Power Cylinder

Mini series

Thrust：98.0N to 392N {10kgf to 40kgf}

This series is suitable for automation with small force near by for the packaging machine and transfer machine, etc.

● With single-phase power source is available

This can be readily used only with a single-phase power source and ancillary equipment is also unnecessary.
(Power cylinder with three-phase motor or brake motor is also available.)
Power cylinders with a potentiometer are optimum for remote operation.

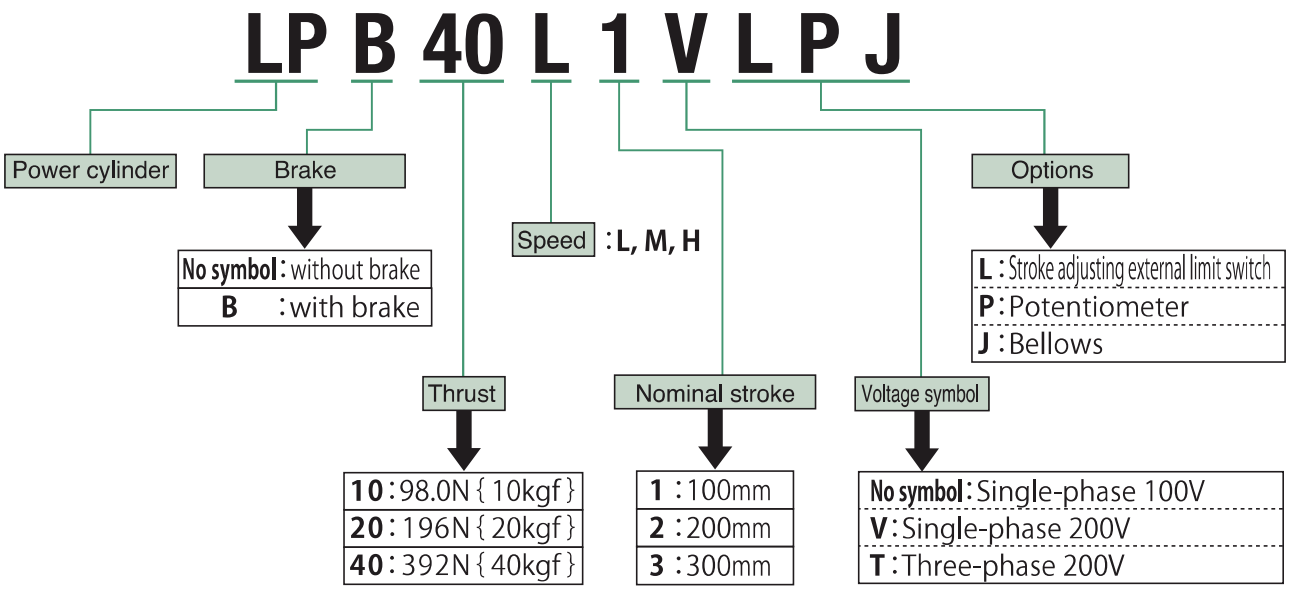
● Long life design

Long life design with a die cast structure, grease hermetically sealed type and large screw diameter.

● Wide variety of options

Wide variety of options such as adjusting limit switches, potentiometers, bellows and trunnion fitting are also available.

Model No. designation



* Specify LP040-T as a trunnion fitting.
* Power cylinders with a three-phase motor and with a brake motor are also available. (Refer to page 119 through 120.)
* Be careful not to make mistakes in motor specifications (power supply, voltage and presence or absence of brake).

Standard model list

Model No.				Rated thrust		Rated speed mm/s 50/60Hz	Stroke mm*
Basic type	With stroke adjusting external limit switch	With potentiometer	With stroke adjusting external limit switch With potentiometer	N	{kgf}		
LP 10H1	LP 10H1L	LP 10H1P	LP 10H1LP	98.0	10	34/42	100
LP 10H2	LP 10H2L	LP 10H2P	LP 10H2LP				200
LP 10H3	LP 10H3L	LP 10H3P	LP 10H3LP				300
LP 20M1	LP 20M1L	LP 20M1P	LP 20M1LP	196	20	17/21	100
LP 20M2	LP 20M2L	LP 20M2P	LP 20M2LP				200
LP 20M3	LP 20M3L	LP 20M3P	LP 20M3LP				300
LP 40L1	LP 40L1L	LP 40L1P	LP 40L1LP	392	40	9/11	100
LP 40L2	LP 40L2L	LP 40L2P	LP 40L2LP				200
LP 40L3	LP 40L3L	LP 40L3P	LP 40L3LP				300

* Mini-series does not take stroke margin into consideration.

Motor specifications

Model	Condenser run type reversible motor			
Number of poles, output	4P 20W (30 min Heat resistance class E)			
Voltage	single-phase 100V		single-phase 200V	
Frequency	50Hz	60Hz	50Hz	60Hz
Current value	0.64A	0.55A	0.32A	0.28A
Condenser capacity	10μF (Withstand voltage 200V)		2.5μF (Withstand voltage 400V)	
Protecting structure	Totally enclosed type (Indoor type)			

Painting color

TSUBAKI olive gray (Munsell 5GY6/0.5 or approximate color)

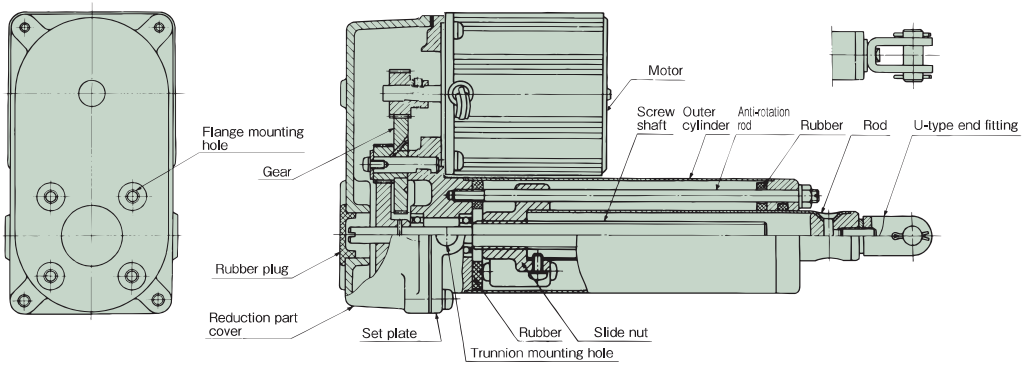
Standard use environment

Environment \ Model	Indoor type
Ambient temperature	−15℃ to 40℃
Relative humidity	85% or less (No dew condensation)
Impact resistance value	1G or less
Installation altitude	1000m or lower above sea level
Atmosphere	Indoor location which is not directly exposed to rain, wind, lightning or sunlight. Extent of sand and dust which exist in general factory (5mg/m³ or less)
Remark	Power cylinders with bellows are recommended in an excessively dusty location.

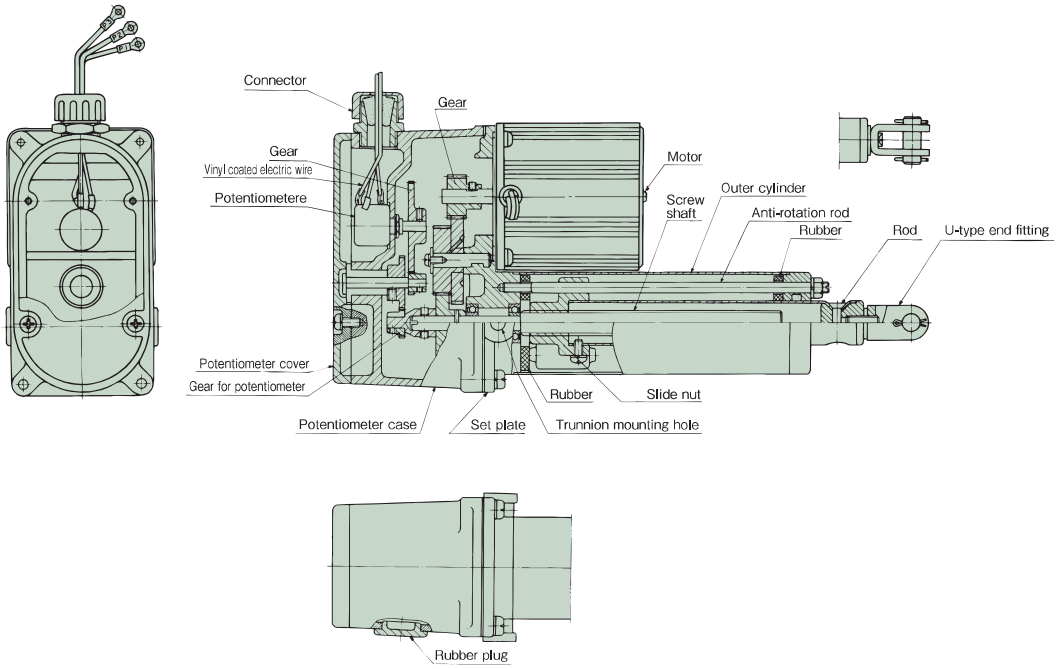
Note) This cylinder cannot be used outdoors.

Structure

Basic type



With potentiometer



Feature

Power cylinder in a small thrust zone operable with a single-phase power source. Various motors including not only single-phase motors but also three-phase motors or brake motors can be selected.

Since the cylinder body incorporates an anti-rotation function, the cylinder can be used as it is even if used with the end set free.

The model with a potentiometer basically built-in a potentiometer. As the potentiometer is rotated via small gear by rotation of the screw shaft, potentiometer output proportional to the stroke can be obtained.

Selection

Conditions of use required for selection

1. Machine to use and application
2. Thrust or load N {kgf}
3. Stroke mm
4. Speed mm/s
5. Frequency of operation, number of cycles/min.
6. Power source voltage, frequency

Selection procedure

Model selection

Determine a model (basic type, with stroke adjusting external limit switch, with potentiometer) according to the application.

Selecting model No.

Select an applicable model No. from the standard model list (Page 115) based on the thrust or load (N{kgf}), stroke (mm), and speed (mm/s).

Characteristics check

Use the power cylinder at an operating frequency below the allowable operating frequency (Table 1).

Table 1 Allowable operating frequency (Number of cycles/min)

10H1	10H2	10H3	20M1	20M2	20M3	40L1	40L2	40L3
6	3	2	3	1.5	1	1.5	1	0.5

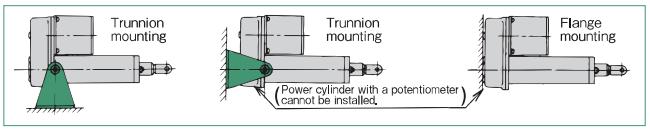
Installation

Installation direction

Either horizontal, vertical and inclined direction is allowed.

Installation method

For installation of the main body, use trunnion fitting (separately sold attachment). (page 119)
Apply grease to the trunnion pin and bracket hole before mounting.
Use tap holes (4-M6) on the reducer part cover to install flange, and use U-shape end fitting or tap hole (M8) for installation of the end.



Installation of external limit switch

1. For power cylinders without a limit switch, separately install a limit switch to regulate the stroke.
2. Check the coasting amount before determination of the mounting position. The coasting amount is approximately 3 to 6mm.
3. Set the limit switch so that the cylinder stops within L dimension in the dimensions table when using in the full nominal stroke.
4. Minimum preset value of the stroke is 60mm.

Vibration insulation treatment

Load is retained by a self-lock system of the trapezoidal screw. However, since secure retention may be difficult in a vibration conveying location, carry out vibration proofing treatment or select a power cylinder with a brake.

Manual operation

Remove the rubber plug on the reducer part and turn the shaft with a screwdriver. When it is turned clockwise, the rod retracts to move by 3mm per one turn. The power cylinder with a potentiometer cannot be manually operated.

Lateral load on rod

Install the power cylinder so as to prevent a bending load (lateral load) from acting on the rod.

Lubrication

This is of a grease lubrication type. As the power cylinder is applied with grease before shipment, use as it is.
Refill grease with reference to Table 2-3 as a guide when temperature rises or noise increases.
For greasing it is necessary to disassemble the main body since there is no greasing port. For disassembling method, contact us separately.

Table 2 Recommended grease

Company name	Grease name
SUMICO LUBRICANT CO., LTD	Moly gear grease
DOW CORNING	Moly coat EP grease

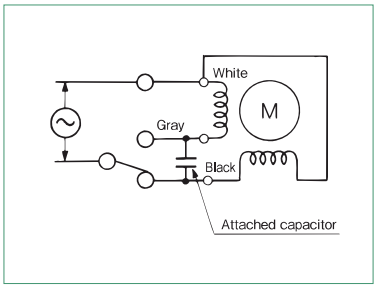
Note) Use the same grease for the screw and the reducer part.

Table 3 Lubrication cycle

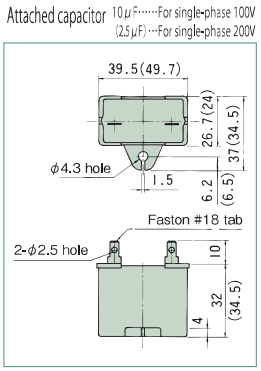
Operating frequency	Lubrication cycle
1001 times/day or more	One to three months
500 to 1000 times/day	Three to six months
100 to 500 times/day	Six months to one year
10 to 100 times/day	One to one and a half years

Note) The above values are for longer use, and do not indicate the life.

Wire connection



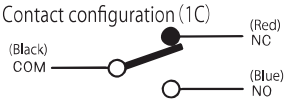
For retracting, turn the switch in reverse.



Limit switch

Model	D2VW-5L2A-1M (OMRON) or equivalent
Electric rating	250V AC 5A (cosφ0.7)

Contact configuration (1C)



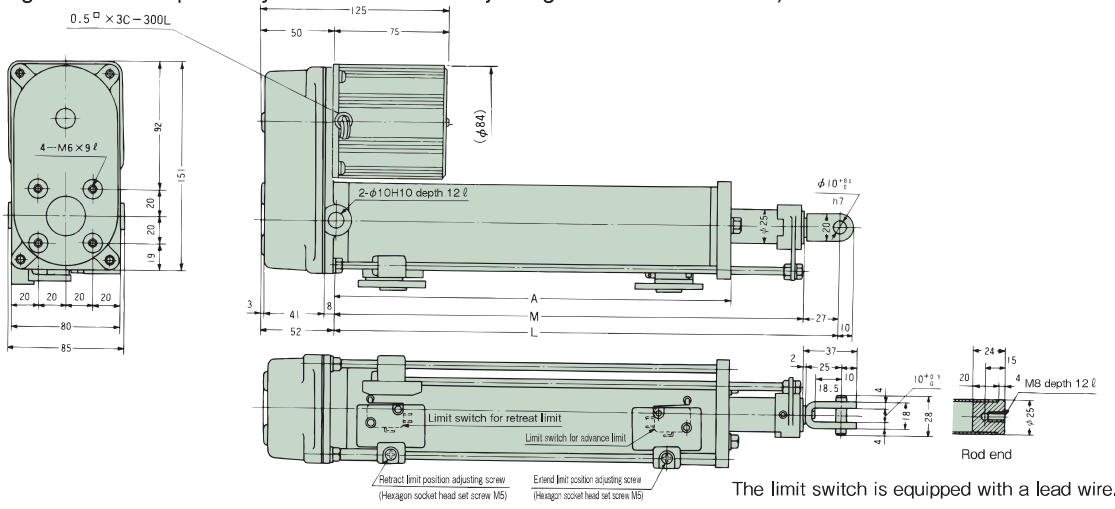
Potentiometer

Model	22-HHP-10N (SAKAE TSUSHIN KOGYO CO., LTD.) equivalent
Resistance value	1kΩ
Effective electric angle	3600°
Rated power	2W
Withstand voltage	1000V AC (1 minute)

To indicate stroke, use stroke indication meter and print board on page 110.

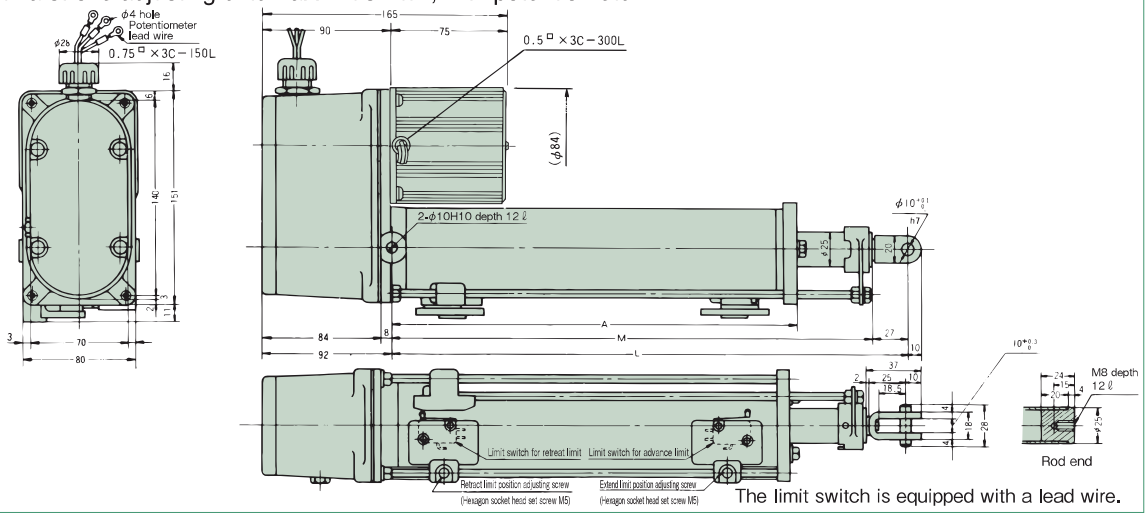
Dimensions Table

Basic type (This diagram shows a power cylinder with stroke adjusting external limit switch.)



The limit switch is equipped with a lead wire.

Power cylinder with a stroke adjusting external limit switch, with potentiometer



The limit switch is equipped with a lead wire.

Unit: mm

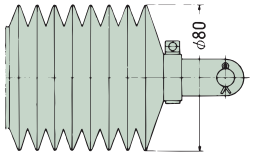
Stroke	A		M			L			Approximate mass kg			
	Basic type	With stroke adjusting external limit switch	Minimum	With bellows		Minimum		maximum	Basic type	With LS	With potentiometer	With LS, potentiometer
				Minimum	Stroke	Without bellows	With bellows					
100	176	179	205	205 (230)	100 (75)	232	232 (257)	332	4.0	4.6	5.1	5.6
200	276	279	305	319 (348)	186 (157)	332	346 (375)	532	4.5	5.1	5.6	6.1
300	376	379	405	433 (469)	272 (236)	432	460 (496)	732	5.0	5.6	6.1	6.6

Note) Dimensions in the parentheses indicate a value for power cylinders with a limit switch.

Options

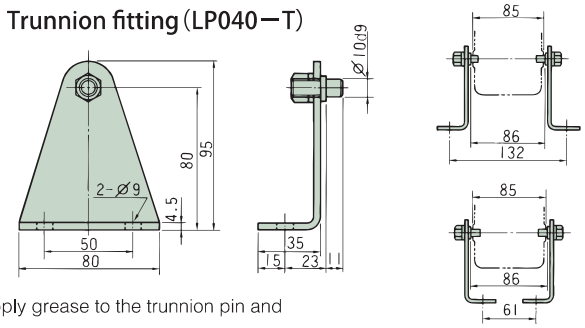
■ Bellows (　−J)

Use bellows when equipment is installed in a location exposed to dust or water.



This shows dimension for a cylinder without a limit switch.
This dimension is ϕ65 for the cylinder with a limit switch.

■ Trunnion fitting (LP040−T)



Apply grease to the trunnion pin and trunnion hole before mounting.

Application

With three-phase motor

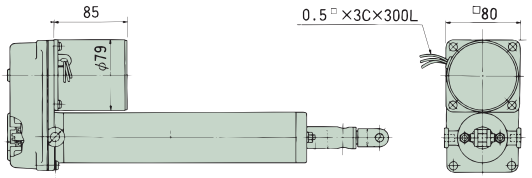
1. Outline

This is a model which can be used with a three-phase power source.
As this motor is of an induction type, the coasting amount slightly increases. Use this model in an application of relatively low frequency.

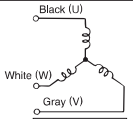
2. Specifications

Same as those of the standard models except for specifications and dimensions of the motor.

<Outside dimension>



<Specifications of motor>

Power	Three-phase 200V　50/60Hz
Motor model	Induction motor
Time rating	Continuous
Output	25W
Rated current	0.25A
Wire connection	 Rod retreat　Replace any two wires.　Rod advance

3. Model No. designation

LP40L1T

Three-phase 200V 50/60Hz

Application

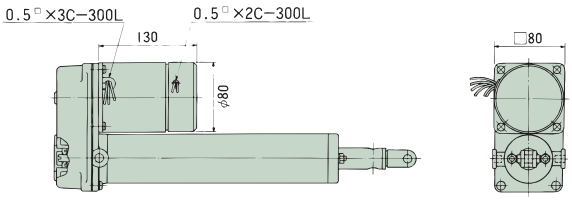
With brake motor

1. Outline

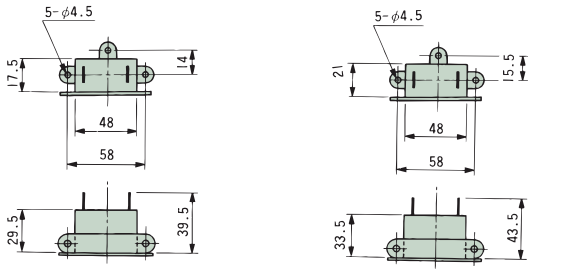
When you want to increase cylinder stop accuracy or reduce the coasting amount, power cylinders with a brake motor are optimum. Load can be securely retained in a vibration conveying location. All brakes retain a load even at power failure because they are of a deenergization type.

2. Specifications

Same as those of the standard models except for specifications and dimensions of the motor.



Outside dimensions of capacitors for single-phase 100V and 200V

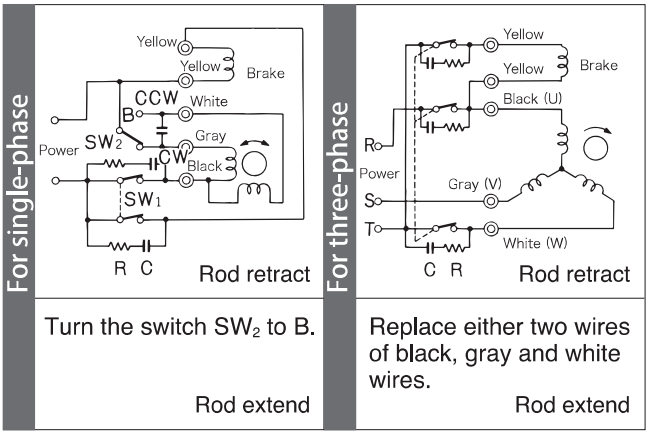


For single-phase 100V (10μF)　　For single-phase 200V (2.5μF)

<Specifications of brake motor>

Power source		Single-phase		Three-phase
		100V 50/60Hz	200V 50/60Hz	200V 50/60Hz
Motor model		Condenser run reversible motor	Condenser run reversible motor	Induction motor
Time rating		30 minutes	30 minutes	Continuous
Output		25W	25W	25W
Rated current		0.8A	0.4A	0.25A
Specifications of brake	Power source	Single-phase 100V	Single-phase 200V	Single-phase 200V
	Input current	12W 0.15A	12W 0.1A	12W 0.1A
	Static friction torque	1kgf·cm	1kgf·cm	1kgf·cm

<Wire connetion>



In the connecting diagram, C.R is a contact protecting CR circuit. Make sure to insert a contact protecting CR as shown in the diagram because the contacts to open/close the brake generate spark when the contacts open/close. C=0.1 to 0.2μF (400V) R=5 to 200Ω (1/4 W or less)
Protecting CR is not attached.

3. Model No. designation

LPB40L1□

No symbol	Single-phase 100V
V	Single-phase 200V
T	Three-phase 200V

With brake motor

⚠ WARNING

■ Cautions for selecting

- ● Cylinders with bellows are available as an option for dust proofing. Note that the effective stroke is shorter in the case of a cylinder with bellows. For effective strokes, refer to the Dimensions Table.
- ● This cylinder is not provided with an overload protecting function.
- ● Even a type without brake calculatory has a self-lock system and retains a load, however, the self-lock system may not work due to vibration or impact. If vibration or impact is given, select a type with a brake.
- ● For operating frequency, refer to the following table.

Operating frequency: Number of cycles/min

Model	LP(B)10H			LP(B)20M			LP(B)40L		
Stroke	100	200	300	100	200	300	100	200	300
Number of cycles	6	3	2	3	1.5	1	1.5	1	0.5

■ Cautions for installation

- ● Securely carry out centering between the center of the trunnion fitting and the center of the end fitting mount part. Prevent a lateral load from acting on the cylinder due to swing particularly when the cylinder operates.
- ● Apply grease to the trunnion pin and the trunnion hole for trunnion mounting.
- ● Also, apply grease to the connecting pin of the end fitting.
- ● All models are of ordinary outdoor specification, and it can be used in a location not exposed to water and steam, etc., where dust is in the extent in an ordinary factory. The power cylinder can generally be used in a range of -15℃ to 40℃, although it varies depending on the use conditions. When using at 40℃ or higher, always protect with a heat insulating cover, etc. Never use in a flammable atmosphere, otherwise it may cause an explosion and fire. In addition, avoid using it in a location where vibration or shock exceeding 1G is applied.

