type			Sliding bushing (Piston rod)		
	Enclosure			IP65		
	Operating temperature range			41 to 104°F (5 to 40°C)		
	Operating humidity range [%RH]			90 or less (No condensation)		
Electric specifications	Motor size			□42		
	Motor type			Servo motor (24 VDC)		
	Encoder			Incremental A/B phase (800 pulse/rotation)/Z phase		
	Rated voltage [V]			24 VDC ±10%		
	Power consumption [W] Note 6)			86		
	Standby power consumption when operating [W] Note 7)			4 (Horizontal)/12 (Vertical)		
	Max. instantaneous power consumption [W] Note 8)			96		
	Controller weight [kg]			0.15 (Screw mounting), 0.17 (DIN rail mounting)		
Lock unit specifications	Type Note 9)			Non-magnetizing type		
	Holding force lbf [N]			17.5 [78]	35.3 [157]	66.1 [294]
	Power consumption [W] Note 10)			5		
	Rated voltage [V]			24 VDC ±10%		

Note 1) Horizontal: The maximum value of the work load. An external guide is necessary to support the load. The actual work load and transfer speed change according to the condition of the external guide.
Vertical: Speed changes according to the work load. Check "Model Selection" on page 3. The values shown in ( ) are the maximum acceleration/deceleration.
Set these values to be 3000 [mm/s²] or less.
Note 2) Pushing force accuracy is ±20% (F.S.).
Note 3) The pushing force values for LEY25A□ is 50% to 95%. The pushing force values change according to the duty ratio and pushing speed. Check "Model Selection" on page 4.
Note 4) The allowable speed for pushing operation. When push conveying a workpiece, operate at the vertical work load or less.
Note 5) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Note 6) The power consumption (including the controller) is for when the actuator is operating.
Note 7) The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation with the maximum work load. Except during the pushing operation.
Note 8) The maximum instantaneous power consumption (including the controller) is for when the actuator is operating. This value can be used for the selection of the power supply.
Note 9) With lock only
Note 10) For an actuator with lock, add the power consumption for the lock.

Weight

Weight/Motor Top Mounting Type

Model		LEY25									LEY32										
Stroke [mm]		30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	Step motor	1.45	1.52	1.69	1.95	2.13	2.30	2.48	2.65	2.83	2.48	2.59	2.88	3.35	3.64	3.91	4.21	4.49	4.76	5.04	5.32
	Servo motor	1.41	1.48	1.65	1.91	2.09	2.26	2.44	2.61	2.79	—	—	—	—	—	—	—	—	—	—	—

Weight/In-line Motor Type

Model		LEY25D									LEY32D										
Stroke [mm]		30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	Step motor	1.46	1.53	1.70	1.96	2.14	2.31	2.49	2.66	2.84	2.49	2.60	2.89	3.36	3.65	3.92	4.22	4.50	4.77	5.05	5.33
	Servo motor	1.42	1.49	1.66	1.92	2.10	2.27	2.45	2.62	2.80	—	—	—	—	—	—	—	—	—	—	—

(1 kg = 2.2 lbs)

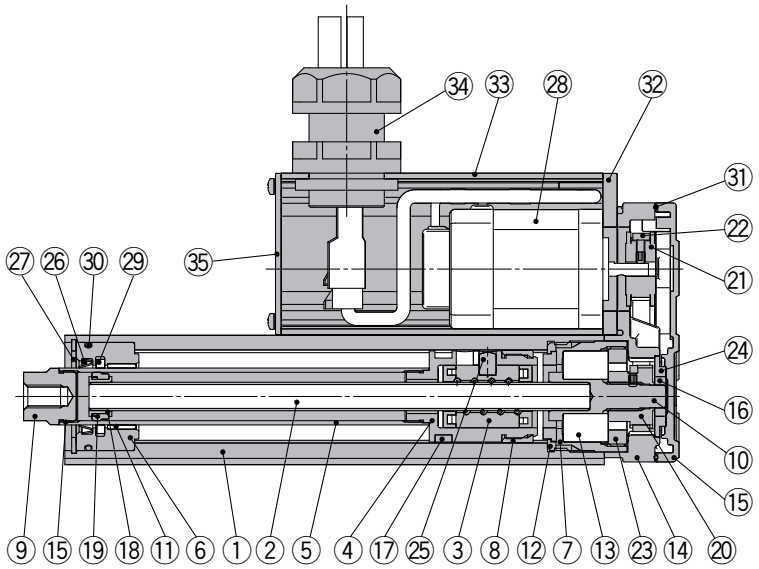
Additional Weight

[kg]

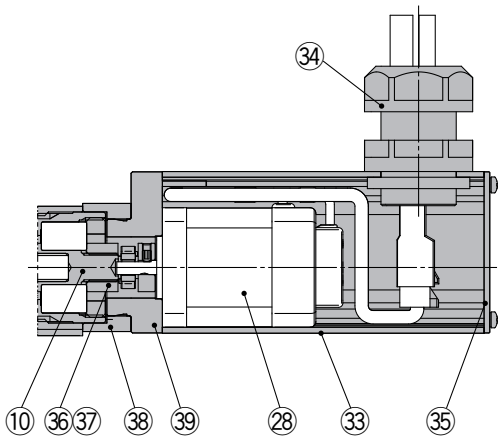
Size		25	32
Lock		0.33	0.63
Rod end male thread	Male thread	0.03	0.03
	Nut	0.02	0.02
Foot (2 sets including mounting bolts)		0.08	0.14
Rod flange (including mounting bolts)		0.17	0.20
Head flange (including mounting bolts)			

