Particle Generation Characteristics

11-LEJS Series ▶ Page 533

Particle Generation Measuring Method

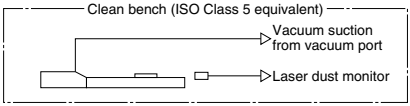
The particle generation data for 11-LEJS series are measured in the following test method.

■Test Method (Example)

Operate the specimen that is placed in an ISO Class 5 equivalent clean bench, and measure the changes of the particle concentration over time until the number of cycles reaches the specified point.

■Measuring Conditions

Measuring instrument	Description	Laser dust monitor (Automatic particle counter by lightscattering method)
	Minimum measurable particle diameter	0.1 μm
	Suction flow rate	28.3 L/min (ANR)
Setting conditions	Sampling time	5 min
	Interval time	55 min
	Sampling air flow	141.5 L (ANR)



Particle generation measuring circuit

■Test Conditions

Size	Speed [mm/s]	Model	Workpiece mass [kg]	Acceleration [mm/s²]	Duty ratio [%]
40	1200	**11-LEJS40□A-200**	4	13000	100
	600	**11-LEJS40□B-200**		10000	
63	1200	**11-LEJS63□A-300**		13000	
	600	**11-LEJS63□B-300**		10000	

∗ Mounting position: Horizontal

■Evaluation Method

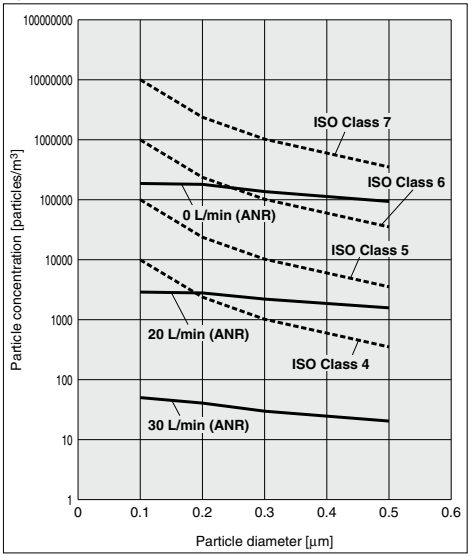
To obtain the measured values of particle concentration, the accumulated value Note 1) of particles captured every 5 minutes, by the laser dust monitor, is converted into the particle concentration in every 1 m^3.
When determining particle generation grades, the 95% upper confidence limit of the average particle concentration (average value), when each specimen is operated at a specified number of cycles Note 2) is considered.
The plots in the graphs indicate the 95% upper confidence limit of the average particle concentration of particles with a diameter within the horizontal axis range.

Note 1) Sampling air flow rate: Number of particles contained in 141.5 L (ANR) of air
Note 2) Actuator: 1 million cycles
Note 3) The particle generation characteristics (Page 532) provide a guide for selection but is not guaranteed.

