

# Electric Rotary Table

## LER Series



### Step Motor (Servo/24 VDC)

**Low profile**



#### Basic type [mm]

Model	H
LER10	42
LER30	53
LER50	68

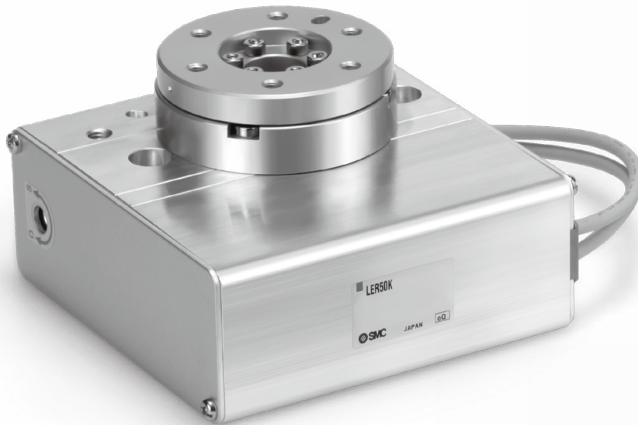
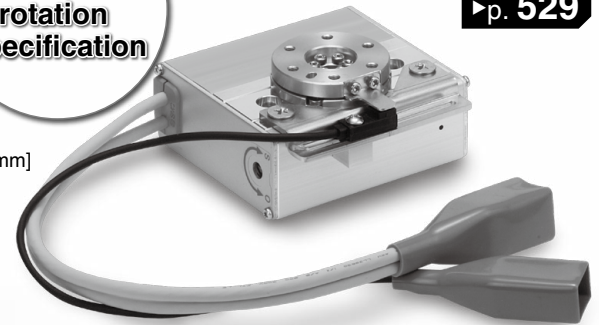
#### High-precision type [mm]

Model	H
LERH10	49
LERH30	62
LERH50	78

**Continuous rotation specification**

● Rotation angle: 360°

▶ p. 529



### ● Shock-less/High speed actuation

Max. speed: 420°/sec (7.33 rad/sec)

Max. acceleration/deceleration: 3000°/sec<sup>2</sup> (52.36 rad/sec<sup>2</sup>)

### ● Positioning repeatability: ±0.03° (High-precision type)

Repeatability at the end: ±0.01° (Pushing control/With external stopper)

### ● Rotation angle

360°, 320° (310°), 180°, 90°

The value indicated in brackets shows the value for the LER10.

### ● Can set speed, acceleration/deceleration, and position (Max. 64 points)

### ● Energy-saving product

Automatic 40% power reduction after the table has stopped.

Size	Rotating torque [N·m]		Max. speed [°/s]		Page
	Basic	High torque	Basic	High torque	
10	0.22	0.32			▶ p. 515
30	0.8	1.2	420	280	
50	6.6	10			

\* Value when an external stopper is mounted.

### Step Motor (Servo/24 VDC) Controllers/Drivers

#### ▶ Step data input type

JXC51/61 Series

- 64 positioning points
- Input using controller setting kit or teaching box



#### ▶ EtherCAT®/EtherNet/IP™/PROFINET/DeviceNet™/IO-Link/CC-Link direct input type

JXCE1/91/P1/D1/L1/M1 Series



#### ▶ Programless type

LECP1 Series

- 14 positioning points
- Control panel setting



#### ▶ Pulse input type

LECPA Series

- \* Not applicable to the continuous rotation specification

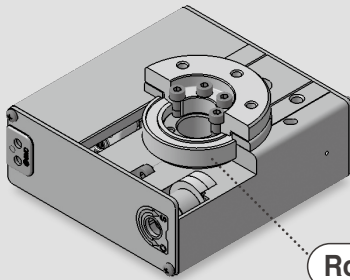


▶ p. 684

- LEFS
- LEFB
- LEJS
- LEJB
- LEL
- LEM
- LEY
- LEYG
- LES
- LESH
- LEPY
- LEPS
- LER
- LEH
- LEY-X5
- 11-LEFS
- 11-LEJS
- 25A-
- LEC
- JXC
- LECS
- LECS-T
- LECY
- Motorless
- LAT3

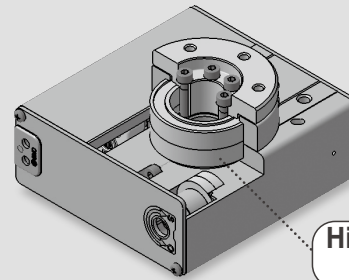
Basic and high-precision types are available.

## Basic type/LER



Rolling bearing

## High-precision type/LERH



High-precision bearing

The movement in the table's radial thrust direction is reduced.

## Rotation angle

360°, 320°(310°), 180°, 90°

The value indicated in brackets shows the value for the LER10.

## High torque

Output is **30** times with special worm gear. Special worm gear with reduced backlash is used.

## Maximum rotation torque can be selected.

Belt deceleration ratio can be selected.

[N·m]

Model	Basic	High torque
LER10	0.22	0.32
LER30	0.8	1.2
LER50	6.6	10.0

## Built-in step motor (Servo/24 VDC)

Space-saving

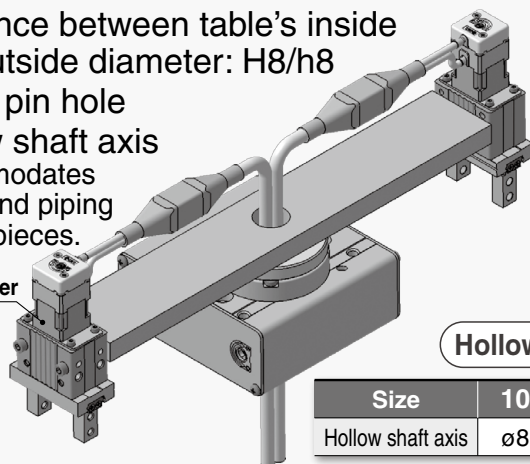
## Manual override screw (Both sides)

Possible to rotate the table with power OFF by manual override.

## Easy Mounting of Workpieces

- Tolerance between table's inside and outside diameter: H8/h8
- Dowel pin hole
- Hollow shaft axis  
Accommodates wiring and piping of workpieces.

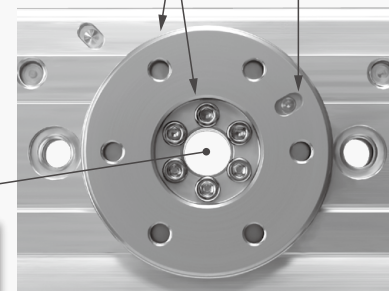
Electric gripper  
*LEH Series*



For alignment of rotation center and workpiece

Dowel pin hole

Positioning of rotating direction



Hollow shaft axis

Size	10	30	50
Hollow shaft axis	ø8	ø17	ø20



Model Selection ..... p. 515

Step Motor (Servo/24 VDC)

## Electric Rotary Table *LER Series*



How to Order ..... p. 521  
 Specifications ..... p. 524  
 Construction ..... p. 525  
 Dimensions ..... p. 526

Step Motor (Servo/24 VDC)

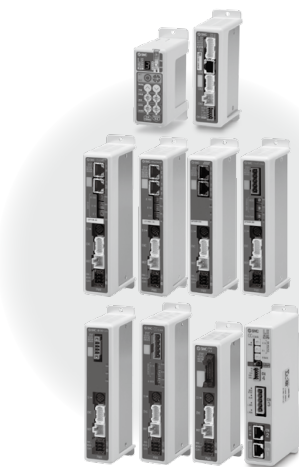
## Continuous Rotation Specification Electric Rotary Table *LER Series*



How to Order ..... p. 529  
 Specifications ..... p. 532  
 Construction ..... p. 533  
 Dimensions ..... p. 534

Specific Product Precautions ..... p. 537

## Step Motor (Servo/24 VDC) Controller



Step Data Input Type/*JXC51/61 Series* ..... p. 706-1  
 EtherCAT®/EtherNet/IP™/PROFINET/DeviceNet™/IO-Link/CC-Link  
 Direct Input Type/*JXCE1/91/P1/D1/L1/M1 Series* ..... p. 741  
 Gateway Unit/*LEC-G Series* ..... p. 715  
 Programless Controller/*LECP1 Series* ..... p. 719  
 Step Motor Driver/*LECPA Series* ..... p. 731  
  
 Actuator Cable ..... p. 758  
 Communication Cable for Controller Setting/*LEC-W2A-□* ..... p. 760  
 Teaching Box/*LEC-T1* ..... p. 761

## 3-Axis Step Motor Controller



EtherNet/IP™ Type/*JXC92 Series* ..... p. 747

## 4-Axis Step Motor Controller (Servo/24 VDC)



Parallel I/O/*JXC73/83 Series* ..... p. 749  
 EtherNet/IP™ Type/*JXC93 Series* ..... p. 749

# Electric Rotary Table

## LER Series

Step Motor (Servo/24 VDC)

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Continuous Rotation Specification p. 529



Step Motor/Servo Motor Controller/Driver p. 684

LEFS  
LEFB

LEJS  
LEJB

LEL

LEM

LEY  
LEYG

LES  
LESH

LEPY  
LEPS

LER

LEH

LEY-X5

11-LEFS

11-LEJS

25A-

LEC

JXC

LECS  
LECS-T

LECY

Motorless

LAT3

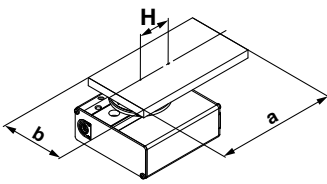
# Model Selection



LER Series ▶ p. 521 Continuous Rotation Specification LER-1 Series ▶ p. 529

## Selection Procedure

Operating conditions



Electric rotary table: LER30J  
 Mounting position: Horizontal  
 Load type: Inertial load  $T_a$   
 Configuration of load: 150 mm x 80 mm (Rectangular plate)  
 Rotation angle  $\theta$ : 180°

Angular acceleration/  
 angular deceleration  $\dot{\omega}$ : 1000°/sec<sup>2</sup>  
 Angular speed  $\omega$ : 420°/sec  
 Load mass [m]: 2.0 kg  
 Distance between shaft and center of gravity H: 40 mm

### Step 1 Moment of inertia—Angular acceleration/deceleration

① Calculation of moment of inertia

**Formula**

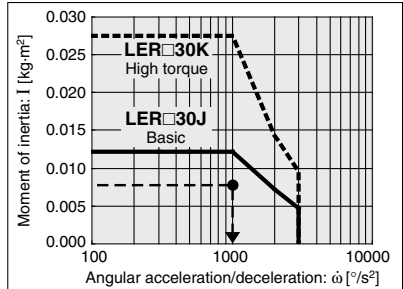
$$I = m \times (a^2 + b^2)/12 + m \times H^2$$

② Moment of inertia—Check the angular acceleration/deceleration  
 Select a model based on the moment of inertia and angular acceleration and deceleration while referencing the (Moment of Inertia—Angular Acceleration/Deceleration graph).

**Selection example**

$$I = 2.0 \times (0.15^2 + 0.08^2)/12 + 2.0 \times 0.04^2 = 0.00802 \text{ kg}\cdot\text{m}^2$$

LER30



### Step 2 Necessary torque

① Load type

- Static load:  $T_s$
- Resistance load:  $T_f$
- Inertial load:  $T_a$

**Formula**

Effective torque  $\geq T_s$   
 Effective torque  $\geq T_f \times 1.5$   
 Effective torque  $\geq T_a \times 1.5$

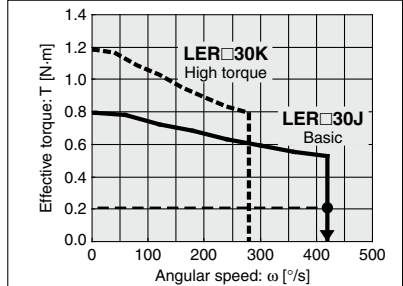
② Check the effective torque

Confirm whether it is possible to control the speed based on the effective torque corresponding with the angular speed while referencing the (Effective Torque—Angular Speed graph).

