Traffa

Bedienhandbuch
Elektrischer Zylinder LEY-AC/-X5

paralle Motorausführung

axiale Motorausführung

Innovative Antriebslösungen

Der optimale Antrieb individuell für Ihre Anforderung

SMC®

Operation Manual

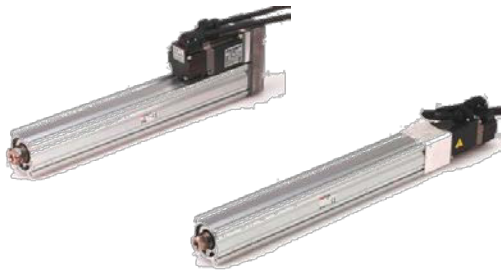| PRODUCT NAME |
| --- |

Electric Actuator ／ Rod Type
《 AC Servo Motor 》

MODEL / Series

LEY Series
Applicable models: **LEY□ , LEYG□**

LEY Series
(Rod type)

LEYG Series
(Guide Rod type)

LECSA
（Pulse input /
Positioning）

LECSC
（CC-Link）

AC Servo Motor Driver
LECS Series

LECSB
（Pulse input）

LECSS
（SSCNETⅢ）
（SSCNETⅢ/H）

SMC Corporation

Contents

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LEY Series / Electric Rod type 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), Japan Industrial Standards (JIS)*1) and other safety regulations*2).

*1) ISO 4414: Pneumatic fluid power -- General rules relating to systems
   ISO 4413: Hydraulic fluid power -- General rules relating to systems
   IEC 60204-1: Safety of machinery -- Electrical equipment of machines (Part 1: General requirements)
   ISO 10218-1992: Manipulating industrial robots -- Safety
   JIS B 8370: General rules for pneumatic equipment.
   JIS B 8361: General rules for hydraulic equipment.
   JIS B 9960-1: Safety of machinery – Electrical equipment for machines. (Part 1: General requirements)
   JIS B 8433-1993: Manipulating industrial robots - Safety. etc.
*2) Labor Safety and Sanitation Law, etc.

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

⚠Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results.

The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product.

This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly.

The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery /equipment until safety is confirmed.

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.

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.

Before machinery /equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1) Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.

2) Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.

3) An application which could have negative effects on people, property, or animals requiring special safety analysis.

4) Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

⚠ LEY Series / Electric Rod type Safety Instructions

⚠ Caution

The product is provided for use in manufacturing industries.
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer /Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*3)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

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.

Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

> ***3)** 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

When the product is exported, strictly follow the laws required by the Ministry of Economy, Trade and Industry (Foreign Exchange and Foreign Trade Control Law).

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1. Procedure before operation

1.1 Preparation

(1) Items to be prepared

Please check on the label, and the quantity of accessories, to confirm that it is the product that was ordered.

Table 1. Componets

No.	Part name	Qty
(1)	Electric Actuator ／LEY Series	1
(2)	Driver / LECS Series	1(in case with driver)
(3)	Motor cable	Pre-installed (1) (in case with cable)
(4)	Encoder cable	
(5)	Lock cable	
(6)	I/O Connector	1(in case with I/O connector)

LECSA(Pulse input / Positioning)

(2) Driver
(3) Motor cable
(5) Lock cable
(4) Encoder cable
DC24V
PC, PLC, etc
(1) Electric Actuator
(6) I/O Connector

LECSB(Pulse input)

(2) Driver
(3) Motor cable
(5) Lock cable
(4) Encoder cable
DC24V
PC, PLC, etc
(1) Electric Actuator
(6) I/O Connector

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LECSC(CC-Link)

(2) Driver

(3) Motor cable

(5) Lock cable

DC24V

(4) Encoder cable

(1) Electric actuator

(6) I/O connector

Host controller, etc
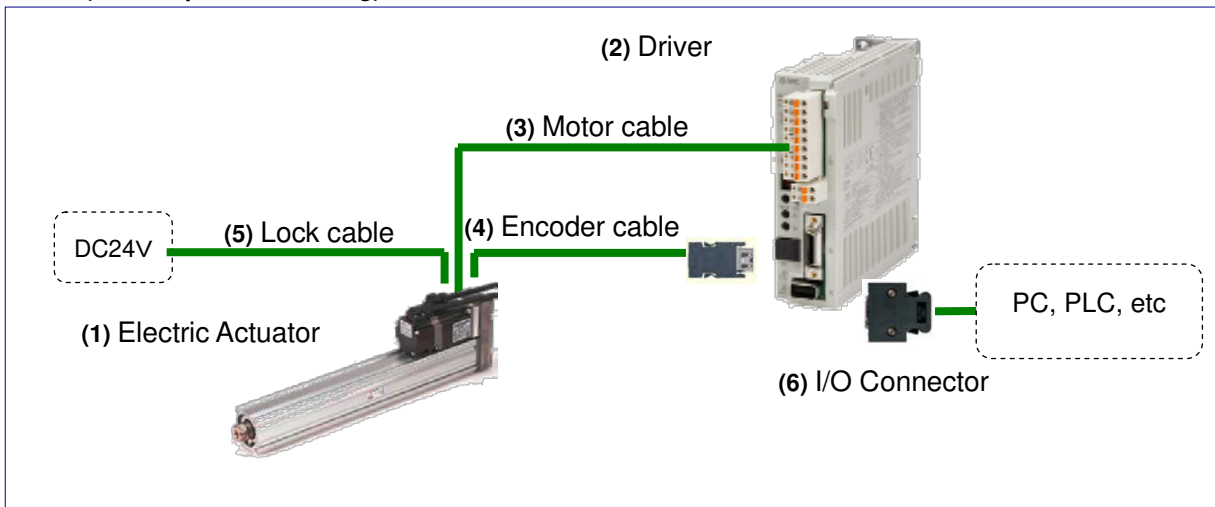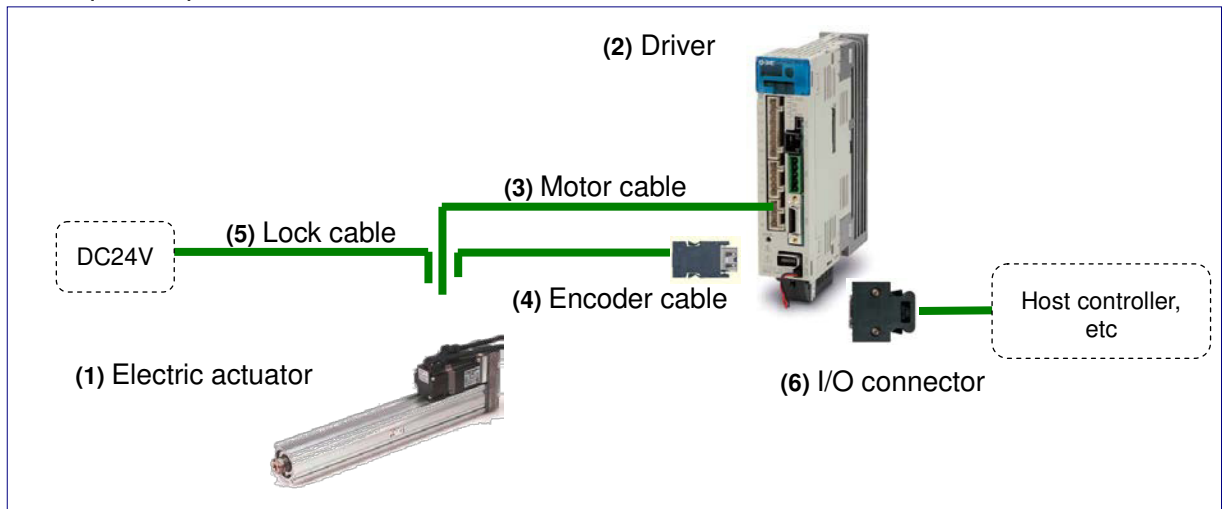
LECSS(SSCNET III) /LECSS-T (SSCNET III / H)

(2) Driver

(3) Motor cable

(5) Lock cable

DC24V

(4) Encoder cable

(1) Electric actuator

(6) I/O connector

Host controller, etc
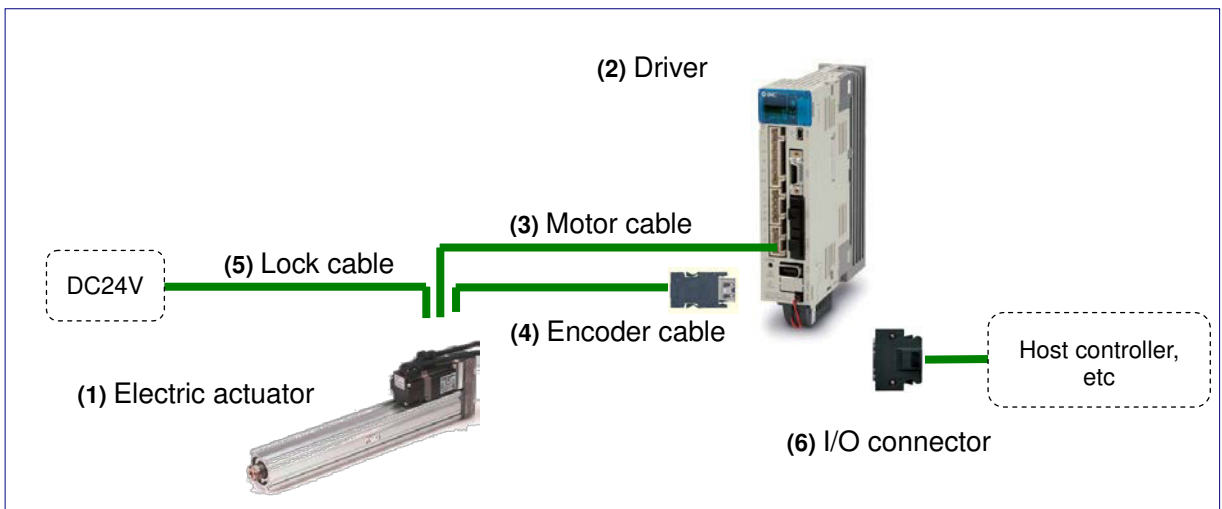
Refer to the " Electric actuator / Common precautions 6.2 Mounting No.11" for details and for cable connection methods.

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1.2 Startup

When switching the power on for the first time, follow the startup procedure below.
Refer to the "Driver operation manual" for wiring method and detailed procedure.

Step	Description
Wiring check	- - - Confirm that the cables to the driver and actuator are connected correctly.
Surrounding environment check	- - - Check the surrounding environment (cable routing and impurity such as wire offcuts or metallic dust) of the driver and the servo motor.
Power-on of the contrd circuit power supply	- - - Follow the procedure shown in the "Driver Operation Manual" to supply power to the product.
I/O signal wiring and cables check during power-on	- - - Check the wiring of the input and output signals and cables[1] according to the procedure shown in the "Driver Operation Manual".
Parameter setting	- - - Set the parameters as necessary, such as selecting the control mode and each control value.
Power-on of the main circuit power supply	- - - Follow the procedure shown in the "Driver Operation Manual" to supply power to the product.
Test operation (JOG operation)	- - - Use the test operation mode (JOG operation) at the slowest speed and check whether the servo motor rotates.[2]
Gain tuning	- - - Operation with a vibration might be done according to the condition. In that case, adjust gain. (Refer to section 1.3)
Actual operation	- - - Check if the cables to the driver and actuator are connected correctly.
Stop	- - - Stops command to stop the operation.

1)CC-Link cable (LECSC), SSCNETIII cable (LECSS)
2)When using test operation mode (JOG operation), the LECSC and LECSS need the
MR-Configurator, the LECSS-T needs the MR-Configurator2.

1.3 Gain tuning

1.3.1 Procedure

Here are the steps for basic gain tuning.
Refer to the "Driver operation manual" for details and for tuning methods other than shown below.

●For LECSA (Pulse input / Positioning)
    A. One-touch tuning
        During motor driving, push "AUTO" button on the front of the driver for three seconds.
        When display panel becomes " $\boxminus\sqcap$ ", push "AUTO" button again.
        ⇒The gain (including filter, etc) is adjusted automatically.
          When the error occurs, refer to the "Driver operation manual".
    B. Auto tuning (Mode1) 1)
        Do this operation, if you are not satisfied with the result of "One-touch tuning".
        Set parameter No.PA08 "001". Afterwards, do 1 and 2 alternately.
            1. Reduce value of parameter No.PA09 to be less than present value.
            2. Operate and ascertain the situation.
        ⇒The gain is adjusted automatically.

●For LECSB (Pulse input), LECSC (CC-Link), LECSS(SSCNETIII)
    A. Adaptive filter II
        Set parameter No.PB01 "0001" and drive the motor.
        ⇒The filter is adjusted automatically.
    B. Auto tuning (Mode1)
        Do this operation, if you are not satisfied with the result of "Adaptive filter II".
        Set parameter No.PA08 "0001". Afterwards, do 1 and 2 alternately.
            1. Reduce value of parameter No.PA09 to be less than present value.
            2. Operate and ascertain the situation.
        ⇒The gain is adjusted automatically.

●For LECSS-T(SSCNET III/H)
    A. Auto tuning (Mode1)
        Set parameter No.PA08 "0001". Afterwards, do 1 and 2 alternately.
            1. Reduce value of parameter No.PA09 to be less than present value.
            2. Operate and ascertain the situation.
        ⇒The gain is adjusted automatically.
    B. Robust filter
        Do this operation, if you are not satisfied with the result of "Auto tuning".
        Set parameter No.PE41 "0001" and drive the motor.
        ⇒The filter is adjusted automatically.

⚠ Warning

A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the appropriate parameter in the initial setting.
Refer to "The recommended the parameter for each driver" for the parameter.

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1)   The auto tuning mode 1 may not be performed properly if the following conditions are not satisfied.
・Time to reach 2,000rpm is the acceleration/deceleration time constant of 5[s] or less.
・Speed is 150rpm or higher.
・Load to motor inertia is 100 times or less.
・The acceleration/deceleration is 10% or more of the rated torque.

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1.3.2 The recommended the parameter for each driver

The recommended the parameter for each driver. Please change the parameter values by use of the customer.Please refer to the manual of the driver for more details.