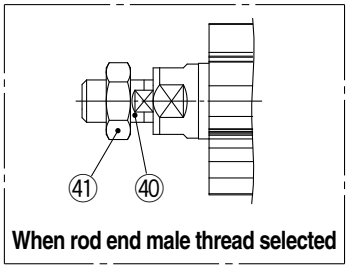
Construction

Motor top mounting type/LEY$^{25}_{32}$



In-line motor type/LEY$^{25}_{32}$D





When rod end male thread selected

Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Ball screw (shaft)**	Alloy steel	
3	**Ball screw nut**	Resin/Alloy steel	
4	**Piston**	Aluminum alloy	
5	**Piston rod**	Stainless steel	Hard chrome anodized
6	**Rod cover**	Aluminum alloy	
7	**Housing**	Aluminum alloy	
8	**Rotation stopper**	POM	
9	**Socket**	Free cutting carbon steel	Nickel plated
10	**Connected shaft**	Free cutting carbon steel	Nickel plated
11	**Bushing**	Lead bronze cast	
12	**Bumper**	Urethane	
13	**Bearing**	—	
14	**Return box**	Aluminum die-cast	Trivalent chromated
15	**Return plate**	Aluminum die-cast	Trivalent chromated
16	**Bearing**	—	
17	**Magnet**	—	
18	**Wear ring holder**	Stainless steel	Stroke 101 mm or more
19	**Wear ring**	POM	Stroke 101 mm or more
20	**Screw shaft pulley**	Aluminum alloy	
21	**Motor pulley**	Aluminum alloy	

No.	Description	Material	Note
22	**Belt**	—	
23	**Bearing stopper**	Aluminum alloy	
24	**Bearing support**	Stainless steel	
25	**Parallel pin**	Stainless steel	
26	**Scraper**	Nylon	
27	**Retaining ring**	Steel for spring	
28	**Motor**	—	
29	**Lub-retainer**	Felt	
30	**O-ring**	NBR	
31	**Gasket**	NBR	
32	**Motor adapter**	Aluminum alloy	Anodized
33	**Motor cover**	Aluminum alloy	Anodized
34	**Seal connector**	—	
35	**End cover**	Aluminum alloy	Anodized
36	**Hub**	Aluminum alloy	
37	**Spider**	NBR	
38	**Motor block**	Aluminum alloy	Anodized
39	**Motor adapter**	Aluminum alloy	LEY25 only
40	**Socket (Male thread)**	Free cutting carbon steel	Nickel plated
41	**Nut**	Alloy steel	

Replacement Parts (Top mounting only)/Belt

No.	Size	Order no.
22	**25**	LE-D-2-2
	32	LE-D-2-3

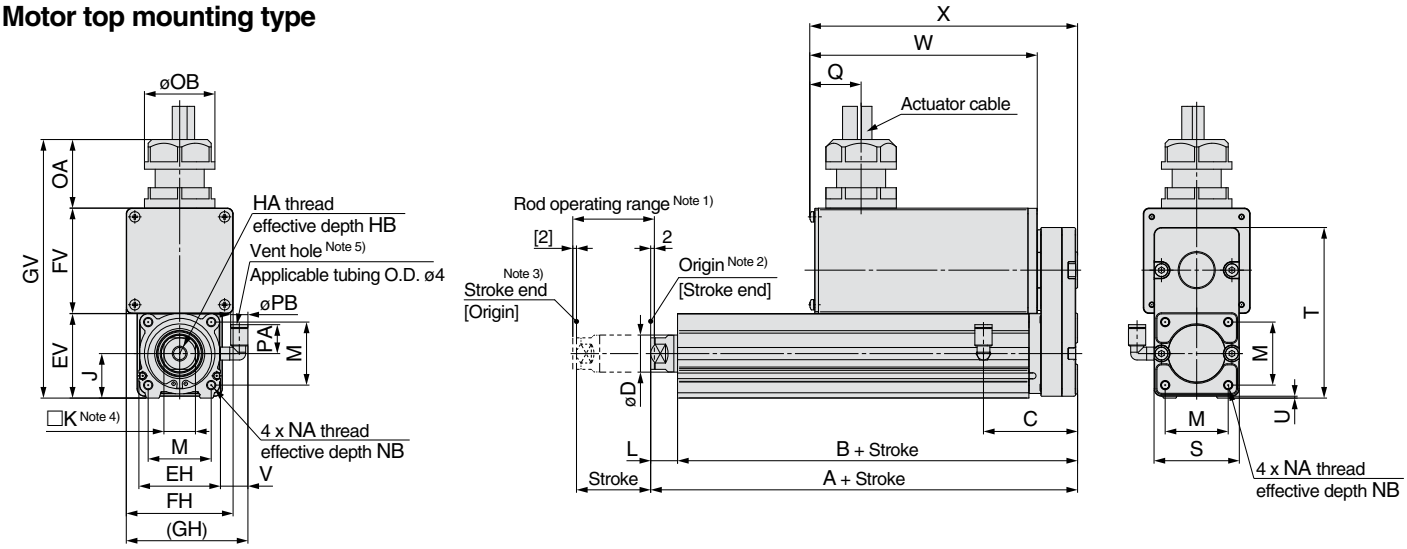
Replacement Parts/Grease Pack

Applied portion	Order no.
Piston rod	GR-S-010 (10 g) GR-S-020 (20 g)

∗ Apply grease on the piston rod periodically.
Grease should be applied at 1 million cycles or 200 km, whichever comes sooner.