**Selection example**

Inertial load:  $T_a$   
 $T_a \times 1.5 = I \times \dot{\omega} \times 2 \pi / 360 \times 1.5$   
 $= 0.00802 \times 1000 \times 0.0175 \times 1.5 = 0.21 \text{ N}\cdot\text{m}$

LER30



### Step 3 Allowable load

① Check the allowable load

- Radial load
- Thrust load
- Moment

**Formula**

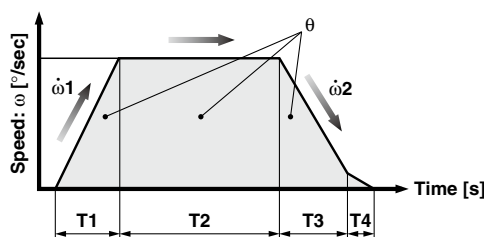
Allowable thrust load  $\geq m \times 9.8$   
 Allowable moment  $\geq m \times 9.8 \times H$

**Selection example**

- Thrust load  
 $2.0 \times 9.8 = 19.6 \text{ N} < \text{Allowable load OK}$
- Allowable moment  
 $2.0 \times 9.8 \times 0.04 = 0.784 \text{ N}\cdot\text{m} < \text{Allowable moment OK}$

### Step 4 Rotation time

① Calculation of cycle time (rotation time)



$\theta$ : Rotation angle [°]  
 $\omega$ : Angular speed [°/sec]  
 $\dot{\omega}1$ : Angular acceleration [°/sec<sup>2</sup>]  
 $\dot{\omega}2$ : Angular deceleration [°/sec<sup>2</sup>]  
 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 positioning is completed

**Formula**

Angular acceleration time  $T1 = \omega / \dot{\omega}1$   
 Angular deceleration time  $T3 = \omega / \dot{\omega}2$   
 Constant speed time  $T2 = \{\theta - 0.5 \times \omega \times (T1 + T3)\} / \omega$   
 Settling time  $T4 = 0.2 \text{ [s]}$   
 Cycle time  $T = T1 + T2 + T3 + T4$

**Selection example**

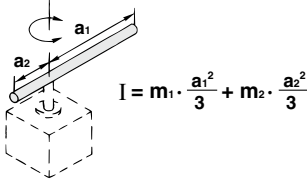
- Angular acceleration time  $T1 = 420 / 1000 = 0.42 \text{ sec}$
- Angular deceleration time  $T3 = 420 / 1000 = 0.42 \text{ sec}$
- Constant speed time  
 $T2 = \{180 - 0.5 \times 420 \times (0.42 + 0.42)\} / 420 = 0.009 \text{ sec}$
- Cycle time  
 $T = T1 + T2 + T3 + T4 = 0.42 + 0.009 + 0.42 + 0.2 = 1.049 \text{ [s]}$

**Formulas for Moment of Inertia (Calculation of moment of inertia I)**

I: Moment of inertia [kg·m<sup>2</sup>] m: Load mass [kg]

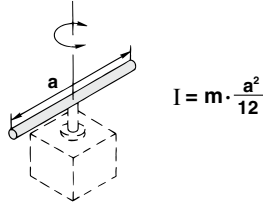
**1. Thin bar**

Position of rotation shaft: Perpendicular to a bar through one end



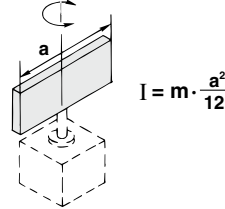
**2. Thin bar**

Position of rotation shaft: Passes through the center of gravity of the bar.



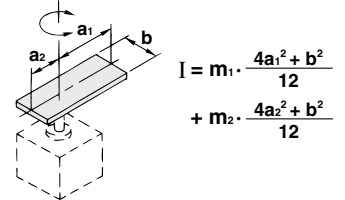
**3. Thin rectangular plate (cuboid)**

Position of rotation shaft: Passes through the center of gravity of a plate.



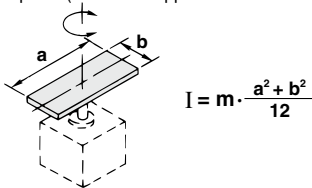
**4. Thin rectangular plate (cuboid)**

Position of rotation shaft: Perpendicular to the plate and passes through one end. (The same applies to thicker cuboids.)



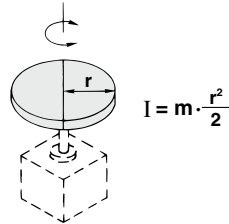
**5. Thin rectangular plate (cuboid)**

Position of the rotation shaft: Passes through the center of gravity of the plate and perpendicular to the plate. (The same applies to thicker cuboids.)



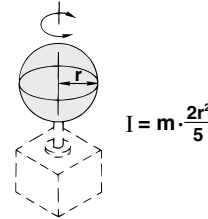
**6. Cylindrical shape (including a thin disk)**

Position of rotation shaft: Center axis



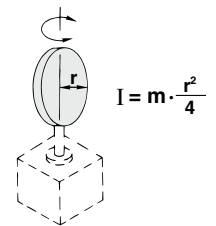
**7. Sphere**

Position of rotation shaft: Diameter

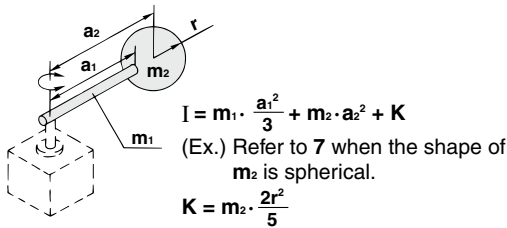


**8. Thin disk (mounted vertically)**

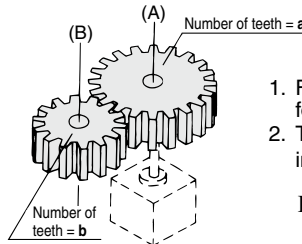
Position of rotation shaft: Diameter



**9. When a load is mounted on the end of the lever**



**10. Gear transmission**



1. Find the moment of inertia  $I_B$  for the rotation of shaft (B).
2. Then, replace the moment of inertia  $I_B$  around the shaft (A) by  $I_A$ ,

$$I_A = \left(\frac{a}{b}\right)^2 \cdot I_B$$

**Load Type**

Load type		
Static load: Ts	Resistance load: Tf	Inertial load: Ta
Only pressing force is necessary. (e.g. for clamping)	Gravity or friction force is applied to rotating direction.	Rotate the load with inertia.
	Gravity is applied.	Center of rotation and center of gravity of the load are concentric.
Friction force is applied.	Rotation shaft is vertical (up and down).	
<b>Ts = F · L</b> Ts: Static load [N·m] F: Clamping force [N] L: Distance from the rotation center to the clamping position [m]	Gravity is applied to rotating direction. <b>Tf = m · g · L</b> Friction force is applied to rotating direction. <b>Tf = μ · m · g · L</b> Tf: Resistance load [N·m] m: Load mass [kg] g: Gravitational acceleration 9.8 [m/s <sup>2</sup> ] L: Distance from the rotation center to the point of application of the gravity or friction force [m] μ: Friction coefficient	<b>Ta = I · ω̇ · 2 π / 360</b> <b>(Ta = I · ω̇ · 0.0175)</b> Ta: Inertial load [N·m] I: Moment of inertia [kg·m <sup>2</sup> ] ω̇: Angular acceleration/deceleration [°/sec <sup>2</sup> ] ω: Angular speed [°/sec]
Necessary torque: <b>T = Ts</b>	Necessary torque: <b>T = Tf x 1.5*1</b>	Necessary torque: <b>T = Ta x 1.5*1</b>
<ul style="list-style-type: none"> <li>• <b>Resistance load: Gravity or friction force is applied to rotating direction.</b> Ex. 1) Rotation shaft is horizontal (lateral), and the rotation center and the center of gravity of the load are not concentric.</li> <li>Ex. 2) Load moves by sliding on the floor. * The total of resistance load and inertial load is the necessary torque. <b>T = (Tf + Ta) x 1.5</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Not resistance load: Neither gravity or friction force is applied to rotating direction.</b> Ex. 1) Rotation shaft is vertical (up and down).</li> <li>Ex. 2) Rotation shaft is horizontal (lateral), and rotation center and the center of gravity of the load are concentric. * Necessary torque is inertial load only. <b>T = Ta x 1.5</b></li> </ul>	

\*1 To adjust the speed, margin is necessary for Tf and Ta.

LEFS  
LEJB  
LEJ  
LEM  
LEY  
LESH  
LEPS  
LER  
LEH  
LEY-X5  
11-LEFS  
11-LEJS  
25A-  
LEC  
JXC  
LECS  
LECS-T  
LECY  
Motorless  
LAT3

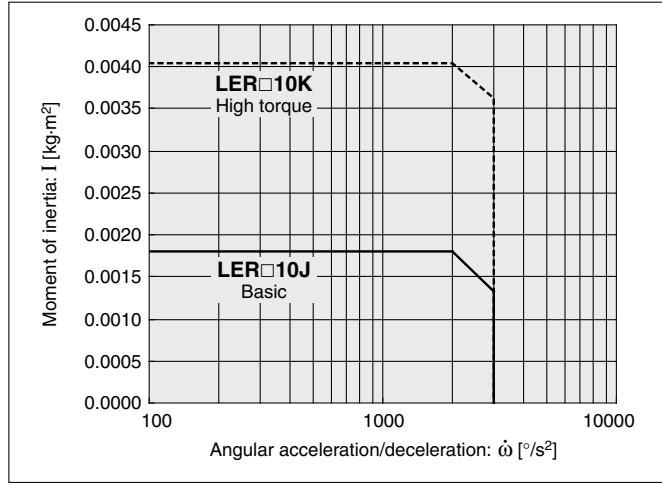




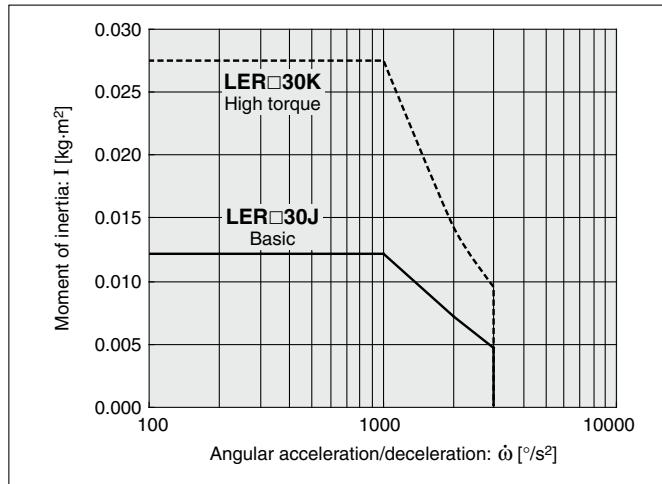
## For Step Motor (Servo/24 VDC) LECPA, JXC□<sub>3</sub><sup>2</sup>