■ Cautions for use

- ● Do not allow a force (traverse load) bending the rod to act.
- ● For position adjustment by manual operation, remove the rubber plug (opposite side of the cylinder) on the gear case and turn the end of the screw shaft with a screw driver. When it is turned counterclockwise, the cylinder extends. Make sure to turn OFF the power for manual operation. The power cylinder with potentiometer cannot be manually operated.
- ● When pressing to an external stopper and stopping the cylinder, place a cushion (such as rubber plate) between them. Operate the limit switch so as not to restrain the motor before pressing against the stopper.

Power Cylinder

Eco series

Eco series servo type

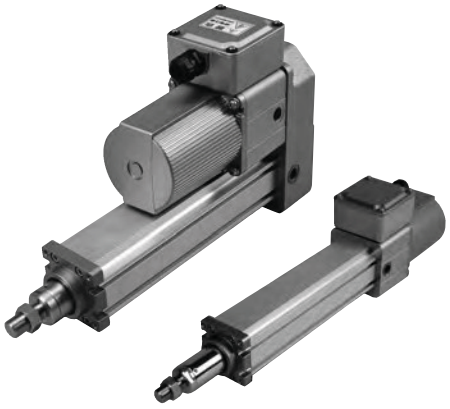
Thrust：150N to 15000N {15.3kgf to 1530kgf}

Maximization of servomotor performance
Realization of high stopping accuracy
Selectable servomotor
Realization of high speeds and wide-ranging thrusts
Reduction in servomotor capacity with precision planetary reducer

Eco series CDS type

Thrust：250N to 1.00kN {25.5kgf to 102kgf}

Self-contained
Environmentally friendly
Running cost reduction
For highly frequent operation and long life
Simple operation



Power Cylinder Eco Series

New lineup for mount coding and with precision planetary reducer

Mount coding

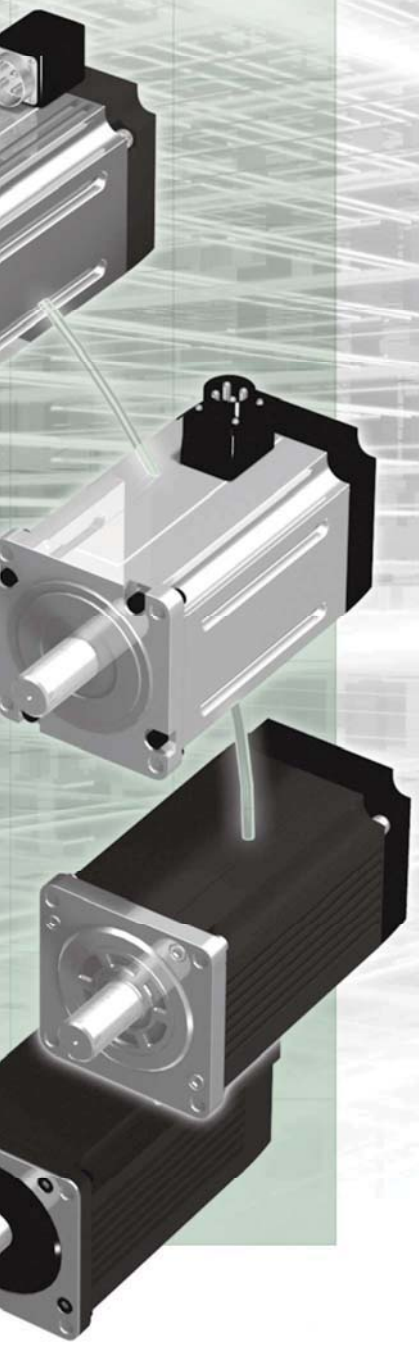
Selection of each company's servomotors is facilitated.

Features

- **Mount coding**
  Each servomotor manufacturer's attaching parts are mount-coded, which can be indicated by main body model No. (for model No. designation, see page 124)
- **Mount codes correspond to 11 domestic manufacturers.**
  We make mounts available so that each company's servomotors can be attached.
- **Simple selection**
  The cylinder capacity for attaching a desired servomotor is indicated in the motor matching table (see from page 128).

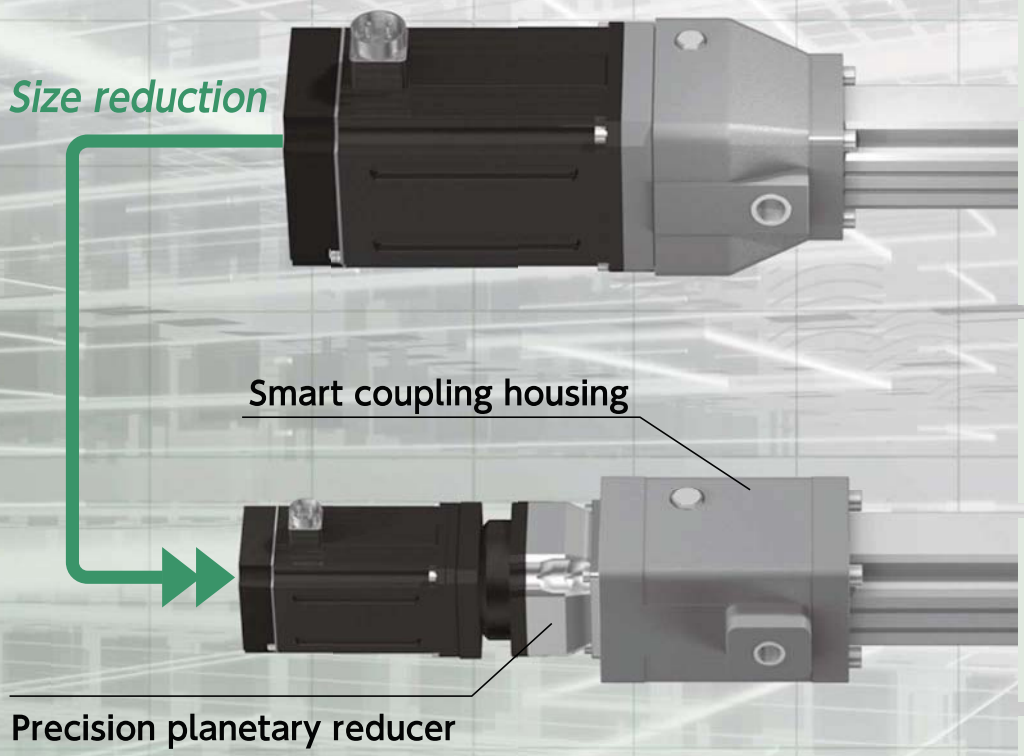
Servo Type

Expanded model



With precision planetary reducer

For low-speed uses, the motor capacity can be reduced in combination with our precision planetary reducer.



Features

- **Equipment cost reduction**
  As the servomotor capacity becomes smaller, the amplifier (driver) also becomes smaller, so that the initial cost can be reduced.
- **Light weight and compactness**
  Due to the reduction in servomotor size, a new smart coupling housing is adopted. Mass reduction is up to approximately 30kg (80%).
- **High-precision positioning**
  Due to the adoption of our precision planetary reducer, the backlash of the reducer will not affect the cylinder accuracy.

Guidance for selection

Power cylinder eco series is available in servo type and CDS type for various uses. Select optimum cylinders according to your use and operating conditions (thrust, speed, stroke, accuracy, expected life, etc.)

Power cylinder eco series

SpeedMech

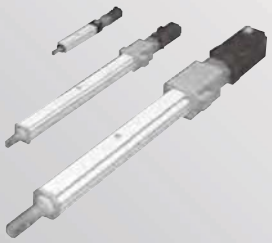
Servo type

- **Servomotor drive**
  Specify desired manufacturer.
- **High stopping accuracy**
  Repeated positioning accuracy ±0.02mm
  Stopping accuracy within ± 0.1mm
- **High-frequency operation**
  Duty factor 50%ED

Motor direct coupling (high speed)

- □45 frame
- □70 frame
- □105 frame

With precision planetary reducer (low speed/small motor capacity)



- □45 frame
- □70 frame
- □105 frame

CDS type

- **Three-phase motor drive**
  Wiring is simple.
- **Simple opening and closing operation between two points**
  No intermediate stop can be made because this is exclusive to press contact stop.
- **Self-contained**
  No LS for stroke adjustment is required because of the inclusion of an automatic stopping function.

Straight shape

Parallel (folded) shape

- □70 frame

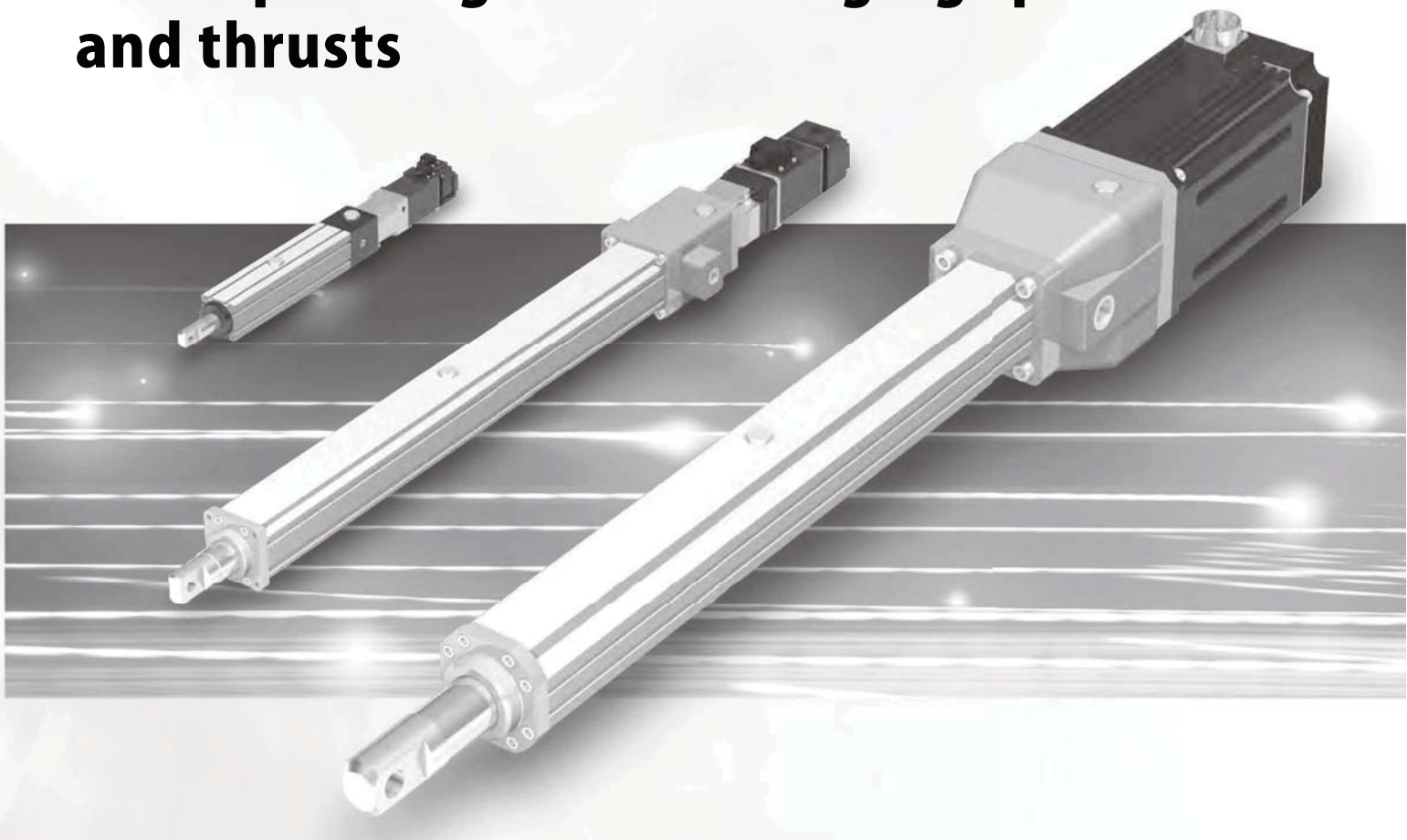
Servomotor manufacturers

Mitsubishi Electric → page 128 | Yaskawa Electric → page 129 | Panasonic → page 130 | Fuji Electric → page 131
Omron → page 132 | Sanyo Denki → page 133 | FANUC → page 134 | Keyence → page 135
Nikki Denso → page 136 | Tamagawa Seiki → page 137 | Hitachi Industrial Equipment Systems → page 138

	Allowable thrust	Maximum speed	Motor capacity range	Maximum stroke	Model No. indication	Dimensions table
LPES15F	150N {15.3kgf}	300mm/s	0.05 to 0.1kW	300mm	→ page 124	→ page 139
LPES30F	300N {30.6kgf}	300mm/s	0.1 to 0.35kW	300mm		
LPES150F	1500N {153kgf}	300mm/s	0.55 to 0.75kW	600mm		→ page 141
LPES300F	3000N {306kgf}	300mm/s	0.3 to 2kW	600mm		
LPES1500F	15000N {1530kgf}	333mm/s	0.85 to 11kW	1000mm		→ page 143
LPES30R	300N {30.6kgf}	100mm/s	0.03 to 0.2kW	300mm		→ page 140
LPES150R	1500N {153kgf}	100mm/s	0.1 to 0.5kW	600mm		→ page 142
LPES300R	3000N {306kgf}	100mm/s	0.13 to 1.5kW	600mm		
LPES1500R	15000N {1530kgf}	167mm/s	0.3 to 5.5kW	1000mm		→ page 144

	Thrust generated	Rated speed	Motor output	Maximum stroke	Model No. indication	Dimensions table
LPE025H	250N {25.5kgf}	160/190/200 mm/s	0.25N•m (50W or equivalent)	600mm	→ page 152	→ page 153
LPE050L	500N {51.0kgf}	90/100/110 mm/s	0.25N•m (50W or equivalent)	600mm		
LPE050H	500N {51.0kgf}	160/170/190 mm/s	0.50N•m (90W or equivalent)	600mm		
LPE100L	1000N {102gf}	90/90/110 mm/s	0.50N•m (90W or equivalent)	600mm		

New models of power cylinders capable of corresponding to wide-ranging speeds and thrusts



Maximization of servomotor performance

Servomotor performance is maximized by combining high-efficiency ball screw and high-rigidity and light-weight disc coupling.
Because of clamp type fastening, there is no backlash like key fastening.
Clamp type fastening also applies even with precision planetary reducer.

Realization of high stopping accuracy

High stopping accuracy is realized through the adoption of high-precision ball screw.
The repeated positioning accuracy*1 is ±0.02mm.
The stopping accuracy*2 is within ±0.1mm.
The accuracies are not affected even with the precision planetary reducer.

*1) Difference in the position of stopping at one point in the same direction of operation
*2) Difference between target point and actual stopping position

Effects with precision planetary reducer

Due to the reduction in servomotor size, the following effects can be expected:
- Peripheral equipment, such as amplifier, can also be made smaller, so that the initial cost can be reduced.
- Electric energy decreases, so that the running cost can also be reduced.
- The coupling housing is also down-sized to be lightweight and compact.

Selectable servomotor

A desired servomotor can be installed.
For an estimate, inform us of the servomotor manufacturer or mount code. Also, specify ⑧ Motor handling in model No. designation.

Note) Each manufacturer has some unsupported models.

Realization of high speeds and wide-ranging thrusts

Can be used at high speeds in a large thrust area.

- □45 frame 300mm/s at the maximum thrust of 300N {30.6kgf}
- □70 frame 300mm/s at the maximum thrust of 3000N {306kgf}
- □105 frame 333mm/s at the maximum thrust of 15000N {1530kgf}

Model No. designation

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨

LPES 1500 R 5 T 10 G5L A SUJ

① Product/series name
Power cylinder
eco series servo type

② Allowable thrust

□45 frame	15：	150N	{15.3kgf}
	30：	300N	{30.6kgf}
□70 frame	150：	1500N	{153kgf}
	300：	3000N	{306kgf}
□105 frame	1500：	15000N	{1530kgf}

③ Motor mounting method
F: Motor direct coupling (no reduction gear ratio)
R: With precision planetary reducer
* For details, see the motor matching table (from page 128).

④ Reduction gear ratio
3：1/3
4：1/4
5：1/5
7：1/7
9：1/9
A：1/10

⑤ Main body shape
T: straight

⑥ Stroke
3：300mm
10：1000mm
* The above numerical values are examples.
For actual strokes, see the standard model list below.

⑦ Mount code
G5L: Example) 750W manufactured by Mitsubishi Electric
* For details, see the motor matching table (from page 132).

⑧ Motor handling
A: Installed by customer
B: Supplied by customer

⑨ Options
W: Waterproof spec IP65 (□70 and □105 frames only)
M: Anti-rod rotation spec (□45 frame only)
S: With 3 magnetic sensors
(See the sensor related option on page 17.)
U: U-type end fitting
N: N-type end fitting (□45 frame only)
(No symbol indicates I-type end fitting.)
J: Bellows (□70 and □105 frames only)
(The strokes do not change even with bellows.)

Standard model list

Model No.	Reduction gear ratio	Allowable thrust N {kgf}	Speed mm/s	Stroke mm	Screw diameter mm	Screw lead mm	Frame size
LPES15F	–	150 {15.3}	300	100 200 300	Φ12	6	□45
LPES30F	–	300 {30.6}	300				
LPES30R3	3		100				
LPES30R4	4		75				
LPES30R5	5		60				
LPES30R7	7		43				
LPES30R9	9		33				
LPES30RA	10		30				
LPES150F	–	1500 {153}	300	100 200 300 400 500 600	Φ20	6	□70
LPES150R3	3		100				
LPES150R4	4		75				
LPES150R5	5		60				
LPES150R7	7		43				
LPES150R9	9		33				
LPES150RA	10		30				
LPES300F	–	3000 {306}	300				
LPES300R3	3		100				
LPES300R4	4		75				
LPES300R5	5		60				
LPES300R7	7		43				
LPES300R9	9		33				
LPES300RA	10		30				
LPES1500F	–	15000 {1530}	333	200 300 400 500 600 800 1000	Φ30	10	□105
LPES1500R3	3		167				
LPES1500R4	4		125				
LPES1500R5	5		100				
LPES1500R7	7		71				
LPES1500R9	9		56				
LPES1500RA	10		50				

* The speeds are values at an input of 3000r/min (except for LPES1500F, the speed of which is a value at an input of 2000r/min).

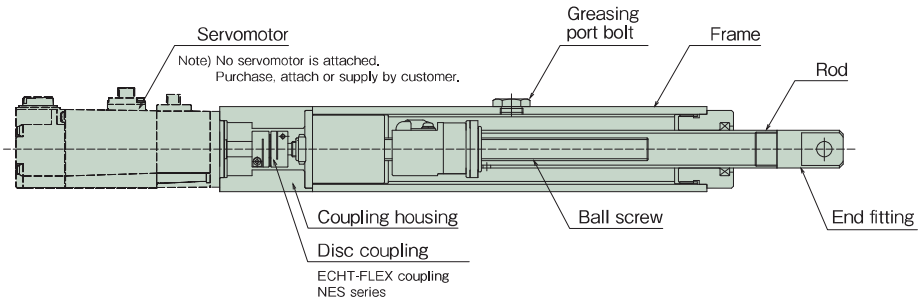
Standard use environment

Model / Environment	Indoor type
Ambient temperature	0 to 40℃
Relative humidity	85% or less (non-condensing)
Impact resistance value	1G or less
Installation altitude	1000m or lower above sea level
Atmosphere	Normally indoors*

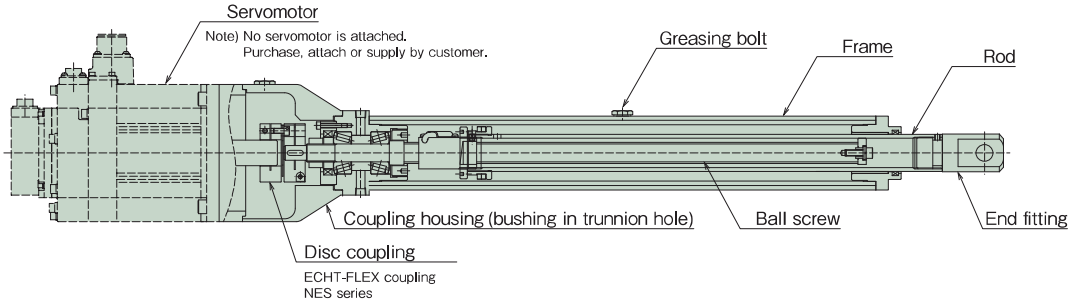
* "Normally indoors" means no exposure to wind, rain and water, and at a general in-factory level of dust.

Structure

□45 frame



□70•□105 frame



Driving part

Motor

A servomotor of almost any manufacturer can be selected. Please attach or supply a servomotor.

Coupling part

Coupling

ECHT-FLEX coupling NES series is adopted. The industry leader in light weight and high rigidity, servomotor functions are fully exerted.

Actuating part

Ball screw

Highly efficient ball screw is adopted.
It can withstand remarkably frequent operations and a long life can be expected.

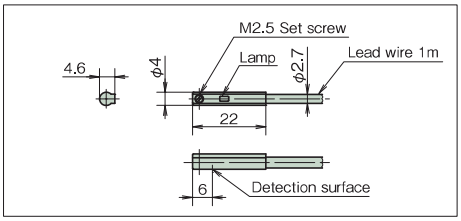
Frame

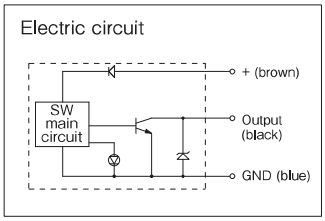
To realize lighter weight, an aluminum frame has been adopted. And the external dimensions of the cylinder are not changed even after mounting a magnetic sensor.

Sensor related option

■Standard magnetic sensor (S)

□45 frame

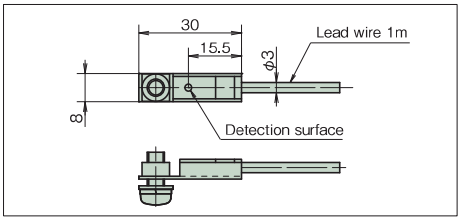


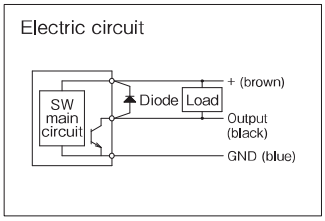


Magnetic sensor specifications

Non-contact switch (DC 3-wire system, lead wire 1m, with lamp)	
Power voltage	5 to 24V DC
Consumption current	10mA or less
Load current	40mA or less
Output specifications	Open collector output

□70 •□105 frame





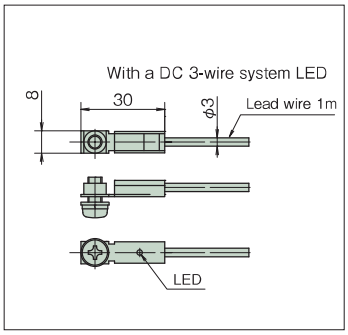
Magnetic sensor specifications

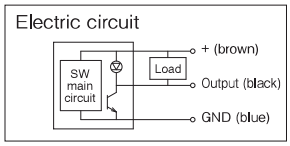
Non-contact switch (DC 3-wire system, lead wire 1m)	
Power voltage	5 to 26V DC
Consumption current	8mA MAX (24V DC)
Output specifications	15mA MAX(24V DC) Open collector output

■Special type (for □70 and □105 frames)

①With (LED) lamp

When the sensor detects, a red lamp lights to indicate detection.
It is useful when setting the position of the magnetic sensor.



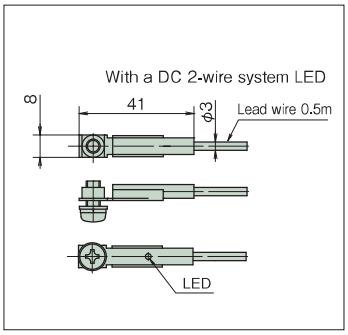


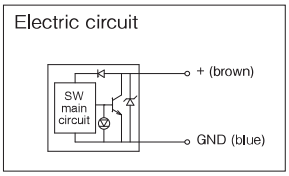
Magnetic sensor specifications

For position detection	
Power voltage	5 to 24V DC
Consumption current	8mA MAX (24V DC)
Output specifications	15mA MAX(24V DC) Open collector output

②2-wire system

* 2-wire system is only with lamp.