Dimensions

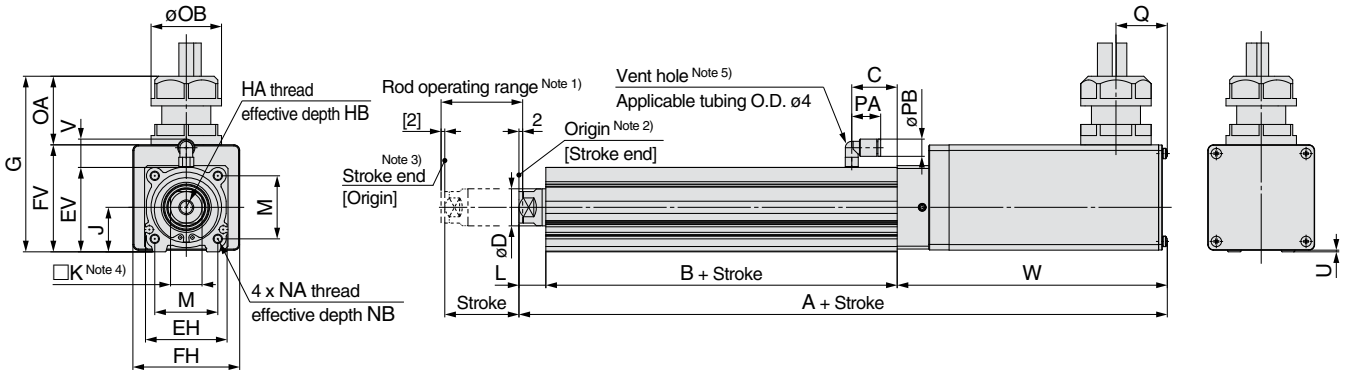
Motor top mounting type



Size	Stroke range (mm)	A	B	C	D	EH	EV	FH	FV	GH	GV	HA	HB	J	K	L	M
25	15 to 100	130.5	116	51	20	44	45.5	57.6	56.8	65.6	139.5	M8 x 1.25	13	24	17	14.5	34
	101 to 400	155.5	141														
32	20 to 100	148.5	130	61	25	51	56.5	69.6	78.6	75.6	173.5	M8 x 1.25	13	31	22	18.5	40
	101 to 500	178.5	160														

Size	Stroke range (mm)	NA	NB	OA	OB	PA	PB	Q	S	T	U	V	W		X	
													Without lock	With lock	Without lock	With lock
25	15 to 100	M5 x 0.8	8	37	38	15.6	9.3	28	46	92	1	14.8	123	173	145	195
	101 to 400															
32	20 to 100	M6 x 1.0	10	37	38	15.6	9.3	28	60	118	1	15.3	123	173	150	200
	101 to 500															

In-line motor type



Size	Stroke range (mm)	A		B	C	D	EH	EV	FH	FV	G	HA	HB	J	K
		Without lock	With lock												
25	15 to 100	250	300	89.5	24.5	20	44	45.5	57.6	57.7	94.7	M8 x 1.25	13	24	17
	101 to 400	275	325	124.5											
32	20 to 100	265.5	315.5	96	26	25	51	56.5	69.6	79.6	116.6	M8 x 1.25	13	31	22
	101 to 500	295.5	345.5	126											

Size	Stroke range (mm)	L	M	NA	NB	OA	OB	PA	PB	Q	U	V	W	
													Without lock	With lock
25	15 to 100	14.5	34	M5 x 0.8	8	37	38	15.6	9.3	28	0.9	15.3	146	196
	101 to 400													
32	20 to 100	18.5	40	M6 x 1.0	10	37	38	15.6	9.3	28	1	15.3	151	201
	101 to 500													

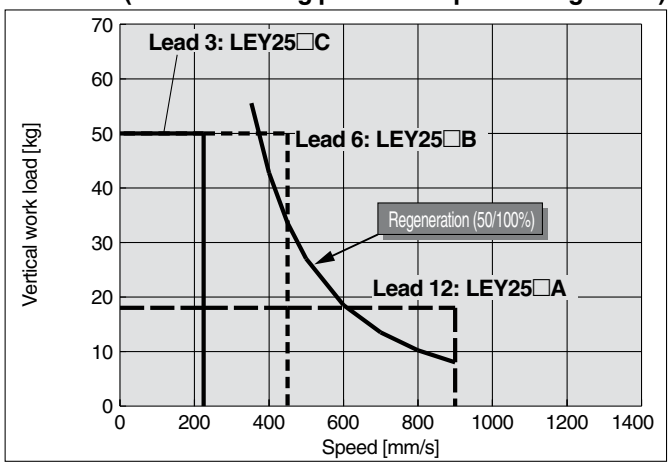
Note 1) Range within which the rod can move when it returns to origin. Make sure a workpiece mounted on the rod does not interfere with the workpieces and facilities around the rod.
Note 2) Position after return to origin.
Note 3) The number in brackets indicates when the direction of return to origin has changed.
Note 4) The direction of rod end width across flats (□K) differs depending on the products.
Note 5) The vent hole is the port for releasing to atmosphere. Do not apply pressure to this hole. Attach tubing to the vent hole and place the end of the tubing so it is not exposed to dust or water.

The dimensions for the mounting are the same as for standard products.

Model Selection

Speed–Vertical Work Load Graph/Required Conditions for "Regeneration Option"

LEY25□ (Motor mounting position: Top mounting/In-line)



Required conditions for "Regeneration option"

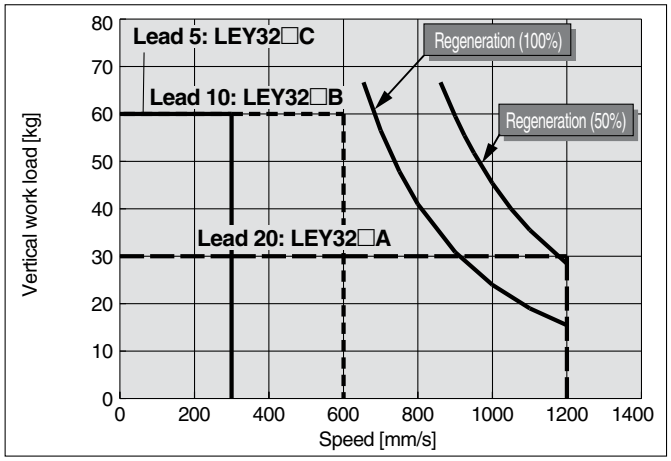
∗ Regeneration option required when using the product above "Regeneration" line in graph. (Order separately)

[How to read the graph]
Required conditions change depending on operating conditions.
Regeneration (50%): Duty ratio 50% or more
Regeneration (100%): Duty ratio 100%

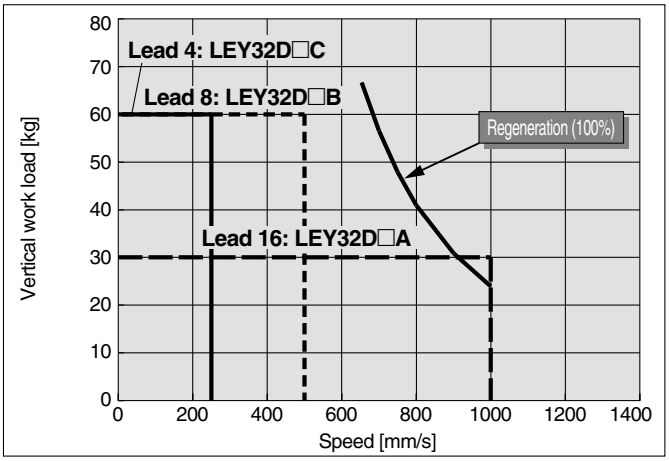
"Regeneration Option" Models

Size	Model
LEY25□	LEC-MR-RB032
LEY32	LEC-MR-RB032
LEY32D	LEC-MR-RB032

LEY32 (Motor mounting position: Top mounting)