### Moment of Inertia—Angular Acceleration/Deceleration

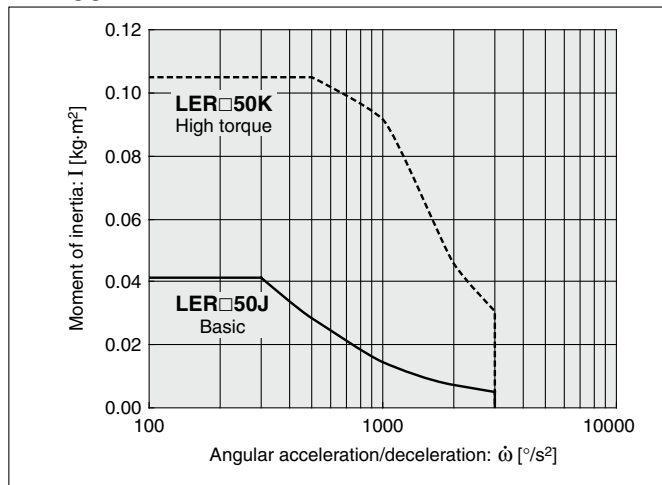
#### LER10



#### LER30

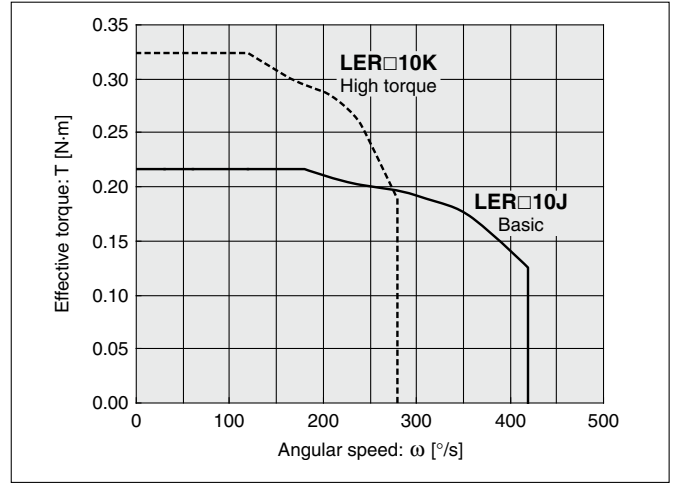


#### LER50

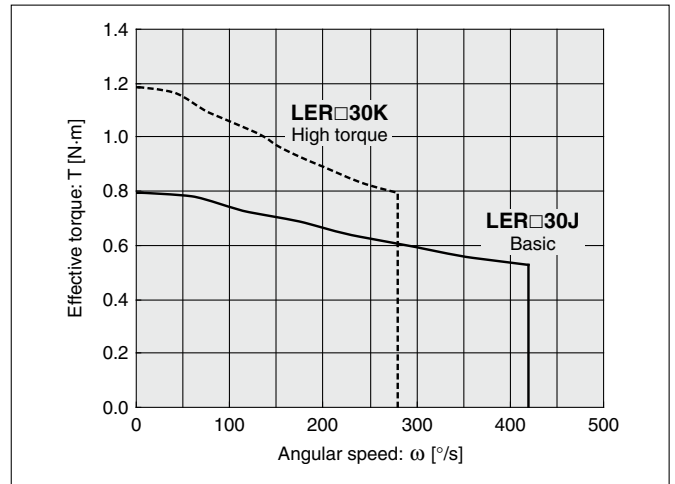


### Effective Torque—Angular Speed

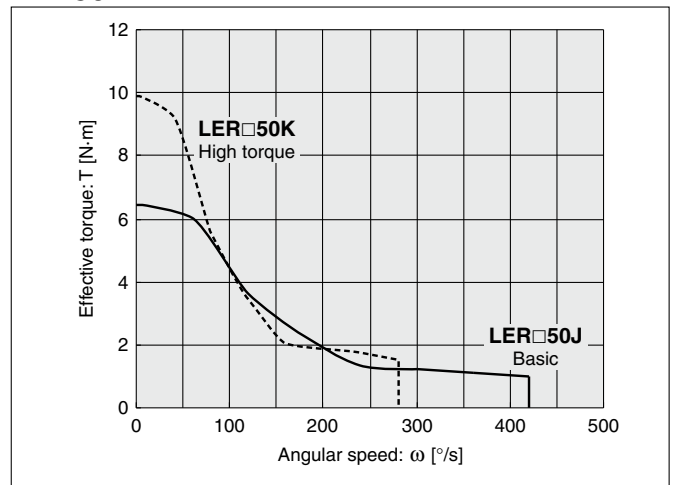
#### LER10



#### LER30



#### LER50



- LEFS
- LEFB
- LEJS
- LEJB
- LEL
- LEM
- LEY
- LEYG
- LES
- LESH
- LEPY
- LEPS
- LER
- LEH
- LEY-X5
- 11-LEFS
- 11-LEJS
- 25A-
- LEC□
- JXC□
- LECS□
- LECS□-T
- LECY□
- Motorless
- LAT3

# LER Series

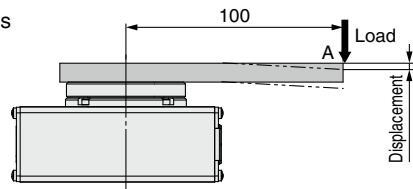
Step Motor (Servo/24 VDC)

## Allowable Load

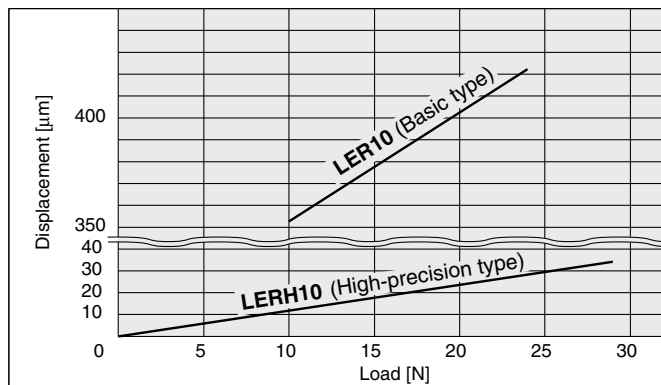
Size	Allowable radial load [N]		Allowable thrust load [N]				Allowable moment [N-m]	
	Basic type	High-precision type	(a)		(b)		Basic type	High-precision type
			Basic type	High-precision type	Basic type	High-precision type		
10	78	86	74		78	107	2.4	2.9
30	196	233	197		363	398	5.3	6.4
50	314	378	296		398	517	9.7	12.0

## Table Displacement (Reference Value)

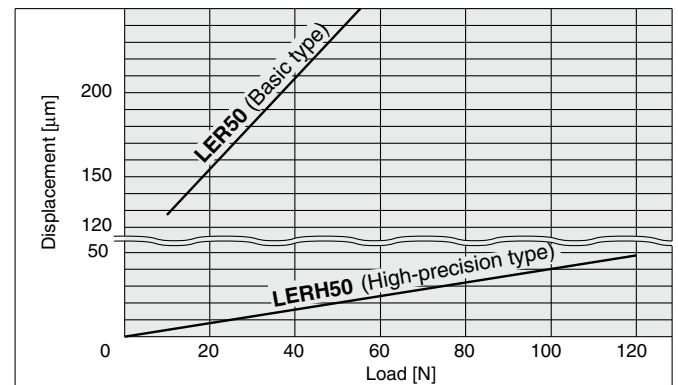
- Displacement at point A when a load is applied to point A 100 mm away from the rotation center.



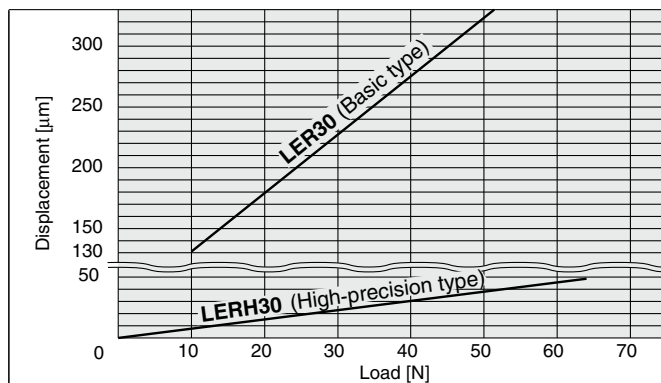
### LER□10



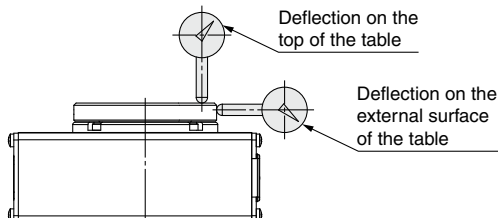
### LER□50



### LER□30



## Deflection Accuracy: Displacement at 180° Rotation (Guide)



Measured part	LER (Basic type)	LERH (High-precision type)
Deflection on the top of the table	0.1	0.03
Deflection on the external surface of the table	0.1	0.03

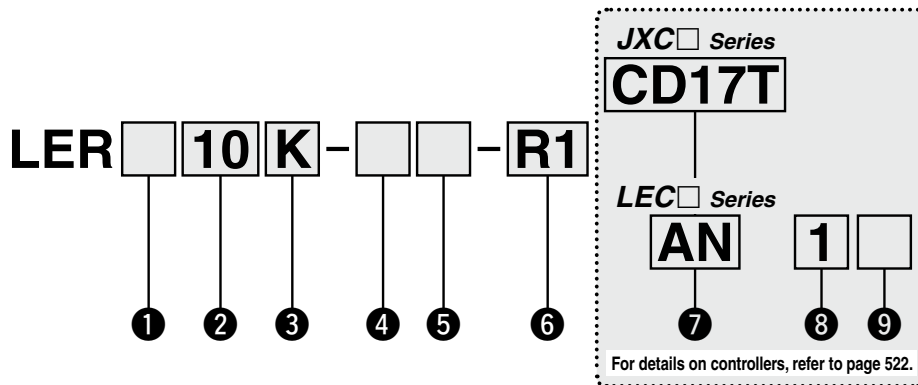
- LAT3
- Motorless
- LECY
- LECS  JXC  LEC
- LECS  LEC -T
- 11-LEJS
- 11-LEFS
- LEY-X5
- LEH
- LER
- LEPY  
LEPS
- LES  
LESH
- LEY  
LEYG
- LEM
- LEL
- LEJS  
LEJB
- LEFS  
LEFB

# Electric Rotary Table

## LER Series LER10, 30, 50



### How to Order



#### 1 Table accuracy

<b>Nil</b>	Basic type
<b>H</b>	High-precision type

#### 2 Size

<b>10</b>
<b>30</b>
<b>50</b>

#### 3 Max. rotating torque [N·m]

Symbol	Type	LER10	LER30	LER50
<b>K</b>	High torque	0.32	1.2	10
<b>J</b>	Basic	0.22	0.8	6.6

#### 4 Rotation angle [°]

Symbol	LER10	LER30	LER50
<b>Nil</b>	310	320	
<b>2</b>	External stopper: 180		
<b>3</b>	External stopper: 90		

#### 5 Motor cable entry

<b>Nil</b>	Basic type (entry on the right side)	
<b>L</b>	Entry on the left side	

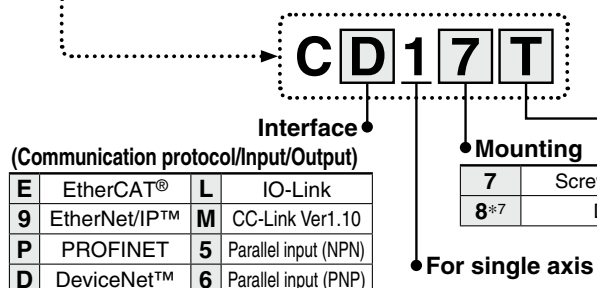
#### 6 Actuator cable type/length\*2

Standard cable [m]		Robotic cable [m]			
<b>Nil</b>	None	<b>R1</b>	1.5	<b>RA</b>	10*1
<b>S1</b>	1.5	<b>R3</b>	3	<b>RB</b>	15*1
<b>S3</b>	3	<b>R5</b>	5	<b>RC</b>	20*1
<b>S5</b>	5	<b>R8</b>	8*1		

## JXC Series (For details, refer to page 523.)

### 7 Controller

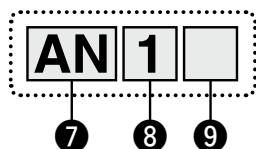
Nil	Without controller
C□1□□	With controller



### Communication plug connector I/O cable\*8

Symbol	Type	Applicable interface
Nil	Without accessory	—
<b>S</b>	Straight type communication plug connector	DeviceNet™ CC-Link Ver1.10
<b>T</b>	T-branch type communication plug connector	DeviceNet™ CC-Link Ver1.10
<b>1</b>	I/O cable (1.5 m)	Parallel input (NPN) Parallel input (PNP)
<b>3</b>	I/O cable (3 m)	
<b>5</b>	I/O cable (5 m)	

## LEC Series (For details, refer to page 523.)



### 7 Controller/Driver type\*3

Nil	Without controller/driver	
<b>1N</b>	<b>LECP1</b>	NPN
<b>1P</b>	(Programless type)	PNP
<b>AN</b>	<b>LECPA*4</b>	NPN
<b>AP</b>	(Pulse input type)	PNP

### 8 I/O cable length\*5

Nil	Without cable (Without communication plug connector)
<b>1</b>	1.5 m
<b>3</b>	3 m*6
<b>5</b>	5 m*6

### 9 Controller/Driver mounting

Nil	Screw mounting
<b>D</b>	DIN rail*7



- \*1 Produced upon receipt of order (Robotic cable only)
- \*2 The standard cable should only be used on fixed parts. For use on moving parts, select the robotic cable. Refer to page 758 if only the actuator cable is required.
- \*3 For details on controllers/drivers and compatible motors, refer to the compatible controllers/drivers on the next page.
- \*4 When pulse signals are open collector, order the current limiting resistor (LEC-PA-R-□) on page 736 separately.
- \*5 When "Without controller/driver" is selected for controller/driver types, I/O cable cannot be selected. Refer to page 724 (For LECP1), or page 736 (For LECPA) if I/O cable is required.

