## New **Electric Actuator High Rigidity and High Precision Slider Type** RoHS

# **Circular arc grooves allow for** high rigidity and high precision.

Moment resistance<sup>\*1 \*2</sup> Improved by 61 % up to

Table displacement<sup>\*1</sup> Reduced by up to

With internal battery-less absolute encoder

- Restart from the last stop position is possible after recovery of the power supply.
- Reduced maintenance (No need for control or replacement)

Positioning repeatability: ±0.01 mm<sup>\*3</sup>

\*3 Excludes the lead H c Sus Step Motor Controller JXC Series p. 3 Battery-less Absolute Type (Step Motor 24 VDC) Direct input type <u> PRQEQ</u>` **⊘ IO**-Link CC-Link <Applicable network> EtherCAT EtherNet/IP Device Net **NIFIT** Step data input type



\*1 Compared with the LEFS

\*2 Size 40, Mep, Overhang: 300 mm

# **LEKFS** Series

## With a 4-row circular arc on each side for high rigidity and high precision (zero clearance)

#### Improved moment resistance



	-,		
Size	Moment	Work load [kg] (Overhang: 300 mn	ו)
	direction	High rigidity guide LEKFS	LEFS
25		7.5 (10% increase)	6.8
32	Pitching (Mep)	18 (35% increase)	13.3
40		37 (61% increase)	23

Improved Dynamic Allowable Moment



### Table displacement amount reduced to 1/2



T - I - I -	D!	1 4
lable	DISP	lacement

Sizo	Table displacement [mm]		Load	Load	
3128	High rigidity guide LEKFS	LEFS	[mm]	[N]	
25	0.022 (50% reduction)	0.044	25	200	
32	0.036 (50% reduction)	0.072	30	450	
40	0.027 (50% reduction)	0.053	37	500	

#### Zero table clearance



#### **Table Clearance**

Size	Displacement due to table clearance	e [mm]
0120	High rigidity guide LEKFS	LEFS
25	0	0.079
32	0	0.068
40	0	0.052

## Auto switches are mountable.

Allows for position detection of the table throughout the stroke



# Same dimensions as the LEF/Complete mounting compatibility is ensured.





## **Compatible Controllers**

Battery-less Absolute Type (Step Motor 24 VDC)

Step Motor Controller JXC Series







**SMC** 

## Speed–Work Load Graph (Guide) For Battery-less Absolute (Step Motor 24 VDC), In-line Motor Type

\* The following graphs show the values when the moving force is 100%.

## LEKFS25/Ball Screw Drive



## LEKFS32/Ball Screw Drive



## LEKFS40/Ball Screw Drive

#### Horizontal





Model Selection LEKFS Series Battery-less Absolute (Step Motor 24 VDC)

## Speed–Work Load Graph (Guide) For Battery-less Absolute (Step Motor 24 VDC), Motor Parallel Type

\* The following graphs show the values when the moving force is 100%.

### LEKFS25(L/R)/Ball Screw Drive



## LEKFS32(L/R)/Ball Screw Drive



## LEKFS40(L/R)/Ball Screw Drive

#### Horizontal





## Static Allowable Moment<sup>\*1</sup>

Model	LEKFS25	LEKFS32	LEKFS40
Pitching [N·m]	61	141	264
Yawing [N·m]	70	141	264
Rolling [N·m]	115	290	473

\*1 The static allowable moment is the amount of static moment which can be applied to the actuator when it is stopped.

If the product is exposed to impact or repeated load, be sure to take adequate safety measures when using the product.

## **Dynamic Allowable Moment**

**LEKFS** Series Battery-less Absolute (Step Motor 24 VDC)

\* These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece overhangs in one direction. When selecting the overhang, refer to the "Calculation of Guide Load Factor" or the Electric Actuator Model Selection Software for confirmation.



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## Model Selection LEKFS Series

## Dynamic Allowable Moment

\* These graphs show the amount of allowable overhang (guide unit) when the center of gravity of the workpiece overhangs in one direction. When selecting the overhang, refer to the "Calculation of Guide Load Factor" or the Electric Actuator Model Selection Software for confirmation.



#### **Calculation of Guide Load Factor**

**SMC** 

1. Decide operating conditions. Model: LEKFS Size: 25/32/40

Acceleration [mm/s²]: **a** Work load [kg]: **m** 

- Mounting orientation: Horizontal/Bottom/Wall/Vertical Work load center position [mm]: Xc/Yc/Zc
- 2. Select the target graph while referencing the model, size, and mounting orientation.
- 3. Based on the acceleration and work load, find the overhang [mm]: Lx/Ly/Lz from the graph.
- 4. Calculate the load factor for each direction.
- $\alpha$ **x** = Xc/Lx,  $\alpha$ **y** = Yc/Ly,  $\alpha$ z = Zc/Lz 5. Confirm the total of  $\alpha$ **x**,  $\alpha$ **y**, and  $\alpha$ z is 1 or less.
- $\alpha \mathbf{x} + \alpha \mathbf{y} + \alpha \mathbf{z} \le \mathbf{1}$

When 1 is exceeded, please consider a reduction of acceleration and work load, or a change of the work load center position and series.

