



Operation Manual

PRODUCT NAME

Electric Actuator / Slider Type
Battery-less absolute encoder

MODEL / Series / Product Number

LEF Series

LEFS*E

LEFB*E



#This manual describes the dedicated terms for "LEFS*E" and "LEFB*E".

Refer to the manual of LEF series about other details.

#Refer to the manual relevant to the controller being used for full operating instructions.

SMC Corporation

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Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential 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.

*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: Manipulating industrial robots -Safety.

etc.



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.

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 used 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 prevent 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 the 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.



Safety Instructions

Caution

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, whichever is first.*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 regulation 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.

Caution

SMC products are not intended for use as instruments for legal metrology.

Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country.

Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

1. Specification

LEFS*E

Model			LEFS16			LEFS25			LEFS32			LEFS40						
Stroke [mm] Note1)	Horizontal		14	15	12	25	30	20	45	50	25	55	65					
	Vertical		2	4	0.5	7.5	15	4	10	20	2	2	23					
Note2) Speed [mm/s]	In-line	Stroke range	~500	10~700	5~360	20~1100	12~750	6~400	24~1200	16~800	8~400	30~1200	20~850	10~300				
			501~600	-	-	20~900	12~540	6~270	24~1200	16~800	8~400	30~1200	20~850	10~300				
			601~700	-	-	20~630	12~420	6~230	24~930	16~620	8~310	30~1200	20~850	10~300				
			701~800	-	-	20~550	12~330	6~180	24~750	16~500	8~250	30~1140	20~760	10~300				
			801~900	-	-	-	-	-	24~610	16~410	8~200	30~930	20~620	10~300				
			901~1000	-	-	-	-	-	24~500	16~340	8~170	30~780	20~520	10~250				
			1001~1100	-	-	-	-	-	-	-	-	30~660	20~440	10~220				
	1011~1200	-	-	-	-	-	-	-	-	30~570	20~380	10~190						
	Parallel	Stroke range	~500	10~500	5~250	20~900	12~600	6~300	24~800	16~650	8~325	30~750	20~550	10~300				
			501~600	-	-	20~900	12~540	6~270	24~800	16~650	8~325	30~750	20~550	10~300				
			601~700	-	-	20~630	12~420	6~230	24~800	16~620	8~310	30~750	20~550	10~300				
			701~800	-	-	20~550	12~330	6~180	24~750	16~500	8~250	30~750	20~550	10~300				
			801~900	-	-	-	-	-	24~610	16~410	8~200	30~750	20~550	10~300				
			901~1000	-	-	-	-	-	24~500	16~340	8~170	30~750	20~520	10~250				
1001~1100			-	-	-	-	-	-	-	-	30~660	20~440	10~220					
1011~1200	-	-	-	-	-	-	-	-	30~570	20~380	10~190							
Max. acceleration/deceleration [mm/s ²]			3,000															
Positioning repeatability [mm]			Basic type		±0.02								High precision type			±0.015 (Lead H : ±0.02)		
Lost motion [mm] note3)			Basic type		0.1 or less								High precision type			0.05 or less		
lead [mm]			10	5	20	12	6	24	16	8	30	20	10					
Impact/vibration resistanc [m/s ²] note4)			50 / 20															
Actuation type			Ball screw(LEFS□), Ball screw+Belt (LEFS□L/R)															
Guide type			Linear Guide															
Operating temperature range [°C]			5 to 40															
Operating humidity range [%RH]			90 or less(No condensation)															
Motor size			□28			□42			□56.4			□56.4						
Motor type			Batteryless Absolute(Step motor 24VDC)															
Encoder			Batteryless Absolute(4096 pulse/rotation)															
Rated voltage [V]			24 VDC±10%															
Power consumption [W] note5)			22			38			50			100						
Standby power consumption when operating [W] note5)			18			16			44			43						
Max. instantaneous power consumption [W] note7)			51			57			123			141						
Type note8)			Non-magnetizing lock															
Holding force [N]			20	39	47	78	157	72	108	216	75	113	225					
Power consumption [W] note9)			2.9			5			5			5						
Rated voltage [V]			24 VDC±10%															

LEFB*E

Model		LEFB16	LEFB25	LEFB32
Stroke [mm] Note1)		300, 500, 600, 700, 800, 900, 1000	300, 500, 600, 700, 800, 900, 1000, 1200, 1500, 1800, 2000	300, 500, 600, 700, 800, 900, 1000, 1200, 1500, 1800, 2000
Work load [kg] note2)	Horizontal	1	10	19
Note2)Speed [mm/s]		48~1100	48 to 1400	48 to 1500
Max. acceleration/deceleration [mm/s ²]		3,000		
Positioning repeatability [mm]		±0.08		
Lost motion [mm] note3)		0.1 or less		
Equivalent lead [mm]		48	48	48
Impact/vibration resistanc [m/s ²] note4)		50 / 20		
Actuation type		Belt		
Guide type		Linear Guide		
Operating temperature range [°C]		5 to 40		
Operating humidity range [%RH]		90 or less(No condensation)		
Motor size		□28	□42	□56.4
Motor type		Batteryless Absolute(Step motor 24VDC)		
Encoder		Batteryless Absolute(4096 pulse/rotation)		
Rated voltage [V]		24VDC±10%		
Power consumption [W] note5)		24	32	52
Standby power consumption when operating [W] note6)		18	16	44
Max. instantaneous power consumption [W] note7)		51	60	127
Type note8)		Non-magnetizing lock		
Holding force [N]		4	19	36
Power consumption [W] note9)		2.9	5	5
Rated voltage [V]		24VDC±10%		