- \*6 When "Pulse input type" is selected for controller/driver types, pulse input usable only with differential. Only 1.5 m cables usable with open collector
- \*7 The DIN rail is not included. It must be ordered separately.
- \*8 Select "Nil" for anything other than DeviceNet™, CC-Link, or parallel input. Select "Nil," "S," or "T" for DeviceNet™ or CC-Link. Select "Nil," "1," "3," or "5" for parallel input.

### ⚠ Caution

#### [CE-compliant products]

① EMC compliance was tested by combining the electric actuator LER series and the controller JXC series. The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with 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 compliance with the EMC directive for the machinery and equipment as a whole.

#### [UL-compliant products (For the LEC series)]

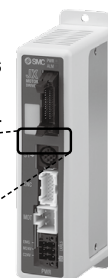
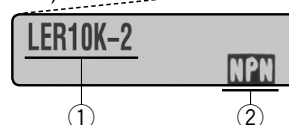
When compliance with UL is required, the electric actuator and controller/driver should be used with a UL1310 Class 2 power supply.

### The actuator and controller/driver are sold as a package.

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

#### <Check the following before use.>

- ① Check the actuator label for the model number. This number should match that of the controller/driver.
- ② Check that the Parallel I/O configuration matches (NPN or PNP).









\* Refer to the Operation Manual for using the products. Please download it via our website: <https://www.smcworld.com>




- LEFS
- LEFB
- LEJS
- LEJB
- LEL
- LEM
- LEM
- LEY
- LEYG
- LES
- LESH
- LEPY
- LEPS
- LER
- LEH
- LEY-X5
- 11-LEFS
- 11-LEJS
- 25A-
- LEC□
- LEC□
- JXC□
- LECS□
- LECS□-T
- LECY□
- Motorless
- LAT3

# LER Series

Step Motor (Servo/24 VDC)

## Compatible Controllers/Drivers

Type	EtherCAT® direct input type	EtherNet/IP™ direct input type	PROFINET direct input type	DeviceNet™ direct input type	IO-Link direct input type	CC-Link direct input type
						
Series	<b>JXCE1</b>	<b>JXC91</b>	<b>JXCP1</b>	<b>JXCD1</b>	<b>JXCL1</b>	<b>JXCM1</b>
Features	EtherCAT® direct input	EtherNet/IP™ direct input	PROFINET direct input	DeviceNet™ direct input	IO-Link direct input	CC-Link direct input
Compatible motor	Step motor (Servo/24 VDC)					
Max. number of step data	64 points					
Power supply voltage	24 VDC					
Reference page	741					

Type	Step data input type	Programless type	Pulse input type
			
Series	<b>JXC51</b> <b>JXC61</b>	<b>LECP1</b>	<b>LECPA</b>
Features	Parallel I/O	Capable of setting up operation (step data) without using a PC or teaching box	Operation by pulse signals
Compatible motor	Step motor (Servo/24 VDC)		
Max. number of step data	64 points	14 points	—
Power supply voltage	24 VDC		
Reference page	706-1	719	731

## Specifications

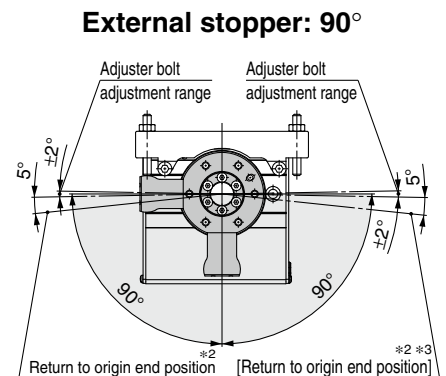
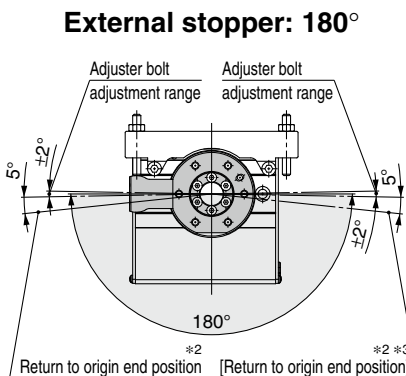
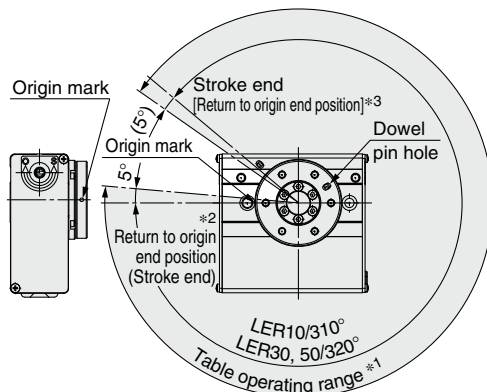
### Step Motor (Servo/24 VDC)

Model		LER□10K	LER□10J	LER□30K	LER□30J	LER□50K	LER□50J	
Actuator specifications	Rotation angle [°]	310			320			
	Lead [°]	8	12	8	12	7.5	12	
	Max. rotating torque [N·m]	0.32	0.22	1.2	0.8	10	6.6	
	Max. pushing torque 40 to 50 % [N·m]*1 *3	0.13 to 0.16	0.09 to 0.11	0.48 to 0.60	0.32 to 0.40	4.0 to 5.0	2.6 to 3.3	
	Max. moment of inertia [kg·m <sup>2</sup> ]*2 *3	JXC□1 LECP1	0.0040	0.0018	0.035	0.015	0.13	0.05
		LECPA JXC□ <sub>2</sub> <sub>3</sub>			0.027	0.012	0.10	0.04
	Angular speed [°/sec]*2 *3	20 to 280	30 to 420	20 to 280	30 to 420	20 to 280	30 to 420	
	Pushing speed [°/sec]	20	30	20	30	20	30	
	Max. angular acceleration/deceleration [°/sec <sup>2</sup> ]*2	3000						
	Backlash [°]	Basic type	±0.3			±0.2		
High-precision type					±0.1			
Positioning repeatability [°]	Basic type	±0.05			±0.05			
	High-precision type				±0.03			
Lost motion [°]*4	Basic type	0.3 or less			0.3 or less			
	High-precision type				0.2 or less			
Impact/Vibration resistance [m/s <sup>2</sup> ]*5	150/30							
Actuation type	Special worm gear + Belt drive							
Max. operating frequency [c.p.m]	60							
Operating temp. range [°C]	5 to 40							
Operating humidity range [%RH]	90 or less (No condensation)							
Weight [kg]	Basic type	0.49		1.1		2.2		
	High-precision type	0.52		1.2		2.4		
External stopper type	Rotation angle [°]	-2/ arm (1 pc.)					180	
		-3/ arm (2 pcs.)					90	
	Repeatability at the end [°]/ with external stopper	±0.01						
	External stopper setting range [°]	±2						
	Weight [kg]	-2/external arm (1 pc.)	Basic type	0.55		1.2		2.5
High-precision type		0.61		1.4		2.7		
-3/external arm (1 pc.)	Basic type	0.57		1.2		2.6		
	High-precision type	0.63		1.4		2.8		
Motor size	□20		□28		□42			
Motor type	Step motor (Servo/24 VDC)							
Encoder	Incremental A/B phase (800 pulse/rotation)							
Power supply [V]	24 VDC ±10%							
Power consumption [W]*6	11		22		34			
Standby power consumption when operating [W]*7	7		12		13			
Max. instantaneous power consumption [W]*8	14		42		57			



- \*1 Pushing force accuracy is LER10: ±30% (F.S.), LER30: ±25% (F.S.), LER50: ±20% (F.S.).
- \*2 The angular acceleration, angular deceleration and angular speed may fluctuate due to variations in the moment of inertia.  
Refer to the "Moment of Inertia—Angular Acceleration/Deceleration, Effective Torque—Angular Speed" graphs on pages 517 and 518 for confirmation.
- \*3 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%)
- \*4 A reference value for correcting an error in reciprocal operation
- \*5 Impact resistance: No malfunction occurred when the slide table was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)  
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
- \*6 The power consumption (including the controller) is for when the actuator is operating.
- \*7 The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation.
- \*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.

## Table Rotation Angle Range



- \*1 This is the range within which the table can move when it returns to origin.  
Make sure workpieces mounted on the table do not interfere with the workpieces and facilities around the table.
- \*2 Position after returning to origin. The position varies depending on whether there is an external stopper.
- \*3 [ ] for when the direction of return to origin has changed

\* The figures show the origin position for each actuator.

LEFS  
LEFB

LEJS  
LEJB

LEL

LEM

LEY  
LEYG

LES  
LESH

LEPY  
LEPS

LER

LEH

LEY-X5

11-LEFS  
11-LEFB

11-LEJS  
11-LEJB

25A-

LEC□

JXC□

LECS□  
LECS□-T

LECY□

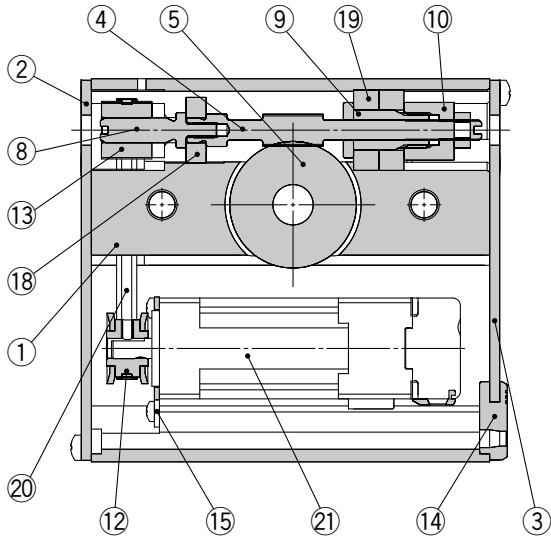
Motorless

LAT3

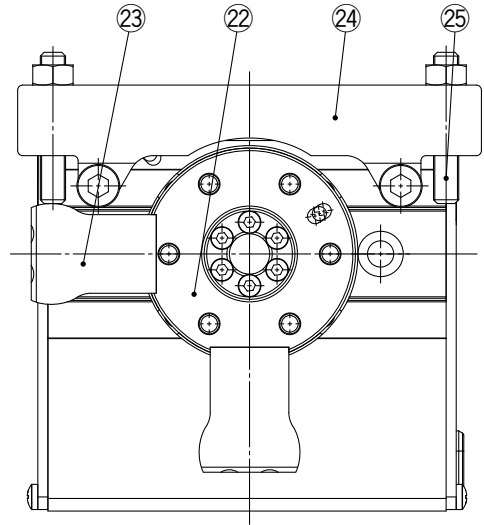
# LER Series

Step Motor (Servo/24 VDC)

