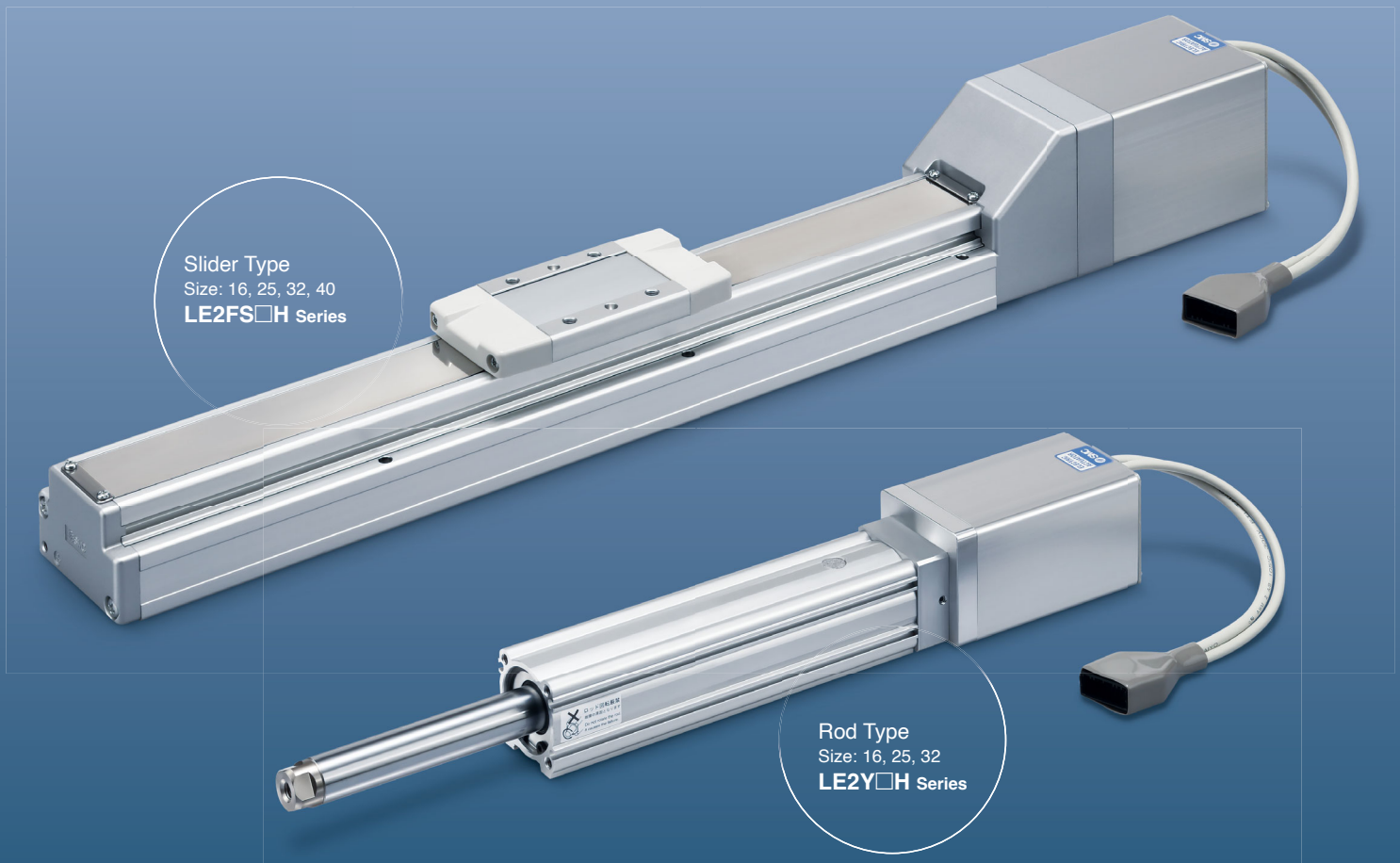
Compatible with Manifold Controller

New

Electric Actuators
Slider Type/Rod Type

Battery-less Absolute (Step Motor 24 VDC)



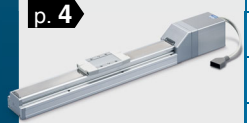
Annual CO_2 emissions: Max. 38 % reduction
(SMC comparison) p. 1

8.7 kg-CO_2e/year **(14.1)**

* The numerical values vary depending on the operating conditions.

Manifold Controller
Up to 16 axes can be connected

Series Variations

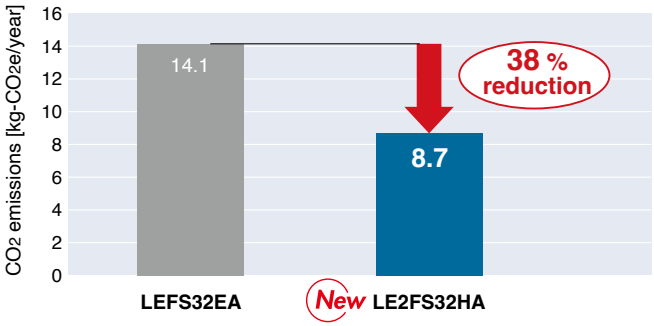
Series	Size	Max. work load [kg]	Max. pushing force [N]	Max. speed [mm/s]	Positioning repeatability [mm]
Slider Type p. 4 	16	18	154	1200	±0.015 (Lead H for size 25/32/40: ±0.02)
	25	40	511		
	32	68	796		
	40	80	637		
Rod Type p. 28 	16	40	154	900	±0.02
	25	70	511		
	32	100	796		

LE2FS□H/LE2Y□H Series

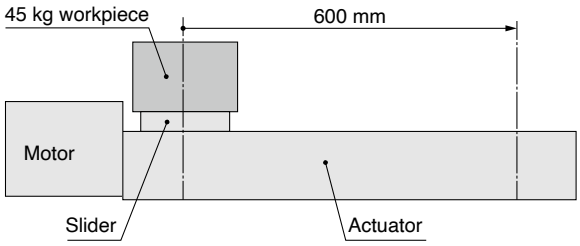
SMC

CAT.EUS100-170A-UK

Annual CO_2 emissions reduced by up to 38 % through motor control optimization (SMC comparison)



Operating conditions
- Slider type, Size 32
- Speed: 50 mm/s
- Acceleration/Deceleration: 3000 mm/s²
- Duty ratio: 20 %

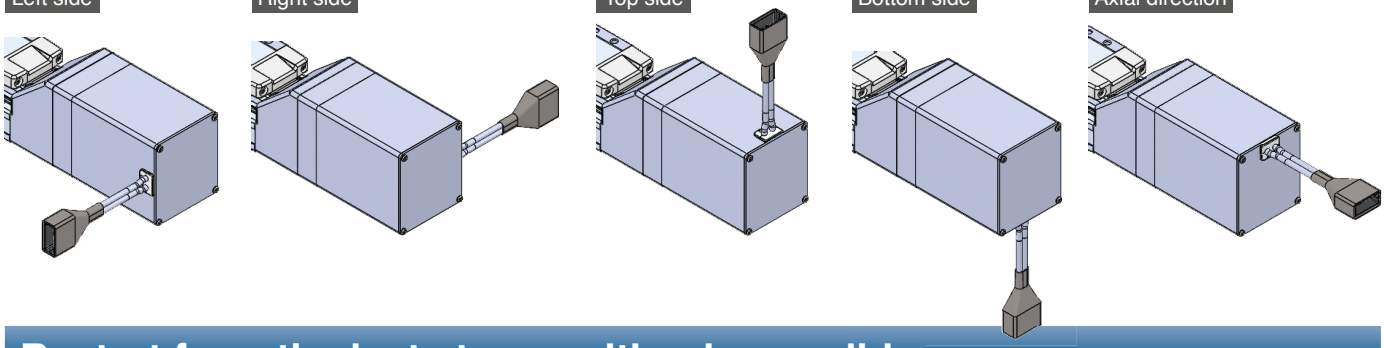


∗ The numerical values vary depending on the operating conditions.

Select from 5 cable entry directions

p. 16, 36

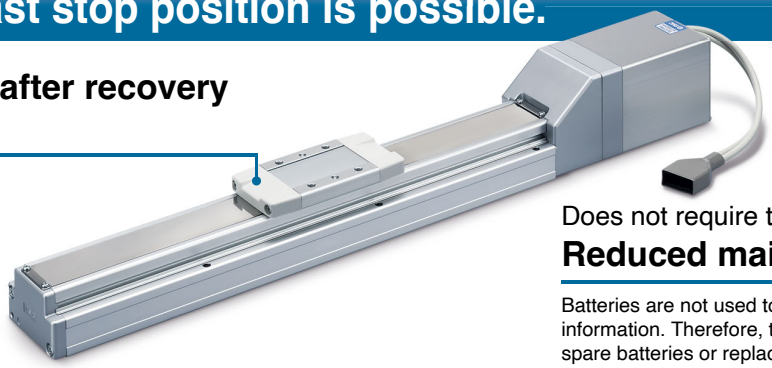
Left side | Right side | Top side | Bottom side | Axial direction



Restart from the last stop position is possible.

Easy operation restart after recovery of the power supply

The position information is held by the encoder even when the power supply is turned off. A return to origin operation is not necessary when the power supply is recovered.



Does not require the use of batteries.

Reduced maintenance

Batteries are not used to store the position information. Therefore, there is no need to store spare batteries or replace dead batteries.

Detection of table stop position by means of an auto switch is possible.

p. 27

For the slider type

Allows for position detection of the table throughout the stroke

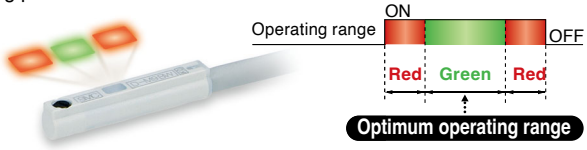
For the rod type

For checking the limit and the intermediate signal

2-colour indicator solid state auto switch (D-M9□ series)

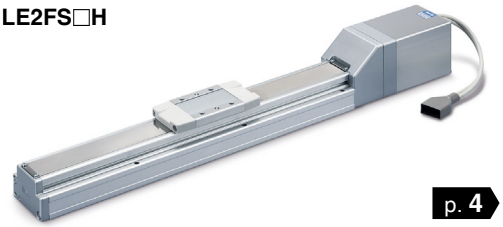
Accurate setting of the mounting position can be performed without mistakes.

A green light lights up when within the optimum operating range.



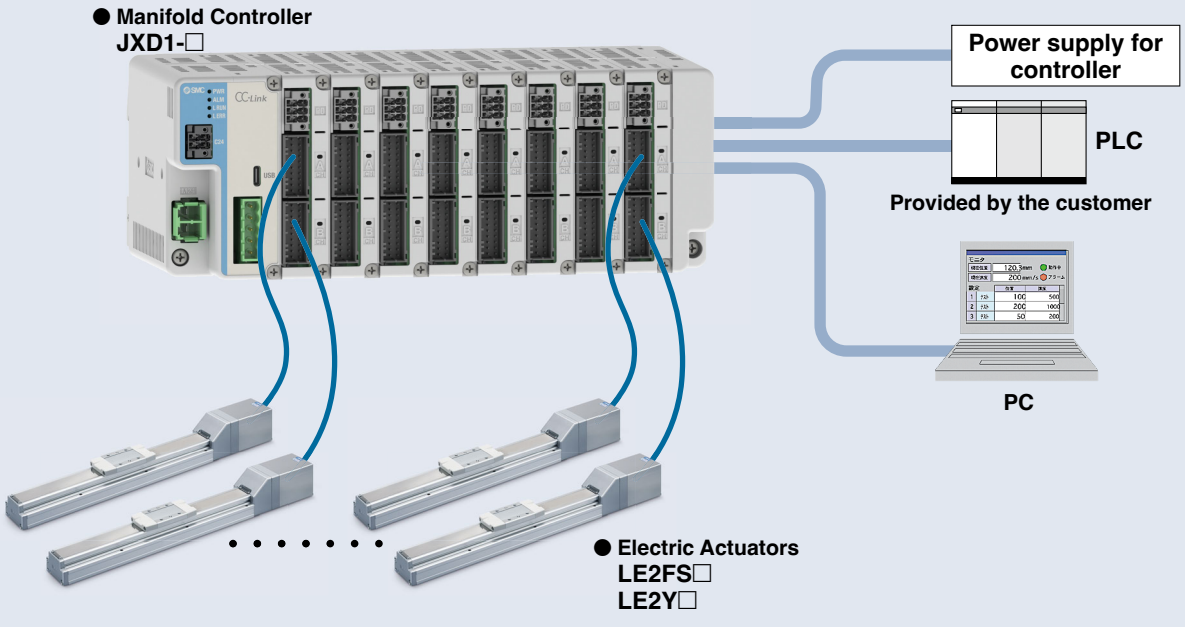
SMC

Variations

Type		Slider type	Rod type
Series		**LE2FS□H**  p. 4	**LE2Y□H**  p. 28
Actuation type		In-line: Ball screw Parallel: Ball screw + Belt	
Max. speed*1 [mm/s]		1200	900
Positioning repeatability [mm]		±0.015 (Lead H for size 25/32/40: ±0.02)	±0.02
Drive motor	Battery-less absolute (Step motor 24 VDC)	●	●
Power supply		24 VDC ±10 %	
Operation mode		Positioning operation Pushing	
Size	**16**	●	●
	25	●	●
	32	●	●
	40	●	—
Max. work load [kg] The values in parentheses are for when mounted vertically.	Size **16**	18 (12)	40 (10)
	Size **25**	40 (15)	70 (30)
	Size **32**	68 (20)	100 (46)
	Size **40**	80 (40)	—
Max. pushing force [N]	Size **16**	154	154
	Size **25**	511	511
	Size **32**	796	796
	Size **40**	637	—
Max. stroke [mm]		1200	500
Auto switch mounting		●	●

*1 The numerical values vary depending on the actuator type, work load, speed, and specifications. Please contact SMC for further details.

System Construction



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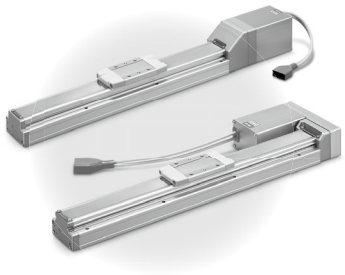
Compatible with Manifold Controller

Electric Actuators

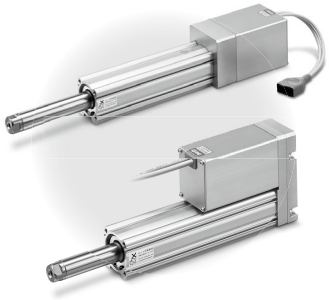
Slider Type LE2FS□H Series p. 4

Battery-less Absolute (Step Motor 24 VDC)



Rod Type LE2Y□H Series p. 28

Battery-less Absolute (Step Motor 24 VDC)



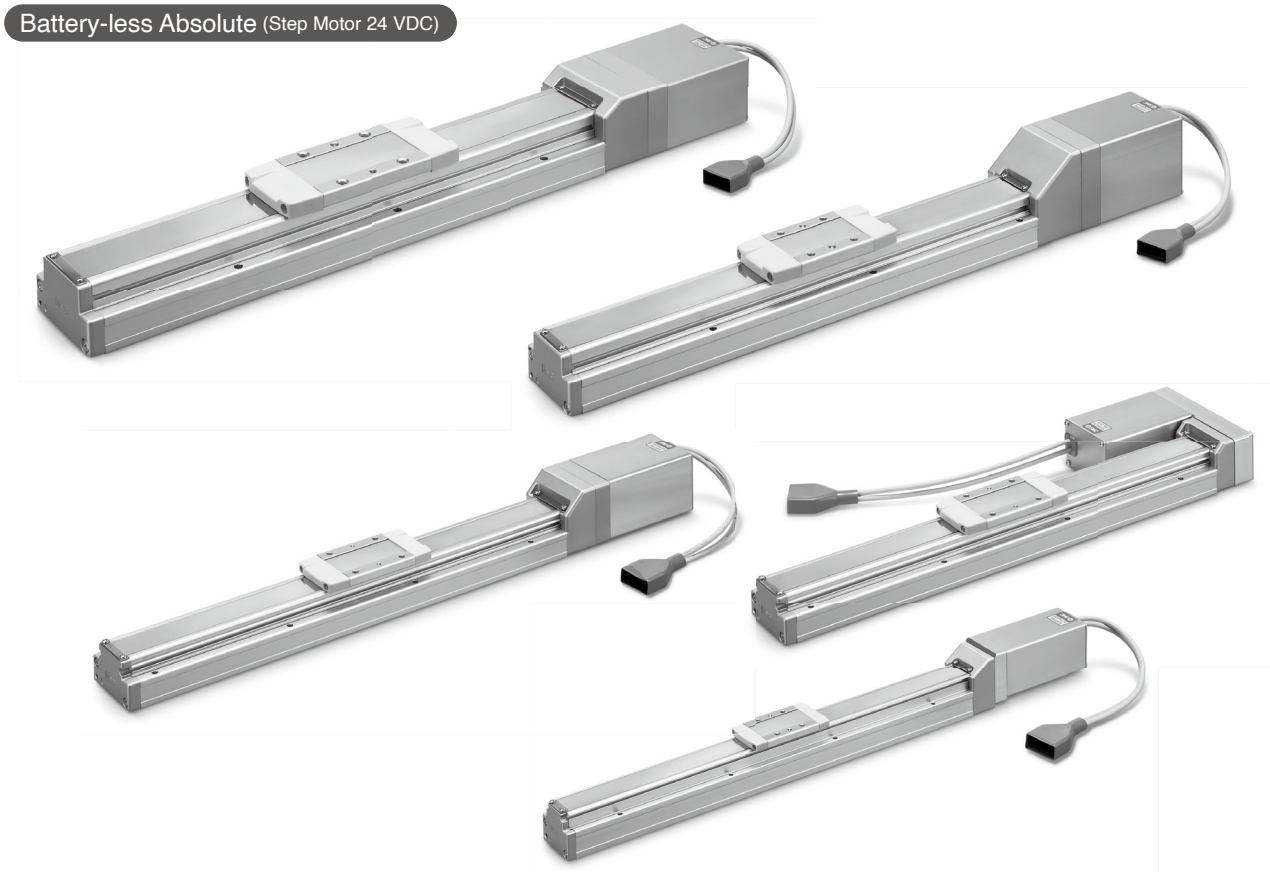
Compatible with Manifold Controller Electric Actuators

Slider Type

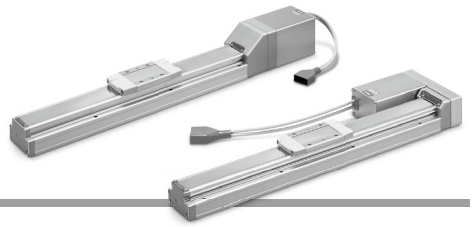
LE2FS□H Series

p. 5

Battery-less Absolute (Step Motor 24 VDC)



Model Selection



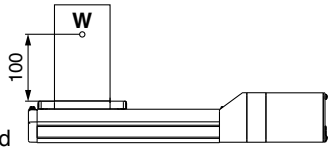
Selection Procedure

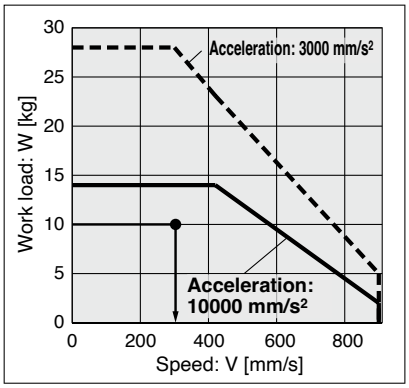
Step 1 Check the work load–speed. → **Step 2** Check the cycle time. → **Step 3** Check the allowable moment.

Selection Example

Operating conditions

- Workpiece mass: 10 [kg]
- Speed: 300 [mm/s]
- Acceleration/Deceleration: 10000 [mm/s²]
- Stroke: 200 [mm]
- Mounting orientation: Horizontal upward
- Workpiece mounting condition:





<Speed–Work load graph> (LE2FS25H/Battery-less absolute)

Step 1 **Check the work load–speed. <Speed–Work load graph>** (pages 8 to 11)

Select a model based on the workpiece mass and speed while referencing the speed–work load graph.

Selection example) The **LE2FS25H-200** can be temporarily selected as a possible candidate based on the graph shown on the right side.

Step 2 **Check the cycle time.**

Calculate **the cycle time** using the following calculation method.

Cycle time:

T can be found from the following equation.

$$T = T1 + T2 + T3 + T4 \text{ [s]}$$

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

$$T1 = V/a1 \text{ [s]} \qquad T3 = V/a2 \text{ [s]}$$

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

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

- T4: Settling time varies depending on the conditions such as actuator types, load, and in position of the step data.
  Reference value for settling time: 0.15 s or less
  The following value is used for this calculation.

$$T4 = 0.15 \text{ [s]}$$

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

$T1 = V/a1 = 300/10000 = 0.03$ [s],

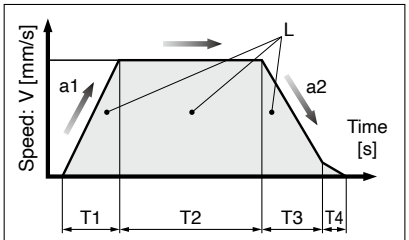
$T3 = V/a2 = 300/10000 = 0.03$ [s]

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{200 - 0.5 \cdot 300 \cdot (0.03 + 0.03)}{300} = 0.64 \text{ [s]}$$

$T4 = 0.15$ [s]

The cycle time can be found as follows.

$T = T1 + T2 + T3 + T4$
$= 0.03 + 0.64 + 0.03 + 0.15$
$=$ **0.85 [s]**

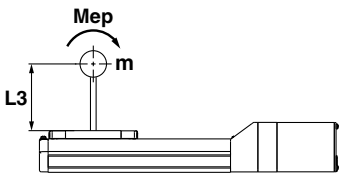


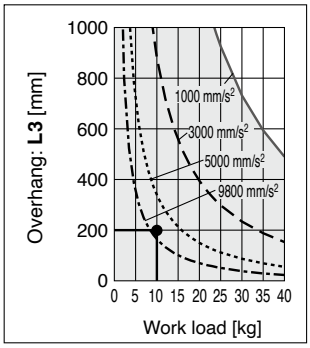
L : Stroke [mm] ··· (Operating condition)
V : Speed [mm/s] ··· (Operating condition)
a1: Acceleration [mm/s²] ··· (Operating condition)
a2: Deceleration [mm/s²] ··· (Operating condition)

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

Step 3 **Check the allowable moment.** **<Static allowable moment>** (page 11) **<Dynamic allowable moment>** (pages 12, 13)

Confirm the moment that applies to the actuator is within the allowable range for both static and dynamic conditions.





Based on the above calculation result, the LE2FS25H-200 should be selected.

Selection Procedure

Pushing Control Selection Procedure

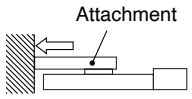
Step 1 Check the duty ratio. → **Step 2** Check the pushing force. → **Step 3** Check the dynamic allowable moment during a pushing operation.

∗ The duty ratio is a ratio of the operation time in one cycle.

Selection Example

Operating conditions

- Mounting condition: Horizontal (pushing)
- Attachment height: 50 [mm]
- Pushing force: 40 [N]
- Duty ratio: 15 [%]
- Speed: 100 [mm/s]
- Stroke: 200 [mm]



Step 1 **Check the duty ratio.**

<Conversion table of pushing force–duty ratio>

Select the [Pushing force] from the duty ratio while referencing the conversion table of pushing force–duty ratio.

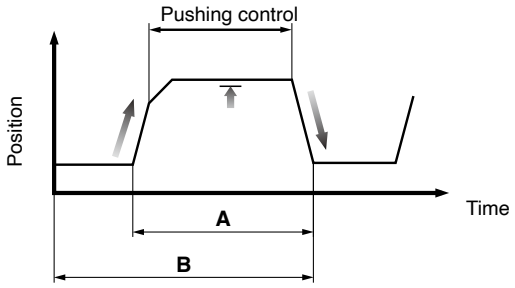
Selection example)
Based on the table below,
- Duty ratio: 100 [%]

The pushing force set value will be 45 [%].

<Conversion table of pushing force–duty ratio>
(LE2FS16H/Battery-less absolute)

Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40 °C or less	45 or less	100	No restriction

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



Duty ratio = A/B x 100 [%]

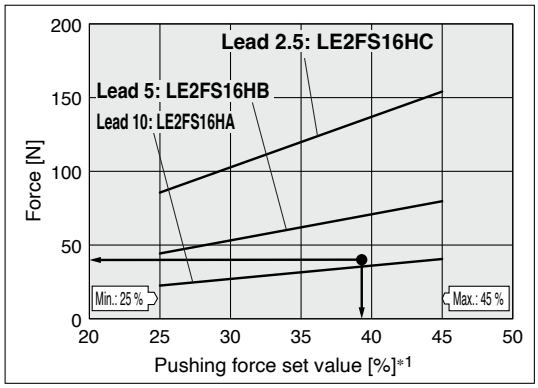
Step 2 **Check the pushing force.**

<Force conversion graph>

Select a model based on the pushing force set value and force while referencing the force conversion graph.

Selection example)
Based on the graph shown on the right side,
- Pushing force: 40 [N]
- Pushing force set value: 39 [%]

The **LE2FS16HA** can be temporarily selected as a possible candidate.



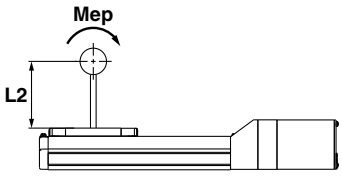
<Force conversion graph>
(LE2FS16□H/Step motor)

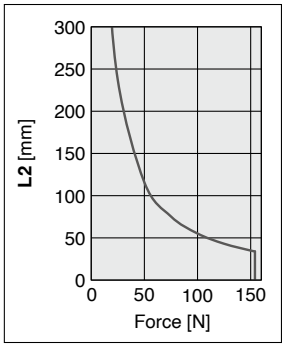
∗1 Set values for the controller

Step 3 **Check the dynamic allowable moment during a pushing operation.**

<Static allowable moment> (page 11)
<Dynamic allowable moment> (page 7)

Confirm the moment that applies to the actuator is within the allowable range for both static and dynamic conditions.

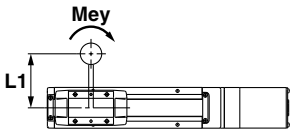
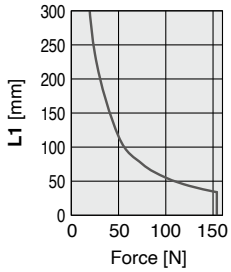
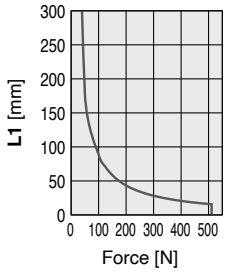
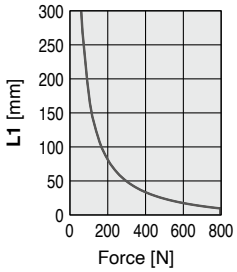
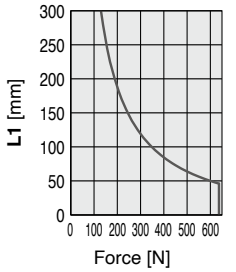
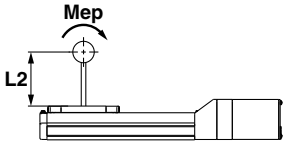
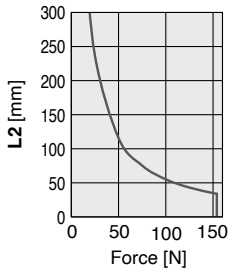
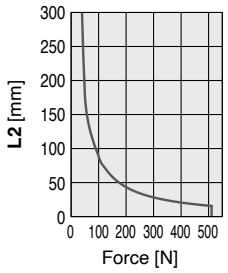
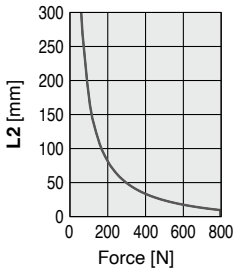
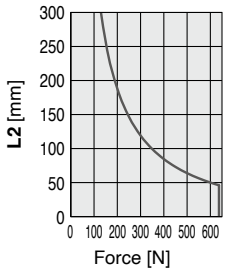




Based on the above calculation result, the LE2FS16HA-200 should be selected.