Magnetic sensor specifications

For position detection	
Power voltage	10 to 28V DC
Load current	5 to 40mA
Internal drop voltage	4V or less

Input shaft conversion inertia moment

Model No.	Reducer frame No.	Inertia moment X10⁻⁴kg·m²					
		100	200	300	400	500	600
LPES15F	-	0.086	0.102	0.119	-	-	-
LPES30F	-	0.134	0.151	0.168	-	-	-
LPES30R3	120	0.045	0.047	0.049	-	-	-
LPES30R4		0.038	0.039	0.041	-	-	-
LPES30R5		0.035	0.036	0.037	-	-	-
LPES30R7		0.033	0.033	0.033	-	-	-
LPES30R9		0.032	0.032	0.032	-	-	-
LPES30RA		0.031	0.032	0.032	-	-	-
LPES150F	-	1.039	1.166	1.292	1.418	1.545	1.671
LPES150R3	160	0.275	0.290	0.304	0.318	0.332	0.346
LPES150R4		0.205	0.213	0.221	0.229	0.237	0.244
LPES150R5		0.172	0.177	0.182	0.187	0.192	0.197
LPES150R7		0.151	0.154	0.156	0.159	0.162	0.164
LPES150R9		0.143	0.144	0.146	0.148	0.149	0.151
LPES150RA		0.140	0.142	0.143	0.144	0.145	0.147
LPES300F	-	1.720	1.846	1.973	2.099	2.225	2.352
LPES300R3	160	0.351	0.365	0.379	0.393	0.407	0.421
LPES300R4		0.247	0.255	0.263	0.271	0.279	0.287
LPES300R5		0.199	0.204	0.209	0.214	0.219	0.224
LPES300R7		0.165	0.168	0.170	0.173	0.175	0.178
LPES300R9		0.151	0.153	0.154	0.156	0.157	0.159
LPES300RA		0.147	0.148	0.150	0.151	0.152	0.154
LPES300R3	220	0.801	0.815	0.829	0.843	0.857	0.871
LPES300R4		0.587	0.595	0.603	0.611	0.619	0.627
LPES300R5		0.539	0.544	0.549	0.554	0.559	0.564
LPES300R7		0.485	0.488	0.490	0.493	0.495	0.498
LPES300R9		0.461	0.463	0.464	0.466	0.467	0.469
LPES300RA		0.457	0.458	0.460	0.461	0.462	0.464

Model No.	Reducer frame No.	Inertia moment X10⁻⁴kg·m²						
		200	300	400	500	600	800	1000
LPES1500F	-	6.913	7.555	8.197	8.838	9.480	10.763	12.047
LPES1500R3	220	2.000	2.072	2.143	2.214	2.286	2.428	2.571
LPES1500R4		1.262	1.302	1.342	1.382	1.423	1.503	1.583
LPES1500R5		0.971	0.996	1.022	1.048	1.073	1.125	1.176
LPES1500R7		0.705	0.718	0.732	0.745	0.758	0.784	0.810
LPES1500R9		0.594	0.602	0.610	0.618	0.626	0.642	0.658
LPES1500RA		0.565	0.572	0.578	0.584	0.591	0.604	0.616
LPES1500F	-	12.513	13.155	13.797	14.438	15.080	16.363	17.647
LPES1500R3	320	4.640	4.712	4.783	4.854	4.926	5.068	5.211
LPES1500R4		3.522	3.562	3.602	3.642	3.683	3.763	3.843
LPES1500R5		3.211	3.236	3.262	3.288	3.313	3.365	3.416
LPES1500R7		2.875	2.888	2.902	2.915	2.928	2.954	2.980
LPES1500R9		2.724	2.732	2.740	2.748	2.756	2.772	2.788
LPES1500RA		2.695	2.702	2.708	2.714	2.721	2.734	2.746
LPES1500F	-	16.113	16.755	17.397	18.038	18.680	19.963	21.247
LPES1500R3	400	11.000	11.072	11.143	11.214	11.286	11.428	11.571
LPES1500R4		8.547	8.587	8.627	8.667	8.708	8.788	8.868
LPES1500R5		8.065	8.090	8.116	8.142	8.167	8.219	8.270
LPES1500R7		7.469	7.482	7.495	7.508	7.521	7.547	7.574
LPES1500R9		7.239	7.247	7.255	7.263	7.271	7.286	7.302
LPES1500RA		7.191	7.198	7.204	7.210	7.217	7.230	7.242

The moment of inertia does not include the moment of inertia of the servomotor.

Operating frequency and duty factor

The working time rate shows a rate of operating time per 30 minutes on a 30-minute basis.
The working time rate is calculated with the right formula.
The allowable cycle number of the Eco series servo type is determined depending on heating of the motor and heating of the ball screw and bearing part. It varies depending on the stroke and thrust in use, use the values specified above as a guide. Additionally, the life of the cylinder is not considered for the values.

Number of cycles	15 times/min.
Working time rate	50%ED

$$\text{Working time rate (\%ED)} = \frac{\text{operating time of a cycle}}{\text{operating time of a cycle + dwell time}} \times 100$$

Life

The life of the ball screw varies depending on peeling due to fatigue of the rolling surface. Check the approximate life with this expected traveling distance graph. However, when shocks are frequently applied, and when appropriate lubrication or maintenance are not provided, the expected traveling distance becomes considerably shorter.

Expected traveling distance (km) =
actual load stroke (m) × operation frequency (times/day) × operating number of days/year × 10^{-3} × expected number of years

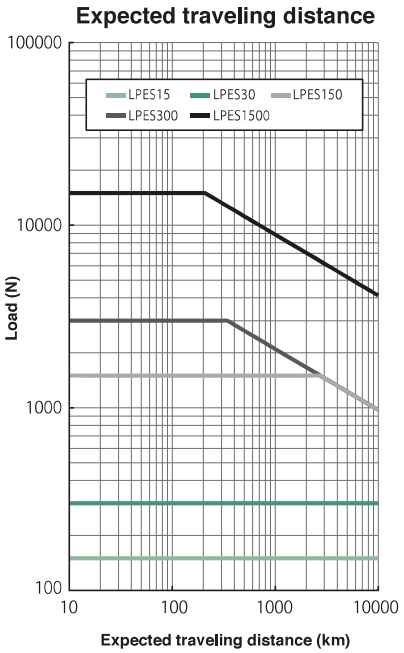
The graph at the right is on an L10 life basis.
The L10 life means the life that can be reached by 90% or more of all is shown as traveling distance.
When selecting a power cylinder based on the life, select the model No. from this graph.

For example, if the expected traveling distance is 1000km and the actual load is 5000N (510kgf), the required power cylinder is LPES1500.
* Select the servomotor capacity from the motor matching table as the actual load < thrust generated.

If the load fluctuates greatly in the middle of stroke, calculate the equivalent load (P_M) by the following equation. Also, with LPES30 and below, the expected traveling distance becomes 10000km or longer.

P_M : equivalent load N
P_{MIN} : minimum load N
P_{MAX} : maximum load N

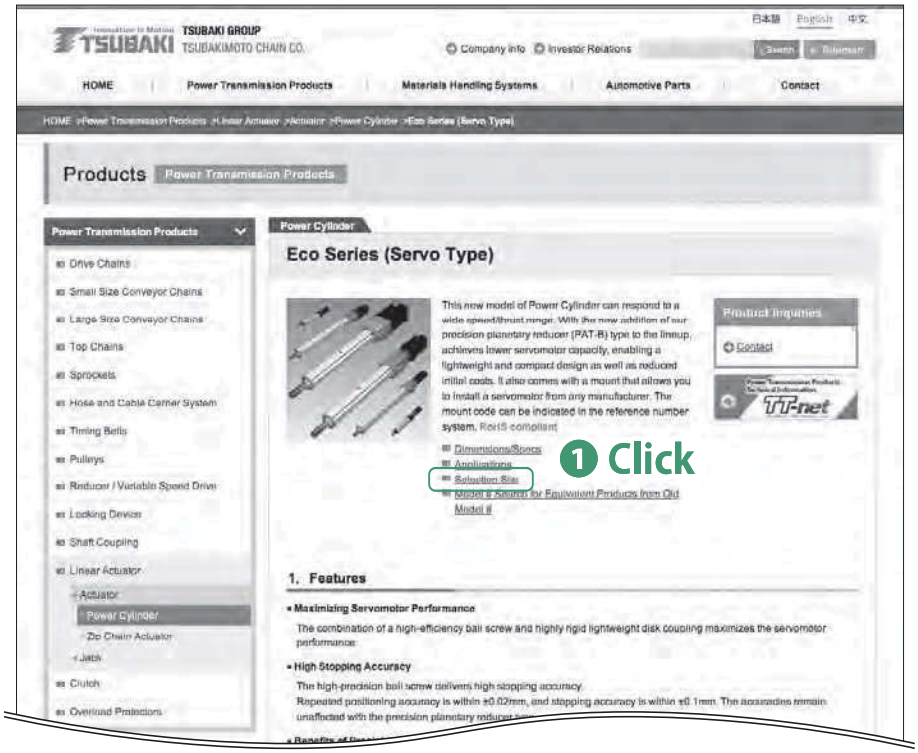
$$P_M = \frac{P_{MIN} + 2 \times P_{MAX}}{3}$$



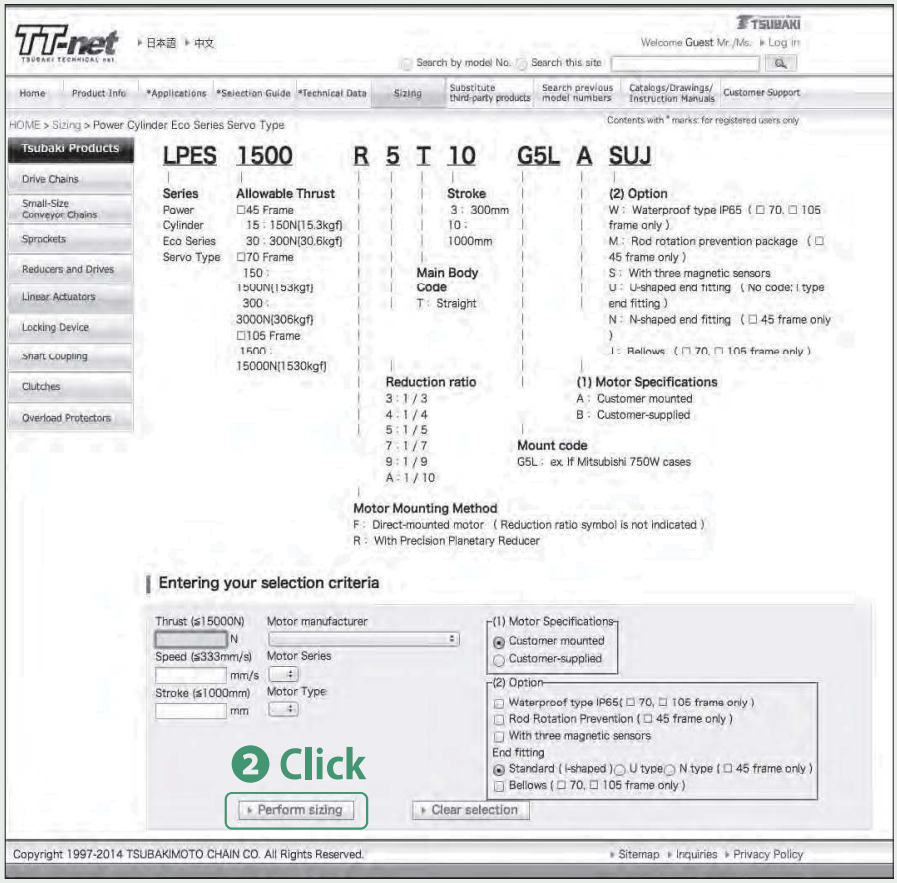
Calculation site for simple selection

Model No. corresponding required specifications is selected on the website.

HOME > Power Transmission Products > Linear Actuator > Actuator > Power Cylinder > Eco Series (Servo Type)
http://tsubakimoto.com/power-transmission/linear-actuator/electro-mechanical/power-cylinder/servo/



HOME > Sizing > Power Cylinder Eco Series Servo Type
https://tt-net.tsubakimoto.co.jp/tecs/calc/sad/lpe/calc_lpes.asp?lang=en



Input necessary conditions and execute selection.

Servomotor matching table

Motors manufactured by Mitsubishi Electric

●J4 series HG-KR/HG-MR ●J3 series HF-KP/HF-MP ●J2-Super series HC-KFS/HC-MFS

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio													
				Motor direct coupling		3		4		5		7		9		10	
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s
HG-KR053(B) HG-MR053(B) HF-KP053(B) HF-MP053(B) HC-KFS053(B) HC-MFS053(B)	0.05	LPES15F	B3D	40	300												
		LPES30R	B3D			130	100	220	75	290	60	300	43	300	33	300	30
HG-KR13(B) HG-MR13(B) HF-KP13(B) HF-MP13(B) HC-KFS13(B) HC-MFS13(B)	0.1	LPES15F	B3D	150	300												
		LPES30F	B3D	190	300												
		LPES30R	B3D			300	100	300	75	300	60						
		LPES150R	B3D									310	43	550	33	810	30
HG-KR23(B) HG-MR23(B) HF-KP23(B) HF-MP23(B) HC-KFS23(B) HC-MFS23(B)	0.2	LPES30F	E4H	300	300												
		LPES150R	E4H			600	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	E4H							1300	60	2100	43	3000	33	3000	30
HG-KR43(B) HG-MR43(B) HF-KP43(B) HF-MP43(B) HC-KFS43(B) HC-MFS43(B)	0.4	LPES150R	E4H			1500	100	1500	75								
		LPES300R	E4H			2200	100	3000	75	3000	60	3000	43				
HG-KR73(B) HG-MR73(B) HF-KP73(B) HF-MP73(B) HC-KFS73(B) HC-MFS73(B)	0.75	LPES150F	G5L	1200	300												
		LPES300R	G5L			3000	100										
		LPES1500R	G5L			1600	167	2700	125	3900	100	6300	71	8600	56	9800	50

●J4 series HG-SR ●J3 series HF-SP ●J2-Super series HC-SFS

HG-SR51(B)	0.5	LPES300F	K3Y	3000	100												
		LPES1500R	K3Y			5800	56	8300	42	11000	33	15000	24	15000	19	15000	17
HF-SP51(B)	0.5	LPES300F	K3Y	3000	100												
		LPES1500R	K3Y			5700	56	8200	42	10900	33	15000	24	15000	19	15000	17
HG-SR81(B) HF-SP81(B) HC-SFS81(B)	0.85	LPES1500F	K3Y	2700	167												
		LPES1500R	K3Y			11400	56	15000	42	15000	33						
HG-SR121(B) HF-SP121(B) HC-SFS121(B)	1.2	LPES1500F	L3R	4600	167												
		LPES1500R	L1R			15000	56										
HG-SR201(B) HF-SP201(B) HC-SFS201(B)	2	LPES1500F	L3R	8900	167												
HG-SR301(B) HF-SP301(B) HC-SFS301(B)	3	LPES1500F	L3R	14300	167												
HG-SR52(B) HF-SP52(B) HC-SFS52(B)	0.5	LPES300R	K3Y			3000	67	3000	50								
		LPES1500R	K3Y			1600	111	2900	83	4000	67	6300	48	8600	37	10000	33
HG-SR102(B)	1	LPES300F	K3Y	3000	200												
		LPES1500R	K3Y			5700	111	8300	83	10800	67	15000	48	15000	37	15000	33
HF-SP102(B) HC-SFS102(B)	1	LPES300F	K3Y	3000	200												
		LPES1500R	K3Y			5600	111	8200	83	10700	67	15000	48	15000	37	15000	33
HG-SR152(B)	1.5	LPES1500F	K3Y	2000	333												
		LPES1500R	K3Y			9700	111	13700	83	15000	67						
HF-SP152(B) HC-SFS152(B)	1.5	LPES1500F	K3Y	2000	333												
		LPES1500R	K3Y			9700	111	13600	83	15000	67						
HG-SR202(B)	2	LPES1500F	L3R	3300	333												
		LPES1500R	L1R			11700	111	15000	83								
HF-SP202(B) HC-SFS202(B)	2	LPES1500F	L3R	3300	333												
		LPES1500R	L1R			11800	111	15000	83								
HG-SR352(B) HF-SP352(B) HC-SFS352(B)	3.5	LPES1500F	L3R	7400	333												
		LPES1500R	L1R			15000	111										
HG-SR502(B) HF-SP502(B) HC-SFS502(B)	5	LPES1500F	L3R	11500	333												
HG-SR702(B) HF-SP702(B) HC-SFS702(B)	7	LPES1500F	L3R	15000	333												

●J3 series HA-LP

HA-LP701M(B)	7	LPES1500F	N1S	15000	250												
HA-LP701M4(B)	7	LPES1500F	N1S	15000	250												
HA-LP502	5	LPES1500F	N1S	11500	333												
HA-LP702	7	LPES1500F	N1S	15000	333												
HA-LP11K24(B)	11	LPES1500F	N1S	15000	333												

* Gray-shaded areas show numerical values with precision planetary reducer.
* Shaded thrusts generated require thrust limits. Make sure to use at the specified thrusts or less.
* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.

Servomotor matching table

Motors manufactured by Yaskawa Electric

V series SGMJV/SGMAV ●Σ II series SGMAH

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio													
				Motor direct coupling		3		4		5		7		9		10	
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s
SGMAH-A3	0.03	LPES30R	B3B											30	33	60	30
SGMJV-A5 SGMAV-A5 SGMAH-A5	0.05	LPES15F	B3D	40	300												
		LPES30R	B3D			120	100	210	75	290	60	300	43	300	33	300	30
SGMJV-01 SGMAV-01 SGMAH-01	0.1	LPES15F	B3D	150	300												
		LPES30F	B3D	190	300												
		LPES30R	B3D			300	100	300	75	300	60						
		LPES150R	B3D									300	43	530	33	800	30
SGMJV-C2 SGMAV-C2	0.15	LPES30F	B3D	300	300												
		LPES150R	B3D					550	75	810	60	1300	43	1500	33	1500	30
		LPES300R	B3D											1600	33	2100	30
SGMJV-02 SGMAV-02 SGMAH-02	0.2	LPES150R	E4H			590	100	1100	75	1500	60	1500	43				
		LPES300R	E4H							1300	60	2100	43	2900	33	3000	30
SGMAH-03	0.3	LPES150R	E4H			1400	100	1500	75								
		LPES300R	E4H					2100	75	2800	60	3000	43				
SGMJV-04 SGMAV-04 SGMAH-04	0.4	LPES150R	E4H			1500	100	1500	75								
		LPES300R	E4H			2100	100	3000	75	3000	60	3000	43				
SGMAV-06	0.55	LPES150F	E4H	630	300												
		LPES300R	E4H			3000	100										
SGMJV-06	0.6	LPES150F	E4H	780	300												
		LPES300R	E4H			3000	100										
SGMAH-07	0.65	LPES150F	G5K	930	300												
		LPES300R	G5K			3000	100										
		LPES1500R	G5K					2000	125	3000	100	5000	71	7000	56	7900	50
SGMJV-08 SGMAV-08 SGMAH-08	0.75	LPES150F	G5L	1200	300												
		LPES1500R	G5L			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50
SGMAV-10	1	LPES300F	G5L	1800	300												
		LPES1500R	G5L			2900	167	4500	125	6100	100	9400	71	12600	56	14200	50

●Σ V series SGMGV

SGMGV-03	0.3	LPES300R	H1H			3000	50	3000	38								
		LPES1500R	H4H					1900	63	2800	50	4600	36	6600	28	7500	25
SGMGV-05	0.45	LPES300F	H2K	1700	150												
		LPES1500R	H4K			2500	83	3900	63	5300	50	8100	36	11200	28	12600	25
SGMGV-09	0.85	LPES300F	K3L	3000	150												
		LPES1500R	K3L			6800	83	9600	63	12500	50	15000	36	15000	28	15000	25
SGMGV-13	1.3	LPES1500F	K3M	2700	250												
		LPES1500R	K3M			11800	83	15000	63	15000	50						
SGMGV-20	1.8	LPES1500F	K3Y	4400	250												
		LPES1500R	K3Y			15000	83										
SGMGV-30	2.9	LPES1500F	L3R	8500	250												
SGMGV-44	4.4	LPES1500F	L3R	14000	250												
SGMGV-55	5.5	LPES1500F	L2S	15000	250												

●Σ V series SGMZS (explosion-proof type)

SGMZS-02	0.2	LPES30F	H1H	300	300												
		LPES150R	H1H			590	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	H1H							1300	60	2100	43	2900	33	3000	30
SGMZS-05	0.5	LPES300R	J7Y			2500	100	3000	75	3000	60	3000	43				
		LPES1500R	J7Y							1600	100	3100	71	4500	56	5200	50
SGMZS-10	1	LPES300F	J7Y	1800	300												
		LPES300R	J7Y			3000	100										
		LPES1500R	J7Y			2900	167	4500	125	6100	100	9400	71	12600	56	14200	50
SGMZS-18	1.8	LPES300F	J8Y	3000	300												
		LPES1500R	J7Y			7200	167	10300	125	13300	100	15000	71	15000	56	15000	50
SGMZS-30A2A	2.97	LPES1500F	M3P	3300	333												
		LPES1500R	M3P			12100	167	15000	125	15000	100						
SGMZS-30A2B	2.96	LPES1500F	M4P	5900	333												
		LPES1500R	M4P			15000	111	15000	83	15000	67						

* Gray-shaded areas show numerical values with precision planetary reducer.
* Shaded thrusts generated require thrust limits. Make sure to use at the specified thrusts or less.
* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.
* Mount codes may change with oil seal. Please contact us or check with the selection tool.

Motors manufactured by Panasonic

●MINAS A5 series MHMD/MSME/MSMD

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio													
				Motor direct coupling		3		4		5		7		9		10	
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s
MSME5A MSMD5A	0.05	LPES15F	B2D	40	300												
		LPES30R	B2D			130	100	220	75	290	60	300	43	300	33	300	30
MSME01 MSMD01	0.1	LPES15F	B2D	150	300												
		LPES30F	B2D	190	300												
		LPES30R	B2D			300	100	300	75	300	60						
MHMD02 MSME02 MSMD02	0.2	LPES30F	E3G	300	300												
		LPES150R	E3G			600	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	E3G							1300	60	2100	43	3000	33	3000	30
MHMD04 MSME04 MSMD04	0.4	LPES150R	E3H			1500	100	1500	75								
		LPES300R	E3H			2200	100	3000	75	3000	60	3000	43				
MHMD08 MSME08 MSMD08	0.75	LPES150F	G4L	1200	300												
		LPES300R	G4L			3000	100										
		LPES1500R	G4L			1600	167	2700	125	3900	100	6300	71	8600	56	9800	50
MSME10	1	LPES300F	J5L	1800	300												
		LPES1500R	J5L			2900	167	4500	125	6100	100	9400	71	12600	56	14200	50
MSME15	1.5	LPES300F	J5L	3000	300												
		LPES1500R	J5L			5600	167	8100	125	10600	100	15000	71	15000	56	15000	50
MSME20	2	LPES1500R	J5L			8300	167	11700	125	15000	100						
MSME30	3	LPES1500F	K3M	3300	333												
		LPES1500R	K3M			13700	167	15000	125								
MSME40	4	LPES1500F	K4Y	5100	333												
		LPES1500R	K4Y			15000	167										
MSME50	5	LPES1500F	K4Y	6900	333												

●MINAS A5 series MDME ●MINAS A4 series MDMA

MDMA08	0.75	LPES300F	K3L	2100	200												
		LPES1500R	K3L			3600	111	5500	83	7300	67	11000	48	14600	37	15000	33
MDME10	1	LPES300F	K3M	3000	200												
		LPES1500R	K3M			5600	111	8200	83	10700	67	15000	48	15000	37	15000	33
MDMA10	1	LPES300F	K3M	3000	200												
		LPES1500R	K3M			5700	111	8300	83	10800	67	15000	48	15000	37	15000	33
MDME15 MDMA15	1.5	LPES1500F	K3M	2000	333												
		LPES1500R	K3M			9700	111	13600	83	15000	67						
MDME20 MDMA20	2	LPES1500F	K3M	3300	333												
		LPES1500R	K3M			13700	111	15000	83								
MDMA25	2.5	LPES1500F	K4Y	4600	333												
		LPES1500R	K4Y			15000	111	15000	83	15000	67						
MDME30 MDMA30	3	LPES1500F	K4Y	6000	333												
		LPES1500R	K4Y			15000	111										
MDMA35	3.5	LPES1500F	M3P	7300	333												
MDME40	4	LPES1500F	L1R	8700	333												
MDMA40	4	LPES1500F	M3P	8600	333												
MDMA45	4.5	LPES1500F	L1R	10000	333												
MDME50	5	LPES1500F	L1R	11500	333												
MDMA50	5	LPES1500F	L1R	11400	333												
MDME75 MDMA75	7.5	LPES1500F	L2S	15000	250												

●MINAS A5 series MFME ●MINAS A4 series MFMA

MFMA04	0.4	LPES300R	K3L			3000	67	3000	50	3000	40						
		LPES1500R	K3L					1700	83	2600	67	4300	48	6100	37	7100	33
MFMA08	0.75	LPES300F	L1M	2100	200												
		LPES1500R	L1M			3600	111	5500	83	7300	67	11000	48	14600	37	15000	33
MFME15 MFMA15	1.5	LPES1500F	L1R	2000	333												
		LPES1500R	L1R			7700	111	11100	83	14300	67	15000	48	15000	37	15000	33
MFME25	2.5	LPES1500F	P2R	4700	333												
		LPES1500R	P2R			15000	111	15000	83	15000	67						
MFMA25	2.5	LPES1500F	P2R	4600	333												
		LPES1500R	P2R			15000	111	15000	83	15000	67						
MFMA35	3.5	LPES1500F	P2R	7300	333												
		LPES1500R	P2R			15000	111	15000	83								
MFME45 MFMA45	4.5	LPES1500F	P3R	10100	333												
		LPES1500F	P3R	10100	333												

* Gray-shaded areas show numerical values with precision planetary reducer.
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* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.