#### Example

- 1. Operating conditions Model: LEKFS40 Size: 40 Mounting orientation: Horizontal Acceleration [mm/s<sup>2</sup>]: 3000 Work load [kg]: 20
- Work load center position [mm]: Xc = 0, Yc = 50, Zc = 200
- 2. Select the graphs for horizontal of the LEKFS40 on page 7.







3. Lx = 400 mm, Ly = 250 mm, Lz = 1500 mm

4. The load factor for each direction can be found as follows.

- $\alpha x = 0/400 = 0$  $\alpha y = 50/250 = 0.2$
- $\alpha z = 200/1500 = 0.2$

#### 5. $\alpha x + \alpha y + \alpha z = 0.33 \le 1$





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## Table Accuracy (Reference Value)



	Traveling parallelism	[mm] (Every 300 mm)
Model	① C side traveling parallelism to A side	② D side traveling parallelism to B side
LEKFS25	0.04	0.02
LEKFS32	0.04	0.02
LEKFS40	0.04	0.02

\* Traveling parallelism does not include the mounting surface accuracy.

## Table Displacement (Reference Value)





\* This displacement is measured when a 15 mm aluminum plate is mounted and fixed on the table.





#### **5** Stroke<sup>\*1</sup>

Sizo			Str	oke		
Size	100	200	300	400	500	600
25						—
32						—
40	—					

6	Мо	tor	ор	ti	0	n		
-				_	_	_	_	_

Nil	Without option
В	With lock

2		cable	type/length
-	Actuator	capie	type/ieiigtii

Robotic	cable		[m]
Nil	None	<b>R8</b>	8* <sup>2</sup>
R1	1.5	RA	10 <sup>*2</sup>
R3	3	RB	15* <sup>2</sup>
R5	5	RC	20 <sup>*2</sup>



- \*1 Please contact SMC for non-standard strokes as they are produced as special orders.
- \*2 Order auto switches separately. (For details, refer to the Web Catalog.)
- \*3 The DIN rail is not included. It must be ordered separately.

## **≜**Caution

#### [CE-compliant products]

EMC compliance was tested by combining the electric actuator LEKFS 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]

The JXC series controllers used in combination with electric actuators are UL certified.

#### [Precautions relating to differences in controller versions]

When the JXC series is to be used in combination with the battery-less absolute encoder, use a controller that is version V3.4 or S3.4 or higher. For details, refer to the **Web Catalog**.

\*4 Select "Nil" for anything other than DeviceNet<sup>™</sup>, CC-Link, or parallel input.

Select "Nil," "S," or "T" for DeviceNet™ or CC-Link. Select "Nil," "1," "3," or "5" for parallel input.

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

Confirm that the combination of the controller and 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.



\* Refer to the Operation Manual for using the products. Please download it via our website.

#### Trademark

EtherNet/IP<sup>™</sup> is a trademark of ODVA. DeviceNet<sup>™</sup> is a trademark of ODVA.

EtherCAT® is registered trademark and patented technology, licensed by Beckhoff Automation GmbH, Germany.

Series         JXCE1         JXC91         JXCP1         JXCD1         JXCL1         JXCM1         JXC51 JXC61
FeaturesEtherCAT® direct inputEtherNet/IP™ direct inputPROFINET direct inputDeviceNet™ 
Compatible motor Battery-less absolute (Step motor 24 VDC)
Max. number of step data 64 points
Power supply voltage 24 VDC