Dynamic Allowable Moment for Pushing

∗ These graphs show the amount of allowable overhang (guide unit) when the centre of gravity of the workpiece overhangs in one direction.

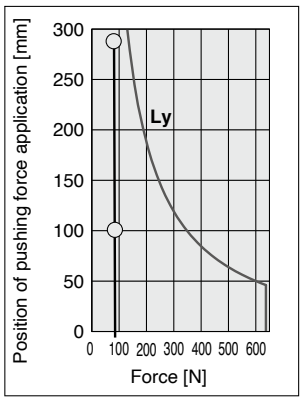
Orientation	Load overhanging direction **F**: Force **Me**: Allowable moment [N·m] L: Overhang to the work load centre of gravity [mm]		Model			
			LE2FS16	**LE2FS25**	**LE2FS32**	**LE2FS40**
Horizontal/Bottom/Wall/Vertical		Y				
		Z				

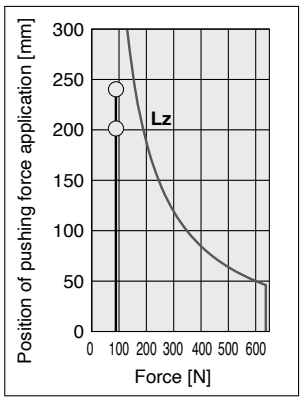
Calculation of Guide Load Factor

1. Decide operating conditions.
   Model: LE2FS□H
   Size: 16/25/32/40
   Pushing force: **F**
   The position applied the pushing force [mm]: **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]: **Ly/Lz** from the graph.
4. Calculate the load factor for each direction.
   αy = Yc/Ly, αz = Zc/Lz
5. Confirm the total of **αy** and **αz** is 1 or less.
   αy + αz ≤ 1
   When 1 is exceeded, please consider a reduction of acceleration and work load, or a change of the work load centre position and series.

Example

1. Operating conditions
   Model: LE2FS40H
   Size: 40
   Work load centre position [mm]: **Yc = 100, Zc = 200**
2. Determine the **fw = 1.5**
3. **Ly = 950 mm, Lz = 800 mm**
4. The load factor for each direction can be found as follows.
   αy = 100/950 = 0.11
5. **αy + αz = 0.36 ≤ 1**



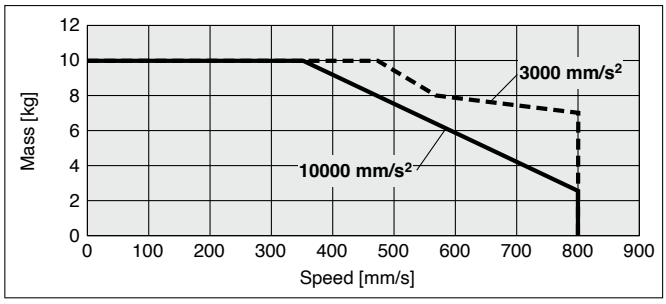


∗ When the product repeatedly cycles with partial strokes, operate it at a full stroke at least once every few dozen cycles.

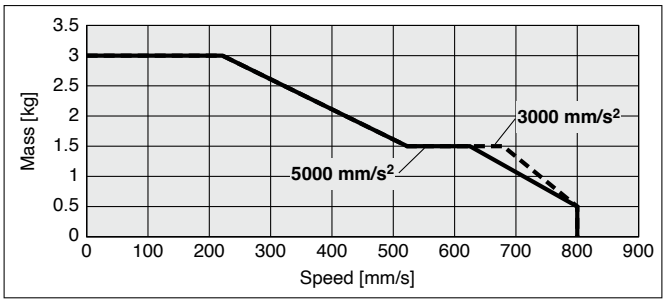
Speed–Work Load Graph (Guide)

LE2FS16/Ball Screw Drive

Horizontal/Lead 10

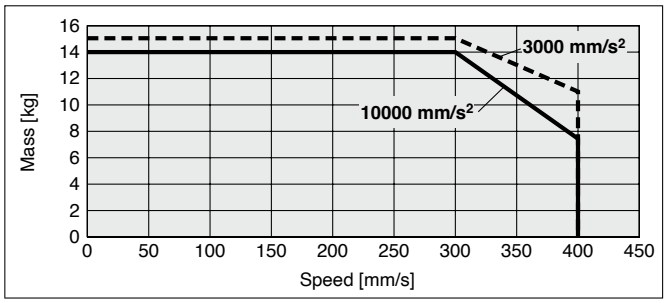


Vertical/Lead 10

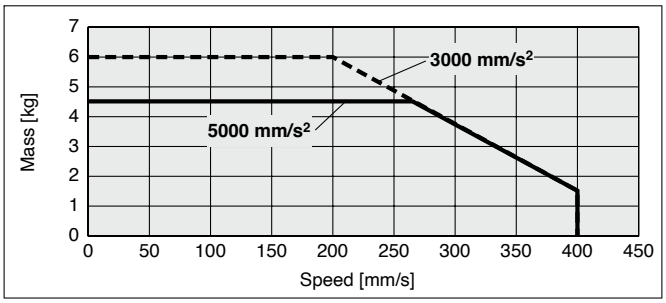


LE2FS16/Ball Screw Drive

Horizontal/Lead 5

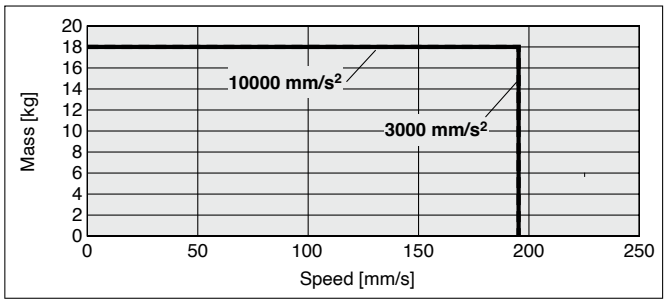


Vertical/Lead 5

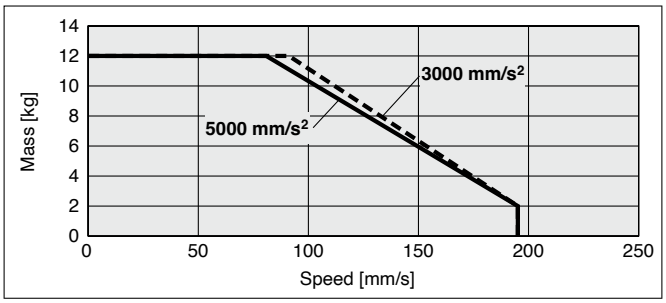


LE2FS16/Ball Screw Drive

Horizontal/Lead 2.5



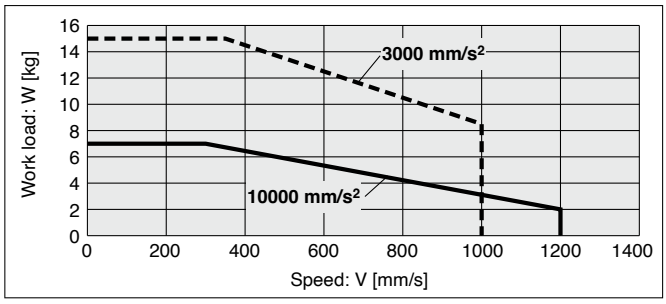
Vertical/Lead 2.5



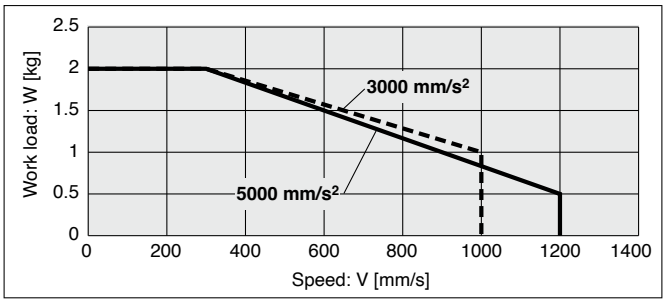
Speed–Work Load Graph (Guide)

LE2FS25/Ball Screw Drive

Horizontal/Lead 20

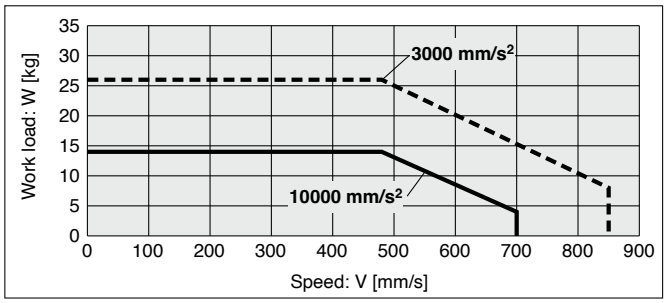


Vertical/Lead 20

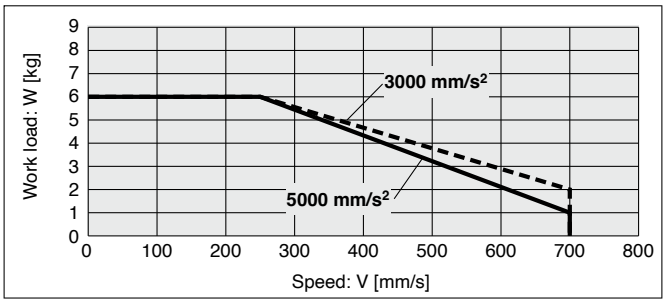


LE2FS25/Ball Screw Drive

Horizontal/Lead 12

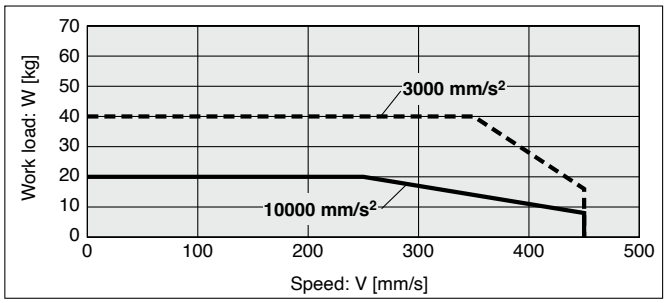


Vertical/Lead 12

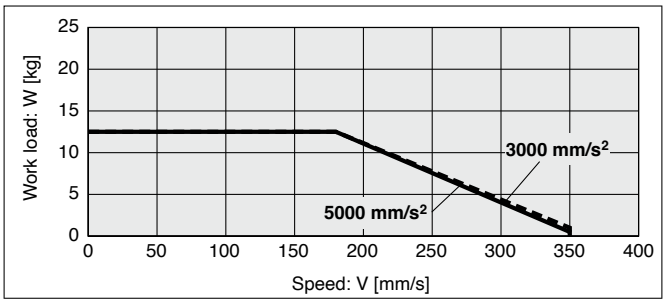


LE2FS25/Ball Screw Drive

Horizontal/Lead 6

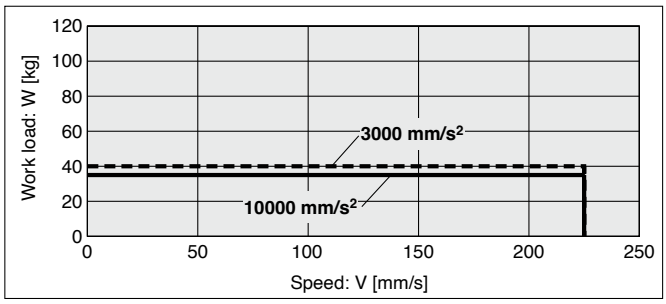


Vertical/Lead 6

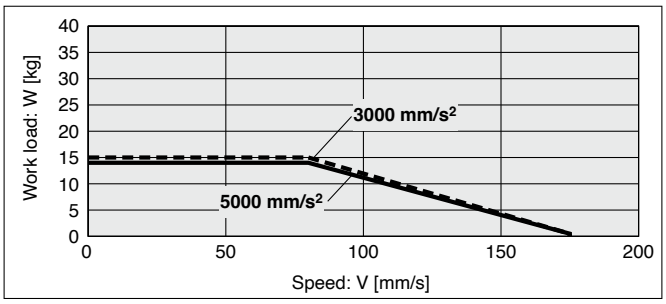


LE2FS25/Ball Screw Drive

Horizontal/Lead 3



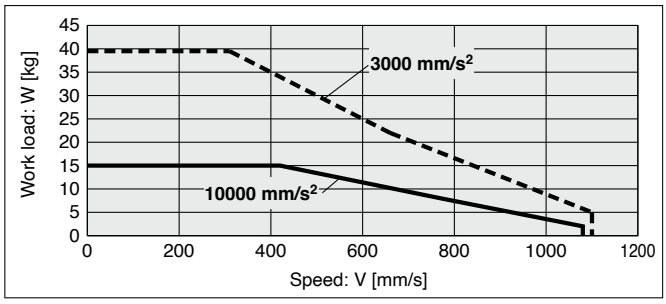
Vertical/Lead 3



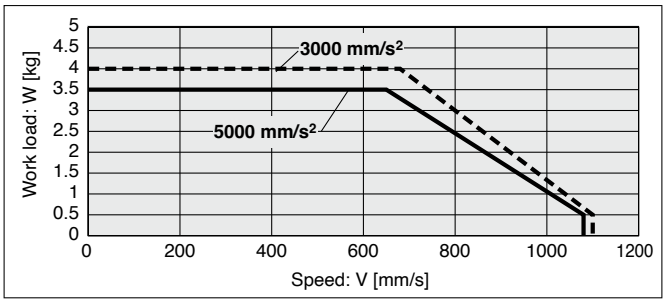
Speed–Work Load Graph (Guide)

LE2FS32/Ball Screw Drive

Horizontal/Lead 24

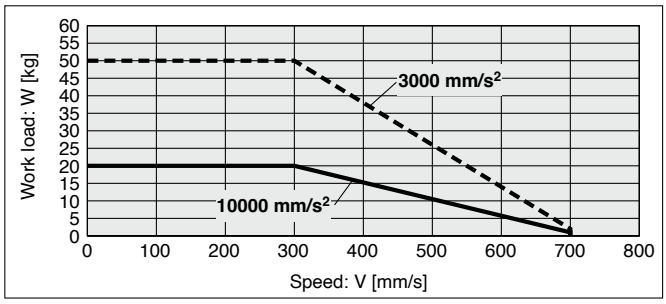


Vertical/Lead 24

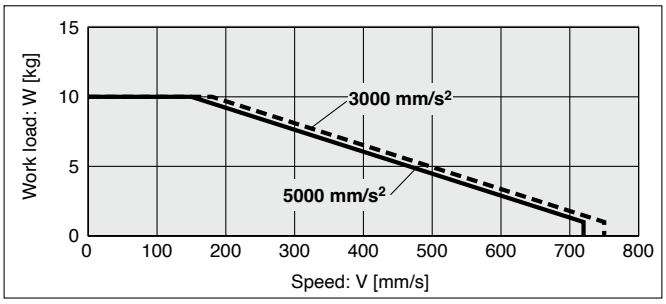


LE2FS32/Ball Screw Drive

Horizontal/Lead 16

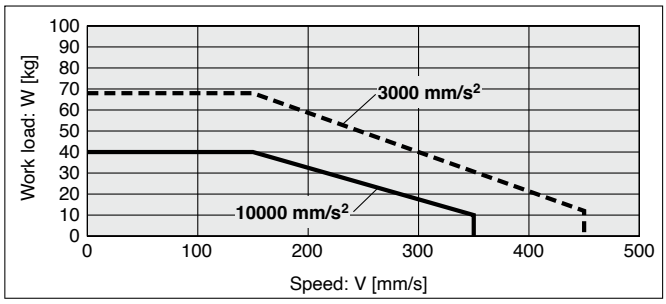


Vertical/Lead 16

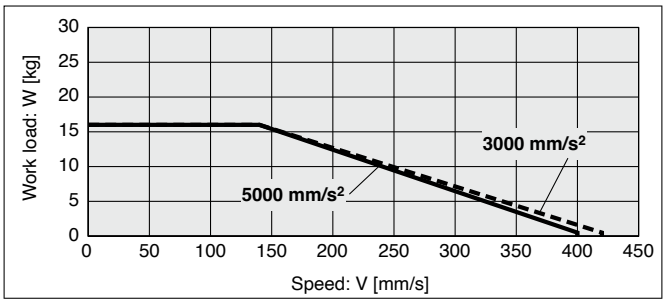


LE2FS32/Ball Screw Drive

Horizontal/Lead 8

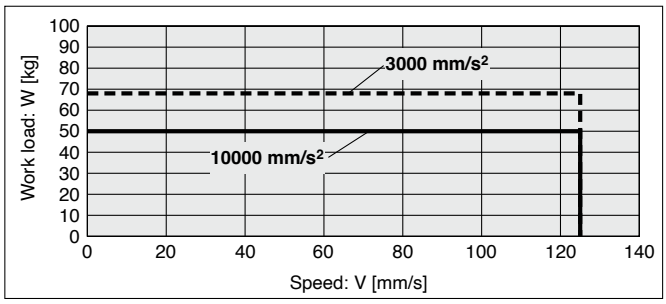


Vertical/Lead 8

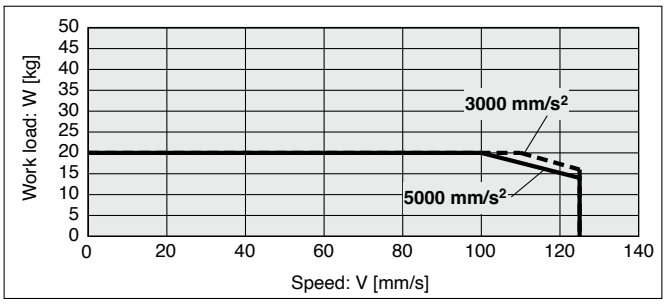


LE2FS32/Ball Screw Drive

Horizontal/Lead 4



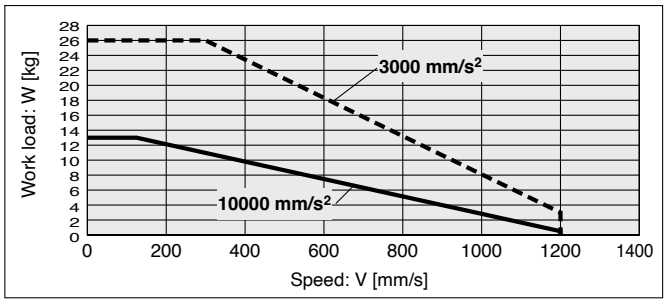
Vertical/Lead 4



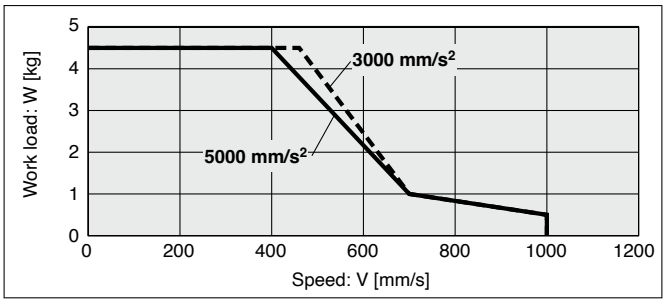
Speed–Work Load Graph (Guide)

LE2FS40/Ball Screw Drive

Horizontal/Lead 30

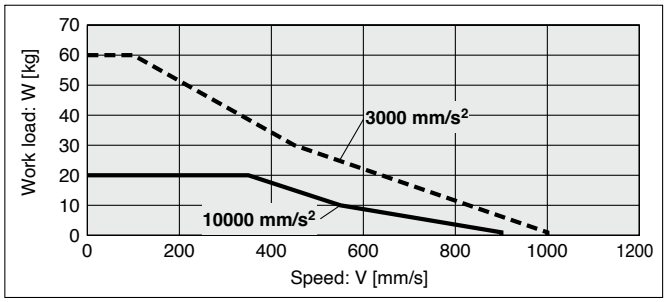


Vertical/Lead 30

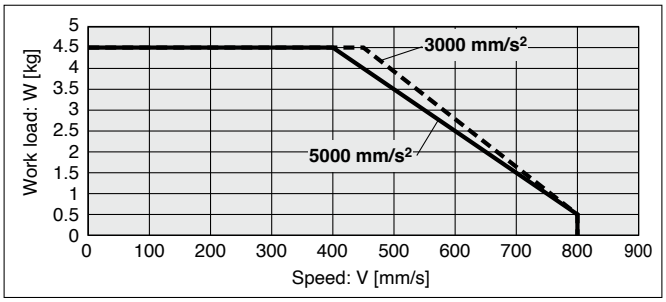


LE2FS40/Ball Screw Drive

Horizontal/Lead 20

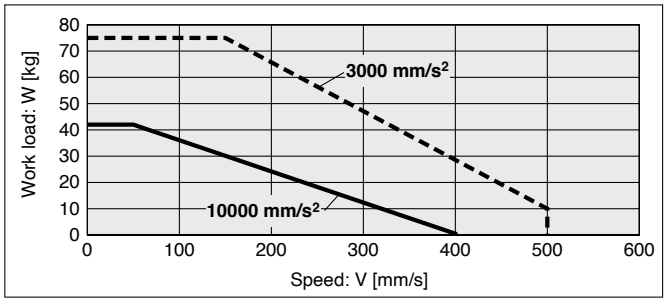


Vertical/Lead 20

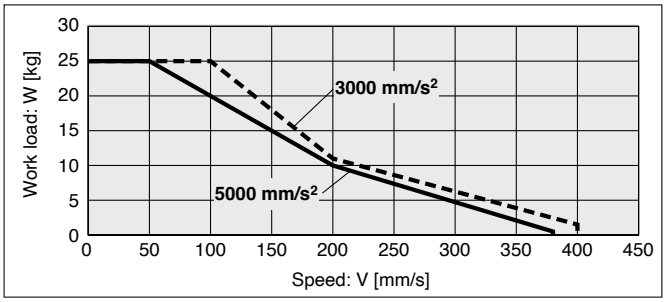


LE2FS40/Ball Screw Drive

Horizontal/Lead 10

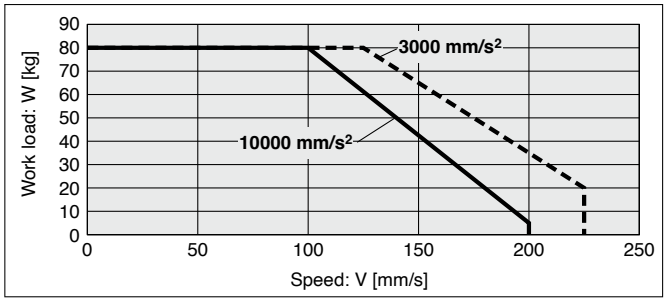


Vertical/Lead 10

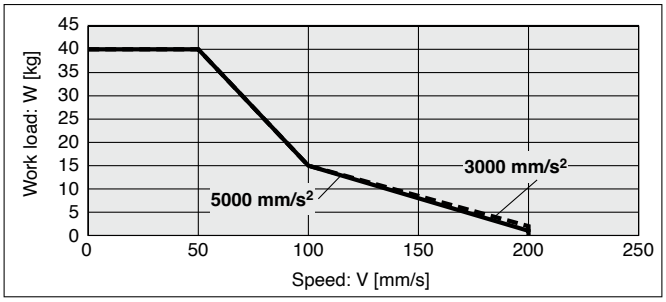


LE2FS40/Ball Screw Drive

Horizontal/Lead 5



Vertical/Lead 5



Static Allowable Moment*1

[N·m]

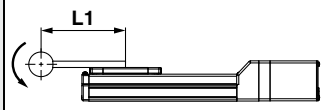
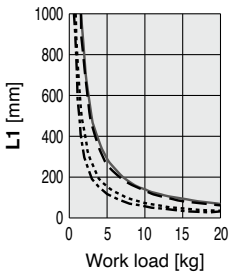
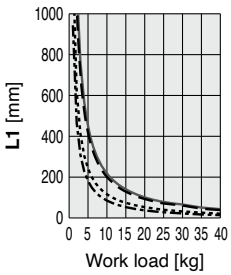
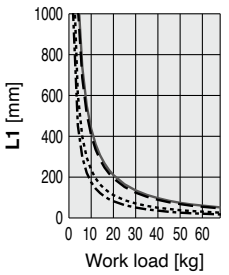
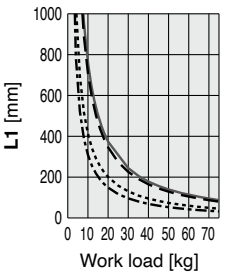
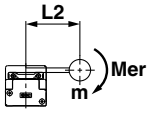
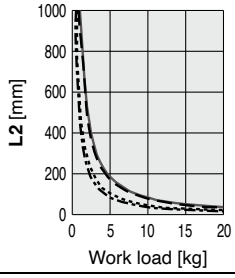
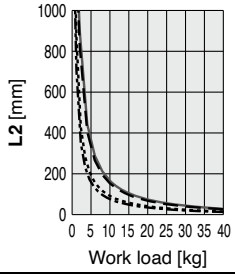
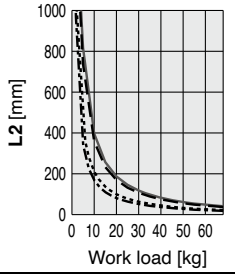
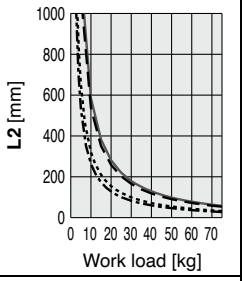
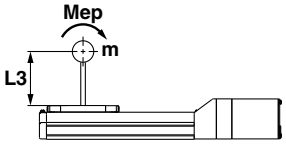
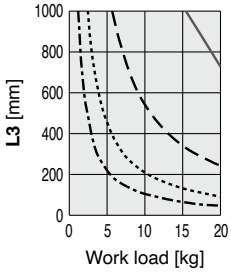
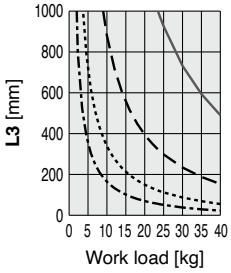
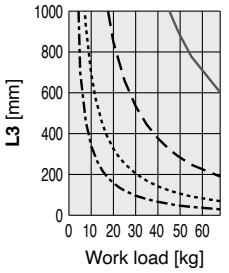
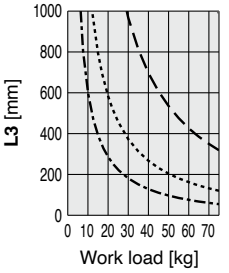
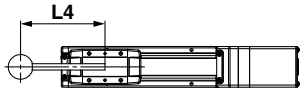
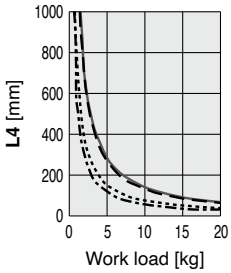
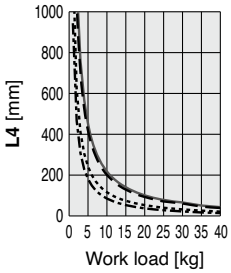
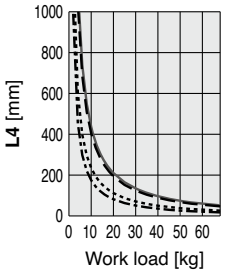
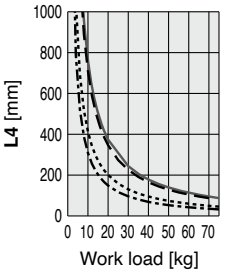
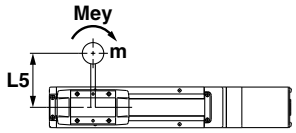
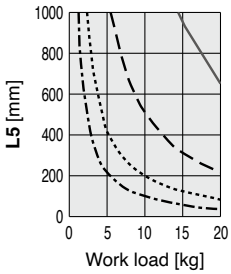
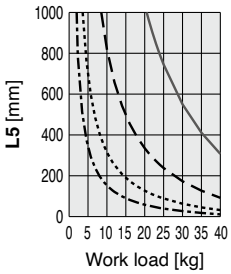
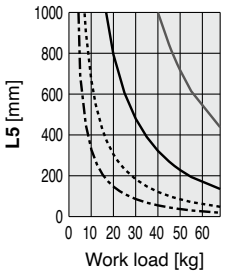
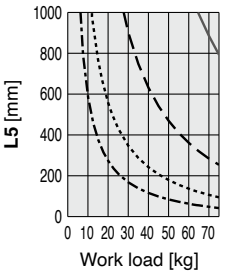
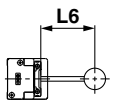
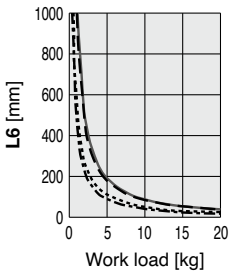
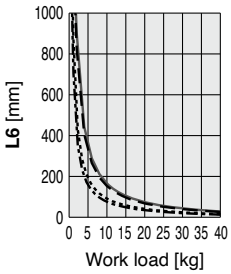
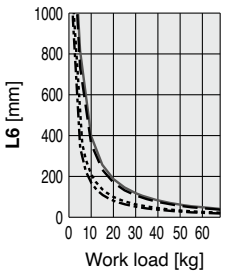
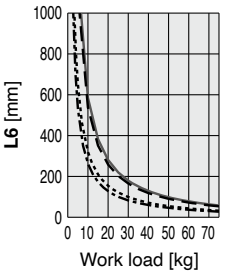
Model	Size	Pitching	Yawing	Rolling
LE2FS□H	**16**	10.0	10.0	20.0
	25	27.0	27.0	52.0
	32	46.0	46.0	101.0
	40	110.0	110.0	207.0

*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

* These graphs show the amount of allowable overhang (guide unit) when the centre of gravity of the workpiece overhangs in one direction.