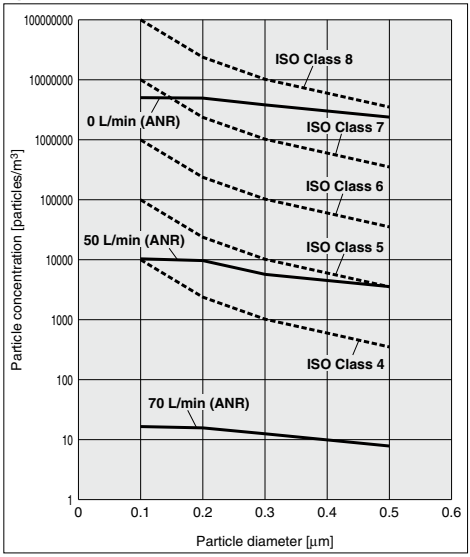
Particle Generation Characteristics

11-LEJS40/Ball Screw Drive

Speed 600 mm/s

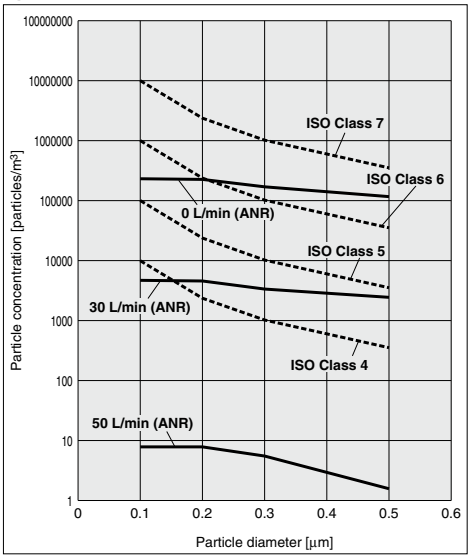


Speed 1200 mm/s

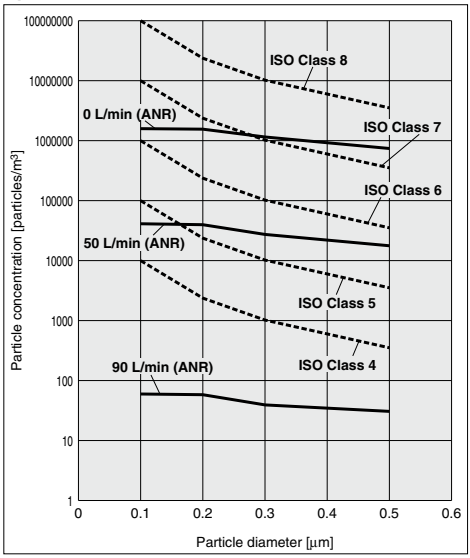


11-LEJS63/Ball Screw Drive

Speed 600 mm/s



Speed 1200 mm/s



Electric Actuator/High Rigidity Slider Type
Ball Screw Drive Clean Room Specification

11-LEJS Series LEJS40, 63

Refer to page 120 for model selection and page 531 for particle generation characteristics.

LECY□ Series ▶ Page 534-1

∗See the table below

How to Order

11 – LEJS H 40 S2 A – 500 □ □ – □ □ □ □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫

Clean series

11	Vacuum type

❶ Accuracy

Nil	Basic type
H	High precision type

❷ Size

40
63

❸ Motor type

Symbol	Type	Output [W]	Actuator size	Compatible driver	UL-compliant
S2∗1	AC servo motor (Incremental encoder)	100	40	LECSA□-S1	—
S3	AC servo motor (Incremental encoder)	200	63	LECSA□-S3	—
S6∗1	AC servo motor (Absolute encoder)	100	40	LECSB□-S5 LECSC□-S5 LECSS□-S5	—
S7	AC servo motor (Absolute encoder)	200	63	LECSB□-S7 LECSC□-S7 LECSS□-S7	—
T6∗2, ∗3	AC servo motor (Absolute encoder)	100	40	LECSB2-T5 LECSC2-T5	—
				LECSS2-T5	●∗3
T7∗3		200	63	LECSB2-T7 LECSC2-T7	—
				LECSS2-T7	●∗3

∗1 For motor type S2 and S6, the compatible driver part number suffixes are S1 and S5 respectively.
∗2 For motor type T6, the compatible driver part number suffix is T5.
∗3 The only compatible drivers complaint with UL standards are the LECSS2-T5 and LECSS2-T7.

❹ Lead [mm]

Symbol	LEJS40	LEJS63
A	16	20
B	8	10

❺ Stroke [mm]∗4

200 to 1500

∗4 Refer to the applicable stroke table for details.

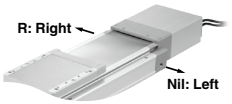
❻ Motor option

Nil	Without option
B	With lock

❼ Vacuum port∗6

Nil	Left
R	Right
D	Both left and right

∗6 Select "D" for the vacuum port for suction of 50 L/min (ANR) or more.



❽ Cable type∗7, ∗8

Nil	Without cable
S	Standard cable
R	Robotic cable (Flexible cable)

∗7 The motor and encoder cables are included. (The lock cable is also included when the motor with lock option is selected.)
∗8 Standard cable entry direction is "(A) Axis side".

❾ Cable length [m]∗7, ∗9

Nil	Without cable
2	2 m
5	5 m
A	10 m

∗9 The length of the encoder, motor and lock cables are the same.