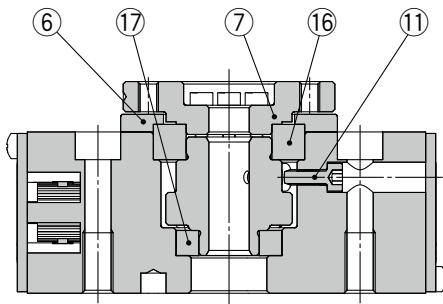
## Construction



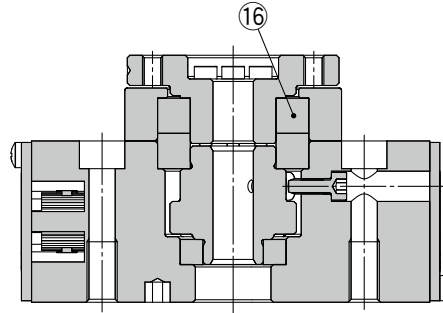
### External stopper type



### Basic type



### High-precision type



### Component Parts

No.	Description	Material	Note
1	Body	Aluminum alloy	Anodized
2	Side plate A	Aluminum alloy	Anodized
3	Side plate B	Aluminum alloy	Anodized
4	Worm screw	Stainless steel	Heat treatment + Special treatment
5	Worm wheel	Stainless steel	Heat treatment + Special treatment
6	Bearing cover	Aluminum alloy	Anodized
7	Table	Aluminum alloy	
8	Joint	Stainless steel	
9	Bearing holder	Aluminum alloy	
10	Bearing stopper	Aluminum alloy	
11	Origin bolt	Carbon steel	
12	Pulley A	Aluminum alloy	
13	Pulley B	Aluminum alloy	
14	Grommet	NBR	
15	Motor plate	Carbon steel	
16	Basic type High-precision type	Deep groove ball bearing Special ball bearing	—
17	Deep groove ball bearing	—	
18	Deep groove ball bearing	—	
19	Deep groove ball bearing	—	
20	Belt	—	
21	Step motor (Servo/24 VDC)	—	

### Component Parts

No.	Description	Material	Note
22	Table	Aluminum alloy	Anodized
23	Arm	Carbon steel	Heat treatment + Electroless nickel treated
24	Holder	Aluminum alloy	Anodized
25	Adjuster bolt	Carbon steel	Heat treatment + Chromating



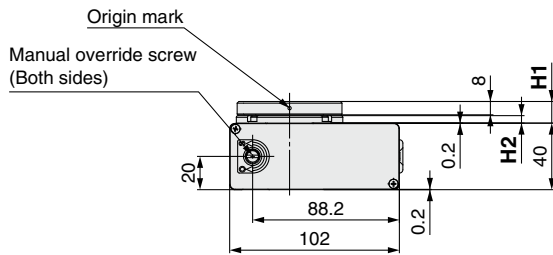
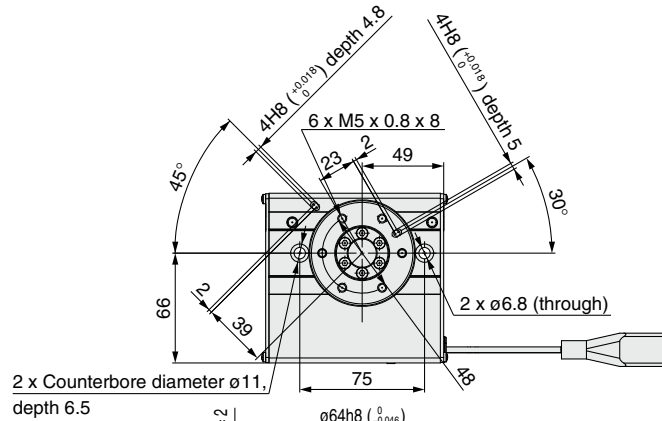


# LER Series

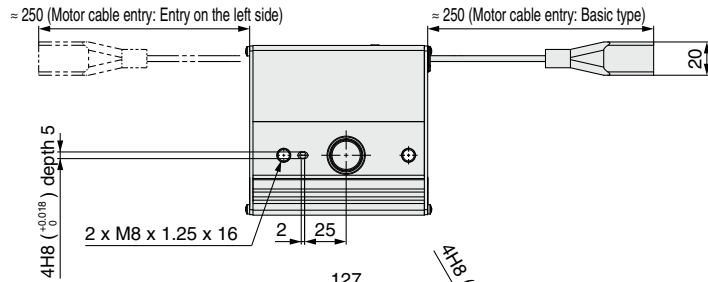
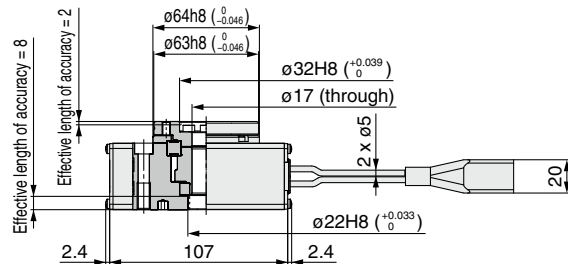
Step Motor (Servo/24 VDC)

## Dimensions

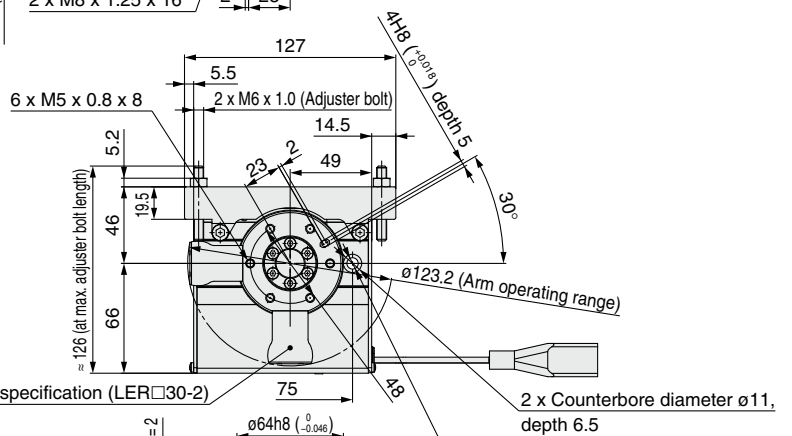
LER□30□ (Rotation angle: 320°)



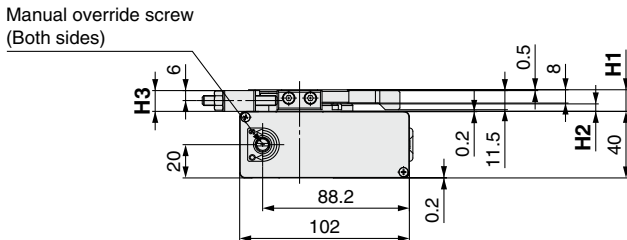
Model	H1	H2
LER30	13	4.5
LERH30	22	13.5



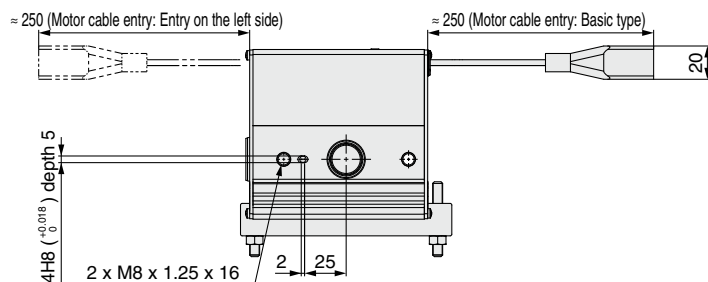
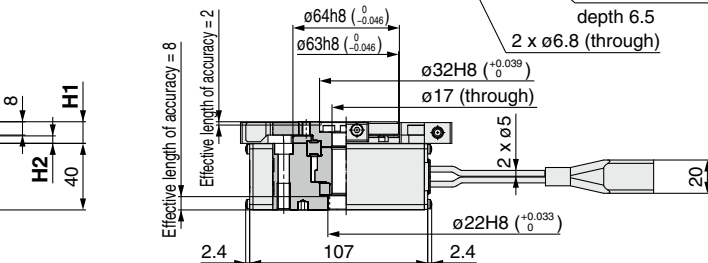
LER□30-2 (Rotation angle: 180°)  
LER□30-3 (Rotation angle: 90°)



\* Not applicable to 180° specification (LER□30-2)



Model	H1	H2	H3
LER30	13	4.5	12.5
LERH30	22	13.5	21.5





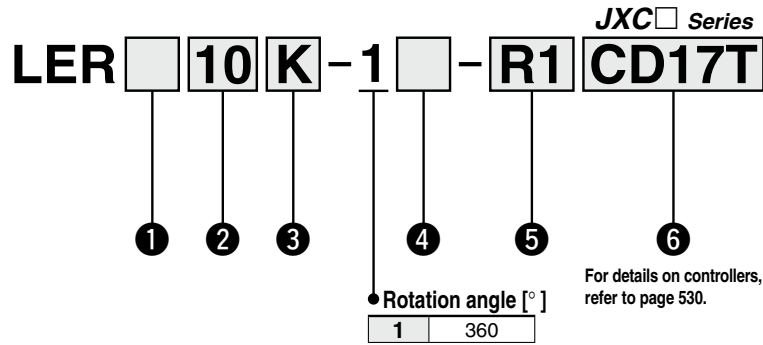
**Continuous Rotation Specification**

# Electric Rotary Table

## LER Series LER10, 30, 50



### How to Order



**1 Table accuracy**

<b>Nil</b>	Basic type
<b>H</b>	High-precision type

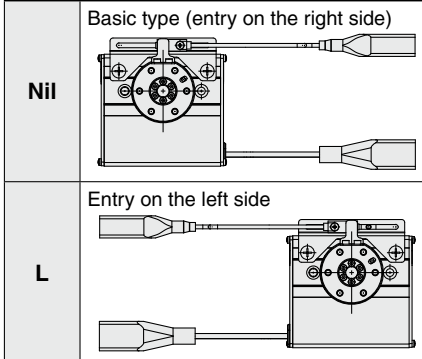
**2 Size**

<b>10</b>
<b>30</b>
<b>50</b>

**3 Max. rotating torque [N·m]**

Symbol	Type	LER10	LER30	LER50
<b>K</b>	High torque	0.32	1.2	10
<b>J</b>	Basic	0.22	0.8	6.6

**4 Motor cable entry**



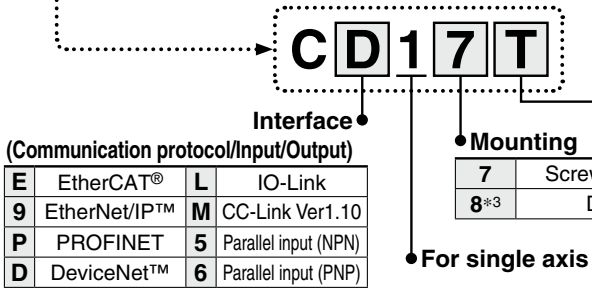
**5 Actuator cable type/length\*2**

Standard cable [m]		Robotic cable [m]			
<b>Nil</b>	None	<b>R1</b>	1.5	<b>RA</b>	10*1
<b>S1</b>	1.5	<b>R3</b>	3	<b>RB</b>	15*1
<b>S3</b>	3	<b>R5</b>	5	<b>RC</b>	20*1
<b>S5</b>	5	<b>R8</b>	8*1		

## JXC Series (For details, refer to page 531.)

### 6 Controller

Nil	Without controller
C□1□□	With controller



### Communication plug connector I/O cable\*4

Symbol	Type	Applicable interface
<b>Nil</b>	Without accessory	—
<b>S</b>	Straight type communication plug connector	DeviceNet™ CC-Link Ver1.10
<b>T</b>	T-branch type communication plug connector	DeviceNet™ CC-Link Ver1.10
<b>1</b>	I/O cable (1.5 m)	Parallel input (NPN) Parallel input (PNP)
<b>3</b>	I/O cable (3 m)	
<b>5</b>	I/O cable (5 m)	

- \*1 Produced upon receipt of order (Robotic cable only)
- \*2 The standard cable should only be used on fixed parts. For use on moving parts, select the robotic cable. Refer to page 758 if only the actuator cable is required.
- \*3 The DIN rail is not included. It must be ordered separately.