[LECSA]

Series			LEY25/LEYG25			LEY25D/LEYG25D			LEY32/LEYG32			LEY32D/LEYG32D		
	Lead symbol		A	B	C	A	B	C	A	B	C	A	B	C
	Lead		12	6	3	12	6	3	20	10	5	16	8	4
Parameter	Para. No	Initial value	Recommended value											
Number of command input pulses per revolution *3	PA05	100	100											
Electronic gear numerator *3	PA06	1	100 (Positioning mode: 10)											
Electronic gear denominator *3	PA07	1	12	6	3	12	6	3	20	10	5	16	8	4
Feel length multiplication (STM) (Multiplier)	PE02	0000	0000 (Less than stroke 1000) / 0001 (Stroke 1000 or more)											
Home position return type	PE03	0010	□□□3 (Stopper type)											
Home position return direction	PE03	0010	□□1□(Motor side)											
Home position return Speed (rpm)	PE04	500	150	300	600	150	300	600	90	180	360	112	225	450
Home position return/JOG operation acceleration/deceleration time constants (msec)	PE07	100	600	300	150	600	300	150	1000	500	250	800	400	200
Home position return position data (μm)	PE08	0	-2000(Less than stroke 1000) / -200 (Stroke 1000 or more)											
Stopper type home position return stopper time (msec)	PE10	100	200											
Stopper type home position return torque limit value (%)	PE11	15	30											
Regenerative option	PA02	000	000 (Non)/ 002 (LEC-MR-RB032)											
Rotation direction selection	PA14	0	0 (+:Counter motors side)			1 (+:Counter motors side)			0 (+:Counter motors side)			1 (+:Counter motors side)		
Adaptive tuning mode	PB01	000	000											
Load to motor inertia moment ratio	PB06	7	7											
Machine resonance suppression filter 1	PB13	4500	4500											
Notch shape selection 1	PB14	000	000											

Series			LEY63				LEY63D		
	Lead symbol		A	B	C	L	A	B	C
	Lead		20	10	5	5(2.86) (Pulley raito 4/7)	20	10	5
Parameter	Para. No	Initial value	Recommended value						
Number of command input pulses per revolution *3	PA05	100	100						
Electronic gear numerator *3	PA06	1	100 (10)			35 (7)	100 (10)		
Electronic gear denominator *3	PA07	1	20	10	5	1(2)	20	10	5
Feel length multiplication (STM) (Multiplier)	PE02	0000	0000 (Less than stroke 1000) / 0001 (Stroke 1000 or more)						
Home position return type	PE03	0010	□□□3 (Stopper type)						
Home position return direction	PE03	0010	□□1□(Motor side)						
Home position return Speed (rpm)	PE04	500	90	180	360	629	90	180	360
Home position return/JOG operation acceleration/deceleration time constants (msec)	PE07	100	1000	500	250	143	1000	500	250
Home position return position data (μm)	PE08	0	-4000(Less than stroke 1000) / -400 (Stroke 1000 or more)						
Stopper type home position return stopper time (msec)	PE10	100	200						
Stopper type home position return torque limit value (%)	PE11	15	30						
Regenerative option	PA02	000	000 (Non)/ 002 (LEC-MR-RB032)/ 003 (LEC-MR-RB12)						
Rotation direction selection	PA14	0	0 (+:Counter motors side)				1 (+:Counter motors side)		
Adaptive tuning mode	PB01	000	000						
Load to motor inertia moment ratio	PB06	7	7						
Machine resonance suppression filter 1	PB13	4500	4500						
Notch shape selection 1	PB14	000	000						

*1 Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.

*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.

*3 When the positioning mode is not set: The travel distance of the actuator per 1 pulse should be 10 [μm/pulse]. When the positioning mode is set: The minimum unit of the travel distance of the actuator should be 1 [μm].

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[LECSB]

Series	Lead symbol		LEY25/LEYG25			LEY25D/LEYG25D			LEY32/LEYG32			LEY32D/LEYG32D		
	Lead symbol	A	B	C	A	B	C	A	B	C	A	B	C
	Lead	12	6	3	12	6	3	20	10	5	16	8	4
Parameter	Para. No	Initial value	Recommended value											
Number of command input pulses per revolution *3	PA05	0	0											
Electronic gear numerator *3	PA06	1	32768		65536	32768		65536	32768		65536	32768		
Electronic gear denominator *3	PA07	1	150	75	75	150	75	75	250	125	125	200	100	50
Regenerative option	PA02	0000	0000 (Non)/ 0002 (LEC-MR-RB032)											
Rotation direction selection	PA14	0	0 (+：Counter motors side)			**1 (+：Counter motors side)**			0 (+：Counter motors side)			**1 (+：Counter motors side)**		
Adaptive tuning mode	PB01	0000	0000											
Load to motor inertia moment ratio	PB06	7	7											
Machine resonance suppression filter 1	PB13	4500	4500											
Notch shape selection 1	PB14	0000	0000											

Series	Lead symbol		LEY63				LEY63D		
	Lead symbol	A	B	C	L	A	B	C
	Lead	20	10	5	5(2.86) (Pulley raito 4/7)	20	10	5
Parameter	Para. No	Initial value	Recommended value						
Number of command input pulses per revolution *3	PA05	0	0						
Electronic gear numerator *3	PA06	1	32768		65536	114688	32768		65536
Electronic gear denominator *3	PA07	1	250	125	125	125	250	125	125
Regenerative option	PA02	0000	0000 (Non)/ 0002 (LEC-MR-RB032)/ 0003 (LEC-MR-RB12)						
Rotation direction selection	PA14	0	0 (+：Counter motors side)				**1 (+：Counter motors side)**		
Adaptive tuning mode	PB01	0000	0000						
Load to motor inertia moment ratio	PB06	7	7						
Machine resonance suppression filter 1	PB13	4500	4500						
Notch shape selection 1	PB14	0000	0000						

*1 Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.

*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.

*3 The travel distance of the actuator per 1 pulse should be 10 [μm/pulse].

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[LECSC]

Series			LEY25/LEYG25			LEY25D/ EYG25D			LEY32/LEYG32			LEY32D/ EYG32D		
	Lead symbol		A	B	C	A	B	C	A	B	C	A	B	C
	Lead		12	6	3	12	6	3	20	10	5	16	8	4
Parameter	Para. No	Initial value	Recommended value											
Electronic gear numerator *3	PA06	1	32768											
Electronic gear enominator *3	PA07	1	1500	750	375	1500	750	375	2500	1250	625	2000	1000	500
Feel length multiplication (STM) (Multiplier)	PA05	0000	0000 (Less than stroke 1000) / 0001 (Stroke 1000 or more)											
Home position return type	PC02	0000	□□□3 （Stopper type）											
Home position return direction	PC03	0001	□□□1 (Motor side)											
Home position return Speed (rpm)	PC04	500	150	300	600	150	300	600	90	180	360	112	225	450
Home position return position data (µm)	PC07	0	-2000(Less than stroke 1000) / -200 (Stroke 1000 or more)											
Stopper type home position return stopper time (msec)	PC09	100	200											
Stopper type home position return torque limit value (%)	PC10	15	30											
Regenerative option	PA02	0000	0000 (Non)/ 0002 (LEC-MR-RB032)											
Rotation direction selection	PA14	0	0 (+：Counter motors side)			1 (+：Counter motors side)			0 (+：Counter motors side)			1 (+：Counter motors side)		
Adaptive tuning mode	PB01	0000	0000											
Load to motor inertia moment ratio	PB06	7	7											
Machine resonance suppression filter 1	PB13	4500	4500											
Notch shape selection 1	PB14	0000	0000											

Series			LEY63				LEY63D		
	Lead symbol		A	B	C	L	A	B	C
	Lead		20	10	5	5(2.86) (Pulley raito 4/7)	20	10	5
Parameter	Para. No	Initial value	Recommended value						
Electronic gear numerator *3	PA06	1	32768			57344	32768		
Electronic gear enominator *3	PA07	1	2500	1250	625	625	2500	1250	625
Feel length multiplication (STM) (Multiplier)	PA05	0000	0000 (Less than stroke 1000) / 0001 (Stroke 1000 or more)						
Home position return type	PC02	0000	□□□3 （Stopper type）						
Home position return direction	PC03	0001	□□□1 (Motor side)						
Home position return speed (rpm)	PC04	500	90	180	360	629	90	180	360
Home position return position data (µm)	PC07	0	-4000(Less than stroke 1000) / -400 (Stroke 1000 or more)						
Stopper type home position return stopper time (msec)	PC09	100	200						
Stopper type home position return torque limit value (%)	PC10	15	30						
Regenerative option	PA02	0000	0000 (Non)/ 0002 (LEC-MR-RB032)/ 0003 (LEC-MR-RB12)						
Rotation direction selection	PA14	0	0 (+：Counter motors side)				1 (+：Counter motors side)		
Adaptive tuning mode	PB01	0000	0000						
Load to motor inertia moment ratio	PB06	7	7						
Machine resonance suppression filter 1	PB13	4500	4500						
Notch shape selection 1	PB14	0000	0000						

*1 Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.

*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.

*3 The minimum unit of the travel distance of the actuator should be 1 [µm].

[LECSS]

Series			LEY25/LEYG25			LEY25D/LEYG25D			LEY32/LEYG32			LEY32D/LEYG32D		
	Lead symbol		A	B	C	A	B	C	A	B	C	A	B	C
	Lead		12	6	3	12	6	3	20	10	5	16	8	4
Parameter	Para. No	Initial value	Recommended value											
Regenerative option	PA02	0000	0000 (Non)/ 0002 (LEC-MR-RB032)											
Rotation direction selection	PA14	0	0 (+：Counter motors side)			1 (+：Counter motors side)			0 (+：Counter motors side)			1 (+：Counter motors side)		
Adaptive tuning mode	PB01	0000	0000											
Load to motor inertia moment ratio	PB06	7	7											
Machine resonance suppression filter 1	PB13	4500	4500											
Notch shape selection 1	PB14	0000	0000											

Series			LEY63				LEY63D		
	Lead symbol		A	B	C	L	A	B	C
	Lead		20	10	5	5(2.86) (Pulley raito 4/7)	20	10	5
Parameter	Para. No	Initial value	Recommended value						
Regenerative option	PA02	0000	0000 (Non)/ 0002 (LEC-MR-RB032)/ 0003 (LEC-MR-RB12)						
Rotation direction selection	PA14	0	0 (+：Counter motors side)			1 (+：Counter motors side)			
Adaptive tuning mode	PB01	0000	0000						
Load to motor inertia moment ratio	PB06	7	7						
Machine resonance suppression filter 1	PB13	4500	4500						
Notch shape selection 1	PB14	0000	0000						

*1 Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.

*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.

* For LECSS, please set the electronic gear with PC, PLC etc. in your application.

[LECSS-T]

Series			LEY25T6 / LEYG25T6			LEY25DT6 / LEYG25DT6			LEY32T7 / LEYG32T7			LEY32DT7 / LEYG32DT7		
	Lead symbol		A	B	C	A	B	C	A	B	C	A	B	C
	Lead		12	6	3	12	6	3	20	10	5	16	8	4
Parameter	Para. No	Initial value	Recommended value											
Regenerative option	PA02	0000	**0000 (Non)/ 0002 (LEC-MR-RB-032)**											
Rotation direction selection	PA14	0	0 (+：Counter motors side)			**1 (+：Counter motors side)**			0 (+：Counter motors side)			**1 (+：Counter motors side)**		
Load to motor inertia moment ratio	PB06	7	7											
Function selection E-3	PE41	0000	0000											

Series			LEY63T8				LEY63DT8		
	Lead symbol		A	B	C	L	A	B	C
	Lead		20	10	5	2.86	20	10	5
Parameter	Para. No	Initial value	Recommended value						
Regenerative option	PA02	0000	**0000 (Non)/ 0002 (LEC-MR-RB-032)/ 0003 (LEC-MR-RB-12)**						
Rotation direction selection	PA14	0	0 (+：Counter motors side)				**1 (+：Counter motors side)**		
Load to motor inertia moment ratio	PB06	7	7						
Function selection E-3	PE41	0000	0000						

*1 Parameter is the recommended value. Please change the parameter to make appropriate value for your operating method.

*2 A mechanical resonance may occur depending on the configuration or the mounting orientation of the transferred object. Please change the parameter in the initial setting.

* For LECSS2-T□, please set the electronic gear with PC, PLC etc. in your application.

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2. Rod type / LEY Series

2.1 Specification

	Model	LEY25* / LEY25D* (Parallel / In-line)			LEY32* (Parallel type)			LEY32D* (In-line type)			LEY63* (Parallel type) / LEY63D* (In-line type)			
	Stroke [mm] Note1)	30, 50, 100, 150, 200, 250,300, 350, 400			30, 50, 100, 150, 200, 250,300, 350, 400, 500			30, 50, 100, 150, 200, 250,300, 350, 400, 500			100, 200, 300, 400, 500, 600, 700, 800			
Actuator specification	Work load [kg] — Horizontal Note 2)	18	50	50	30	60	60	30	60	60	40	70	80	200
	Work load [kg] — Vertical	8	16	30	9	19	37	12	24	46	19	38	72	115
	Thrust [N] Note3) (Set value LEY25/32：15 to 30%) (Set value LEY63 ：15 to 50%) (Set value LEY25T32T：12 to 24%) (Set value LEY63T ：12 to 40%)	65~131	127~255	242~485	79~157	154~308	294~588	98~197	192~385	368~736	156~521	304~1012	573~1910	1003~3343
	Maximum Speed Note4) Range of stroke [mm/s] — to 300	900	450	225	1200	600	300	1000	500	250	1000	500	250	70
	305 to 400	600	300	150										
	405 to 500	-	-	-	800	400	200	640	320	160				
	505 to 600	-	-	-	-	-	-	-	-	-	800	400	200	
	605 to 700	-	-	-	-	-	-	-	-	-	600	300	150	
	705 to 800	-	-	-	-	-	-	-	-	-	500	250	125	
	Pushing speed [mm/s] Note5)	35 or less			30 or less						30 or less			
	acceleration/deceleration [mm/s²]	5,000			5,000						5,000			3,000
	Positioning repeatability [mm]	±0.02[Basic type] / ±0.01[High precision type]												
	Lost motion[mm]	0.1 or less[Basic type] / 0.05 or less[High precision type]												
	Lead[mm] (Including pulley ratio)	12	6	3	20	10	5	16	8	4	20	10	5	2.86
	Impact resistance/vibration Resistance [m/s²] Note6)	50 / 20			50 / 20						50 / 20			
	Drive method	Ball screw and Belt [1:1] / Ball screw			Ball screw and Belt [1.25:1]			Ball screw			Ball screw			Ball screw and Belt [4:7]
	Guide type	Sliding bush (Piston rod part)			Sliding bush (Piston rod part)						Sliding bush (Piston rod part)			
	Operating temperature range [℃]	5 to 40			5 to 40						5 to 40			
	Operating humidity range [%RH]	90 or less(No condensation)			90 or less (No condensation)						90 or less (No condensation)			
Electric specification	Motor output/size	100W／□40			200W／□60						400W／□60			
	Type of Motor	AC servo motor (100/200VAC)			AC servo motor (100/200VAC)						AC servo motor (200VAC)			
	Encoder	[Type of Motor: S2,S3,S4]: Incremental 17bit encoder (Resolution: 131072 p/rev) [Type of Moto: S6,S7,S8]: Absolute 18bit encoder (Resolution: 262144 p/rev) [Type of Moto: T6,T7,T8]: Absolute 22bit encoder (Resolution: 4194304 p/rev)												
Lock specification	Type Note7)	No excitation operating type			No excitation operating type						No excitation operating type			
	Holding force [N]	131	255	607	607	607	588	197	385	736	313	607	1146	2006
	Power consumption [W] at 20℃ Note8)	6.3			7.9			7.9			7.9			
	Rated voltage [V]	24VDC ⁰₋₁₀%			24VDC ⁰₋₁₀%			DC24 ⁰₋₁₀%			DC24 ⁰₋₁₀%			

Note 1) The middle stroke other than the above are produced upon receipt of order.
Note 2) The maximum value of the horizontal workload. (An external guide is necessary[Coefficient of friction:0.1 or less]).
    The actual workload will depend on the type of external guide.
Note 3) Thrust setting range when "thrust control" in torque control mode, etc.   Set it referring to the thrust conversion graph shown in the catalog as a guide.
Note 4) The allowable speed changes by the stroke.
Note 5) Allowable impact speed when "impact work" in torque control mode, etc.
Note 6) Impact resistance: No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
    Vibration resistance: No malfunction occurred in a test ranging between 45 to 2000 Hz, when the actuator was tested in both an axial direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Note 7) Only when the motor option, "with lock", is selected.
Note 8) For an actuator with lock, add the power consumption for the lock.