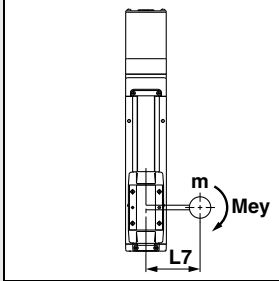
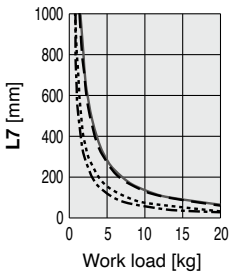
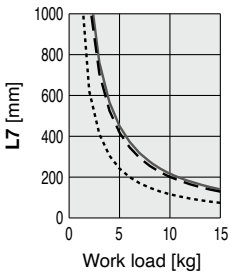
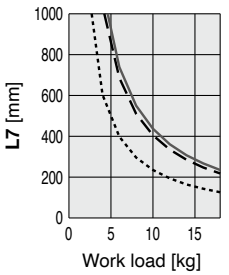
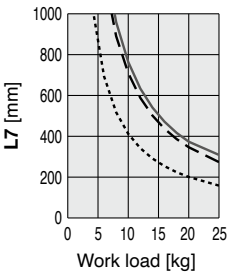
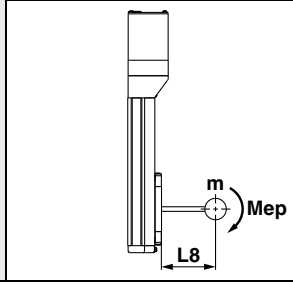
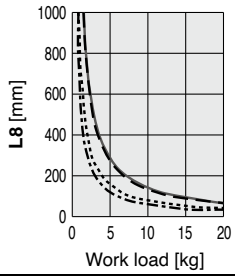
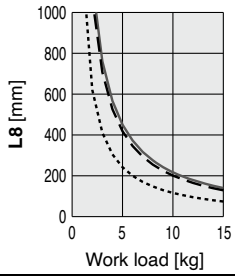
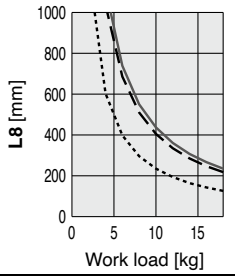
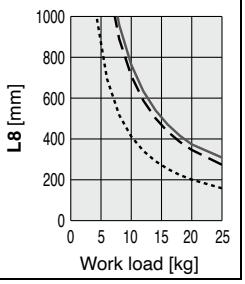
Acceleration ——1000 mm/s² – – –3000 mm/s² ·····5000 mm/s² –·–·–10000 mm/s²

Orientation	Load overhanging direction **m** : Work load [kg] **Me**: Allowable moment [N·m] **L** : Overhang to the work load centre of gravity [mm]		Model			
			LE2FS16H	**LE2FS25H**	**LE2FS32H**	**LE2FS40H**
Horizontal/Bottom		X				
		Y				
		Z				
Wall		X				
		Y				
		Z				

Dynamic Allowable Moment

* These graphs show the amount of allowable overhang (guide unit) when the centre of gravity of the workpiece overhangs in one direction.

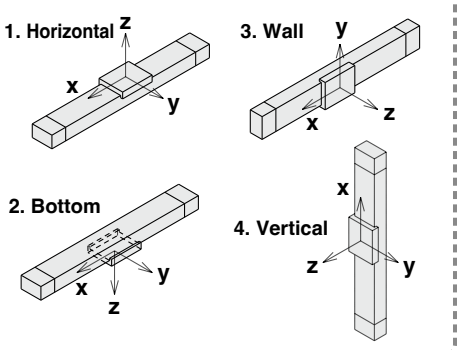
Acceleration ——1000 mm/s² — — —3000 mm/s² ·····5000 mm/s²

Orientation	Load overhanging direction **m** : Work load [kg] **Me**: Allowable moment [N·m] **L** : Overhang to the work load centre of gravity [mm]		Model			
			LE2FS16H	**LE2FS25H**	**LE2FS32H**	**LE2FS40H**
Vertical		Y				
		Z				

Calculation of Guide Load Factor

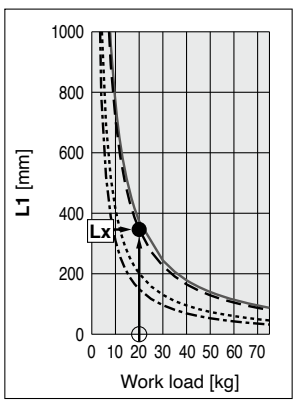
1. Decide operating conditions.
   Model: LE2FS□H
   Size: 16/25/32/40
   Mounting orientation: Horizontal/Bottom/Wall/Vertical
   Acceleration [mm/s²]: **a**
   Work load [kg]: **m**
   Work load centre position [mm]: **Xc/Yc/Zc**
2. Select the target graph while referencing the model, size, and mounting 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.
   α**x = Xc/Lx**, α**y = Yc/Ly**, α**z = Zc/Lz**
5. Confirm the total of α**x**, α**y**, and α**z** is 1 or less.
   α**x + αy + αz ≤ 1**
   When 1 is exceeded, please consider a reduction of acceleration and work load, or a change of the work load centre position and series.

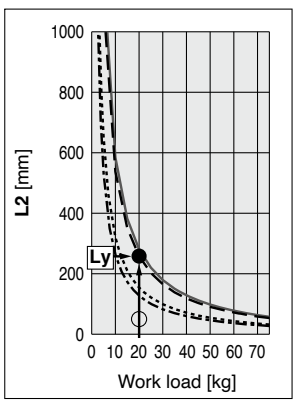
Mounting orientation



Example

1. Operating conditions
   Model: LE2FS40H
   Size: 40
   Mounting orientation: Horizontal
   Acceleration [mm/s²]: 3000
   Work load [kg]: 20
   Work load centre position [mm]: **Xc = 0**, **Yc = 50**, **Zc = 200**
2. Select the graphs for horizontal of the LE2FS40H on page 12.
3. **Lx = 350 mm**, **Ly = 250 mm**, **Lz = 1000 mm**
4. The load factor for each direction can be found as follows.
   α**x = 0/350 = 0**
   α**y = 50/250 = 0.2**
   α**z = 200/1000 = 0.2**
5. α**x + αy + αz = 0.4 ≤ 1**





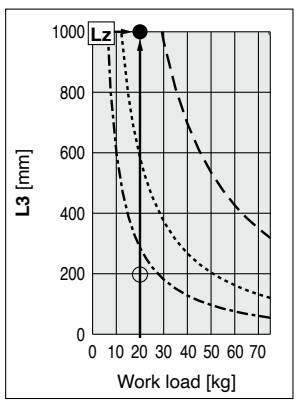
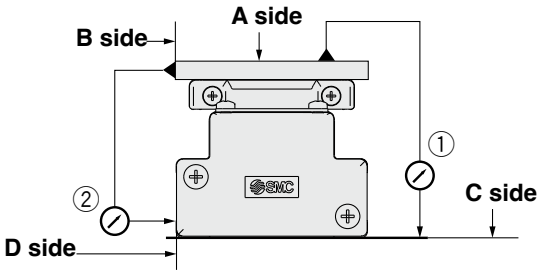


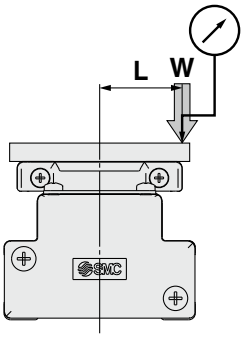
Table Accuracy (Reference Value)

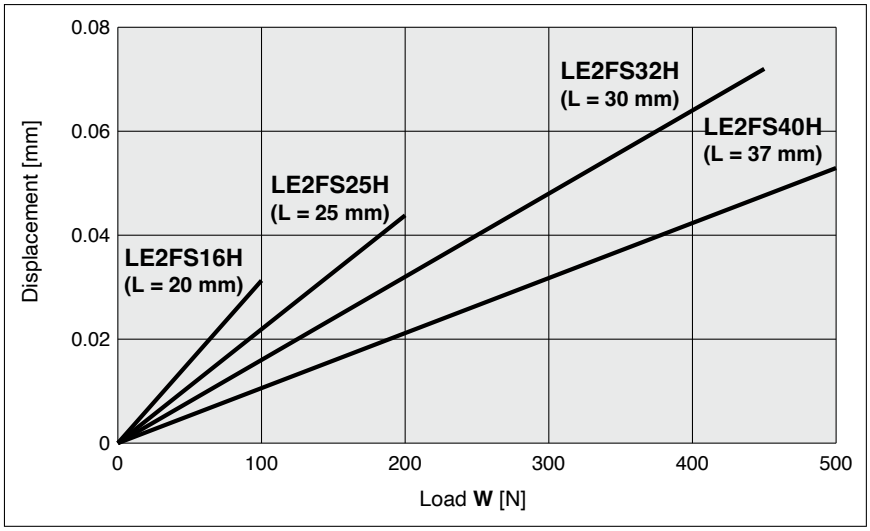


Model	Traveling parallelism [mm] (Every 300 mm)	
	① C side traveling parallelism to A side	② D side traveling parallelism to B side
LE2FS16H	0.05	0.03
LE2FS25H	0.05	0.03
LE2FS32H	0.05	0.03
LE2FS40H	0.05	0.03

∗ Traveling parallelism does not include the mounting surface accuracy. (Excludes when the stroke exceeds 2000 mm)

Table Displacement (Reference Value)

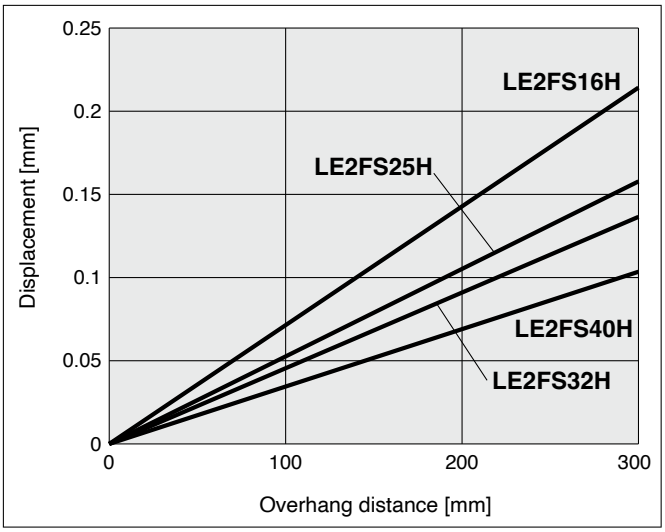




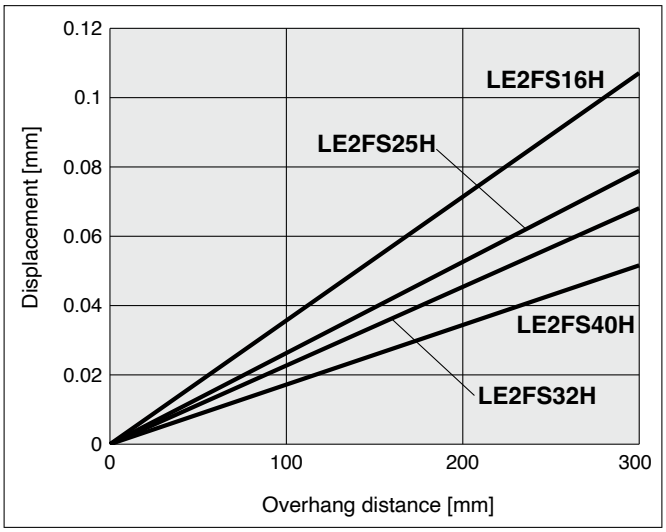
∗ This displacement is measured when a 15 mm aluminium plate is mounted and fixed on the table.
∗ Check the clearance and play of the guide separately.

Overhang Displacement Due to Table Clearance (Initial Reference Value)

Basic type

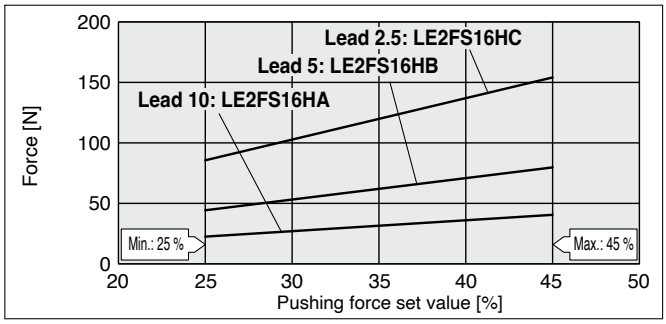


High-precision type



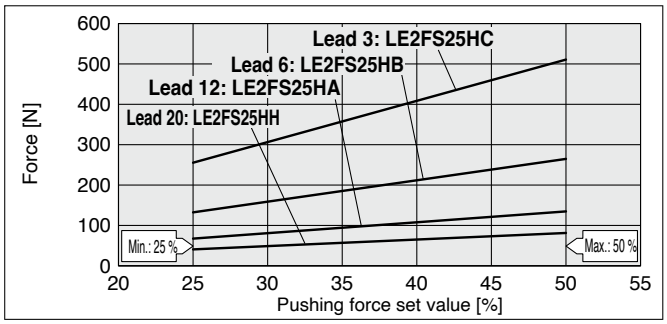
Force Conversion Graph (Guide)

LE2FS16□H



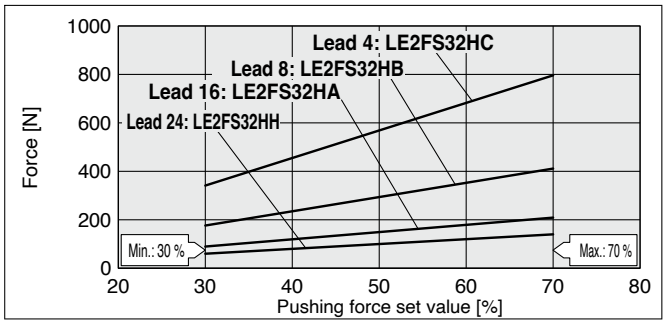
Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40 °C or less	45 or less	100	No restriction

LE2FS25□H



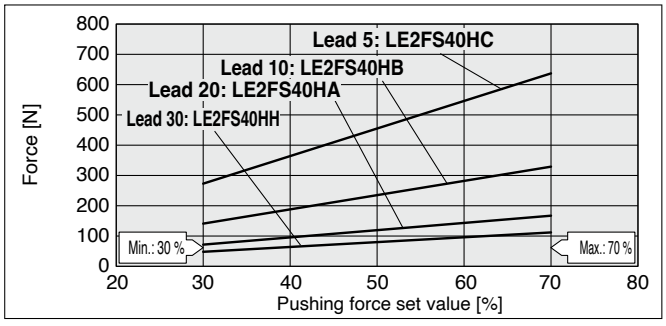
Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40 °C or less	50 or less	100	No restriction

LE2FS32□H



Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40 °C or less	70 or less	100	No restriction

LE2FS40□H



Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40 °C or less	70 or less	100	No restriction

<Limit Values for Pushing Force and Trigger Level in Relation to Pushing Speed>

Model	Lead	Pushing speed [mm/s]	Pushing force (Setting input value)
LE2FS16□H	A/B/C	1 to 50	25 to 45 %
LE2FS25□H	H/A/B/C	1 to 35	25 to 50 %
LE2FS32□H	H/A/B/C	1 to 30	30 to 70 %
LE2FS40□H	H/A/B/C	1 to 30	30 to 70 %

There is a limit to the pushing force in relation to the pushing speed. If the product is operated outside of the range (low pushing force), the completion signal [INP] may be output before the pushing operation has been completed (during the moving operation).
If operating with the pushing speed below the min. speed, please check for operating problems before using the product.

<Set Values for Vertical Upward Transfer Pushing Operations>

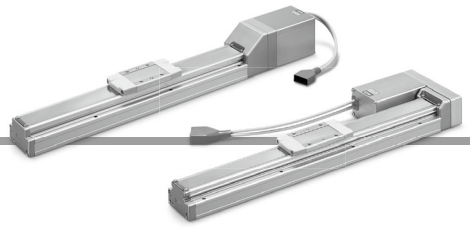
For vertical loads (upward), set the pushing force to the max. value shown below and operate at the work load or less.

Model	LE2FS16□H			LE2FS25□H				LE2FS32□H				LE2FS40□H			
Lead	A	B	C	H	A	B	C	H	A	B	C	H	A	B	C
Work load [kg]	1	1.5	3	1	2.5	5	10	2	4.5	9	18	1.5	3	7	14
Pushing force	45 %			50 %				70 %				70 %			

Battery-less Absolute (Step Motor 24 VDC)

Compatible with Manifold Controller

Slider Type
LE2FS□H Series LE2FS16, 25, 32, 40



How to Order

LE2FS 32 R 1 H A – 300 A G

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽

❶ Size

16
25
32
40

❷ Motor mounting position

D	In-line
R	Right side parallel
L	Left side parallel

❸ Motor cable entry direction

1	Axial
2	Right
3	Left
4	Top
5	Bottom

❹ Motor type

Symbol	Type	Compatible controller
H	Battery-less absolute (Step motor 24 VDC)	JXD1

❺ Lead [mm]

Symbol	LE2FS16	LE2FS25	LE2FS32	LE2FS40
H	—	20	24	30
A	10	12	16	20
B	5	6	8	10
C	2.5	3	4	5

❻ Stroke

50	50
to	to
1200	1200

∗ For details, refer to the applicable stroke table below.

❼ Motor option

A	Without option
B	With lock

❽ Grease application (Seal band part)

G	With
N	Without (Roller specification)

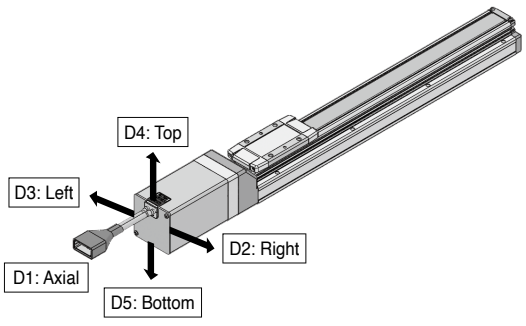
The auto switches should be ordered separately.
For details, refer to pages 27 and 48 to 50.

Applicable Stroke Table

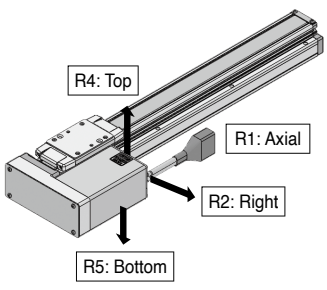
Size	Stroke																					
	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1100	1200
16	●	●	●	●	●	●	●	●	●	●	–	–	–	–	–	–	–	–	–	–	–	–
25	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	–	–	–	–	–	–
32	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	–	–
40	–	–	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

Motor Mounting Position

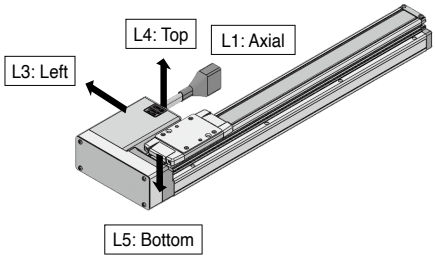
D: In-line



R: Right side parallel
→R3 is not selectable.



L: Left side parallel
→L2 is not selectable.



Specifications

	Model			LE2FS16□H			LE2FS25□H				LE2FS32□H				LE2FS40□H			
Actuator specifications	Stroke [mm]*1			50 to 500			50 to 800				50 to 1000				150 to 1200			
	Work load [kg]*6		Horizontal	10	15	18	15	26	40	40	39.5	50	68	68	26	60	75	80
			Vertical	3	6	12	2	6	12.5	15	4	10	16	20	4.5	4.5	25	40
	Pushing force [N]*2 *3 *4			23 to 41	44 to 80	86 to 154	41 to 81	67 to 135	132 to 265	255 to 511	60 to 140	90 to 209	176 to 411	341 to 796	48 to 112	72 to 167	141 to 329	273 to 637
	Speed [mm/s]	Stroke range	Up to 400	10 to 800	5 to 400	3 to 195	20 to 1200	12 to 850	6 to 450	3 to 225	24 to 1100	16 to 750	8 to 450	4 to 125	30 to 1200	20 to 1000	10 to 500	5 to 225
			401 to 450	10 to 700	5 to 360	3 to 170	20 to 1100	12 to 750	6 to 400	3 to 225	24 to 1100	16 to 750	8 to 450	4 to 125	30 to 1200	20 to 1000	10 to 500	5 to 225
			401 to 500	10 to 600	5 to 300	3 to 140	20 to 1100	12 to 750	6 to 400	3 to 225	24 to 1100	16 to 750	8 to 450	4 to 125	30 to 1200	20 to 1000	10 to 500	5 to 225
			501 to 600	—	—	—	20 to 900	12 to 540	6 to 270	3 to 135	24 to 1100	16 to 750	8 to 400	4 to 125	30 to 1200	20 to 1000	10 to 500	5 to 225
			601 to 700	—	—	—	20 to 630	12 to 420	6 to 230	3 to 115	24 to 930	16 to 620	8 to 310	4 to 125	30 to 1200	20 to 900	10 to 440	5 to 220
			701 to 800	—	—	—	20 to 550	12 to 330	6 to 180	3 to 90	24 to 750	16 to 500	8 to 250	4 to 125	30 to 1140	20 to 760	10 to 350	5 to 175
			801 to 900	—	—	—	—	—	—	—	24 to 610	16 to 410	8 to 200	4 to 100	30 to 930	20 to 620	10 to 280	5 to 140
			901 to 1000	—	—	—	—	—	—	—	24 to 500	16 to 340	8 to 170	4 to 85	30 to 780	20 to 520	10 to 250	5 to 125
			1001 to 1100	—	—	—	—	—	—	—	—	—	—	—	30 to 660	20 to 440	10 to 220	5 to 110
			1101 to 1200	—	—	—	—	—	—	—	—	—	—	—	30 to 570	20 to 380	10 to 190	5 to 95
	Max. acceleration/deceleration [mm/s²]		Horizontal	10000														
			Vertical	5000														
	Pushing speed [mm/s]*5			1 to 50			1 to 35				1 to 30				1 to 30			
	Positioning repeatability [mm]			±0.015 (Lead H: ±0.02)														
	Lost motion [mm]*7			0.1 or less														
	Lead [mm]			10	5	2.5	20	12	6	3	24	16	8	4	30	20	10	5
	Impact/Vibration resistance [m/s²]*8			50/20														
	Actuation type			Ball screw (LE2FS□H), Ball screw + Belt (LE2FS□$^{R}_{L}$H)														
	Guide type			Linear guide														
	Operating temperature range [°C]			5 to 40														
	Operating humidity range [%RH]			90 or less (No condensation)														
Electric specifications	Motor size			□28			□42				□56.4							
	Motor type			Battery-less absolute (Step motor 24 VDC)														
	Encoder			Battery-less absolute														
	Power supply voltage [V]			24 VDC ±10 %														
	Power [W]*9 *11			Max. power 58			Max. power 72				Max. power 93				Max. power 93			
Lock unit specifications	Type*10			Non-magnetizing lock														
	Holding force [N]			29	59	118	47	78	157	294	72	108	216	421	75	113	225	421
	Power [W]*11			4			8				8				8			
	Power supply voltage [V]			24 VDC ±10 %														

*1 Please contact SMC for non-standard strokes as they are produced as special orders.
*2 Pushing force accuracy is ±20 % (F.S.).
*3 The pushing force set values for LE2FS16□H are 25 % to 45 %, for LE2FS25□H are 25 % to 50 %, for LE2FS32□H are 30 % to 70 %, and for LE2FS40□H are 30 % to 70 %. The pushing force values change according to the duty ratio and pushing speed. Check the “Force Conversion Graph” in the catalogue.
*4 The speed and force may change depending on the cable length, load, and mounting conditions. Furthermore, if the cable length exceeds 5 m, then it will decrease by up to 10 % for each 5 m. (At 15 m: Reduced by up to 20 %)
*5 The allowable speed for pushing operation. When push conveying a workpiece, operate at the vertical work load or less.
*6 The max. work load at 3000 mm/s² acceleration and deceleration speed
Work load varies depending on the speed and acceleration. Check the “Speed–Work Load Graph” in the catalogue.
Furthermore, if the cable length exceeds 5 m, the speed and work load specified in the “Speed–Work Load Graph” may decrease by up to 10 % for each 5 m increase.
*7 A reference value for correcting errors in reciprocal operation
*8 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.)
*9 Indicates the max. power during operation (excluding the controller). This value can be used for the selection of the power supply.
*10 With lock only
*11 For an actuator with lock, add the power for the lock.