LEY32D (Motor mounting position: In-line)



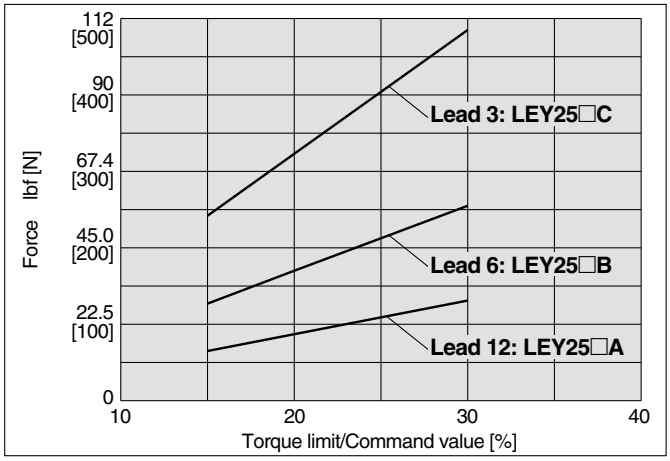
Allowable Stroke Speed

[mm/s]

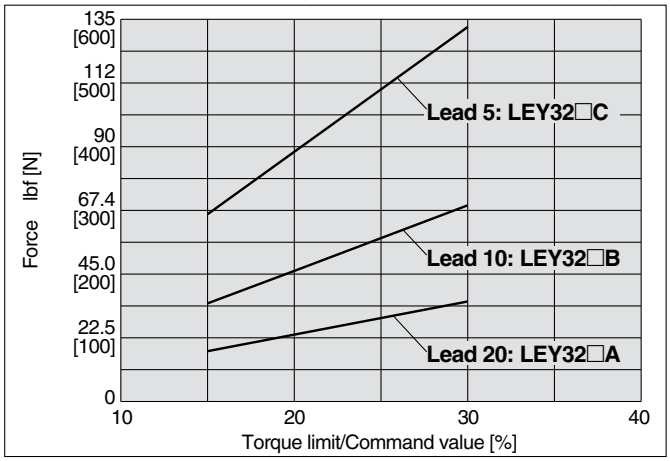
Model	AC servo motor	Lead		Stroke [mm]										
		Symbol	[mm]	30	50	100	150	200	250	300	350	400	450	500
LEY25□ (Motor mounting position: Top mounting/In-line)	100 W /□40	**A**	12	900							600		—	—
		B	6	450							300		—	—
		C	3	225							150		—	—
		(Motor rotation speed)		(4500 rpm)							(3000 rpm)		—	—
LEY32 (Motor mounting position: Top mounting)	200 W /□60	**A**	20	1200									800	
		B	10	600									400	
		C	5	300									200	
		(Motor rotation speed)		(3600 rpm)									(2400 rpm)	
LEY32D (Motor mounting position: In-line)	200 W /□60	**A**	16	1000									640	
		B	8	500									320	
		C	4	250									160	
		(Motor rotation speed)		(3750 rpm)									(2400 rpm)	

Force Conversion Graph

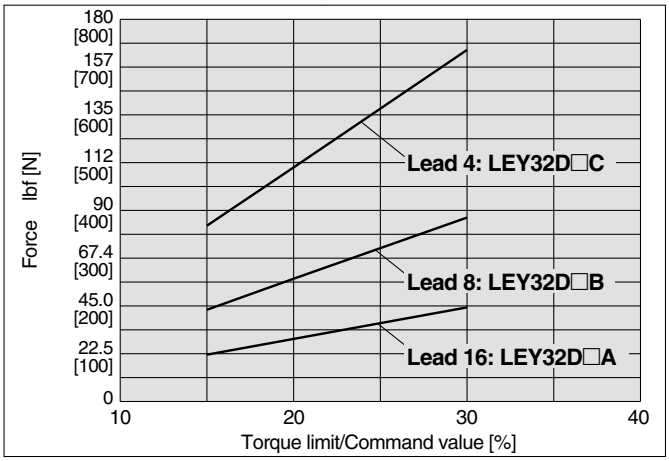
LEY25□ (Motor mounting position: Top mounting/In-line)



LEY32 (Motor mounting position: Top mounting)

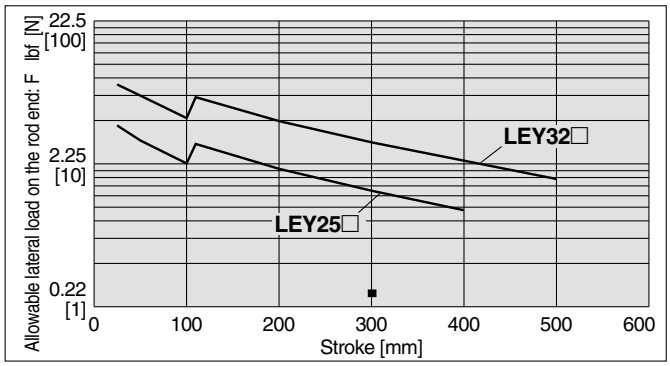


LEY32D (Motor mounting position: In-line)

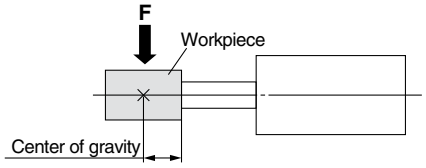


∗1 Motor type: When limiting torque with incremental encoder, parameter No. PC12/the value of the internal torque command should be set 30% or less.
∗2 Motor type: When limiting torque with absolute encoder, parameter No. PC13/the value of the maximum output command for analog torque should be set 30% or less.