[Product Weight]
[kg]

Model		LEY25* (Parallel type)											LEY25D* (In-line mounting type)										
Stroke [mm]		30	50	100	150	200	250	300	350	400			30	50	100	150	200	250	300	350	400		
Type of Motor	Incremental Encoder	1.31	1.38	1.55	1.81	1.99	2.16	2.34	2.51	2.69			1.34	1.41	1.58	1.84	2.02	2.19	2.37	2.54	2.72		
	Absolute Encoder	1.37	1.44	1.61	1.87	2.05	2.22	2.40	2.57	2.75			1.40	1.47	1.64	1.90	2.08	2.25	2.43	2.60	2.78		

Model		LEY32* (Parallel type)											LEY32D* (In-line mounting type)										
Stroke [mm]		30	50	100	150	200	250	300	350	400	450	500	30	50	100	150	200	250	300	350	400	450	500
Type of Motor	Incremental Encoder	2.42	2.53	2.82	3.29	3.57	3.85	4.14	4.42	4.70	4.98	5.26	2.44	2.55	2.84	3.31	3.59	3.87	4.16	4.44	4.72	5.00	5.28
	Absolute Encoder	2.36	2.47	2.76	3.23	3.51	3.79	4.08	4.36	4.64	4.92	5.20	2.38	2.49	2.78	3.25	3.53	3.81	4.10	4.38	4.66	4.94	5.22

Model		LEY63* (Parallel type)											LEY63D* (In-line mounting type)										
Stroke [mm]		100	200	300	400	500	600	700	800				100	200	300	400	500	600	700	800			
Type of Motor	Incremental Encoder	5.4	6.6	8.3	9.4	10.5	12.2	13.4	14.5				5.6	6.7	8.4	9.6	10.7	12.4	13.5	14.7			
	Absolute Encoder	5.5	6.7	8.4	9.5	10.6	12.3	13.5	14.6				5.7	6.8	8.5	9.7	10.8	12.5	13.6	14.8			

[Additional weight for lock]
[kg]

Size		25	32	63	Size	25	32	63
Lock	Incremental Encoder	0.20	0.40	0.4	Foot style (Body mounting bolt is included、2sets)	0.08	0.14	0.26
	Absolute Encoder	0.30	0.66	0.6	Rod side flange style (Body mounting bolt is included)	0.17	0.20	0.51
Rod end male thread	Part of male thread	0.03	0.03	0.12	Motor side flange style (Body mounting bolt isincluded)		-	-
	Nut	0.02	0.02	0.04	Double clevis style (Clevis pin, Type C retaining ring for axis, Body mounting bolt is included)	0.16	0.22	0.58

2.2 How to Order

LEY		32		S3	B	−	200					−	S2	A1	
	①	②	③	④	⑤		⑥	⑦	⑧	⑨	⑩		⑪	⑫	⑬	⑭

① Accuracy

Nil	Basic type
H	High precision type

② Size

25
32
63

③ Motor mounting position

Nil	Top mounting type
R	Right side parallel type
L	Left side parallel type
D	In-line type

④ Motor type

Symbol	Type	Output [W]	Size	Compatible driver
S2	AC servo motor (Incremental encoder)	100	25	LECSA□-S1
S3		200	32	LECSA□-S3
S4		400	63	LECSA2-S4
S6	AC servo motor (Absolute encoder)	100	25	LECS[B/C/S]□-S5
S7		200	32	LECS[B/C/S]□-S7
S8		400	63	LECS[B/C/S]2-S8
T6		100	25	LECSS2-T5
T7		200	32	LECSS2-T7
T8		400	63	LECSS2-T8

⑤ Lead[mm]

symbol	LEY25	LEY32	LEY63
A	12	16(20)	20
B	6	8(10)	10
C	3	4(5)	5
L	-	-	-(2.86)

*The values shown in ( ) are the lead for top mounting, right/left side parallel types. (Equivalent lead which includes the pulley ratio)

⑥ Stroke [mm]

30	30
to	to
800	800

⑦ Dust and drip proof option

《Only available for LEY63 》

記号	LEY25/32	LEY63
Nil	Without option	Equivalent to IP5x（Dust proof）
P	−	Equivalent to IP65 (Dust and drip proof) ／with Port for breath

⑧ Motor option

Nil	Without option
B	With lock

⑨ Rod end thread

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

⑩ Mounting

Symbol	Type	Motor mounting Parallel	Motor mounting In-line
Nil	Ends tapped /Body bottom tapped	●	●
L	Foot	●	-
F	Rod flange	●	●
G	Head flange	●	-
D	Double clevis	●	-

* Mounting bracket is shipped together, (but not assembled).
* When mounting styles are [Rod/Head flange] or [Ends tapped] with horizontal cantilever, use it within the Following stroke.
　・LEY25:200 or less ・LEY32:100 or less ・LEY63:400 or less
* In case of [Double clevis], use the actuator within the following stroke limit.
　・LEY25:200 or less ・LEY32：200 or less ・LEY63:300 or less
* "G" Head flange is not available for LEY32

⑪ Actuator cable type

Nil	Without cable
B	Standard cable
R	Robot cable（Flexible cable）

* Motor cable and encoder cable are included. (Lock cable is also included if motor option "With lock" is selected.)

⑫ Cable length [m]

Nil	Without cable
2	2
5	5
A	10

* Common to encoder / motor / lock cable

⑬ Driver type

	Compatible driver	Power supply voltage [V]
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
C1	LECSC1-S□	100 to 120
C2	LECSC2-S□	200 to 230
S1	LECSS1-S□	100 to 120
S2	LECSS2-S□	200 to 230
	LECSS2-T□	200 to 240

・＊ When the driver type is selected, the cable is
・included. Select cable type and cable length.
・Example)
・S2S2: Standard cable (2 m) + Driver (LECSS2)
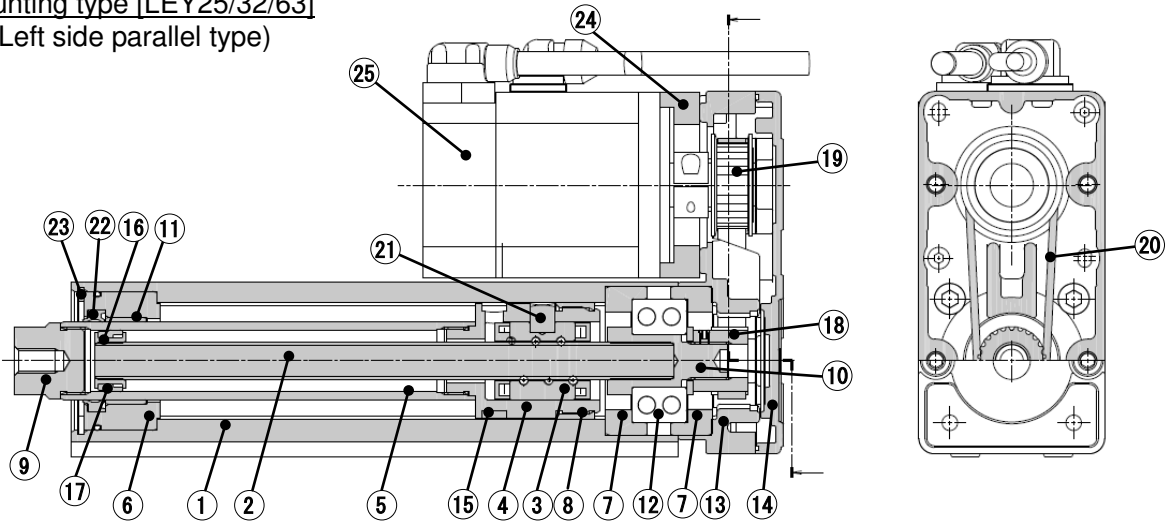・S2 : Standard cable (2 m)
・Nil : Without cable and driver
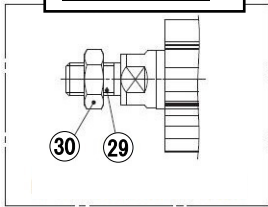
⑭ I/O cable length [m]

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

*Applicable stroke table

Model ＼ Storoke [mm]	30	50	100	150	200	250	300	350	400	450	500	600	700	800
LEY25	●	●	●	●	●	●	●	●	●	-	-	-	-	-
LEY32	●	●	●	●	●	●	●	●	●	●	●	-	-	-
LEY63	-	-	●	-	●	-	●	-	●	-	●	●	●	●

*Consult with SMC for the manufacture of intermediate strokes.
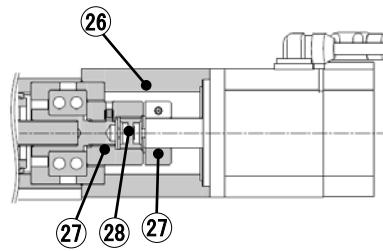
SMC

2.3 Construction

Top mounting type [LEY25/32/63]
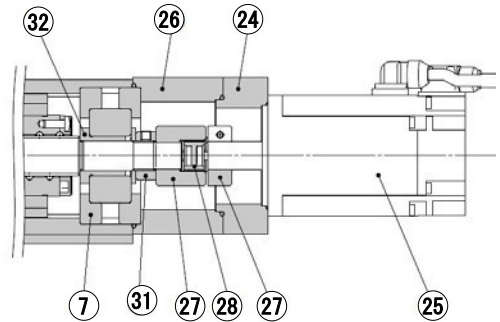(Right / Left side parallel type)

Rod end
male thread

In-line mounting type [LEY25/32]

In-line mounting type [LEY63]

Parts list

No.	Part	Material	Remarks	No.	Part	Material	Remarks
1	Body	Aluminum alloy	Anodized	19	Pulley (For motor)	Aluminum alloy	
2	Ball screw shaft	Alloy steel		20	Belt	-	
3	Ball screw nut	Resin alloy steel		21	Parallel pin	Stainless steel	
4	Piston	Aluminum alloy		22	Rod seal	NBR	
5	Piston rod	Stainless steel	Hard chrome anodized	23	Retaining ring	Steel for spring	Phosphate coated
6	Rod cover	Aluminum alloy		24	Motor adapter	Aluminum alloy	Coating
7	Bearing hplder	Aluminum alloy		25	Motor	-	
8	Rotation stopper	POM		26	Motor block	Aluminum alloy	Coating
9	Socket	Free cutting carbon steels	Nickel plated	27	Hub	Aluminum alloy	
10	Connected shaft	Free cutting carbon steels	Nickel plated	28	Spider	Urethane	Spider
11	Bushing	Bearing alloy		29	Socket (male thread)	Free cutting carbon steels	Nickel plated
12	Bearing	-		30	Nut	Alloy steel	Zinc chormaed
13	Return box	Aluminum die-cast	Coating	31	Lock-nut	Alloy steel	Black dyed
14	Return plate	Aluminum die-cast	Coating	32	Speacer-A	Stainless steel	
15	Magnet	-					
16	Wear ring holder	Stainless steel	Only stroke 101mm or more (LEY63:All strokes)				
17	Wear ring	POM	Only stroke 101mm or more (LEY63:All strokes)				
18	Pulley (For Screw shaft)	Aluminum alloy					

Mounting bracket part number

Size	Foot	Flange	Double clevis
25	LEY-L025	LEY-F025	LEY-D025
32	LEY-L032	LEY-F032	LEY-D032
63	LEY-L063	LEY-F063	LEY-D063

Maintenance parts / belt

Size	Part number
25	LE-D-2-2
32	LE-D-2-4
63[Lead:A/B/C]	LE-D-2-5
63[Lead:L]	LE-D-2-6

/ When ordering foot bracket, order 2 pieces per actuator.
/ Parts belonging to each bracket are as follows.
  Foot, Flange: Body mounting bolt.
  Double clevis: Clevis pin, Type C retaining ring for axis, Body mounting bolt.

3. Guide rod type / LEYG Series

3.1 Specification

Model			LEYG25 M L * / LEYG25 M L D*			LEYG32 M L * (Parallel type)			LEYG32 M L D* (In-line mounting type)		
Actuator specification	Stroke [mm] Note1)		30, 50, 100, 150, 200, 250,300			30, 50, 100, 150, 200, 250,300			30, 50, 100, 150, 200, 250,300		
	Work load [kg]	Horizontal Note 2)	18	50	50	30	60	60	30	60	60
		Vertica	7	15	29	7	17	35	10	22	44
	Thrust [N] Note3) (Set value: 15 to 30%)		65〜131	127〜255	242〜485	79〜157	154〜308	294〜588	98〜197	192〜385	368〜736
	Maximum Speed [mm/s] Note4)	to 300 stroke	900	450	225	1200	600	300	1000	500	250
	Pushing speed [mm/s] Note5)		35 or less			30 or less			30 or less		
	acceleration/deceleration [mm/s^2]		5,000			5,000					
	Positioning repeatability [mm]		±0.02[Basic type] / ±0.01[High precision type]								
	Lost motion[mm]		0.1 or less[Basic type] / 0.05 or less[High precision type]								
	Lead[mm] (Including pulley ratio)		12	6	3	20	10	5	16	8	4
	Impact resistance/vibration Resistance [m/s^2] Note6)		50 / 20			50 / 20					
	Drive method		Ball screw and Belt [1:1]/ Ball screw			Ball screw and Belt [1.25:1]			Ball screw		
	Guide type		Slide bearing (LEYG□M), Ball bushing bearing (LEYG□L)								
	Operating temperature range [℃]		5 to 40			5 to 40					
	Operating humidity range [%RH]		90 or less(No condensation)			90 or less (No condensation)					
Electric specification	Motor output/size		100W／□40			200W／□60					
	Type of Motor		AC servo motor (100/200VAC)			AC servo motor (100/200VAC)					
	Encoder		[Type of Motor: S2,S3]: Incremental 17bit encoder (Resolution: 131072 p/rev) [Type of Moto: S6,S7]: Absolute 18bit encoder (Resolution: 262144 p/rev)								
Lock specification	Type Note7)		No excitation operating type								
	Holding force [N]		131	255	485	157	308	588	197	385	736
	Power consumption [W] at 20℃ Note8)		6.3			7.9			7.9		
	Rated voltage [V]		24VDC $^0_{-10\%}$								

Note 1) The middle stroke other than the above are produced upon receipt of order.
Note 2) The maximum value of the horizontal workload. (An external guide is necessary[Coefficient of friction:0.1 or less]).
         The actual workload will depend on the type of external guide.
Note 3) Thrust setting range when "thrust control" in torque control mode, etc.   Set it referring to the thrust conversion graph shown in the
          catalog as a guide.
Note 4) The allowable speed changes by the stroke.
Note 5) Allowable impact speed when "impact work" in torque control mode, etc.
Note 6) Impact resistance:
          No malfunction occurred when the actuator was tested with a drop tester in both an axial direction and perpendicular direction
          to the lead screw. (The test was performed with the actuator in the initial state.)
       Vibration resistance:
          No malfunction occurred in a test ranging between 45 to 2000 Hz, when the actuator was tested in both an axial
          direction and a perpendicular direction to the lead screw. (The test was performed with the actuator in the initial state.)
Note 7) Only when the motor option, "with lock", is selected.
Note 8) For an actuator with lock, add the power consumption for the lock.

