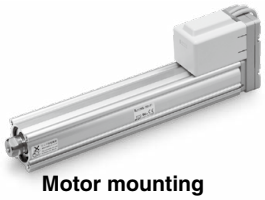
Model Selection

LEY□E Series ▶ p. 447



Motor mounting position: Parallel

Motor mounting position: In-line

Selection Procedure

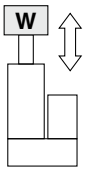
Positioning Control Selection Procedure

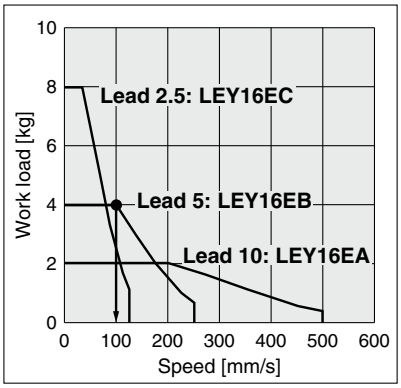
Step 1 Check the work load–speed. (Vertical transfer) → **Step 2** Check the cycle time.

Selection Example

Operating conditions

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





<Speed–Vertical work load graph> (LEY16/Battery-less absolute)

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 **LEY16EB** 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 449 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.

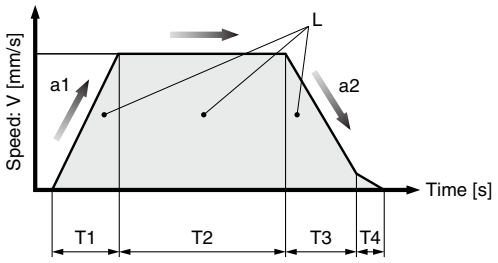
$$T1 = V/a1 \text{ [s]} \qquad T3 = V/a2 \text{ [s]}$$

- 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 motor types, load and in position of the step data. Therefore, calculate the settling time while referencing the following value.

$$T4 = 0.2 \text{ [s]}$$



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.

$$T1 = V/a1 = 100/3000 = 0.033 \text{ [s]}, \quad T3 = V/a2 = 100/3000 = 0.033 \text{ [s]}$$

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

$$T4 = 0.2 \text{ [s]}$$

The cycle time can be found as follows.

$T = T1 + T2 + T3 + T4 = 0.033 + 1.967 + 0.033 + 0.2 =$ **2.233 [s]**

Based on the above calculation result, the LEY16EB-200 should be selected.

Selection Procedure

Pushing Control Selection Procedure

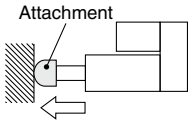
Step 1 Check the duty ratio. → **Step 2** Check the pushing force. → **Step 3** Check the lateral load on the rod end.

∗ 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: 68 [N]
- Duty ratio: 18 [%]
- 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.

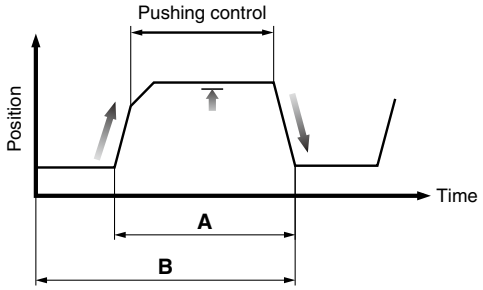
Selection example)
Based on the table below,
- Duty ratio: 18 [%]

The pushing force set value will be 60 [%].

<Conversion table of pushing force–duty ratio>
(LEY16/Battery-less absolute)

Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40 or less	100	No restriction
50	30	45 or less
60	18	15 or less
65	15	10 or less

∗ [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.



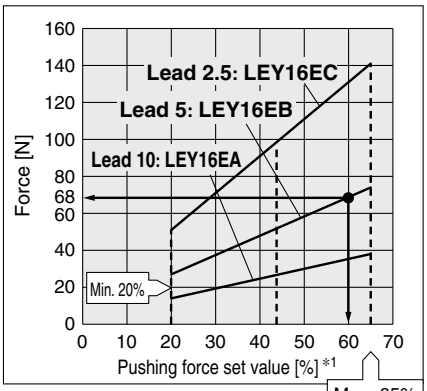
Duty ratio = A/B x 100 [%]

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 set value: 60 [%]
- Pushing force: 68 [N]

The **LEY16EB** can be temporarily selected as a possible candidate.



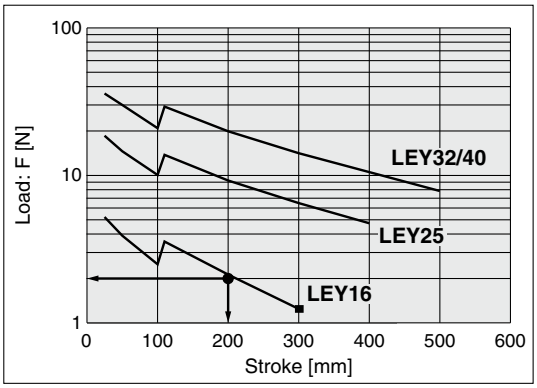
<Force conversion graph>
(LEY16/Battery-less absolute)
∗1 Set values for the controller

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.



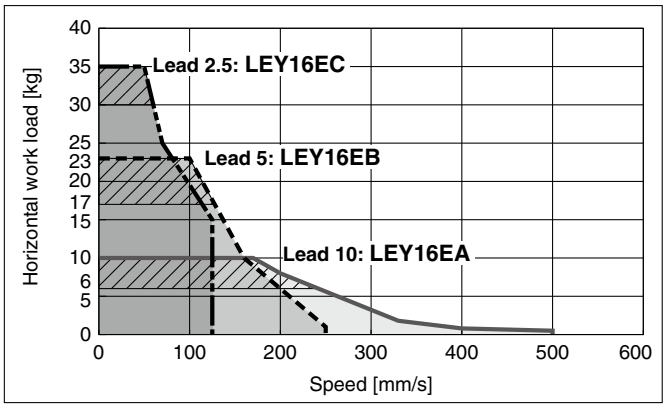
<Graph of allowable lateral load on the rod end>

Based on the above calculation result, the LEY16EB-200 should be selected.

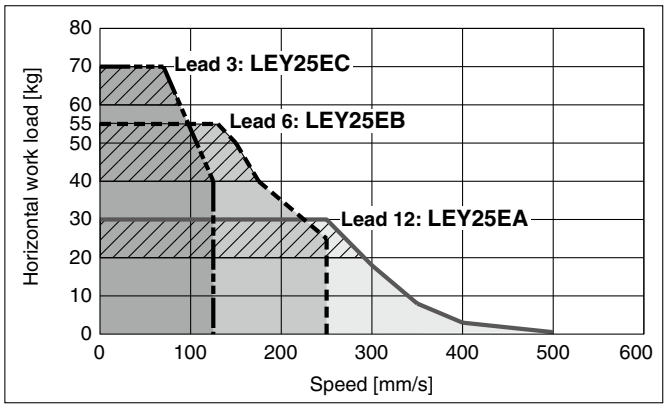
Speed–Work Load Graph (Guide)
For Battery-less Absolute (Step Motor 24 VDC)

Horizontal

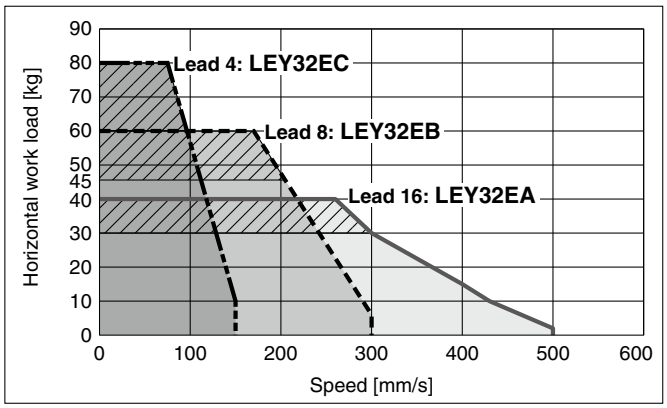
LEY16□E



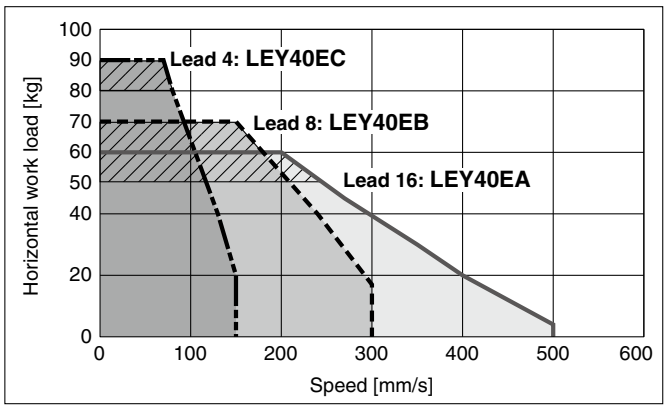
LEY25□E



LEY32□E

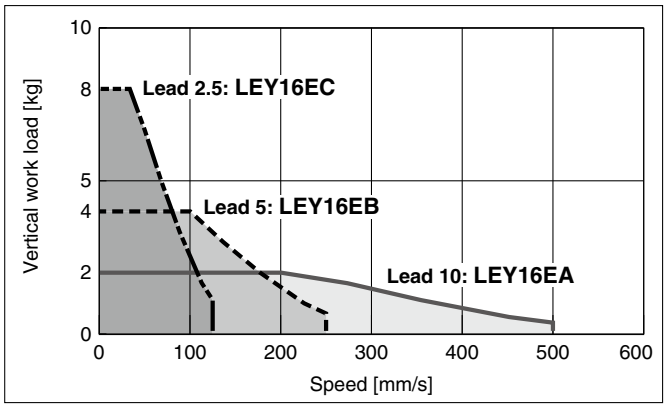


LEY40□E

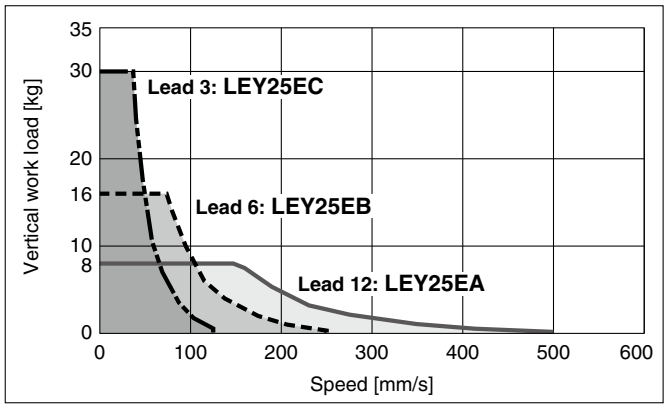


Vertical

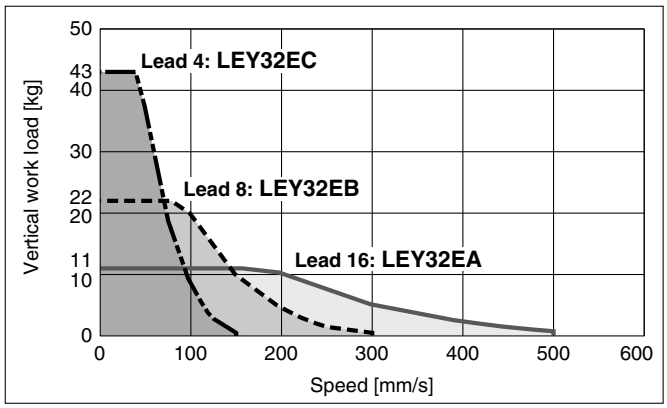
LEY16□E



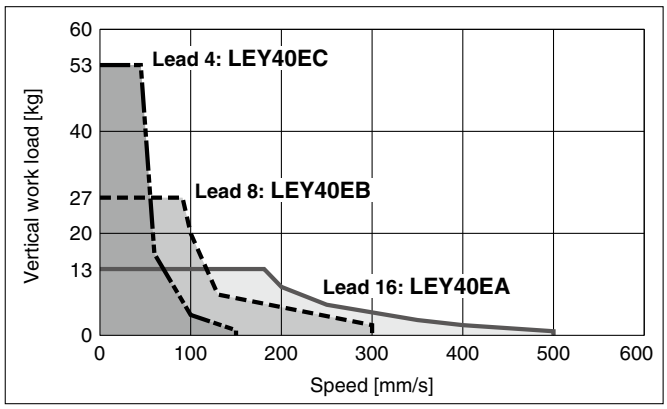
LEY25□E



LEY32□E



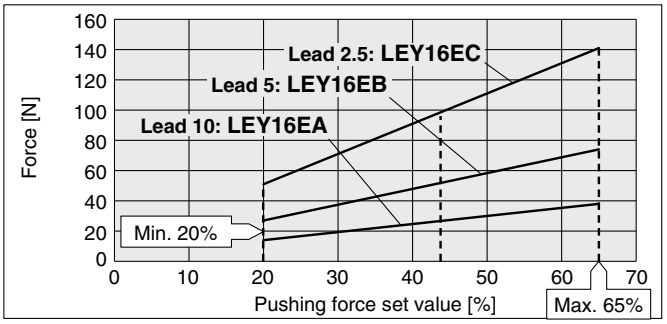
LEY40□E



Force Conversion Graph (Guide)