Servomotor matching table

Motors manufactured by Fuji Electric

●ALPHA 5 series GYS ●FALDIC-α series GYS

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio													
				Motor direct coupling		3		4		5		7		9		10	
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s
GYS500D5 GYS500DC	0.05	LPES15F	B3B	40	300												
		LPES30R	B3B			120	100	210	75	290	60	300	43	300	33	300	30
GYS101D5 GYS101DC	0.1	LPES15F	B3D	150	300												
		LPES30F	B3D	190	300												
		LPES30R	B3D			300	100	300	75	300	60						
		LPES150R	B3D									300	43	530	33	800	30
GYS201D5 GYS201DC	0.2	LPES30F	E4H	300	300												
		LPES150R	E4H			590	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	E4H							1300	60	2100	43	2900	33	3000	30
GYS401D5-□□6 GYS371DC	0.375	LPES150R	E4H			1500	100	1500	75	1500	60						
		LPES300R	E4H			1800	100	2900	75	3000	60	3000	43	3000	33		
GYS401D5-□□2 GYS401DC	0.4	LPES150R	E4H			1500	100	1500	75								
		LPES300R	E4H			2100	100	3000	75	3000	60	3000	43				
GYS751D5 GYS751DC	0.75	LPES150F	G5K	1200	300												
		LPES300R	G5K			3000	100										
		LPES1500R	G5K			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50
GYS102D	1	LPES300F	J4Y	1800	300												
		LPES1500R	J4Y			2900	167	4500	125	6100	100	9400	71	12600	56	14200	50
GYS152D	1.5	LPES300F	J4Y	3000	300												
		LPES1500R	J4Y			5600	167	8100	125	10600	100	15000	71	15000	56	15000	50
GYS202D	2	LPES1500F	J4Y	1500	333												
		LPES1500R	J4Y			8300	167	11700	125	15000	100						
GYS302D	3	LPES1500F	K4P	3300	333												
		LPES1500R	K4P			12300	167	15000	125								
GYS402D	4	LPES1500F	K4P	5100	333												
		LPES1500R	K4P			15000	167										
GYS502D	5	LPES1500F	K4P	6900	333												

●ALPHA 5 series GYC ●FALDIC-α series GYC

GYC101D5 GYC101DC	0.1	LPES30F	E5D	190	300												
		LPES30R	E4D			300	100	300	75	300	60						
		LPES150R	E4D									300	43	530	33	800	30
GYC201D5 GYC201DC	0.2	LPES30F	G2H	300	300												
		LPES150R	G5H			590	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	G5H							1300	60	2100	43	2900	33	3000	30
GYC401D5 GYC401DC	0.4	LPES150R	G5H			1500	100	1500	75								
		LPES300R	G5H			2100	100	3000	75	3000	60	3000	43				
		LPES1500R	G5H									1900	71	2900	56	3400	50
GYC751D5 GYC751DC	0.75	LPES300R	J2K			3000	100										
		LPES1500R	J2K			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50
GYC102D5 GYC102DC	1	LPES300F	K3Y	1800	300												
		LPES1500R	K3Y			2900	167	4500	125	6100	100	9400	71	12600	56	14200	50
GYC152D5 GYC152DC	1.5	LPES300F	K3Y	3000	300												
		LPES1500R	K3Y			5600	167	8100	125	10600	100	15000	71	15000	56	15000	50
GYC202D5 GYC202DC	2	LPES1500F	K3Y	1500	333												
		LPES1500R	K3Y			8300	167	11700	125	15000	100						

●ALPHA 5 series GYG ●FALDIC-W series GYG

GYG501C	0.5	LPES300R	K3L			3000	67	3000	50								
		LPES1500R	K3L			1600	111	2800	83	4000	67	6300	48	8600	37	9900	33
GYG501B	0.5	LPES300F	K3L	2000	150												
		LPES300R	K3L			3000	50										
		LPES1500R	K3L			3000	83	4600	63	6200	50	9400	36	12800	28	14400	25
GYG751C	0.75	LPES300F	K3L	2200	200												
		LPES1500R	K3L			3600	111	5500	83	7400	67	11000	48	14600	37	15000	33
GYG851B	0.85	LPES300F	K3L	3000	150												
		LPES1500R	K3L			6800	83	9700	63	12500	50	15000	36	15000	28	15000	25
GYG102C	1	LPES300F	K3M	3000	200												
		LPES1500R	K3M			5600	111	8200	83	10700	67	15000	48	15000	37		
GYG132B	1.3	LPES1500F	K3M	2600	250												
		LPES1500R	K3M			11700	83	15000	63	15000	50						
GYG152C	1.5	LPES1500F	K3M	2000	333												
		LPES1500R	K3M			9700	111	13600	83	15000	67						
GYG202C	2	LPES1500F	K3M	3300	333												
		LPES1500R	K3M			13700	111	15000	83								
GYG182BC	1.8	LPES1500F	L3R	4400	250												
		LPES1500R	L1R			15000	83	15000	63	15000	50						
GYG292BC	2.9	LPES1500F	L3R	8400	250												

* Gray-shaded areas show numerical values with precision planetary reducer.
* Shaded thrusts generated require thrust limits. Make sure to use at the specified thrusts or less.
* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.

Motors manufactured by Omron

●R88M-K series

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio													
				Motor direct coupling		3		4		5		7		9		10	
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s
R88M-K05030H (T)	0.05	LPES15F	B3D	40	300												
		LPES30R	B3D			130	100	220	75	290	60	300	43	300	33	300	30
R88M-K10030L (S) R88M-K10030H (T)	0.1	LPES15F	B3D	150	300												
		LPES30F	B3D	190	300												
		LPES30R	B3D			300	100	300	75	300	60						
		LPES150R	B3D									310	43	550	33	810	30
R88M-K20030L (S) R88M-K20030H (T)	0.2	LPES30F	E3G	300	300												
		LPES150R	E3G			600	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	E3G							1300	60	2100	43	3000	33	3000	30
R88M-K40030L (S) R88M-K40030H (T)	0.4	LPES150R	E3H			1500	100	1500	75								
		LPES300R	E3H			2200	100	3000	75	3000	60	3000	43				
R88M-K40020F (C)	0.4	LPES300R	J4L			3000	67	3000	50	3000	40						
		LPES1500R	J4L					1800	83	2600	67	4400	48	6100	37	7200	33
R88M-K60020F (C)	0.6	LPES300F	J5L	1500	200												
		LPES1500R	J4L			2400	111	3900	83	5300	67	8100	48	11000	37	12600	33
R88M-K75030H (T)	0.75	LPES150F	G4L	1200	300												
		LPES300R	G4L			3000	100										
		LPES1500R	G4L			1600	167	2700	125	3900	100	6300	71	8600	56	9800	50
R88M-K75030F (C)	0.75	LPES300R	J4L			3000	100	3000	75								
		LPES1500R	J4L			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50
R88M-K90010H (T) R88M-K90010F (C)	0.9	LPES1500F	K7M	3000	167												
		LPES1500R	K3M			12200	56	15000	42	15000	33	15000	24				
R88M-K1K030H (T) R88M-K1K030F (C)	1	LPES300F	J5L	1800	300												
		LPES1500R	J4L			2900	167	4500	125	6100	100	9400	71	12600	56	14200	50
R88M-K1K020H (T) R88M-K1K020F(C)	1	LPES300F	K3M	3000	200												
		LPES1500R	K3M			5600	111	8200	83	10700	67	15000	48	15000	37	15000	33
R88M-K1K530H (T) R88M-K1K530F(C)	1.5	LPES300F	J5L	3000	300												
		LPES1500R	J4L			5600	167	8100	125	10600	100	15000	71	15000	56	15000	50
R88M-K1K520H (T) R88M-K1K520F(C)	1.5	LPES1500F	K3M	2000	333												
		LPES1500R	K3M			9700	111	13600	83	15000	67						
R88M-K2K030H (T) R88M-K2K030F (C)	2	LPES1500R	J4L			8300	167	11700	125	15000	100						
R88M-K2K020H (T) R88M-K2K020F (C)	2	LPES1500F	K3M	3300	333												
		LPES1500R	K3M			13700	111	15000	83								
R88M-K2K010H (T) R88M-K2K010F (C)	2	LPES1500F	L3R	8900	167												
		LPES1500R	L1R			15000	56										
R88M-K3K030H (T) R88M-K3K030F (C)	3	LPES1500F	K3M	3300	333												
		LPES1500R	K3M			13700	167	15000	125								
R88M-K3K020H (T) R88M-K3K020F (C)	3	LPES1500F	K4Y	6000	333												
		LPES1500R	K4Y			15000	111										
R88M-K3K010H (T) R88M-K3K010F (C)	3	LPES1500F	L3R	14400	167												
R88M-K4K030H (T) R88M-K4K030F (C)	4	LPES1500F	K4Y	5100	333												
		LPES1500R	K4Y			15000	167										
R88M-K4K020H (T) R88M-K4K020F (C)	4	LPES1500F	L1R	8700	333												
R88M-K5K030H (T) R88M-K5K030F (C)	5	LPES1500F	K4Y	6900	333												
R88M-K5K020H (T) R88M-K5K020F (C)	5	LPES1500F	L1R	11500	333												

●R7M-A/Z series

R7M-A03030	0.03	LPES30R	B3B											30	33	60	30
R7M-A05030	0.05	LPES15F	B3B	40	300												
		LPES30R	B3B			120	100	210	75	290	60	300	43	300	33	300	30
R7M-A10030 R7M-Z10030-S1	0.1	LPES15F	B3D	150	300												
		LPES30F	B3D	190	300												
		LPES30R	B3D			300	100	300	75	300	60						
		LPES150R	B3D									300	43	530	33	800	30
R7M-A20030 R7M-Z20030-S1	0.2	LPES30F	E4H	300	300												
		LPES150R	E4H			590	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	E4H							1300	60	2100	43	2900	33	3000	30
R7M-A40030 R7M-Z40030-S1	0.4	LPES150R	E4H			1500	100	1500	75								
		LPES300R	E4H			2100	100	3000	75	3000	60	3000	43				
R7M-A75030 R7M-Z75030-S1	0.75	LPES150F	G5K	1200	300												
		LPES300R	G5K			3000	100										
		LPES1500R	G5K			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50

* Gray-shaded areas show numerical values with precision planetary reducer.
* Shaded thrusts generated require thrust limits. Make sure to use at the specified thrusts or less.
* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.

Servomotor matching table

Motors manufactured by Sanyo Denki

●R2 series

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio															
				Motor direct coupling		3		4		5		7		9		10			
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s		
R2AA04003F R2EA04003F	0.03	LPES30R	B4B									30	43	50	33	90	30		
R2AA04005F R2EA04005F	0.05	LPES15F	B3D	40	300														
		LPES30R	B4D			120	100	210	75	290	60	300	43	300	33	300	30		
R2EA04008F	0.08	LPES15F	B3D	130	300														
		LPES30R	B4D			300	100	300	75	300	60								
R2AA04010F	0.1	LPES15F	B3D	150	300														
		LPES30F	B3D	190	300														
		LPES30R	B4D			300	100	300	75	300	60								
		LPES150R	B3D									300	43	530	33	800	30		
R2AA06010F	0.1	LPES30F	E5D	190	300														
		LPES30R	E4D			300	100	300	75	300	60								
		LPES150R	E4D									300	43	530	33	800	30		
R2AA06020F R2EA06020F	0.2	LPES30F	E4H	300	300														
		LPES150R	E4H			590	100	1100	75	1500	60	1500	43	1500	33	1500	30		
		LPES300R	E4H							1300	60	2100	43	2900	33	3000	30		
R2AA08020F	0.2	LPES30F	G2H	300	300														
		LPES150R	G5H			590	100	1100	75	1500	60	1500	43	1500	33	1500	30		
		LPES300R	G5H							1300	60	2100	43	2900	33	3000	30		
R2AA06040F	0.4	LPES150R	E4H			1500	100	1500	75										
		LPES300R	E4H			2100	100	3000	75	3000	60	3000	43						
R2AA08040F	0.4	LPES150R	G5H			1500	100	1500	75										
		LPES300R	G5H			2100	100	3000	75	3000	60	3000	43						
		LPES1500R	G5H									1900	71	2900	56	3400	50		
R2AA08075F	0.75	LPES150F	G5K	1200	300														
		LPES300R	G5K			3000	100												
		LPES1500R	G5K			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50		

●Q1 series

Q1AA10100D	1	LPES300F	J4M	1800	300														
		LPES300R	J4M			3000	100												
		LPES1500R	J4M			2900	167	4500	125	6100	100	9500	71	12700	56	14300	50		
Q1AA12100D	1	LPES300F	K6M	1800	300														
		LPES300R	K6M			3000	100												
		LPES1500R	K6M			2900	167	4500	125	6100	100	9500	71	12700	56	14300	50		
Q1AA10150D	1.5	LPES300F	J4M	3000	300														
		LPES1500R	J4M			5700	167	8200	125	10700	100	15000	71	15000	56	15000	50		
Q1AA10200D	2	LPES1500F	J4M	1500	333														
		LPES1500R	J4M			8300	167	11700	125	15000	100								
Q1AA12200D	2	LPES300F	K6M	3000	300														
		LPES1500F	K6M	1500	333														
		LPES1500R	K6M			8300	167	11700	125	15000	100	15000	71	15000	56	15000	50		
Q1AA10250D	2.5	LPES1500F	J4M	2400	333														
		LPES1500R	J4M			11000	167	15000	125										
Q1AA12300D	3	LPES1500F	K6P	3400	333														
		LPES1500R	K6P			12400	167	15000	125										
Q1AA13300D	3	LPES1500F	K3P	3300	333														
		LPES1500R	K3P			12200	167	15000	125	15000	100	15000	71						
Q1AA13400D	4	LPES1500F	K3P	5100	333														
		LPES1500R	K3P			15000	167												
Q1AA18450M	4.5	LPES1500F	L1R	14100	250														
Q1AA13500D	5	LPES1500F	K3P	6800	333														

●Q2 series

Q2CA08050H	0.5	LPES300	H1K			3000	67												
		LPES1500	H1K			1600	111	2900	83	4000	67	6300	48	8600	37	10000	33		
Q2AA08100D	1	LPES300	H1K	1800	300														
		LPES1500	H1K			2900	167	4500	125	6100	100	9400	71	12600	56	14200	50		
Q2AA10100H Q2CA10100H	1	LPES300	J4M	3000	200														
		LPES1500	J4M			6000	111	8700	83	11400	67	15000	48	15000	37	15000	33		
Q2AA13100H	1	LPES300	K3M	3000	200														
		LPES1500	K3M			6000	111	8700	83	11400	67	15000	48	15000	37	15000	33		
Q2AA10150H	1.5	LPES1500	J4M	2000	333														
		LPES1500	J4M			9700	111	13700	83	15000	67								
Q2AA13150H Q2CA13150H	1.5	LPES1500	K3M	2200	333														
		LPES1500	K3M			10200	111	14400	83	15000	67								
Q2AA13200H Q2CA13200H	2	LPES1500	K3P	3300	333														
		LPES1500	K3P			12300	111	15000	83										
Q2AA18200H	2	LPES1500	L1R	3300	333														
		LPES1500	L1R			11700	111	15000	83	15000	67	15000	48	15000	37				
Q2AA22250H	2.5	LPES1500	P2R	4700	333														
		LPES1500	P2R			15000	111	15000	83	15000	67								
Q2AA18350H Q2CA18350H	3.5	LPES1500	L1R	7400	333														
		LPES1500	L1R			15000	111												
Q2AA22350H	3.5	LPES1500	P2R	7600	333														
Q2AA18450H Q2CA18450H	4.5	LPES1500	L1R	10100	333														
Q2AA22450R	4.5	LPES1500	P2R	10100	333														
Q2AA18550R Q2AA18550H	5.5	LPES1500	L3S	15000	250														

* Gray-shaded areas show numerical values with precision planetary reducer.
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* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.

Motors manufactured by FANUC

●α is series (straight shaft)

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio													
				Motor direct coupling		3		4		5		7		9		10	
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s
αiS 2/5000 (HV) (straight shaft)	0.75	LPES300R	H1F			3000	100	3000	75								
		LPES1500R	H4F					1800	125	2800	100	4700	71	6600	56	7500	50
αiS 2/6000 (HV) (straight shaft)	1	LPES300R	H1F			3000	100	3000	75								
		LPES1500R	H4F					1800	125	2800	100	4700	71	6600	56	7500	50
αiS 4/5000 (HV) (straight shaft)	1	LPES300F	Z9Z	2600	300												
		LPES1500R	H1H			4300	167	6400	125	8400	100	12700	71	15000	56	15000	50
αiS 8/6000 (HV) (straight shaft)	2.2	LPES1500R	K3L			11100	167	15000	125	15000	100	15000	71				
αiS 8/4000 HV (straight shaft)	2.3	LPES1500R	K3L			11100	167	15000	125	15000	100	15000	71				
αiS 8/4000 (straight shaft)	2.5	LPES1500R	K3L			11100	167	15000	125	15000	100	15000	71				
αiS 12/4000 HV (straight shaft)	2.5	LPES1500F	Z9Z	4700	333												
		LPES1500R	K3Y			15000	167	15000	125	15000	100						
αiS 12/4000 (straight shaft)	2.7	LPES1500F	Z9Z	4700	333												
		LPES1500R	K3Y			15000	167	15000	125	15000	100						
αiS 22/4000 (straight shaft)	4.5	LPES1500F	Z9Z	10400	333												
αiS 22/4000 HV (straight shaft)		LPES1500F	Z9Z	10400	333												
αiS 50/3000 (HV) (straight shaft)	5	LPES1500F	Z9Z	15000	333												
αiS 30/4000 (HV) (straight shaft)	5.5	LPES1500F	Z9Z	14900	333												
αiS 40/4000 (HV) (straight shaft)	5.5	LPES1500F	Z9Z	15000	333												

●α iF series (straight shaft)

αiF 1/5000 (straight shaft)	0.5	LPES150R	H1F			1500	100	1500	75	1500	60						
		LPES300R	H1F			1600	100	2500	75	3000	60	3000	43	3000	33	3000	30
		LPES1500R	H4F											1500	56	1900	50
αiF 2/5000 (straight shaft)	0.75	LPES300R	H1F			3000	100	3000	75								
		LPES1500R	H4F					1800	125	2800	100	4700	71	6600	56	7500	50
αiF 4/4000 (straight shaft)	1.4	LPES300F	Z9Z	2700	300												
αiF 4/4000 HV (straight shaft)		LPES1500R	K3L			4300	167	6400	125	8400	100	12700	71	15000	56	15000	50
αiF 8/3000 (HV) (straight shaft)	1.6	LPES1500R	K3L			11100	167	15000	125	15000	100	15000	71				
αiF 12/3000 (HV) (straight shaft)	3	LPES1500F	Z9Z	4700	333												
		LPES1500R	L1R			15000	167										
αiF 22/3000 (HV) (straight shaft)	4	LPES1500F	Z9Z	10400	333												
αiF 40/3000 (straight shaft)	6	LPES1500F	Z9Z	15000	333												
αiF 30/3000 (straight shaft)	7	LPES1500F	Z9Z	14900	333												

●β is series (straight shaft)

βiS 0.2/5000 (straight shaft)	0.05	LPES15F	Z9Z	40	300												
		LPES30R	B4D			130	100	220	75	290	60	300	43	300	33	300	30
βiS 0.3/5000 (straight shaft)	0.1	LPES15F	Z9Z	150	300												
		LPES30F	Z9Z	190	300												
		LPES30R	B4D			300	100	300	75	300	60						
		LPES150R	B3D									310	43	550	33	810	30
βiS 0.4/5000 (straight shaft)	0.13	LPES30F	Z9Z	270	300												
		LPES150R	E4E							450	60	840	43	1200	33	1500	30
		LPES300R	E4E													1500	30
βiS 0.5/6000 (straight shaft)	0.35	LPES30F	Z9Z	300	300												
		LPES150R	E4E			630	100	1200	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	E4E							1300	60	2200	43	3000	33	3000	30
βiS 1/5000 (straight shaft)	0.4	LPES150R	E4H			1500	100	1500	75	1500	60						
		LPES300R	E4H			1900	100	3000	75	3000	60	3000	43	3000	33		
βiS 1/6000 (straight shaft)	0.5	LPES150R	E4H			1500	100	1500	75								
		LPES300R	E4H			2100	100	3000	75	3000	60	3000	43				
βiS 2/4000 (HV) (straight shaft)	0.5	LPES300R	H1F			3000	100	3000	75								
		LPES1500R	H4F					1800	125	2800	100	4700	71	6600	56	7500	50
βiS 4/4000 (HV) (straight shaft)	0.75	LPES300F	Z9Z	2100	300												
		LPES1500R	H1H			3500	167	5200	125	7000	100	10700	71	14200	56	15000	50
βiS 8/3000 (HV) (straight shaft)	1.2	LPES300F	Z9Z	3000	200												
		LPES1500R	K3L			9400	111	13300	83	15000	67	15000	48	15000	37		
βiS 12/2000 (straight shaft)	1.4	LPES1500F	Z9Z	3900	333												
		LPES1500R	K3Y			15000	111	15000	83	15000	67						
βiS 22/1500 (straight shaft)	1.4	LPES1500F	Z9Z	9200	200												
		LPES1500R	L1R			15000	67										
βiS 12/3000 (HV) (straight shaft)	1.8	LPES1500F	Z9Z	4200	333												
		LPES1500R	K3Y			15000	111	15000	83								
βiS 22/2000 (HV) (straight shaft)	2.5	LPES1500F	Z9Z	9200	333												

* Gray-shaded areas show numerical values with precision planetary reducer.
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* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.

Servomotor matching table

Motors manufactured by Keyence

●MV series

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio													
				Motor direct coupling		3		4		5		7		9		10	
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s
MV-M05 (B05)	0.05	LPES15F	B3D	40	300												
		LPES30R	B3D			120	100	210	75	290	60	300	43	300	33	300	30
MV-M10 (B10)	0.1	LPES15F	B3D	150	300												
		LPES30F	B3D	190	300												
		LPES30R	B3D			300	100	300	75	300	60						
		LPES150R	B3D									300	43	530	33	800	30
MV-M20 (B20)	0.2	LPES30F	E4H	300	300												
		LPES150R	E4H			590	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	E4H							1300	60	2100	43	2900	33	3000	30
MV-M40 (B40)	0.4	LPES150R	E4H			1500	100	1500	75								
		LPES300R	E4H			2100	100	3000	75	3000	60	3000	43				
MV-M75 (B75)	0.75	LPES150F	G4K	1200	300												
		LPES300R	G4K			3000	100										
		LPES1500R	G4K			1600	167	2700	125	3800	100	6200	71	8500	56	9700	50

●SV series

SV-M005 (B005)	0.05	LPES15F	B3D	40	300												
		LPES30R	B3D			120	100	210	75	290	60	300	43	300	33	300	30
SV-M010 (B010)	0.1	LPES15F	B3D	150	300												
		LPES30F	B3D	190	300												
		LPES30R	B3D			300	100	300	75	300	60						
		LPES150R	B3D									300	43	530	33	800	30
SV-M020 (B020)	0.2	LPES30F	E4H	300	300												
		LPES150R	E4H			590	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	E4H							1300	60	2100	43	2900	33	3000	30
SV-M040 (B040)	0.4	LPES150R	E4H			1500	100	1500	75								
		LPES300R	E4H			2100	100	3000	75	3000	60	3000	43				
SV-M075 (B075)	0.75	LPES150F	G5L	1200	300												
		LPES300R	G5L			3000	100										
		LPES1500R	G5L			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50
SV-M100A (B100A)	0.85	LPES300F	K3L	3000	150												
		LPES1500R	K3L			6800	83	9600	63	12500	50	15000	36	15000	28	15000	25
SV-M150A (B150A)	1.3	LPES1500F	K3M	2700	250												
		LPES1500R	K3M			11800	83	15000	63	15000	50						
SV-M200A (B200A)	1.8	LPES1500F	K3Y	4400	250												
		LPES1500R	K3Y			15000	83										
SV-M300A (B300A)	2.9	LPES1500F	L3R	8500	250												
SV-M500A (B500A)	4.4	LPES1500F	L3R	14000	250												

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* Shaded thrusts generated require thrust limits. Make sure to use at the specified thrusts or less.
* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.

Motors manufactured by Nikki Denso

●NA100 series

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio													
				Motor direct coupling		3		4		5		7		9		10	
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s
NA100-110F(B)-10	1.2	LPES1500F	K4Z	4600	167												
		LPES1500R	Z9P			15000	56	15000	42	15000	33						
NA100-180F(B)-10	1.9	LPES1500F	L1Z	8400	167												
NA100-110F(B)	2.2	LPES1500F	K4Z	3900	333												
		LPES1500R	Z9P			13900	111	15000	83	15000	67	15000	48				
NA100-270F(B)-10	2.8	LPES1500F	Z9Z	13300	167												
NA100-370F(B)-10	3.7	LPES1500F	Z9Z	15000	167												
NA100-180F(B)	3.7	LPES1500F	L1Z	8000	333												
		LPES1500R	Z9P			15000	111										
NA100-110F-40	3.7	LPES1500F	K4Z	2900	333												
		LPES1500R	Z9P			11000	167	15000	125	15000	100	15000	71	15000	56		
NA100-270F(B)	5.5	LPES1500F	Z9Z	12800	333												
NA100-180F-40	5.5	LPES1500F	L1Z	5400	333												
		LPES1500R	Z9P			15000	167										
NA100-370F(B) NA100-370AF(B)	7.5	LPES1500F	Z9Z	15000	333												
NA100-270F-40	7.5	LPES1500F	Z9Z	8100	333												
NA100-370F-40	11	LPES1500F	Z9Z	12800	333												

●NA80 series

NA80-05	0.05	LPES15F	B3D	40	300												
		LPES30R	Z9D			120	100	210	75	290	60	300	43	300	33	300	30
NA80-10	0.1	LPES15F	B3D	150	300												
		LPES30F	B3D	190	300												
		LPES30R	Z9D			300	100	300	75	300	60						
		LPES150R	Z9D									300	43	530	33	800	30
NA80-20	0.2	LPES30F	E4H	300	300												
		LPES150R	Z9H			600	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	Z9H							1300	60	2100	43	3000	33	3000	30
NA80-40	0.4	LPES150R	Z9H			1500	100	1500	75								
		LPES300R	Z9H			2100	100	3000	75	3000	60	3000	43				
NA80-60	0.6	LPES150F	G7L	780	300												
		LPES300R	Z9L			3000	100										
		LPES1500R	Z9L					1600	125	2500	100	4400	71	6100	56	7000	50
NA80-75	0.75	LPES150F	G7L	1200	300												
		LPES1500R	Z9L			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50
NA830-162	1.6	LPES300F	K2M	3000	300												
		LPES1500R	Z9M			6200	167	8800	125	11500	100	15000	71	15000	56	15000	50
NA830-332	3.3	LPES1500F	K2M	3900	333												
		LPES1500R	Z9M			15000	167	15000	125	15000	100						
NA820-402	4	LPES1500F	L1Q	8700	333												
		LPES1500R	Z9Q			15000	111										
NA820-602	6	LPES1500F	L1Q	14100	333												
NA820-752	7.5	LPES1500F	L1Q	15000	333												

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* Shaded thrusts generated require thrust limits. Make sure to use at the specified thrusts or less.
* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.