[Product Weight]   [kg]

Model		Guide type	LEYG25*（Parallel type)							LEYG32*（Parallel type）						
Stroke [mm]			30	50	100	150	200	250	300	30	50	100	150	200	250	300
Type of Motor Model	Incremental Encoder	M	1.80	1.99	2.31	2.73	3.07	3.41	3.67	3.24	3.50	4.05	4.80	5.35	5.83	6.28
		L	1.81	2.02	2.26	2.69	2.95	3.27	3.51	3.24	3.51	3.90	4.64	5.06	5.56	5.96
	Absolute Encoder	M	1.86	2.05	2.37	2.79	3.13	3.47	3.73	3.18	3.44	3.99	4.74	5.29	5.77	6.22
		L	1.87	2.08	2.32	2.75	3.01	3.33	3.57	3.18	3.45	3.84	4.58	5.00	5.50	5.90

Model		Guide type	LEYG25D* (In-line mounting type)							LEYG32D* (In-line mounting type)						
Stroke [mm]			30	50	100	150	200	250	300	30	50	100	150	200	250	300
Type of Motor Model	Incremental Encoder	M	1.83	2.02	2.34	2.76	3.10	3.44	3.70	3.26	3.52	4.07	4.82	5.37	5.85	6.30
		L	1.84	2.05	2.29	2.72	2.98	3.30	3.54	3.26	3.53	3.92	4.66	5.08	5.58	5.98
	Absolute Encoder	M	1.89	2.08	2.40	2.82	3.16	3.50	3.76	3.20	3.46	4.01	4.76	5.31	5.79	6.24
		L	1.90	2.11	2.35	2.78	3.04	3.36	3.60	3.20	3.47	3.86	4.60	5.02	5.52	5.92

[Additional weight for lock]   [kg]

Size		25	32
Lock	Incremental Encoder	0.20	0.40
	Absolute Encoder	0.30	0.66

SMC

3.2 How to Order

LEY □ G 32 M □ S3 B − 200 □ □ − S 2 A1 □

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫ ⑬

① Accuracy

Nil	Basic type
H	High precision type

② Size

25
32

③ Bearing type

M	Sliding bearing
L	Ball bushing bearing

④ Motor mounting position

Nil	Top mounting type
D	In-line type

⑤ Motor type

Symbol	Type	Output [W]	Size	Compatible driver
S2	AC servo motor (Incremental encoder)	100	25	LECSA□-S1
S3		200	32	LECSA□-S3
S6	AC servo motor (Absolute encoder)	100	25	LECS[B/C/S]□-S5
S7		200	32	LECS[B/C/S]□-S7
T6		100	25	LECSS□-T5
T7		200	32	LECSS□-T7

⑥ Lead[mm]

symbol	LEY25	LEY32
A	12	16(20)
B	6	8(10)
C	3	4(5)

⑦ Stroke [mm]

30	30
to	to
300	300

⑧ Motor option

Nil	Without option
B	With lock

⑨ Guide option

Nil	Without option
F	With grease holding function

* Only available for slide bearings

⑩ Actuator cable type

Nil	Without cable
B	Standard cable
R	Robot cable (Flexible cable)

* Motor cable and encoder cable are included. (Lock cable is also included if motor option "With lock" is selected.)

⑪ Cable length [m]

Nil	Without cable
2	2
5	5
A	10

* Common to encoder / motor / lock cable

⑫ Driver type

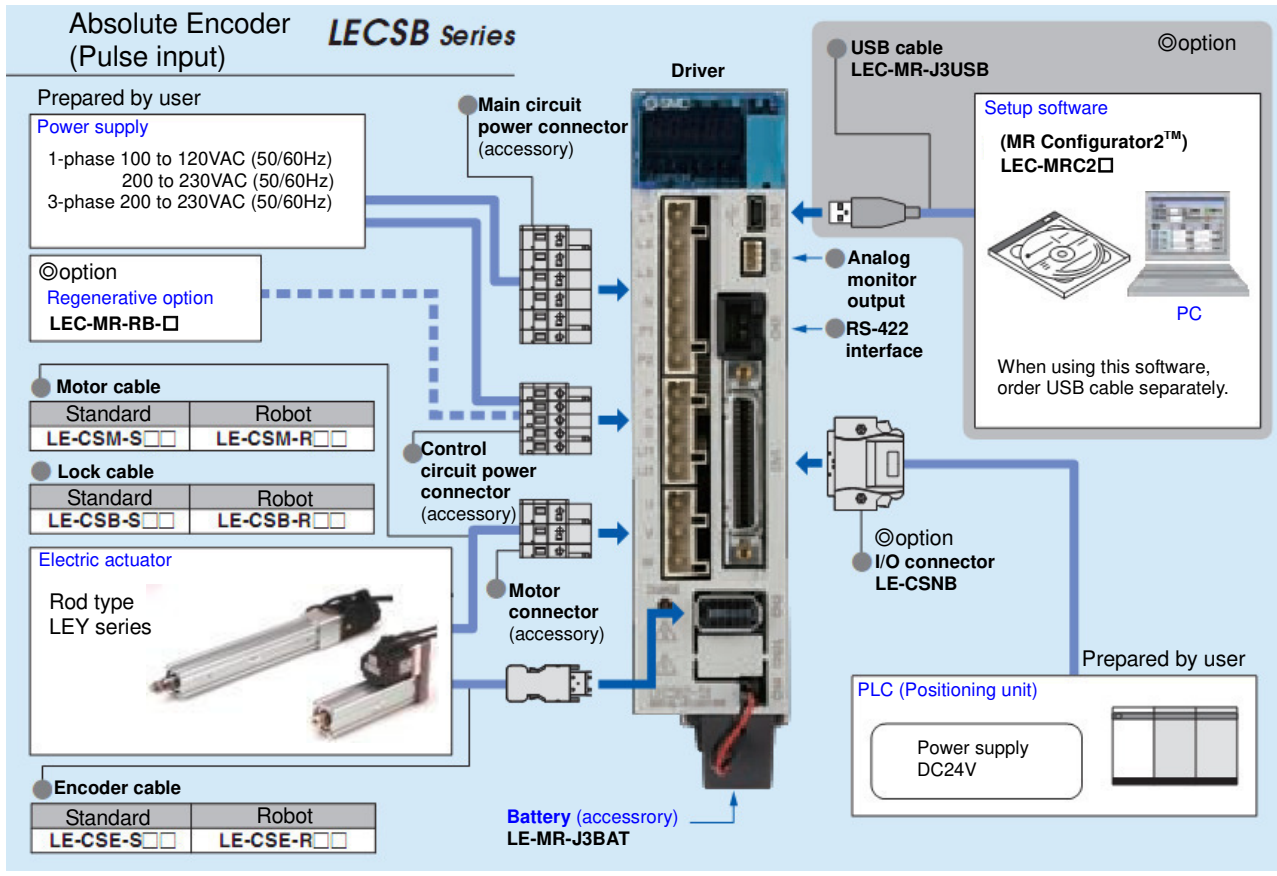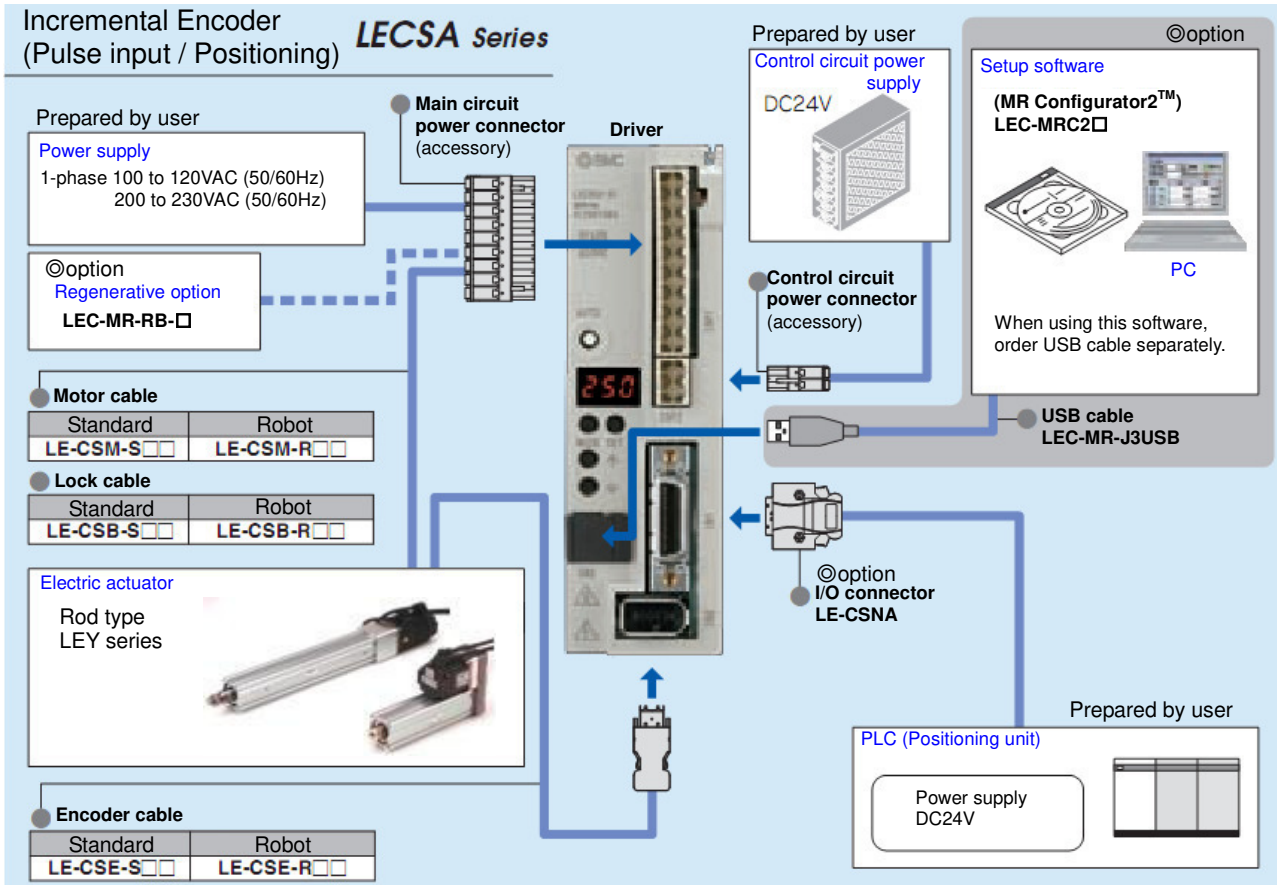|	Compatible driver	Power supply voltage [V]
Nil	Without controller	
A1	LECSA1-S□	100 to 120
A2	LECSA2-S□	200 to 230
B1	LECSB1-S□	100 to 120
B2	LECSB2-S□	200 to 230
C1	LECSC1-S□	100 to 120
C2	LECSC2-S□	200 to 230
S1	LECSS1-S□	100 to 120
S2	LECSS2-S□	200 to 230
	LECSS2-T□	200 to 240

• * 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)
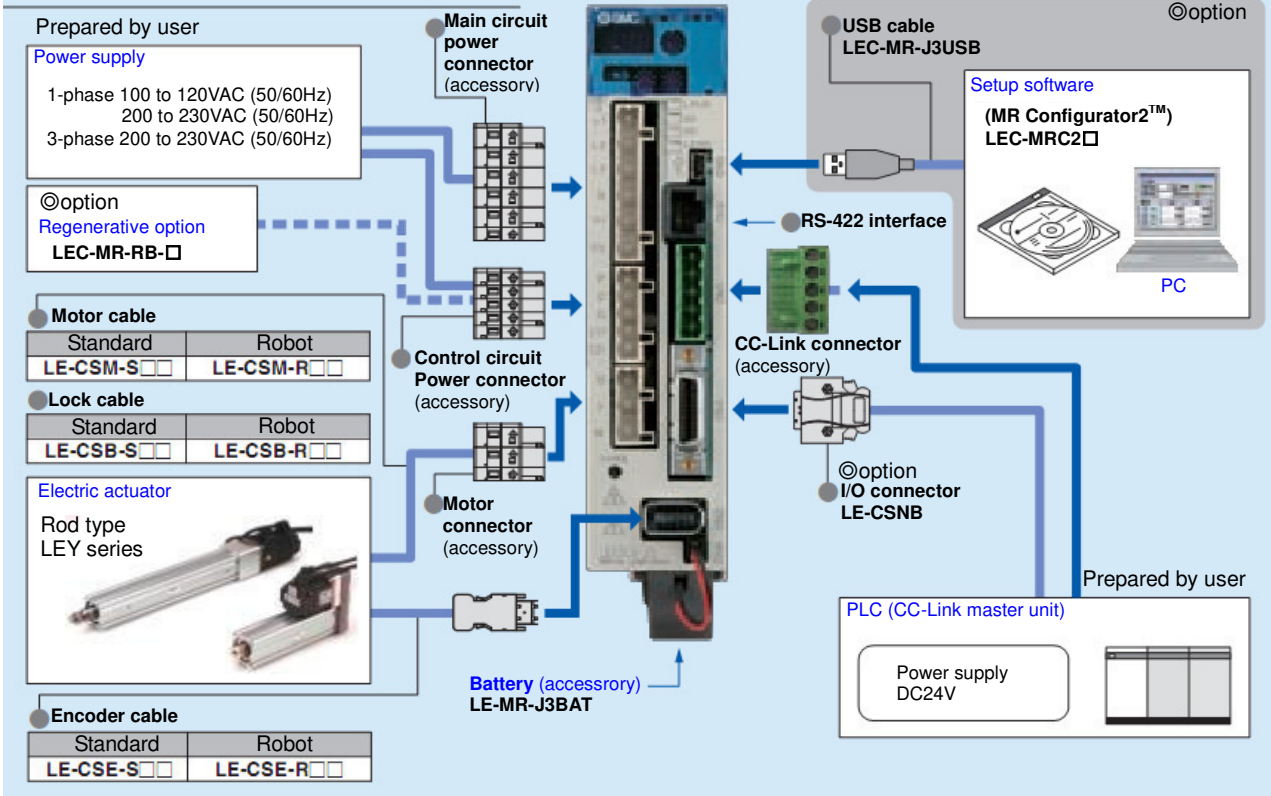• Nil : Without cable and driver

⑬ I/O cable length [m]

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

*Applicable stroke table

Model	Stroke [mm]	30	50	100	150	200	250	300
LEYG25		●	●	●	●	●	●	●
LEYG32		●	●	●	●	●	●	●

*Consult with SMC for the manufacture of intermediate strokes.

SMC

3.3 Construction

Motor mounting position :
  Top mountng type

Motor mounting position :
  In-line mounting type

When "Grease maintenance mechanism" is selected

LEYG²⁵₃₂M : 50 stroke or less

LEYG²⁵₃₂M□□B̂-□□F : 50 stroke or less

LEYG²⁵₃₂M : Over 50 stroke

LEYG²⁵₃₂M□□B̂-□□F : Over 50 stroke

LEYG²⁵₃₂L : 100 stroke or less

LEYG²⁵₃₂L : Over 100 stroke

No.	Part	Material	Remarks	No	Part	Material	Remarks
1	Body	Aluminum alloy	Anodized	21	Parallel pin	Stainless steel	
2	Ballscrew shaft	Alloy steel		22	Rod seal	NBR	
3	Ball screw nut	Resin alloy steel		23	Retaining ring	Spring steel	Phosphate coated
4	Piston	Aluminum alloy		24	Motor adapter	Aluminum alloy	Coating
5	Piston rod	Stainless steel	Hard chrome anodized	25	Motor	-	
6	Rod cover	Aluminum alloy		26	Motor block	Aluminum alloy	Coating
7	Bearing holder	Aluminum alloy		27	Hub	Aluminum alloy	
8	Rotation Stopper	POM		28	Spider	Urethane	Spider
9	Socket	Free cutting carbon steels	Nickel plated	29	Guide attachment	Aluminium alloy	Anodized
10	Connected shaft	Free cutting carbon steels	Nickel plated	30	Guide rod	Carbon steel	-
11	Bushing	Bearing alloy		31	Plate	Aluminium alloy	Anodized
12	Bearing	-		32	Plate mounting bolt	Carbon tool steel	Nickel plateing
13	Return box	Aluminum die-cast	Coating	33	Guide bolt	Carbon tool steel	Nickel plateing
14	Return plate	Aluminum die-cast	Coating	34	Slide Bearing	Bearing alloy	
15	Magnet	-		35	Felt	Felt	
16	Wear ring holder	Stainless steel	Only stroke 101mm or more	36	Holder	Resin	
17	Wear ring	POM	Only stroke 101mm or more	37	Retaining ring	Steel for spring	Phosphate coated
18	Pulley (For Screw shaft)	Aluminum alloy		38	Ball bushing	-	
19	Pulley (For motor)	Aluminum alloy		39	Spacer	Aluminium alloy	Chormated
20	Belt	-					

Support block

Size	Part number
25	LEYG-S025
32	LEYG-S032

*Mounting bolt (2 pieces) is included in Support block.