- \*4 Select "Nil" for anything other than DeviceNet™, CC-Link, or parallel input. Select "Nil," "S," or "T" for DeviceNet™ or CC-Link. Select "Nil," "1," "3," or "5" for parallel input.

### ⚠ Caution

#### [CE-compliant products]

① EMC compliance was tested by combining the electric actuator LER series and the controller LEC/JXC series. The EMC depends on the configuration of the customer's control panel and the relationship with other electrical equipment and wiring. Therefore, compliance with 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 compliance with the EMC directive for the machinery and equipment as a whole.

#### [UL-compliant products (For the LEC series)]

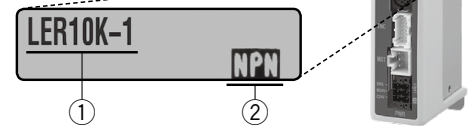
When compliance with UL is required, the electric actuator and controller/driver should be used with a UL1310 Class 2 power supply.

### The actuator and controller/driver are sold as a package.

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

#### <Check the following before use.>

- ① Check the actuator label for the model number. This number should match that of the controller/driver.
- ② Check that the Parallel I/O configuration matches (NPN or PNP).



\* Refer to the Operation Manual for using the products. Please download it via our website: <https://www.smcworld.com>

LEFS  
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LEM

LEY  
LEYG

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LESH

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LEPS

LER

LEH

LEY-X5

11-LEFS

11-LEJS

25A-

LEC□

JXC□

LECS□  
LECS□-T

LECY□







Motorless


LAT3

# LER Series

Step Motor (Servo/24 VDC)

## Compatible Controllers

Type	EtherCAT® direct input type 	EtherNet/IP™ direct input type 	PROFINET direct input type 	DeviceNet™ direct input type 	IO-Link direct input type 	CC-Link direct input type 
Series	<b>JXCE1</b>	<b>JXC91</b>	<b>JXCP1</b>	<b>JXCD1</b>	<b>JXCL1</b>	<b>JXCM1</b>
Features	EtherCAT® direct input	EtherNet/IP™ direct input	PROFINET direct input	DeviceNet™ direct input	IO-Link direct input	CC-Link direct input
Compatible motor	Step motor (Servo/24 VDC)					
Max. number of step data	64 points					
Power supply voltage	24 VDC					
Reference page	741					

Type	Step data input type 
Series	<b>JXC51</b> <b>JXC61</b>
Features	Parallel I/O
Compatible motor	Step motor (Servo/24 VDC)
Max. number of step data	64 points
Power supply voltage	24 VDC
Reference page	706-1

## Specifications

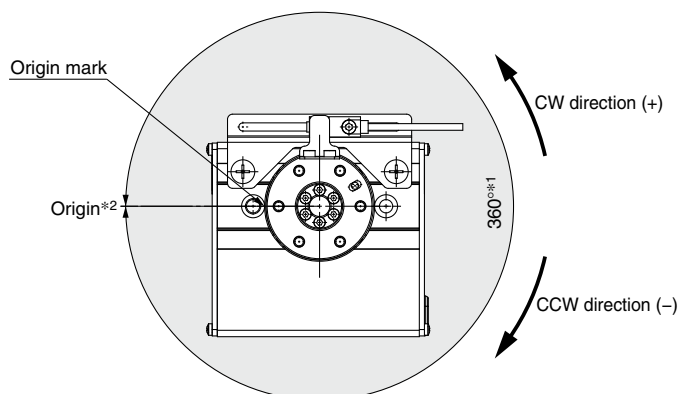


### Step Motor (Servo/24 VDC)

Model		LER□10K	LER□10J	LER□30K	LER□30J	LER□50K	LER□50J	
Rotation angle [°]		360						
Angle setting range [°]*9		±20000000						
Max. rotating torque [N·m]		0.32	0.22	1.2	0.8	10	6.6	
Max. pushing torque 40 to 50 % [N·m]*1 *3		0.13 to 0.16	0.09 to 0.11	0.48 to 0.60	0.32 to 0.40	4.0 to 5.0	2.6 to 3.3	
Max. moment of inertia [kg·m <sup>2</sup> ]*2 *3		0.0040	0.0018	0.035	0.015	0.13	0.05	
Angular speed [°/sec]*2 *3		20 to 280	30 to 420	20 to 280	30 to 420	20 to 280	30 to 420	
Pushing speed [°/sec]		20	30	20	30	20	30	
Max. angular acceleration/deceleration [°/sec <sup>2</sup> ]*2		3000						
Actuator specifications	Backlash [°]	Basic type	±0.3		±0.2			
		High-precision type			±0.1			
	Positioning repeatability [°]	Basic type	±0.05		±0.05			
		High-precision type			±0.03			
	Lost motion [°]*4	Basic type	0.3 or less		0.3 or less			
		High-precision type			0.2 or less			
Impact/Vibration resistance [m/s <sup>2</sup> ]*5		150/30						
Actuation type		Special worm gear + Belt drive						
Max. operating frequency [c.p.m]		60						
Operating temperature range [°C]		5 to 40						
Operating humidity range [%RH]		90 or less (No condensation)						
Weight [kg]	Basic type	0.51		1.2		2.3		
	High-precision type	0.55		1.3		2.5		
Motor size		□20		□28		□42		
Motor type		Step motor (Servo/24 VDC)						
Encoder		Incremental A/B phase (800 pulse/rotation)						
Proximity sensor (for return to origin)/Input circuit		2-wire						
Proximity sensor (for return to origin)/Input point		1 input						
Power supply [V]		24 VDC ±10%						
Power consumption [W]*6		11		22		34		
Standby power consumption when operating [W]*7		7		12		13		
Max. instantaneous power consumption*8		14		42		57		
Electric specifications	Motor size		□20		□28		□42	
	Motor type		Step motor (Servo/24 VDC)					
	Encoder		Incremental A/B phase (800 pulse/rotation)					
	Proximity sensor (for return to origin)/Input circuit		2-wire					
	Proximity sensor (for return to origin)/Input point		1 input					
	Power supply [V]		24 VDC ±10%					
Power consumption [W]*6		11		22		34		
Standby power consumption when operating [W]*7		7		12		13		
Max. instantaneous power consumption*8		14		42		57		

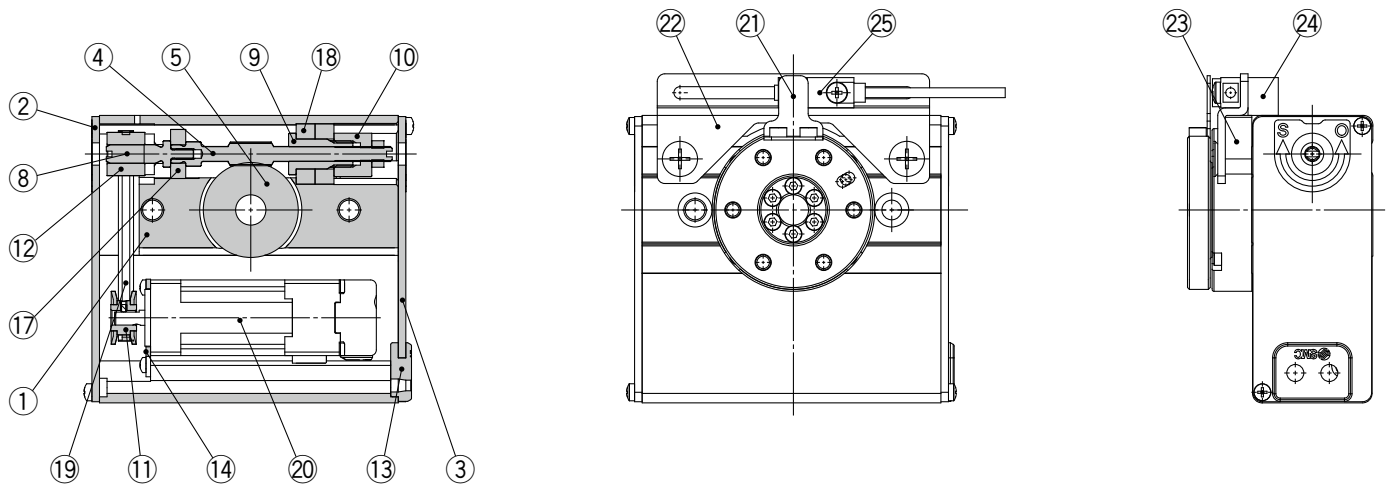
- \*1 Pushing force accuracy is LER10: ±30% (F.S.), LER30: ±25% (F.S.), LER50: ±20% (F.S.).
- \*2 The angular acceleration, angular deceleration and angular speed may fluctuate due to variations in the moment of inertia. Refer to the "Moment of Inertia—Angular Acceleration/Deceleration, Effective Torque—Angular Speed" graphs on pages 517 and 518 for confirmation.
- \*3 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%)
- \*4 A reference value for correcting an error in reciprocal operation
- \*5 Impact resistance: No malfunction occurred when the slide table was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)  
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. The test was performed in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
- \*6 The power consumption (including the controller) is for when the actuator is operating.
- \*7 The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during operation.
- \*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.
- \*9 The angle displayed on the monitor is automatically reset to 0° every 360°.  
To set an angle (position), use the "Relative" movement mode.  
If an angle of 360° or more is set using the "Absolute" movement mode, the correct operation cannot be performed.

### Table Rotation Angle Range

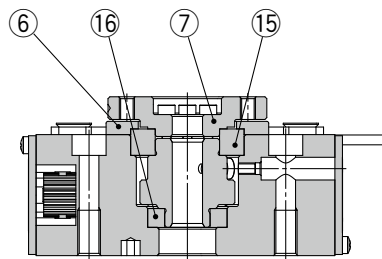


- \*1 This is the range within which the table can move. Make sure workpieces mounted on the table do not interfere with the workpieces and facilities around the table.
- \*2 The sensor detection range is recognized as origin. When detecting the sensor, the table rotates in the reverse direction within the sensor detection range.