❿ Driver type∗6

	Compatible driver	Power supply voltage [V]	UL-compliant
Nil	Without driver	—	—
A1	LECSA1-S□	100 to 120	—
A2	LECSA2-S□	200 to 230	—
B1	LECSB1-S□	100 to 120	—
B2	LECSB2-S□	200 to 230	—
	LECSB2-T□	200 to 240	—
C1	LECSC1-S□	100 to 120	—
C2	LECSC2-S□	200 to 230	—
	LECSC2-T□		—
S1	LECSS1-S□	100 to 120	—
S2	LECSS2-S□	200 to 230	—
	LECSS2-T□	200 to 240	●

∗6 When the driver type is selected, the cable is included. Select cable type and cable length.
Example) S2S2: Standard cable (2 m) + Driver (LECSS2)
S2 : Standard cable (2 m)
Nil : Without cable and driver

⓫ I/O cable length [m]∗10

Nil	Without cable
H	Without cable (Connector only)
1	1.5

∗10 When "Without driver" is selected for driver type, only "Nil: Without cable" can be selected.
Refer to page 624 if I/O cable is required. (Options are shown on page 624.)

Applicable Stroke Table∗5

●: Standard

Model \ Stroke [mm]	200	300	400	500	600	700	800	900	1000	1200	1500
11-LEJS40	●	●	●	●	●	●	●	●	●	●	—
11-LEJS63	—	●	●	●	●	●	●	●	●	●	●

∗5 Please consult with SMC for non-standard strokes as they are produced as special orders.

For auto switches, refer to pages 142 to 144.

Compatible Driver

Driver type	Pulse input type/ Positioning type	Pulse input type	CC-Link direct input type	SSCNET Ⅲ type	Pulse Input Type	CC-Link Direct Input Type	SSCNETⅢ/H type
Series	LECSA	LECSB	LECSC	LECSS	LECSB-T	LECSC-T	LECSS-T
Number of point tables	Up to 7	—	Up to 255	—	Up to 255	Up to 255 (2 stations occupied)	—
Pulse input	○	○	—	—	○	—	—
Applicable network	—	—	CC-Link	SSCNET Ⅲ	—	CC-Link	SSCNET Ⅲ/H
Control encoder	Incremental 17-bit encoder	Absolute 18-bit encoder	Absolute 18-bit encoder	Absolute 18-bit encoder	Absolute 22-bit encoder	Absolute 18-bit encoder	Absolute 22-bit encoder
Communication function	USB communication	USB communication, RS422 communication	USB communication, RS422 communication	USB communication	USB communication, RS422 communication		USB communication
Power supply voltage [V]	100 to 120 VAC (50/60 Hz), 200 to 230 VAC (50/60 Hz)				200 to 240 VAC (50/60 Hz)	200 to 230 VAC (50/60 Hz)	200 to 240 VAC (50/60 Hz)
Reference page	Page 607						