Graph of Allowable Lateral Load on The Rod End (Guide)



[Stroke] = [Product stroke] + [Distance from the rod end to the center of gravity of the workpiece]



Electric Actuator/Rod Type

AC Servo Motor (100/200 W)

CE RoHS

Series LEY-X5

LEY25, 32



How to Order

LEY 25 ❶ S2 ❷ B ❸ – 100 ❹ ❺ ❻ – S ❼ 2 ❽ A1 ❾ – X5

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫ ⓬

● Dust/Drip proof specifications

❶ Size

25	
32	

❷ Motor mounting position

Nil	Top mounting type
D	In-line type

❸ Motor type*

Symbol	Type	Output [W]	Actuator size	Compatible drivers
S2	AC servo motor (Incremental encoder)	100	25	LECSA□-S1
S3	AC servo motor (Incremental encoder)	200	32	LECSA□-S3
S6	AC servo motor (Absolute encoder)	100	25	LECSB□-S5 LECSC□-S5 LECSS□-S5
S7	AC servo motor (Absolute encoder)	200	32	LECSB□-S7 LECSC□-S7 LECSS□-S7

* For motor type S2 and S6, the compatible driver part number suffixes are S1 and S5 respectively.

❹ Lead [mm]

Symbol	LEY25□	LEY32□ Note 1)
A	12	16 (20)
B	6	8 (10)
C	3	4 (5)

Note 1) The values shown in ( ) are the equivalent lead which includes the pulley ratio for size 32 top mounting type.

❺ Stroke [mm]

30	30
to	to
500	500

* Refer to the applicable stroke table.

❻ Motor option

Nil	Without lock
B	With lock Note 2)

Note 2) When "With lock" is selected for the top mounting type, the motor body will stick out of the end of the body for size 25 with strokes 30 or less. Check for interference with workpieces before selecting a model.

❼ Rod end thread

Nil	Rod end female thread
M	Rod end male thread (1 rod end nut is included.)

❽ Mounting

Nil	Ends tapped (Standard)
U	Body bottom tapped
L	Foot
F	Rod flange
G	Head flange

* When the in-line type is selected, the foot, head flange and double clevis cannot be selected.
* Mounting bracket is shipped together, (but not assembled).
* For horizontal cantilever mounting with the rod flange, head flange and ends tapped, use the actuator within the following stroke range.
  - LEY25: 200 or less
  - LEY32: 100 or less
* Head flange is not available for the LEY32.

❾ Cable type Note3)

Nil	Without cable
S	Standard cable
R	Robotic cable (Flexible cable)

Note 3) Motor cable and encoder cable are included. (Lock cable is also included if motor option "With lock" is selected.)

❿ Cable length [m] Note 4)

Nil	Without cable
2	2
5	5
A	10

Note 4) Encoder/Motor/Lock cable

⓫ Driver type

	Compatible drivers	Power supply voltage [V]
Nil	Without driver	—
A1	LECSA1	100 to 120
A2	LECSA2	200 to 230
B1	LECSB1	100 to 120
B2	LECSB2	200 to 230
C1	LECSC1	100 to 120
C2	LECSC2	200 to 230
S1	LECSS1	100 to 120
S2	LECSS2	200 to 230

⓬ I/O connector

Nil	Without connector
H	With connector

Applicable stroke table

Model \ Stroke	30	50	100	150	200	250	300	350	400	450	500
LEY25	●	●	●	●	●	●	●	●	●	—	—
LEY32	●	●	●	●	●	●	●	●	●	●	●

Specifications

Model				LEY25S$^{2}_{6}$/LEY25DS$^{2}_{6}$			LEY32S$^{3}_{7}$ (Top mounting)			LEY32DS$^{3}_{7}$ (In-line)		
Actuator specifications	Stroke [mm]			30, 50, 100, 150, 200 250, 300, 350, 400			30, 50, 100, 150, 200, 250 300, 350, 400, 450, 500			30, 50, 100, 150, 200, 250 300, 350, 400, 450, 500		
	Work load [kg]	Horizontal Note 1)		18	50	50	30	60	60	30	60	60
		Vertical		8	16	30	9	19	37	12	24	46
	Pushing force lbf [N] Note 2) (Set value: 15 to 30%) Note 3)			14.6 to 29.4 (65 to 131)	28.6 to 57.3 (127 to 255)	54.4 to 109 (242 to 485)	17.8 to 35.3 (79 to 157)	34.6 to 69.2 (154 to 308)	66.1 to 132.2 (294 to 588)	22.0 to 44.3 (98 to 197)	43.2 to 86.6 (192 to 385)	82.7 to 165.5 (368 to 736)
	Max. speed Note 4) [mm/s]	Stroke range	Up to 300	900	450	225	1200	600	300	1000	500	250
			305 to 400	600	300	150						
			405 to 500	—	—	—	800	400	200	640	320	160
	Pushing speed [mm/s²] Note 5)			35 or less			30 or less			30 or less		
	Max. acceleration/deceleration [mm/s²]			5,000			5,000					
	Positioning repeatability [mm]			±0.02			±0.02					
	Lead [mm]			12	6	3	20 Note 6)	10 Note 6)	5 Note 6)	16	8	4
	Impact/Vibration resistance [m/s²] Note 7)			50/20			50/20					
	Actuation type			Ball screw + Belt/Ball screw			Ball screw + Belt			Ball screw		
	Guide type			Sliding bushing (Piston rod)			Sliding bushing (Piston rod)					
	Enclosure			IP65								
	Operating temperature range °F [°C]			41 to 104 [5 to 40]			41 to 104 [5 to 40]					
	Operating humidity range [%RH]			90 or less (No condensation)			90 or less (No condensation)					
	Required conditions for "Regeneration option" [kg] Note 8)		Horizontal	8 or more	31 or more	Not required	15 or more	Not required	Not required	23 or more	Not required	Not required
			Vertical	3 or more	2 or more	2 or more	6 or more	7 or more	11 or more	6 or more	7 or more	12 or more
Electric specifications	Motor size			100 W/□40			200 W/□60					
	Motor type			AC servo motor (100/200 VAC)			AC servo motor (100/200 VAC)					
	Encoder			Motor type S2, S3: Incremental 17-bit encoder (Resolution: 131072 p/rev) Motor type S6, S7: Absolute/incremental dual 18-bit encoder (Resolution: 262144 p/rev)								
Lock unit specifications	Type Note 9)			Non-magnetizing lock								
	Holding force lbf [N]			29.4 (131)	57.3 (255)	109 (485)	35.3 (157)	69.2 (308)	132.2 (588)	44.3 (197)	86.6 (385)	165.5 (736)
	Power consumption at 68°F (20°C) [W] Note 10)			6.3			7.9			7.9		
	Rated voltage [V]			24 VDC $^{0}_{-10\%}$								