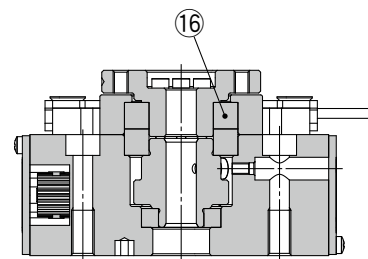
## Construction



**Basic type**



**High-precision type**



### Component Parts

No.	Description	Material	Note
1	<b>Body</b>	Aluminum alloy	Anodized
2	<b>Side plate A</b>	Aluminum alloy	Anodized
3	<b>Side plate B</b>	Aluminum alloy	Anodized
4	<b>Worm screw</b>	Stainless steel	Heat treatment + Special treatment
5	<b>Worm wheel</b>	Stainless steel	Heat treatment + Special treatment
6	<b>Bearing cover</b>	Aluminum alloy	Anodized
7	<b>Table</b>	Aluminum alloy	
8	<b>Joint</b>	Stainless steel	
9	<b>Bearing holder</b>	Aluminum alloy	
10	<b>Bearing stopper</b>	Aluminum alloy	
11	<b>Pulley A</b>	Aluminum alloy	
12	<b>Pulley B</b>	Aluminum alloy	
13	<b>Grommet</b>	NBR	
14	<b>Motor plate</b>	Carbon steel	
15	Basic type	Deep groove ball bearing	
	High-precision type	Special ball bearing	
16	<b>Deep groove ball bearing</b>	—	
17	<b>Deep groove ball bearing</b>	—	
18	<b>Deep groove ball bearing</b>	—	
19	<b>Belt</b>	—	
20	<b>Step motor (Servo/24 VDC)</b>	—	

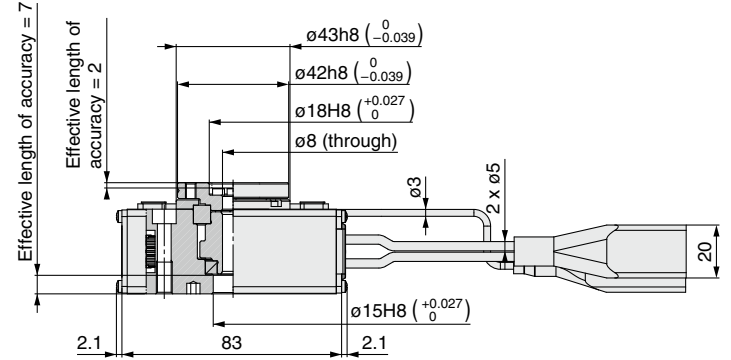
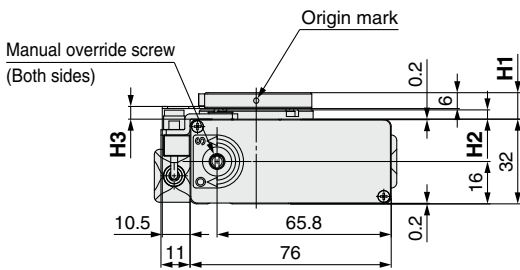
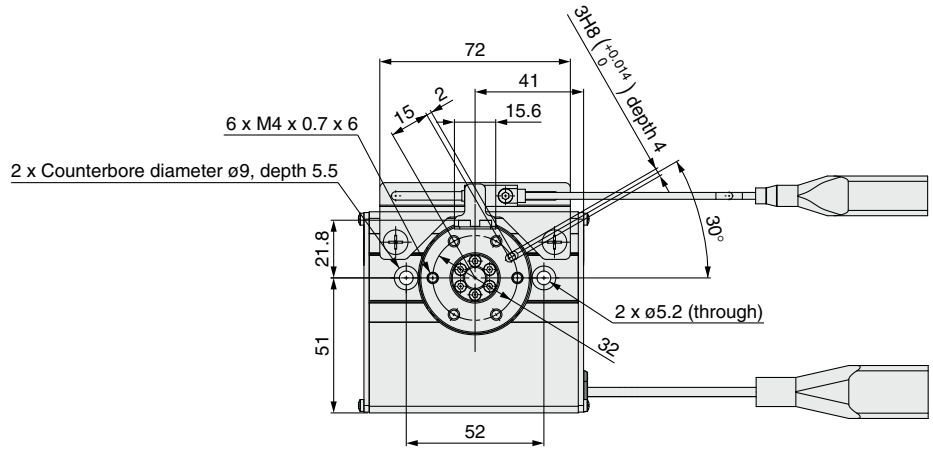
### Component Parts (360° type)

No.	Description	Material	Note
21	<b>Proximity dog</b>	Stainless steel	
22	<b>Sensor holder</b>	Carbon steel	Chromating
23	<b>Sensor holder spacer</b>	Aluminum alloy	Anodized (High-precision type can be used only)
24	<b>Square nut</b>	Aluminum alloy	
25	<b>Proximity sensor assembly</b>	—	



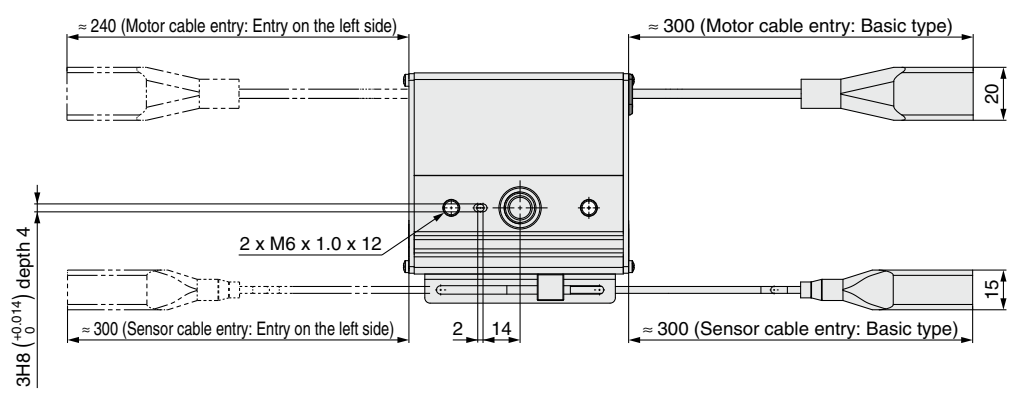
Dimensions

LER□10□



**Dimensions** [mm]

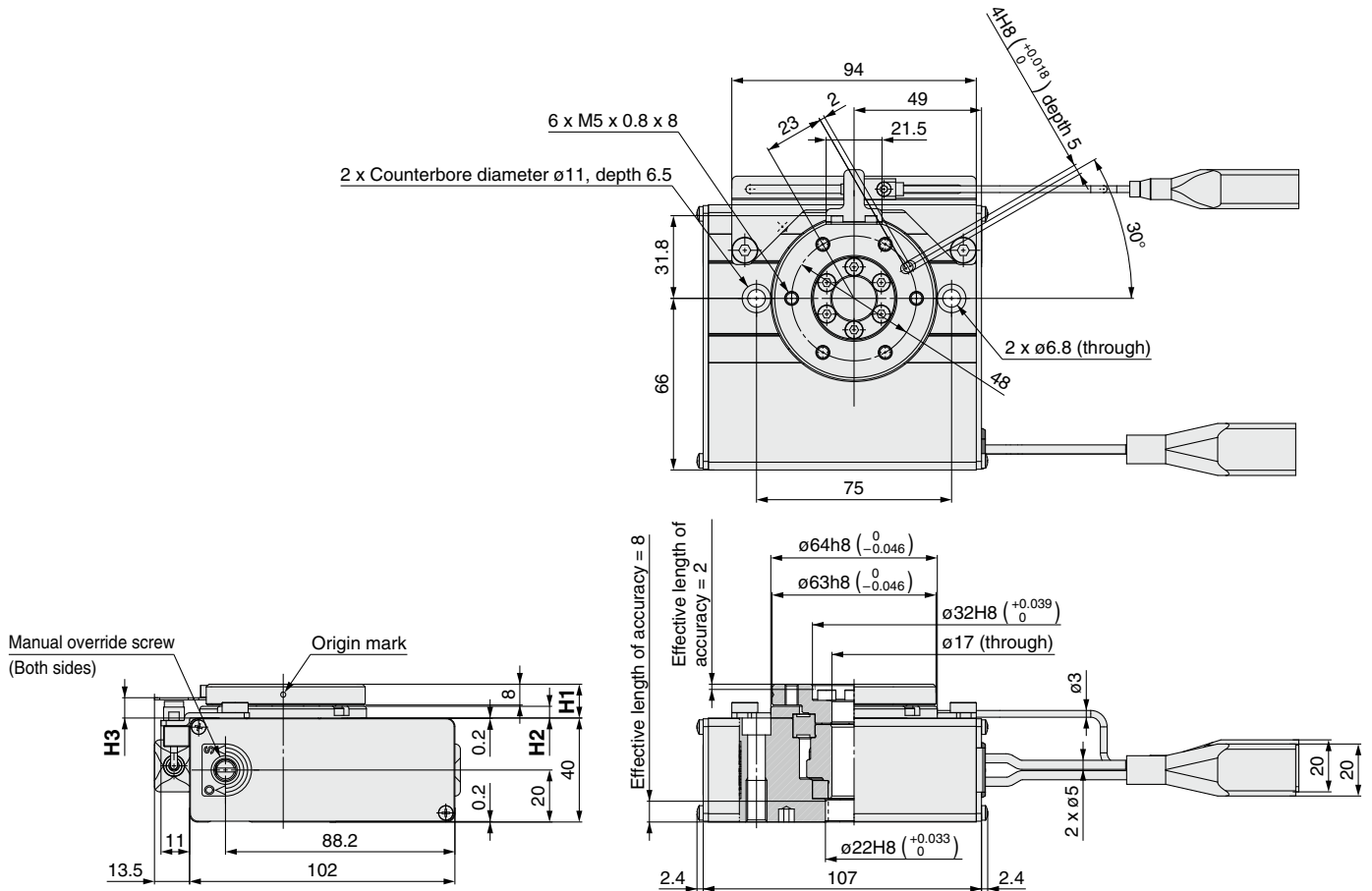
Model	H1	H2	H3
LER10	10	3.5	4.8
LERH10	17	10.5	11.8



- LEFS
- LEFB
- LEJS
- LEJB
- LEL
- LEM
- LEY
- LEYG
- LES
- LESH
- LEPY
- LEPS
- LER**
- LEH
- LEH
- LEY-X5
- 11-LEFS
- 11-LEJS
- 25A-
- LEC□
- LEC
- JXC□
- JXC
- LECS□
- LECS□-T
- LECY□
- Motorless
- LAT3