Specifications

11-LEJS40, 63 AC Servo Motor

Model				11-LEJS40S$^{\frac{2}{3}}$/T6		11-LEJS63S$^{\frac{2}{3}}$/T7	
Actuator specifications	Stroke [mm] Note 1)			200, 300, 400, 500, 600, 700, 800 900, 1000, 1200		300, 400, 500, 600, 700, 800, 900 1000, 1200, 1500	
	Work load [kg] Note 2)		Horizontal	30	55	45	85
			Vertical	5	10	10	20
	Speed Note 3) [mm/s]	Stroke range	Up to 500	1200	600	1200	600
			501 to 600	1050	520	1200	600
			601 to 700	780	390	1200	600
			701 to 800	600	300	930	460
			801 to 900	480	240	740	370
			901 to 1000	390	190	600	300
			1001 to 1100	320	160	500	250
			1101 to 1200	270	130	420	210
			1201 to 1300	—	—	360	180
			1301 to 1400	—	—	310	150
			1401 to 1500	—	—	270	130
	Max. acceleration/deceleration [mm/s^2]			20000 (Refer to pages 124 and 125 for limit according to work load and duty ratio.)			
	Positioning repeatability [mm]		Basic type	±0.02			
			High precision type	±0.01			
	Lost motion [mm] Note 4)		Basic type	0.1 or less			
			High precision type	0.05 or less			
	Lead [mm]			16	8	20	10
	Impact/Vibration resistance [m/s^2] Note 5)			50/20			
	Actuation type			Ball screw			
	Guide type			Linear guide			
	Grease	Ball screw/Linear guide portion		Low particle generation grease			
	Cleanliness class Note 6)			ISO Class 4 (ISO14644-1)			
	Allowable external force [N]			20			
	Operating temperature range [°C]			5 to 40			
	Operating humidity range [%RH]			90 or less (No condensation)			
	Regeneration option			May be required depending on speed and work load. (Refer to page 121.)			
Electric specifications	Motor output [W]/Size [mm]			100/□40		200/□60	
	Motor type			AC servo motor (100/200 VAC)			
	Encoder Note 15)			Motor type S2, S3: Incremental 17-bit encoder (Resolution: 131072 p/rev) Motor type S6, S7: Absolute 18-bit encoder (Resolution: 262144 p/rev) Motor type T6, T7: Absolute 22-bit encoder (Resolution: 4194304 p/rev) (For LECSB-T□, LECSS-T□) Motor type T6, T7: Absolute 18-bit encoder (Resolution: 262144 p/rev) (For LECSC-T□)			
	Power consumption [W] Note 7)		Horizontal	65		80	
			Vertical	165		235	
	Standby power consumption when operating [W] Note 8)		Horizontal	2		2	
			Vertical	10		12	
	Max. instantaneous power consumption [W] Note 9)			445		725	
Lock unit specifications	Type Note 10)			Non-magnetizing lock			
	Holding force [N]			101	203	330	660
	Power consumption [W] at 20°C Note 11)			6.3		7.9	
	Rated voltage [V]			24 VDC $^{0}_{-10\%}$			

Note 1) Please consult with SMC for non-standard strokes as they are produced as special orders.
Note 2) Refer to "Speed–Work Load Graph (Guide)" on page 121 for details.
Note 3) The allowable speed changes according to the stroke.
Note 4) A reference value for correcting an error in reciprocal operation.
Note 5) 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. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Note 6) The amount of particle generation changes according to the operating conditions and suction flow rate. Refer to the particle generation characteristics for details.
Note 7) The power consumption (including the driver) is for when the actuator is operating.
Note 8) The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.
Note 9) The maximum instantaneous power consumption (including the driver) is for when the actuator is operating. This value can be used for the selection of the power supply.
Note 10) Only when motor option "With lock" is selected.
Note 11) For an actuator with lock, add the power consumption for the lock.
Note 12) Sensor magnet position is located in the table center.
For detailed dimensions, refer to "Auto Switch Mounting Position" on page 142.
Note 13) Do not allow collisions at either end of the table traveling distance. Additionally, when running the positioning operation, do not set within 2 mm of both ends.
Note 14) For the manufacture of intermediate strokes, please contact SMC. (11-LEJS40/Manufacturable stroke range: 200 to 1200 mm, 11-LEJS63/Manufacturable stroke range: 300 to 1500 mm)
Note 15) The resolution will change depending on the driver type.

Weight

Model	11-LEJS40									
Stroke [mm]	200	300	400	500	600	700	800	900	1000	1200
Product weight [kg]	5.6	6.4	7.1	7.9	8.7	9.4	10.2	11.0	11.7	13.3
Additional weight with lock [kg]	S2: 0.2/S6: 0.3/T6: 0.2									

Model	11-LEJS63									
Stroke [mm]	300	400	500	600	700	800	900	1000	1200	1500
Product weight [kg]	11.4	12.7	13.9	15.2	16.4	17.7	18.9	20.1	22.6	26.4
Additional weight with lock [kg]	S3: 0.4/S7: 0.7/T7: 0.4									

Electric Actuator/High Rigidity Slider Type Ball Screw Drive

Clean Room Specification

11-LEJS Series LEJS40, 63

Refer to page 120 for model selection and page 531 for particle generation characteristics.

CE RoHS

LECS□ Series ▶ Page 533

How to Order

Dimensions are the same as those of the LECS□ series. For details, refer to page 535 and onwards.