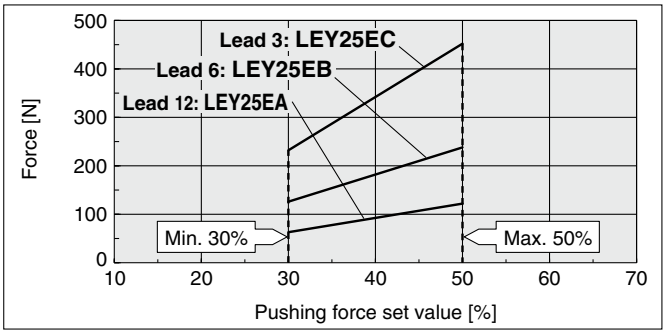
Battery-less Absolute (Step Motor 24 VDC)

LEY16□E



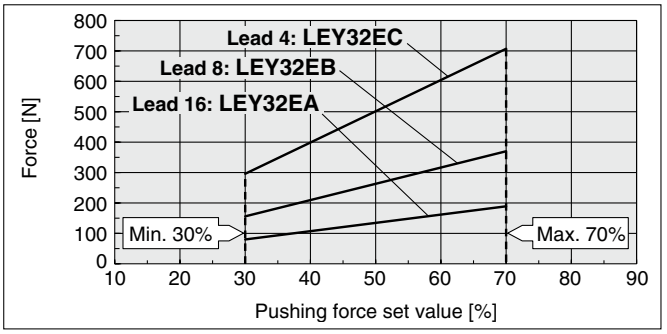
Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
30°C or less	65 or less	100	No restriction
40°C	40 or less	100	No restriction
	50	30	45 or less
	60	18	15 or less
	65	15	10 or less

LEY25□E



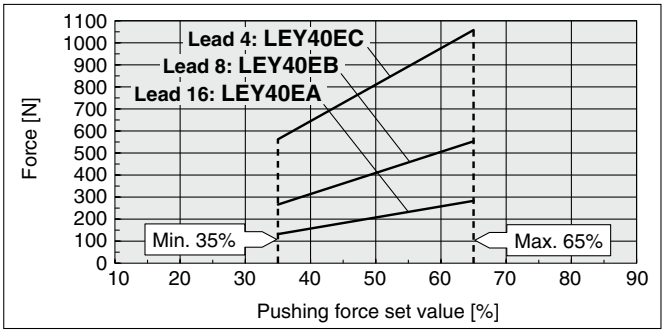
Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40°C or less	50 or less	100	No restriction

LEY32□E



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

LEY40□E



Ambient temperature	Pushing force set value [%]	Duty ratio [%]	Continuous pushing time [min]
40°C or less	65 or less	100	No restriction

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

Without Load

Model	Lead	Pushing speed [mm/s]	Pushing force (Setting input value)
LEY16□E	A/B/C	21 to 50	45 to 65%
LEY25□E	A/B/C	21 to 35	40 to 50%
LEY32□E	A	24 to 30	50 to 70%
	B/C	21 to 30	
LEY40□E	A	24 to 30	50 to 65%
	B/C	21 to 30	

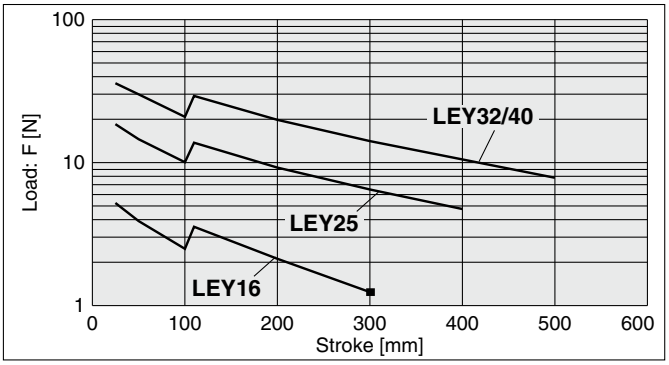
There is a limit to the pushing force in relation to the pushing speed. If the product is operated outside of the range (low pushing force), the completion signal [INP] may be output before the pushing operation has been completed (during the moving operation).
If operating with the pushing speed below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

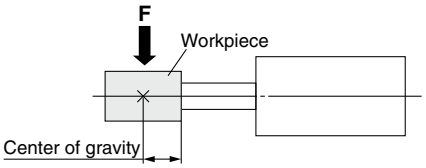
Model	LEY16□E			LEY25□E			LEY32□E			LEY40□E		
Lead	A	B	C	A	B	C	A	B	C	A	B	C
Work load [kg]	1	1.5	3	2.5	5	10	4.5	9	18	7	14	28
Pushing force	65%			50%			70%			65%		

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



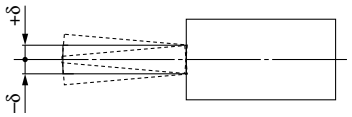
∗ The changes in the graph waveforms are due to the difference in components of different product strokes.

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



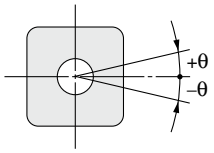
Rod Displacement: δ [mm]

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, 40	±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°
40	

∗ 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.

Battery-less Absolute (Step Motor 24 VDC)

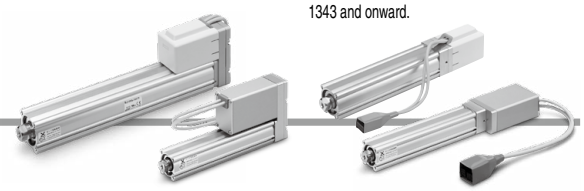
Rod Type

LEY Series LEY16, 25, 32, 40

CE UKCA RoHS

* For details, refer to page 1343 and onward.

How to Order



Motor mounting position: Parallel

Motor mounting position: In-line

LEY 25 ❶ E ❷ B ❸ – 30 ❹ C ❺ ❻ ❼ – R1 ❽ CD17T ❾

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿

❿ For details on controllers, refer to the next page.

❶ Size

16
25
32
40

❷ Motor mounting position/Motor cover direction

Symbol	Motor mounting position	Motor cover direction
Nil	Top side parallel	—
D	In-line	—*1
D1		Left*2
D2		Right*2
D3		Top*2
D4		Bottom*2

❸ Motor type

E	Battery-less absolute (Step motor 24 VDC)

❹ Lead [mm]

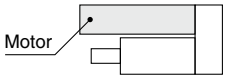
Symbol	LEY16	LEY25	LEY32/40
A	10	12	16
B	5	6	8
C	2.5	3	4

❺ Stroke*3 [mm]

Stroke	Note	
	Size	Applicable stroke
30 to 300	16	30, 50, 100, 150, 200, 250, 300
30 to 400	25	30, 50, 100, 150, 200, 250, 300, 350, 400
30 to 500	32/40	30, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500

❻ Motor option*4

C	With motor cover
W	With lock/motor cover



❼ Rod end thread

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

❽ Mounting*5

Symbol	Type	Motor mounting position	
		Parallel	In-line
Nil	Ends tapped/ Body bottom tapped*6	●	●
L	Foot	●	—
F	Rod flange*6	●*8	●
G	Head flange*6	●*9	—
D	Double clevis*7	●	—

❾ Actuator cable type/length

Robotic cable [m]

Nil	None	R8	8*10
R1	1.5	RA	10*10
R3	3	RB	15*10
R5	5	RC	20*10

⑩ Controller

Nil	Without controller
C□1□□	With controller

C D 1 7 T

Interface (Communication protocol/Input/Output)

Symbol	Type	Number of axes, Special specification: Standard	Number of axes, Special specification: With STO sub-function
5	Parallel input (NPN)	●	
6	Parallel input (PNP)	●	
E	EtherCAT	●	●
9	EtherNet/IP™	●	●
P	PROFINET	●	●
D	DeviceNet®	●	
L	IO-Link	●	●
M	CC-Link	●	

Mounting

7	Screw mounting
8∗11	DIN rail

Number of axes, Special specification

Symbol	Number of axes	Specification
1	Single axis	Standard
F	Single axis	With STO sub-function

Communication plug connector, I/O cable∗12

Symbol	Type	Applicable interface
Nil	Without accessory	—
S	Straight type communication plug connector	DeviceNet® CC-Link Ver. 1.10
T	T-branch type communication plug connector	
1	I/O cable (1.5 m)	Parallel input (NPN) Parallel input (PNP)
3	I/O cable (3 m)	
5	I/O cable (5 m)	

∗1 Sizes 25, 32, and 40 only
∗2 Size 16 only
∗3 Please contact SMC for non-standard strokes as they are produced as special orders.
∗4 When "With lock/motor cover" is selected for the top side parallel motor type, the motor body will stick out from the end of the body for size 16 with strokes of 50 mm or less and size 40 with strokes of 30 mm or less. Check for interference with workpieces before selecting a model.
∗5 The mounting bracket is shipped together with the product but does not come assembled.
∗6 For the horizontal cantilever mounting of the rod flange, head flange, or ends tapped types, use the actuator within the following stroke range.
· LEY25: 200 or less · LEY32/40: 100 or less
∗7 For the mounting of the double clevis type, use the actuator within the following stroke range.
· LEY16: 100 or less · LEY25: 200 or less · LEY32/40: 200 or less
∗8 The rod flange type is not available for the LEY16 with strokes of 50 mm or less and LEY40 with strokes of 30 mm or less, and motor option "With lock/motor cover."
∗9 The head flange type is not available for the LEY32/40.
∗10 Produced upon receipt of order
∗11 The DIN rail is not included. It must be ordered separately.
∗12 Select "Nil" for anything other than DeviceNet®, CC-Link, or parallel input.
Select "Nil," "S," or "T" for DeviceNet® or CC-Link.
Select "Nil," "1," "3," or "5" for parallel input.

⚠Caution

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

[Precautions relating to differences in controller versions]
When the JXC series is to be used in combination with the battery-less absolute encoder, use a controller that is version V3.4 or S3.4 or higher. For details, refer to pages 1077 and 1078.

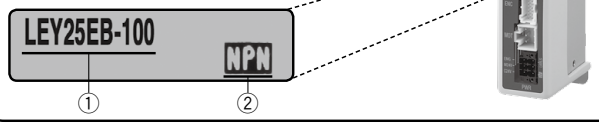
[UL certification]
The JXC series controllers used in combination with electric actuators are UL certified.

The actuator and controller are sold as a package.