Note 1) The maximum value of the horizontal work load. The actual work load changes according to the condition of the external guide. Please confirm using actual device.
Note 2) The force setting range for the pushing operation with the torque control mode, etc. Set it referring to "Force Conversion Graph" on page 11.
Note 3) Set values for the driver.
Note 4) The allowable speed changes according to the stroke.
Note 5) The allowable collision speed for the pushing operation with the torque control mode, etc.
Note 6) Equivalent lead which includes the pulley ratio [1.25:1]
Note 7) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Note 8) The work load conditions which require "Regeneration option" when operating at the maximum speed (Duty ratio: 100%).
Order the regeneration option separately. For details and order numbers, refer to "Required Conditions for Regeneration Option" on page 10.
Note 9) Only when motor option "With lock" is selected.
Note 10) For an actuator with lock, add the power consumption for the lock.

Weight

Product Weight

(kg)

Series		LEY25S□ (Motor mounting position: Top mounting)									LEY32S□ (Motor mounting position: Top mounting)										
Stroke [mm]		30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Motor type	Incremental encoder	1.31	1.38	1.55	1.81	1.99	2.16	2.34	2.51	2.69	2.42	2.53	2.82	3.29	3.57	3.85	4.14	4.42	4.70	4.98	5.26
	Absolute encoder	1.37	1.44	1.61	1.87	2.05	2.22	2.40	2.57	2.75	2.36	2.47	2.76	3.23	3.51	3.79	4.08	4.36	4.64	4.92	5.20

Series		LEY25DS□ (Motor mounting position: In-line)									LEY32DS□ (Motor mounting position: In-line)										
Stroke [mm]		30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Motor type	Incremental encoder	1.34	1.41	1.58	1.84	2.02	2.19	2.37	2.54	2.72	2.44	2.55	2.84	3.31	3.59	3.87	4.16	4.44	4.72	5.00	5.28
	Absolute encoder	1.40	1.47	1.64	1.90	2.08	2.25	2.43	2.60	2.78	2.38	2.49	2.78	3.25	3.53	3.81	4.10	4.38	4.66	4.94	5.22

Additional Weight

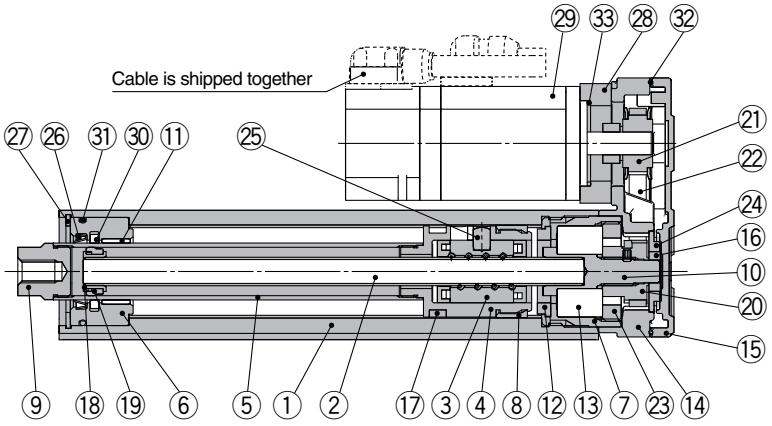
(kg)

(1 Kg = 2.2 lbs)

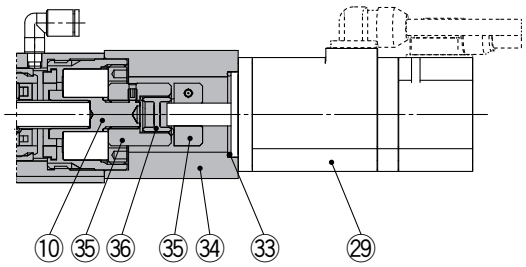
Size		25	32
Lock	Incremental encoder	0.20	0.40
	Absolute encoder	0.30	0.66
Rod end male thread	Male thread	0.03	0.03
	Nut	0.02	0.02
Foot (2 sets including mounting bolts)		0.08	0.14
Rod flange (including mounting bolts)		0.17	0.20
Head flange (including mounting bolts)			

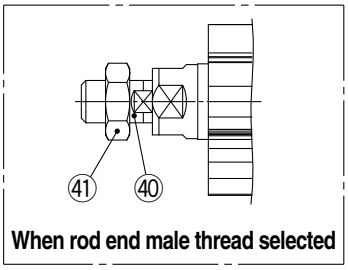
Construction

Motor top mounting type/LEY $^{25}_{32}$



In-line motor type/LEY $^{25}_{32}$ D





When rod end male thread selected

Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Ball screw (shaft)**	Alloy steel	
3	**Ball screw nut**	Resin/Alloy steel	
4	**Piston**	Aluminum alloy	
5	**Piston rod**	Stainless steel	Hard chrome plated
6	**Rod cover**	Aluminum alloy	
7	**Housing**	Aluminum alloy	
8	**Rotation stopper**	POM	
9	**Socket**	Free cutting carbon steel	Nickel plated
10	**Connected shaft**	Free cutting carbon steel	Nickel plated
11	**Bushing**	Lead bronze cast	
12	**Bumper**	Urethane	
13	**Bearing**	—	
14	**Return box**	Aluminum die-cast	Coating
15	**Return plate**	Aluminum die-cast	Coating
16	**Bearing**	—	
17	**Magnet**	—	
18	**Wear ring holder**	Stainless steel	Stroke 101 mm or more
19	**Wear ring**	POM	Stroke 101 mm or more