11 – LEJS H 40 V6 A – 500 □ □ – □ □ □ □

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫

Clean series

11	Vacuum type

❶ Accuracy

Nil	Basic type
H	High precision type

❷ Size

40
63

❸ Motor type *1

Symbol	Type	Output [W]	Actuator size	Compatible*2 driver
V6	AC servo motor (Absolute encoder)	100	40	LECYM2-V5 LECYU2-V5
V7	AC servo motor (Absolute encoder)	200	63	LECYM2-V7 LECYU2-V7

*1 For motor type V6, the compatible driver part number suffix is V5.
*2 For details of the driver, refer to page 607.

❹ Lead [mm]

Symbol	LEJS40	LEJS63
A	16	20
B	8	10

❺ Stroke [mm]*3

200 to 1500

*3 Refer to the applicable stroke table for details.

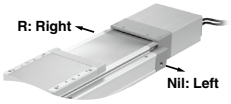
❻ Motor option

Nil	Without option
B	With lock

❼ Vacuum port*5

Nil	Left
R	Right
D	Both left and right

*5 Select "D" for the vacuum port for suction of 50 L/min (ANR) or more.



❽ Cable type*6, *7, *8

Nil	Without cable
S	Standard cable
R	Robotic cable (Flexible cable)

*6 When the driver type is selected, the cable is included. Select cable type and cable length.
Example)
S2S2: Standard cable (2 m) + Driver (LECSS2)
S2: Standard cable (2 m)
Nil: Without cable and driver
*7 The motor and encoder cables are included. (The lock cable is also included when the motor with lock option is selected.)
*8 Standard cable entry direction is "(A) Axis side".

❾ Cable length [m]*6, *9

Nil	Without cable
3	3
5	5
A	10
C	20

*9 The length of the encoder, motor and lock cables are the same.

❿ Driver type*6

	Compatible driver	Power supply voltage [V]
Nil	Without driver	—
M2	LECYM2-V□	200 to 230
U2	LECYU2-V□	200 to 230

⓫ I/O cable length [m]*10

Nil	Without cable
H	Without cable (Connector only)
1	1.5

*10 When "Without driver" is selected for driver type, only "Nil: Without cable" can be selected.
Refer to page 624 if I/O cable is required.
(Options are shown on page 624.)

Applicable Stroke Table*4

●: Standard

Model \ Stroke [mm]	200	300	400	500	600	700	800	900	1000	1200	1500
11-LEJS40	●	●	●	●	●	●	●	●	●	●	—
11-LEJS63	—	●	●	●	●	●	●	●	●	●	●

*4 Please consult with SMC for non-standard strokes as they are produced as special orders.

For auto switches, refer to pages 142 to 144.

Compatible Driver

Driver type	MECHATROLINK-Ⅱ type	MECHATROLINK-Ⅲ type
		
Series	**LECYM**	**LECYU**
Applicable network	MECHATROLINK-Ⅱ	MECHATROLINK-Ⅲ
Control encoder	Absolute 20-bit encoder	
Communication device	USB communication, RS-422 communication	
Power supply voltage [V]	200 to 230 VAC (50/60 Hz)	
Reference page	Page 628-1	

Specifications

AC Servo Motor (100/200 W)