Servomotor matching table

Motors manufactured by Tamagawa Seiki

●TBL-i Ⅱ series

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio													
				Motor direct coupling		3		4		5		7		9		10	
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s
TS4601	0.03	LPES30R	B4D											30	33	60	30
TS4602	0.05	LPES15F	B3D	40	300												
		LPES30R	B4D			120	100	210	75	290	60	300	43	300	33	300	30
TS4603	0.1	LPES15F	B3D	150	300												
		LPES30F	B3D	190	300												
		LPES30R	B4D			300	100	300	75	300	60						
		LPES150R	B3D									300	43	530	33	800	30
TS4606	0.1	LPES30F	E5D	190	300												
		LPES30R	E4D			300	100	300	75	300	60						
		LPES150R	E4D									300	43	530	33	800	30
TS4607	0.2	LPES30F	E4H	300	300												
		LPES150R	E4H			600	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	E4H							1300	60	2100	43	3000	33	3000	30
TS4611	0.2	LPES30F	G2H	300	300												
		LPES150R	G5H			600	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	G5H							1300	60	2100	43	3000	33	3000	30
TS4609	0.4	LPES150R	E4H			1500	100	1500	75								
		LPES300R	E4H			2100	100	3000	75	3000	60	3000	43				
TS4612	0.4	LPES150R	G5H			1500	100	1500	75								
		LPES300R	G5H			2100	100	3000	75	3000	60	3000	43				
		LPES1500R	G5H									1900	71	2900	56	3400	50
TS4613	0.6	LPES150F	G7L	780	300												
		LPES300R	G5L			3000	100										
		LPES1500R	G5L					1600	125	2500	100	4400	71	6100	56	7000	50
TS4614	0.75	LPES150F	G7L	1200	300												
		LPES1500R	G5L			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50
TS4813	1	LPES300F	J2M	1900	300												
		LPES1500R	J4M			3100	167	4800	125	6400	100	9900	71	13200	56	14900	50
TS4815	1.5	LPES300F	J2M	3000	300												
		LPES1500R	J4M			5700	167	8200	125	10700	100	15000	71	15000	56	15000	50
TS4833	1.6	LPES1500R	K3M			6200	167	8800	125	11500	100						
TS4817	2	LPES1500F	J2M	1800	333												
		LPES1500R	J4M			9100	167	12700	125	15000	100						
TS4882	2	LPES1500F	L1Q	3300	333												
		LPES1500R	L1Q			12000	111	15000	83	15000	67	15000	48				
TS4836	3.3	LPES1500F	K2M	3900	333												
		LPES1500R	K3M			15000	167	15000	125								
TS4884	4	LPES1500F	L1Q	8700	333												
		LPES1500R	L1Q			15000	111										
TS4839	5	LPES1500F	K2Z	6900	333												
TS4887	6	LPES1500F	L1Q	14100	333												
TS4889	7.5	LPES1500F	L1Q	15000	333												

●TRE series

TS3253 TS3353 TS1983	0.03	LPES30R	B2C									30	43	50	33	90	30
TS3252 TS3352 TS1982	0.06	LPES30R	E2D			210	100	300	75	300	60	300	43	300	33	300	30
TS3251 TS3351 TS1981	0.1	LPES30F	E2D	190	300												
		LPES30R	E2D			300	100										
		LPES150R	E2D									300	43	540	33	810	30
TS3250 TS3350 TS1980	0.2	LPES30F	G1Z	300	300												
		LPES150R	G1Z			590	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	G1Z							1300	60	2100	43	2900	33	3000	30

* Gray-shaded areas show numerical values with precision planetary reducer.
* Shaded thrusts generated require thrust limits. Make sure to use at the specified thrusts or less.
* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.

Motors manufactured by Hitachi Industrial Equipment Systems

●ADMA series

Motor type	Motor capacity kW	Power cylinder model No.	Mount code	Reduction gear ratio													
				Motor direct coupling		3		4		5		7		9		10	
				Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s	Thrust generated N	Rated speed mm/s
ADMA-R5L ADMA-R5M	0.05	LPES15F	B3D	40	300												
		LPES30R	B3D			130	100	220	75	290	60	300	43	300	33	300	30
ADMA-01L ADMA-01M	0.1	LPES15F	B3D	150	300												
		LPES30F	B3D	190	300												
		LPES30R	B3D			300	100	300	75	300	60						
		LPES150R	B3D									310	43	550	33	810	30
ADMA-02L ADMA-02M	0.2	LPES30F	E4H	300	300												
		LPES150R	E4H			600	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	E4H							1300	60	2100	43	3000	33	3000	30
ADMA-04L ADMA-04M	0.4	LPES150R	E4H			1500	100	1500	75								
		LPES300R	E4H			2100	100	3000	75	3000	60	3000	43				
ADMA-08L	0.75	LPES150F	G5L	1200	300												
		LPES300R	G5L			3000	100										
		LPES1500R	G5L			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50
ADMA-10L	1	LPES300F	H2Y	1800	300												
		LPES1500R	H1Y			2900	167	4500	125	6100	100	9400	71	12600	56	14200	50
ADMA-15L	1.5	LPES300F	H2Y	3000	300												
		LPES1500R	H1Y			5600	167	8100	125	10600	100	15000	71	15000	56	15000	50
ADMA-20L	2	LPES1500F	H2Y	1500	333												
		LPES1500R	H1Y			8300	167	11700	125	15000	100						
ADMA-30L	3	LPES1500F	K4P	3300	333												
		LPES1500R	K4P			12300	167	15000	125								
ADMA-50L	5	LPES1500F	K4P	6900	333												
		LPES1500R	K4P			15000	167										

●ADMB series

ADMB-01L ADMB-01M	0.1	LPES30F	E5D	190	300												
		LPES30R	E4D			300	100	300	75	300	60						
		LPES150R	E4D									310	43	550	33	810	30
ADMB-02L ADMB-02M	0.2	LPES30F	G2H	300	300												
		LPES150R	G5H			600	100	1100	75	1500	60	1500	43	1500	33	1500	30
		LPES300R	G5H							1300	60	2100	43	3000	33	3000	30
ADMB-04L ADMB-04M	0.4	LPES150R	G5H			1500	100	1500	75								
		LPES300R	G5H			2100	100	3000	75	3000	60	3000	43				
		LPES1500R	G5H									1900	71	2900	56	3400	50
ADMB-08L	0.75	LPES300R	K3L			3000	100										
		LPES1500R	K3L			1600	167	2700	125	3900	100	6300	71	8600	56	9700	50
ADMB-10L	1	LPES300F	K2L	1800	300												
		LPES1500R	K3L			2900	167	4500	125	6100	100	9400	71	12600	56	14200	50

●ADMC series

ADMC-04L	0.4	LPES300F	H2Y	1400	150												
		LPES300R	H1Y			3000	50	3000	38								
		LPES1500R	H1Y			2000	83	3200	63	4400	50	6900	36	9600	28	10800	25
ADMC-08L	0.75	LPES300F	H2Y	3000	150												
		LPES1500R	H1Y			5700	83	8200	63	10700	50	15000	36	15000	28	15000	25
ADMC-10L	1	LPES1500F	H2Y	1500	250												
		LPES1500R	H1Y			8400	83	11800	63	15000	50						
ADMC-15L	1.5	LPES1500F	K4P	3300	250												
		LPES1500R	K4P			12400	83	15000	63								
ADMC-20L	2	LPES1500F	K4P	5100	250												
		LPES1500R	K4P			15000	83										
ADMC-30L	2.9	LPES1500F	L3R	8400	250												
ADMC-45L	4.5	LPES1500F	L3R	14100	250												

●ADMG series

ADMG-05HP	0.5	LPES300R	H1K			3000	67										
		LPES1500R	H1K			1600	111	2900	83	4000	67	6300	48	8600	37	10000	33
ADMG-10HP	1	LPES300F	J4M	3000	200												
		LPES1500R	J4M			6000	111	8700	83	11400	67	15000	48	15000	37	15000	33
ADMG-15HP	1.5	LPES1500F	K3M	2200	333												
		LPES1500R	K3M			10300	111	14400	83	15000	67						
ADMG-20HP	2	LPES1500F	K3P	3300	333												
		LPES1500R	K3P			12300	111	15000	83								
ADMG-35HP	3.5	LPES1500F	L1R	7400	333												
		LPES1500R	L1R			15000	111										
ADMG-45HP	4.5	LPES1500F	L1R	10100	333												

* Gray-shaded areas show numerical values with precision planetary reducer.
* Shaded thrusts generated require thrust limits. Make sure to use at the specified thrusts or less.
* Shaded rated speeds require speed limits. Make sure to use at the specified speeds or less.

Dimensions table (□45 frame)

LPES15FT□□□□

Stroke

Fig. 1

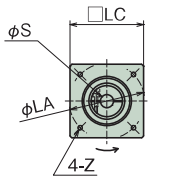
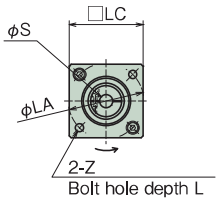
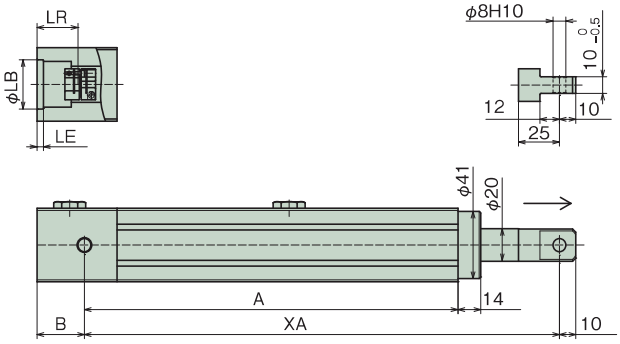
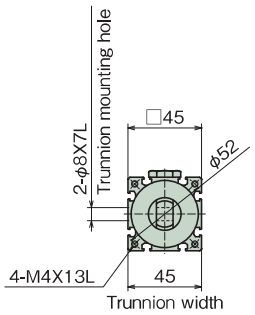


Fig. 2







Unit: mm

Mount code	LC	LB	LE	S	LR	LA	Z	L	B	Drawing
A3D	45	22	4	8	24	48	M3X11L	-	28	1
B2D	45	30	4	8	24	45	M3X11L	-	28	
B3B	45	30	4	6	25	46	M4X13L	49	29	2
B3D	45	30	4	8	25	46	M4X13L	49	29	
C1C	45	34	4	7	24	48	M3X11L	-	28	1
Z9Z										

* For dimensions in blanks, contact us.

Unit: mm

Stroke	A	XA	
		MIN	MAX
100	228	290	390
200	328	410	610
300	428	510	810

Stroke	Mass
100	1.5
200	1.9
300	2.2

* The above mass does not include the mass of the servomotor.

LPES30FT□□□□

Mount code
Stroke

Fig. 1

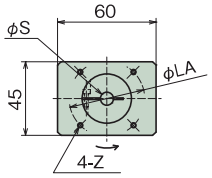
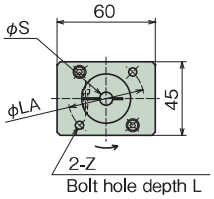
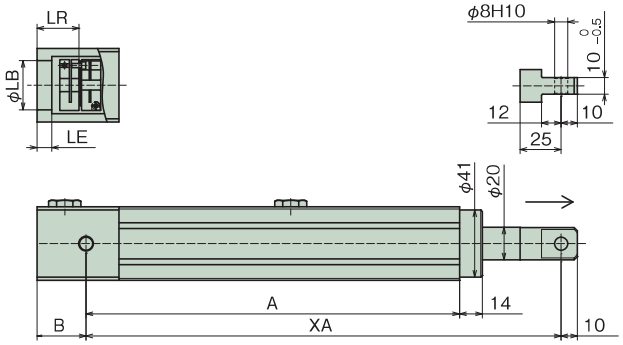


Fig. 2





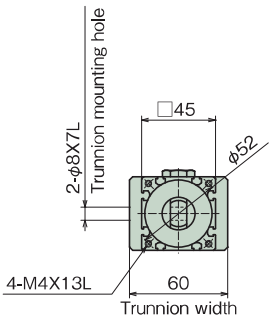
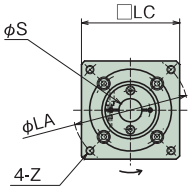
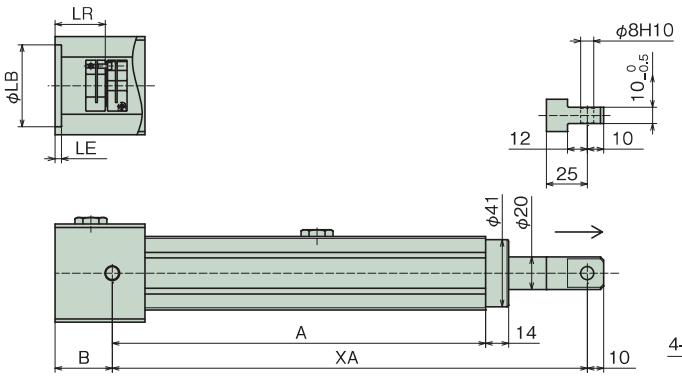
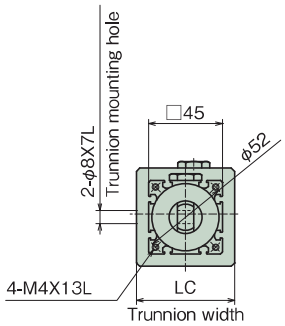


Fig. 3







Unit: mm

Mount code	LC	LB	LE	S	LR	LA	Z	L	B	Drawing
A3D	-	22	8	8	24	48	M3X11L	-	29	1
B2D	-	30	9	8	25	45	M3X11L	-	30	
B3D	-	30	9	8	25	46	M4X13L	50	30	2
E1C	60	50	5	7	24	60	M4X12L	-	29	
E2D	60	50	5	8	30	60	M4X12L	-	35	
E3D	60	50	5	8	25	70	M4X12L	-	30	
E3G	60	50	5	11	30	70	M4X12L	-	35	
E4H	60	50	5	14	30	70	M5X12L	-	35	
E5D	60	50	5	8	25	70	M5X12L	-	30	3
G1G	80	70	5	11	30	90	M5X12L	-	35	
G1H	80	70	5	14	30	90	M5X12L	-	35	
G1Z	80	70	5	12	30	90	M5X12L	-	35	
G2H	80	70	5	14	30	90	M6X17L	-	35	
H1H	90	80	5	14	30	100	M6X17L	-	35	
Z9Z										

* For dimensions in blanks, contact us.

Unit: mm

Stroke	A	XA	
		MIN	MAX
100	228	290	390
200	328	410	610
300	428	510	810

Unit: kg

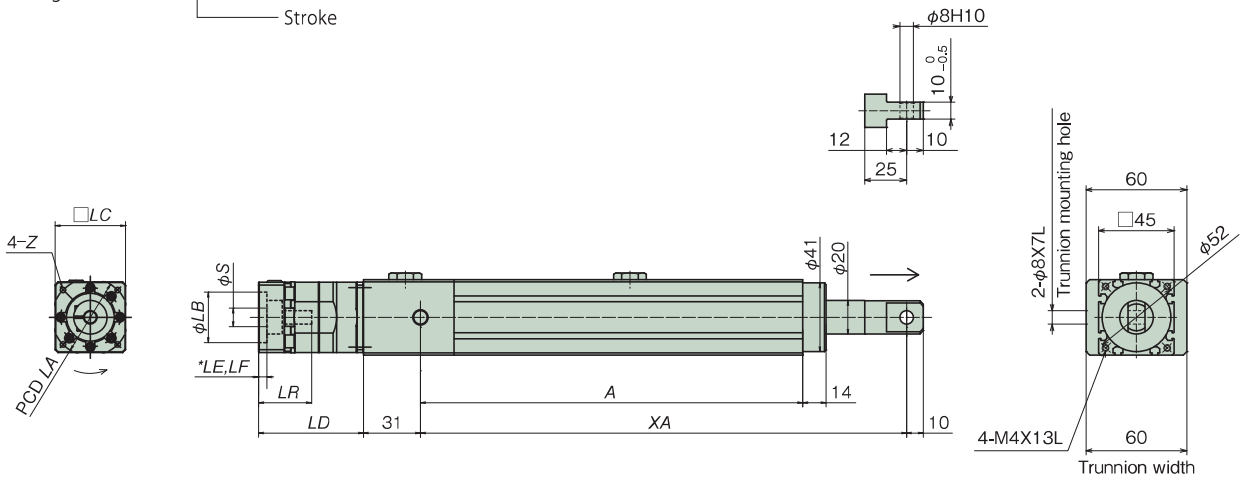
Stroke	Mass
100	1.6
200	2.0
300	2.4

mass of the servomotor.

Dimensions table (□45 frame)

■ LPES30R□T□□□□

Reduction gear ratio — Mount code
Stroke



Unit: mm

Mount code	LC	LB	LE*	S	LR	LF*	LA	Z	LD
B2D	42	30	5	8	32	5	45	M3×7L	62.5
B3D	42	30	5	8	32	5	46	M4×9L	62.5
E3G	65	50	5	11	35	6	70	M4×9L	65.5

* LE : spigot depth. LF : distance to coupling.

Unit: mm

Stroke	A	XA	
		MIN	MAX
100	228	290	390
200	328	410	610
300	428	510	810

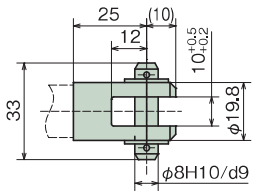
Unit: kg

Stroke	Mass
100	2.2
200	2.6
300	3.0

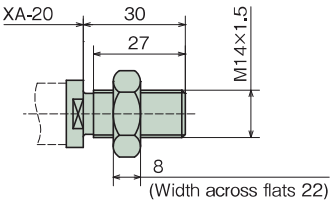
* The above mass does not include the mass of the servomotor.

■ Options

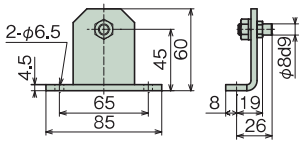
U-type end fitting (- U)



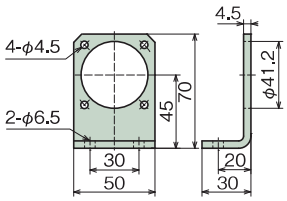
N-type end fitting (- N)



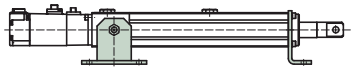
Trunnion fitting (LPE015-T)



Foot fitting (LPE015-F)



Trunnion fitting + foot fitting (LPE015-FT)

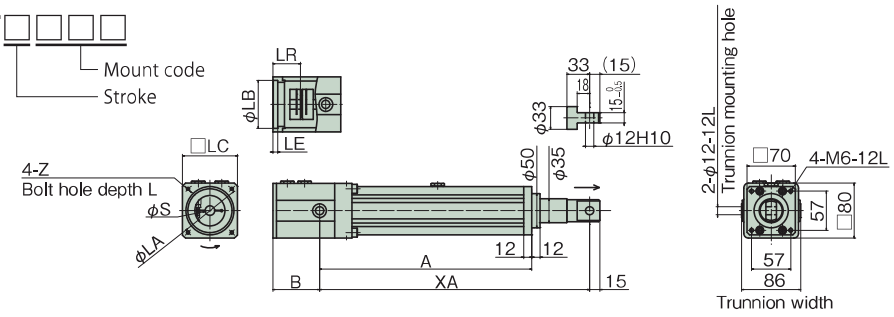


In the case of the above installation, model No. LPE15-FT comes with a set of trunnion and foot fittings.

Dimensions table (□70 frame)

LPES150FT□□□□

Mount code
Stroke



Unit: mm

マウントコード	LC	LB	LE	S	LR	LA	Z	L	B
E4H	80	50	8	14	30	70	M5X8L	-	68
G4K	80	70	5	16	40	90	M5X16L	14	77
G4L	80	70	5	19	35	90	M5X16L	9	72
G5K	80	70	5	16	40	90	M6X16L	14	77
G5L	80	70	5	19	40	90	M6X16L	14	77
G7L	80	70	5	19	35	90	M6X16L	9	72
Z9Z									

* For dimensions in blanks, contact us.

Unit: mm

Stroke	A	XA	
		MIN	MAX
100	309	395	495
200	409	495	695
300	509	595	895
400	609	695	1095
500	709	795	1295
600	809	895	1495

Unit: kg

Stroke	Mass
100	8.6
200	9.5
300	10.5
400	11.4
500	12.3
600	13.3

* The above mass does not include the mass of the servomotor.

LPES300FT□□□□

Mount code
Stroke

Fig. 1

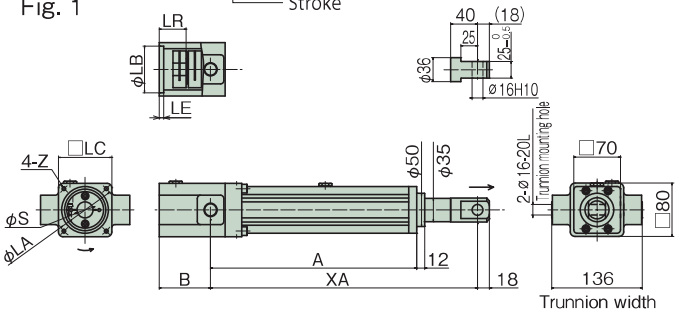
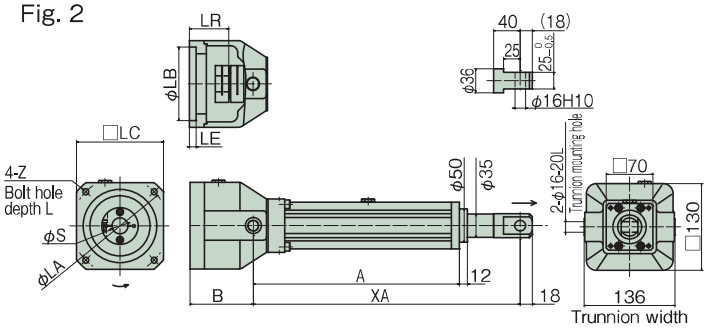


Fig. 2



Unit: mm

Mount code	LC	LB	LE	S	LR	LA	Z	L	B	Drawing
G5K	80	70	5	16	40	90	M6X16L	-	77	1
G5L	80	70	5	19	40	90	M6X16L	-	77	
H1K	130	80	7	16	35	100	M6X7L	-	74	2
H2K	130	80	7	16	40	100	M6X7L	-	77	
H2L	130	80	22	19	55	100	M6X22L	-	92	
H2Y	130	80	12	24	45	100	M6X12L	-	82	
J2M	130	95	10	22	40	115	M8X10L	-	80	
J3Y	130	95	12	24	45	115	M6X12L	-	82	
J4M	130	95	12	22	45	115	M8X12L	-	82	
J4Y	130	95	12	24	45	115	M8X12L	-	82	
J5L	130	95	23	19	55	115	M8X10L	-	93	
J7Y	130	95	19	24	40	135	M8X19L	-	80	
J8Y	130	95	19	24	50	135	M8X19L	-	89	

Unit: mm

Mount code	LC	LB	LE	S	LR	LA	Z	L	B	Drawing
K2L	130	110	10	19	40 to 41	145	M8X20L	6	79	2
K2M	130	110	10	22	40	145	M8X20L	6	79	
K3L	130	110	25	19	55 to 58	145	M8X20L	22	95	
K3M	130	110	25	22	55	145	M8X20L	22	95	
K3Y	130	110	25	24	55 to 58	145	M8X20L	22	95	
K6M	130	110	12	22	45	145	M8X20L	9	82	
K7M	130	110	37	22	70	145	M8X20L	34	107	
L1M	176	114.3	22	22	55	200	M12X19L	-	92	
Z9Z										

* For dimensions in blanks, contact us.

Unit: mm

Stroke	A	XA	
		MIN	MAX
100	309	400	500
200	409	500	700
300	509	600	900
400	609	700	1100
500	709	800	1300
600	809	900	1500

Unit: kg

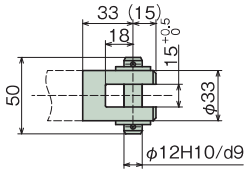
Stroke	Mass
100	14.3
200	15.2
300	16.1
400	17.1
500	18.0
600	19.0

* The above mass does not include the mass of the servomotor.

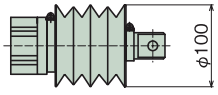
Options

LPES150

U-type end fitting (- U)

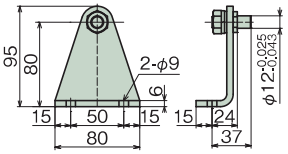


Bellows (- J)



When bellows are equipped, flange mount is not available.

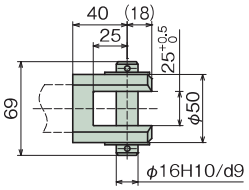
Trunnion fitting (LPE025-T) Mass: 0.6kg



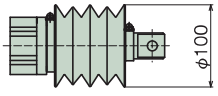
Order the trunnion fitting separately from main body model No. without entering any symbol at the end of model No.