Weight

In-line Motor

Series	LE2FS16									
Stroke [mm]	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	0.85	0.92	1.00	1.07	1.15	1.22	1.30	1.37	1.45	1.52
Additional weight with lock [kg]	0.16									

Series	LE2FS25															
Stroke [mm]	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Product weight [kg]	1.77	1.91	2.05	2.19	2.33	2.47	2.61	2.75	2.89	3.03	3.17	3.31	3.45	3.59	3.73	3.87
Additional weight with lock [kg]	0.31															

Series	LE2FS32																			
Stroke [mm]	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Product weight [kg]	3.12	3.32	3.52	3.72	3.92	4.12	4.32	4.52	4.72	4.92	5.12	5.32	5.52	5.72	5.92	6.12	6.32	6.52	6.72	6.92
Additional weight with lock [kg]	0.58																			

Series	LE2FS40																			
Stroke [mm]	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1100	1200
Product weight [kg]	4.99	5.27	5.55	5.83	6.11	6.39	6.77	6.95	7.23	7.51	7.79	8.07	8.35	8.63	8.91	9.19	9.47	9.75	10.31	10.87
Additional weight with lock [kg]	0.60																			

Right/Left Side Parallel Motor

Series	LE2FS16$^{R}_{L}$									
Stroke [mm]	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	0.85	0.92	1.00	1.07	1.15	1.22	1.30	1.37	1.45	1.52
Additional weight with lock [kg]	0.16									

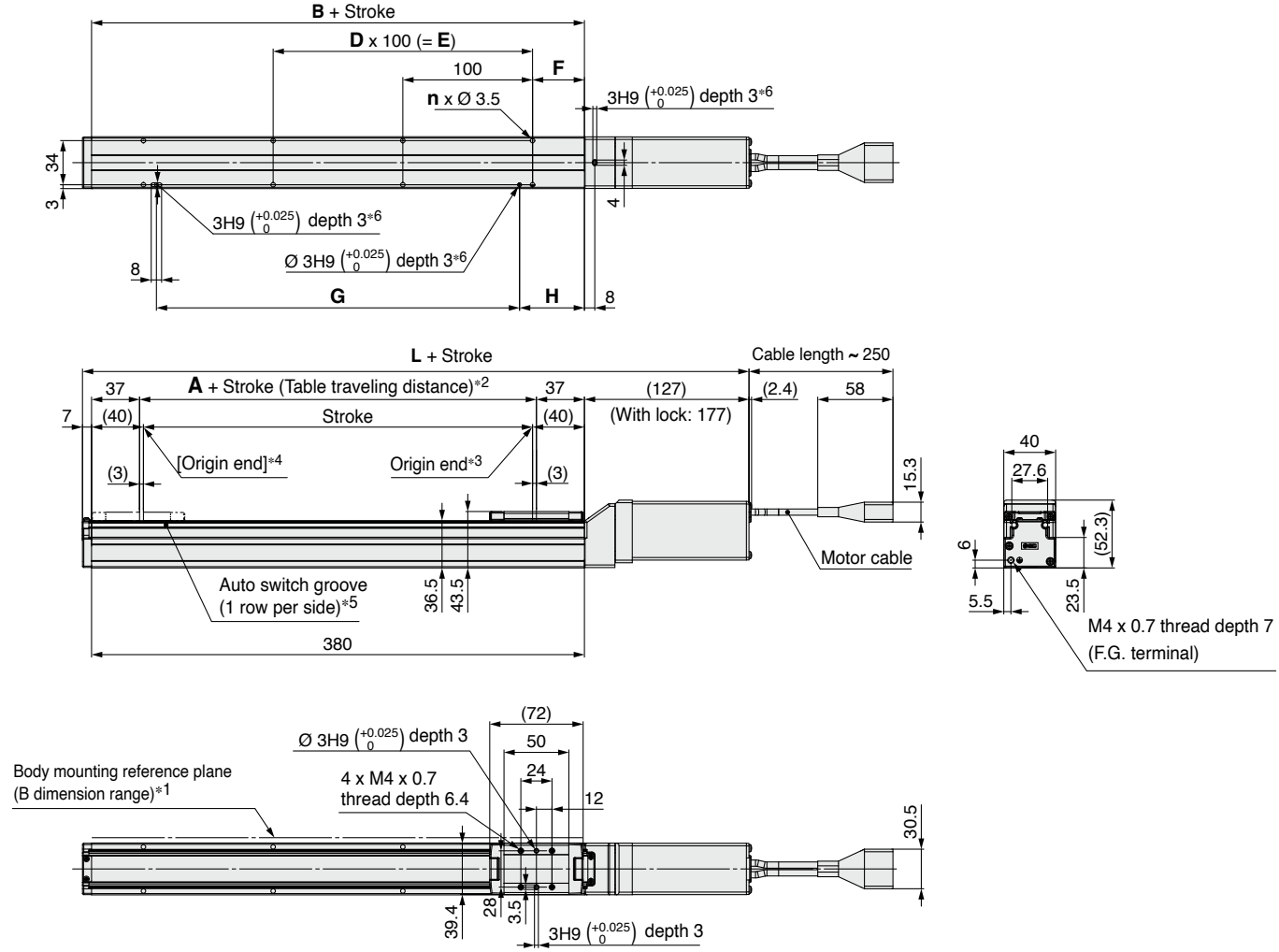
Series	LE2FS25$^{R}_{L}$															
Stroke [mm]	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
Product weight [kg]	1.75	1.89	2.03	2.17	2.31	2.45	2.59	2.73	2.87	3.01	3.15	3.29	3.43	3.57	3.71	3.85
Additional weight with lock [kg]	0.31															

Series	LE2FS32$^{R}_{L}$																			
Stroke [mm]	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Product weight [kg]	3.09	3.29	3.49	3.69	3.89	4.09	4.29	4.49	4.69	4.89	5.09	5.29	5.49	5.69	5.89	6.09	6.29	6.49	6.69	6.89
Additional weight with lock [kg]	0.58																			

Series	LE2FS40$^{R}_{L}$																			
Stroke [mm]	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1100	1200
Product weight [kg]	5.15	5.43	5.71	5.99	6.27	6.55	6.93	7.11	7.39	7.67	7.95	8.23	8.51	8.79	9.07	9.35	9.63	9.91	10.47	11.03
Additional weight with lock [kg]	0.60																			

Dimensions: In-line Motor

LE2FS16H



*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 The distance the table moves according to movement instructions
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.

*3 Indicates the factory default origin position (0 mm)

*4 [ ] refers to when the rotation direction reference is changed.

*5 The applicable auto switch (D-M9□) should be ordered 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.

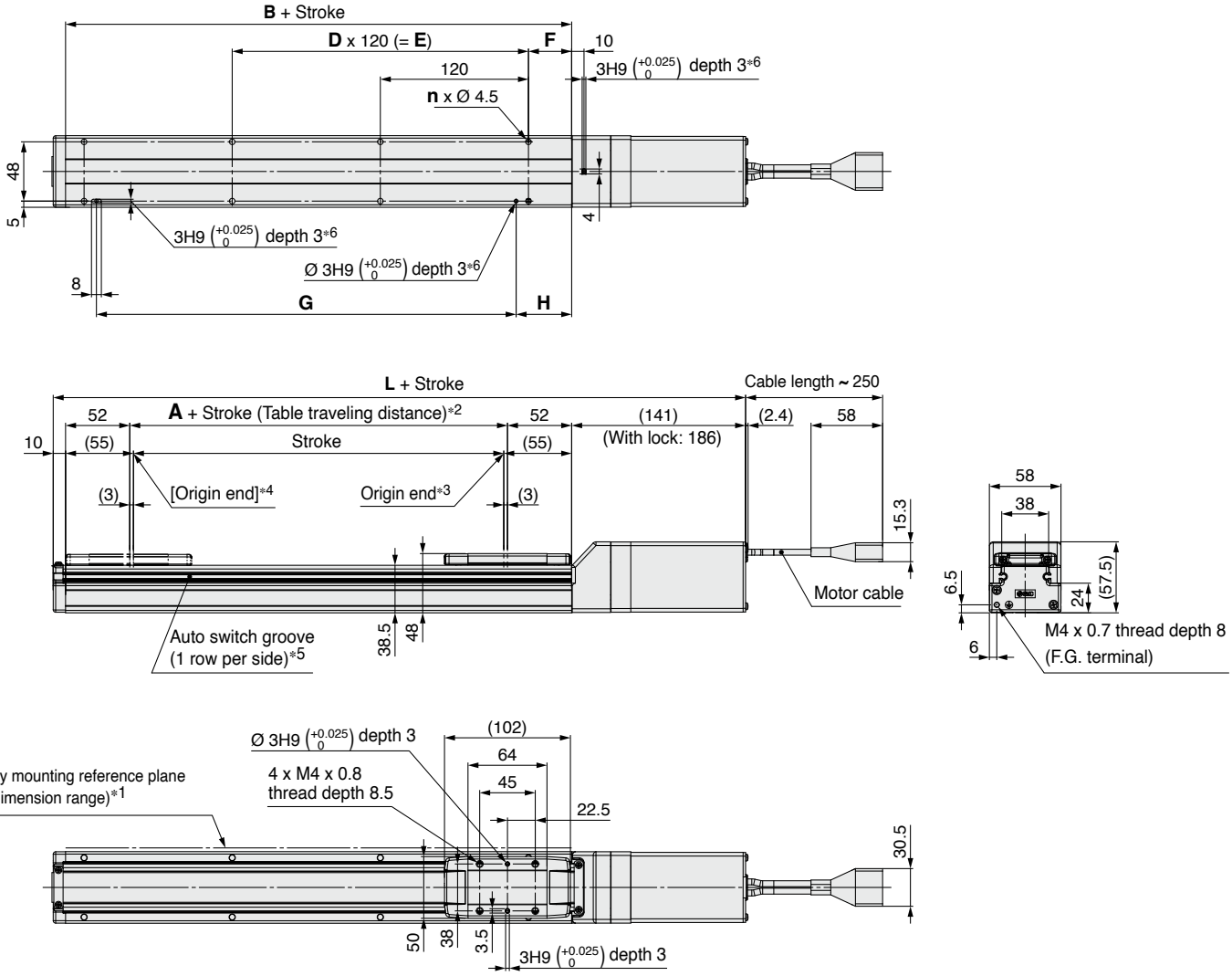
* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	L		A	B	n	D	E	F	G	H
	Without lock	With lock								
50	214	264	6	80	4	—	—	15	80	25
100, 150								40		50
200, 250					6	2	200		180	
300, 350					8	3	300		280	
400, 450					10	4	400		380	
500					12	5	500		480	

Dimensions: In-line Motor

LE2FS25H



*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 The distance the table moves according to movement instructions
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.

*3 Indicates the factory default origin position (0 mm)

*4 [ ] refers to when the rotation direction reference is changed.

*5 The applicable auto switch (D-M9□) should be ordered 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.

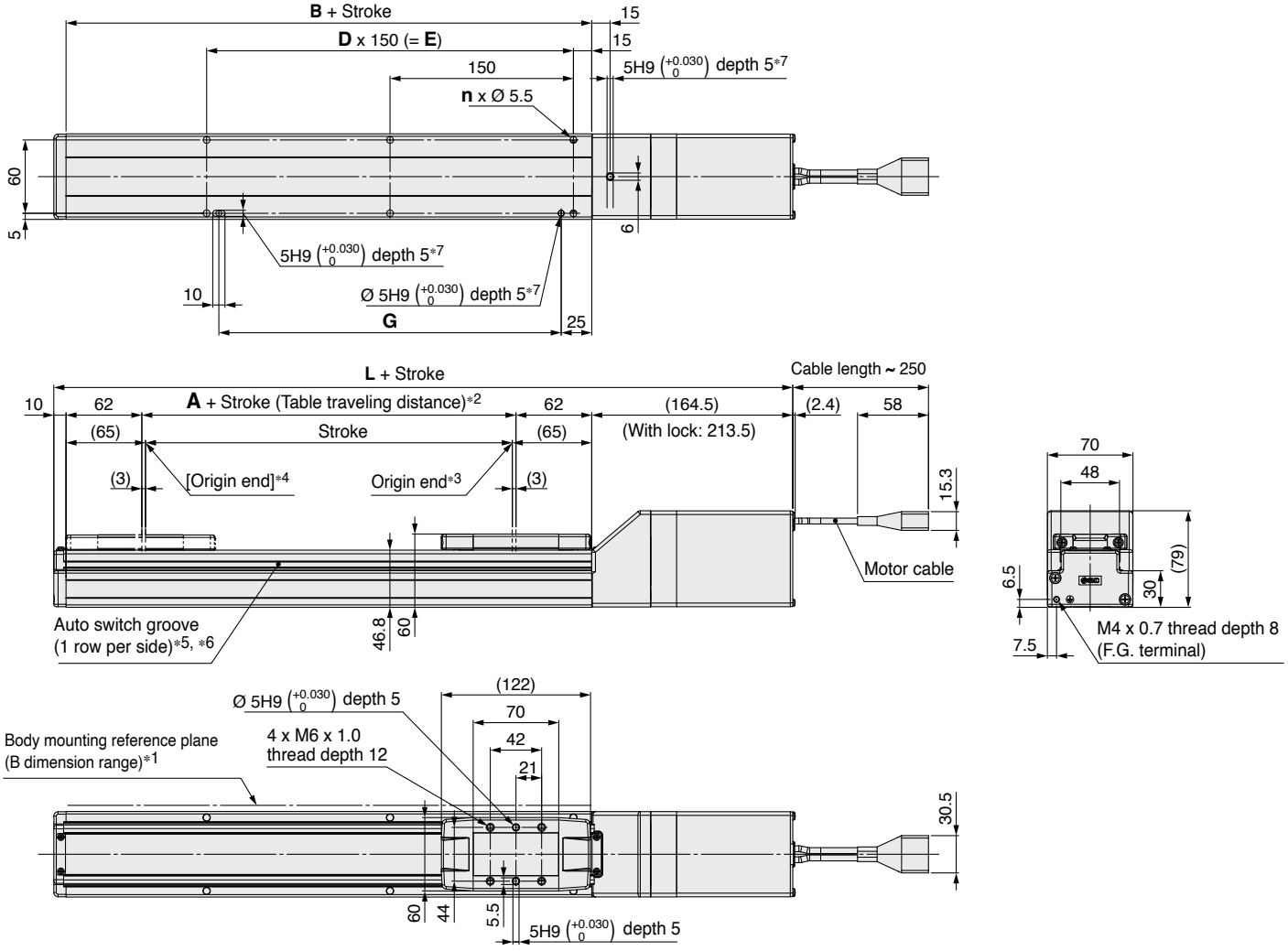
* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	L		A	B	n	D	E	F	G	H
	Without lock	With lock								
50	261	306	6	110	4	—	—	20	100	30
100, 150								35		45
200, 250					6	2	240		220	
300, 350, 400					8	3	360		340	
450, 500					10	4	480		460	
550, 600, 650					12	5	600		580	
700, 750					14	6	720		700	
800					16	7	840		820	

Dimensions: In-line Motor

LE2FS32H



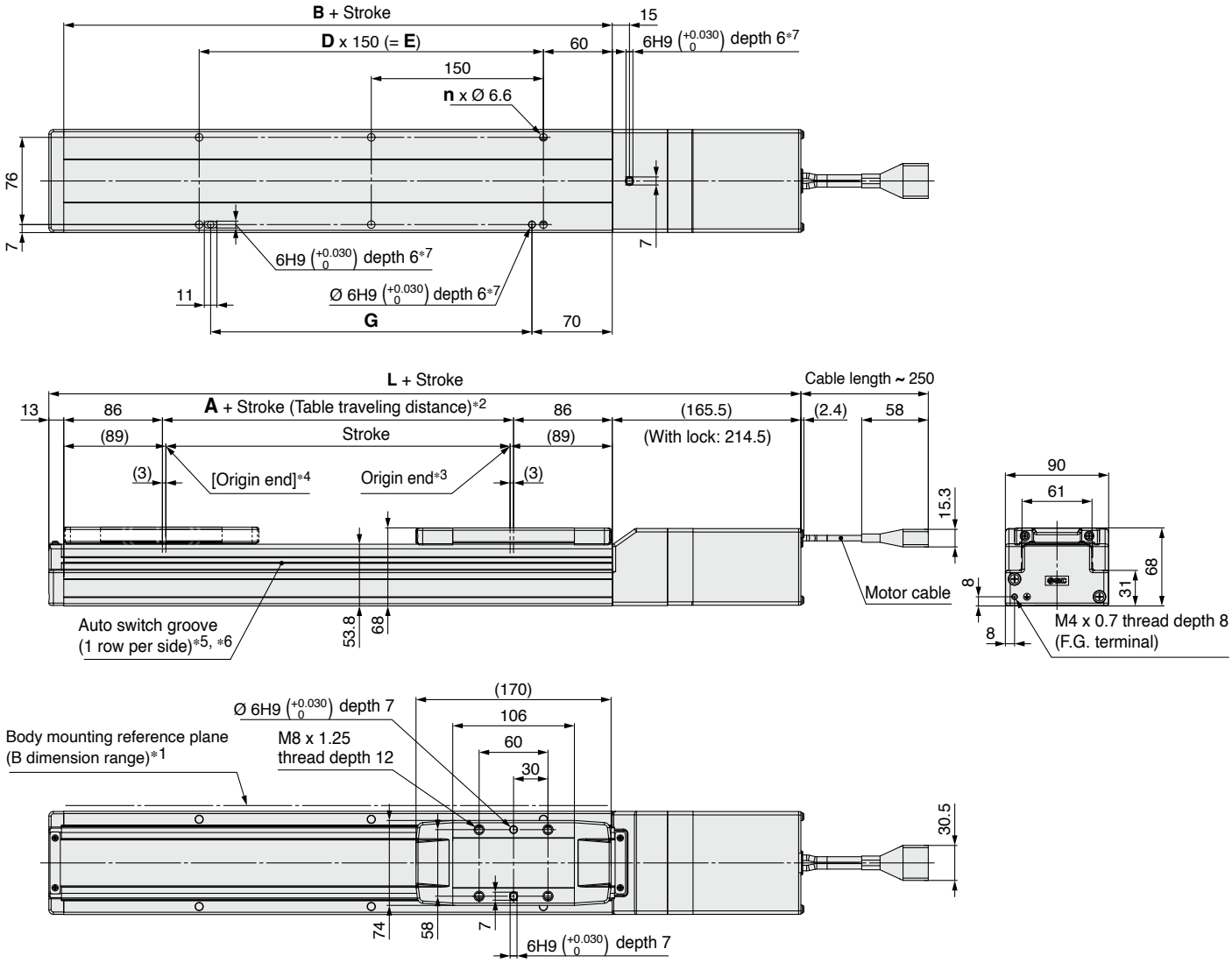
∗1 When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height: 5 mm)
In addition, be aware that surfaces other than the body mounting reference plane (B dimension range) may slightly protrude from the body mounting reference plane. Be sure to provide a clearance of 1 mm or more to avoid interference with workpieces, facilities, etc.
∗2 The distance the table moves according to movement instructions
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
∗3 Indicates the factory default origin position (0 mm)
∗4 [ ] refers to when the rotation direction reference is changed.
∗5 The applicable auto switch (D-M9□) should be ordered separately.
∗6 A switch spacer (BMY 3 - 0 1 6) is required to secure auto switches. Please order it separately.
∗7 When using the positioning pin holes on the bottom, use either the one on the body side or the one on the housing side.
∗ The axial cable entry direction is shown.

Dimensions [mm]

Stroke	L		A	B	n	D	E	G
	Without lock	With lock						
50, 100, 150	304.5	353.5	6	130	4	—	—	130
200, 250, 300					6	2	300	280
350, 400, 450					8	3	450	430
500, 550, 600					10	4	600	580
650, 700, 750					12	5	750	730
800, 850, 900					14	6	900	880
950, 1000					16	7	1050	1030

Dimensions: In-line Motor

LE2FS40H



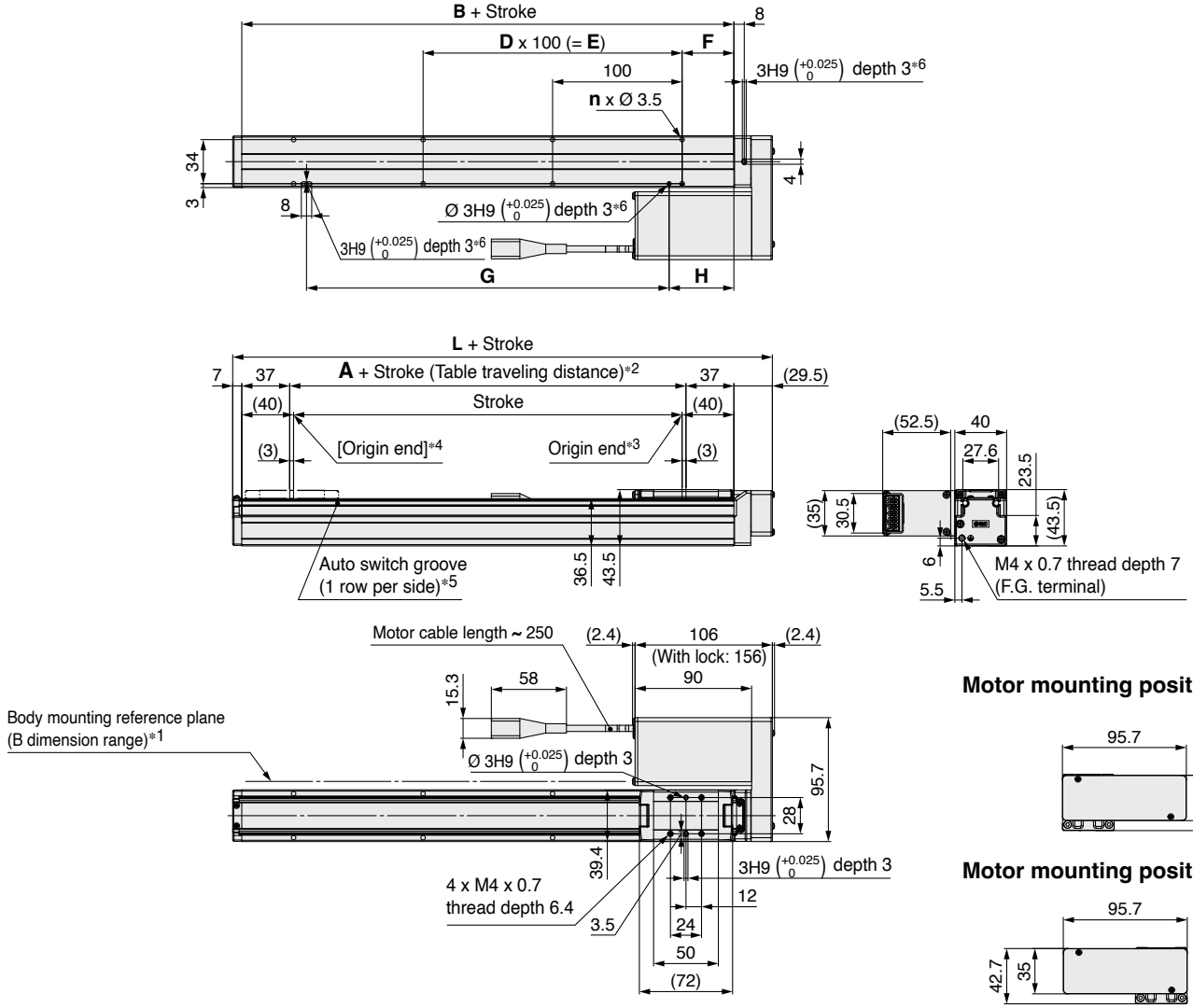
*1 When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height: 5 mm)
In addition, be aware that surfaces other than the body mounting reference plane (B dimension range) may slightly protrude from the body mounting reference plane. Be sure to provide a clearance of 1 mm or more to avoid interference with workpieces, facilities, etc.
*2 The distance the table moves according to movement instructions
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*3 Indicates the factory default origin position (0 mm)
*4 [ ] refers to when the rotation direction reference is changed.
*5 The applicable auto switch (D-M9□) should be ordered separately.
*6 A switch spacer (BMY 3 - 0 1 6) is required to secure auto switches. Please order it separately.
*7 When using the positioning pin holes on the bottom, use either the one on the body side or the one on the housing side.
* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	L		A	B	n	D	E	G
	Without lock	With lock						
150	356.5	405.5	6	178	4	—	—	130
200, 250, 300					6	2	300	280
350, 400, 450					8	3	450	430
500, 550, 600					10	4	600	580
650, 700, 750					12	5	750	730
800, 850, 900					14	6	900	880
950, 1000					16	7	1050	1030
1100, 1200					18	8	1200	1180

Dimensions: Right/Left Side Parallel Motor

LE2FS16(L/R)H



*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 The distance the table moves according to movement instructions
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.

*3 Indicates the factory default origin position (0 mm)

*4 [ ] refers to when the rotation direction reference is changed.

*5 The applicable auto switch (D-M9□) should be ordered 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. Refer to the catalogue for detailed dimensions of the left side parallel type.

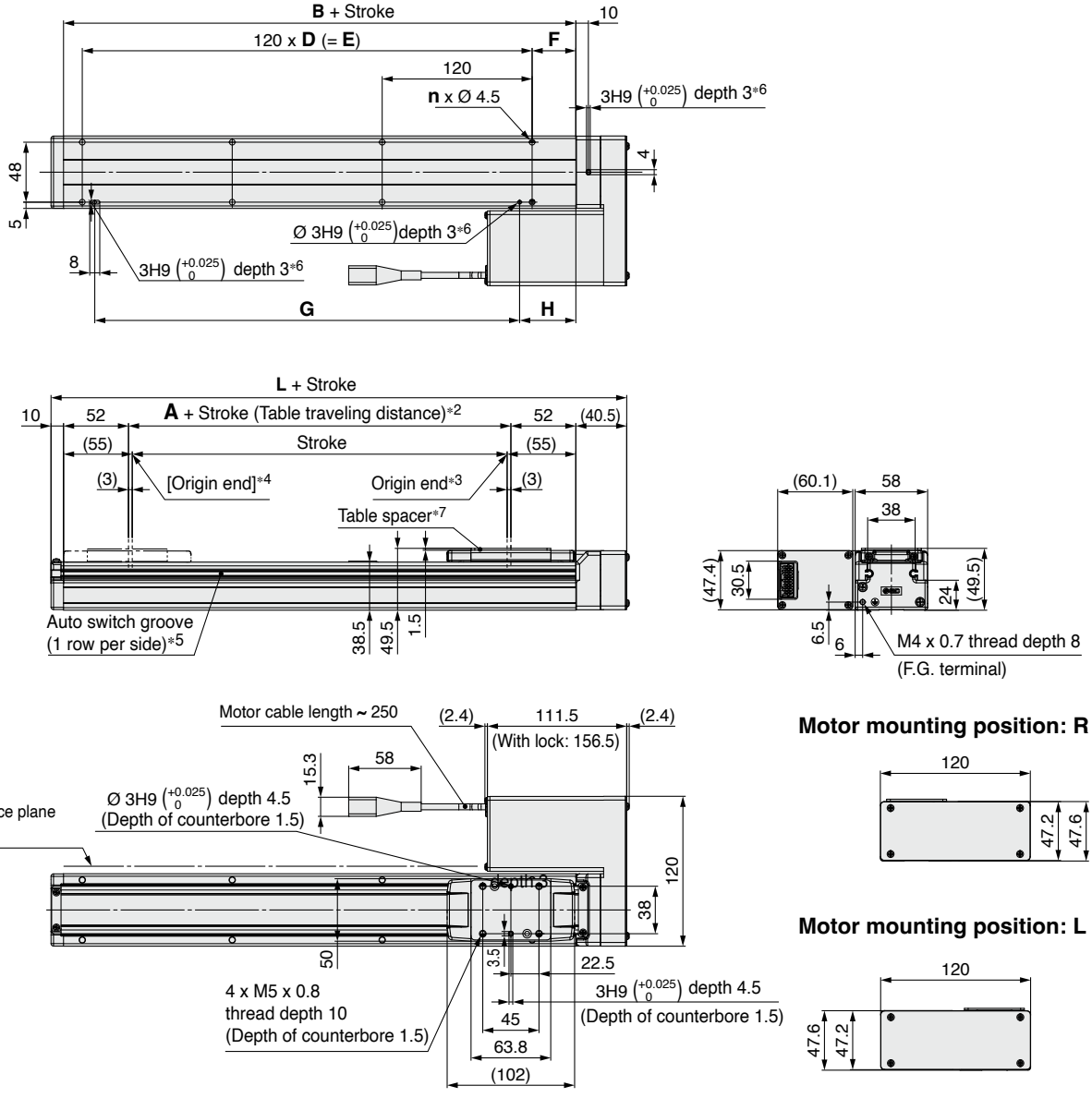
* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	L	A	B	n	D	E	F	G	H
50	116.5	6	80	4	—	—	15	80	25
100, 150							40		50
200, 250				6	2	200		180	
300, 350				8	3	300		280	
400, 450				10	4	400		380	
500				12	5	500		480	

Dimensions: Right/Left Side Parallel Motor

LE2FS25(L/R)H



*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 The distance the table moves according to movement instructions
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.

*3 Indicates the factory default origin position (0 mm)

*4 [ ] refers to when the rotation direction reference is changed.

*5 The applicable auto switch (D-M9□) should be ordered 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.

*7 The table spacer is shipped together with the product but does not come assembled.

* This illustration shows the motor mounting position for the right side parallel type. Refer to the catalogue for detailed dimensions of the left side parallel type.