## Specifications

#### Battery-less Absolute (Step Motor 24 VDC)

					/									
		Mod	el			LEKFS25	;		LEKFS32			LEKFS40		
	Stroke [m	stroke [mm]			100 to 500			100 to 500			200 to 600			
	Work lood	[[ka]*1		Horizontal	12	25	30	20	45	50	25	55	65	
	work load			Vertical	0.5	7.5	15	4	10	20	2	2	23	
		In line	Stroke	Up to 500	20 to 1100	12 to 750	6 to 400	24 to 1200	16 to 800	8 to 400	Image: station         Image: station           isation         isation           isation         isation	20 to 850	10 to 300	
su	Speed*1	in-ine	range	501 to 600	—	_	_	_	—		30 to 1200	20 to 850	10 to 300	
tio	[mm/s]	Parallal	Stroke	Up to 500	20 to 900	12 to 600	6 to 300	24 to 800	16 to 650	8 to 325	30 to 750	20 to 550	10 to 300	
fica		Faiallei	range	501 to 600	—	_	—	—	—	_	30 to 750	20 to 550	10 to 300	
eci	Max. acce	leration/de	celeration [	mm/s²]					3000					
ds .	Positionin	ng repeatab	ility [mm]					±0.0 <sup>-</sup>	1 (Lead H: ±	0.02)				
ator	Lost moti	on [mm]*2							0.05					
Stu	Lead [mm	]			20	12	6	24	16	8	30	20	10	
Ă	Impact/Vibration resistance [m/s <sup>2</sup> ]*3			50/20										
	Actuation type			Ball screw										
	Guide type			Linear guide										
	Operating	temperatu	re range [°	C]					5 to 40					
	Operating	humidity r	ange [%RH	]	90 or less (No condensation)									
Su	Motor size	e			□42 □56.4									
atio	Motor typ	e					Bat	tery-less ab	solute (Step	p motor 24	VDC)			
ific	Encoder						Bat	tery-less ab	solute (409	6 pulse/rota	ation)			
bec	Rated vol	tage [V]	· · ·					2	4 VDC ±10	%	1			
ŝ	Power co	nsumption	<b>[W]</b> *4			38			50			100		
ect	Standby po	wer consum	ption when o	perating [W]*5		16			44			43		
Ξ	Max. insta	ntaneous p	ower consu	mption [W]*6		57			123			141		
ations	Type*7							Non-	magnetizin	g lock	1	LEKFS40 200 to 600 55 2 00 20 to 850 00 20 to 850 50 20 to 550 50 20 to 550 20 to 550 20 to 550 50 20 to 550 5		
pecific	Holding fo	orce [N]			47	78	157	72	108	216	75	113	225	
units	Power co	nsumption	[W]*8			5			5			5		
Lock	Rated vol	tage [V]						2	4 VDC ±10	%				

\*1 Speed changes according to the work load. Check the "Speed–Work Load Graph (Guide)" on pages 5 and 6.

Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10% for each 5 m.

\*2 A reference value for correcting errors in reciprocal operation

\*3 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. (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.)

\*4 The power consumption (including the controller) is for when the actuator is operating.

\*5 The standby power consumption when operating (including the controller) is for when the actuator is stopped in the set position during the operation.

\*6 The max. 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.

\*7 With lock only

\*8 For an actuator with lock, add the power consumption for the lock.

## **Dimensions: In-line Motor**

#### LEKFS25E



\*1 When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height: 5 mm)

In addition, be aware that surfaces other than the body mounting reference plane (B dimension range) may slightly protrude from the body mounting reference plane. Be sure to provide a clearance of 1 mm or more to avoid interference with workpieces, facilities, etc.

- \*2 This is the distance within which the table can move when it returns to origin. Make sure workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
- \*3 Position after returning to origin
- \*4 [] for when the direction of return to origin has changed
- \*5 When using the positioning pin holes on the bottom, use either the one on the body side or the one on the housing side.

Dimensions										[mm]
Model	L Without lock	With lock	Α	в	n	D	Е	F	G	н
LEKFS25E	335.5	380.5	106	210	4	-	_		100	
LEKFS25E -200	435.5	480.5	206	310	6	2	240		220	
LEKFS25E -300	535.5	580.5	306	410	8	3	360	35	340	45
LEKFS25E -400	635.5	680.5	406	510	8	3	360		340	
LEKFS25E	735.5	780.5	506	610	10	4	480		460	

## **Dimensions: In-line Motor**



\*1 When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height: 5 mm)

In addition, be aware that surfaces other than the body mounting reference plane (B dimension range) may slightly protrude from the body mounting reference plane. Be sure to provide a clearance of 1 mm or more to avoid interference with workpieces, facilities, etc.

\*2 This is the distance within which the table can move when it returns to origin. Make sure workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.

- \*3 Position after returning to origin
- \*4 [] for when the direction of return to origin has changed
- \*5 A switch spacer (BMY3-016) is required to secure auto switches. Please order it separately.
- \*6 When using the positioning pin holes on the bottom, use either the one on the body side or the one on the housing side.

Dimensions								[mm]
Model	Without lock	With lock	Α	В	n	D	E	G
LEKFS32E -100	382	434	106	230	4	—	_	130
LEKFS32E -200	482	534	206	330	6	2	300	280
LEKFS32E -300	582	634	306	430	6	2	300	280
LEKFS32E -400	682	734	406	530	8	3	450	430
LEKFS32E -500	782	834	506	630	10	4	600	580
LEKFS32E -600	882	934	606	730	10	4	600	580



#### **Dimensions: In-line Motor**



\*1 When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height: 5 mm)

In addition, be aware that surfaces other than the body mounting reference plane (B dimension range) may slightly protrude from the body mounting reference plane. Be sure to provide a clearance of 1 mm or more to avoid interference with workpieces, facilities, etc.