LPES300

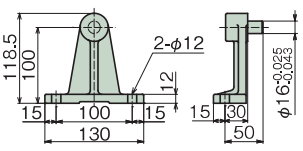
U-type end fitting (- U)



Bellows (- J)



Trunnion fitting (LPE300-T) Mass: 3.3kg



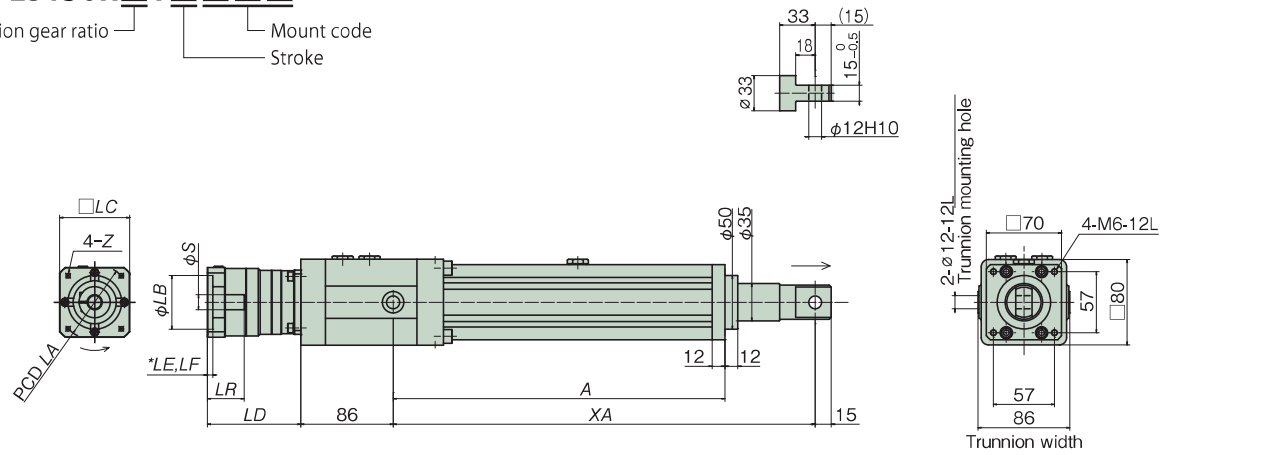
Order the trunnion fitting separately from main body model No. without entering any symbol at the end of model No.

Dimensions table (□70 frame)

The dimensions of Planetary Reducer Type may changed, contact us.

■ LPES150R□T□□□□

Reduction gear ratio — Mount code / Stroke



Unit: mm

Mount code	LC	LB	LE*	S	LR	LF*	LA	Z	LD
B3D	42	30	5	8	32	5	46	M4×9L	84
E3G	65	50	5	11	35	5	70	M4×9L	87
E3H	65	50	5	14	35	5	70	M4×9L	87
E4D	60	50	10	8	37	10	70	M5×11L	67.5
E4E	65	50	5	9	35	5	70	M5×11L	87
E4H	65	50	5	14	35	5	70	M5×11L	87
G5H	80	70	5	14	35	5	90	M6×13L	87
H1F	90	80	15	10	45	15	100	M6×13L	97
H1H	90	80	15	14	45	15	100	M6×13L	97

* LE : spigot depth. LF : distance to coupling.

Unit: mm

Stroke	A	XA	
		MIN	MAX
100	309	395	495
200	409	495	695
300	509	595	895
400	609	695	1095
500	709	795	1295
600	809	895	1495

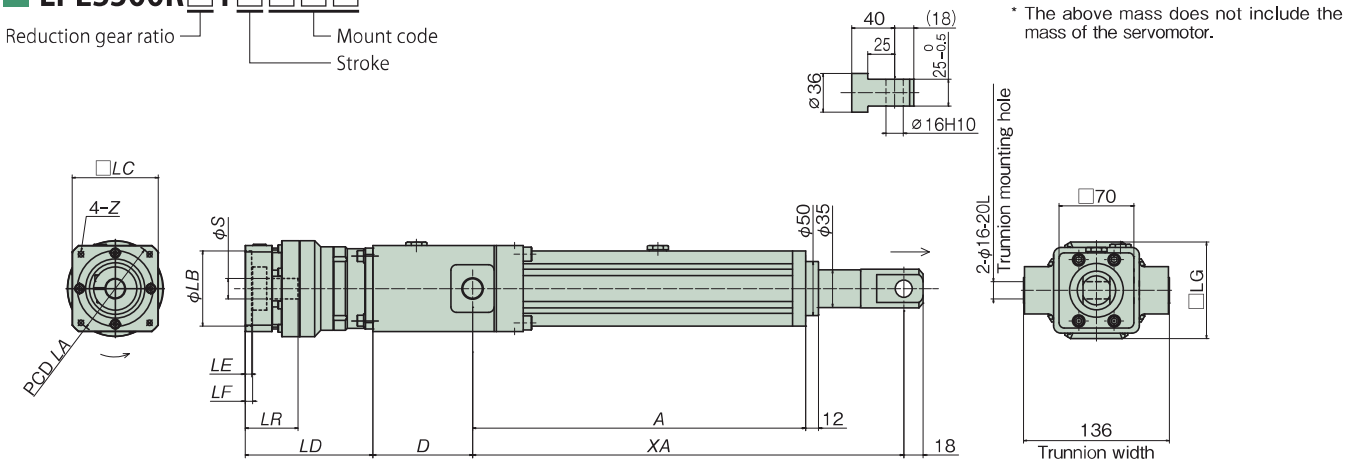
Unit: kg

Stroke	Mass
100	10.7
200	11.6
300	12.6
400	13.5
500	14.4
600	15.4

* The above mass does not include the mass of the servomotor.

■ LPES300R□T□□□□

Reduction gear ratio — Mount code / Stroke



Unit: mm

Mount code	LC	LB	LE	S	LR	LF	LA	Z	LD	LG	D
B3D	42	30	5	8	32	5	46	M4×9L	62.5	42	85
E3G	65	50	5	11	35	5	70	M4×9L	87	63	85
E3H	65	50	5	14	35	5	70	M4×9L	87	63	85
E4E	65	50	5	9	35	5	70	M5×11L	87	63	85
E4H	65	50	5	14	35	5	70	M5×11L	87	63	85
G5H	80	70	5	14	35	5	90	M6×13L	87	63	85
G5K	80	70	6	16	50	8	90	M6×13L	102	75	85
H1F	90	80	15	10	45	15	100	M6×13L	97	63	85
H1H	90	80	15	14	45	15	100	M6×13L	97	63	85
G4L	80	70	6	19	50	7	90	M5×11L	118.5	89	93
G5L	80	70	6	19	50	7	90	M6×13L	118.5	89	93
J4L	100	95	16	19	60	17	115	M8×17L	128.5	89	93
J7Y	115	95	8	24	67	12	135	M8×17L	135.5	90	93
K3L	130	110	21	19	65	22	145	M8×17L	133.5	89	93
K3Y	130	110	8	24	62	7	145	M8×17L	130.5	90	93

Unit: mm

Stroke	A	XA	
		MIN	MAX
100	309	400	500
200	409	500	700
300	509	600	900
400	609	700	1100
500	709	800	1300
600	809	900	1500

Unit: kg

Stroke	Mass (with PAT-B160)	Mass (with PAT-B220)
100	14.6	16.0
200	15.5	16.9
300	16.4	17.8
400	17.4	18.8
500	18.3	19.7
600	19.3	20.7

* The above mass does not include the mass of the servomotor.

Dimensions table (□105 frame)

LPES1500FT□□□□□

Mount code
Stroke

Fig. 1

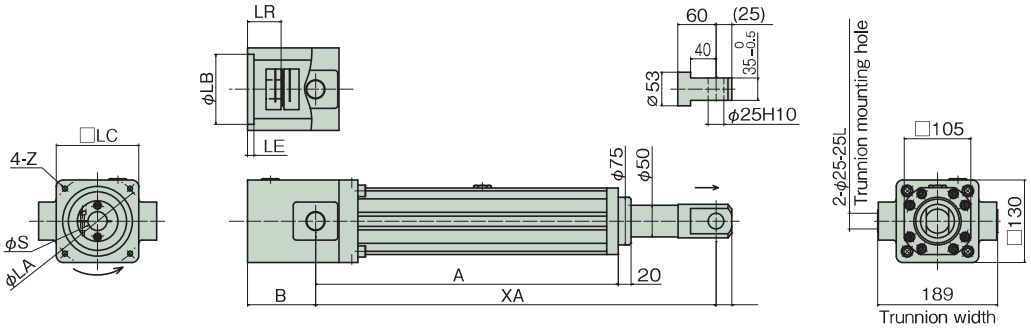
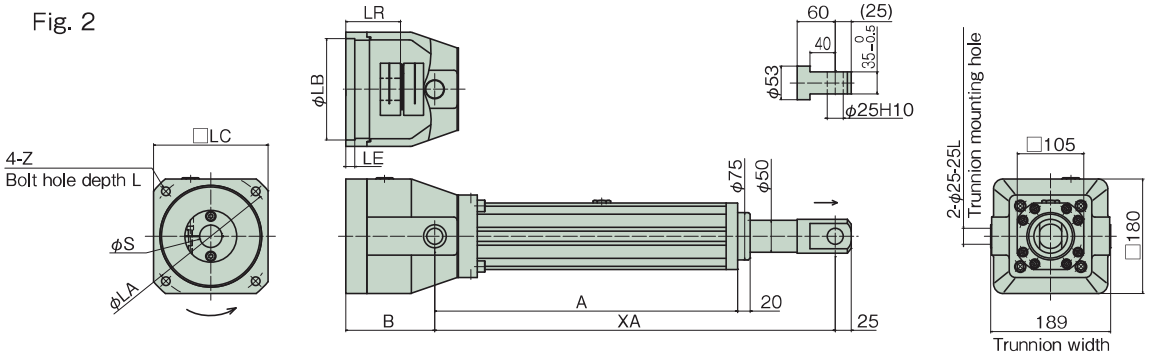


Fig. 2



Unit: mm

Mount code	LC	LB	LE	S	LR	LA	Z	L	B	Drawing
H2Y	130	80	12	24	45	100	M6X12L	-	101	
J2M	130	95	10	22	40	115	M8X16L	-	96	
J3Y	130	95	5	24	45	115	M6X12L	-	101	
J4M	130	95	5	22	45	115	M8X16L	-	101	
J4Y	130	95	5	24	45	115	M8X16L	-	101	
K2M	130	110	9	22	40	145	M8X16L	-	96	
K2Z	130	110	9	26	40	145	M8X16L	-	96	
K3M	130	110	9	22	55 to 58	145	M8X16L	-	111	
K3P	130	110	9	28	55	145	M8X16L	-	111	1
K3Y	130	110	9	24	55 to 58	145	M8X16L	-	111	
K4P	130	110	9	28	63	145	M8X16L	-	119	
K4Y	130	110	9	24	65	145	M8X16L	-	119	
K4Z	130	110	9	28(j6)	63	145	M8X16L	-	119	
K6M	130	110	5	22	45	135	M8X16L	-	101	
K6P	130	110	5	28	55	135	M8X16L	-	111	
K7M	130	110	9	22	70	145	M8X16L	-	124	
L1P	180	114.3	11	28	55	200	M12X25L	7	114	
L1Q	180	114.3	11	32	50	200	M12X25L	7	109	
L1R	180	114.3	21	35	65 to 70	200	M12X25L	17	124	
L1Z	180	114.3	21	28(j6)	65	200	M12X25L	17	124	
L2S	180	114.3	65	42	113	200	M12X25L	61	168	
L3R	180	114.3	10	35	79 to 80	200	M12X25L	29	136	2
L3S	180	114.3	10	42	79	200	M12X25L	29	136	
M3P	180	130	17	28	60 to 65	165	M10X25L	-	120	
M4P	180	130	17	28	70	165	M10X25L	-	125	
N1S	200	180	6	42	85	215	M12X25L	33	140	
P2Q	220	200	6	32	65	235	M12X29L	-	124	
P2R	220	200	6	35	65	235	M12X29L	-	124	2
P3R	220	200	6	35	70	235	M12X29L	-	124	
Z9Z										

* For dimensions in blanks, contact us.

Unit: mm

Stroke	A	XA	
		MIN	MAX
200	537	680	880
300	637	790	1090
400	737	900	1300
500	837	1010	1510
600	937	1115	1715
800	1137	1335	2135
1000	1337	1555	2555

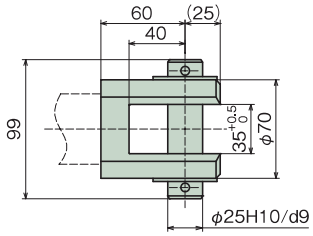
Unit: kg

Stroke	Mass
200	39.9
300	42.9
400	44.4
500	46.7
600	48.9
800	53.9
1000	57.9

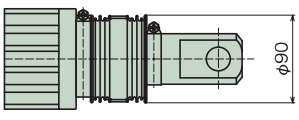
* The above mass does not include the mass of the servomotor.

Options

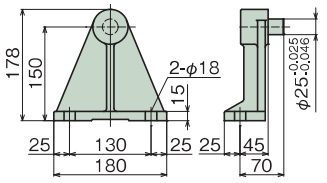
U-type end fitting (-U)



Bellows (-J)



Trunnion fitting (LPE400-T) Mass: 7.0kg



Order the trunnion fitting separately from main body model No. without entering any symbol at the end of model No.

Dimensions table (□105 frame)

The dimensions of Planetary Reducer Type may changed, contact us.

■ LPES1500R□T□□□□□

Reduction gear ratio — Mount code
Stroke

Fig. 1

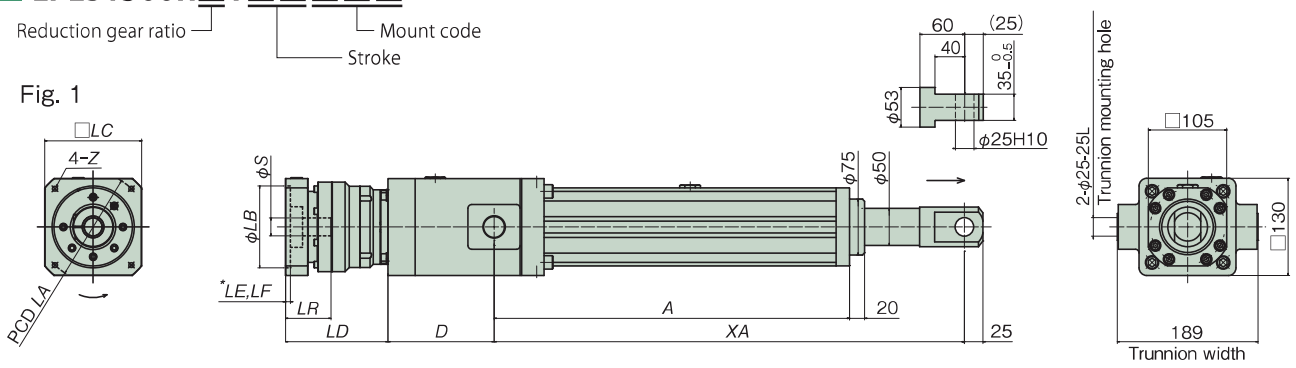
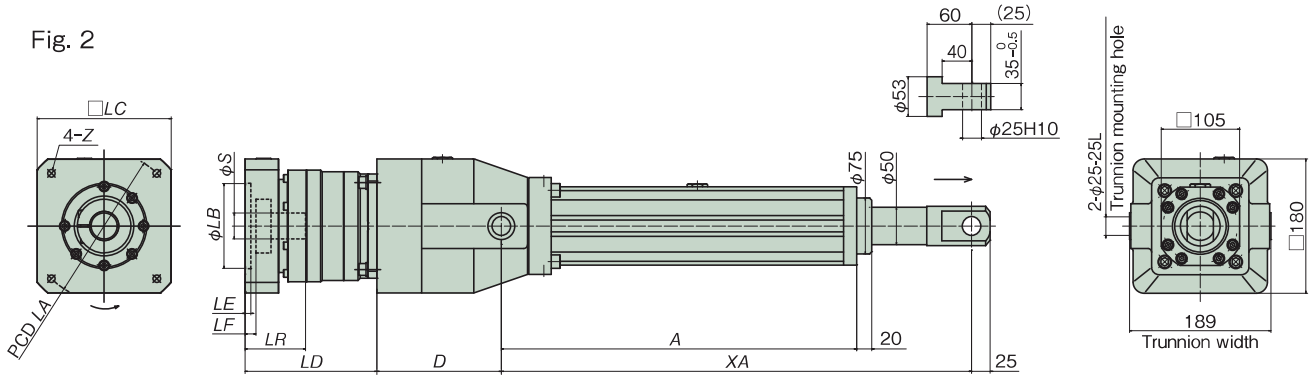


Fig. 2



Unit: mm

Mount code	LC	LB	LE*	S	LR	LF*	LA	Z	LD	D	Drawing
G4K	80	70	6	16	50	7	90	M5×11L	118.5	111	
G4L	80	70	6	19	50	7	90	M5×11L	118.5	111	
G5H	80	70	5	14	35	5	90	M6×13L	108.5	111	
G5K	80	70	6	16	50	7	90	M6×13L	118.5	111	
G5L	80	70	6	19	50	7	90	M6×13L	118.5	111	
H1H	90	80	15	14	45	15	100	M6×13L	118.5	111	
H4K	90	80	16	16	60	17	100	M6×13L	128.5	111	1
J4L	100	95	16	19	60	17	115	M8×17L	128.5	111	
J7Y	115	95	8	24	67	12	135	M8×17L	135.5	111	
K3L	130	110	21	19	65	22	145	M8×17L	133.5	111	
K3M	130	110	18	22	77	22	145	M8×17L	145.5	111	
K3Y	130	110	8	24	62	7	145	M8×17L	130.5	111	
M3P	150	130	8	28	67	12	165	M10×21L	142.5	143	
L1R	180	114.3	8	35	82	15	200	M12×25L	177	167	2

* LE : spigot depth. LF : distance to coupling.

Unit: mm

Stroke	A	XA	
		MIN	MAX
200	537	680	880
300	637	790	1090
400	737	900	1300
500	837	1010	1510
600	937	1115	1715
800	1137	1335	2135
1000	1337	1555	2555

Unit: kg

Stroke	Mass (with PAT-B220)	Mass (with PAT-B320)	Mass (with PAT-B400)
200	39.1	42.1	56.4
300	42.1	45.1	59.4
400	43.6	46.6	60.9
500	45.9	48.9	63.2
600	48.1	51.1	65.4
800	53.1	56.1	70.4
1000	57.1	60.1	74.4

* The above mass does not include the mass of the servomotor.

Application Solution

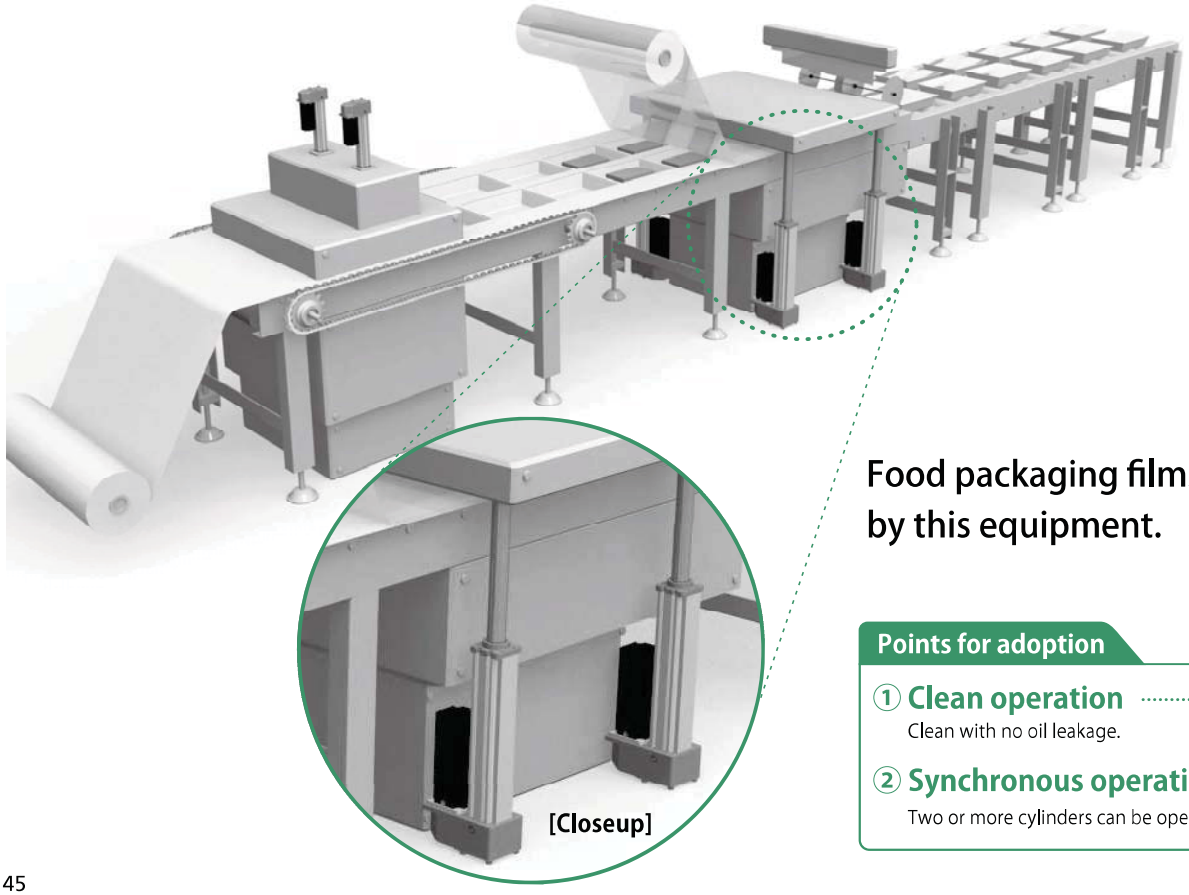
Glass substrate tilting equipment

Points for adoption

① **Swinging operation**
Swinging operation can be performed because the servo cylinder is pin-connected with the equipment.

② **High-frequency operation**
High-frequency operation with the frequency of starts 15 times/min. and a duty factor 50%ED can be performed.

Film welding equipment



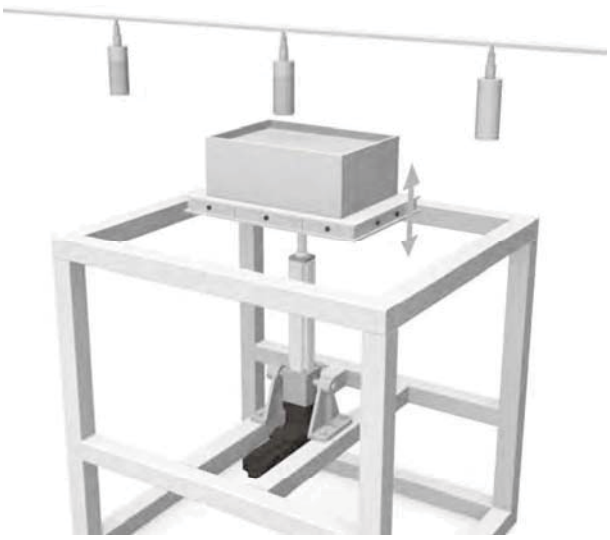
Food packaging films are welded by this equipment.

Points for adoption

① **Clean operation**
Clean with no oil leakage.

② **Synchronous operation**
Two or more cylinders can be operated synchronously.

Coating equipment



Workpieces are coated by moving up and down a tank containing a coating agent.

Points for adoption

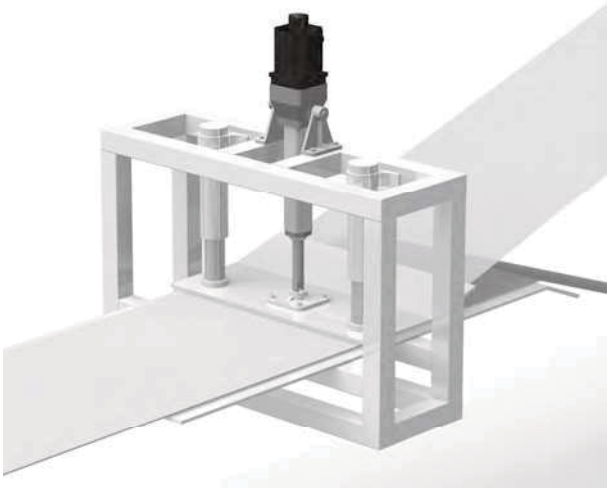
① **Accurate feeding operation**

Accurate feeding operation is possible with the servo cylinder for a decrease in liquid level caused by the number of times of coating.

② **Shortening of overall length**

In relation to the equipment, the overall length of the servo cylinder needs to be shortened, which is handled by an orthogonal type precision planetary reducer.

Bonding equipment



Two sheets of automotive parts are bonded by this equipment.

Points for adoption

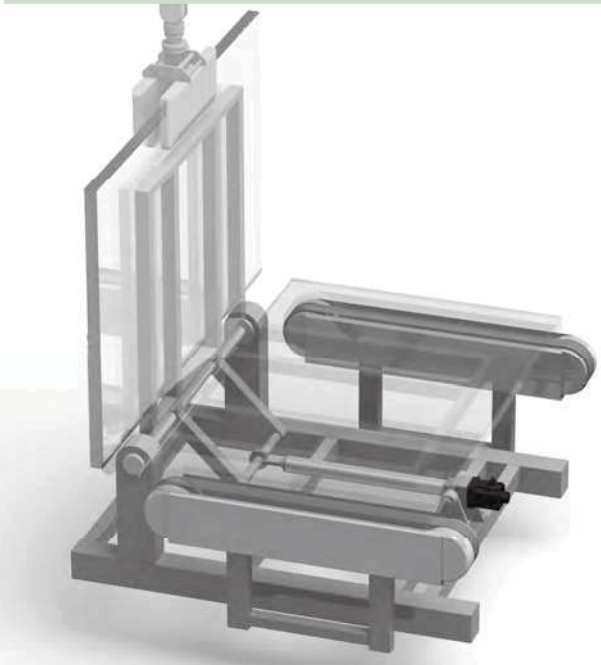
① **Accurate positioning**

Fine positioning can be performed against jigs that differ in size according to sheet materials.