- Note 1) The strokes shown in () are produced upon receipt of order.
 Note 2) The speed is dependent on the workload. Check "Speed-workload graphs" in the WEB catalog.
 Note 3) A reference value for correcting an error in reciprocal operation.
 Note 4) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and 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, when the actuator was tested in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
 Note 5) The "Power consumption" (including the controller) is for when the actuator is operating.
 Note 6) The "Standby power consumption when operating" (including the controller) is for when the actuator is stopped in the set position during operation.
 Note 7) The "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 8) Only applies to actuators supplied with a lock.
 Note 9) For the actuator with lock, please add the power consumption for the lock.

2. How to order

LEFS H 25 R E H - 200 B C N K - R1 CD17T

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ Controller
Refer to catalog.

① Accuracy		② Size		③ Motor mounting		④ Motor type		⑤ Lead [mm]				⑥ Stroke [mm]		
Nil	Basic type	16		Nil	In-line	E	Batteryless absolute (Step motor 24VDC)	Symbol	LEFS16	LEFS25	LEFS32	LEFS40	50 to 1200	50 to 1200
H	High precision type	25		R	Right side parallel			H	-	20	24	30		
		32		L	Left side parallel			A	10	12	16	20		
		40						B	5	6	8	10		
⑦ Motor option		⑧ Auto switch compatibility		⑨ Grease application (Seal band part)		⑩ Positioning hole		⑪ Actuator cable type/length (Robotic cable) [m]						
Nil	Without option	Nil	None	Nil	With	Nil	Housing B bottom	Nil	None	R8	8			
B	With lock	C	With (Includes 1 mounting bracket)	N	Without (Roller specification)	K	Body bottom 2 locations	R1	1.5	RA	10			
								R3	3	RB	15			
								R5	5	RC	20			

Table of stroke [mm]

	50	100	150	200	250	300	350	400	450	500
LEFS16	●	●	●	●	●	●	●	●	●	●
LEFS25	●	●	●	●	●	●	●	●	●	●
LEFS32	●	●	●	●	●	●	●	●	●	●
LEFS40	-	-	●	●	●	●	●	●	●	●

	550	600	650	700	750	800	850	900	950	1000	1100	1200
LEFS25	●	●	●	●	●	●	-	-	-	-	-	-
LEFS32	●	●	●	●	●	●	●	●	●	●	-	-
LEFS40	●	●	●	●	●	●	●	●	●	●	●	●

LEFB 25 E T - 300 B C N K - R1 CD17T

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ Controller
Refer to catalog.

① Size		② Motor type		③ Equivalent lead [mm]		④ Stroke [mm]		⑤ Motor option			
16		E	Batteryless absolute (Step motor 24VDC)	T	48	300 to 2000	300 to 2000	Nil	Without option		
25								B	With lock		
32											
⑥ Auto switch compatibility		⑦ Grease application (Seal band part)		⑧ Positioning hole		⑨ Actuator cable type/length (Robotic cable) [m]					
Nil	None	Nil	With	Nil	Housing B bottom	Nil	None	R8	8		
C	With (Includes 1 mounting bracket)	N	Without (Roller specification)	K	Body bottom 2 locations	R1	1.5	RA	10		
						R3	3	RB	15		
						R5	5	RC	20		

Table of stroke [mm]

	300	500	600	700	800	900	1000	1200	1500	1800	2000
LEFB16	●	●	●	●	●	●	●	-	-	-	-
LEFB25	●	●	●	●	●	●	●	●	●	●	●
LEFB32	●	●	●	●	●	●	●	●	●	●	●

- Note 1) Please consult with SMC for non-standard strokes as they are produced as special orders.
 Note 2) Excluding the LEFS16 for "With auto switch compatibility".
 Note 3) If 2 or more of auto switches are required, please order them separately. (Part no. LEF-D-2-1 For details, refer to the Web Catalog.)
 Note 4) The auto switches must be ordered separately. (For details, refer to the Web Catalog.)
 Note 5) When "Nil" is selected, the product will not come with a built-in magnet for an auto switch, and so a mounting bracket cannot be secured. Be sure to select an appropriate model initially as the product cannot be changed to have auto switch compatibility after purchase.
 Note 6) For the details on the mounting method of auto switches, refer to the Web Catalog.

Caution

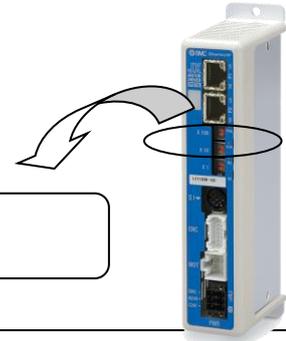
Actuator and controller are sold as a set.

When purchasing without controller,
make sure that the combination of actuator and controller is correct.

<Be sure to check the following before use.>

① "Actuator" matches "Actuator part number described in controller."

①
LEFS25EB-100



3. Specific product precautions

About precautions for installation of actuator, refer to [Specific precautions for Battery-less absolute encoder] that is described in the manual of used controller.

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Note: Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

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