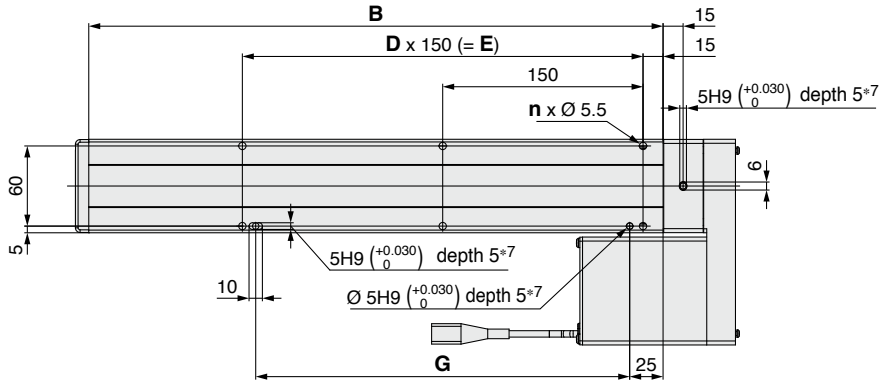
* The axial cable entry direction is shown.

Dimensions [mm]

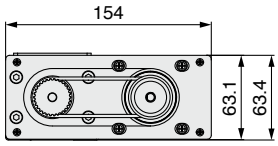
Stroke	L	A	B	n	D	E	F	G	H
50	160.5	6	110	4	—	—	20	100	30
100, 150							35		45
200, 250				6	2	240		220	
300, 350, 400				8	3	360		340	
450, 500				10	4	480		460	
550, 600, 650				12	5	600		580	
700, 750				14	6	720		700	
800				16	7	840		820	

Dimensions: Right/Left Side Parallel Motor

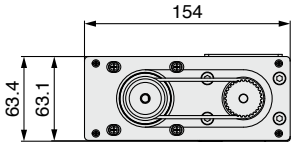
LE2FS32(L/R)H

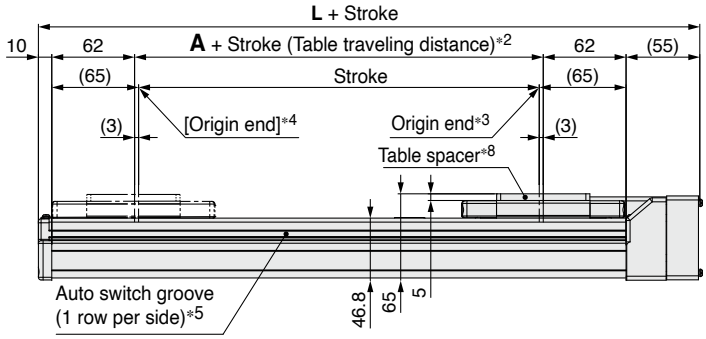


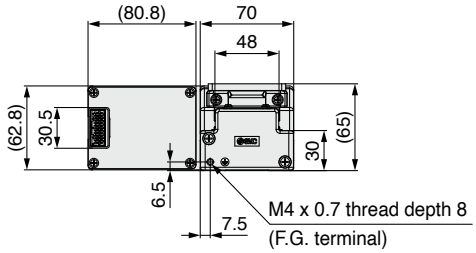
Motor mounting position: R

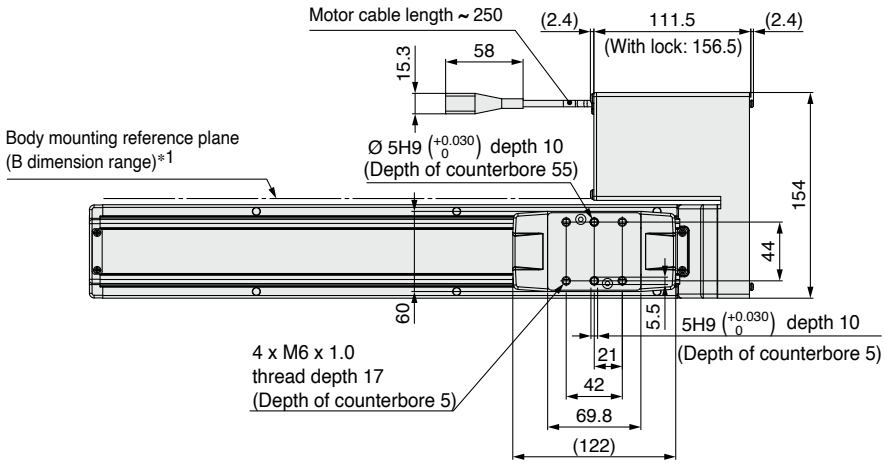


Motor mounting position: L









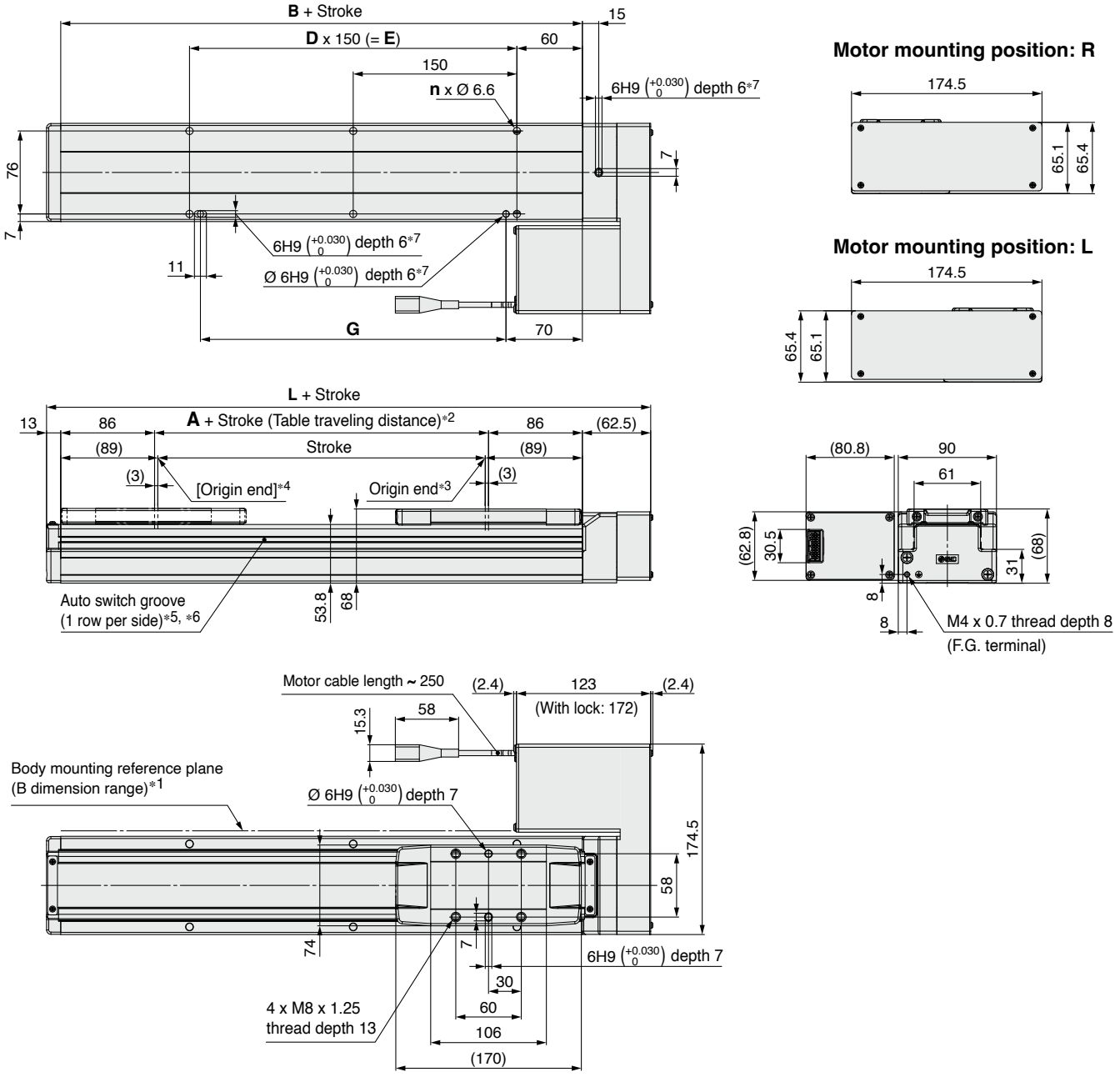
*1 When mounting the actuator using the body mounting reference plane, set the height of the opposite surface or pin to be 3 mm or more. (Recommended height: 5 mm)
In addition, be aware that surfaces other than the body mounting reference plane (B dimension range) may slightly protrude from the body mounting reference plane. Be sure to provide a clearance of 1 mm or more to avoid interference with workpieces, facilities, etc.
*2 The distance the table moves according to movement instructions
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.
*3 Indicates the factory default origin position (0 mm)
*4 [ ] refers to when the rotation direction reference is changed.
*5 The applicable auto switch (D-M9□) should be ordered separately.
*6 A switch spacer (BMY3-016) is required to secure auto switches. Please order it separately.
*7 When using the positioning pin holes on the bottom, use either the one on the body side or the one on the housing side.
*8 The table spacer is shipped together with the product but does not come assembled.
* This illustration shows the motor mounting position for the right side parallel type. Refer to the catalogue for detailed dimensions of the left side parallel type.
* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	L	A	B	n	D	E	G
50, 100, 150	195	6	130	4	—	—	130
200, 250, 300				6	2	300	280
350, 400, 450				8	3	450	430
500, 550, 600				10	4	600	580
650, 700, 750				12	5	750	730
800, 850, 900				14	6	900	880
950, 1000				16	7	1050	1030

Dimensions: Right/Left Side Parallel Motor

LE2FS40(L/R)H



*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 The distance the table moves according to movement instructions
Make sure that workpieces mounted on the table do not interfere with other workpieces or the facilities around the table.

*3 Indicates the factory default origin position (0 mm)

*4 [ ] refers to when the rotation direction reference is changed.

*5 The applicable auto switch (D-M9□) should be ordered separately.

*6 A switch spacer (BMY3-016) is required to secure auto switches. Please order it separately.

*7 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. Refer to the catalogue for detailed dimensions of the left side parallel type.

* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	L	A	B	n	D	E	G
150	253.5	6	178	4	—	—	130
200, 250, 300				6	2	300	280
350, 400, 450				8	3	450	430
500, 550, 600				10	4	600	580
650, 700, 750				12	5	750	730
800, 850, 900				14	6	900	880
950, 1000				16	7	1050	1030
1100, 1200				18	8	1200	1180

LE2FS□H Series
Auto Switch Mounting

Detailed specifications: From p. 48

Auto Switch Mounting Position

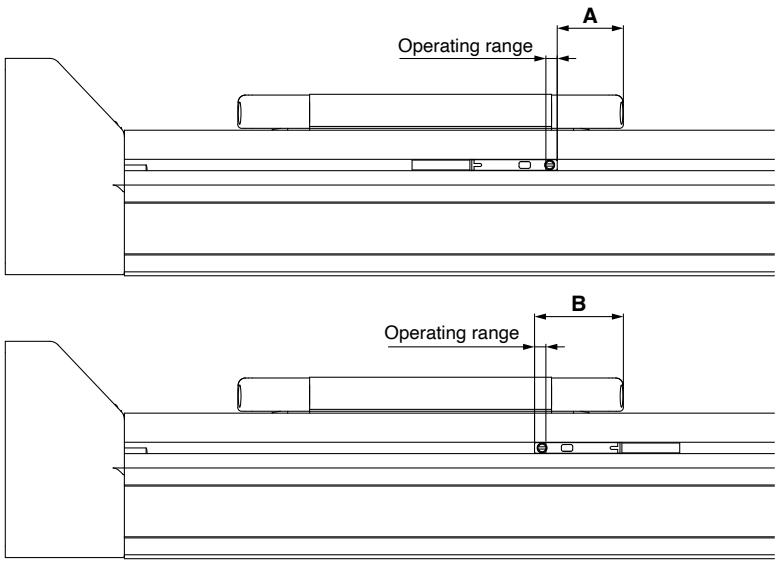


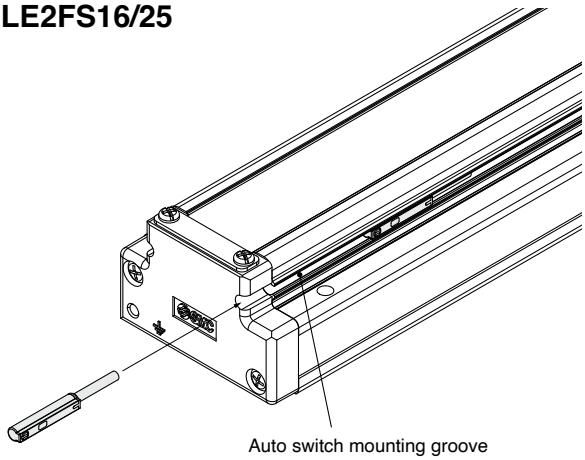
Table 1 Auto Switch Mounting Dimensions [mm]

Model	Size	A	B	Operating range
LE2FS	16	12.5	24.5	3.0
	25	17.5	29.5	3.0
	32	26.3	39.1	3.4
	40	32.2	45.4	3.6

* The applicable auto switch is D-M9 (N/P/B) (W) (M/L/Z).
* The operating range is a guideline including hysteresis, not meant to be guaranteed. There may be large variations depending on the ambient environment.
* Adjust the auto switch after confirming the operating conditions in the actual setting.

Auto Switch Mounting

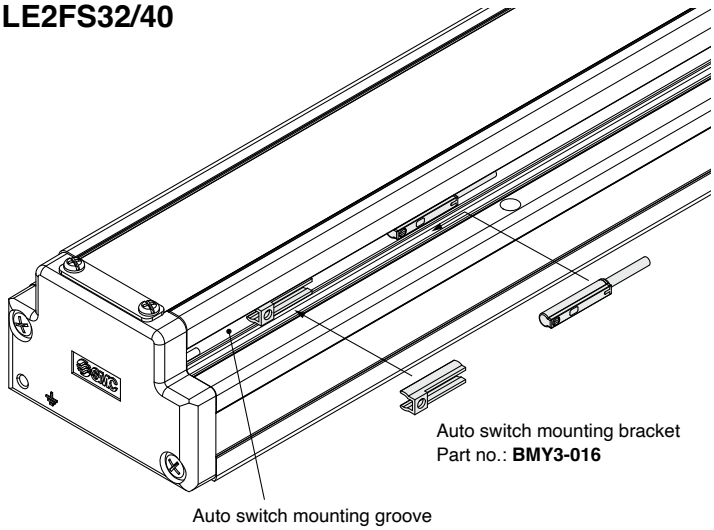
LE2FS16/25



Auto Switch Mounting Screw

Tightening torque [N·m]
0.1 to 0.15

LE2FS32/40



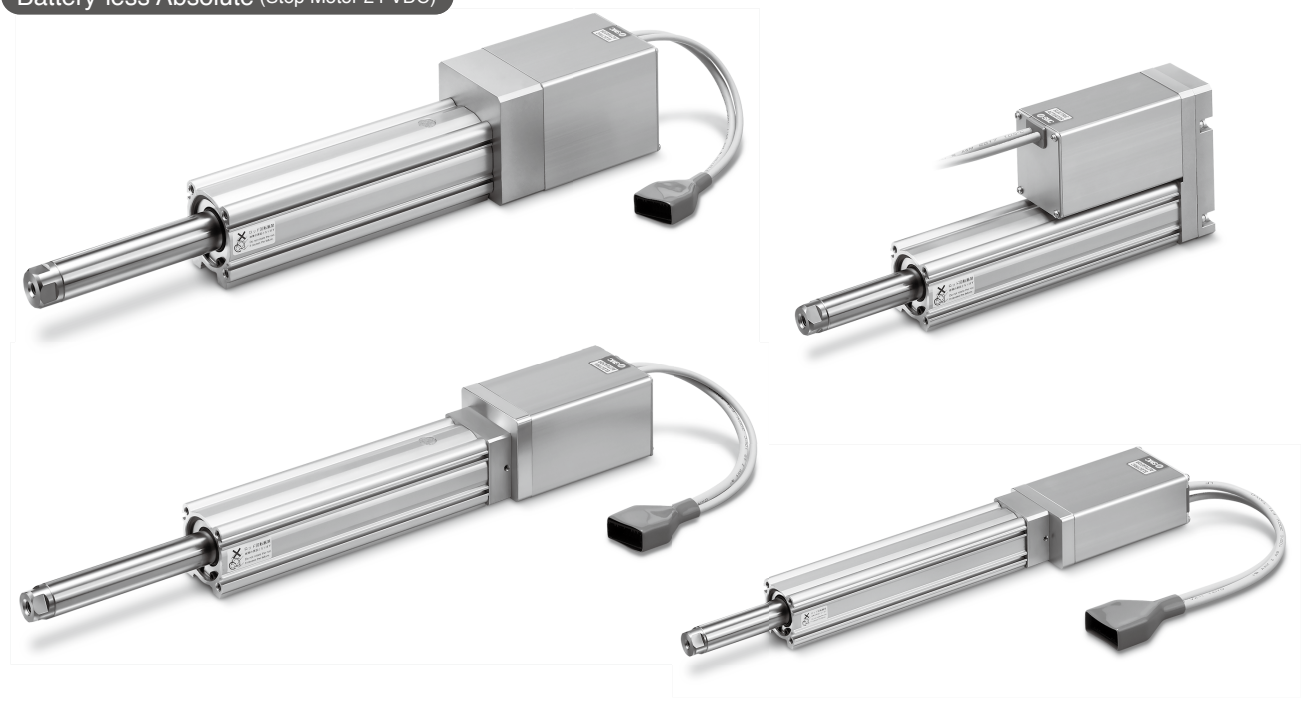
* The applicable auto switch is D-M9 (N/P/B) (W) (M/L/Z).
* When tightening the auto switch mounting screw (included with the auto switch), use a watchmaker's screwdriver with a handle diameter of 5 to 6 mm.
* Prepare an auto switch mounting bracket (BMY3-016) when mounting the auto switch on to the LE2FS32/40.

Rod Type

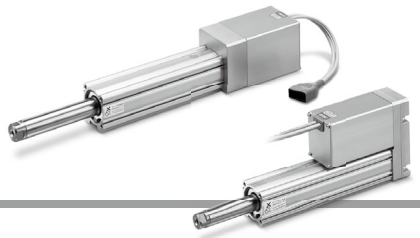
LE2Y□H Series

p. 29

Battery-less Absolute (Step Motor 24 VDC)



Model Selection



Selection Procedure

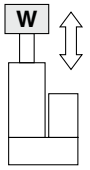
Positioning Control Selection Procedure

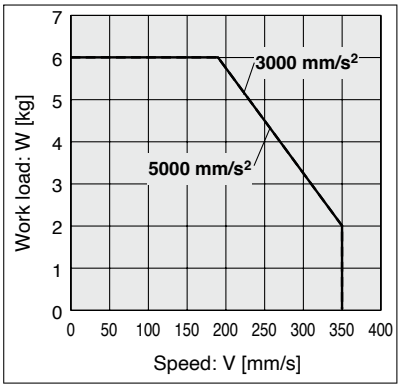
Step 1 Check the work load–speed. (Vertical transfer) → **Step 2** Check the cycle time.

Selection Example

Operating conditions

- Workpiece mass: 2 [kg]
- Speed: 100 [mm/s]
- Acceleration/Deceleration: 5000 [mm/s^2]
- Stroke: 200 [mm]
- Workpiece mounting condition: Vertical upward downward transfer





<Speed–Vertical work load graph> (LE2Y16□HB/Step motor)

Step 1 **Check the work load–speed. <Speed–Vertical work load graph>**

Select a model based on the workpiece mass and speed while referencing the speed–vertical work load graph.

Selection example) The **LE2Y16THB-200** can be temporarily selected as a possible candidate based on the graph shown on the right side.

* It is necessary to mount a guide outside the actuator when used for horizontal transfer. When selecting the target model, refer to the horizontal work load in the specifications on page 37 and the precautions.

Step 2 **Check the cycle time.**

Calculate **the cycle time** using the following calculation method.

Cycle time:

T can be found from the following equation.

$$T = T1 + T2 + T3 + T4 \text{ [s]}$$

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

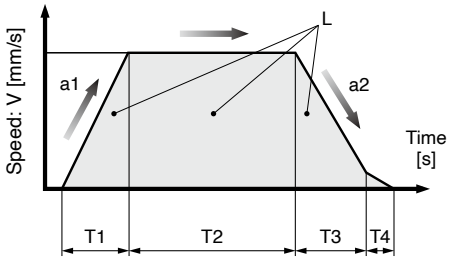
$$T1 = V/a1 \text{ [s]} \qquad T3 = V/a2 \text{ [s]}$$

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

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

- T4: Settling time varies depending on the conditions such as actuator types, load, and in position of the step data.
  Reference value for settling time: 0.15 s or less
  The following value is used for this calculation.

$$T4 = 0.15 \text{ [s]}$$



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

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

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

$$T1 = V/a1 = 100/5000 = 0.02 \text{ [s]}, \quad T3 = V/a2 = 100/5000 = 0.02 \text{ [s]}$$

$$T2 = \frac{L - 0.5 \cdot V \cdot (T1 + T3)}{V} = \frac{200 - 0.5 \cdot 100 \cdot (0.02 + 0.02)}{100} = 1.98 \text{ [s]}$$

$$T4 = 0.15 \text{ [s]}$$

The cycle time can be found as follows.

$$T = T1 + T2 + T3 + T4 = 0.02 + 1.98 + 0.02 + 0.15 = \mathbf{2.17 \text{ [s]}}$$

Based on the above calculation result, the LE2Y16THB-200 should be selected.

Selection Procedure

Pushing Control Selection Procedure

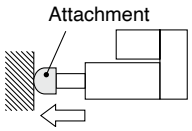
Step 1 Check the duty ratio. → **Step 2** Check the pushing force. → **Step 3** Check the lateral load on the rod end.

∗ The duty ratio is a ratio of the operation time in one cycle.

Selection Example

Operating conditions

- Mounting condition: Horizontal (pushing)
- Attachment weight: 0.2 [kg]
- Pushing force: 40 [N]
- Duty ratio: 15 [%]
- Speed: 100 [mm/s]
- Stroke: 200 [mm]



Step 1 **Check the duty ratio.**
<Conversion table of pushing force–duty ratio>

Select the [Pushing force] from the duty ratio while referencing the conversion table of pushing force–duty ratio.

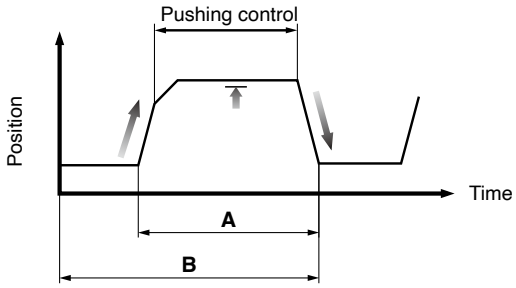
Selection example)
Based on the table below,
- Duty ratio: 15 [%]

The pushing force set value will be 45 [%].

<Conversion table of pushing force–duty ratio>
(LE2Y16□H/Battery-less absolute)

Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40 °C or less	45 or less	100	No restriction

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



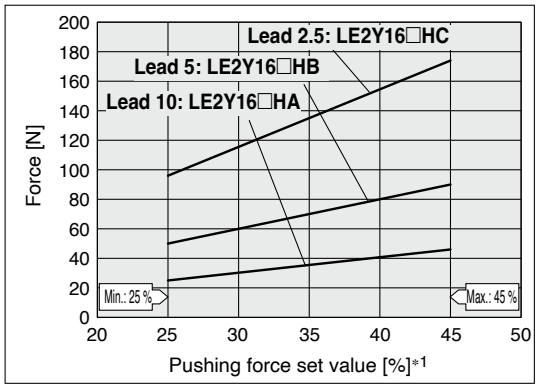
Duty ratio = A/B x 100 [%]

Step 2 **Check the pushing force.**
<Force conversion graph>

Select a model based on the pushing force set value and force while referencing the force conversion graph.

Selection example)
Based on the graph shown on the right side,
- Pushing force: 40 [N]
- Pushing force set value: 33 [%]

The **LE2Y16□HB** can be temporarily selected as a possible candidate.



<Force conversion graph>
(LE2Y16□H/Step motor)

∗1 Set values for the controller

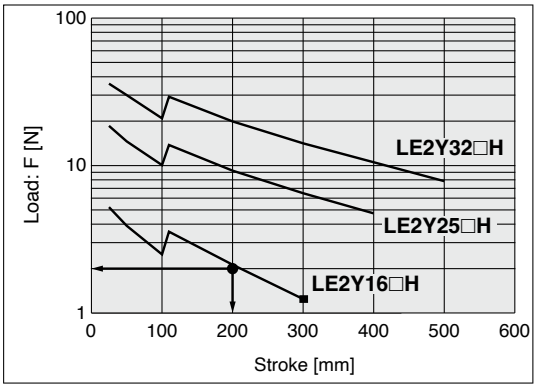
Step 3 **Check the lateral load on the rod end.**
<Graph of allowable lateral load on the rod end>

Confirm the allowable lateral load on the rod end of the actuator: LEY16□, which has been selected temporarily while referencing the graph of allowable lateral load on the rod end.

Selection example)
Based on the graph shown on the right side,
- Attachment weight: 0.2 [kg] ≈ 2 [N]
- Product stroke: 200 [mm]

The lateral load on the rod end is in the allowable range.

Based on the above calculation result, the LE2Y16□HB-200 should be selected.



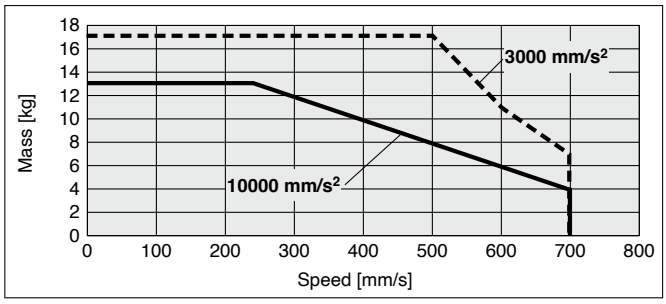
<Graph of allowable lateral load on the rod end>

Speed–Work Load Graph (Guide)

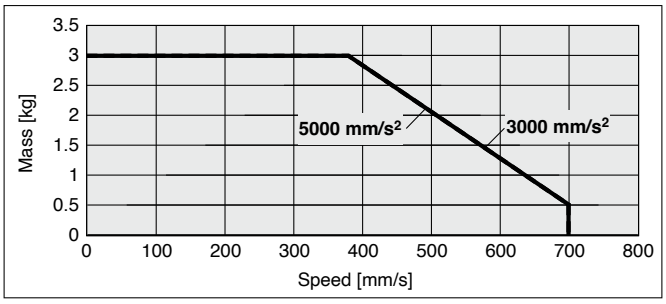
∗ The following graphs show the values when the external guide is used together.