Model				11-LEJS40V6		11-LEJS63V7	
Actuator specifications	Stroke [mm] Note 1)			200, 300, 400, 500, 600, 700, 800 900, 1000, 1200		300, 400, 500, 600, 700, 800, 900 1000, 1200, 1500	
	Work load [kg] Note 2)		Horizontal	30	55	45	85
			Vertical	5	10	10	20
	Speed Note 3) [mm/s]	Stroke range	Up to 500	1200	600	1200	600
			501 to 600	1050	520	1200	600
			601 to 700	780	390	1200	600
			701 to 800	600	300	930	460
			801 to 900	480	240	740	370
			901 to 1000	390	190	600	300
			1001 to 1100	320	160	500	250
			1101 to 1200	270	130	420	210
			1201 to 1300	—	—	360	180
			1301 to 1400	—	—	310	150
			1401 to 1500	—	—	270	130
	Max. acceleration/deceleration [mm/s²]			20000 (Refer to pages 124 and 125 for limit according to work load and duty ratio.)			
	Positioning repeatability [mm]		Basic type	±0.02			
			High precision type	±0.01			
	Lost motion [mm] Note 4)		Basic type	0.1 or less			
			High precision type	0.05 or less			
	Lead [mm]			16	8	20	10
	Impact/Vibration resistance [m/s²] Note 5)			50/20			
	Actuation type			Ball screw			
	Guide type			Linear guide			
	Grease	Ball screw/Linear guide portion		Low particle generation grease			
	Cleanliness class Note 6)			ISO Class 4 (ISO14644-1)			
	Operating temperature range [°C]			5 to 40			
	Operating humidity range [%RH]			90 or less (No condensation)			
	Regenerative resistor			May be required depending on speed and work load. (Refer to page 131-2.)			
Electric specifications	Motor output [W]/Size [mm]			100/□40		200/□60	
	Motor type			AC servo motor (200 VAC)			
	Encoder			Absolute 20-bit encoder (Resolution: 1048576 p/rev)			
	Power consumption [W] Note 7)		Horizontal	65		80	
			Vertical	165		235	
	Standby power consumption when operating [W] Note 8)		Horizontal	2		2	
			Vertical	10		12	
	Max. instantaneous power consumption [W] Note 9)			445		725	
Lock unit specifications	Type Note 10)			Non-magnetizing lock			
	Holding force [N]			101	202	162	324
	Power consumption at 20°C [W] Note 11)			5.5		6	
	Rated voltage [V]			24 VDC $^{+10\%}_{0}$			

Note 1) Please consult with SMC for non-standard strokes as they are produced as special orders.
Note 2) Refer to "Speed–Work Load Graph (Guide)" on page 131-2 for details.
Note 3) The allowable speed changes according to the stroke.
Note 4) A reference value for correcting an error in reciprocal operation.
Note 5) 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. (Test was performed with the actuator in the initial state.)
Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz. Test was performed in both an axial direction and a perpendicular direction to the lead screw. (Test was performed with the actuator in the initial state.)
Note 6) The amount of particle generation changes according to the operating conditions and suction flow rate. Refer to the particle generation characteristics for details.
Note 7) The power consumption (including the driver) is for when the actuator is operating.
Note 8) The standby power consumption when operating (including the driver) is for when the actuator is stopped in the set position during the operation.
Note 9) The maximum instantaneous power consumption (including the driver) is for when the actuator is operating. This value can be used for the selection of the power supply.
Note 10) Only when motor option "With lock" is selected.
Note 11) For an actuator with lock, add the power consumption for the lock.
Note 12) Sensor magnet position is located in the table center.
For detailed dimensions, refer to "Auto Switch Mounting Position".
Note 13) Do not allow collisions at either end of the table traveling distance. Additionally, when running the positioning operation, do not set within 2 mm of both ends.
Note 14) For the manufacture of intermediate strokes, please contact SMC. (11-LEJS40/Manufacturable stroke range: 200 to 1200 mm, 11-LEJS63/Manufacturable stroke range: 300 to 1500 mm)