No.	Description	Material	Note
20	**Screw shaft pulley**	Aluminum alloy	
21	**Motor pulley**	Aluminum alloy	
22	**Belt**	—	
23	**Bearing stopper**	Aluminum alloy	
24	**Bearing support**	Stainless steel	
25	**Parallel pin**	Stainless steel	
26	**Scraper**	Nylon	
27	**Retaining ring**	Steel for spring	
28	**Motor adapter**	Aluminum alloy	Coating
29	**Motor**	—	
30	**Lube-retainer**	Felt	
31	**O-ring**	NBR	
32	**Gasket**	NBR	
33	**O-ring**	NBR	
34	**Motor block**	Aluminum alloy	Coating
35	**Hub**	Aluminum alloy	
36	**Spider**	Urethane	
37	**Socket (Male thread)**	Free cutting carbon steel	Nickel plated
38	**Nut**	Alloy steel	Zinc chromated

Replacement Parts (Top mounting only)/Belt

No.	Size	Order no.
22	**25**	LE-D-2-2
	32	LE-D-2-4

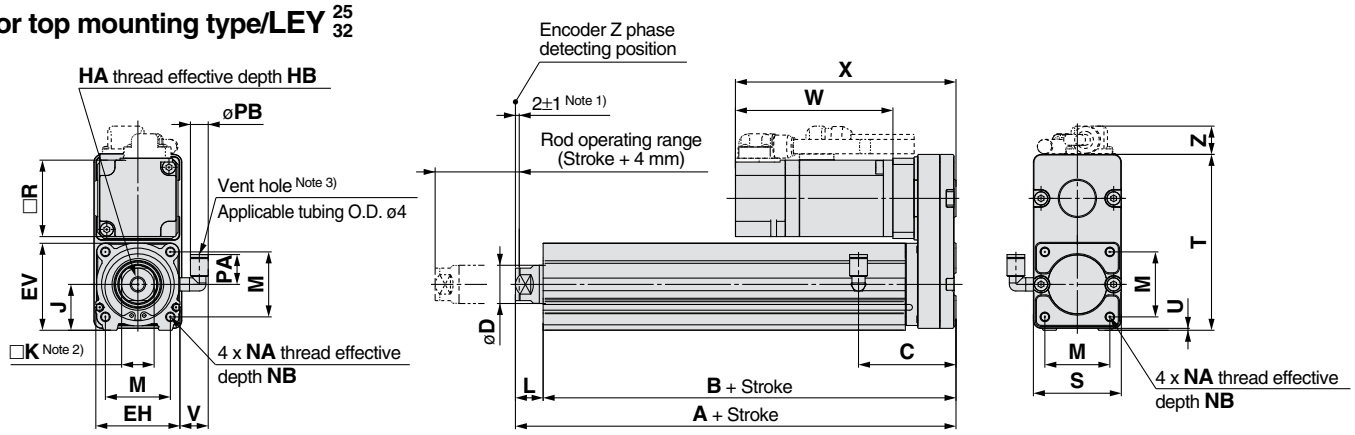
Replacement Parts/Grease Pack

Applied portion	Order no.
Piston rod	GR-S-010 (10 g) GR-S-020 (20 g)

∗ Apply grease on the piston rod periodically.
Grease should be applied at 1 million cycles or 200 km, whichever comes sooner.

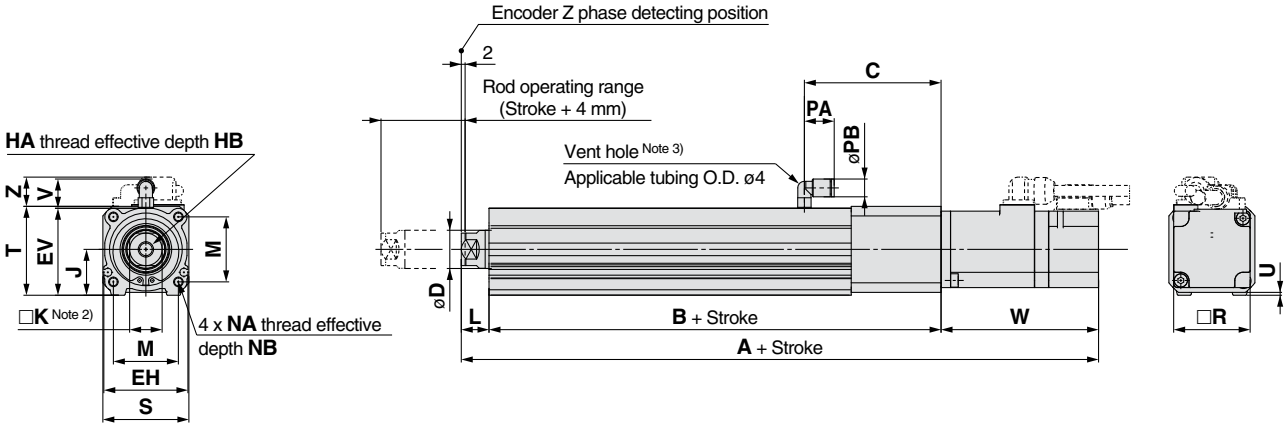
Dimensions

Motor top mounting type/LEY $^{25}_{32}$



Size	Stroke range (mm)	A	B	C	D	EH	EV	HA	HB	J	K	L	M	NA	NB
25	15 to 100	130.5	116	51	20	44	45.5	M8 x 1.25	13	24	17	14.5	34	M5 x 0.8	8
	101 to 400	155.5	141												
32	20 to 100	148.5	130	61	25	51	56.5	M8 x 1.25	13	31	22	18.5	40	M6 x 1.0	10
	101 to 500	178.5	160												

Size	Stroke range (mm)	PA	PB	R	S	T	U	V	Incremental encoder				Absolute encoder			
									Without lock		With lock		Without lock		With lock	
									W	X	W	X	W	X	W	X
25	15 to 100	15.6	9.3	40	46	92	1	14.8	87	120	123.9	156.9	82.4	115.4	123.5	156.5
	101 to 400															
32	20 to 100	15.6	9.3	60	60	118	1	15.3	88.2	128.2	116.8	156.8	76.6	116.6	116.1	156.1
	101 to 500															