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

<Check the following before use.>

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



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

Type	Step data input type	EtherCAT direct input type	EtherCAT direct input type with STO sub-function	EtherNet/IP™ direct input type	EtherNet/IP™ direct input type with STO sub-function	PROFINET direct input type	PROFINET direct input type with STO sub-function	DeviceNet® direct input type	IO-Link direct input type	IO-Link direct input type with STO sub-function	CC-Link direct input type
											
Series	**JXC51 JXC61**	**JXCE1**	**JXCEF**	**JXC91**	**JXC9F**	**JXCP1**	**JXCPF**	**JXCD1**	**JXCL1**	**JXCLF**	**JXCM1**
Features	Parallel I/O	EtherCAT direct input	EtherCAT direct input with STO sub-function	EtherNet/IP™ direct input	EtherNet/IP™ direct input with STO sub-function	PROFINET direct input	PROFINET direct input with STO sub-function	DeviceNet® direct input	IO-Link direct input	IO-Link direct input with STO sub-function	CC-Link direct input
Compatible motor	Battery-less absolute (Step motor 24 VDC)										
Max. number of step data	64 points										
Power supply voltage	24 VDC										
Reference page	1017	1063									

Specifications

Battery-less Absolute (Step Motor 24 VDC)

Model				LEY16□E			LEY25□E			LEY32□E			LEY40□E		
Actuator specifications	Work load [kg]*1	Horizontal	(3000 [mm/s²])	6	17	30	20	40	60	30	45	60	50	60	80
			(2000 [mm/s²])	10	23	35	30	55	70	40	60	80	60	70	90
		Vertical	(3000 [mm/s²])	2	4	8	8	16	30	11	22	43	13	27	53
	Pushing force [N]*2 *3 *4			14 to 38	27 to 74	51 to 141	63 to 122	126 to 238	232 to 452	80 to 189	156 to 370	296 to 707	132 to 283	266 to 553	562 to 1058
	Speed [mm/s]*4			15 to 500	8 to 250	4 to 125	18 to 500	9 to 250	5 to 125	24 to 500	12 to 300	6 to 150	24 to 500	12 to 300	6 to 150
	Max. acceleration/deceleration [mm/s²]			3000											
	Pushing speed [mm/s]*5			50 or less			35 or less			30 or less			30 or less		
	Positioning repeatability [mm]			±0.02											
	Lost motion [mm]*6			0.1 or less											
	Screw lead [mm]			10	5	2.5	12	6	3	16	8	4	16	8	4
	Impact/Vibration resistance [m/s²]*7			50/20											
	Actuation type			Ball screw + Belt (LEY□)/Ball screw (LEY□D)											
	Guide type			Sliding bushing (Piston rod)											
	Operating temperature range [°C]			5 to 40											
	Operating humidity range [%RH]			90 or less (No condensation)											
	Enclosure			IP40 (Excludes the operation hole for the manual override screw on the motor cover when motor option “C” or “W” is selected for motor type “Nil”)											
Electric specifications	Motor size			□28			□42			□56.4			□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 *10			Max. power 43			Max. power 48			Max. power 104			Max. power 106		
Lock unit specifications	Type*9			Non-magnetizing lock											
	Holding force [N]			20	39	78	78	157	294	108	216	421	127	265	519
	Power [W]*10			2.9			5			5			5		
	Rated voltage [V]			24 VDC ±10%											

∗1 Horizontal: The maximum value of the work load. An external guide is necessary to support the load (Friction coefficient of guide: 0.1 or less). The actual work load and transfer speed change according to the condition of the external guide. Also, speed changes according to the work load. Check the “Model Selection” on pages 422 and 423.
Vertical: Speed changes according to the work load. Check the “Model Selection” on pages 421 and 423.
The values shown in ( ) are the acceleration/deceleration.
Set these values to be 3000 [mm/s²] or less.

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

∗3 The pushing force values for LEY16□E are 20% to 65%, for LEY25□E are 30% to 50%, for LEY32□E are 30% to 70%, and for LEY40□E are 35% to 65%. The pushing force values change according to the duty ratio and pushing speed. Check the “Model Selection” on page 424.

∗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 (including the controller). This value can be used for the selection of the power supply.

∗9 With lock only

∗10 For an actuator with lock, add the power for the lock.

Weight

Weight: Top Side Parallel Motor Type

Series	LEY16E							LEY25E									LEY32E										
Stroke [mm]	30	50	100	150	200	250	300	30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	0.75	0.79	0.9	1.04	1.15	1.26	1.37	1.21	1.28	1.45	1.71	1.89	2.06	2.24	2.41	2.59	2.13	2.24	2.53	2.81	3.21	3.5	3.78	4.07	4.36	4.64	4.93

Series	LEY40E										
Stroke [mm]	30	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	2.44	2.55	2.84	3.12	3.52	3.81	4.09	4.38	4.67	4.95	5.24

Weight: In-line Motor Type

Series	LEY16DE							LEY25DE									LEY32DE										
Stroke [mm]	30	50	100	150	200	250	300	30	50	100	150	200	250	300	350	400	30	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	0.72	0.76	0.87	1.01	1.12	1.23	1.34	1.2	1.27	1.44	1.7	1.88	2.05	2.23	2.4	2.58	2.12	2.23	2.52	2.8	3.2	3.49	3.77	4.06	4.35	4.63	4.92

Series	LEY40DE										
Stroke [mm]	30	50	100	150	200	250	300	350	400	450	500
Product weight [kg]	2.43	2.54	2.83	3.11	3.51	3.8	4.08	4.37	4.66	4.94	5.24

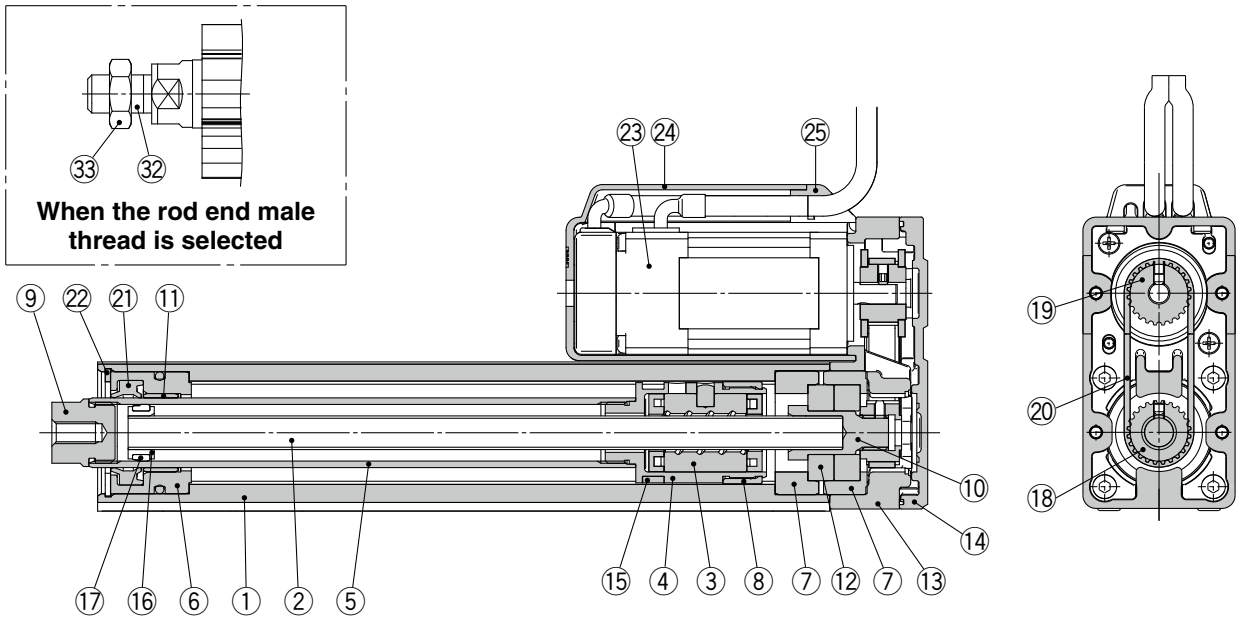
Additional Weight

[kg]

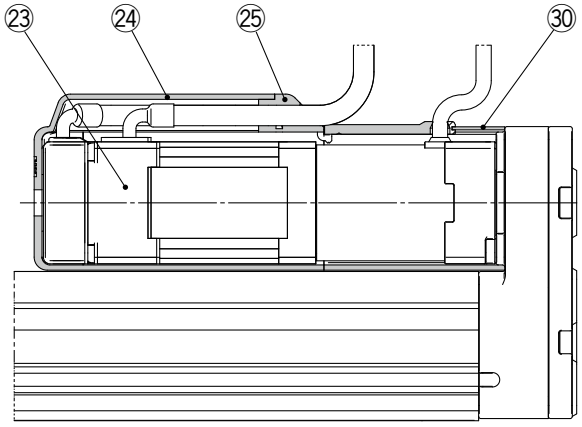
Size		16	25	32	40
Lock/Motor cover		0.16	0.29	0.57	0.57
Rod end male thread	**Male thread**	0.01	0.03	0.03	0.03
	Nut	0.01	0.02	0.02	0.02
Foot bracket (2 sets including mounting bolt)		0.06	0.08	0.14	0.14
Rod flange (including mounting bolt)		0.13	0.17	0.20	0.20
Head flange (including mounting bolt)					
Double clevis (including pin, retaining ring, and mounting bolt)		0.08	0.16	0.22	0.22

Construction

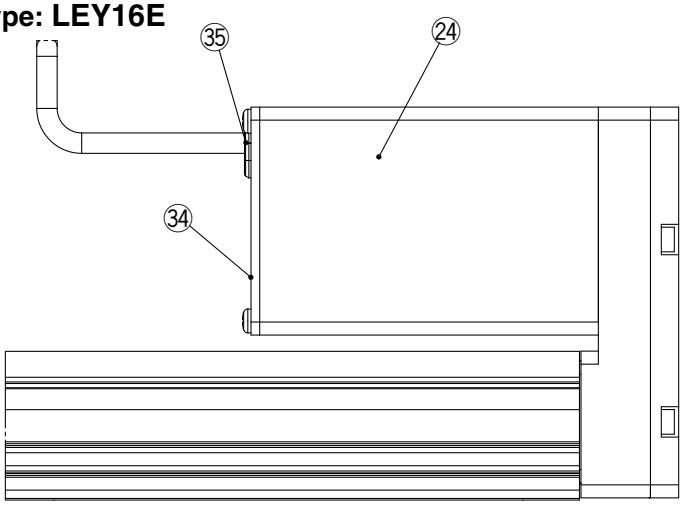
Top side parallel motor type: LEY 25 / 32 / 40 E