Maintenance parts / belt

Size	Part number
25	LE-D-2-2
32	LE-D-2-4

4. Product Outline

4.1 System construction

Incremental Encoder (Pulse input / Positioning)   *LECSA Series*

Prepared by user

Power supply
1-phase 100 to 120VAC (50/60Hz)
200 to 230VAC (50/60Hz)

◎option
Regenerative option
LEC-MR-RB-□

Motor cable

Standard	Robot
LE-CSM-S□□	LE-CSM-R□□

Lock cable

Standard	Robot
LE-CSB-S□□	LE-CSB-R□□

Electric actuator
Rod type
LEY series

Encoder cable

Standard	Robot
LE-CSE-S□□	LE-CSE-R□□

Main circuit power connector (accessory)

Driver

`250`

Prepared by user
Control circuit power supply
DC24V

Control circuit power connector (accessory)

◎option
Setup software
(MR Configurator2™) LEC-MRC2□

PC

When using this software, order USB cable separately.

USB cable LEC-MR-J3USB

◎option
I/O connector LE-CSNA

Prepared by user

PLC (Positioning unit)
Power supply DC24V

Absolute Encoder (Pulse input)   *LECSB Series*

Prepared by user

Power supply
1-phase 100 to 120VAC (50/60Hz)
200 to 230VAC (50/60Hz)
3-phase 200 to 230VAC (50/60Hz)

◎option
Regenerative option
LEC-MR-RB-□

Motor cable

Standard	Robot
LE-CSM-S□□	LE-CSM-R□□

Lock cable

Standard	Robot
LE-CSB-S□□	LE-CSB-R□□

Electric actuator
Rod type
LEY series

Encoder cable

Standard	Robot
LE-CSE-S□□	LE-CSE-R□□

Main circuit power connector (accessory)

Driver

Control circuit power connector (accessory)

Motor connector (accessory)

USB cable LEC-MR-J3USB

◎option

Analog monitor output

RS-422 interface

Setup software
(MR Configurator2™) LEC-MRC2□

PC

When using this software, order USB cable separately.

◎option
I/O connector LE-CSNB

Prepared by user

PLC (Positioning unit)
Power supply DC24V

Battery (accessory)
LE-MR-J3BAT

SMC

Absolute Encoder (CC-Link) — *LECSC Series*

Prepared by user

Power supply
- 1-phase 100 to 120VAC (50/60Hz)
- 200 to 230VAC (50/60Hz)
- 3-phase 200 to 230VAC (50/60Hz)

◎option
Regenerative option
LEC-MR-RB-□

● **Motor cable**

Standard	Robot
LE-CSM-S□□	LE-CSM-R□□

● **Lock cable**

Standard	Robot
LE-CSB-S□□	LE-CSB-R□□

Electric actuator
Rod type
LEY series

● **Encoder cable**

Standard	Robot
LE-CSE-S□	LE-CSE-R□

Driver

● **Main circuit power connector** (accessory)

● **Control circuit Power connector** (accessory)

● **Motor connector** (accessory)

Battery (accessory)
LE-MR-J3BAT

● **USB cable LEC-MR-J3USB** ◎option

Setup software
(MR Configurator2™)
LEC-MRC2□

PC

● **RS-422 interface**

CC-Link connector (accessory)

◎option
● **I/O connector LE-CSNB**

Prepared by user

PLC (CC-Link master unit)
Power supply DC24V

Absolute Encoder (SSCNET III) — *LECSS Series*

Prepared by user

Power supply
- 1-phase 100 to 120VAC (50/60Hz)
- 200 to 230VAC (50/60Hz)
- 3-phase 200 to 230VAC (50/60Hz)

◎option
Regenerative option
LEC-MR-RB-□

● **Motor cable**

Standard	Robot
LE-CSM-S□□	LE-CSM-R□□

● **Lock cable**

Standard	Robot
LE-CSB-S□□	LE-CSB-R□□

Electric actuator
Rod type
LEY series

● **Encoder cable**

Standard	Robot
LE-CSE-S□□	LE-CSE-R□□

Driver

● **Main circuit power connector** (accessory)

Control circuit power connector (accessory)

● **Motor connector** (accessory)

Battery (accessory)
LE-MR-J3BAT

● **USB cable LEC-MR-J3USB** ◎option

Setup software
(MR Configurator2™)
LEC-MRC2□

PC

◎option
● **I/O connector LE-CSNS**

CN1A
CN1B
CN1A

◎option
● **SSCNET III optical cable LE-CSS-□**

Prepared by user

PLC (Positioning unit / motion controller)
Power supply DC24V

SMC

(SSCNET III/H)

◎option

Setup software
(MR Configurator2™)
LEC-MRC2□

PC

Provided by customer

Power supply
1-phase 200 to 240VAC (50/60Hz)
3-phase 200 to 240VAC (50/60Hz)

Main circuit power connector
(accessory)

Driver

● **USB cable**
LEC-MR-J3USB

◎option
Regenerative option
LEC-MR-RB-□

CN3

◎option
I/O connector
LE-CSNS

● **Motor cable**

Standard	Robot
LE-CSM-S□□	**LE-CSM-R□□**

● **Lock cable**

Standard	Robot
LE-CSB-S□□	**LE-CSB-R□□**

Control circuit power connector
(accessory)

CN1A

◎option
SSCNET III
optical cable
LE-CSS-□

● **Motor connector**
(accessory)

CN1B   CN1A

Battery (accessory)
LE-MR-J3BAT

● **Encoder cable**

Standard	Robot
LE-CSE-S□□	**LE-CSE-R□□**

Provided by customer

PLC (Positioning unit / motion controller)

Power supply
DC24V

Electric actuator
Rod type
LEY series

SMC

4.2 Function/Configuration

The following control mode can be selected for applicable actuators.
Please refer to the "Driver Operation Manual" about wiring and parameter setting.

Table. Applicable control mode.

| Driver | Control mode[Note1] | | | Encoder | Positioning | | Parameter select |
	Position control	Speed control	Torque control		Point table method	Program method[Note3]	
LECSA (Pulse input / positioning)	Pulse train	ON/OFF signal (Internal speed)	ON/OFF signal (Internal torque)	Incremental	ON/OFF signal 3 points (max. 7 points)[Note2]	ON/OFF signal 4 programs (max. 8 Programs)[Note2]	PA01
LECSB (Pulse input)	Pulse train	Analog command	Analog command	Absolute	-	-	PA01
LECSC (CC-Link)	CC-Link (When 2 stations are occupied)	-	-	Absolute	CC-Link 31 points(When 1 station is occupied) 255 points(When 2 stations are occupied)	-	PC30
LECSS (SSCNET III)	Note4)			Absolute	-	-	Note4)
LECSS (SSCNET III/H)	Note4)			Absolute	-	-	Note4)
Operation method	Positioning operation	Speed command operation	Torque command operation	-	Positioning operation by point table No. setting	Positioning operation by program No. setting	-

Note 1   Make the moving range limitation by external sensor etc to avoid actuator hitting to the work piece or stroke end.
    When using the thrust control, the following parameter should be set.
    If not, it will cause malfunction.
    - LECSA: The value of the parameter value [PC12] "Internal torque command" should be 30% or less. (LEY63 : 50% or less)
    - LECSB: The value of the parameter value [PC13] "Analog torque maximum output command" should be 30% or less. (LEY63 : 50% or less)
    (30% = Maximum pushing force of the product.)
    - LECSS-T: The value of the parameter value [PC13] "Analog torque maximum output command" should be 24% or less. (LEY63 : 40% or less)
    When the control equivalent to the pushing operation of the controller LECP series is performed, select the LECSS driver and combine it with the Motion or Simple Motion (manufactured by Mitsubishi Electric Corporation) which has a pushing operation function.

Note2) To set the maximum value for the each method, it is necessary to change the setting.
    Please refer "Driver Operation Manual".
Note3) The MR Configurator is necessary to control by the program method.
    Order separately.
    -MR Configurator2™ (Setup software Japanese version) / LEC- MRC2
    -MR Configurator2 ™(Setup software English version) / LEC-MRC2E
    -MR Configurator2 ™(Setup software Chinese version) / LEC-MRC2C
    -USB cable for Setup software (3m) / LEC-MR-J3USB
Note4) The LECSS/LECSS-T is set by upper positioning unit or motion controller.

SMC

5. Wiring of cables / Common precautions

⚠ **Warning**

1. **Adjusting, mounting or wiring change should never be done before shutting off the power supply to the product.**
   Electrical shock, malfunction and damaged can result.
2. **Never disassemble the cable. Use only specified cables.**
3. **Never connect or disconnect the cable or connector with power on.**

⚠ **Caution**

1. **Wire the connector securely. Do not apply any voltage to the terminals other than those specified in the product manual.**
2. **Wire the connector securely.**
   Check for correct connector wiring and polarity.
3. **Take appropriate measures against noise.**
   Noise in a signal line may cause malfunction. As a countermeasure, separate high voltage and low voltage cables, and shorten wiring lengths, etc.
4. **Do not route wires and cables together with power or high voltage cables.**
   The product can malfunction due to interference of noise and surge voltage from power and high voltage cables to the signal line. Route the wires of the product separately from power or high voltage cables.
5. **Take care that actuator movement does not catch cables.**
6. **Operate with cables secured. Avoid bending cables at sharp angles where they enter the product.**
7. **Avoid twisting, folding, rotating or applying an external force to the cable.**
   Risk of electric shock, wire break, contact failure and loss of control for the product can happen.
8. **Select "Robotic type cables" in case of inflecting cable (encoder/motor/lock) repeatedly.**
   Refer to the "Driver operation manual" for the bending life of the bending radius of the cable.
9. **Confirm proper wiring of the product.**
   Poor insulation (interference with other circuits, poor insulation between terminals and etc.) can apply excessive voltage or current to the product causing damage.

[Transportation]

⚠ **Caution**

1. **Do not carry or swing the product by the cable**

SMC

6. Electric actuators / Common precautions

6.1 Design and selection

⚠ **Warning**

1. **Be sure to read the Operation Manual (this manual and the one for the driver: LEC series).**
   Handling or usage/operation other than that specified in the Operation Manual may lead to breakage and operation failure of the product.
   Any damage attributed to the use beyond the specifications is not guaranteed.

2. **There is a possibility of dangerous sudden action by the product if sliding parts of machinery are twisted due to external forces etc.**
   In such cases, human injury may occur, such as by catching hands or feet in the machinery, or damage to the machinery itself may occur.
   Design the machinery should be designed to avoid such dangers.

3. **A protective cover is recommended to minimize the risk of personal injury.**
   If a driven object and moving parts of the product are in close proximity, personal injury may occur.
   Design the system to avoid contact with the human body.

4. **Securely tighten all stationary parts and connected parts so that they will not become loose.**
   When the product operates with high frequency or is installed where there is a lot of vibration, ensure that all parts remain secure.

5. **Consider a possible loss of power source.**
   Take measures to prevent injury and equipment damage even in the case of a power source failure.

6. **Consider behavior of emergency stop of whole system.**
   Design the system so that human injury and/or damage to machinery and equipment will not be caused, when it is stopped by a safety device for abnormal conditions such as a power outage or a manual emergency stop of whole system.

7. **Consider the action when operation is restarted after an emergency stop or abnormal stop of whole system.**
   Design the system so that human injury or equipment damage will not occur upon restart of operation of whole system.

8. **Never disassemble or modify (including additional machining) the product.**
   An injury ro failure can result.
   It will cause the loss of the product performance.

9. **When using it for vertical application, it is necessary to build in a safety device.**
   The rod may fall due to the weight of work. The safety device should not interfere with normal operation of the machine.

⚠ **Caution**

1. **Operate within the limits of the maximum usable stoke.**
   The product will be damaged if it is used with the stroke which is over the maximum stroke. Refer to the specifications of the product.

2. **When the product repeatedly cycles with partial strokes, operate it at a full stroke at least once every 10 strokes.**
   Otherwise, lubrication can run out.

3. **Do not use the product in applications where excessive external force or impact force is applied to it.   The product can be damaged.**
   Each component that includes motor is made with accurate tolerance.
   So even slightly deformed or miss-alignment of component may lead operation failure of the product.

4. **Refer to a common auto switch /matter (Best Pneumatics No 2) when an auto switch is built in and used.**

5. **Do not exceed product specification, even if work load is supported by external linear guides.**
   The moment to actuator is reduced by external guide, but required ability for transport (relationship between speed and work load) is not redeuced.

6.2 Mounting

⚠ **Warning**

1. **Install and operate the product only after reading the Operation Manual carefully and under standing its contents. Keep the manual in a safe place future reference.**

2. **Observe the tightening torque for screws.**
   Tighten the screws to the recommended torque for mounting the product.

3. **Do not make any alterations to this product.**
   Alterations made to this product may lead to a loss of durability and damage to the product, which can lead to human injury and damage to other equipment and machinery.

4. **When using external guide, the guide axis should be parallel to the actuator axis.**
   There will be damage/excessive wear on the lead screw if the external guide is not parallel.

5. **When an external guide is used, connect the moving parts of the product and the load in such a way that there is no interference at any point within the stroke.**
   Do not scratch or dent the sliding parts of the product tube or piston rod etc., by striking or grasping them with other objects. Components are manufactured to precise tolerances, so that even a slight deformation may cause faulty operation.

6. **Prevent the seizure of rotating parts.**
   Prevent the seizure of rotating parts (pins, etc.) by applying grease.

7. **Do not use the product until you verify that the equipment can operate properly.**
   After mounting or repair, connect the power supply to the product and perform appropriate functional inspections to check it is mounted properly.

8. **Cantilever**
   When the actuator is operated at high speed while it is fixed at one end and free at the other end (flange type, foot type, double clevis type, direct mount type), a bending moment may act on the actuator due to vibration generated at the stroke end, which can damage the actuator. In such a case, install a support bracket to suppress the vibration of the actuator body or reduce the speed so that the actuator does not vibrate. Use a support bracket also when moving the actuator body or when a long stroke actuator is mounted horizontally and fixed at one end.

9. **When attaching work piece, do not apply strong impact or large moment.**
   If an external force over the allowable moment is applied, it may cause looseness in the guide unit, an increase in sliding resistance or other problems.

10. **Maintenance space**
    Allow sufficient space for maintenance and inspection.

11. **Mounting connectors**
    Tighten the screws evenly. Tightening torques are as indicated below.

For encoder connector
Screw size: M2
Tightening torque: 0.1 N·m

For brake connector
Screw size: M2
Tightening torque: 0.2 N·m

For power supply connector
Screw size: M2
Tightening torque: 0.2 N·m

SMC
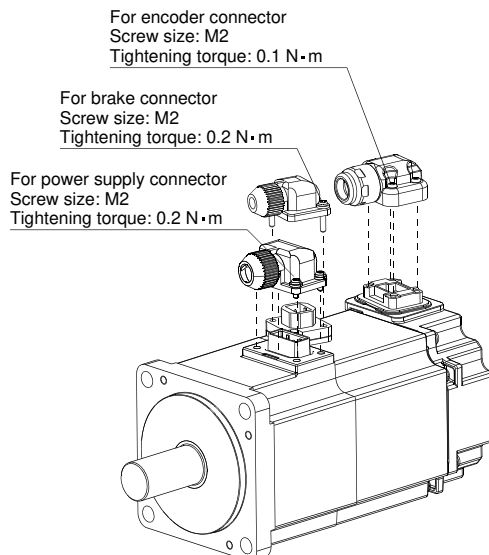
⚠ **Warning**

1. **If abnormal heating, smoking or fire, etc., occurs in the product, immediately shut off the power supply.**

2. **Immediately stop operation if abnormal operation noise or vibration occurs.**
    If abnormal operation noise or vibration occurs, the product may have been mounted incorrectly. Unless operation of the product is stopped for inspection, the product can be seriously damaged.
3. **Never touch the rotating part of the motor or moving part of the actuator while in operation.**
    Alterations made to this product may lead to a loss of durability and damage to the product, which can lead to human injury and damage to other equipment and machinery.
4. **When installing, adjusting, inspecting or performing maintenance on the product, driver and related equipment, be sure to shut off the power supply to them.**
    Then, lock it so that no one other than the person working can turn the power on, or implement measures such as a safety plug.