② **Torque control**

Pressing force for bonding can be controlled.

Workpiece erecting equipment



A glass substrate is erected for insertion into a cassette by this equipment.

Points for adoption

① **Accurate positioning**

The glass substrate can be erected to an accurate position by the servo positioning function.

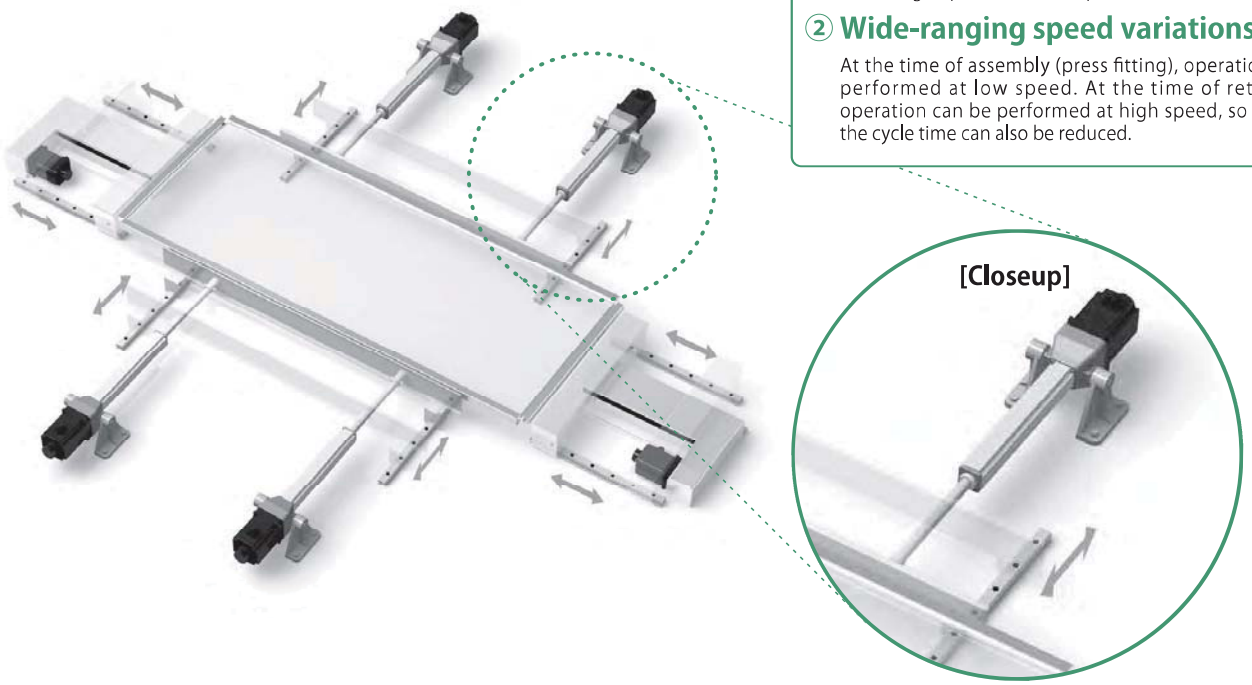
② **Selectable servomotor manufacturer**

A desired servomotor manufacturer can be specified according to control compatibility with peripheral equipment.

Application Solution

Frame assembling equipment

Aluminum frames are accurately assembled (press-fit) to a product in four directions by this equipment.



Points for adoption

① **Torque control**

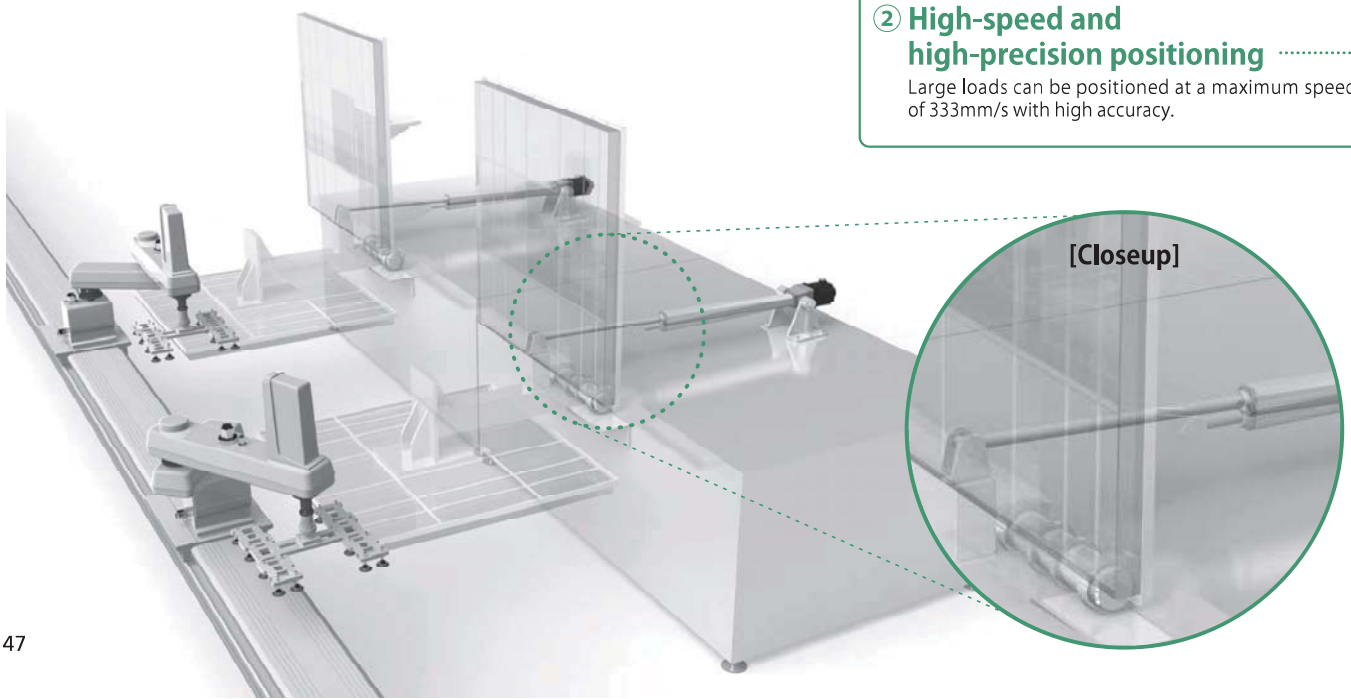
At the time of assembly (press fitting), pressing force can be controlled as desired. (Pressing force differs according to product and shape.)

② **Wide-ranging speed variations**

At the time of assembly (press fitting), operation is performed at low speed. At the time of return, operation can be performed at high speed, so that the cycle time can also be reduced.

Glass inspection equipment

Transferred glass is erected from 0 to 90 degrees and glass surfaces are inspected.



Points for adoption

① **Support of large loads**

Large loads of 8000N (up to 15000N) can be supported.

② **High-speed and high-precision positioning**

Large loads can be positioned at a maximum speed of 333mm/s with high accuracy.

Press-fitting equipment (press)

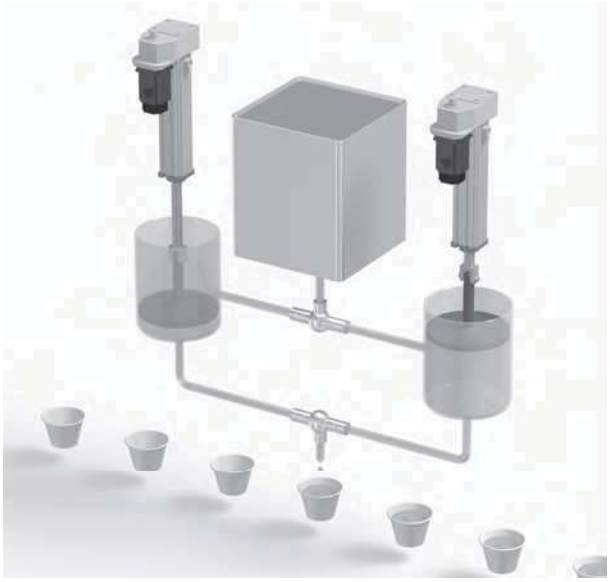
Diverse metallic parts are press-fit and assembled by this equipment.

Points for adoption

① **Multiple-point positioning**
Compared with air cylinders, positioning can be performed as desired.

② **Torque control**
Pressing force is variable with workpieces and jigs.

Injection equipment



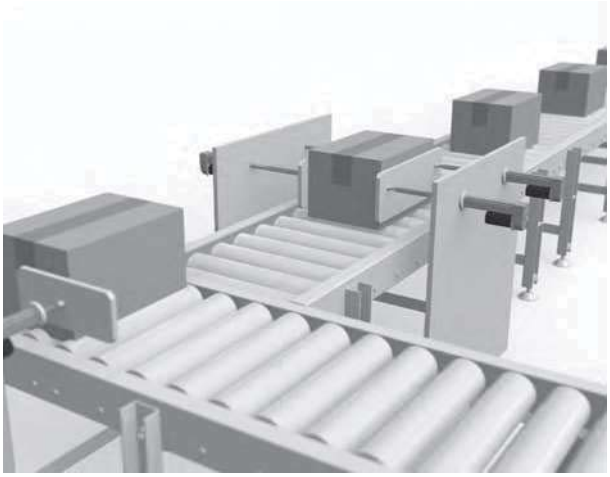
Diverse foods are quantitatively injected into special-purpose containers by this equipment.

Points for adoption

① **Clean operation**
Clean with no oil leakage.

② **Accurate speed control**
Compared with conventional pump type, materials can be mixed in proportions and foods can be injected in accurately determined quantities by adjusting the speed of each piston.

Equipment for arraying and pushing conveyed objects



Conveyed objects are arrayed on the roller conveyor as desired and ejected by this equipment.

Points for adoption

① **Accurate positioning**
The servo positioning function allows desired arrays on the conveyor.

② **Torque control**
Pressing force can be controlled according to the type of conveyed object.

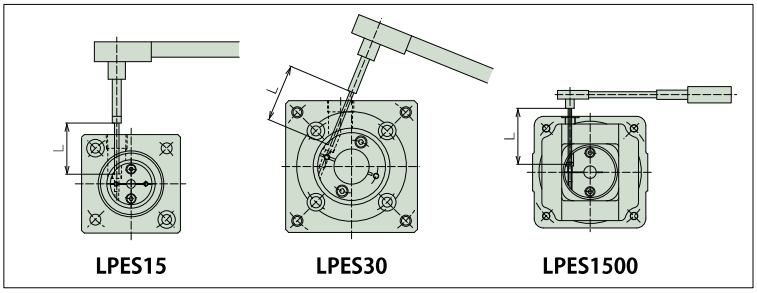
③ **Flange mounting is possible depending on the installation space.**

Servomotor mounting procedures (when installed by customer)

■Motor direct coupling

1. Prepare a servomotor. (An output shaft with/without keyway can be used.)
2. Set the servo motor with the coupling mounting hole of the motor flange facing upward. (□45 and □105 frames only)
3. Cleanly wipe away rust, dust, antirust oil, etc., of the motor shaft.
4. Loosen the clamp bolt of the coupling.
5. Remove the plug of the coupling case, turn the input shaft and set the clamp bolt head of the coupling to the position of the plug hole.
   ⚠ For LPES30, there is a need to insert a torque wrench at an angle as shown below.
6. Smoothly insert the motor shaft to the coupling.
   ⚠ If the motor is turned in the direction of rotation, the phase to the clamp bolt may be shifted.
7. Pay sufficient attention not to insert the motor shaft in a tilted manner.
8. After inserting the spigot facing part completely, attach it with the motor attaching bolt.
9. Using a torque wrench, tighten the clamp bolt of the coupling at the specified tightening torque.
10. Attach the removed plug to the coupling case.

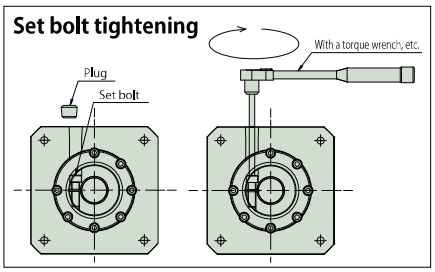
* Refer to the instruction manual for details.



Model number	Coupling bolt size	Tightening torque N•m {kgf•m}	L mm
LPES15	M2	0.5 {0.04}	30
LPES30	M2.5	1.0 {0.10}	40
LPES150	M4	3.8 {0.39}	60
LPES300			70
LPES1500	M6	12 {1.22}	90

■With precision planetary reducer

1. When the motor shaft is round



1. Set the reducer with the motor mounting surface upward.
2. Cleanly wipe rust, dust, rust inhibitor, etc., off the motor shaft.
3. Remove the plug from the adapter, turn the input shaft, and align the bolt head with the position of the plug hole.
4. Check that the set bolt has been loosened with a hexagonal spanner, etc.
5. Smoothly insert the motor shaft in the input shaft hole. At this time, be aware that if the motor shaft is inserted in a tilted manner, galling with the shaft hole, etc., will occur, resulting in failure to mount properly.
6. After complete insertion of the spigot portion, completely fix the motor to the adapter at an appropriate tightening torque.
7. Tighten the set bolt of the input shaft with a torque wrench or the like at the tightening torque in the following table. At this time, be aware that if it is tightened at under the specified torque, looseness of the set bolt can lead to problems, such as a slip of the motor shaft.
   Do not apply Loctite and other anti-loosening agents to the set bolt. Proper tightening torque may not be obtained, resulting in insufficient tightening.
8. Attach the plug. Now, the motor setting is completed.

It is assumed that the clamp fit may slide with an unexpected impact. Give consideration to a separate safety mechanism for elevation drive, etc.

● Set bolt tightening torque table

Bolt Size	M3	M4	M5	M6	M8	M10
Tightening Torque N•m {kgf•m}	1.9 {0.18}	4.3 {0.44}	8.7 {0.89}	15 {1.50}	36 {3.70}	71 {7.20}

* The bolt tightening torque should be in the range of the above numerical values multiplied by 1.0 – 1.2.

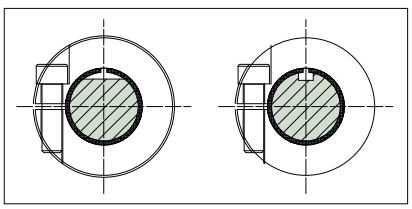
● Motor mount bolt tightening torque table

Bolt Size	M3	M4	M5	M6	M8
Tightening Torque N•m {kgf•m}	1.1 {0.11}	2.5 {0.26}	5.1 {0.52}	8.7 {0.89}	21 {2.10}

* The bolt tightening torque should be in the range of the above numerical values multiplied by 1.0 – 1.2.

2. Mounting a keyed motor

A keyed motor shaft can be used in clamp type as is the case with a round shaft by removing the key.
Set the motor shaft keyway (D cut), each slit, and set bolt in position as shown in the illustration on the right-hand side. Other procedures for mounting to the reducer are the same as the round shaft's case.



⚠ WARNING

■ Cautions for selecting

● Anti-rod rotation mechanism is not provided with this cylinder. Turning force is generated to the rod owing to the thrust, make sure to perform prevention of rotation on the equipment side.
The turning force placed on the rod at the time of the maximum thrust is as shown in the following table.

Model number	LPES15	LPES30	LPES150	LPES300	LPES1500
Rod turning force N·m {kgf·m}	0.16 {0.016}	0.32 {0.031}	1.60 {0.16}	3.19 {0.33}	26.6 {2.72}

● Load holding mechanism is not provided with this cylinder in the cylinder main body. If a dangerous situation is anticipated during stoppage and when the product is broken, use a servomotor with a magnetic brake to hold the load, or provide a brake mechanism outside. It is same to use for elevating device or horizontal use and displacement is problem.

● Structurally, this power cylinder is an indoor type. Since there are problems, such as rust formation, store in a good indoor environment. Pay sufficient attention to humidity. Be aware that if it is installed in a place where the temperature changes rapidly, condensation will occur, causing failure or rust.

● Do not store or use in a corrosive atmosphere. Also, it cannot be used in a flammable atmosphere.

● Do not use in a place where there is no expectation for heat dissipation, such as in a closed container because doing so will cause failure.

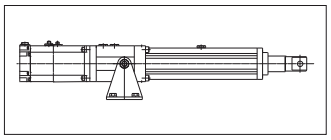
■ Cautions for installation

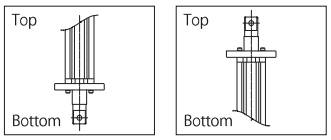
● Use a trunnion mount or a flange mount (possible only for LPES150 or smaller) to install the main body. When used with oscillation, select an I-type or a U-type end fitting. If a lateral load is applied, provide a guide so as not to receive the direct lateral load or the bending moment.

● When it is installed with a flange mount, install it in the vertical direction. (Refer to the figure at the right.)
* When considering use of a flange mount for a type of LPES300 or larger, please contact Tsubakimoto chain beforehand.

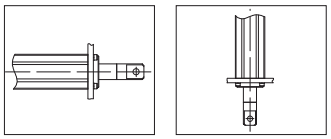
● For use in a static condition without swinging the cylinder, select ① Flange mount or ② Trunnion mount + foot mount. It can be installed either horizontally or vertically. (□45 frame only)

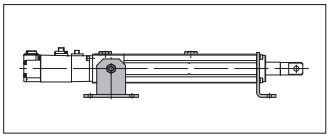
● When it is used horizontally for a long stroke, support the bottom part of the frame end as shown in the figure below. At this point, do not fix the frame and the supporting base.

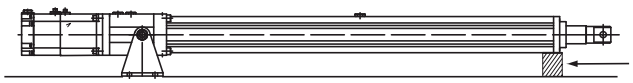

Trunnion mount



Flange mount


① Flange mount


② Trunnion mount + foot mount


Frame end support
(Do not fix.)

■ Cautions for use

● Overload protection mechanism is not provided with this cylinder in the cylinder main body, so provide protection against overvoltage, overcurrent, overload of the servo driver (servo amplifier). Additionally, manufacture the opposite side equipment of the power cylinder with a strength sufficient to withstand the maximum torque of the servomotor.

● Manual operation shaft is not provided with this cylinder for a structural reason, so adjust the cylinder position by operating the servo driver (servo amplifier) at very low speed.

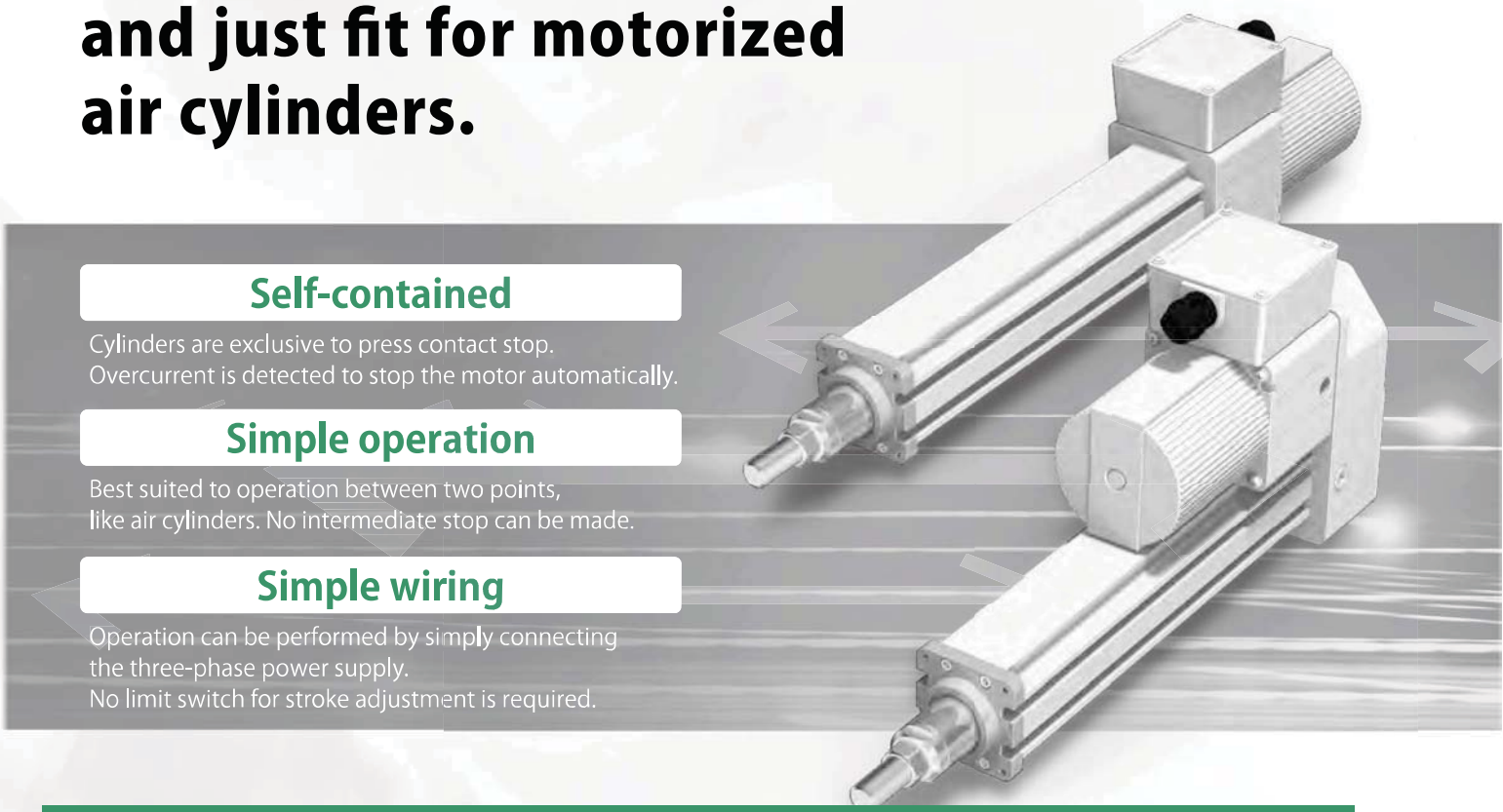
● Daphne Eponex SR No.2 is applied to the screw shaft of this cylinder at the time of shipment, however, periodic lubrication is required. Refer to the table at the right for the lubrication amount of grease and the lubrication cycle.
The application amount of the grease is 10 – 15g per stroke of 100mm.
And as grease for maintenance, JWGS100G is available (sold separately) from our company.

Frequency of operation	Lubrication cycle
1000 reciprocations/day or more	Every 1 month – 3 months
500 – 1000 reciprocations/day	Every 3 months – 6 months
100 – 500 reciprocations/day	Every 6 months – 1 year
10 – 100 reciprocations/day	Every 1 year – 1.5 years

・On the rod periphery, apply grease according to the lubrication cycle so that an oily film does not run out. Use the same grease as the one used for the screw.
・Determine the lubrication cycle according to the situation of operation.

Power cylinder eco series CDS type

New type power cylinders designed exclusively for press contact stop, and just fit for motorized air cylinders.



Self-contained

Cylinders are exclusive to press contact stop.
Overcurrent is detected to stop the motor automatically.

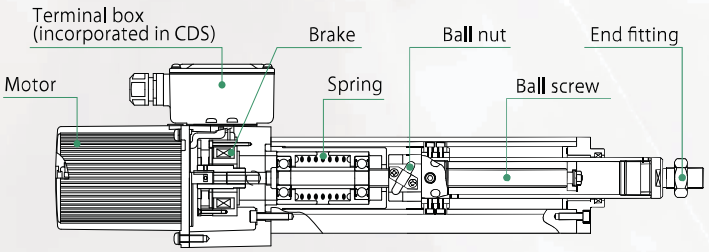
Simple operation

Best suited to operation between two points,
like air cylinders. No intermediate stop can be made.

Simple wiring

Operation can be performed by simply connecting
the three-phase power supply.
No limit switch for stroke adjustment is required.

Structure of SpeedMech

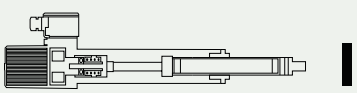


The basic structure of this electric cylinder is a combination of a screw and motor, which is the same as conventional power cylinders.
This SpeedMech enables the cylinder to stop without a limit switch by the combination of the spring built into the actuating part and the special board (CDS) mounted in the terminal box.
Also, compared with conventional electric cylinders, life is extended through the adoption of the first ball screw in this size and also the holding brake that is actuated after the motor is stopped.

Operating principle of SpeedMech

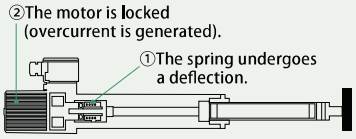
1 The cylinder extends.

The cylinder rod extends by an extend signal. The rod stops in the middle of stroke due to the stopper, etc., of the equipment on the other side. Or, the rod stops when reaching the stroke end.



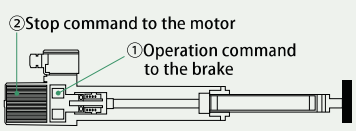
2 The spring undergoes a deflection to lock the motor.

As the rod has stopped, the spring undergoes a deflection.
At the same time, the motor is locked and the current value rises suddenly (overcurrent is generated).