Top side parallel motor type, With lock/motor cover

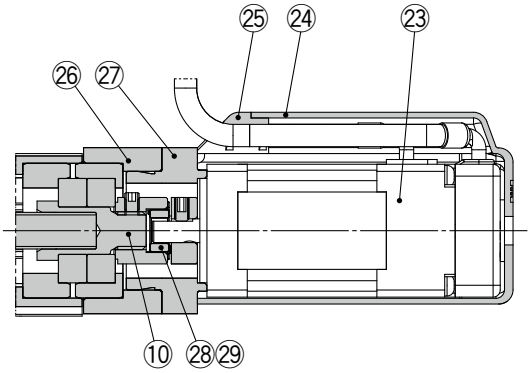


Top side parallel motor type: LEY16E

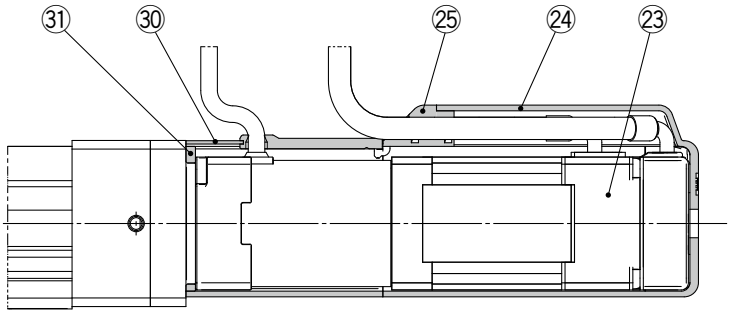


Construction

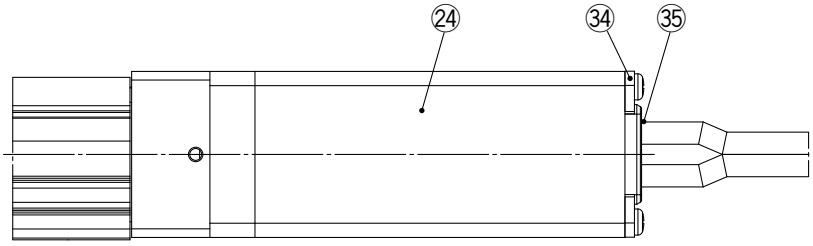
In-line motor type: LEY32DE 25 40



In-line motor type, With lock/motor cover



In-line motor type: LEY16DE



Component Parts

No.	Description	Material	Note
1	**Body**	Aluminum alloy	Anodized
2	**Ball screw shaft**	Alloy steel	
3	**Ball screw nut**	Synthetic resin/Alloy steel	
4	**Piston**	Aluminum alloy	
5	**Piston rod**	Stainless steel	Hard chrome plating
6	**Rod cover**	Aluminum alloy	
7	**Bearing holder**	Aluminum alloy	
8	**Rotation stopper**	Synthetic resin	
9	**Socket**	Free cutting carbon steel	Nickel plating
10	**Connected shaft**	Free cutting carbon steel	Nickel plating
11	**Bushing**	Bearing alloy	
12	**Bearing**	—	
13	**Return box**	Aluminum die-cast	Coating
14	**Return plate**	Aluminum die-cast	Coating
15	**Magnet**	—	
16	**Wear ring holder**	Stainless steel	Stroke 101 mm or more
17	**Wear ring**	Synthetic resin	Stroke 101 mm or more
18	**Screw shaft pulley**	Aluminum alloy	
19	**Motor pulley**	Aluminum alloy	
20	**Belt**	—	
21	**Seal**	NBR	
22	**Retaining ring**	Steel for spring	Phosphate coating
23	**Motor**	—	
24	**Motor cover**	Aluminum alloy	Anodized/LEY16 only
		Synthetic resin	
25	**Grommet**	Synthetic resin	Only “With motor cover”
26	**Motor block**	Aluminum alloy	Anodized
27	**Motor adapter**	Aluminum alloy	Anodized/LEY16, 25 only
28	**Hub**	Aluminum alloy	
29	**Spider**	NBR	
30	**Motor cover with lock**	Aluminum alloy	Only “With lock/motor cover”/LEY25, 32, 40
31	**Cover support**	Aluminum alloy	Only “With lock/motor cover”/LEY25, 32, 40
32	**Socket (Male thread)**	Free cutting carbon steel	Nickel plating
33	**Nut**	Alloy steel	Zinc chromating
34	**End cover**	Aluminum alloy	Anodized/LEY16 only
35	**Rubber bushing**	NBR	LEY16 only

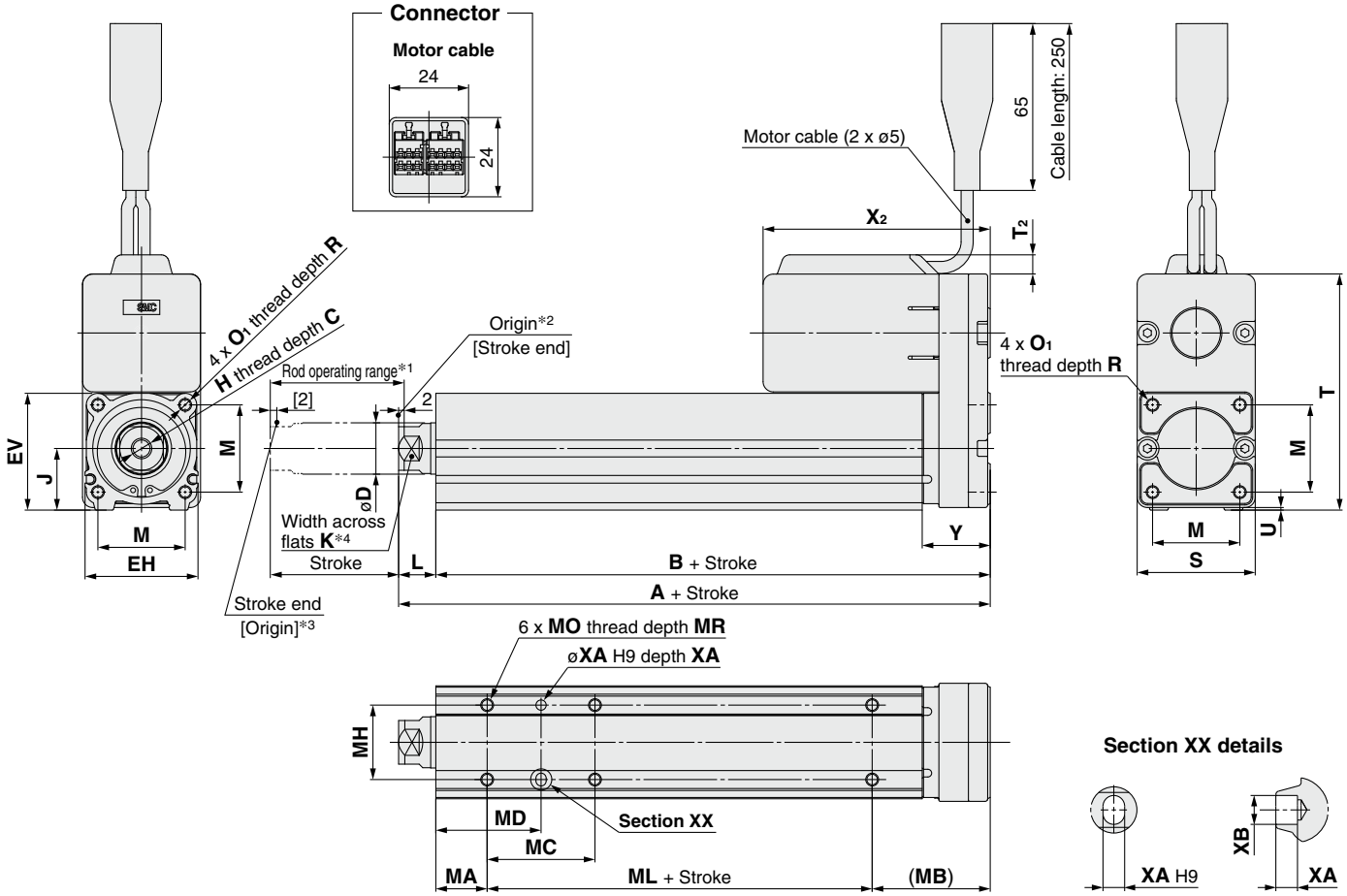
Replacement Parts (Top side parallel only)/Belt

No.	Size	Order no.
20	**16**	LE-D-2-7
	25	LE-D-2-2
	32, 40	LE-D-2-3

Replacement Parts/Grease Pack

Applied portion	Order no.
Piston rod	GR-S-010 (10 g) GR-S-020 (20 g)

Dimensions: Top Side Parallel Motor



*1 This is the range within which the rod can move when it returns to origin. Make sure that workpieces mounted on the rod do not interfere with other workpieces or the facilities around the rod.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 The direction of rod end width across flats (□K) differs depending on the products.

[mm]

Size	Stroke range [mm]	A	B	C	D	EH	EV	H	J	K	L	M	O1	R	S	T	T2	U	V	X2		Y
																				Without lock	With lock	
16	30 to 100	101	90.5	10	16	34	34.3	M5 x 0.8	18	14	10.5	25.5	M4 x 0.7	7	35	90.5	—	0.5	28	100.5	145.5	22.5
	105 to 300	121	110.5																			
25	30 to 100	130.5	116	13	20	44	45.5	M8 x 1.25	24	17	14.5	34	M5 x 0.8	8	46	92	7.5	1	42	88.5	129	26.5
	105 to 400	155.5	141																			
32	30 to 100	148.5	130	13	25	51	56.5	M8 x 1.25	31	22	18.5	40	M6 x 1.0	10	60	118	8.5	1	56.4	98.5	141.5	34
	105 to 500	178.5	160																			
40	30 to 100	148.5	130	13	25	51	56.5	M8 x 1.25	31	22	18.5	40	M6 x 1.0	10	60	118	8.5	1	56.4	120.5	163.5	34
	105 to 500	178.5	160																			

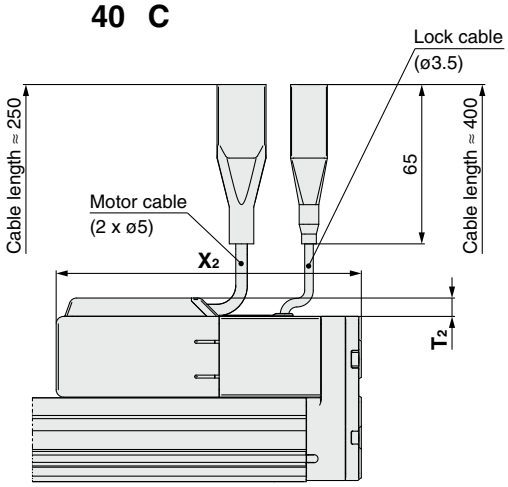
Body Bottom Tapped

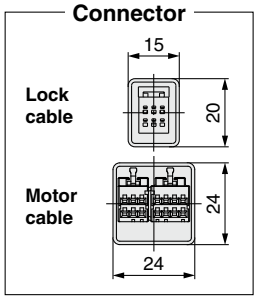
[mm]

Size	Stroke range [mm]	MA	MB	MC	MD	MH	ML	MO	MR	XA	XB
16	30 to 35	15	35.5	17	23.5	23	40	M4 x 0.7	5.5	3	4
	40 to 100			32	31						
	105 to 300			62	46		60				
25	30 to 35	20	46	24	32	29	50	M5 x 0.8	6.5	4	5
	40 to 100			42	41						
	105 to 120						75				
	125 to 200			59	49.5						
	205 to 400			76	58						
32 40	30 to 35	25	55	22	36	30	50	M6 x 1	8.5	5	6
	40 to 100			36	43						
	105 to 120						80				
	125 to 200			53	51.5						
	205 to 500			70	60						