Size	Stroke range (mm)	Incremental encoder				Absolute encoder				B	C	D	EH	EV	HA	HB
		Without lock		With lock		Without lock		With lock								
		A	W	A	W	A	W	A	W							
25	15 to 100	238	87	274.9	123.9	233.4	82.4	274.5	123.5	136.5	71.5	20	44	45.5	M8 x 1.25	13
	101 to 400	263		299.9		258.4		299.5		161.5						
32	20 to 100	262.7	88.2	291.3	116.8	251.1	76.6	290.6	116.1	156	87	25	51	56.5	M8 x 1.25	13
	101 to 500	292.7		321.3		281.1		320.6		186						

Size	Stroke range (mm)	J	K	L	M	NA	NB	PA	PB	R	S	T	U	V
25	15 to 100	24	17	14.5	34	M5 x 0.8	8	15.6	9.3	40	45	46.5	1.5	15.3
	101 to 400													
32	20 to 100	31	22	18.5	40	M6 x 1.0	10	15.6	9.3	60	60	61	1	15.3
	101 to 500													

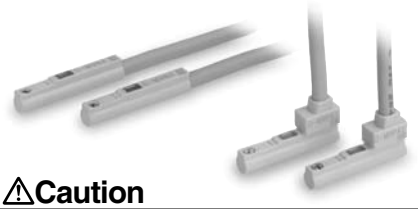
Note 1) Range within which the rod can move.
Make sure a workpiece mounted on the rod does not interfere with the workpieces and facilities around the rod.
Note 2) The direction of rod end width across flats (□K) differs depending on the products.
Note 3) The vent hole is the port for releasing to atmosphere. Do not apply pressure to this hole.
Attach tubing to the vent hole and place the end of the tubing so it is not exposed to dust or water.

The dimensions for the mounting are the same as for standard products.

Water Resistant 2-Color Indication
Solid State Auto Switch: Direct Mounting Style
D-M9NA(V)/D-M9PA(V)/D-M9BA(V) CE RoHS

Grommet

- **Water (coolant) resistant type**
- **2-wire load current is reduced (2.5 to 40 mA).**
- **The optimum operating range can be determined by the color of the light. (Red → Green ← Red)**
- **Using flexible cable as standard.**



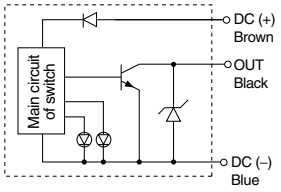
⚠Caution

Precautions

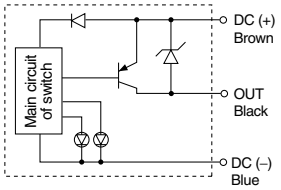
Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Auto Switch Internal Circuit

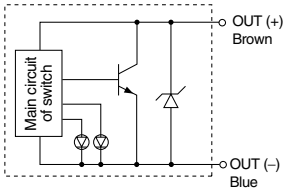
D-M9NA/M9NAV



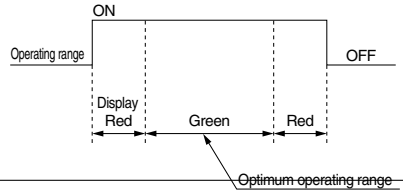
D-M9PA/M9PAV



D-M9BA/M9BAV



Indicator light/Indication method



Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□A, D-M9□AV (With indicator light)						
Auto switch model	D-M9NA	D-M9NAV	D-M9PA	D-M9PAV	D-M9BA	D-M9BAV
Electrical entry	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)				4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Operating range ..... Red LED lights up. Optimum operating range ..... Green LED lights up.					
Standards	CE marking					

• Lead wires — Oilproof flexible heavy-duty vinyl cord: ø2.7 x 3.2 ellipse, 0.15 mm², 2 cores (D-M9BA(V)), 3 cores (D-M9NA(V), D-M9PA(V))

Note 1) Refer to Best Pneumatics No. 2 for solid state auto switch common specifications.

Note 2) Refer to Best Pneumatics No. 2 for lead wire length.

Weight

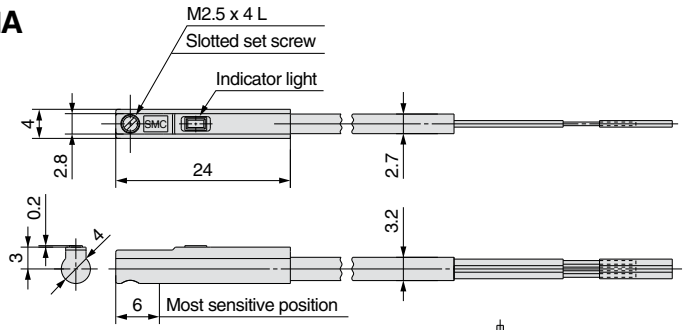
[g]

Auto switch model		D-M9NA (V)	D-M9PA (V)	D-M9BA (V)
Lead wire length (m)	0.5	8	8	7
	1	14	14	13
	3	41	41	38
	5	68	68	63

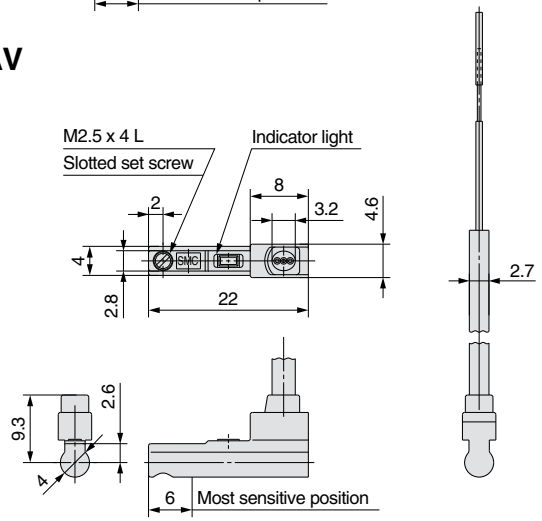
Dimensions

[mm]

D-M9□A



D-M9□AV



SMC