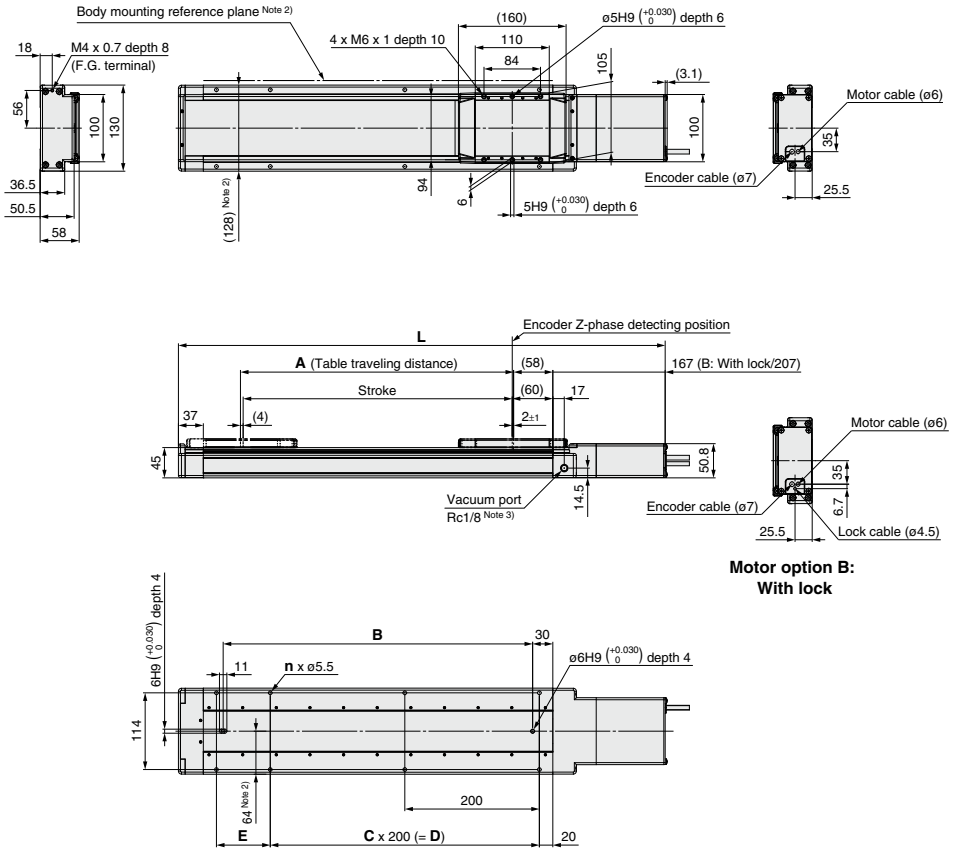
Weight

Model	11-LEJS40									
Stroke [mm]	200	300	400	500	600	700	800	900	1000	1200
Product weight [kg]	5.6	6.4	7.1	7.9	8.7	9.4	10.2	11.0	11.7	13.3
Additional weight with lock [kg]	0.3 (Absolute encoder)									

Model	11-LEJS63									
Stroke [mm]	300	400	500	600	700	800	900	1000	1200	1500
Product weight [kg]	11.4	12.7	13.9	15.2	16.4	17.7	18.9	20.1	22.6	26.4
Additional weight with lock [kg]	0.7 (Absolute encoder)									

Dimensions: Ball Screw Drive

11-LEJS40



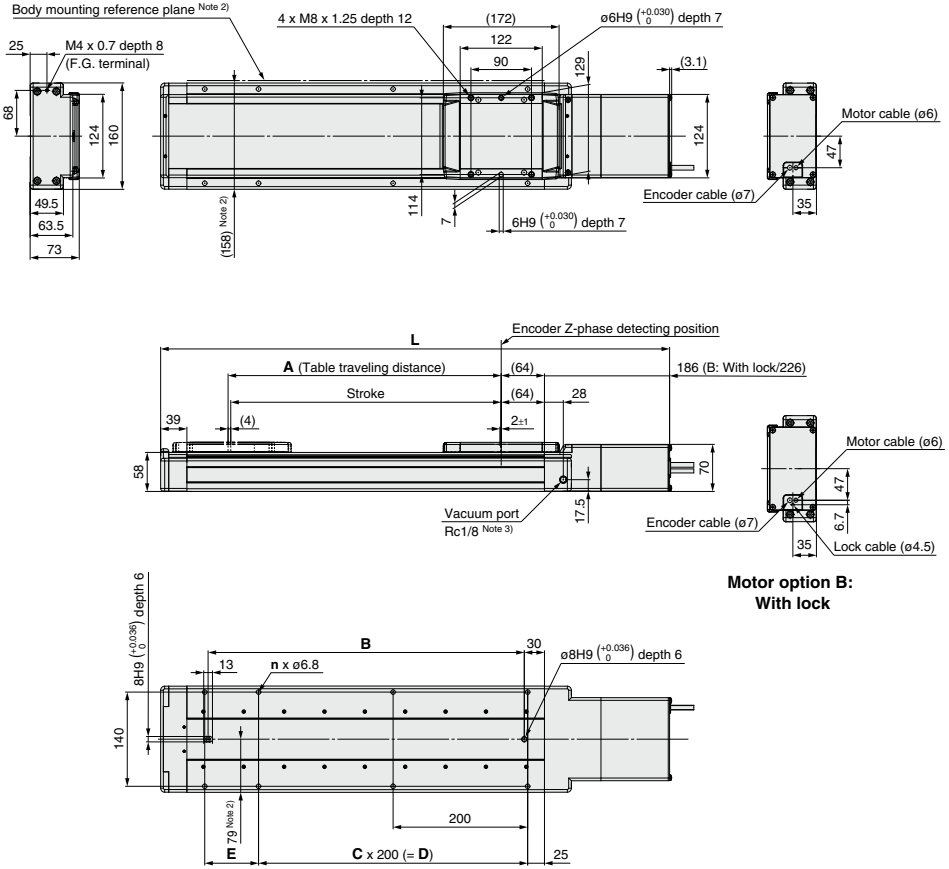
Note 1) Please consult with SMC for adjusting the Z-phase detecting position at the stroke end of the end side.
Note 2) When mounting the actuator using the body mounting reference plane, use a pin. Set the height of the pin to be 5 mm or more because of round chamfering. (Recommended height 6 mm)
Note 3) This drawing shows the left type.
Note 4) The amount of particle generation changes according to the operating conditions and suction flow rate.