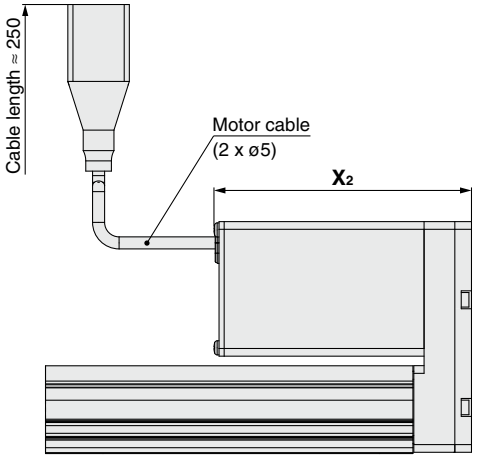
Dimensions: Top Side Parallel Motor

With lock/motor cover: LEY$^{25}_{40}$$^{A}_{C}$EB-□W

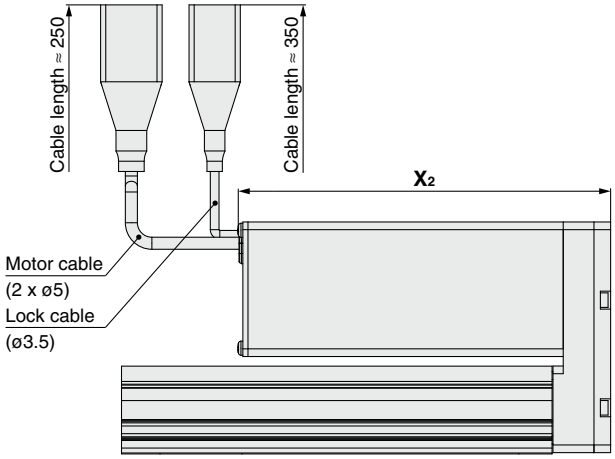




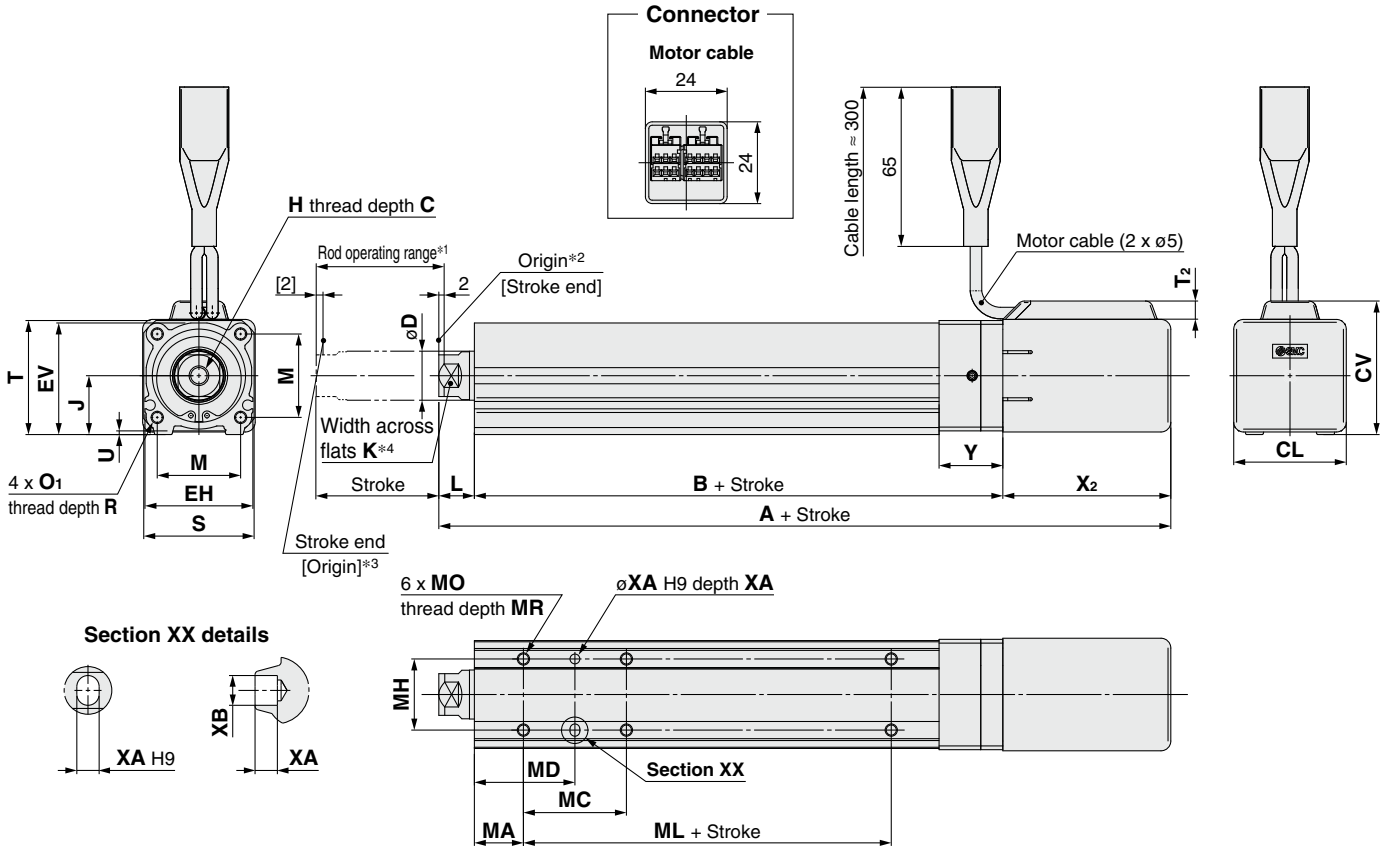
With motor cover: LEY16E$^{A}_{C}$B-□C



With lock/motor cover: LEY16E$^{A}_{C}$B-□W



Dimensions: In-line Motor



*1 This is the range within which the rod can move when it returns to origin. Make sure that workpieces mounted on the rod do not interfere with other workpieces or the facilities around the rod.
*2 Position after returning to origin
*3 [ ] for when the direction of return to origin has changed
*4 The direction of rod end width across flats (□K) differs depending on the products.
*5 Refer to page 456 for motor cover dimensions of the LEY16.

[mm]

Size	Stroke range [mm]	A		B	C	CL	CV	D	EH	EV	H	J	K	L	M	O_1	R	S	T	T_2	U	X_2		Y
		Without lock	With lock																			Without lock	With lock	
16	30 to 100	186.5	231.5	94	10	—	—*6	16	34	34.3	M5 x 0.8	18	14	10.5	25.5	M4 x 0.7	7	35*5	35.5	—	0.5	82	127	26
	105 to 300	206.5	251.5	114																				
25	30 to 100	198.5	239	115.5	13	46	54.5	20	44	45.5	M8 x 1.25	24	17	14.5	34	M5 x 0.8	8	45	46.5	7.5	1.5	68.5	109	26
	105 to 400	223.5	264	140.5																				
32	30 to 100	220	263	128	13	60	69.5	25	51	56.5	M8 x 1.25	31	22	18.5	40	M6 x 1	10	60	61	8.5	1	73.5	116.5	32
	105 to 500	250	293	158																				
40	30 to 100	242	285	128	13	60	69.5	25	51	56.5	M8 x 1.25	31	22	18.5	40	M6 x 1	10	60	61	8.5	1	95.5	138.5	32
	105 to 500	272	315	158																				

*6 Refer to page 456.

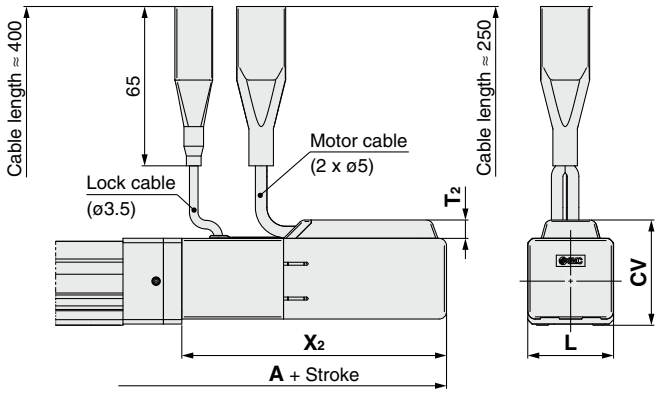
Body Bottom Tapped

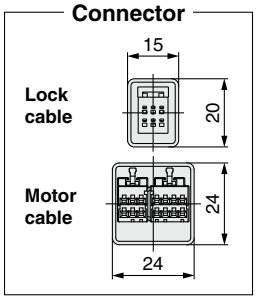
[mm]

Size	Stroke range [mm]	MA	MC	MD	MH	ML	MO	MR	XA	XB
16	30 to 35	15	17	23.5	23	40	M4 x 0.7	5.5	3	4
	40 to 100		32	31						
	105 to 300		62	46		60				
25	30 to 35	20	24	32	29	50	M5 x 0.8	6.5	4	5
	40 to 100		42	41						
	105 to 120					75				
	125 to 200		59	49.5						
	205 to 400		76	58						
32 40	30 to 35	25	22	36	30	50	M6 x 1	8.5	5	6
	40 to 100		36	43						
	105 to 120					80				
	125 to 200		53	51.5						
	205 to 500		70	60						

Dimensions: In-line Motor

With lock/motor cover: LEY25/32/40DEB-□W



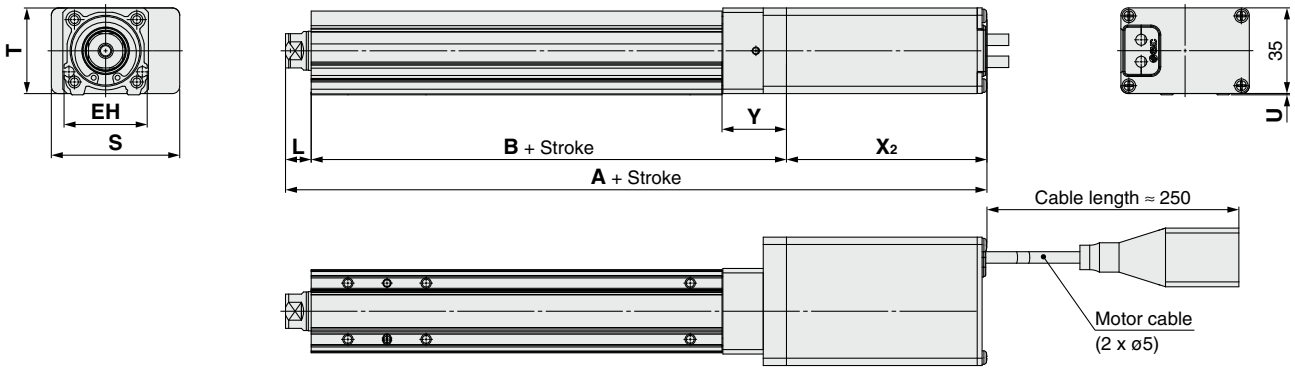


[mm]

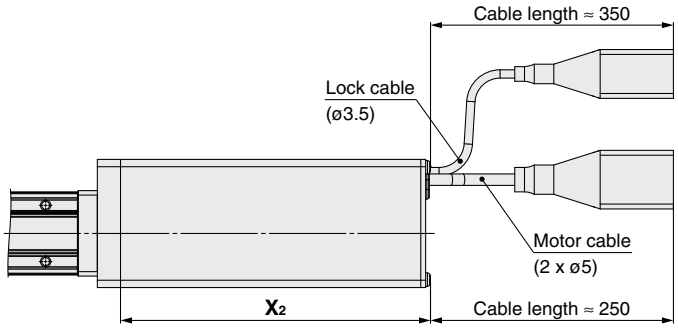
Size	Stroke range	T_2	L	CV
16	Up to 100	7.5	35	—*1
	105 to 300			
25	Up to 100	7.5	46	54.4
	105 to 400			
32	Up to 100	7.5	60	68.5
	105 to 500			
40	Up to 100	7.5	60	68.5
	105 to 500			

*1 Refer to the table below.

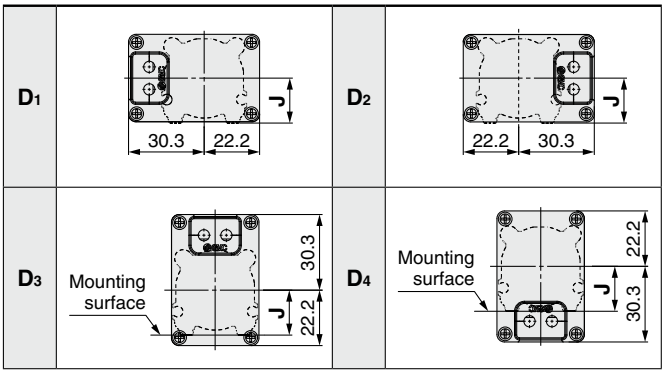
With motor cover: LEY16D□EB-□C



With lock/motor cover: LEY16D□EB-□W



Motor Cover Direction

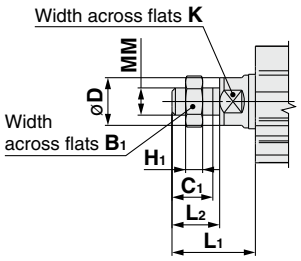


CV Dimensions (Size 16)

Motor cover direction	CV
D_1	35.5
D_2	35.5
D_3	48.3
D_4	40.2

Dimensions

End male thread: LEY16/25/32/40A/C□EB-□□M



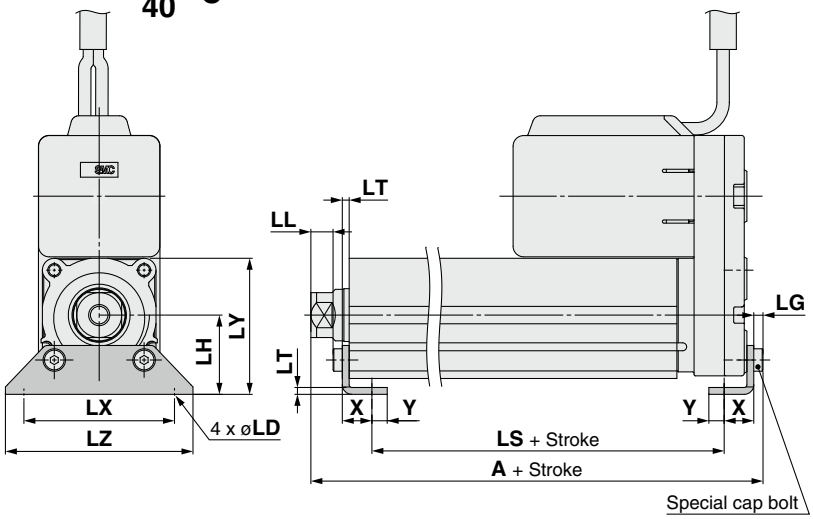
[mm]

Size	B1	C1	øD	H1	K	L1	L2	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, 40	22	20.5	25	8	22	42.0	23.5	M14 x 1.5

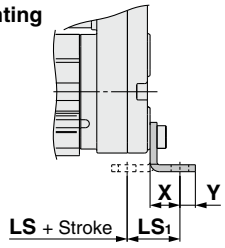
∗ The L1 measurement is when the unit is in the original position. At this position, 2 mm at the end.