LE2Y16□HA

Horizontal/Lead 10

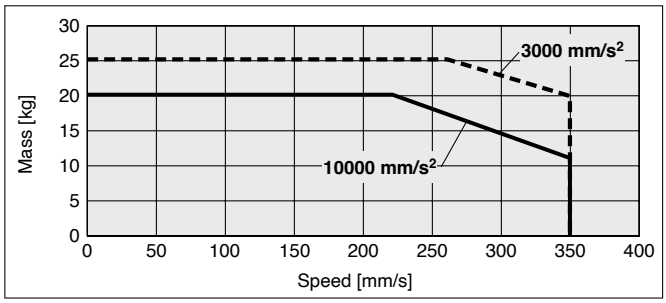


Vertical/Lead 10

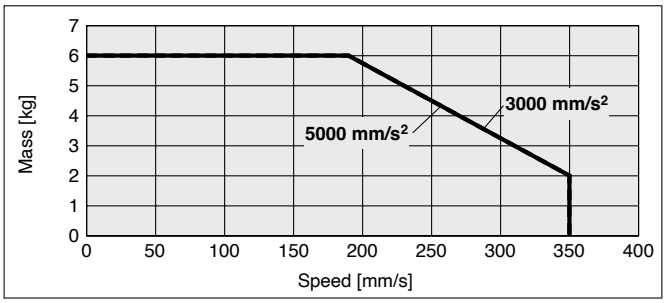


LE2Y16□HB

Horizontal/Lead 5

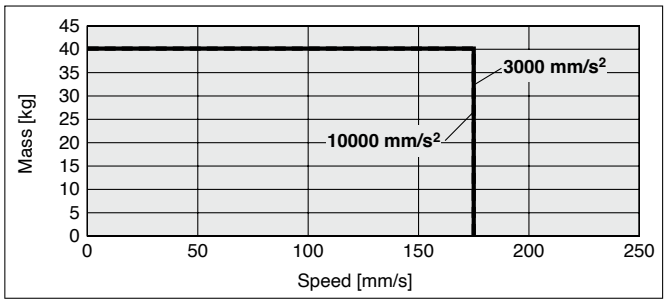


Vertical/Lead 5

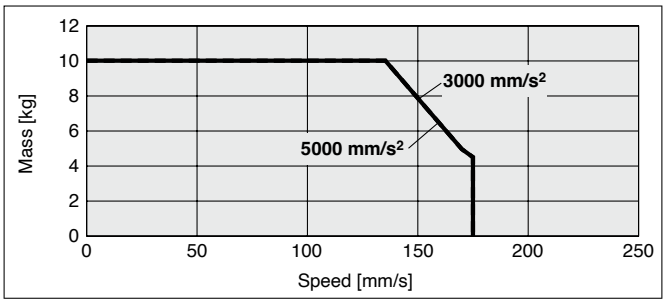


LE2Y16□HC

Horizontal/Lead 2.5



Vertical/Lead 2.5

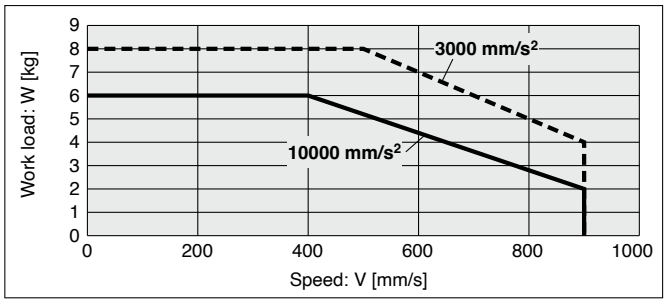


Speed–Work Load Graph (Guide)

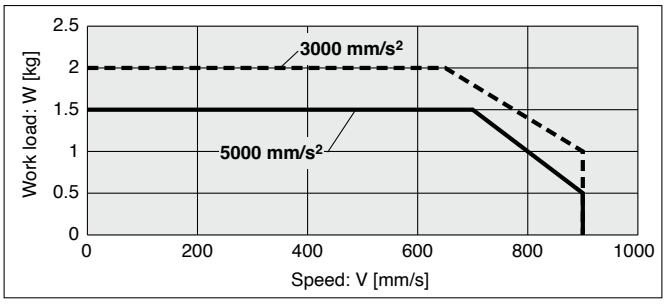
∗ The following graphs show the values when the external guide is used together.

LE2Y25□HH

Horizontal/Lead 20

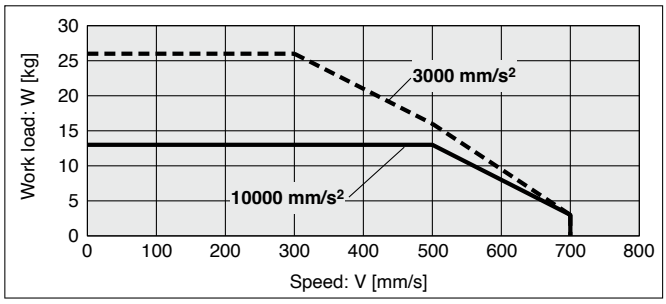


Vertical/Lead 20

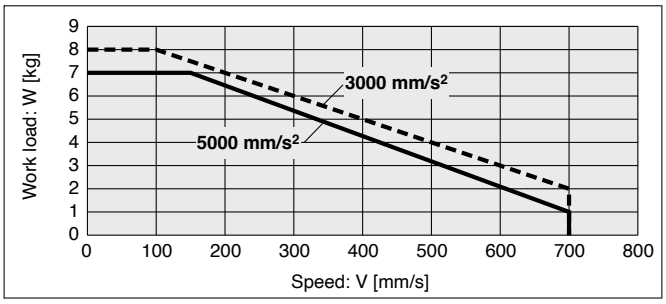


LE2Y25□HA

Horizontal/Lead 12

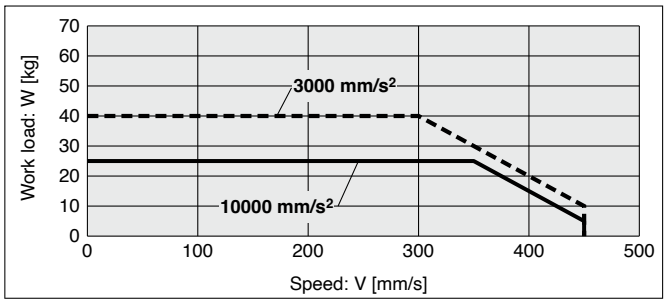


Vertical/Lead 12

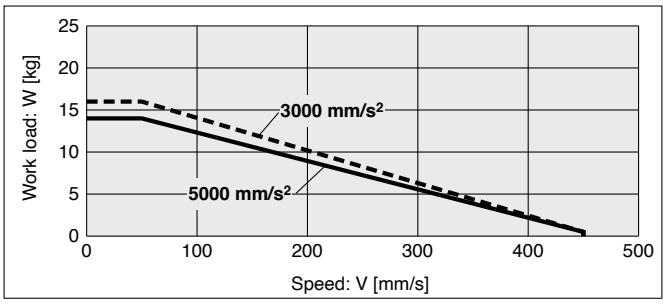


LE2Y25□HB

Horizontal/Lead 6

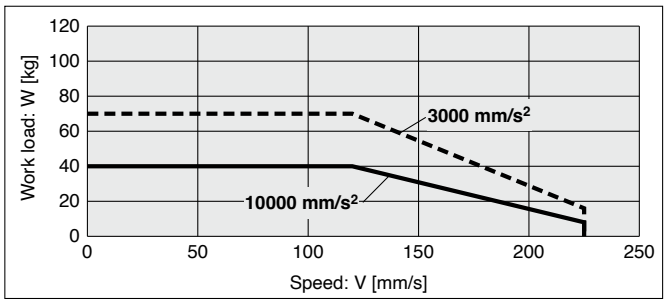


Vertical/Lead 6

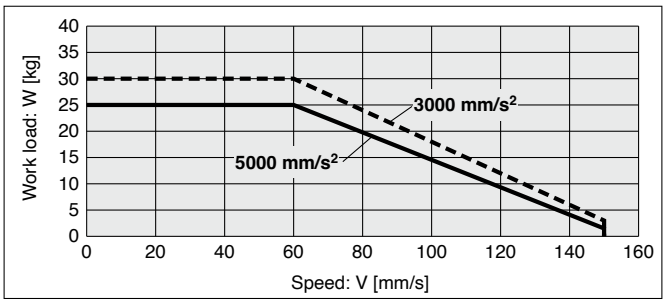


LE2Y25□HC

Horizontal/Lead 3



Vertical/Lead 3

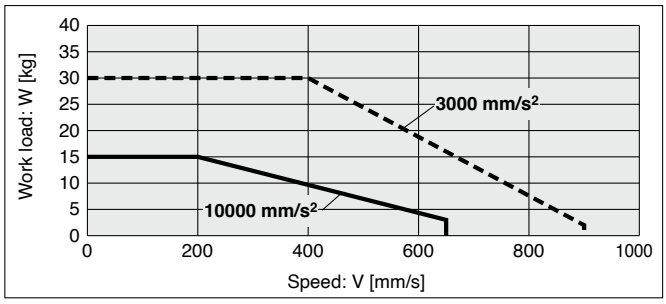


Speed–Work Load Graph (Guide)

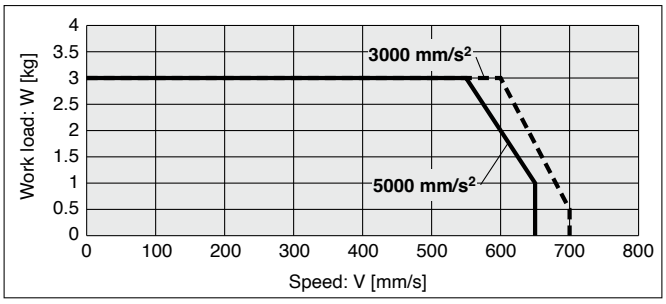
∗ The following graphs show the values when the external guide is used together.

LE2Y32□HH

Horizontal/Lead 24

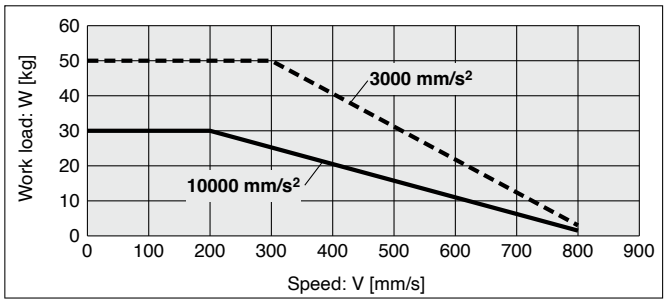


Vertical/Lead 24

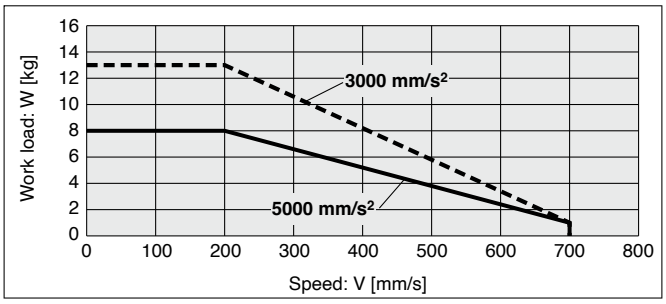


LE2Y32□HA

Horizontal/Lead 16

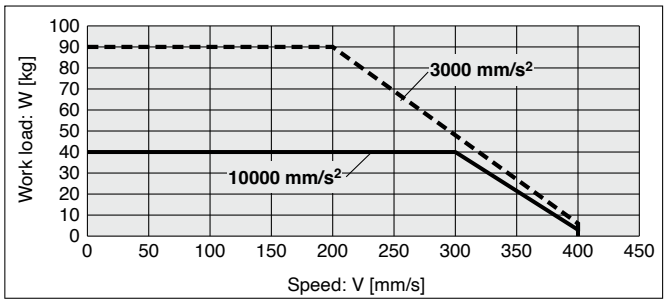


Vertical/Lead 16

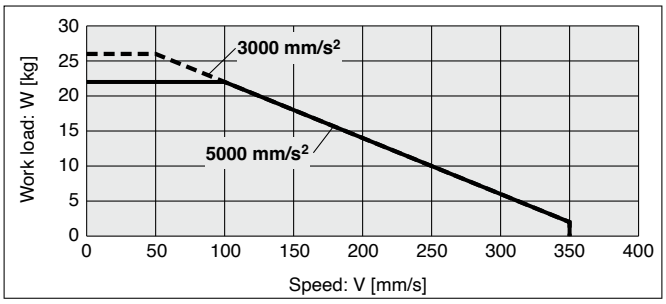


LE2Y32□HB

Horizontal/Lead 8

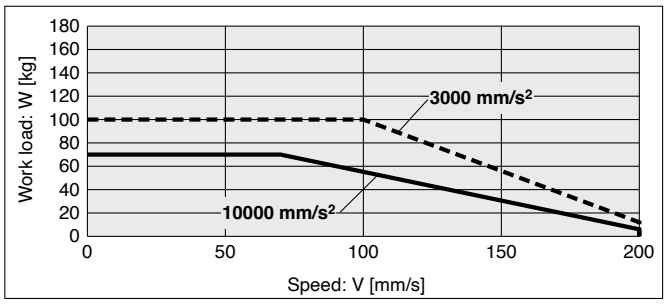


Vertical/Lead 8

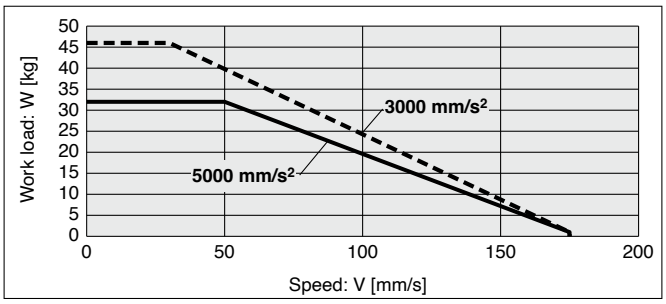


LE2Y32□HC

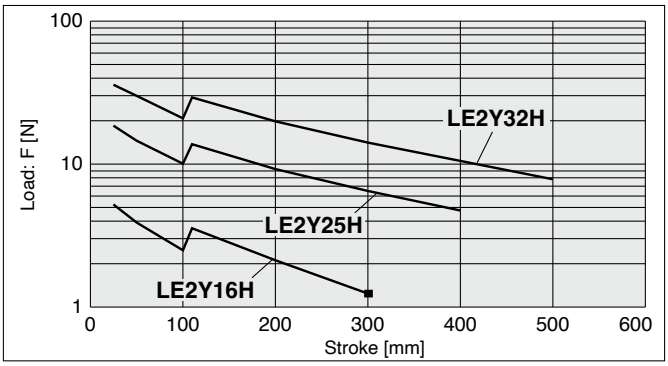
Horizontal/Lead 4



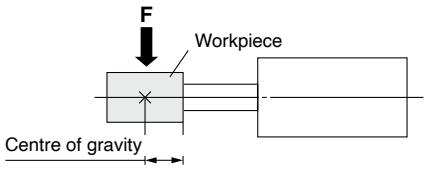
Vertical/Lead 4



Graph of Allowable Lateral Load on the Rod End (Guide)

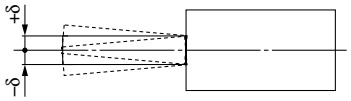


[Stroke] = [Product stroke] + [Distance from the rod end to the centre of gravity of the workpiece]



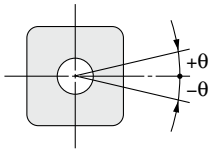
Rod Displacement: δ [mm]

Size \ Stroke	30	50	100	150	200	250	300	350	400	450	500
16	±0.4	±0.5	±0.9	±0.8	±1.1	±1.3	±1.5	—	—	—	—
25	±0.3	±0.4	±0.7	±0.7	±0.9	±1.1	±1.3	±1.5	±1.7	—	—
32	±0.3	±0.4	±0.7	±0.6	±0.8	±1.0	±1.1	±1.3	±1.5	±1.7	±1.8



∗ The values without a load are shown.

Non-rotating Accuracy of Rod

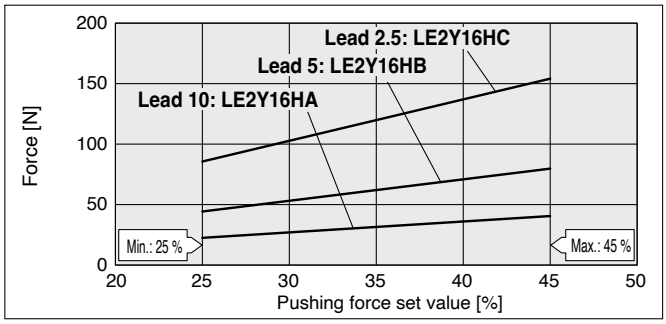


Size	Non-rotating accuracy θ
16	±1.1°
25	±0.8°
32	±0.7°

∗ Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod.
Failure to do so may result in the deformation of the non-rotating guide, abnormal auto switch responses, play in the internal guide, or an increase in the sliding resistance.

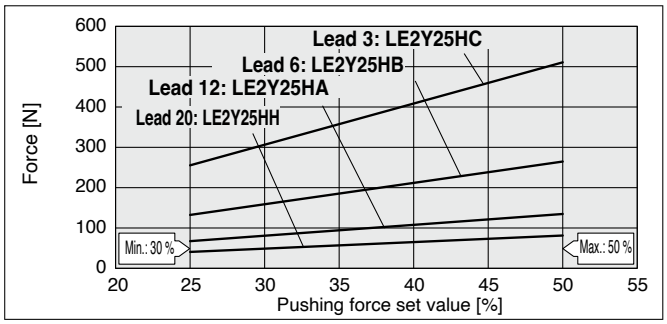
Force Conversion Graph (Guide)

LE2Y16□H



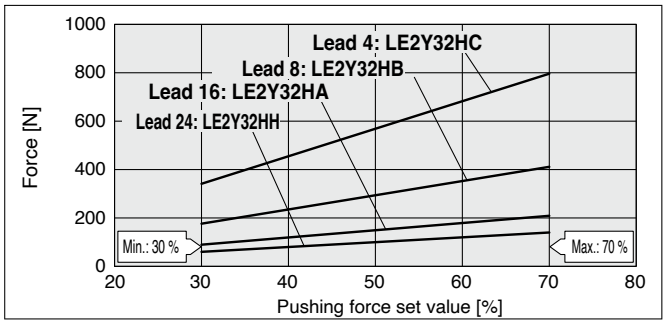
Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40 °C or less	45 or less	100	No restriction

LE2Y25□H



Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40 °C or less	50 or less	100	No restriction

LE2Y32□H



Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40 °C or less	70 or less	100	No restriction

<Limit Values for Pushing Force and Trigger Level in Relation to Pushing Speed>

Model	Lead	Pushing speed [mm/s]	Pushing force (Setting input value)
LE2Y16□H	A/B/C	1 to 50	25 to 45 %
LE2Y25□H	H/A/B/C	1 to 35	25 to 50 %
LE2Y32□H	H/A/B/C	1 to 30	30 to 70 %

There is a limit to the pushing force in relation to the pushing speed. If the product is operated outside of the range (low pushing force), the completion signal [INP] may be output before the pushing operation has been completed (during the moving operation).
If operating with the pushing speed below the min. speed, please check for operating problems before using the product.

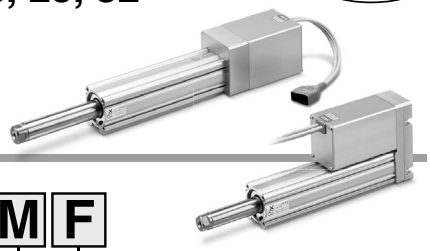
<Set Values for Vertical Upward Transfer Pushing Operations>

For vertical loads (upward), set the pushing force to the max. value shown below and operate at the work load or less.

Model	LE2Y16□H			LE2Y25□H				LE2Y32□H			
Lead	A	B	C	H	A	B	C	H	A	B	C
Work load [kg]	1	1.5	3	1	2.5	5	10	2	4.5	9	18
Pushing force	45 %			50 %				70 %			

Compatible with Manifold Controller

Rod Type
LE2Y□H Series LE2Y16, 25, 32



How to Order

LE2Y 25 T 1 H B – 50 A M F

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

❶ Size

16
25
32

❷ Motor mounting position

T	Top side parallel
R	Right side parallel
L	Left side parallel
D	In-line

❸ Motor cable entry direction

1	Axial
2	Right
3	Left
4	Top
5	Bottom

❹ Motor type

Symbol	Type	Compatible controller
H	Battery-less absolute (Step motor 24 VDC)	JXD1

❺ Lead [mm]

Symbol	LE2Y16	LE2Y25	LE2Y32
H	—	20	24
A	10	12	16
B	5	6	8
C	2.5	3	4

❻ Stroke [mm]

30	30
to	to
500	500

❼ Motor option

A	Without option
B	With lock

❽ Rod end thread

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

❾ Mounting

Symbol	Type	Motor mounting position	
		Parallel	In-line
S	Ends tapped Body bottom tapped	●∗1	●
L	Foot bracket	●	—
F	Rod flange	●∗1, ∗3	●
G	Head flange	●∗4	—
D	Double clevis	●∗2	—

∗1 For the horizontal cantilever mounting of the rod flange or ends tapped types, use the actuator within the following stroke range.
∗2 For the mounting of the double clevis type, use the actuator within the following stroke range.
· LE2Y16: 50 mm or less ·LE2Y25: 150 mm or less ·LE2Y32: 200 mm or less
∗3 The rod flange type is not available for the LE2Y16 when the stroke is 5 0 mm or less and the "With lock" motor option is selected. It is also not available for the LE2Y25/32 when the stroke is 30 mm or less and the "With lock" motor option is selected.
∗4 The head flange type is not available for the LE2Y32.
∗ The mounting bracket is shipped together with the product but does not come assembled.

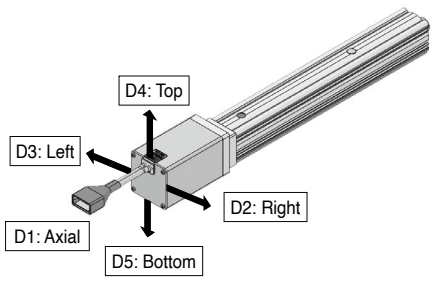
Applicable Stroke Table

Size	Stroke [mm]											
	30	50	100	150	200	250	300	350	400	450	500	Manufacturable stroke range
16	●	●	●	●	●	●	●	—	—	—	—	15 to 300
25	●	●	●	●	●	●	●	●	●	—	—	15 to 400
32	●	●	●	●	●	●	●	●	●	●	●	20 to 500

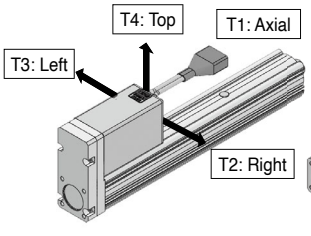
The auto switches should be ordered separately. For details, refer to pages 47 to 50.

Motor Mounting Position

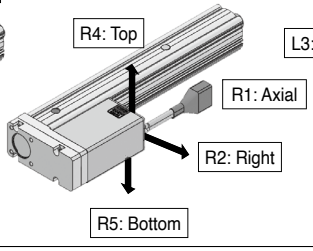
D: In-line



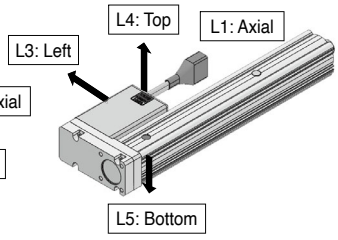
T: Top side parallel
→T5 is not selectable.



R: Right side parallel
→R3 is not selectable.



L: Left side parallel
→L2 is not selectable.



Specifications

Model				LE2Y16□H			LE2Y25□H				LE2Y32□H			
Actuator specifications	Stroke [mm]			30 to 300			30 to 400				30 to 500			
	Work load [kg]*1		Horizontal	17	25	40	8	26	40	70	30	50	90	100
			Vertical	3	6	10	2	8	16	30	3	13	26	46
	Pushing force [N]*2 *3 *4			23 to 41	44 to 80	86 to 154	41 to 81	67 to 135	132 to 265	255 to 511	60 to 140	90 to 209	176 to 411	341 to 796
	Speed [mm/s]	Stroke range	Up to 300	15 to 700	8 to 350	4 to 175	30 to 900	18 to 700	9 to 450	5 to 225	30 to 900	24 to 800	12 to 400	6 to 200
			350 to 400	—	—	—	30 to 900	18 to 600	9 to 300	5 to 150	30 to 900	24 to 640	12 to 320	6 to 160
			450 to 500	—	—	—	—	—	—	—	30 to 900	24 to 640	12 to 320	6 to 160
	Max. acceleration/ deceleration [mm/s²]		Horizontal	10000										
			Vertical	5000										
	Pushing speed [mm/s]*5			1 to 50			1 to 35				1 to 30			
	Positioning repeatability [mm]			±0.02										
	Lost motion [mm]*6			0.1 or less										
	Lead [mm]			10	5	2.5	20	12	6	3	24	16	8	4
	Impact/Vibration resistance [m/s²]*7			50/20										
	Actuation type			Ball screw + Belt (LE2Y□ (T/L/R), /Ball screw (LE2Y□D□H)										
	Guide type			Sliding bushing (Piston rod)										
	Operating temperature range [°C]			5 to 40										
	Operating humidity range [%RH]			90 or less (No condensation)										
Electric specifications	Motor size			□28			□42				□56.4			
	Motor type			Battery-less absolute (Step motor 24 VDC)										
	Encoder			Battery-less absolute										
	Power supply voltage [V]			24 VDC ±10 %										
	Power [W]*8 *9			Max. power 74			Max. power 71				Max. power 93			
Lock unit specifications	Type*10			Non-magnetizing lock										
	Holding force [N]			29	59	118	47	78	157	294	75	108	216	421
	Power [W]*9			4			8				8			
	Power supply voltage [V]			24 VDC ±10 %										

*1 Horizontal: Please use an external guide (friction coefficient: 0.1 or less). The work load shows the maximum value. The actual work load and transfer speed change according to the condition of the external guide.
For the speed, acceleration, and duty ratio according to the work load, check the "Speed–Work Load Graph" in the catalogue.
Vertical: If the rod orientation is vertical or radial load is applied to the rod, please use an external guide (friction coefficient: 0.1 or less). The work load represents the maximum value. The actual work load and transfer speed change according to the condition of the external guide.
For the speed, acceleration, and duty ratio according to the work load, check the "Speed–Work Load Graph" in the catalogue.
The values shown in ( ) are the max. acceleration/deceleration.
Set the acceleration/deceleration speed to 10000 [mm/s²] or less for the horizontal direction and 5000 [mm/s²] or less for the vertical direction.

*2 Pushing force accuracy is ±20 % (F.S.).

*3 The pushing force set values for LE2Y16□H are 25 % to 45 %, for LE2Y25□H are 25 % to 50 %, and for LE2Y32□H are 30 % to 70 %.
The pushing force values change according to the duty ratio and pushing speed. Check the "Force Conversion Graph" in the catalogue.

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

*5 The allowable speed for pushing operation. When push conveying a workpiece, operate at the vertical work load or less.

*6 A reference value for correcting errors in reciprocal operation

*7 Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and a perpendicular direction to the lead screw. (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.)

*8 Indicates the max. power during operation (excluding the controller). This value can be used for the selection of the power supply.

*9 For an actuator with lock, add the power for the lock.