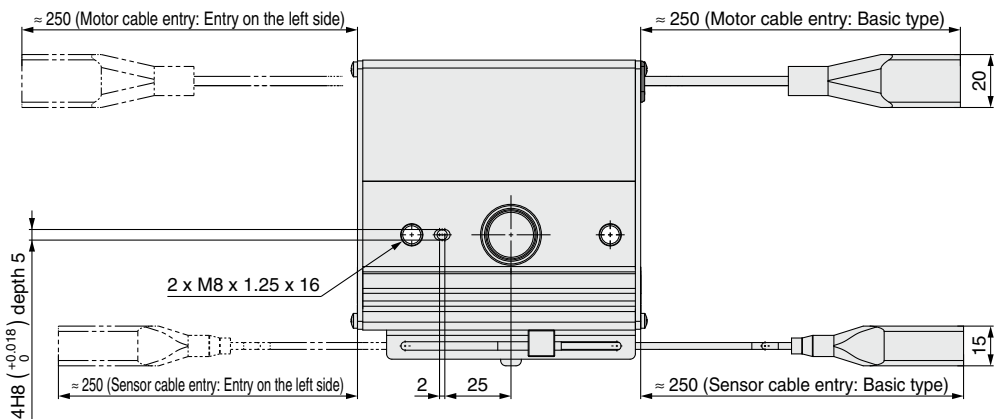
## Dimensions

### LER□30



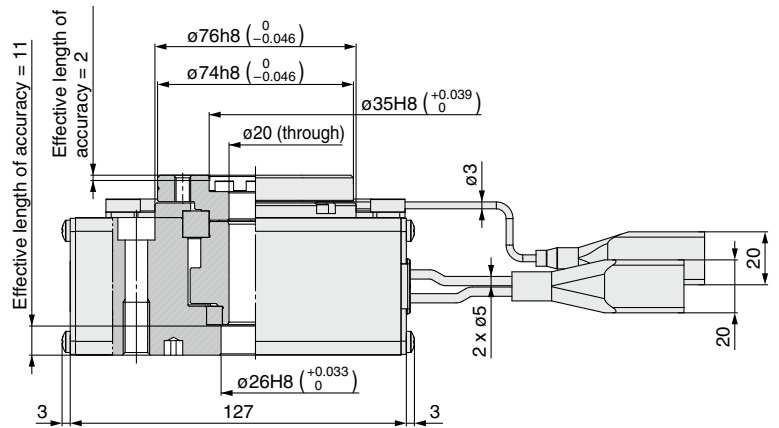
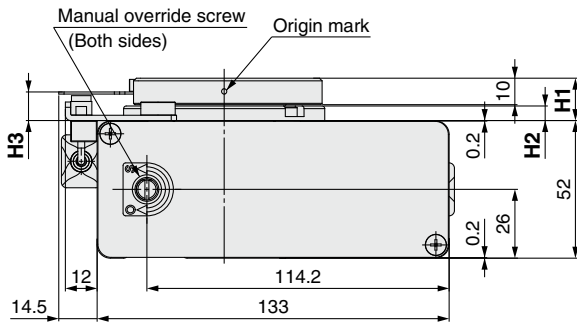
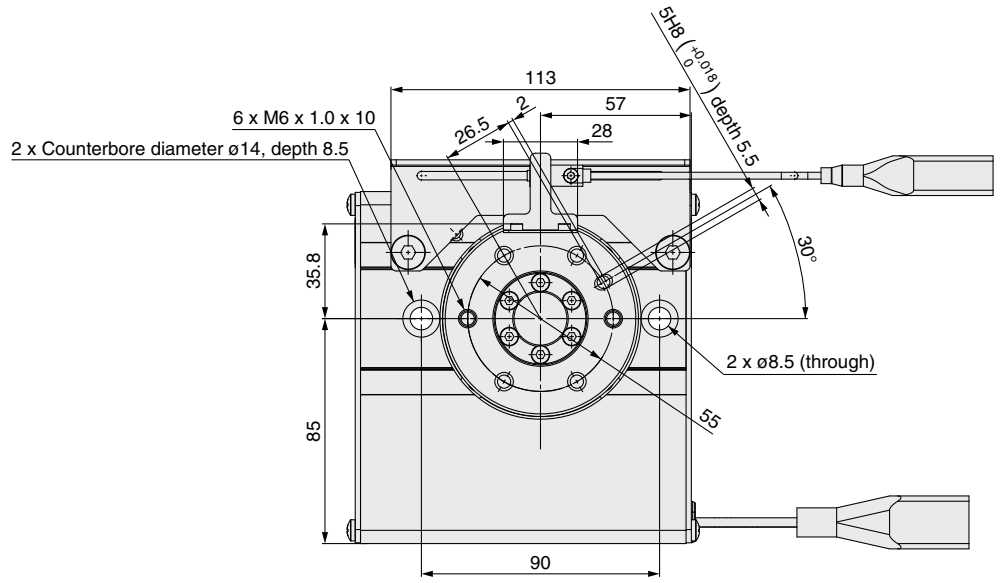
### Dimensions [mm]

Model	H1	H2	H3
LER30	13	4.5	7.8
LERH30	22	13.5	16.8



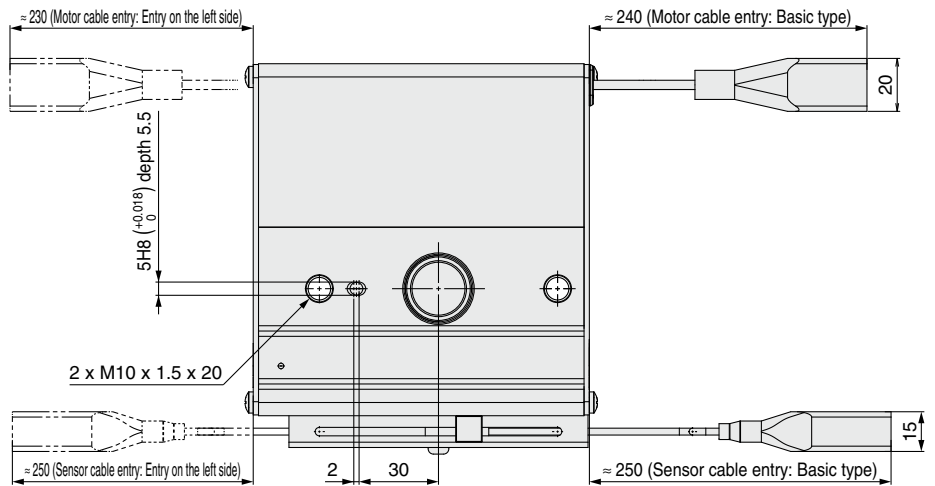
Dimensions

LER□50



Dimensions [mm]

Model	H1	H2	H3
LER50	16	5.5	10.8
LERH50	26	15.5	20.8



- LEFS
- LEFB
- LEJS
- LEJB
- LEL
- LEM
- LEY
- LEYG
- LES
- LESH
- LEPY
- LEPS
- LER**
- LEH
- LEY-X5
- 11-LEFS
- 11-LEJS
- 25A-
- LEC□
- JXC□
- LECS□
- LECS□-T
- LECY□
- Motorless
- LAT3



# LER Series Specific Product Precautions 1

Be sure to read this before handling the products. Refer to page 984 for safety instructions, pages 985 to 990 for electric actuator precautions.

## Design / Selection

### Warning

1. If the operating conditions involve load fluctuations, ascending/descending movements, or changes in the frictional resistance, ensure that safety measures are in place to prevent injury to the operator or damage to the equipment.  
Failure to provide such measures could accelerate the operation speed, which may be hazardous to humans, machinery, and other equipment.
2. Power failure may result in a decrease in the pushing force; ensure that safety measures are in place to prevent injury to the operator or damage to the equipment.  
When the product is used for clamping, the clamping force could be decreased due to power failure, potentially creating a hazardous situation in which the workpiece is released.

### Caution

1. If the operating speed is set too fast and the moment of inertia is too large, the product could be damaged.  
Set appropriate product operating conditions in accordance with the model selection procedure.
2. If more precise repeatability of the rotation angle is required, use the product with an external stopper, with repeatability of  $\pm 0.01^\circ$  ( $180^\circ$  and  $90^\circ$  with adjustment of  $\pm 2^\circ$ ) or by directly stopping the workpiece using an external object utilizing the pushing operation.
3. When using the electric rotary table with an external stopper, or by directly stopping the load externally, be sure to set to [Pushing operation].  
Also, ensure that the workpiece is not impacted externally during the positioning operation or in the range of positioning operation.

## Mounting

### Warning

1. Do not drop or hit the electric rotary table to avoid scratching and denting the mounting surfaces.  
Even a slight deformation can cause the deterioration of accuracy and operation failure.
2. When mounting the load, tighten the mounting screws within the specified torque range.  
Tightening the screws with a higher torque than recommended may result in a malfunction, while tightening with a lower torque can result in the displacement of the mounting position.

#### Mounting the workpiece to the electric rotary table

The load should be mounted with the torque specified in the following table by screwing the screw into the mounting female thread. If long screws are used, they can interfere with the body and cause a malfunction.

Model	Screw size	Thread length [mm]	Max. tightening torque [N·m]
LER□10	M4 x 0.7	6	1.4
LER□30	M5 x 0.8	8	3.0
LER□50	M6 x 1	10	5.0

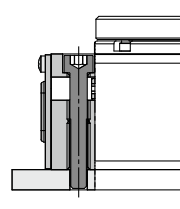
3. When mounting the electric rotary table, tighten the mounting screws within the specified torque range.  
Tightening the screws with a higher torque than recommended may result in a malfunction, while tightening with a lower torque can result in the displacement of the mounting position.

## Mounting

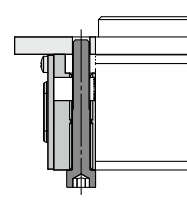
### Warning

#### Through-hole mounting

Body mounting/Bottom



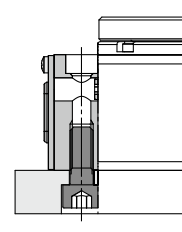
Body mounting/Top



Model	Screw size	Max. tightening torque [N·m]
LER□10	M5 x 0.8	3.0
LER□30	M6 x 1	5.0
LER□50	M8 x 1.25	12.0

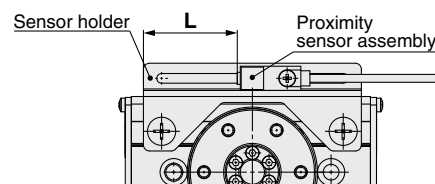
#### Body tapped mounting

Body mounting/Bottom



Model	Screw size	Max. tightening torque [N·m]	Max. screw-in depth [mm]
LER□10	M6 x 1	5.0	12
LER□30	M8 x 1.25	12.0	16
LER□50	M10 x 1.5	25.0	20

4. The mounting face has holes and slots for positioning. Use them for accurate positioning of the electric rotary table if required.
5. If it is necessary to operate the electric rotary table when it is not energized, use the manual override screws.  
When it is necessary to operate the product by the manual override screws, check the position of the manual override screws of the product, and leave necessary space. Do not apply excessive torque to the manual override screws. This may lead to damage and malfunction.
6. The  $360^\circ$  type proximity sensor for return to origin can be changed  $\pm 30^\circ$ . When changing the position of the proximity sensor for return to origin, tighten the screws with a tightening torque of  $0.6 \pm 0.1$  [N·m].



Model	L [mm] (Initial setting) Cable entry: Basic type/Entry on the left side (Between the sensor holder end face and proximity sensor end face)
LER□10-1	31/31
LER□30-1	42/42
LER□50-1	51.5/51.5



# LER Series Specific Product Precautions 2

Be sure to read this before handling the products. Refer to page 984 for safety instructions, pages 985 to 990 for electric actuator precautions.

## Handling

### ⚠ Caution

**1. When an external guide is used, connect it in such a way that no impact or load is applied to it.**

Use a free moving connector (such as a coupling).

**2. The moving force should be the initial value (100%).**

If the moving force is set below the initial value, there may be variation in the cycle time, or an alarm may be generated.

**3. INP output signal**

1) Positioning operation

When the product comes within the set range of the step data [In position], the INP output signal will turn ON.

Initial value: Set to [0.50] or higher.

2) Pushing operation

When the effective force exceeds the [Trigger LV] value (including force during operation), the INP output signal will turn ON.

The [Trigger LV] should be set between 40% and [Pushing force].

a) To ensure that the clamping and external stop is achieved by [Pushing force], it is recommended that the [Trigger LV] be set to the same value as the [Pushing force].

b) When the [Trigger LV] and the [Pushing force] are set below the specified range, there is the possibility that the INP output signal will turn ON from the pushing start position.

<Pushing force and trigger LV range>

Model	Pushing force set value [%]	Trigger LV set value [%]
LER□	40 to 50	40 to 50

**4. When using the electric rotary table with an external stopper, or by directly stopping the load externally, be sure to set to [Pushing operation].**

**Also, ensure that the workpiece is not impacted externally during the positioning operation or in the range of positioning operation.**

If the product is used in the positioning operation mode, there may be galling or other problems when the product/workpiece comes into contact with the external stopper or external object.

**5. When the table is stopped by the pushing operation mode (stopping/clamping), set the product to a position of at least 1° away from the workpiece. (This position is referred to as the pushing start position.)**

If the pushing start position (stopping or clamping) is set to the same position as the external stop position, the following alarms may be generated and operation may become unstable.

a. "Posn failed"

The product cannot reach the pushing start position within the target time.

b. "Pushing ALM"

The product is pushed back from the pushing start position after starting to push.

c. "Deviation over flow"

Displacement exceeding the specified value is generated at the pushing start position.

**6. There is no backlash effect when the product is stopped externally by pushing operation.**

For the return to origin, the origin position is set by the pushing operation.

## Handling

### ⚠ Caution

**7. For the specification with an external stopper, an angle adjuster bolt is provided as standard.**

The rotation angle adjustment range is  $\pm 2^\circ$  from the angle rotation end.

If the angle adjustment range is exceeded, the rotation angle may change due to insufficient strength of the external stopper. One revolution of the adjuster bolt is approximately equal to  $1^\circ$  of rotation.

**8. In case that gravity is added to the workpiece along the rotation direction when product is mounted vertically, the workpiece may fall down when "SVON" signal is OFF or EMG is not energizing.**

**9. When mounting the product, secure a bending diameter of 40 mm or longer for the motor cable.**

**10. The 360° type proximity sensor for return to origin responds when it approaches anything made of metal. For this reason, be sure to keep metal objects other than the proximity dog away from the sensor during return to origin.**

Recommended distance: 5 mm or more

## Maintenance

### ⚠ Danger

**1. The high-precision type bearing is assembled by pressing into position. It is not possible to disassemble it.**

LEFS  
LEFB

LEJS  
LEJB

LEL

LEM

LEY  
LEYG

LES  
LESH

LEPY  
LEPS

LER

LEH

LEY-X5

11-LEFS

11-LEJS

25A-

LEC□

JXC□

LECS□  
LECS□-T

LECY□

Motorless

LAT3