∗ Refer to pages 499 and 500 for details on the rod end nut and mounting bracket.
∗ Refer to the “Handling” precautions on pages 574 to 577 when mounting end brackets such as knuckle joint or workpieces.

Foot: LEY16/25/32/40A/CEB-□□□L



Outward mounting



Included parts
· Foot bracket
· Body mounting bolt

Foot

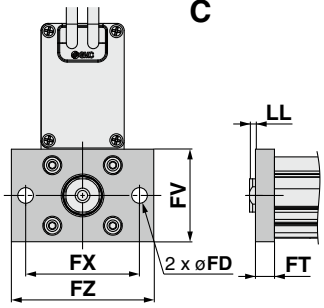
[mm]

Size	Stroke range [mm]	A	LS	LS1	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
	105 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
	105 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
40	105 to 500	185.7	144											

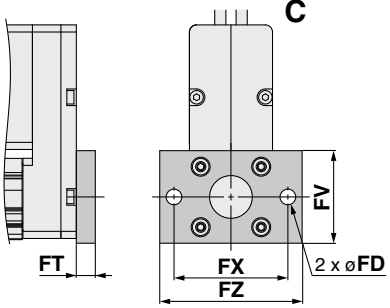
Material: Carbon steel (Chromating)
∗ The A measurement is when the unit is in the original position. At this position, 2 mm at the end.

Dimensions

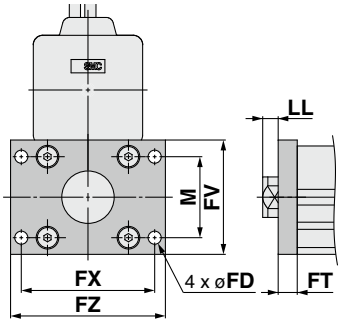
Rod flange: LEY16□EB$^{A}_{C}$-□□□F



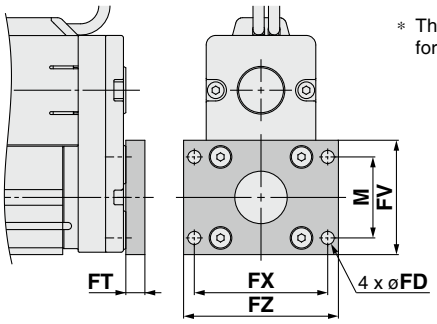
Head flange: LEY16EB$^{A}_{C}$-□□□G



Rod flange: LEY$^{25}_{32}_{40}$□EB$^{A}_{C}$-□□□F



Head flange: LEY25EB$^{A}_{C}$-□□□G



∗ The head flange type is not available for the LEY32/40.

Included parts
· Flange
· Body mounting bolt

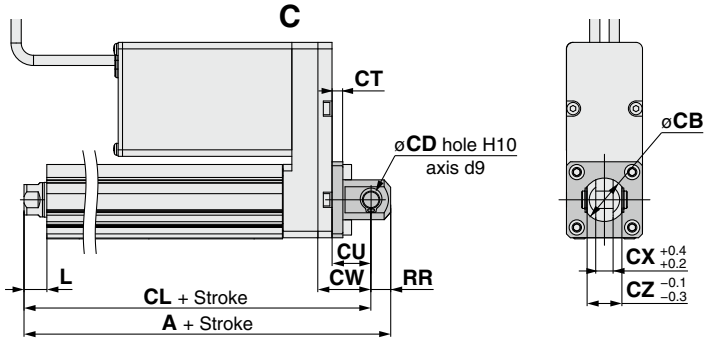
Rod/Head Flange

[mm]

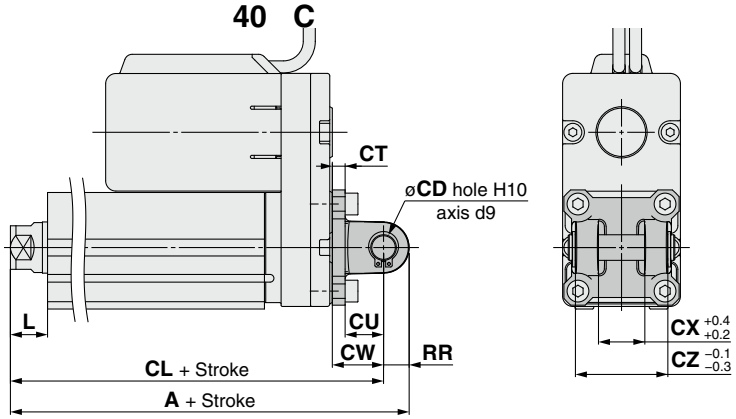
Size	FD	FT	FV	FX	FZ	LL	M
16	6.6	8	39	48	60	2.5	—
25	5.5	8	48	56	65	6.5	34
32, 40	5.5	8	54	62	72	10.5	40

Material: Carbon steel (Nickel plating)

Double clevis: LEY16EB$^{A}_{C}$-□□□D



Double clevis: LEY$^{25}_{32}_{40}$EB$^{A}_{C}$-□□□D



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

∗ Refer to pages 499 and 500 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
	105 to 200	185.5	175.5			
32	30 to 100	180.5	170.5	—	10	6
40	105 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
	105 to 200						
32	30 to 100	14	22	18	36	18.5	10
40	105 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.

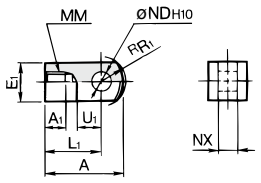
Accessory Mounting Brackets 1

Accessory Brackets/Support Brackets

Single Knuckle Joint

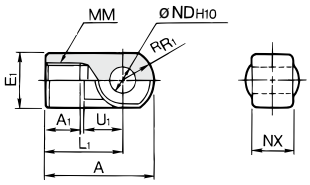
∗ If a knuckle joint is used, select the body option [end male thread].

I-G02



Material: Carbon steel

I-G04
I-G05
I-G10



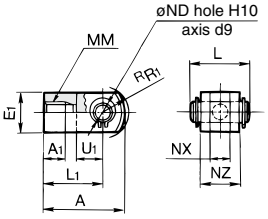
Material: Cast iron

[mm]

Part no.	Applicable size	A	A1	E1	L1	MM	R1	U1	NDH10	NX
I-G02	**16**	34	8.5	□16	25	M8 x 1.25	10.3	11.5	8 $^{+0.058}_{0}$	8 $^{-0.2}_{-0.4}$
I-G04	**25, 32, 40**	42	14	ø22	30	M14 x 1.5	12	14	10 $^{+0.058}_{0}$	18 $^{-0.3}_{-0.5}$
I-G05	**63**	56	18	ø28	40	M18 x 1.5	16	20	14 $^{+0.070}_{0}$	22 $^{-0.3}_{-0.5}$

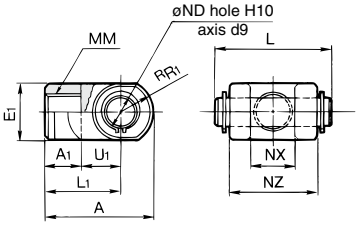
Double Knuckle Joint

Y-G02



Material: Carbon steel

Y-G04
Y-G05
Y-G10



Material: Cast iron

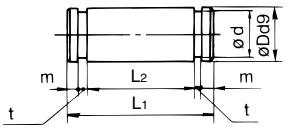
∗ Knuckle pin and retaining ring are included. [mm]

Part no.	Applicable size	A	A1	E1	L1	MM	R1
Y-G02	**16**	34	8.5	□16	25	M8 x 1.25	10.3
Y-G04	**25, 32, 40**	42	16	ø22	30	M14 x 1.5	12
Y-G05	**63**	56	20	ø28	40	M18 x 1.5	16

Part no.	Applicable size	U1	NDH10	NX	NZ	L	Applicable pin part no.
Y-G02	**16**	11.5	8 $^{+0.058}_{0}$	8 $^{+0.4}_{+0.2}$	16	21	**IY-G02**
Y-G04	**25, 32, 40**	14	10 $^{+0.058}_{0}$	18 $^{+0.5}_{+0.3}$	36	41.6	**IY-G04**
Y-G05	**63**	20	14 $^{+0.070}_{0}$	22 $^{+0.5}_{+0.3}$	44	50.6	**IY-G05**

Knuckle Pin

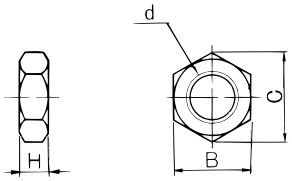
∗ Common with double clevis pin



Material: Carbon steel
[mm]

Part no.	Applicable size	Dd9	L1	L2	d	m	t	Retaining ring
IY-G02	**16**	8 $^{-0.040}_{-0.076}$	21	16.2	7.6	1.5	0.9	Type C retaining ring 8
IY-G04	**25, 32, 40**	10 $^{-0.040}_{-0.076}$	41.6	36.2	9.6	1.55	1.15	Type C retaining ring 10
IY-G05	**63**	14 $^{-0.050}_{-0.093}$	50.6	44.2	13.4	2.05	1.15	Type C retaining ring 14

Rod End Nut



Material: Carbon steel
[mm]

Part no.	Applicable size	d	H	B	C
NT-02	**16**	M8 x 1.25	5	13	15.0
NT-04	**25, 32, 40**	M14 x 1.5	8	22	25.4
NT-05	**63**	M18 x 1.5	11	27	31.2
DA00B7	**100**	M20 x 1.5	12	30	34.6

Mounting Bracket Part Nos.

Mounting bracket	Order qty.	Applicable size					Contents
		16	**25**	**32, 40**	**63**	**100**	
Foot bracket	2∗1	LEY-L016	LEY-L025	LEY-L032	LEY-L063	LEY-L100	Foot bracket x 2 Mounting bolt x 4
Flange	1	LEY-F016	LEY-F025	LEY-F032	LEY-F063	LEY-F100	Flange x 1 Mounting bolt x 4
Double clevis	1	LEY-D016	LEY-D025	LEY-D032	LEY-D063	D5080	Clevis x 1 Mounting bolt x 4 Clevis pin x 1 Type C retaining ring for axis x 2

∗1 When ordering foot brackets, order 2 pieces per actuator.

Simple Joint Brackets

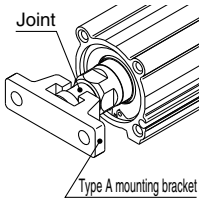
* The joint is not included for type A and type B mounting brackets. Therefore, it must be ordered separately.
* Use with a force of 7800 N or less.