\*2 This is the distance within which the table can move when it returns to origin. Make sure workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.

- \*3 Position after returning to origin
- \*4 [] for when the direction of return to origin has changed
- \*5 A switch spacer (BMY3-016) is required to secure auto switches. Please order it separately.
- \*6 When using the positioning pin holes on the bottom, use either the one on the body side or the one on the housing side.

Dimensions								[mm]
Model	Without lock	With lock	Α	В	n	D	Е	G
LEKFS40E -200	556	605	206	378	6	2	300	280
LEKFS40E -300	656	705	306	478	6	2	300	280
LEKFS40E -400	756	805	406	578	8	3	450	430
LEKFS40E	856	905	506	678	10	4	600	580
LEKFS40E -600	956	1005	606	778	10	4	600	580





## **Dimensions: Motor Parallel**

#### LEKFS25R



\*1 When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height: 5 mm) In addition, be aware that surfaces other than the body mounting reference plane (B dimension range) may slightly protrude from the body mounting reference plane. Be sure to provide a clearance of 1 mm or more to avoid interference with workpieces, facilities, etc.

**SMC** 

- \*2 This is the distance within which the table can move when it returns to origin. Make sure workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
- \*3 Position after returning to origin
- \*4 [] for when the direction of return to origin has changed
- \*5 When using the positioning pin holes on the bottom, use either the one on the body side or the one on the housing side.
- \* This illustration shows the motor mounting position for the right side parallel type.

Dimensions									[mm
Model	L	Α	В	n	D	E	F	G	Н
LEKFS2500-100	260.5	106	210	4	—	—		100	
LEKFS250-200	360.5	206	310	6	2	240	]	220	
LEKFS2500-300	460.5	306	410	8	3	360	35	340	45
LEKFS250-400	560.5	406	510	8	3	360	]	340	
LEKFS2500-500	660.5	506	610	10	4	480		460	

## **Dimensions: Motor Parallel**

#### LEKFS32R



- \*1 When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height: 5 mm) In addition, be aware that surfaces other than the body mounting reference plane (B dimension range) may slightly protrude from the body mounting reference plane. Be sure to provide a clearance of 1 mm or more to avoid interference with workpieces, facilities, etc.
- \*2 This is the distance within which the table can move when it returns to origin. Make sure workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
- \*3 Position after returning to origin
- \*4 [] for when the direction of return to origin has changed
- \*5 A switch spacer (BMY3-016) is required to secure auto switches. Please order it separately.
- \*6 When using the positioning pin holes on the bottom, use either the one on the body side or the one on the housing side.
- \* This illustration shows the motor mounting position for the right side parallel type.

Dimensions	isions									
Model	L	Α	В	n	D	E	G			
LEKFS32 -100	295	106	230	4	—	—	130			
LEKFS32 -200	395	206	330	6	2	300	280			
LEKFS32 -300	495	306	430	6	2	300	280			
LEKFS32 -400	595	406	530	8	3	450	430			
LEKFS32 -500	695	506	630	10	4	600	580			



## **Dimensions: Motor Parallel**

#### LEKFS40R



\*1 When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height: 5 mm) In addition, be aware that surfaces other than the body mounting reference plane (B dimension range) may slightly protrude from the body mounting reference plane. Be sure to provide a clearance of 1 mm or more to avoid interference with workpieces, facilities, etc.

**SMC** 

- \*2 This is the distance within which the table can move when it returns to origin. Make sure workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
- \*3 Position after returning to origin
- \*4 [] for when the direction of return to origin has changed
- \*5 A switch spacer (BMY3-016) is required to secure auto switches. Please order it separately.
- \*6 When using the positioning pin holes on the bottom, use either the one on the body side or the one on the housing side.
- \* This illustration shows the motor mounting position for the right side parallel type.

Dimensions							[mm]
Model	L	Α	В	n	D	E	G
LEKFS40 -200	453.4	206	378	6	2	300	280
LEKFS40 -300	553.4	306	478	6	2	300	280
LEKFS40 -400	653.4	406	578	8	3	450	430
LEKFS40 -500	753.4	506	678	10	4	600	580
LEKFS40 -600	853.4	606	778	10	4	600	580

## Electric Actuator High Rigidity and High Precision Slider Type



A Safety Instructions Be sure to read the "Handling Precautions for SMC Products" (M-E03-3) and "Operation Manual" before use.