⚠ **Caution**

1. **Keep the driver and product combined as delivered for use.**
    The product is set in parameters for shipment. If it is combined with a different parameter, failure can result.
2. **Check the product for the following points before operation.**
    a) Damage to power supply line and signal line.
    b) Looseness of the connector to each power line and signal line.
    c) Looseness of the actuator /cylinder and Driver /driver mounting
    d) Abnormal operation
    e) Emergency stop of the total system
3. **When more than one person is performing work, decide on the procedures, signals, measures and resolution for abnormal conditions before beginning the work. Also, designate a person to supervise work other than those performing work.**
4. **Actual speed of the product will be changed by the workload.**
    Before selecting a product, check the catalog for the instructions regarding selection and specifications.
5. **Do not apply a load, impact or resistance in addition to a transferred load during return to origin.**
    In the case of the return to origin by pushing force, additional force will cause displacement of the origin position since it is based on detected motor torque.
6. **Do not remove the nameplate.**
7. **Operation test should be done by low speed. Start operation by predefined speed after confirming there is no trouble.**
8. **Do not apply impact/collision/resistance for mover of actuator in operation.**
    It will cause decrease of product's life, damage to product, and so on

[Ground]

⚠ **Warning**

1. **Do the earth construction surely.**
2. **Refer to the driver manual for the grounding procedure and notes.**

[Unpackaging]

⚠ **Caution**

1. **Check the received product is as ordered**
    If the different product is installed from the one ordered, injury or damage can result.

6.4 Operating environment

⚠ **Warning**

Avoid use in the following environments.

   a. Locations where a large amount of dusts and cutting chips are airborne.

   b. Locations where the ambient temperature is outside the range of the temperature specification (refer to specifications).

   c. Locations where the ambient humidity is outside the range of the humidity specification (refer to specifications).

   d. Locations where corrosive gas, flammable gas, sea water, water and steam are present.

   e. Locations where strong magnetic or electric fields are generated.

   f. Locations where direct vibration or impact is applied to the product.

   g. Areas that are dusty, or are exposed to splashes of water and oil drops.

   h. Areas exposed to direct sunlight (ultraviolet ray).

2. **Do not use in an environment where the product is directly exposed to liquid, such as cutting oils.**
    If cutting oils, coolant or oil mist contaminates the product, failure or increased sliding resistance can result.

3. **Install a protective cover when the product is used in an environment directly exposed to foreign matters such as dust, cutting chips and spatter.**
    Play or increased sliding resistance can result.

4. **Shade the sunlight in the place where the product is applied with direct sunshine.**

5. **Shield the product if there is a heat source nearby.**
    When there is a heat source surrounding the product, the radiated heat from the heat source can increase the temperature of the product beyond the operating temperature range. Protect it with a cover, etc.

6. **Grease oil can be decreased due to external environment and operating conditions, and it deteriorates lubrication performance to shorten the life of the product.**

[Storage]

⚠ **Warning**

1. **Do not store the product in a place in direct contact with rain or water drops or is exposed to harmful gas or liquid.**

2. **Store in an area that is shaded from direct sunlight and has a temperature and humidity within the specified range (-10°C to 60°C and 90%RH or less No condensation or freezing).**

3. **Do not apply vibration and impact to the product during storage.**

⚙ SMC

6.5 Maintenance

⚠ **Warning**

1. **Do not disassemble or repair the product.**

    Fire or electric shock can result. Contact SMC, in case of disassembly for the maintenance.

2. **Before modifying or checking the wiring, the voltage should be checked with a tester 5 minutes after the power supply is turned off.**

    Electrical shock can result.

⚠ **Caution**

1. **Maintenance should be performed according to the procedure indicated in the Operating Manual.**

    Incorrect handling can cause an injury, damage or malfunction of equipment and machinery.

2. **Removal of product**

    When equipment is serviced, first confirm that measures are in place to prevent dropping of work pieces and run-away of equipment, etc, and then cut the power supply to the system. When machinery is restarted, check that operation is normal with actuators in the proper positions.

[Lubrication]

⚠ **Caution**

1. **The product has been lubricated for life at manufacturer, and does not require lubrication in service.**
    Contact SMC if lubrication will be applied.

6.6 Precautions for actuator with lock

⚠ **Warning**

1. **Do not use the lock as a safety lock or a control that requires a locking force.**
    The lock used for the product with a lock is designed to prevent dropping of work piece.
2. **For vertical mounting, use the product with a lock.**
    If the product is not equipped with a lock, the product will move and drop the work piece when the power is removed.
3. **"Measures against drops" means preventing a work piece from dropping due to its weight when the product operation is stopped and the power supply is turned off.**
4. **Do not apply an impact load or strong vibration while the lock is activated.**
    If an external impact load or strong vibration is applied to the product, the lock will lose it's holding force and damage to the sliding part of the lock or reduced lifetime can result. The same situations will happen when the lock slips due to a force hight than its holding force, as this will accelerate the wear to the lock.
5. **Do not apply liquid or oil and grease to the lock or its surrounding.**
    When liquid or oil and grease is applied to the sliding part of the lock, its holding force will be reduce significantly. Or, lock sliding part performance and condition changes may be cause of lock release malfunction.
6. **Take measures against drops and check that safety is assured before mounting, adjustment and inspection of the product.**
    If the lock is released with the product mounted vertically, a work piece can drop due to its weight.

7. Electric actuators / Rod Type Common precautions

7.1 Design

⚠ **Warning**

1. **Do not apply a load in excess of the actuator specification.**
   A product should be selected based on the maximum work load and allowable moment.
   If the product is used outside of the operating specification, eccentric load applied to the guide will become excessive and have adverse effects such as creating play in the guide, reduced accuracy and reduced product life.

2. **Do not use the product in applications where excessive external force or impact force is applied to it.**
   The product can be damaged.
   The components including the motor are manufactured to precise tolerances.
   So that even a slight deformation may cause faulty operation or seizure.

7.2 Selection

⚠ **Warning**

1. **Do not exceed the speed limit of the actuator specification.**
   Select a suitable actuator by the relationship of allowable work load and speed.
   Noise or reduction of accuracy may occur if the actuator is operated in excess of its specification and could lead to reduced accuracy and reduced product file.

2. **When the product repeatedly cycles with partial strokes (100mm), lubrication can run out.**
   Operate it at a full stroke at least once a day or every 1000 strokes.

7.3 Handling

⚠ **Caution**

1. **For thrust control, make sure to set it to "torque control mode", and operate within the "pushing speed" range of each model.**
   Do not hit the workpiece or the stroke end with the piston in the "position control mode", "speed control mode" or "positioning mode". The lead screw, bearing and internal stopper may be damaged, causing malfunction.

2. **When using the thrust control, the following parameter should be set.**
   - LECSA: The value of the parameter value [PC12] "Internal torque command" should be 30% or less. (LEY63 : 50% or less)
   - LECSB: The value of the parameter value [PC13] "Analog torque maximum output command" should be 30% or less. (LEY63 : 50% or less)
   - LECSS-T: The value of the parameter value [PC13] "Analog torque maximum output command" should be 24% or less. (LEY63 : 40% or less)
   It may lead to breakage and malfunction.

3. **Normal/reverse torque limit value is set to 100 % as a default.**
   It is the maximum torque (the limit value) in the "position control mode", "speed control mode" or "positioning mode". When the product is operated with a smaller value than the default, acceleration when driving can decrease. Set it upon confirmation with the actual equipment used.

4. **The maximum speed of this actuator varies depending on the stroke of the product.**
   When selecting a product, check the catalog for the model selection.

5. **Do not apply a load, impact or resistance in addition to a transferred load during return to origin.**
   Otherwise, the origin can be displaced since it is based on detected motor torque.

6. **Do not scratch or gouge the sliding parts of the piston rod, by striking or grasping them with other objects.**
   Piston rod is manufactured to precise tolerances, so that even a slight deformation may cause malfunction.

7. **Please connect it so that the impact and load may not be added to the rod from the side when external guide is used.**

SMC

8. **Please do not operate body itself by the piston rod fixing.**
An excessive load joins the piston rod, and it causes defective operation and the longevity decrease.

9. **When the actuator is operated at high speed while it is fixed at one end and free at the other end (flange type, foot type, double clevis type, direct mount type), a bending moment may act on the actuator due to vibration generated at the stroke end, which can damage the actuator. In such a case, install a support bracket to suppress the vibration of the actuator body or reduce the speed so that the actuator does not vibrate.**
Use a support bracket also when moving the actuator body or when a long stroke actuator is mounted horizontally and fixed at one end.

10. **Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod.**
If rotational torque is applied, the non-rotating guide will become deformed, thus affecting the non-rotating accuracy.
Refer to the table below for the approximate values of the allowable range of rotational torque.

Allowable rotational torque (Nm or less)	LEY25**	LEY32**	LEY63**
	1.1	1.4	2.8

To screw a bracket or a nut onto the threaded portion at the tip of the piston rod, make sure to retract the piston rod entirely, and place a wrench over the flat portion of the rod that protrudes. Tighten it by giving consideration to prevent the tightening torque from being applied to the non-rotating guide.

11. **When rotational torque is applied to the plate end, use within the allowable range. [LEYG series]**
Excessive torque could cause the guide rod and bushing to be deformed, causing looseness of the guide or increase in sliding resistance.
The applied rotational torque should be less than the "Allowable Rotational Torque of Plate" in the table below.

Stroke [mm]		30	50	100	200	300
Allowable Rotational Torque of Plate[Nm]	LEYG25M	1.56	1.29	3.50	2.18	1.36
	LEYG32M	2.55	2.09	5.39	3.26	1.88
	LEYG25L	1.52	3.57	2.47	2.05	1.44
	LEYG32L	2.80	5.76	4.05	3.23	2.32

12. **When the fluctuation of load is caused during operation, malfunction/noise/alarm may occur.**
The tuning of gain may not suit for fluctuation load. Adjust the gain properly by following the manual of driver.

SMC

7.4 Mounting

⚠ **Caution**

1. **Fix 'Socket' square width across flats in the piston rod point with the spanner etc. , prevent the piston rod from rotating, and tighten the screw tightening when work piece or jig, etc. are installed properly by the torque value within the range of the limitation.**
    It causes the abnormal reaction of an auto switch, the space of an internal guide, and an increase of the sliding resistance, etc..
2. **When mounting the workpiece or other device to the actuator tighten the fixing screws with adequate torque within the specified torque range.**
    Tightening the screws with a higher torque than the maximum may cause malfunction, whilst tightening with a lower torque can cause the displacement of the mounting position or in extreme conditions detaching of the work piece.

<LEY series>

Work fixed / Rod end female thread

Soket
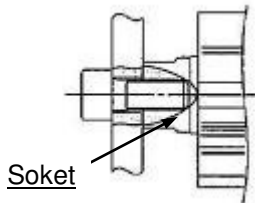
Model	Bolt	Max. tightening torque [Nm]	Max.thread depth [mm]	Scket width across flats [mm]
LEY25	M8x1.25	12.5	13	17
LEY32	M8x1.25	12.5	13	22
LEY63	M16x2	106	21	36

Work fixed / Rod end male thread

Rod end nut

Soket

Thread depth of bracket
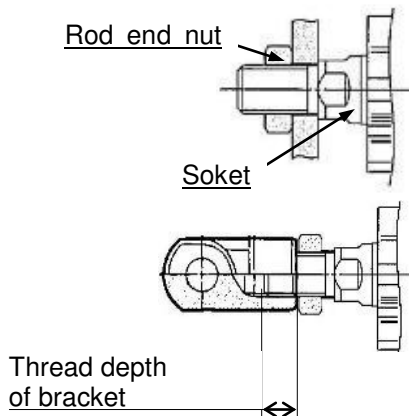
Model	Thread size	Max. tightening torque [Nm]	Max.thread length [mm]	Scket width across flats [mm]
LEY25	M14x1.5	50	20.5	17
LEY32	M14x1.5	50	20.5	22
LEY63	M18x1.5	97	26	36

Model	Rod end nut		thread depth of bracket[mm]
	Width across flats [mm]	Length [mm]	
LEY25	22	8	14
LEY32	22	8	14
LEY63	27	11	18

Mounting / Body bottom tapped style (When "Body bottom tappde" is selected)
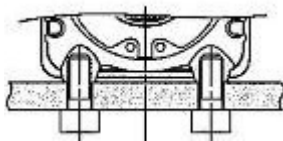
Model	Bolt	Max. tightening torque [Nm]	Max.thread depth [mm]
LEY25	M5x0.8	3.0	6.5
LEY32	M6x1.0	5.2	8.5
LEY63	M8x1.25	12.5	10

Mounting / Rod side・Head side tapped style

Rod side
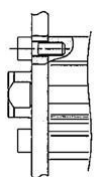
Head side
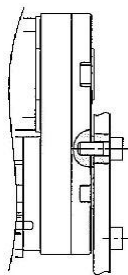
LEY*D is excluded

Model	Bolt	Max. tightening torque [Nm]	Max.thread depth [mm]
LEY25	M5x0.8	3.0	8
LEY32	M6x1.0	5.2	10
LEY63	M8x1.25	12.5	16

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\<LEYG series\>

Work fixed/ Plate tapped style
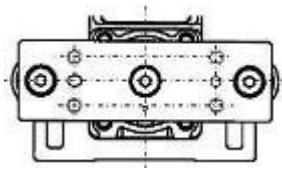
Model	Bolt	Max. tightening torque [N•m]	Max. thread depth [mm]
LEYG25^M_L	M6 x 1.0	5.2	11
LEYG32^M_L	M6 x 1.0	5.2	12

Mounting / Upper mounting tapped style
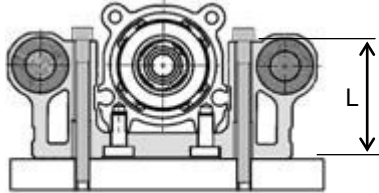
Model	Bolt	Max. tightening torque [N•m]	Length L [mm]
LEYG25^M_L	M5 x 0.8	3.0	40.3
LEYG32^M_L	M5 x 0.8	3.0	50.3

Mounting / Lower mounting tapped style
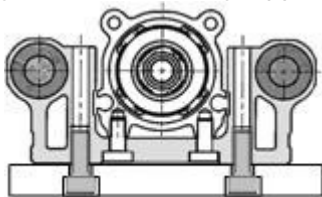
Model	Bolt	Max. tightening torque [N•m]	Max. thread depth [mm]
LEYG25^M_L	M6 x 1.0	5.2	12
LEYG32^M_L	M6 x 1.0	5.2	12
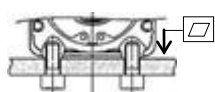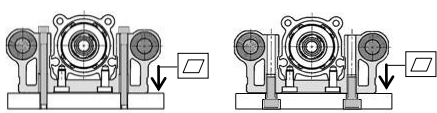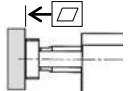
Mounting / Head side tapped style
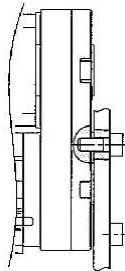
Model	Bolt	Max. tightening torque [N•m]	Max. thread depth [mm]
LEYG25^M_L	M8 x 0.8	3.0	8
LEYG32^M_L	M8 x 1.0	5.2	10

3. Keep the flatness of the mounting surface within the following ranges when mounting the actuator body and work piece.
Insufficient flatness of the work piece or the surface onto which the actuator body is to be mounted can cause increased sliding resistance.