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

Joint **LEY-U025**

Applicable size

025	25, 32, 40



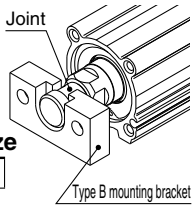
Mounting bracket **YA-03**

Mounting bracket

YA	Type A mounting bracket
YB	Type B mounting bracket

Applicable size

03	25, 32, 40



Allowable Eccentricity [mm]

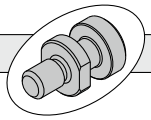
Applicable size	25	32	40
Eccentricity tolerance	±1		
Backlash	0.5		

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

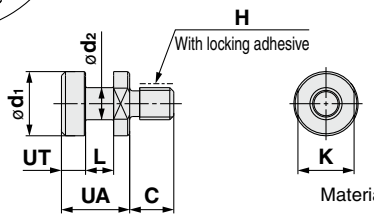
Example) Order no.
- Joint..... LEY-U025
- Type A mounting bracket..... YA-03

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

Applicable size	Joint part no.	Applicable mounting bracket part no.	
		Type A mounting bracket	Type B mounting bracket
25, 32, 40	LEY-U025	YA-03	YB-03



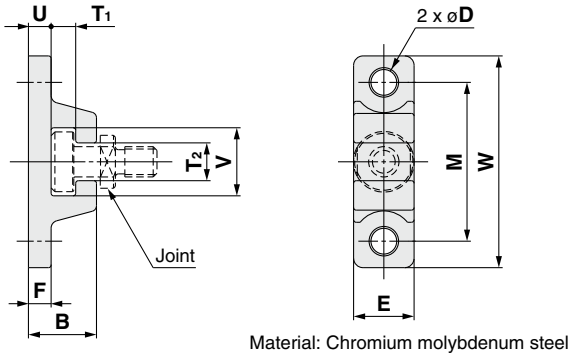
Joint



Material: Stainless steel
[mm]

Part no.	Applicable size	UA	C	d_1	d_2	H	K	L	UT	Weight [g]
LEY-U025	**25, 32, 40**	17	11	16	8	M8 x 1.25	14	7	6	22

Type A Mounting Bracket

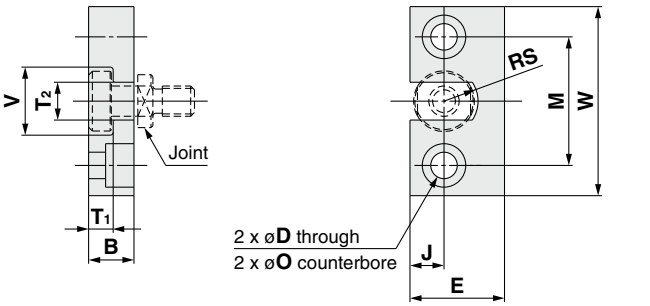


Material: Chromium molybdenum steel
[mm]

Part no.	Applicable size	B	D	E	F	M	T_1	T_2	U
YA-03	**25, 32, 40**	18	6.8	16	6	42	6.5	10	6

Part no.	Applicable size	V	W	Weight [g]
YA-03	**25, 32, 40**	18	56	55

Type B Mounting Bracket



Material: Stainless steel
[mm]

Part no.	Applicable size	B	D	E	J	M	øO
YB-03	**25, 32, 40**	12	7	25	9	34	11.5 depth 7.5

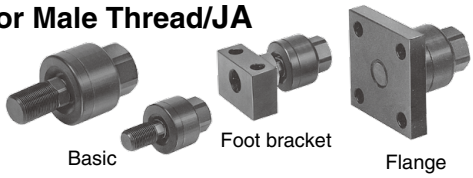
Part no.	Applicable size	T_1	T_2	V	W	RS	Weight [g]
YB-03	**25, 32, 40**	6.5	10	18	50	9	80

Floating Joints (Refer to the **Web Catalog** for details.)

●For Male Thread/JC (Light weight type)

- **With an aluminum case**

●For Male Thread/JA



●For Male Thread/JS (Stainless steel)

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

Applicable size	Thread size
16	M8 x 1.25
25, 32, 40	M14 x 1.5
63	M18 x 1.5

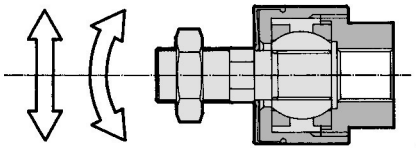
●For Female Thread/JB

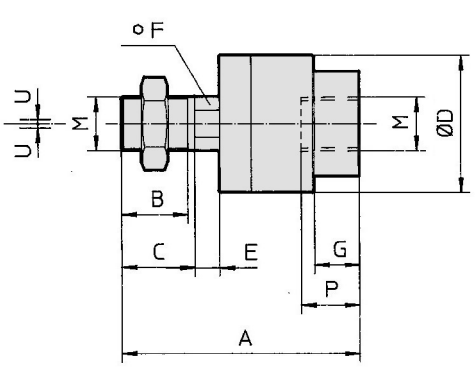
Applicable size	Thread size
16	M5 x 0.8
25, 32, 40	M8 x 1.25
63	M16 x 2
100	M20 x 1.5

Accessory Mounting Brackets 2

Dimensions: Piston Rod Accessories

Floating joint: JA



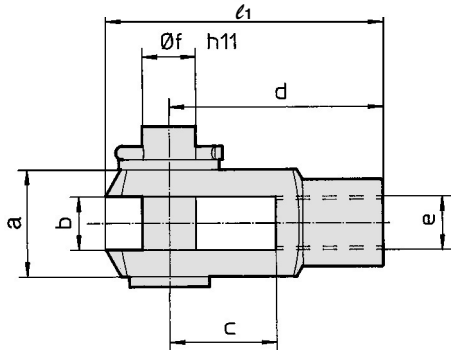


[mm]

Size	Part no.	M	A	B	C	øD	E	F	G	H	P	U	Load [kN]	Weight [g]	Rotating angle
100	**JAH50-20-150**	M20 x 1.5	101	28	31	59.5	11.5	24	16	32	18	2	18	1080	±0.5°

∗ Black color

Rod clevis: GKM (ISO 8140)

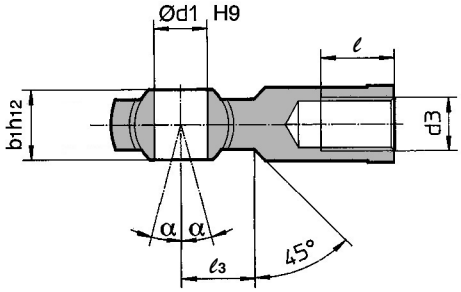


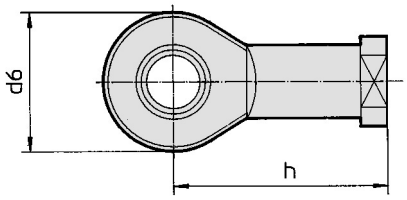
[mm]

Size	Part no.	e	b	d	øf h11 (Shaft)	øf H9 (Hole)	ℓ1	c (Min.)	a (Max.)
100	**GKM20-40**	M20 x 1.5	$20^{+0.5}_{+0.15}$	80	20	20	105	40	40

∗ Supplied with clevis pin and clevis pin bracket

Rod end: KJ (ISO 8139)





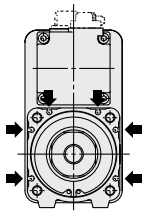
[mm]

Size	Part no.	d3	ød1 H9	h	d6 (Max.)	b1 h12	ℓ (Min.)	α	ℓ3
100	**KJ20D**	M20 x 1.5	20	77	50	25	33	4°	27

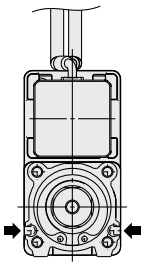
LEY Series
Auto Switch Mounting

Auto Switch Proper Mounting Position

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

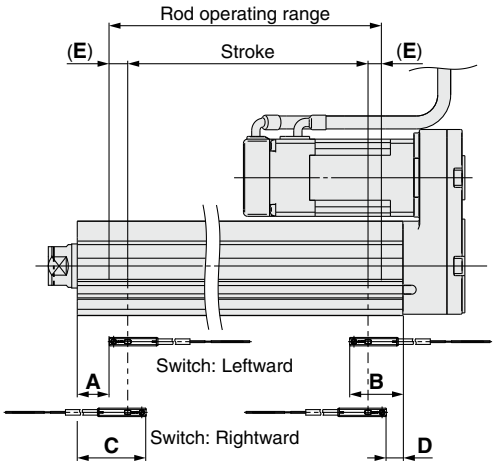


LEY63



LEY16, 25, 32, 40

➡ Switch mounting groove



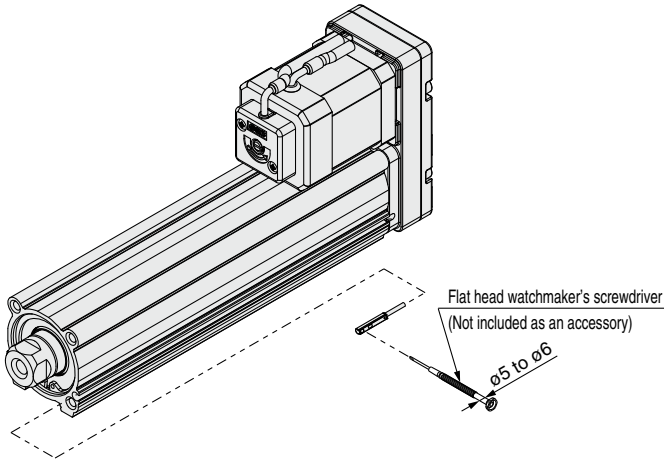
[mm]

Size	Stroke range	Auto switch position				Return to origin distance	Operating range
		Leftward mounting		Rightward mounting			
		A	B	C	D	E	—
16	10 to 100	21.5	46.5	33.5	34.5	(2)	2.9
	105 to 300	41.5		53.5			
25	15 to 100	27	62.5	39	50.5	(2)	4.2
	105 to 400	52		64			
32/40	20 to 100	30.5	65.5	42.5	53.5	(2)	4.9
	105 to 500	60.5		72.5			
63	50 to 200	37	86	49	74	(4)	9.8
	205 to 500	72		84			
	505 to 800	107		119			

* The values in the table to the left 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.
* For LEYG series models (with a guide), an auto switch cannot be mounted on the guide attachment side (rod side).
* 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

Size: 16, 25, 32, 40, 63



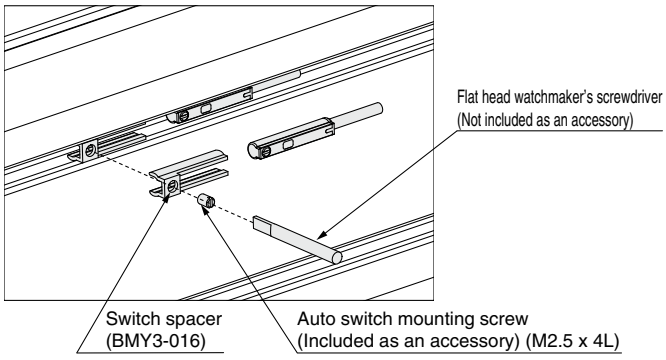
Tightening Torque for Auto Switch Mounting Screw [N·m]

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.

Size: 100

A switch spacer is required in order to mount an auto switch.
When mounting an auto switch, first, hold a switch spacer between your fingers and press it into the slot. When doing this, confirm that it is set in the correct mounting orientation, or reinsert it if necessary. Next, insert the auto switch into the slot and slide it until it is positioned under the switch spacer.
After confirming the mounting position, use a flat head watchmaker's screwdriver to tighten the included auto switch mounting screw.



Switch Spacer Part No.

Switch spacer	BMY3-016

Tightening Torque for Auto Switch Mounting Screw

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

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.**

⚠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□, 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.					
Standard	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]	ø2.6		
Insulator	Number of cores	3 cores (Brown/Blue/Black)		2 cores (Brown/Blue)
	Outside diameter [mm]	ø0.88		
Conductor	Effective area [mm²]	0.15		
	Strand diameter [mm]	ø0.05		
Min. bending radius [mm] (Reference values)		17		

∗ Refer to page 1363 for solid state auto switch common specifications.
∗ Refer to page 1363 for lead wire lengths.