*10 With lock only

Weight

Top/Right/Left Side Parallel Motor

Series	LE2Y16						
Stroke [mm]	30	50	100	150	200	250	300
Product weight [kg]	0.75	0.79	0.90	1.04	1.15	1.26	1.37

Series	LE2Y25									LE2Y32										
Stroke [mm]	30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	1.74	1.81	1.98	2.24	2.42	2.59	2.77	2.94	3.12	2.74	2.85	3.14	3.42	3.82	4.11	4.39	4.68	4.97	5.25	5.54

In-line Motor

Series	LE2Y16D						
Stroke [mm]	30	50	100	150	200	250	300
Product weight [kg]	0.72	0.76	0.87	1.01	1.12	1.23	1.34

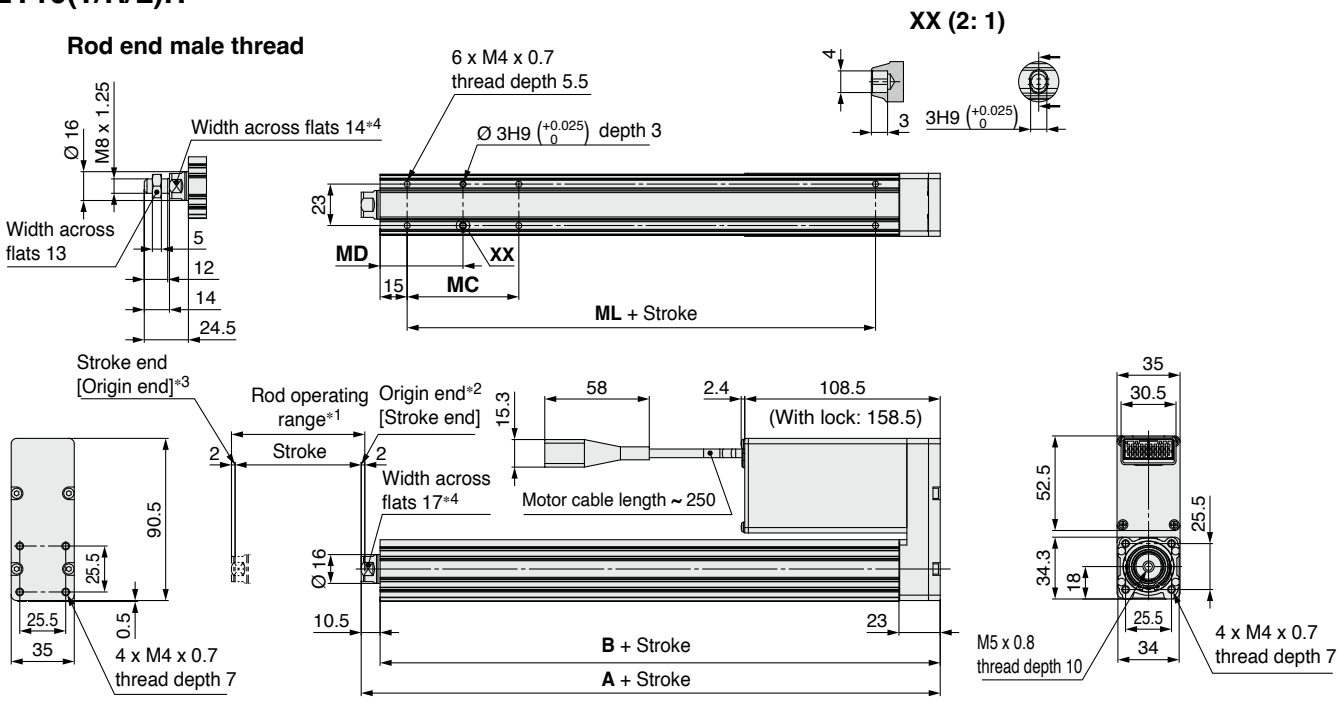
Series	LE2Y25D									LE2Y32D										
Stroke [mm]	30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	1.60	1.67	1.84	2.10	2.28	2.45	2.63	2.80	2.98	2.55	2.66	2.95	3.23	3.63	3.92	4.20	4.49	4.78	5.06	5.35

Additional Weight

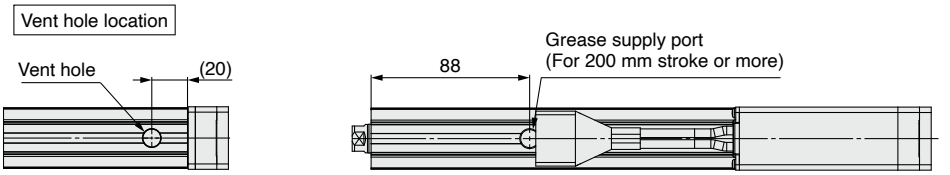
Size		25	32
Lock/Motor cover		0.33	0.65
Rod end male thread	**Male thread**	0.03	0.03
	Nut	0.02	0.02
Foot bracket (2 sets including mounting bolt)		0.08	0.14
Rod flange (including mounting bolt)		0.17	0.20
Head flange (including mounting bolt)			
Double clevis (including pin, retaining ring, and mounting bolt)		0.16	0.22

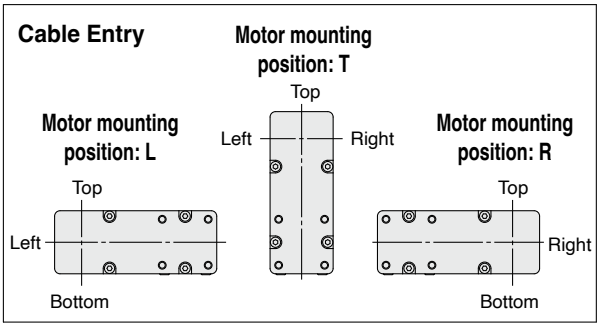
Dimensions: Top Side Parallel Motor

LE2Y16(T/R/L)H



<Rod operating range>
*1 The range of movement of the rod according to the movement instructions.
Make sure that workpieces mounted on the rod do not interfere with other workpieces or the facilities around the rod.
*2 Indicates the factory default origin position (0 mm)
*3 [ ] refers to when the rotation direction reference is changed.





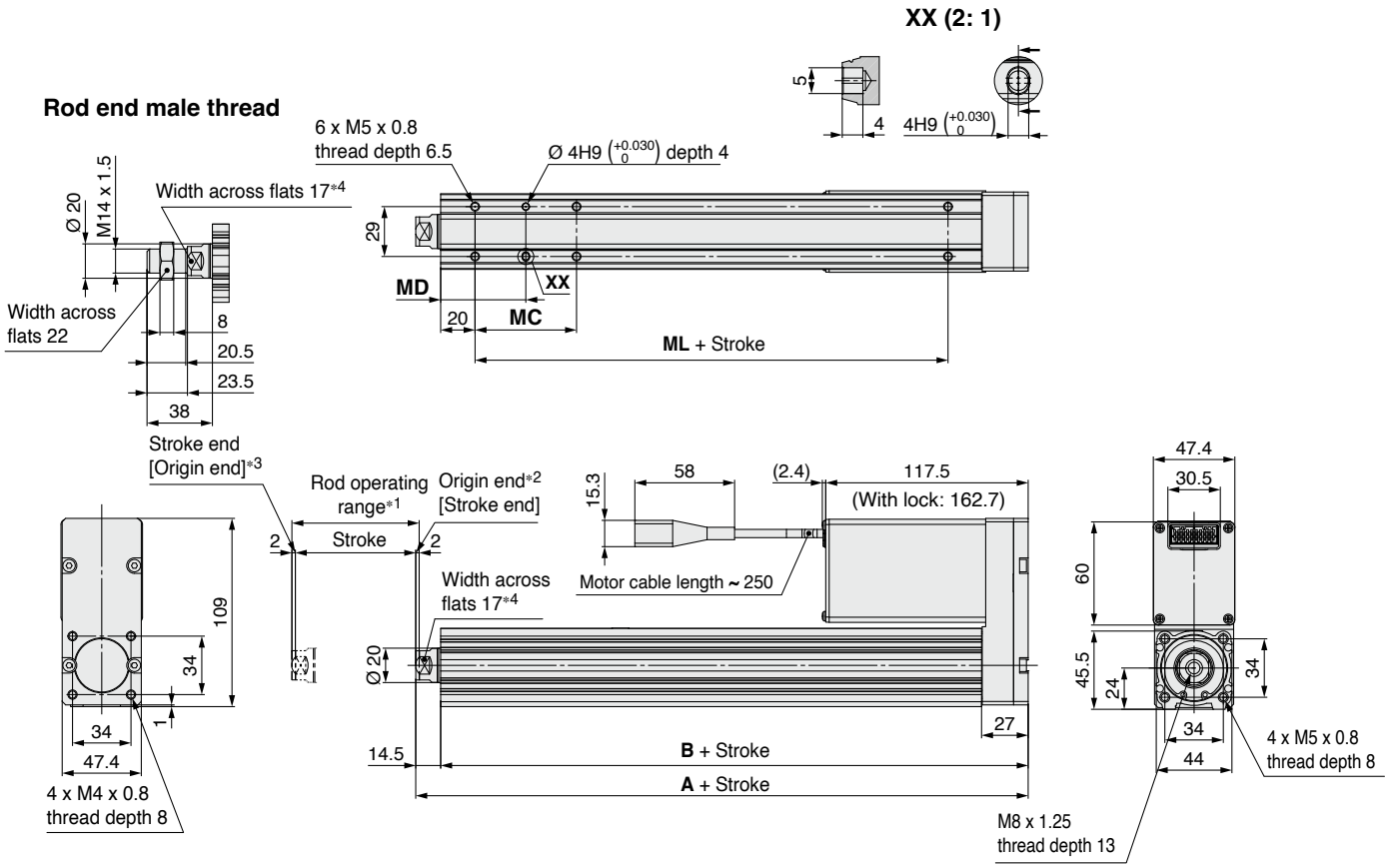
*4 The direction of the rod end width across flats is different for each single unit, so it is not always the same as the direction in the drawing.
* For details on the mounting bracket dimensions, refer to the catalogue.
* This illustration shows the motor mounting position for the top side parallel type. Refer to the catalogue for detailed dimensions of the right/left side parallel type.
* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	A	B	MC	MD	ML
30	101.5	91	17	23.5	40
50, 100			32	31	
150, 200, 250, 300	121.4	111	62	46	60

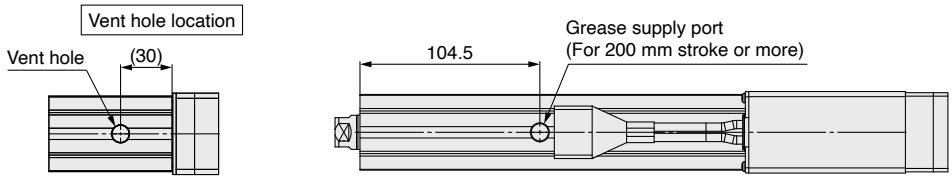
Dimensions: Top Side Parallel Motor

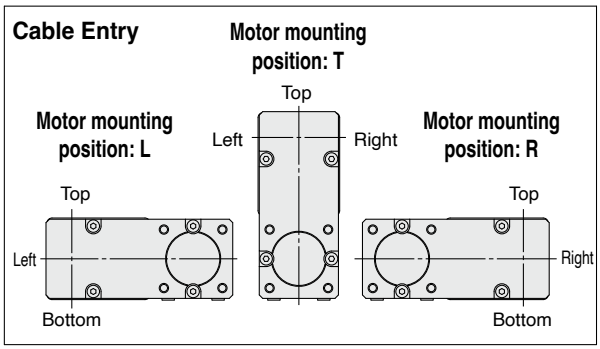
LE2Y25(T/R/L)H



<Rod operating range>

*1 The range of movement of the rod according to the movement instructions.
Make sure that workpieces mounted on the rod do not interfere with other workpieces or the facilities around the rod.
*2 Indicates the factory default origin position (0 mm)
*3 [ ] refers to when the rotation direction reference is changed.





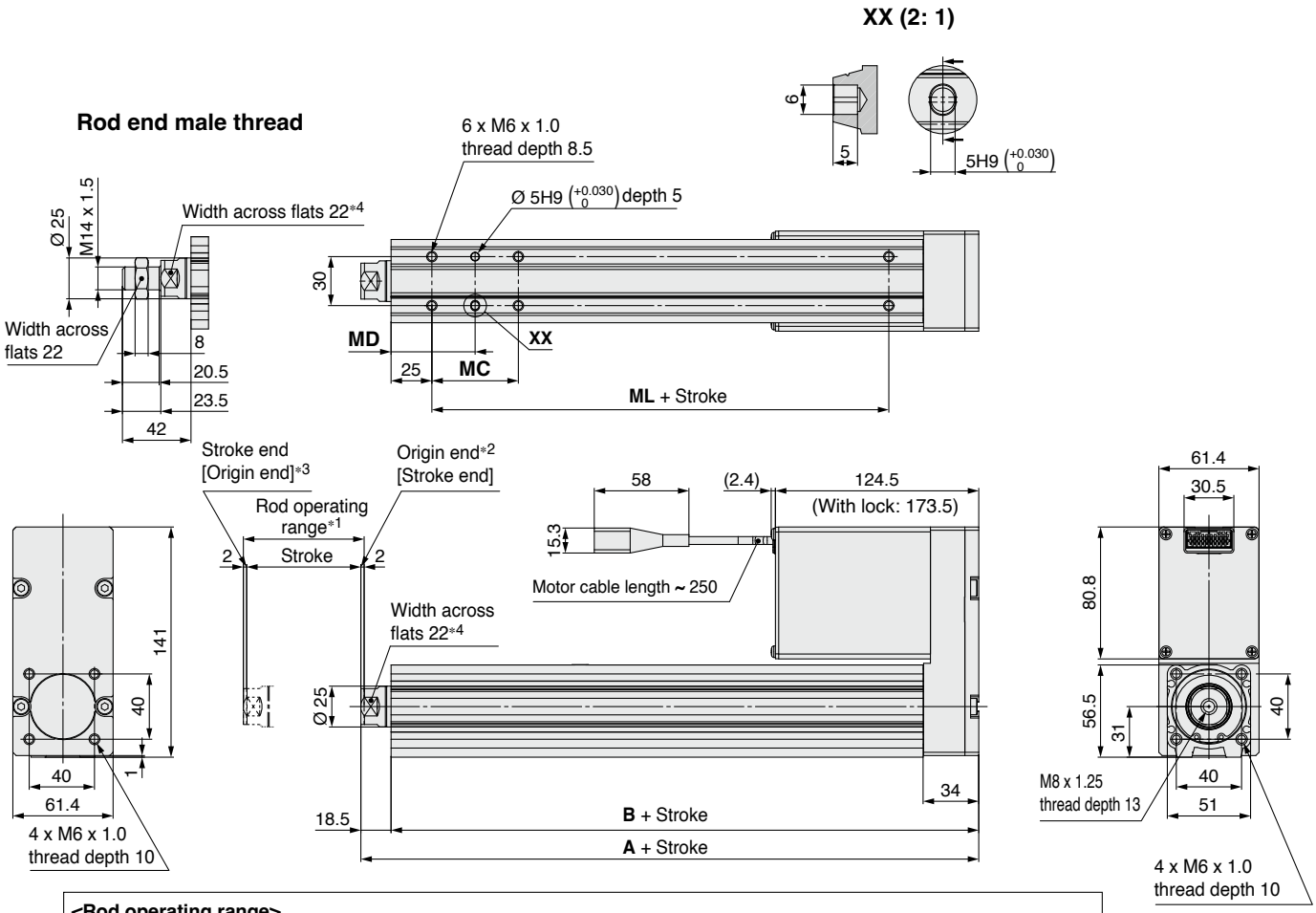
*4 The direction of the rod end width across flats is different for each single unit, so it is not always the same as the direction in the drawing.
* For details on the mounting bracket dimensions, refer to the catalogue.
* This illustration shows the motor mounting position for the top side parallel type. Refer to the catalogue for detailed dimensions of the right/left side parallel type.
* The axial cable entry direction is shown.

Dimensions [mm]

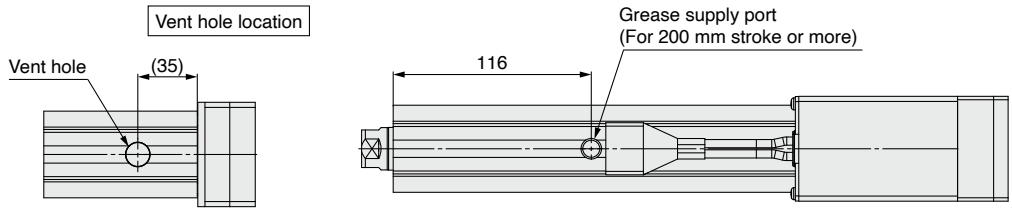
Stroke	A	B	MC	MD	ML
30	131	116.5	24	32	50
50, 100			42	41	
150, 200	156	141.5	59	49.5	75
250, 300, 350, 400			76	58	

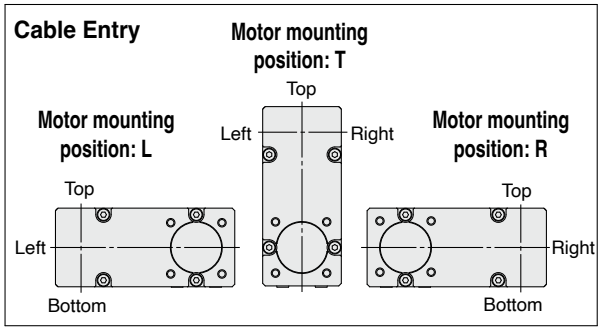
Dimensions: Top Side Parallel Motor

LE2Y32(T/R/L)H



<Rod operating range>
*1 The range of movement of the rod according to the movement instructions.
Make sure that workpieces mounted on the rod do not interfere with other workpieces or the facilities around the rod.
*2 Indicates the factory default origin position (0 mm)
*3 [ ] refers to when the rotation direction reference is changed.





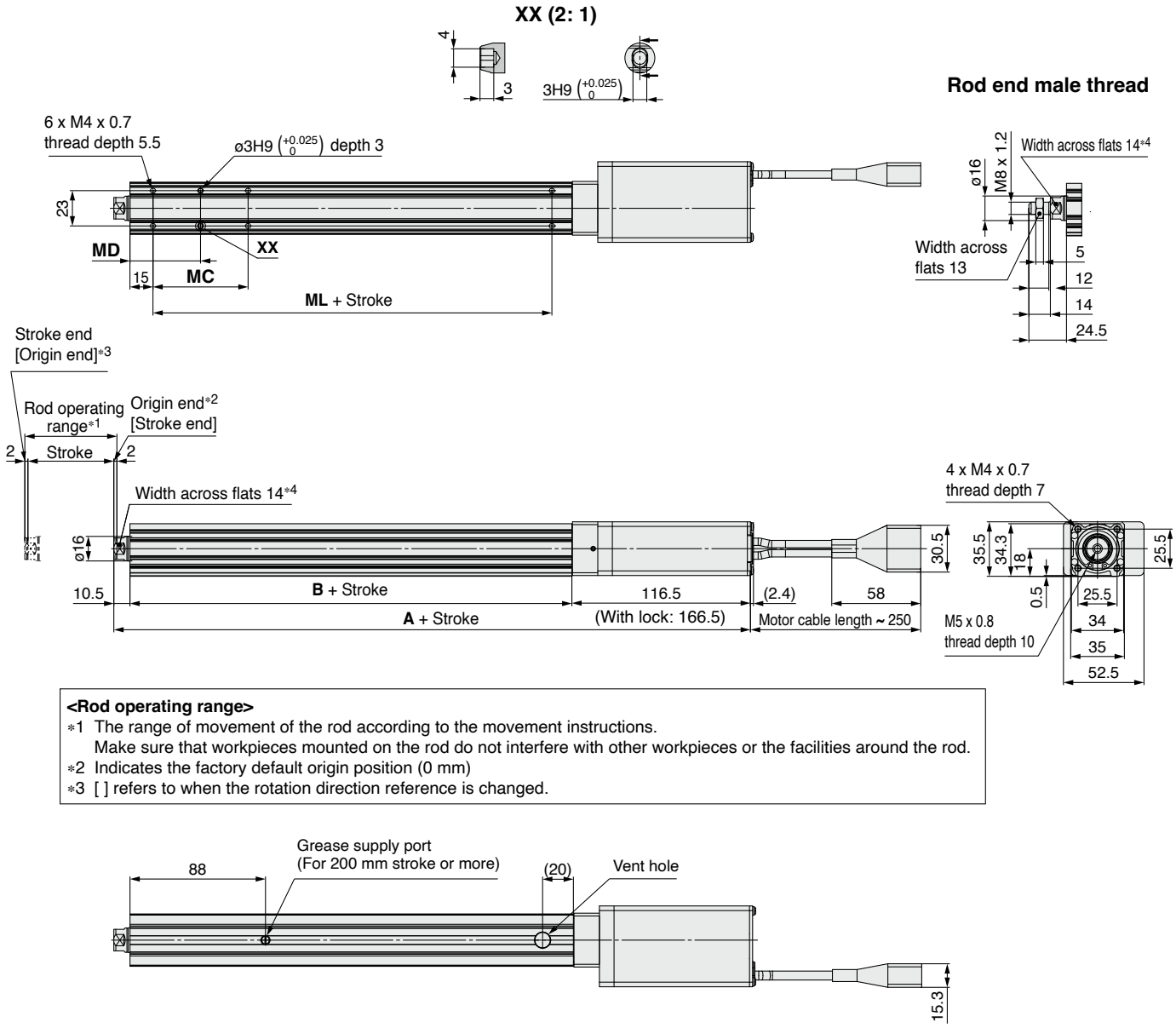
*4 The direction of the rod end width across flats is different for each single unit, so it is not always the same as the direction in the drawing.
* For details on the mounting bracket dimensions, refer to the catalogue.
* This illustration shows the motor mounting position for the top side parallel type. Refer to the catalogue for detailed dimensions of the right/left side parallel type.
* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	A	B	MC	MD	ML
30	148.5	130	22	36	50
50, 100			36	43	
150, 200	178.5	160	53	51.5	80
250, 300, 350, 400			70	60	

Dimensions: In-line Motor

LE2Y16DH



<Rod operating range>
*1 The range of movement of the rod according to the movement instructions.
Make sure that workpieces mounted on the rod do not interfere with other workpieces or the facilities around the rod.
*2 Indicates the factory default origin position (0 mm)
*3 [ ] refers to when the rotation direction reference is changed.

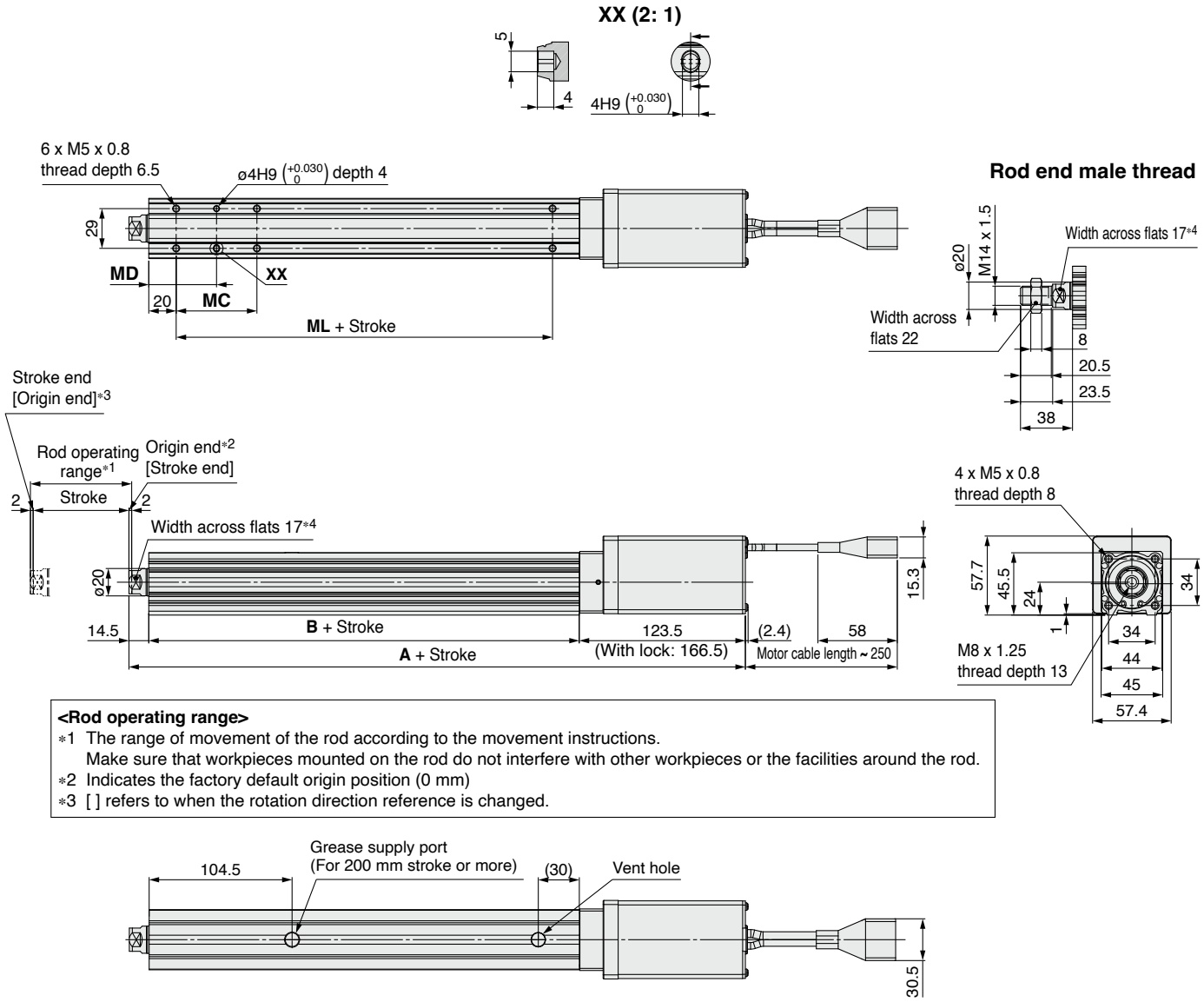
*4 The direction of the rod end width across flats is different for each single unit, so it is not always the same as the direction in the drawing.
* For details on the mounting bracket dimensions, refer to the catalogue.
* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	A		B	MC	MD	ML
	Without lock	With lock				
30	195	245	68	17	23.5	40
50, 100				32	31	
150, 200, 250, 300	215	265	88	62	46	60

Dimensions: In-line Motor

LE2Y25DH



<Rod operating range>
*1 The range of movement of the rod according to the movement instructions.
Make sure that workpieces mounted on the rod do not interfere with other workpieces or the facilities around the rod.
*2 Indicates the factory default origin position (0 mm)
*3 [ ] refers to when the rotation direction reference is changed.

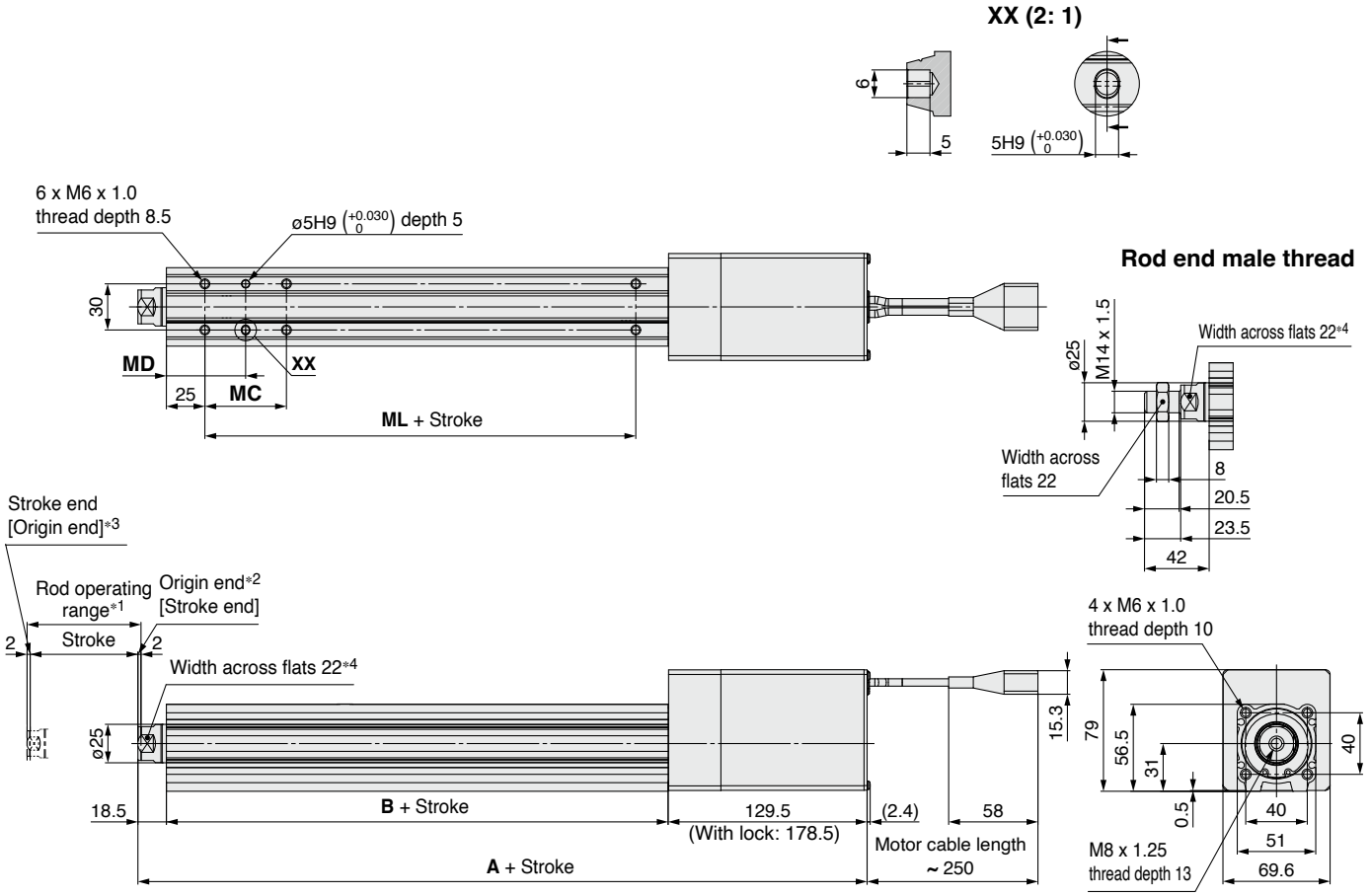
*4 The direction of the rod end width across flats is different for each single unit, so it is not always the same as the direction in the drawing.
* For details on the mounting bracket dimensions, refer to the catalogue.
* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	A		B	MC	MD	ML
	Without lock	With lock				
30	225.5	270.5	89.5	24	32	50
50, 100				42	41	
150, 200	250.5	295.5	114.5	59	49.5	75
250, 300, 350, 400				76	58	

Dimensions: In-line Motor

LE2Y32DH

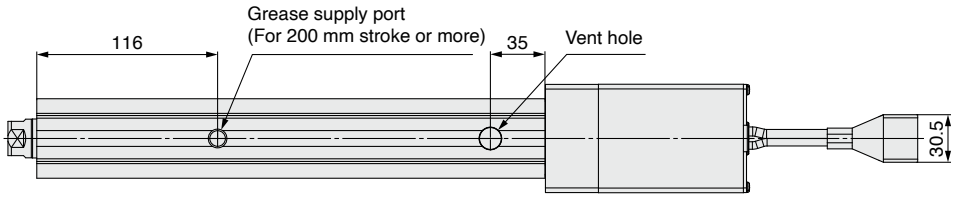


<Rod operating range>

*1 The range of movement of the rod according to the movement instructions.
Make sure that workpieces mounted on the rod do not interfere with other workpieces or the facilities around the rod.