Model	Mounting part		Flatness
LEY*	Actuator body /Body bottom tapped style		0.1mm or less
LEYG*	Actuator body / Upper mounting tapped style / Lower mounting tapped style		0.02mm or less
	Work piece /Plate tapped style		0.02mm or less

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4. Encloure

$$IP - \boxed{}\ \boxed{}$$
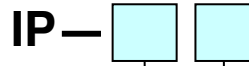
First characteristic numeral   Second characteristic numeral

・First Characteristics:Degrees of protection against solid foreign objects

0	Non-protected
1	Protected against solid foreign objects of 50 mm and grater
2	Protected against solid foreign objects of 12 mm and grater
3	Protected against solid foreign objects of 2.5 mm and grater
4	Protected against solid foreign objects of 1.0 mm and grater
5	Dust-protected
6	Dust-tight

・Second Characteristics:Degrees of protection against water

0	Non-protected	-
1	Protected against vertically falling water drops	Dripproof type 1
2	Protected against vertically falling water drops when enclosure tilted up to 15°	Dripproof type 2
3	Protected against rainfall when enclosure tilted up to 60°	Rainroof type
4	Protected against splashing water	Splashprof type
5	Protected against water jets	Water-jet-proof type
6	Protected against powerful water jets	Powerful water-jet-proof type
7	Protected against the effects of temporary immersion in water	Immersible type
8	Protected against the effects of continuous immersion in water	Submersible type

Example)IP65:Dust-tight, Water-jet-proof type "Water-jet-proof type" means that no water intrudes inside an equipment that could hinder from operating normally by means of applying water for 3 minutes in the prescribed manner. Take appropriate protection measures, since a device is not usable in an environment where a droplet of water is splashed constantly.Keep the flatness of the mounting surface within the following ranges when mounting the a

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7.5 Precaution on maintenance

⚠ **Caution**
1. **Cut the power supply during maintenance and replacement of the product.**

[Maintenance frequency]
Preform maintenance according to the table below.

	Appearance check	Check belt
Inspection before daily operation	○	
Inspection every six months *	○	○
Inspection every 250km *	○	○
Inspection are every five million times *	○	○

*Either of inspection early time is selected.

[Items for visual appearance check]
1. Loose set screws, abnormal dirt.
2. Check of flaw and cable joint
3. Vibration, noise.

[Items for belt check]
Stop operation immediately and replace the belt when belt appear to be like photos below.

a . Tooth shape canvas is worn out
Canvas fiber becomes fuzzy. Rubber is removed and the fiber becomes whitish. Lines of fibers become unclear.

Teeth become fuzzy

b . Peeling off or wearing of the side of the belt
Belt corner becomes round and frayed thread sticks out.

c . Belt partially cut
Belt is partially cut. Foreign matter caught in teeth other than cut part causes flaw.

d . Vertical line of belt teeth
Flaw which is made when the belt runs on the flange.

e . Rubber back of the belt is softened and sticky

f . Crack on the back of the belt

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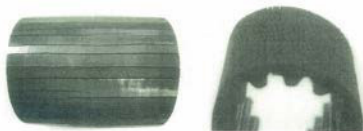
8. Troubleshooting

8.1 Alarms and Warning

When a fault occurs during the operation, the corresponding alarm or warning is displayed.
If any alarm or warning has occurred, refer to 「Driver Operation Manual」and take the appropriate action.
After removing the cause of the alarm, the alarm can be deactivated in any of the methods marked ○ in the alarm deactivation column.

・LECSA(Pulse input / Positioning)

	No.	LED display	Name	Alarm deactivation		
				Power OFF→ON	Press "SET" on current alarm screen.	Alarm reset (RES)
Alarm	A.10	A.10	Undervoltage	○	○	○
	A.12	A.12	Memory error 1 (RAM)	○		
	A.13	A.13	Clock error	○		
	A.15	A.15	Memory error 2 (EEP-ROM)	○		
	A.16	A.16	Encoder initial communication error1	○		
	A.17	A.17	Board error	○		
	A.19	A.19	Memory error 3 (Flash-ROM)	○		
	A.1A	A.1A	Motor combination error	○		
	A.1C	A.1C	Software combination error	○		
	A.1E	A.1E	Encoder initial communication error 2	○		
	A.1F	A.1F	Encoder initial communication error 3	○		
	A.20	A.20	Encoder normal communication error 1	○		
	A.21	A.21	Encoder normal communication error 2	○		
	A.24	A.24	Main circuit error	○	○	○
	A.30	A.30	Regenerative error	(Note 1) ○	(Note 1) ○	(Note 1) ○
	A.31	A.31	Overspeed	○	○	○
	A.32	A.32	Overcurrent	○		
	A.33	A.33	Overvoltage	○	○	○
	A.35	A.35	Command frequency error	○	○	○
	A.37	A.37	Parameter error	○		
	A.45	A.45	Main circuit device overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○
	A.46	A.46	Servo motor overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○
	A.50	A.50	Overload 1	(Note 1) ○	(Note 1) ○	(Note 1) ○
	A.51	A.51	Overload 2	(Note 1) ○	(Note 1) ○	(Note 1) ○
	A.52	A.52	Error excessive	○	○	○
	A.8E	A.8E	USB communication error	○	○	○
	888	888	Watchdog	○		

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	No.	3-digit, 7-segment LED display	Name	The servo motor stops /does not stop.
Warning	A.90	A.90	Home positioning incomplete warning	Stops
	A.91	A.91	Driver overheat warning	Does not stop
	A.96	A.96	Home position setting error	Stops
	A.97	A.97	Program operation disabled	Does not stop
	A.98	A.98	Software limit warning	Stops (Note 2)
	A.99	A.99	Stroke limit warning	Stops (Note 2)
	A.E0	A.E0	Excessive regeneration warning	Does not stop
	A.E1	A.E1	Overload warning 1	Does not stop
	A.E6	A.E6	Servo forced stop warning	Stops
	A.E9	A.E9	Main circuit off warning	Stops
	A.EC	A.EC	Overload warning 2	Does not stop
	A.ED	A.Ed	Output watt excess warning	Does not stop
	A.F0	A.F0	Tough drive warning	Does not stop

Note 1. Deactivate the alarm about 30 minutes of cooling time after removing the cause of occurrence.

2. Operation to the direction which cancels the warning can be performed.

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·LECSB(Pulse input)

	Display	Alarm code (Note 2) CN1 22 (bit2)	CN1 23 (bit1)	CN1 24 (bit0)	Name	Alarm deactivation Power OFF→ON	Press "SET" on current alarm screen.	Alarm reset (RES)
Alarm	AL.10	0	1	0	Undervoltage	○	○	○
	AL.12	0	0	0	Memory error 1 (RAM)	○		
	AL.13	0	0	0	Clock error	○		
	AL.15	0	0	0	Memory error 2 (EEP-ROM)	○		
	AL.16	1	1	0	Encoder error 1 (At power on)	○		
	AL.17	0	0	0	Board error	○		
	AL.19	0	0	0	Memory error 3 (Flash-ROM)	○		
	AL.1A	1	1	0	Motor combination error	○		
	AL.20	1	1	0	Encoder error 2 (during runtime)	○		
	AL.21	1	1	0	Encoder error 3 (during runtime)	○		
	AL.24	1	0	0	Main circuit error	○	○	○
	AL.25	1	1	0	Absolute position erase	○		
	AL.30	0	0	1	Regenerative error	(Note 1) ○	(Note 1) ○	(Note 1) ○
	AL.31	1	0	1	Overspeed	○	○	○
	AL.32	1	0	0	Overcurrent	○		
	AL.33	0	0	1	Overvoltage	○	○	○
	AL.35	1	0	1	Command pulse frequency alarm	○	○	○
	AL.37	0	0	0	Parameter error	○		
	AL.45	0	1	1	Main circuit device overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○
	AL.46	0	1	1	Servo motor overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○
	AL.47	0	1	1	Cooling fan alarm	○		
	AL.50	0	1	1	Overload 1	(Note 1) ○	(Note 1) ○	(Note 1) ○
	AL.51	0	1	1	Overload 2	(Note 1) ○	(Note 1) ○	(Note 1) ○
	AL.52	1	0	1	Error excessive	○	○	○
	AL.8A	0	0	0	Serial communication time-out	○	○	○
	AL.8E	0	0	0	Serial communication error	○	○	○
	88888				Watchdog	○		

Note 1. Deactivate the alarm about 30 minutes of cooling time after removing the cause of occurrence.
   2. 0: off
      1: on

	Display	Name
Warning	AL.92	Battery cable disconnection warning
	AL.96	Home position setting error
	AL.99	Stroke limit warning
	AL.9F	Battery warning
	AL.E0	Excessive regeneration warning
	AL.E1	Overload warning 1
	AL.E3	Absolute position counter warning
	AL.E5	ABS time-out warning
	AL.E6	Servo emergency stop warning
	AL.E8	Cooling fan speed reduction warning
	AL.E9	Main circuit off warning
	AL.EA	ABS servo on warning
	AL.EC	Overload warning 2
	AL.ED	Output watt excess warning

·LECSC(CC-Link)

	Display	Name	Alarm deactivation				Display	Name
			Power OFF→ON	(Note3) MR Configurator2 parameter unit	(Note2) Alarm reset (RES)		A90	Home positioning incomplete warning
Alarms	A10	Undervoltage	○	○	○	Warning	A92	Open battery cable warning
	A12	Memory error 1 (RAM)	○				A96	Home position setting error
	A13	Clock error	○				A98	Software limit warning
	A15	Memory error 2 (EEP-ROM)	○				A99	Stroke limit warning
	A16	Encoder error 1 (At power on)	○				A9D	CC-Link warning 1
	A17	Board error	○				A9E	CC-Link warning 2
	A19	Memory error 3 (Flash-ROM)	○				A9F	Battery warning
	A1A	Motor combination error	○				AE0	Excessive regeneration warning
	A20	Encoder error 2 (during runtime)	○				AE1	Overload warning 1
	A21	Encoder error 3 (during runtime)	○				AE3	Absolute position counter warning
	A24	Main circuit error	○	○	○		AE6	Servo emergency stop warning
	A25	Absolute position erase	○				AE8	Cooling fan speed reduction warning
	A30	Regenerative error	(Note 1) ○	(Note 1) ○	(Note 1) ○		AE9	Main circuit off warning
	A31	Overspeed	○	○	○		AEC	Overload warning 2
	A32	Overcurrent	○				AED	Output watt excess warning
	A33	Overvoltage	○	○	○			
	A35	Command pulse frequency alarm	○	○	○			
	A37	Parameter error	○					
	A45	Main circuit device overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	A46	Servo motor overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	A47	Cooling fan alarm	○					
	A50	Overload 1	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	A51	Overload 2	(Note 1) ○	(Note 1) ○	(Note 1) ○			
	A52	Error excessive	○	○	○			
	A61	Operation alarm	○	○	○			
	A8A	Serial communication time-out	○	○	○			
	A8D	CC-Link alarm	○	○	○			
	A8E	Serial communication error	○	○	○			
	888	Watchdog	○					

Note 1. Deactivate the alarm about 30 minutes of cooling time after removing the cause of occurrence.
    2. Turns on RY(n+1)A or RY(n+3)A.
    3. Clicking the "Alarm reset" button on the "Alarm display" screen of set up software (MR Configurator2) allows an alarm to be deactivated. Pressing the "STOP RESET" key of the parameter unit allows an alarm to be deactivated.

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·LECSS(SSCNET III)

	Display	Name	Alarm deactivation		
			Power OFF→ON	Error reset	CPU reset
Alarms	10	Undervoltage	○	○	○
	12	Memory error 1 (RAM)	○		
	13	Clock error	○		
	15	Memory error 2 (EEP-ROM)	○		
	16	Encoder error 1 (At power on)	○		
	17	Board error	○		
	19	Memory error 3 (Flash-ROM)	○		
	1A	Motor combination error	○		
	20	Encoder error 2	○		
	24	Main circuit error	○	○	○
	25	Absolute position erase	○		
	30	Regenerative error	(Note 1) ○	(Note 1) ○	(Note 1) ○
	31	Overspeed	○	○	○
	32	Overcurrent	○		
	33	Overvoltage	○	○	○
	34	Receive error 1	○	(Note 2) ○	○
	35	Command frequency error	○	○	○
	36	Receive error 2	○	○	○
	37	Parameter error	○		
	45	Main circuit device overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○
	46	Servo motor overheat	(Note 1) ○	(Note 1) ○	(Note 1) ○
	47	Cooling fan error	○		
	50	Overload 1	(Note 1) ○	(Note 1) ○	(Note 1) ○
	51	Overload 2	(Note 1) ○	(Note 1) ○	(Note 1) ○
	52	Error excessive	○	○	○
	8A	USB communication time-out error	○	○	○
	8E	USB communication error	○	○	○
	888	Watchdog	○		

	Display	Name
Warning	92	Battery cable disconnection warning
	96	Home position setting warning
	9F	Battery warning
	E0	Excessive regeneration warning
	E1	Overload warning 1
	E3	Absolute position counter warning
	E4	Parameter warning
	E6	Servo forced stop warning
	E7	Servo system Controller forced stop warning
	E8	Cooling fan speed reduction warning
	E9	Main circuit off warning
	EC	Overload warning 2
	ED	Output watt excess warning

Note 1. Deactivate the alarm about 30 minutes of cooling time after removing the cause of occurrence.

2. In some servo system controller communication status, the alarm factor may not be removed.

·LECSS-T(SSCNET III / H)

	No.	Name	Detail display	Detail name	Stop Method (Note3, 4)	Alarm reset		
						Error reset	CPU reset	Power off → on
Alarm	10	Undervoltage	10.1	Voltage drop in the control circuit power	EDB	○	○	○
			10.2	Voltage drop in the main circuit power	SD	○	○	○
	12	Memory error 1 (RAM)	12.1	RAM error 1	DB			○
			12.2	RAM error 2	DB			○
			12.3	RAM error 3	DB			○
			12.4	RAM error 4	DB			○
			12.5	RAM error 5	DB			○
	13	Clock error	13.1	Clock error 1	DB			○
			13.2	Clock error 2	DB			○
	14	Control process error	14.1	Control process error 1	DB			○
			14.2	Control process error 2	DB			○
			14.3	Control process error 3	DB			○
			14.4	Control process error 4	DB			○
			14.5	Control process error 5	DB			○
			14.6	Control process error 6	DB			○
			14.7	Control process error 7	DB			○
			14.8	Control process error 8	DB			○
			14.9	Control process error 9	DB			○
			14.A	Control process error 10	DB			○
	15	Memory error 2 (EEP-ROM)	15.1	EEP-ROM error at power on	DB			○
			15.2	EEP-ROM error during operation	DB			○
	16	Encoder initial communication error 1	16.1	Encoder initial communication - Receive data error 1	DB			○
			16.2	Encoder initial communication - Receive data error 2	DB			○
			16.3	Encoder initial communication - Receive data error 3	DB			○
			16.5	Encoder initial communication - Transmission data error 1	DB			○
			16.6	Encoder initial communication - Transmission data error 2	DB			○
			16.7	Encoder initial communication - Transmission data error 3	DB			○
			16.A	Encoder initial communication - Process error 1	DB			○
			16.B	Encoder initial communication - Process error 2	DB			○
			16.C	Encoder initial communication - Process error 3	DB			○
			16.D	Encoder initial communication - Process error 4	DB			○
			16.E	Encoder initial communication - Process error 5	DB			○
			16.F	Encoder initial communication - Process error 6	DB			○