Weight

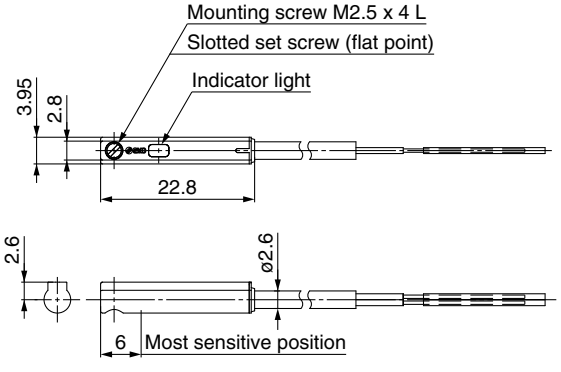
[g]

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

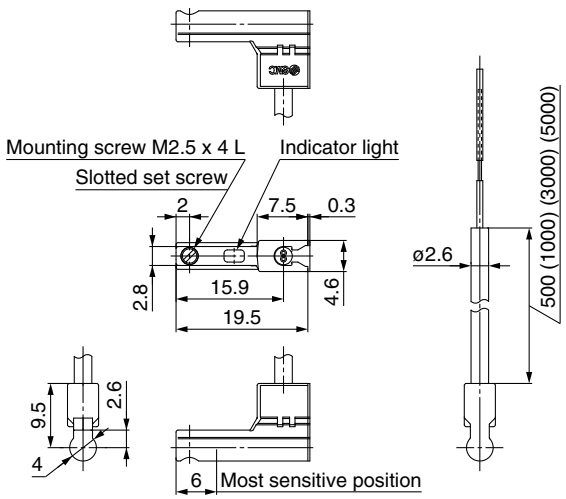
Dimensions

[mm]

D-M9□



D-M9□V



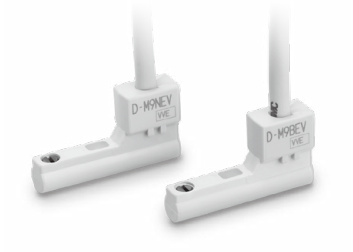
SMC

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.					
Standard	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]	ø2.6		
Insulator	Number of cores	3 cores (Brown/Blue/Black)		2 cores (Brown/Blue)
	Outside diameter [mm]	ø0.88		
Conductor	Effective area [mm²]	0.15		
	Strand diameter [mm]	ø0.05		
Min. bending radius [mm] (Reference values)		17		

∗ Refer to page 1363 for solid state auto switch common specifications.
∗ Refer to page 1363 for lead wire lengths.

Weight

[g]

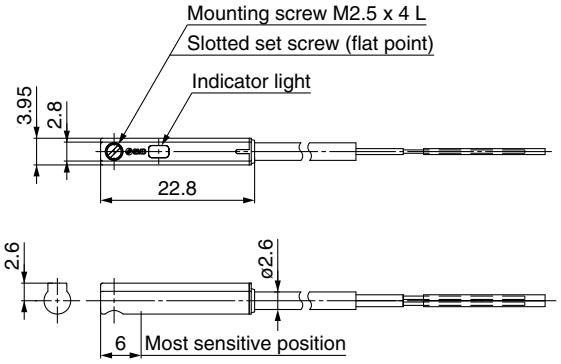
Auto switch model		D-M9NE(V)	D-M9PE(V)	D-M9BE(V)
Lead wire length	0.5 m (**Nil**)	8		7
	1 m (**M**)∗1	14		13
	3 m (**L**)	41		38
	5 m (**Z**)∗1	68		63

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

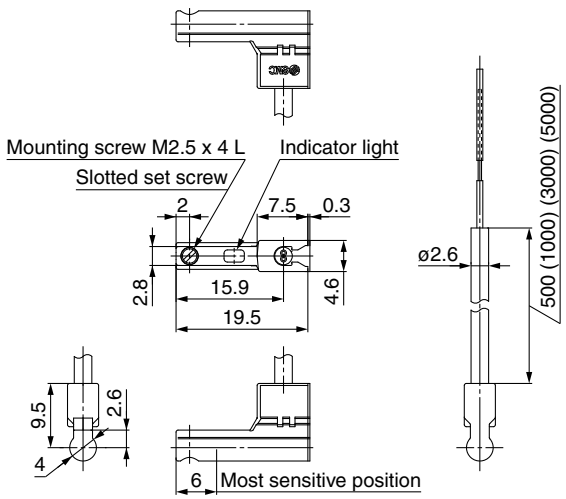
Dimensions

[mm]

D-M9□E



D-M9□EV



2-Color 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 color of the light. (Red → Green ← Red)**

⚠Caution

Precautions

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

Auto Switch 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.					
Standard	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]	ø2.6		
Insulator	Number of cores	3 cores (Brown/Blue/Black)		2 cores (Brown/Blue)
	Outside diameter [mm]	ø0.88		
Conductor	Effective area [mm²]	0.15		
	Strand diameter [mm]	ø0.05		
Min. bending radius [mm] (Reference values)		17		

∗ Refer to page 1363 for solid state auto switch common specifications.
∗ Refer to page 1363 for lead wire lengths.

Weight

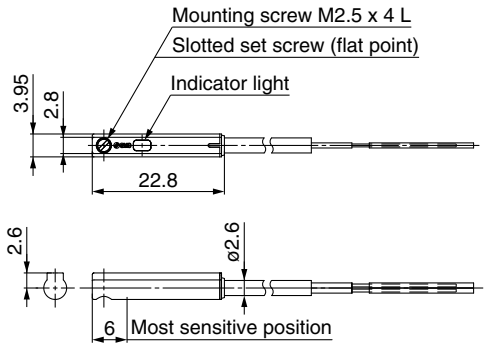
[g]

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

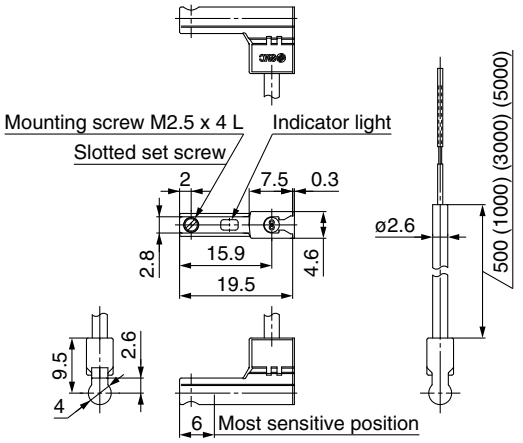
Dimensions

[mm]

D-M9□W



D-M9□WV



SMC

LEY/LEYG Series
Battery-less Absolute Encoder Type Specific Product Precautions

Be sure to read this before handling the products. Refer to page 1351 for safety instructions and pages 1352 to 1357 for electric actuator precautions.

Handling

⚠Caution

1. Absolute encoder ID mismatch error at the first connection

In the following cases, an "ID mismatch error" alarm occurs after the power is turned ON. Perform a return to origin operation after resetting the alarm before use.

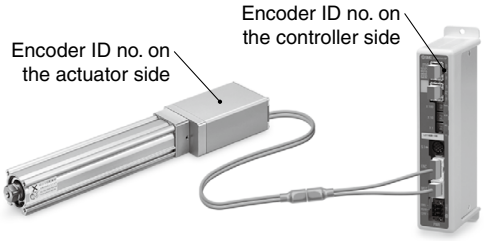
- When an electric actuator is connected and the power is turned ON for the first time after purchase*1
- When the actuator or motor is replaced
- When the controller is replaced

*1 If you have purchased an electric actuator and controller with the set part number, the pairing may have already been completed and the alarm may not be generated.

"ID mismatch error"

Operation is enabled by matching the encoder ID on the electric actuator side with the ID registered in the controller. This alarm occurs when the encoder ID is different from the registered contents of the controller. By resetting this alarm, the encoder ID is registered (paired) to the controller again.

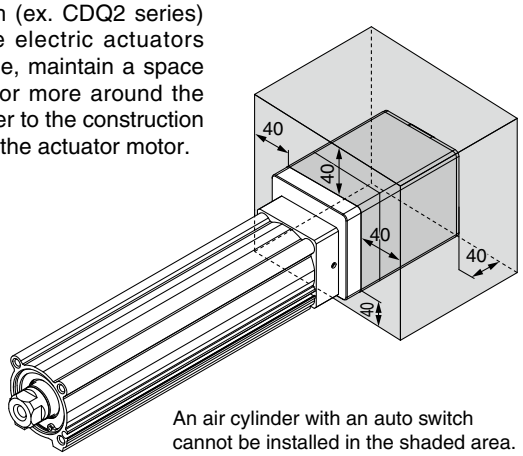
When a controller is changed after pairing is completed				
	Encoder ID no. (* Numbers below are examples.)			
Actuator	17623	17623	17623	17623
Controller	17623	17699	17699	17623
ID mismatch error occurred?	No	Yes	Error reset ⇒ No	



The ID number is automatically checked when the control power supply is turned ON.
An error is output if the ID number does not match.

2. In environments where strong magnetic fields are present, use may be limited.

A magnetic sensor is used in the encoder. Therefore, if the actuator motor is used in an environment where strong magnetic fields are present, malfunction or failure may occur.
Do not expose the actuator motor to magnetic fields with a magnetic flux density of 1 mT or more.
When installing an electric actuator and an air cylinder with an auto switch (ex. CDQ2 series) or multiple electric actuators side by side, maintain a space of 40 mm or more around the motor. Refer to the construction drawing of the actuator motor.

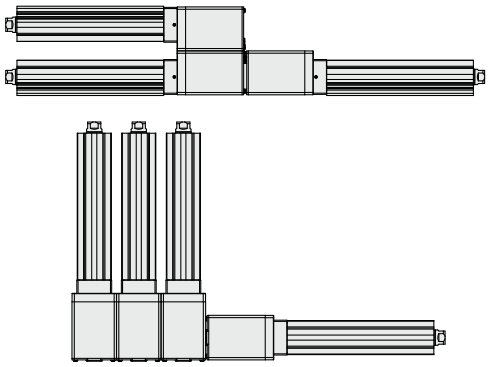


An air cylinder with an auto switch cannot be installed in the shaded area.

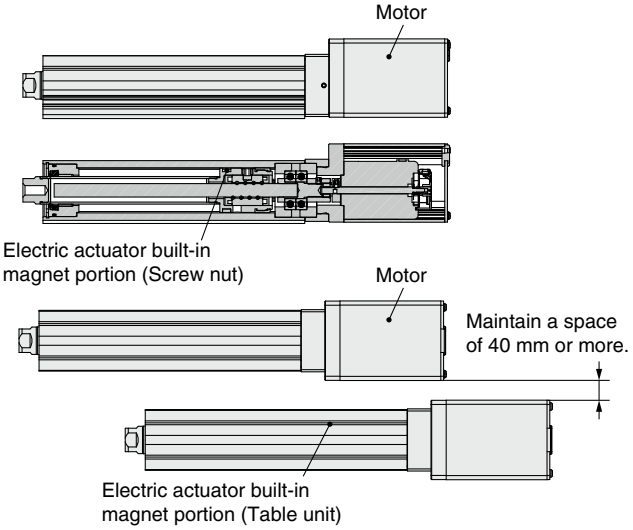
● When lining up actuators

SMC actuators can be used with their motors adjacent to each other. However, for actuators with a built-in auto switch magnet, maintain a space of 40 mm or more between the motors and the position where the magnet passes.
For the LEY series, the magnet is in the piston portion. (Refer to the construction drawings in the catalog for details.)

○ Can be used with their motors adjacent to each other

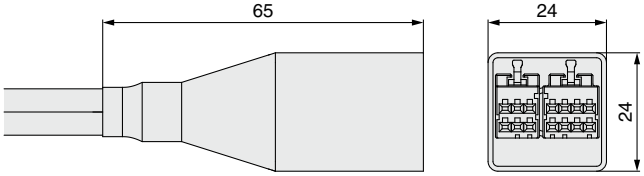


✕ Do not allow the motors to be in close proximity to the position where the magnet passes.



3. The connector size of the motor cable is different from that of the electric actuator with an incremental encoder.

The motor cable connector of an electric actuator with a battery-less absolute encoder is different from that of an electric actuator with an incremental encoder. As the connector cover dimensions are different, take the dimensions below into consideration during the design process.



Battery-less absolute encoder connector cover dimensions