*2 Indicates the factory default origin position (0 mm)

*3 [ ] refers to when the rotation direction reference is changed.



*4 The direction of the rod end width across flats is different for each single unit, so it is not always the same as the direction in the drawing.

* For details on the mounting bracket dimensions, refer to the catalogue.

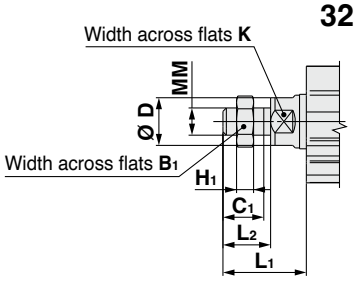
* The axial cable entry direction is shown.

Dimensions [mm]

Stroke	A		B	MC	MD	ML
	Without lock	With lock				
30	244	293	96	22	36	50
50, 100				36	43	
150, 200	274	323	126	53	51.5	80
250, 300, 350, 400				70	60	

Dimensions

End male thread: LE2Y 16/25/32 □H A/B/C -□□M□



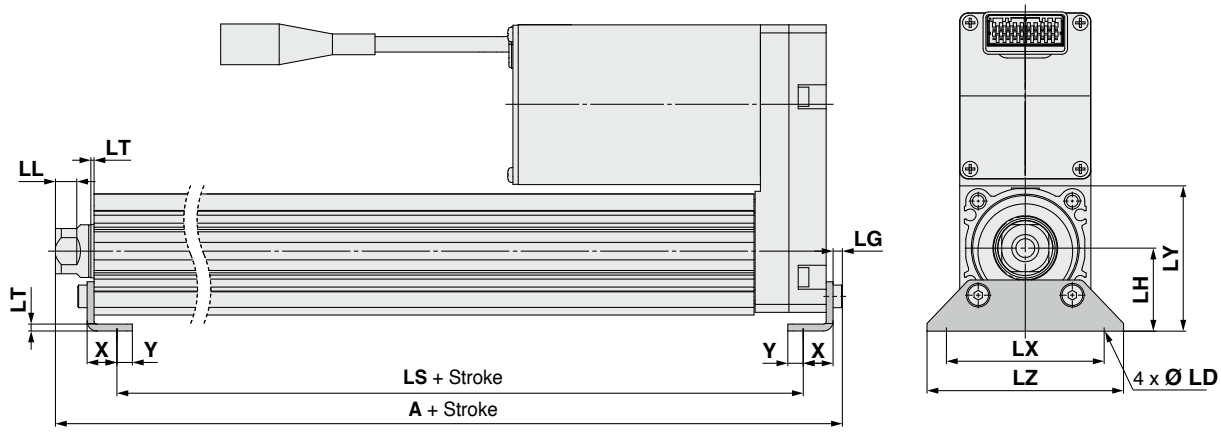
[mm]

Size	B_1	C_1	Ø D	H_1	K	L_1	L_2	MM
16	13	12	16	5	14	24.5	14	M8 x 1.25
25	22	20.5	20	8	17	38	23.5	M14 x 1.5
32	22	20.5	25	8	22	42	23.5	M14 x 1.5

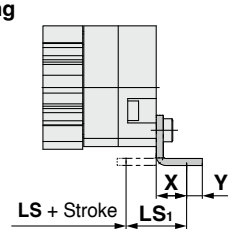
∗ The L_1 measurement is when the unit is in the original position. At this position, 2 mm at the end.

∗ Refer to the **Web Catalogue** for details on the rod end nut and mounting bracket.
∗ Refer to the specific product precautions ("Handling") in the **Web Catalogue** when mounting end brackets such as knuckle joint or workpieces.

Foot bracket: LE2Y 16/25/32 □H A/B/C -□□□L



Outward mounting



Included parts
· Foot bracket
· Body mounting bolt

Foot Bracket

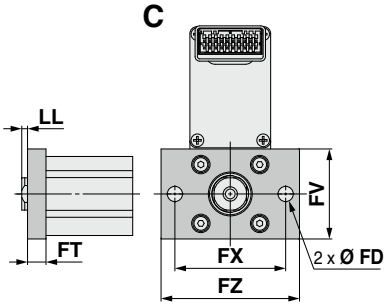
[mm]

Size	Stroke range [mm]	A	LS	LS_1	LL	LD	LG	LH	LT	LX	LY	LZ	X	Y
16	30 to 100	106.1	76.7	16.1	5.4	6.6	2.8	24	2.3	48	40.3	62	9.2	5.8
	101 to 300	126.1	96.7											
25	30 to 100	136.6	98.8	19.8	8.4	6.6	3.5	30	2.6	57	51.5	71	11.2	5.8
	101 to 400	161.6	123.8											
32	30 to 100	155.7	114	19.2	11.3	6.6	4	36	3.2	76	61.5	90	11.2	7
	101 to 500	185.7	144											

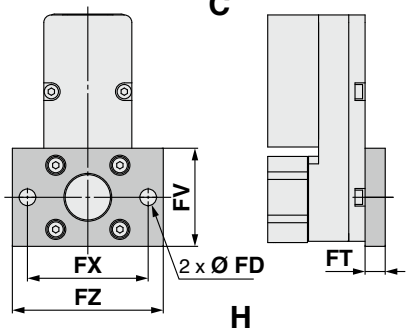
Material: Carbon steel (Chromating)
∗ The A measurement is when the unit is in the original position. At this position, 2 mm at the end.
∗ When the motor mounting is the right or left side parallel type, the head side foot bracket should be mounted outward.

Dimensions

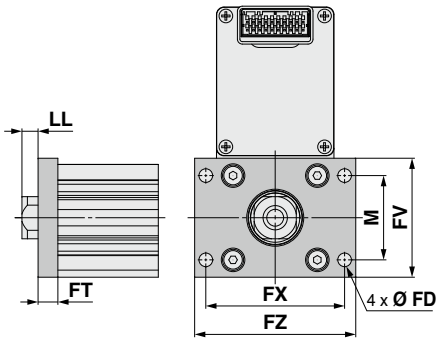
Rod flange: LE2Y16□HB-□□□F



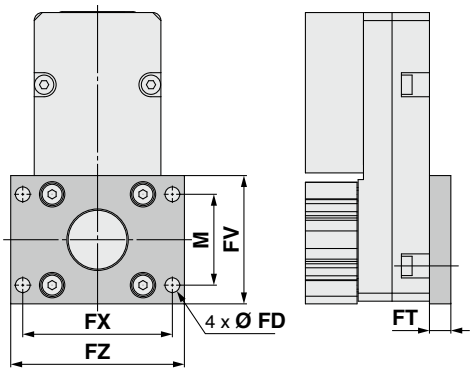
Head flange: LE2Y16HB-□□□G



Rod flange: LE2Y25/32□HB-□□□F



Head flange: LE2Y25□HB-□□□G



∗ The head flange type is not available for the LE2Y32.

Included parts
· Flange
· Body mounting bolt

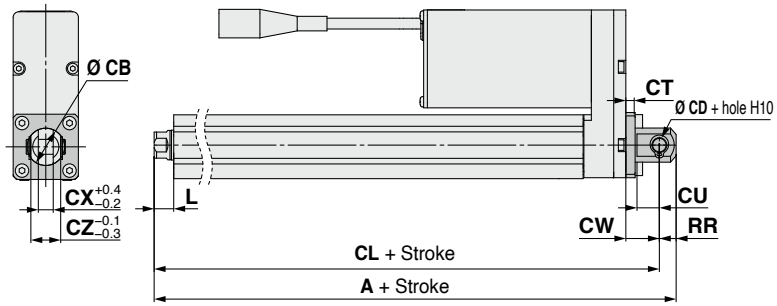
Rod/Head Flange

[mm]

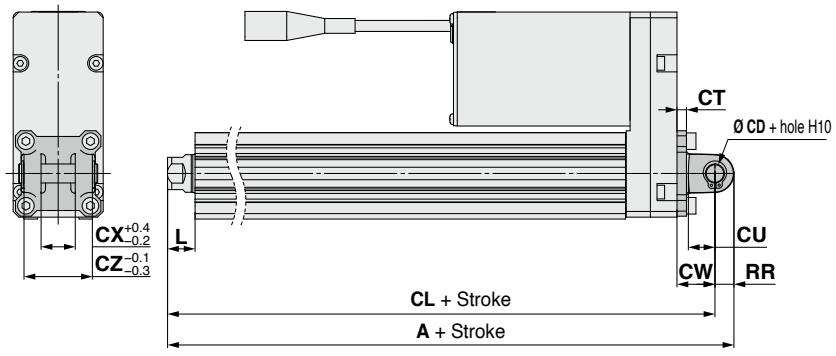
Size	FD	FT	FV	FX	FZ	LL	M
16	6.6	8	39	48	60	2.5	—
25	5.5	8	48	56	65	6.5	34
32	5.5	8	54	62	72	10.5	40

Material: Carbon steel (Nickel plating)

Double clevis: LE2Y16HB-□□□D



Double clevis: LE2Y25/32HB-□□□D



Included parts
· Double clevis
· Body mounting bolt
· Clevis pin
· Retaining ring

∗ Refer to the **Web Catalogue** for details on the rod end nut and mounting bracket.

Double Clevis

[mm]

Size	Stroke range [mm]	A	CL	CB	CD	CT
16	30 to 100	128	119	20	8	5
25	30 to 100	160.5	150.5	—	10	5
	101 to 200	185.5	175.5			
32	30 to 100	180.5	170.5	—	10	6
	101 to 200	210.5	200.5			

Size	Stroke range [mm]	CU	CW	CX	CZ	L	RR
16	30 to 100	12	18	8	16	10.5	9
25	30 to 100	14	20	18	36	14.5	10
	101 to 200						
32	30 to 100	14	22	18	36	18.5	10
	101 to 200						

Material: Cast iron (Coating)

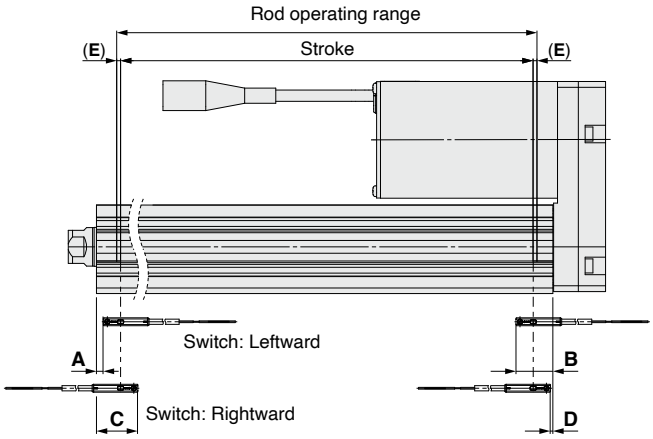
∗ The A and CL measurements are when the unit is in the original position. At this position, 2 mm at the end.

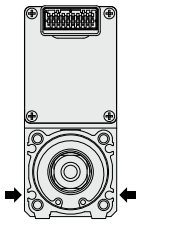
For the models and dimensions of the mounting bracket and simple joint bracket, refer to the **Web Catalogue** for the LEY series.

LE2Y□H Series
Auto Switch Mounting

Auto Switch Proper Mounting Position

Applicable auto switch: D-M9□(V), D-M9□E(V), D-M9□W(V), D-M9□A(V)





LE2Y16, 25, 32

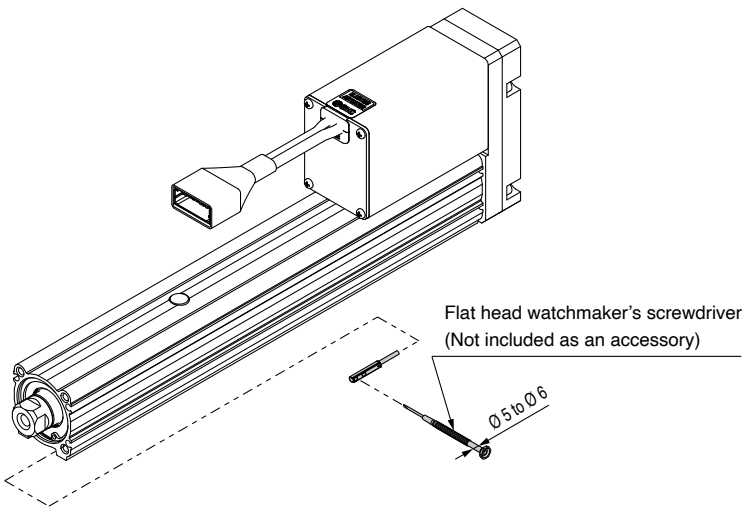
➡ Switch mounting groove

[mm]

Size	Stroke range	Auto switch position				Return to origin distance	Operating range
		Leftward mounting		Rightward mounting			
		A	**B**	**C**	**D**	**E**	—
16	30 to 100	21.5	46.5	33.5	34.5	(2)	2.9
	105 to 300	41.5		53.5			
25	30 to 100	27	62.5	39	50.5	(2)	4.2
	105 to 400	52		64			
32	30 to 100	30.5	65.5	42.5	53.5	(2)	4.9
	105 to 500	60.5		72.5			

* The values in the table above are to be used as a reference when mounting auto switches for stroke end detection. Adjust the auto switch after confirming the operating conditions in the actual setting.
* An auto switch cannot be mounted on the same side as a motor.
* Since the operating range is provided as a guideline including hysteresis, it cannot be guaranteed (assuming approx. ±30 % dispersion). It may change substantially depending on the ambient environment.

Auto Switch Mounting



Tightening Torque for Auto Switch Mounting Screw

[N·m]

Auto switch model	Tightening torque
D-M9□(V) **D-M9□E(V)** **D-M9□W(V)**	0.05 to 0.15
D-M9□A(V)	0.05 to 0.10

* When tightening the auto switch mounting screw (included with the auto switch), use a watchmaker's screwdriver with a handle diameter of 5 to 6 mm.

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

Refer to the SMC website for details on products that are compliant with international standards.

Grommet

- **2-wire load current is reduced (2.5 to 40 mA).**
- **Using flexible cable as standard spec.**

Auto Switch Specifications

PLC: Programmable Logic Controller

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

Oilproof Flexible Heavy-duty Lead Wire Specifications

Auto switch model		D-M9N(V)	D-M9P(V)	D-M9B(V)
Sheath	Outside diameter [mm]	Ø 2.6		
Insulator	Number of cores	3 cores (Brown/Blue/Black)		2 cores (Brown/Blue)
	Outside diameter [mm]	Ø 0.88		
Conductor	Effective area [mm²]	0.15		
	Strand diameter [mm]	Ø 0.05		
Min. bending radius [mm] (Reference values)		17		

* Refer to the **Web Catalogue** for solid state auto switch common specifications.
* Refer to the **Web Catalogue** for lead wire lengths.

⚠Caution

Precautions

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

Weight

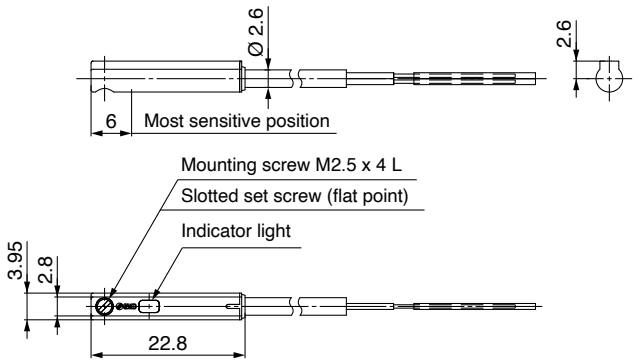
[g]

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

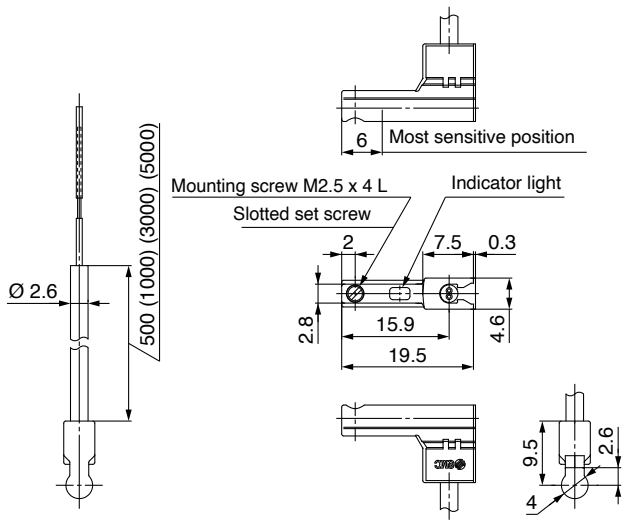
Dimensions

[mm]

D-M9□



D-M9□V

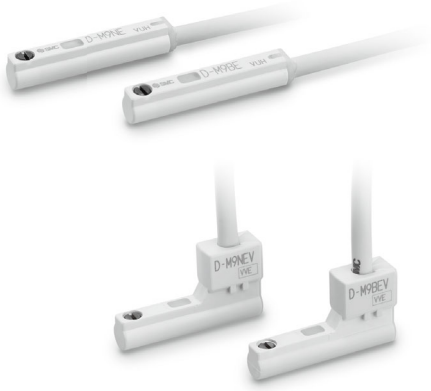


Normally Closed Solid State Auto Switch Direct Mounting Type
D-M9NE(V)/D-M9PE(V)/D-M9BE(V)

Refer to the SMC website for details on products that are compliant with international standards.

Grommet

- **Output signal turns on when no magnetic force is detected.**
- **Can be used for the actuator adopted by the solid state auto switch D-M9 series (excluding special order products)**



⚠Caution

Precautions

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

Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□E, D-M9□EV (With indicator light)						
Auto switch model	D-M9NE	D-M9NEV	D-M9PE	D-M9PEV	D-M9BE	D-M9BEV
Electrical entry direction	In-line	Perpendicular	In-line	Perpendicular	In-line	Perpendicular
Wiring type	3-wire				2-wire	
Output type	NPN		PNP		—	
Applicable load	IC circuit, Relay, PLC				24 VDC relay, PLC	
Power supply voltage	5, 12, 24 VDC (4.5 to 28 V)				—	
Current consumption	10 mA or less				—	
Load voltage	28 VDC or less		—		24 VDC (10 to 28 VDC)	
Load current	40 mA or less				2.5 to 40 mA	
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)				4 V or less	
Leakage current	100 μA or less at 24 VDC				0.8 mA or less	
Indicator light	Red LED illuminates when turned ON.					
Standards	CE/UKCA marking					

Oilproof Flexible Heavy-duty Lead Wire Specifications

Auto switch model		D-M9NE(V)	D-M9PE(V)	D-M9BE(V)
Sheath	Outside diameter [mm]	Ø 2.6		
Insulator	Number of cores	3 cores (Brown/Blue/Black)		2 cores (Brown/Blue)
	Outside diameter [mm]	Ø 0.88		
Conductor	Effective area [mm²]	0.15		
	Strand diameter [mm]	Ø 0.05		
Min. bending radius [mm] (Reference values)		17		

∗ Refer to the **Web Catalogue** for solid state auto switch common specifications.
∗ Refer to the **Web Catalogue** for lead wire lengths.

Weight

[g]

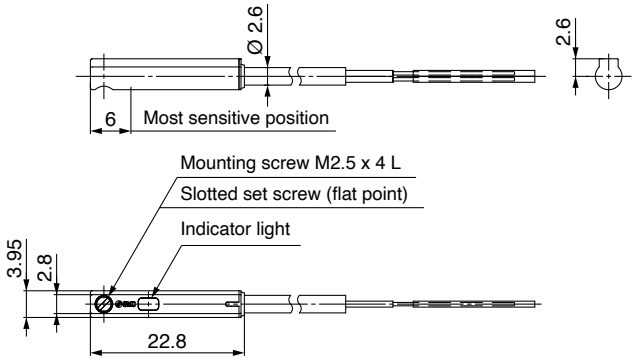
Auto switch model		D-M9NE(V)	D-M9PE(V)	D-M9BE(V)
Lead wire length	0.5 m (—)	8		7
	1 m (**M**)∗1	14		13
	3 m (**L**)	41		38
	5 m (**Z**)∗1	68		63

∗1 The 1 m and 5 m options are produced upon receipt of order.

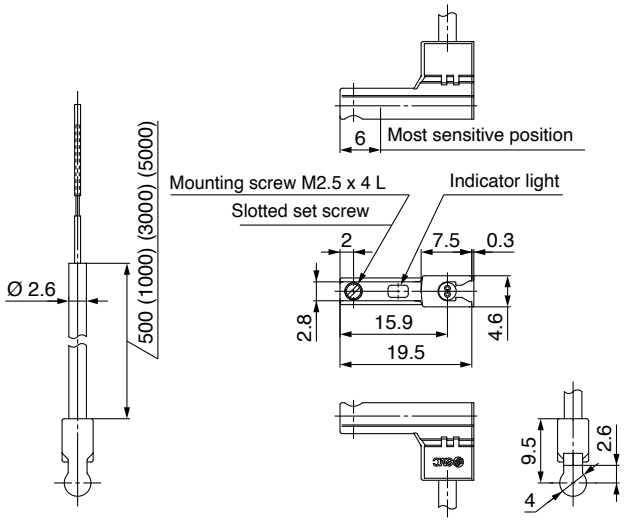
Dimensions

[mm]

D-M9□E



D-M9□EV



SMC

2-Colour Indicator Solid State Auto Switch
Direct Mounting Type
D-M9NW(V)/D-M9PW(V)/D-M9BW(V)

Refer to the SMC website for details on products that are compliant with international standards.

Grommet

- **2-wire load current is reduced (2.5 to 40 mA).**
- **Using flexible cable as standard spec.**
- **The proper operating range can be determined by the colour of the light. (Red → Green ← Red)**

⚠Caution

Precautions

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

Auto Switch Specifications

PLC: Programmable Logic Controller

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

Oilproof Flexible Heavy-duty Lead Wire Specifications

Auto switch model		D-M9NW(V)	D-M9PW(V)	D-M9BW(V)
Sheath	Outside diameter [mm]	Ø 2.6		
Insulator	Number of cores	3 cores (Brown/Blue/Black)		2 cores (Brown/Blue)
	Outside diameter [mm]	Ø 0.88		
Conductor	Effective area [mm²]	0.15		
	Strand diameter [mm]	Ø 0.05		
Min. bending radius [mm] (Reference values)		17		

* Refer to the **Web Catalogue** for solid state auto switch common specifications.
* Refer to the **Web Catalogue** for lead wire lengths.

Weight

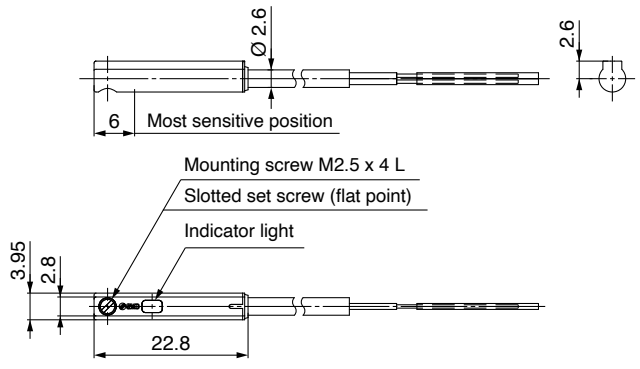
[g]

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

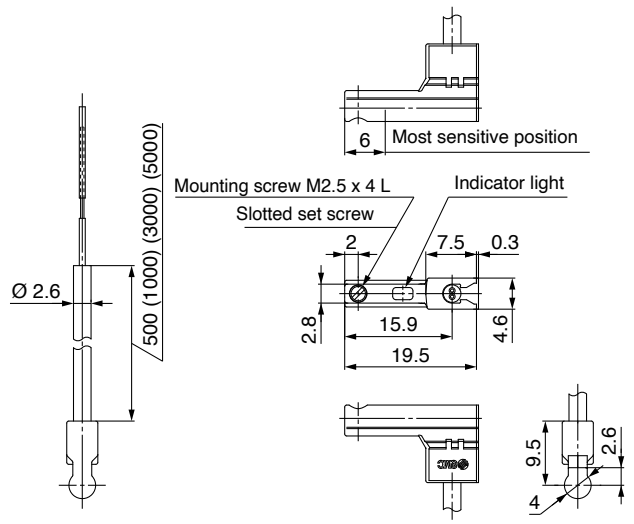
Dimensions

[mm]

D-M9□W



D-M9□WV



⚠ 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.

⚠ **Danger:**	**Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
⚠ **Warning:**	**Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
⚠ **Caution:**	**Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

1) ISO 4414: Pneumatic fluid power – General rules and safety requirements for systems and their components.
ISO 4413: Hydraulic fluid power – General rules and safety requirements for systems and their components.
IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
ISO 10218-1: Robots and robotic devices - Safety requirements for industrial robots - Part 1: Robots.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
Since the product specified here is 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 catalogue 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. Our products cannot be used beyond their specifications.
Our products are not developed, designed, and manufactured to be used under the following conditions or environments.
Use under such conditions or environments is not covered.
1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Use for nuclear power, railways, aviation, space equipment, ships, vehicles, military application, equipment affecting human life, body, and property, fuel equipment, entertainment equipment, emergency shut-off circuits, press clutches, brake circuits, safety equipment, etc., and use for applications that do not conform to standard specifications such as catalogues and operation manuals.
3. Use for interlock circuits, except for use with double interlock such as installing a mechanical protection function in case of failure. Please periodically inspect the product to confirm that the product is operating properly.

⚠ Caution

We develop, design, and manufacture our products to be used for automatic control equipment, and provide them for peaceful use in manufacturing industries.
Use in non-manufacturing industries is not covered.
Products we manufacture and sell cannot be used for the purpose of transactions or certification specified in the Measurement Act.
The new Measurement Act prohibits use of any unit other than SI units in Japan.

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 catalogue for the particular products.

2) Vacuum pads are excluded from this 1 year warranty.
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered. Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

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