No.	Name	Detail display	Detail name	Stop Method (Note3, 4)	Alarm reset Error reset	CPU reset	Power off → on
17	Board error	17.1	Board error 1	DB			○
		17.3	Board error 2	DB			○
		17.4	Board error 3	DB			○
		17.5	Board error 4	DB			○
		17.6	Board error 5	DB			○
		17.8	Board error 6 (Note 5)	EDB			○
19	Memory error 3 (FLASH-ROM)	19.1	Flash-ROM error 1	DB			○
		19.2	Flash-ROM error 2	DB			○
1A	Servo motor combination error	1A.1	Servo motor combination error	DB			○
		1A.2	Servo motor control mode combination error	DB			○
1E	Encoder initial communication error 2	1E.1	Encoder malfunction	DB			○
		1E.2	Load-side encoder malfunction	DB			○
1F	Encoder initial communication error 3	1F.1	Incompatible encoder	DB			○
		1F.2	Incompatible load-side encoder	DB			○
20	Encoder normal communication error 1	20.1	Encoder normal communication - Receive data error 1	EDB			○
		20.2	Encoder normal communication - Receive data error 2	EDB			○
		20.3	Encoder normal communication - Receive data error 3	EDB			○
		20.5	Encoder normal communication - Transmission data error 1	EDB			○
		20.6	Encoder normal communication - Transmission data error 2	EDB			○
		20.7	Encoder normal communication - Transmission data error 3	EDB			○
		20.9	Encoder normal communication - Receive data error 4	EDB			○
		20.A	Encoder normal communication - Receive data error 5	EDB			○
21	Encoder normal communication error 2	21.1	Encoder data error 1	EDB			○
		21.2	Encoder data update error	EDB			○
		21.3	Encoder data waveform error	EDB			○
		21.4	Encoder non-signal error	EDB			○
		21.5	Encoder hardware error 1	EDB			○
		21.6	Encoder hardware error 2	EDB			○
		21.9	Encoder data error 2	EDB			○
24	Main circuit error	24.1	Ground fault detected by hardware detection circuit	DB			○
		24.2	Ground fault detected by software detection function	DB	○	○	○
25	Absolute position erased	25.1	Servo motor encoder - Absolute position erased	DB			○
27	Initial magnetic pole detection error	27.1	Magnetic pole detection - Abnormal termination	DB			○
		27.2	Magnetic pole detection - Time out error	DB			○
		27.3	Magnetic pole detection - Limit switch error	DB			○
		27.4	Magnetic pole detection - Estimated error	DB			○
		27.5	Magnetic pole detection - Position deviation error	DB			○
		27.6	Magnetic pole detection - Speed deviation error	DB			○
		27.7	Magnetic pole detection - Current error	DB			○
28	Linear encoder error 2	28.1	Linear encoder - Environment error	EDB			○
2A	Linear encoder error 1	2A.1	Linear encoder error 1-1	EDB			○
		2A.2	Linear encoder error 1-2	EDB			○
		2A.3	Linear encoder error 1-3	EDB			○
		2A.4	Linear encoder error 1-4	EDB			○
		2A.5	Linear encoder error 1-5	EDB			○
		2A.6	Linear encoder error 1-6	EDB			○
		2A.7	Linear encoder error 1-7	EDB			○
		2A.8	Linear encoder error 1-8	EDB			○
2B	Encoder counter error	2B.1	Encoder counter error 1	EDB			○
		2B.2	Encoder counter error 2	EDB			○

	No.	Name	Detail display	Detail name	Stop Method (Note3, 4)	Alarm reset Error reset	Alarm reset CPU reset	Alarm reset Power off → on
Alarm	30	Regenerative error (Note 1)	30.1	Regeneration heat error	DB	O (Note 1)	O (Note 1)	O (Note 1)
			30.2	Regeneration signal error	DB	O (Note 1)	O (Note 1)	O (Note 1)
			30.3	Regeneration feedback signal error	DB	O (Note 1)	O (Note 1)	O (Note 1)
	31	Overspeed	31.1	Abnormal motor speed	SD	O	O	O
	32	Overcurrent	32.1	Overcurrent detected at hardware detection circuit (during operation)	DB			O
			32.2	Overcurrent detected at software detection function (during operation)	DB	O	O	O
			32.3	Overcurrent detected at hardware detection circuit (during a stop)	DB			O
			32.4	Overcurrent detected at software detection function (during a stop)	DB	O	O	O
	33	Overvoltage	33.1	Main circuit voltage error	EDB	O	O	O
	34	SSCNET receive error 1	34.1	SSCNET receive data error	SD	O	O (Note 2)	O
			34.2	SSCNET connector connection error	SD	O	O	O
			34.3	SSCNET communication data error	SD	O	O	O
			34.4	Hardware error signal detection	SD	O	O	O
	35	Command frequency error	35.1	Command frequency error	SD	O	O	O
	36	SSCNET receive error 2	36.1	Continuous communication data error	SD	O	O	O
	37	Parameter error	37.1	Parameter setting range error	DB		O	O
			37.2	Parameter combination error	DB		O	O
	3A	Inrush current suppression circuit error	3A.1	Inrush current suppression circuit error	EDB			O
	3E	Operation mode error	3E.1	Operation mode error	DB			O
	42	Servo control error (for linear servo motor and direct drive motor)	42.1	Servo control error by position deviation	EDB	O (Note 3)	O (Note 3)	O
			42.2	Servo control error by speed deviation	EDB	O (Note 3)	O (Note 3)	O
			42.3	Servo control error by torque/thrust deviation	EDB	O (Note 3)	O (Note 3)	O
		Fully closed loop control error (during fully closed loop control)	42.8	Fully closed loop control error by position deviation	EDB	O (Note 3)	O (Note 3)	O
			42.9	Fully closed loop control error by speed deviation	EDB	O (Note 3)	O (Note 3)	O
			42.A	Fully closed loop control error by position deviation during command stop	EDB	O (Note 3)	O (Note 3)	O
	45	Main circuit device overheat (Note 1)	45.1	Main circuit device overheat error	SD	O (Note 1)	O (Note 1)	O (Note 1)
	46	Servo motor overheat (Note 1)	46.1	Abnormal temperature of servo motor 1	SD	O (Note 1)	O (Note 1)	O (Note 1)
			46.2	Abnormal temperature of servo motor 2	SD	O (Note 1)	O (Note 1)	O (Note 1)
			46.3	Thermistor disconnected	SD	O (Note 1)	O (Note 1)	O (Note 1)
			46.5	Abnormal temperature of servo motor 3	DB	O (Note 1)	O (Note 1)	O (Note 1)
			46.6	Abnormal temperature of servo motor 4	DB	O (Note 1)	O (Note 1)	O (Note 1)
	47	Cooling fan error	47.1	Cooling fan stop error	SD			O
			47.2	Cooling fan speed reduction error	SD			O

	No.	Name	Detail display	Detail name	Stop Method (Note3, 4)	Alarm reset		
						Error reset	CPU reset	Power off → on
Alarm	50	Overload 1 (Note 1)	50.1	Thermal overload error 1 during operation	SD	○ (Note 1)	○ (Note 1)	○ (Note 1)
			50.2	Thermal overload error 2 during operation	SD	○ (Note 1)	○ (Note 1)	○ (Note 1)
			50.3	Thermal overload error 4 during operation	SD	○ (Note 1)	○ (Note 1)	○ (Note 1)
			50.4	Thermal overload error 1 during a stop	SD	○ (Note 1)	○ (Note 1)	○ (Note 1)
			50.5	Thermal overload error 2 during a stop	SD	○ (Note 1)	○ (Note 1)	○ (Note 1)
			50.6	Thermal overload error 4 during a stop	SD	○ (Note 1)	○ (Note 1)	○ (Note 1)
	51	Overload 2 (Note 1)	51.1	Thermal overload error 3 during operation	DB	○ (Note 1)	○ (Note 1)	○ (Note 1)
			51.2	Thermal overload error 3 during a stop	DB	○ (Note 1)	○ (Note 1)	○ (Note 1)
	52	Error excessive	52.1	Excess droop pulse 1	SD	○	○	○
			52.3	Excess droop pulse 2	SD	○	○	○
			52.4	Error excessive during 0 torque limit	SD	○	○	○
			52.5	Excess droop pulse 3	EDB	○	○	○
	54	Oscillation detection	54.1	Oscillation detection error	EDB	○	○	○
	56	Forced stop error	56.2	Over speed during forced stop	EDB	○	○	○
			56.3	Estimated distance over during forced stop	EDB	○	○	○
	63	STO timing error	63.1	STO1 off	DB	○	○	○
			63.2	STO2 off	DB	○	○	○
	70	Load-side encoder initial communication error 1	70.1	Load-side encoder initial communication - Receive data error 1	DB			○
			70.2	Load-side encoder initial communication - Receive data error 2	DB			○
			70.3	Load-side encoder initial communication - Receive data error 3	DB			○
			70.5	Load-side encoder initial communication - Transmission data error 1	DB			○
			70.6	Load-side encoder initial communication - Transmission data error 2	DB			○
			70.7	Load-side encoder initial communication - Transmission data error 3	DB			○
			70.A	Load-side encoder initial communication - Process error 1	DB			○
			70.B	Load-side encoder initial communication - Process error 2	DB			○
			70.C	Load-side encoder initial communication - Process error 3	DB			○
			70.D	Load-side encoder initial communication - Process error 4	DB			○
			70.E	Load-side encoder initial communication - Process error 5	DB			○
			70.F	Load-side encoder initial communication - Process error 6	DB			○

	No.	Name	Detail display	Detail name	Stop Method (Note3, 4)	Alarm reset		
						Error reset	CPU reset	Power off → on
Alarm	71	Load-side encoder normal communication error 1	71.1	Load-side encoder communication - Receive data error 1	EDB			○
			71.2	Load-side encoder communication - Receive data error 2	EDB			○
			71.3	Load-side encoder communication - Receive data error 3	EDB			○
			71.5	Load-side encoder communication - Transmission data error 1	EDB			○
			71.6	Load-side encoder communication - Transmission data error 2	EDB			○
			71.7	Load-side encoder communication - Transmission data error 3	EDB			○
			71.9	Load-side encoder communication - Transmission data error 4	EDB			○
			71.A	Load-side encoder communication - Transmission data error 5	EDB			○
	72	Load-side encoder normal communication error 2	72.1	Load-side encoder data error 1	EDB			○
			72.2	Load-side encoder data update error	EDB			○
			72.3	Load-side encoder data waveform error	EDB			○
			72.4	Load-side encoder non-signal error	EDB			○
			72.5	Load-side encoder hardware error 1	EDB			○
			72.6	Load-side encoder hardware error 2	EDB			○
			72.9	Load-side encoder data error 2	EDB			○
	8A	USB communication time-out error	8A.1	USB communication time-out error	SD	○	○	○
	8E	USB communication error	8E.1	USB communication receive error	SD	○	○	○
			8E.2	USB communication checksum error	SD	○	○	○
			8E.3	USB communication character error	SD	○	○	○
			8E.4	USB communication command error	SD	○	○	○
			8E.5	USB communication data number error	SD	○	○	○
	888	Watchdog	88._	Watchdog	DB			○

Note 1. Leave for about 30 minutes of cooling time after removing the cause of occurrence.

2. In some controller communication status, the alarm factor may not be removed.

3. Stop method indicates as follows:
   ・DB: Stops with dynamic brake. (Coasts for the driver without dynamic brake.)
   ・EDB: Stops with electronic dynamic brake for 400 W or less drivers
   　　　Stops with dynamic brake for 750 W drivers
   ・SD: Forced stop deceleration

4. This is applicable when [Pr. PA04] is set to the initial value. The stop system of SD can be changed to DB using [Pr. PA04].

5. This alarm will occur only in the J3 compatibility mode.

	No.	Name	Detail display	Detail name	Stop method (Note 2, 3)
Warning	91	Servo amplifier overheat warning (Note 1)	91.1	Main circuit device overheat warning	
	92	Battery cable disconnection warning	92.1	Encoder battery cable disconnection warning	
			92.3	Battery degradation	
	95	STO warning	95.1	STO1 off detection	DB
			95.2	STO2 off detection	DB
	96	Home position setting warning	96.1	In-position warning at home positioning	
			96.2	Command input warning at home positioning	
	9F	Battery warning	9F.1	Low battery	
			9F.2	Battery degradation warning	
	E0	Excessive regeneration warning (Note 1)	E0.1	Excessive regeneration warning	
	E1	Overload warning 1 (Note 1)	E1.1	Thermal overload warning 1 during operation	
			E1.2	Thermal overload warning 2 during operation	
			E1.3	Thermal overload warning 3 during operation	
			E1.4	Thermal overload warning 4 during operation	
			E1.5	Thermal overload error 1 during a stop	
			E1.6	Thermal overload error 2 during a stop	
			E1.7	Thermal overload error 3 during a stop	
			E1.8	Thermal overload error 4 during a stop	
	E2	Servo motor overheat warning	E2.1	Servo motor temperature warning	
	E3	Absolute position counter warning	E3.2	Absolute position counter warning	
			E3.5	Encoder absolute positioning counter warning	
	E4	Parameter warning	E4.1	Parameter setting range error warning	
	E6	Servo forced stop warning	E6.1	Forced stop warning	SD
	E7	Controller forced stop warning	E7.1	Controller forced stop warning	SD
	E8	Cooling fan speed reduction warning	E8.1	Decreased cooling fan speed warning	
			E8.2	Cooling fan stop	
	E9	Main circuit off warning	E9.1	Servo-on signal on during main circuit off	DB
			E9.2	Bus voltage drop during low speed operation	DB
			E9.3	Ready-on signal on during main circuit off	DB
	EC	Overload warning 2 (Note 1)	EC.1	Overload warning 2	
	ED	Output watt excess warning	ED.1	Output watt excess warning	
	F0	Tough drive warning	F0.1	Instantaneous power failure tough drive warning	
			F0.3	Vibration tough drive warning	
	F2	Drive recorder - Miswriting warning	F2.1	Drive recorder - Area writing time-out warning	
			F2.2	Drive recorder - Data miswriting warning	
	F3	Oscillation detection warning	F3.1	Oscillation detection warning	

Note 1. Leave for about 30 minutes of cooling time after removing the cause of occurrence.
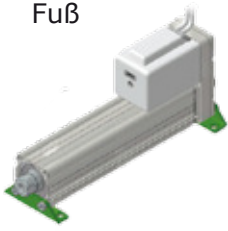   2. Stop method indicates as follows:
      ・DB: Stops with dynamic brake. (Coasts for the driver without dynamic brake.)
      ・SD: Decelerates to a stop
   3. This is applicable when [Pr. PA04] is set to the initial value. The stop system of SD can be changed to DB using [Pr. PA04].

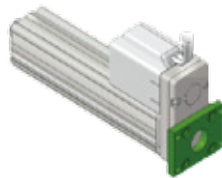# Montagemöglichkeiten

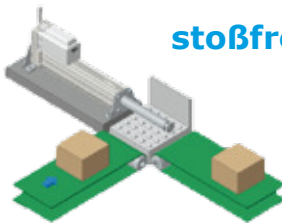## Montage mit Befestigungselement

Fuß

Flansch vorne

Flansch hinten

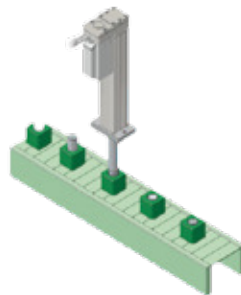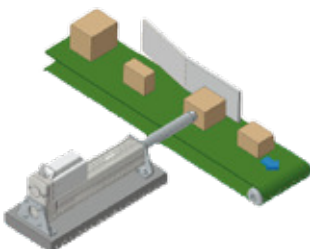Gabelbefestigung

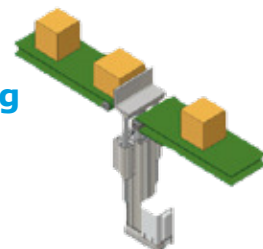# Anwendungsbeispiele

stoßfreier Transfer

Push-anwendung

Einpressvorgänge

Anschlag

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