[mm]

Model	L		A	B	n	C	D	E
	Without lock	With lock						
11-LEJS40□□□-200□□-□□□□	523.5	563.5	206	260	6	1	200	80
11-LEJS40□□□-300□□-□□□□	623.5	663.5	306	360	6	1	200	180
11-LEJS40□□□-400□□-□□□□	723.5	763.5	406	460	8	2	400	80
11-LEJS40□□□-500□□-□□□□	823.5	863.5	506	560	8	2	400	180
11-LEJS40□□□-600□□-□□□□	923.5	963.5	606	660	10	3	600	80
11-LEJS40□□□-700□□-□□□□	1023.5	1063.5	706	760	10	3	600	180
11-LEJS40□□□-800□□-□□□□	1123.5	1163.5	806	860	12	4	800	80
11-LEJS40□□□-900□□-□□□□	1223.5	1263.5	906	960	12	4	800	180
11-LEJS40□□□-1000□□-□□□□	1323.5	1363.5	1006	1060	14	5	1000	80
11-LEJS40□□□-1200□□-□□□□	1523.5	1563.5	1206	1260	16	6	1200	80

Dimensions: Ball Screw Drive

11-LEJS63



Motor option B: With lock

Note 1) Please consult with SMC for adjusting the Z-phase detecting position at the stroke end of the end side.
Note 2) When mounting the actuator using the body mounting reference plane, use a pin. Set the height of the pin to be 5 mm or more because of round chamfering. (Recommended height 6 mm)
Note 3) This drawing shows the left type.
Note 4) The amount of particle generation changes according to the operating conditions and suction flow rate.

[mm]

Model	L		A	B	n	C	D	E
	Without lock	With lock						
11-LEJS63□□□-300□□-□□□□	656.5	696.5	306	370	6	1	200	180
11-LEJS63□□□-400□□-□□□□	756.5	796.5	406	470	8	2	400	80
11-LEJS63□□□-500□□-□□□□	856.5	896.5	506	570	8	2	400	180
11-LEJS63□□□-600□□-□□□□	956.5	996.5	606	670	10	3	600	80
11-LEJS63□□□-700□□-□□□□	1056.5	1096.5	706	770	10	3	600	180
11-LEJS63□□□-800□□-□□□□	1156.5	1196.5	806	870	12	4	800	80
11-LEJS63□□□-900□□-□□□□	1256.5	1296.5	906	970	12	4	800	180
11-LEJS63□□□-1000□□-□□□□	1356.5	1396.5	1006	1070	14	5	1000	80
11-LEJS63□□□-1200□□-□□□□	1556.5	1596.5	1206	1270	16	6	1200	80
11-LEJS63□□□-1500□□-□□□□	1856.5	1896.5	1506	1570	18	7	1400	180