3 The brake is actuated to stop the motor.

The rise in current value is detected by the CDS, and an operation command is sent to the brake. Subsequently, a stop command is sent to the motor to stop the motor. At this time, a pressing force is maintained by the brake force.



Model No. designation

① LPE ② 100 ③ L ④ K ⑤ 5 ⑥ MSIJ

①Product/series name
Power Cylinder
Eco series

②Rated thrust
025： 250N {25.5kgf}
050： 500N {51.0kgf}
100：1000N {102kgf}

③Rated speed
L and H: check the actual speed with reference to the standard model list

④Main body shape
T: straight
K: parallel

⑤Stroke
1 : 100mm
2 : 200mm
3 : 300mm
4 : 400mm
5 : 500mm
6 : 600mm

⑥Options
M: anti-rod rotation specifications
S: with magnetic sensor*
I : I-type end fitting (the standard end part is a screw shape.)
U: U-type end fitting
J : bellows

* When a magnetic sensor is equipped, anti-rod rotation specifications are always adopted. (Code: MS)

Standard model list

Model number	Rated thrust N {kgf}	Rated speed mm/s 200/200/220V 50/60/60Hz	Motor output	Standard stroke mm
LPE025H	250 {25.5}	160/190/200	0.25N·m (50W or equivalent)	100 200 300 400 500 600
LPE050L	500 {51.0}	90/100/110	0.25N·m (50W or equivalent)	
LPE050H	500 {51.0}	160/170/190	0.50N·m (90W or equivalent)	
LPE100L	1.00k {102}	90/90/110	0.50N·m (90W or equivalent)	

* Pressing force varies depending on the machine type, and is two or three times the rated thrust.

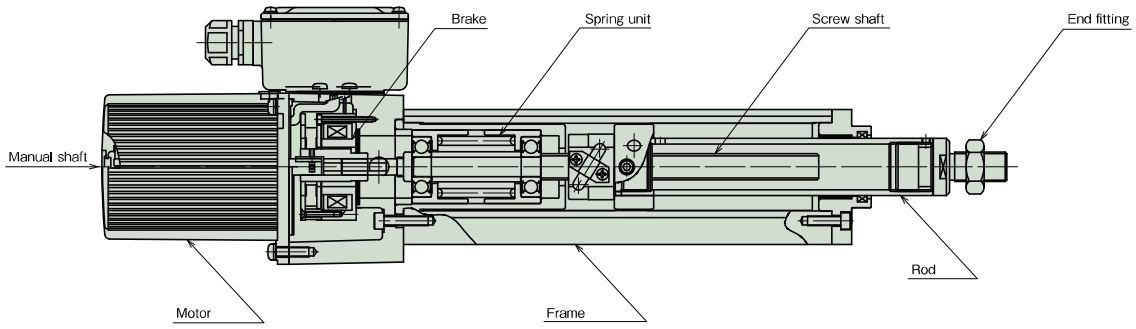
Standard environment of use

Environment \ Model	Indoor type
Ambient temperature	0 to 40℃
Relative humidity	45 to 85% (non-condensing)
Shock resistance value	0.5G or less
Installation altitude	1000m or lower above sea level
Ambient	Normally indoors*

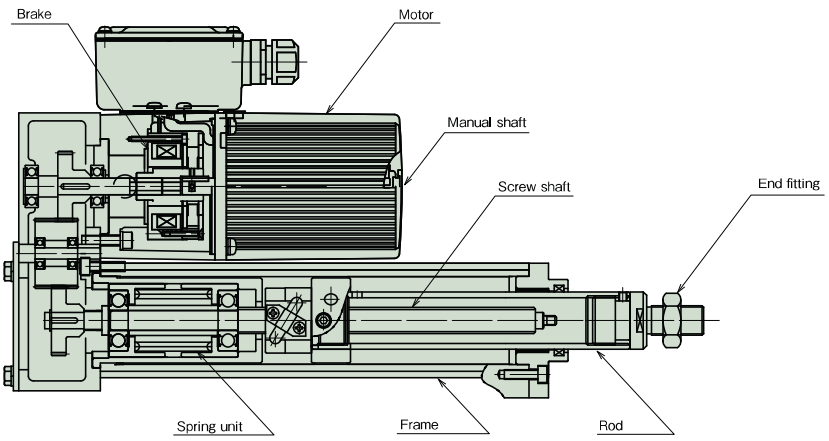
* Normally indoors means no exposure to wind, rain and water, and dust at a level inside an ordinary factory.

Structure

Straight

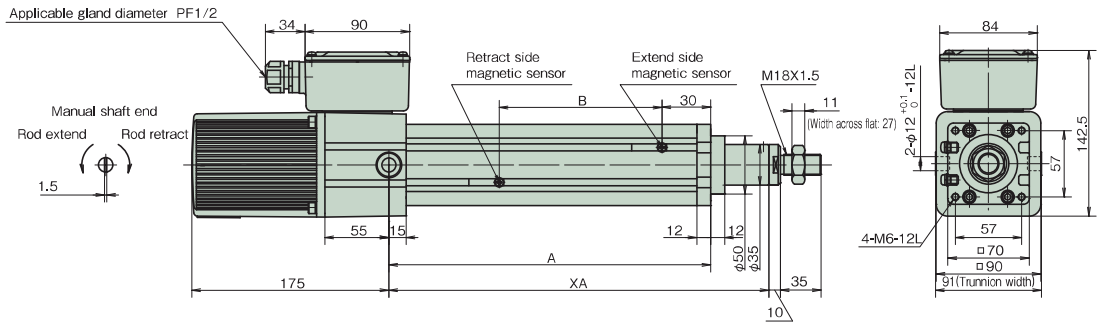


Parallel



Dimensions Table

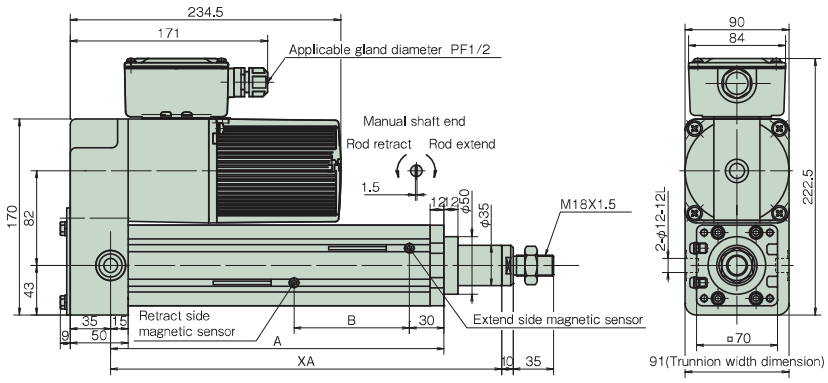
Straight



Unit: mm

Model	Main body shape	Stroke	A	B	XA		Approximate mass (kg)
					MIN	MAX	
LPE025H LPE050L LPE050H LPE100L	T	100	289	100	339	439	9
		200	389	200	439	639	10
		300	489	300	539	839	11
		400	589	400	639	1039	12
		500	689	500	739	1239	13
		600	789	600	839	1439	14

Parallel

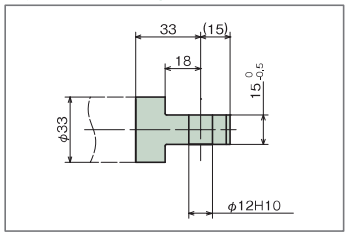


Unit: mm

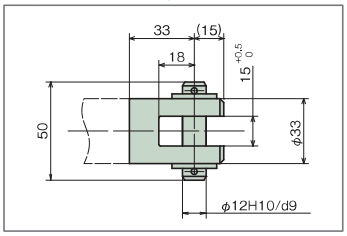
Model	Main body shape	Stroke	A	B	XA		Approximate mass (kg)
					MIN	MAX	
LPE025H LPE050L LPE050H LPE100L	K	100	289	100	339	439	14
		200	389	200	439	639	15
		300	489	300	539	839	16
		400	589	400	639	1039	17
		500	689	500	739	1239	18
		600	789	600	839	1439	19

Options

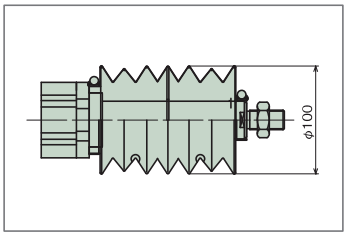
I-type end fitting (-I)



U-type end fitting (-U)

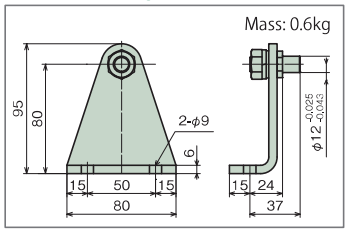


Bellows (-J)



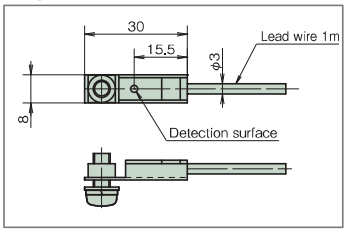
When bellows are equipped, flange mount is not available.

Trunnion fitting (LPE025-T)



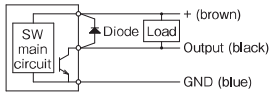
Order the trunnion fitting separately from main body model No. without entering any symbol at the end of model No.

Magnetic sensor (-MS)



The magnetic sensor cannot be attached later. If it is necessary, place an order first. Types with a lamp or 2 wire type are also available. Refer to page 129.

Electric circuit



Magnetic sensor specifications

No contact switch (DC 3-wire system) (lead wire 1m)	
Power voltage	5 to 26V DC
Consumption current	8mA MAX (24V DC)
Output specifications	15mA MAX (24V DC) Open collector output

Selection

Conditions of use required for selection

1. Machine to use and application
2. Thrust or load N{kgf}
3. Stroke mm
4. Speed mm/s
5. Frequency of operation, starts/min.
6. Power voltage, frequency
7. Type of load of machine used
8. Environment of use
9. Hours of operation and annual number of operating days

Selection procedures

1. Select the suitable model number from the standard model list (page156) based on thrust, speed and stroke.
2. Check that the number of cycles of the selected cylinder is within the allowable range with reference to the table at the right. (Table 1)
3. Check that the use conditions are satisfied with reference to the thrust – speed graph. (Figure 1)
4. In the case of use for transportation, check that the mass of the conveyed material is within the allowable range. (Table 2)
5. Select options as required.

Table 1 Allowable number of starts

starts/min.

Model number	Stroke mm	Thrust N			
		10	250	500	1000
LPE025H	100	15	12	—	—
	200	15	12	—	—
	300	10	10	—	—
	400	9	5	—	—
	500	8	4	—	—
	600	6	3	—	—
LPE050L	100	15	10	5	—
	200	8	8	5	—
	300	5	5	5	—
	400	5	5	3	—
	500	5	4	2	—
	600	4	4	2	—
LPE050H	100	15	12	10	—
	200	12	10	8	—
	300	10	10	6	—
	400	9	8	5	—
	500	8	7	4	—
	600	7	6	3	—
LPE100L	100	12	10	8	5
	200	8	8	8	5
	300	5	5	5	4
	400	5	5	5	3
	500	5	5	4	2
	600	4	4	4	2

Figure 1 Thrust – speed graph

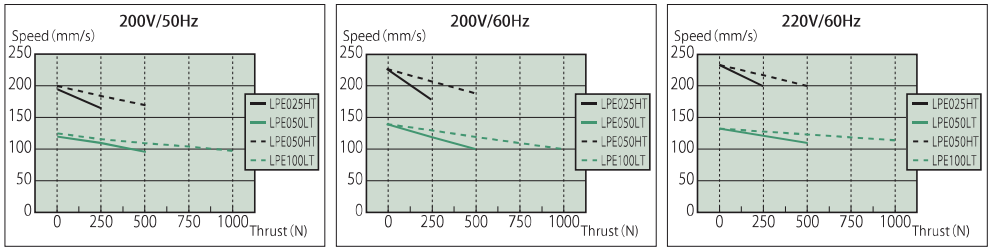


Table 2 Conveyed material mass in consideration of inertia

kg

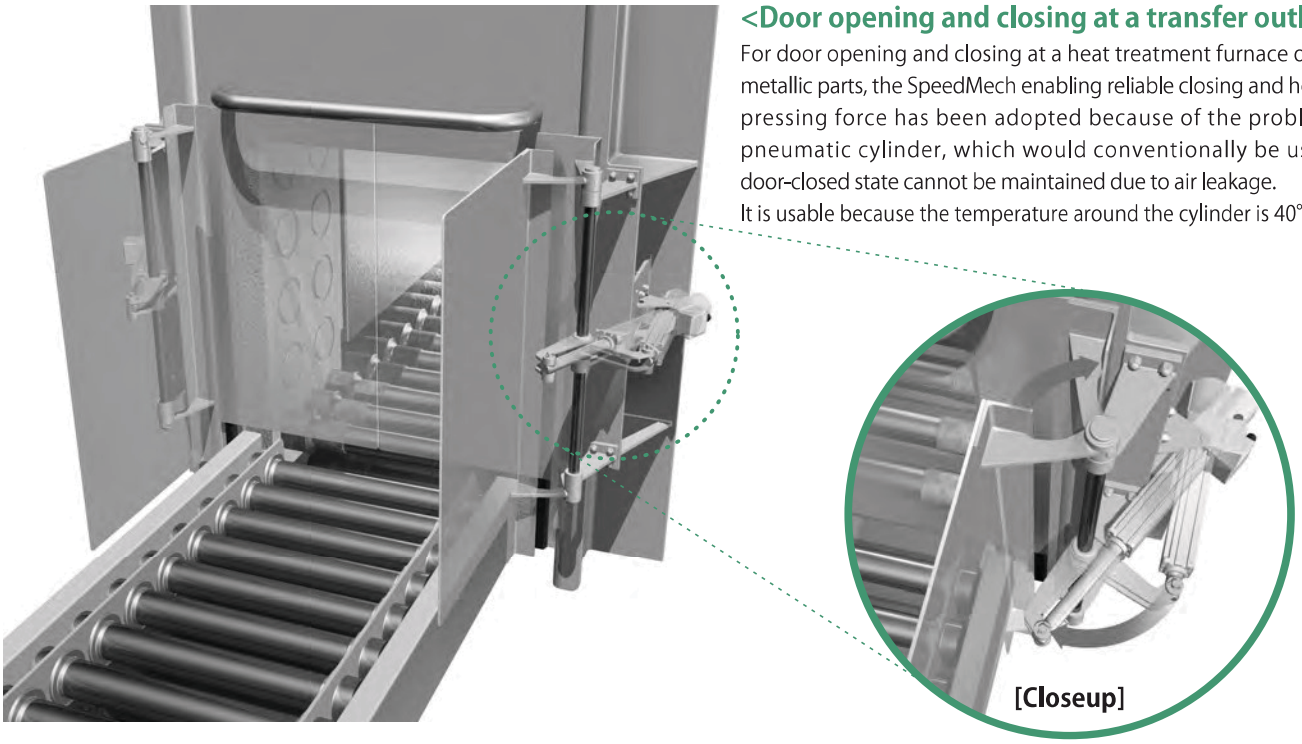
Model number	Horizontal	Vertical
LPE025HT	50	25
LPE050LT	100	50
LPE050HT	100	50
LPE100LT	200	100

* The data of the above table 1 and figure 1 are numerical values at an ambient temperature of 20℃. The numerical values may vary depending on the ambient temperature and other conditions, so use them as a guide.
* Select a power cylinder of a sufficient thrust, allowing for a safety rate so that the loads used (static and dynamic) do not exceed the rated thrust.

Application Solution

Heat treatment furnace <for door opening and closing> Link structure

● Substitution for pneumatic cylinders

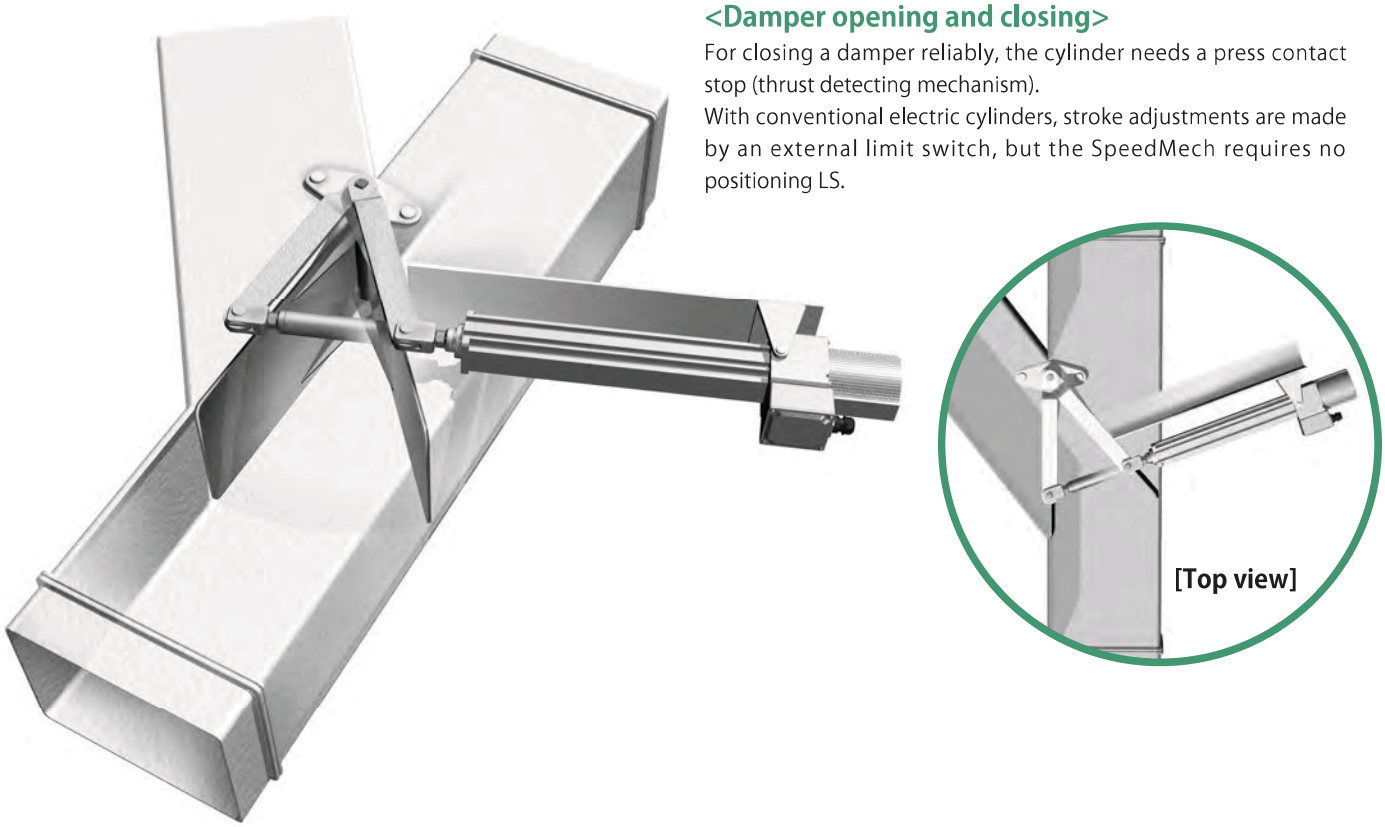


<Door opening and closing at a transfer outlet>

For door opening and closing at a heat treatment furnace outlet for metallic parts, the SpeedMech enabling reliable closing and holding of pressing force has been adopted because of the problem of a pneumatic cylinder, which would conventionally be used: the door-closed state cannot be maintained due to air leakage.
It is usable because the temperature around the cylinder is 40°C or less.

Air duct <for damper opening and closing> Link structure

● Substitution for other companies' electric cylinders



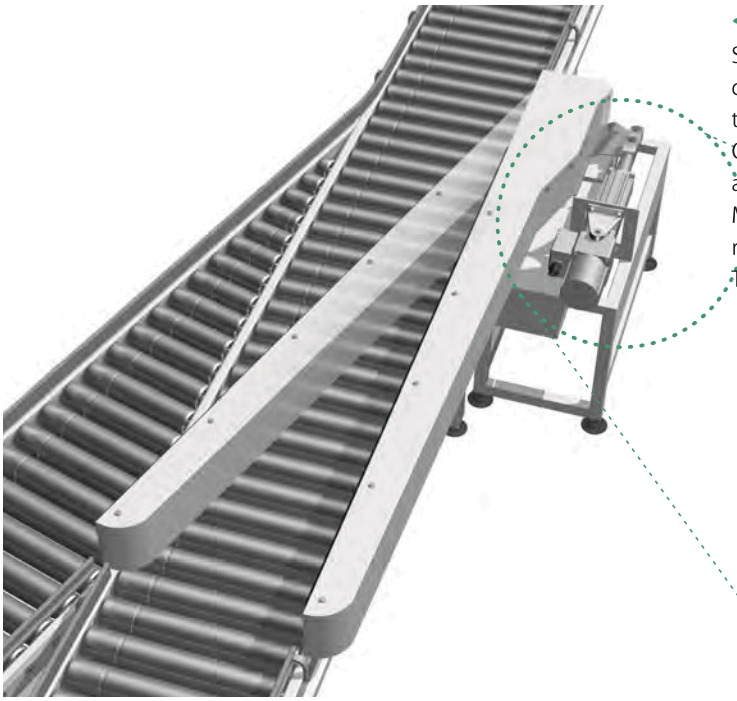
<Damper opening and closing>

For closing a damper reliably, the cylinder needs a press contact stop (thrust detecting mechanism).
With conventional electric cylinders, stroke adjustments are made by an external limit switch, but the SpeedMech requires no positioning LS.

Sorting <for roller conveyor>

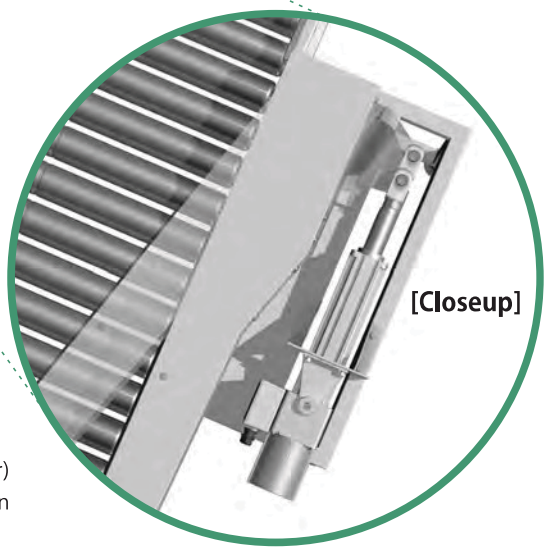
Link structure

● Substitution for pneumatic cylinders



<Sorting (branching) of conveyed objects>

Since the destinations of conveyed objects are limited to two directions, reciprocations between two points are sufficient for the cylinder.
On the extending side, the cylinder extends to the stroke end and stops automatically. The same applies on the retracting side.
Magnetic sensors are equipped because there is a need to remotely confirm the side on which the guide exists.
The SpeedMech and guide are a link mechanism.

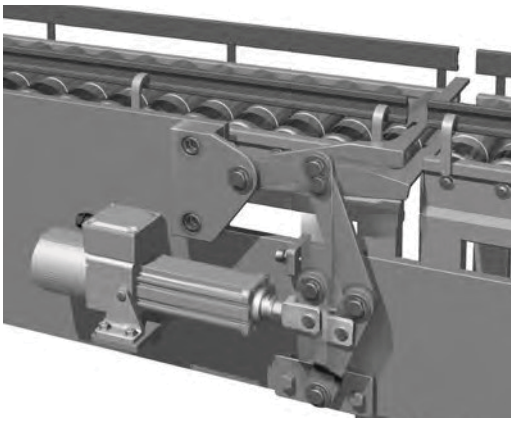


<Roller conveyor>

Conveyed objects on the roller conveyor are guided by moving the guide (bar) for direction change according to their destinations. The SpeedMech has been adopted to drive this guide.

Stopper

Link structure



● Substitution for pneumatic cylinders

A conveyed object on the conveyor is temporarily stopped by the stopper. When the cylinder rod fully extends, the stopper goes down, allowing the conveyed object to pass through. When the cylinder rod retracts to the backward limit, the stopper goes up to stop the conveyed object.

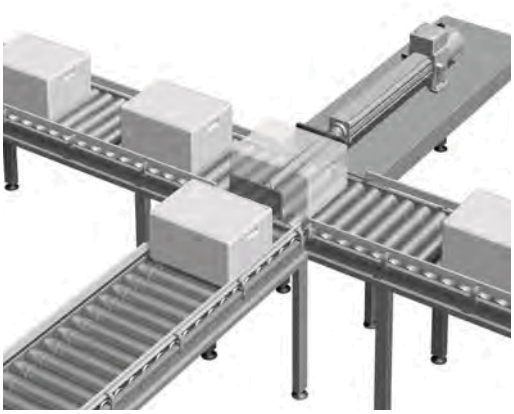
Points for adoption

① **Total cost reduction**
Compared with air type, the total cost can be reduced. The running cost can also be reduced.

② **Environment-friendliness**
Pneumatic type has adverse environmental effects caused by noise and oil mist generation.

Pusher

Direct-push structure



● Substitution for pneumatic cylinders

A specific object conveyed on the conveyor is pushed by the pusher to change the traveling direction. On the extending side, the cylinder extends to the stroke end to fully push the conveyed object with reliability. After the conveyed object is fully pushed, the cylinder rod is returned as quickly as possible.

Points for adoption

① **Simplified piping and wiring**
In the case of air, piping and wiring become complicated because solenoid valves, speed controllers, etc., are required.

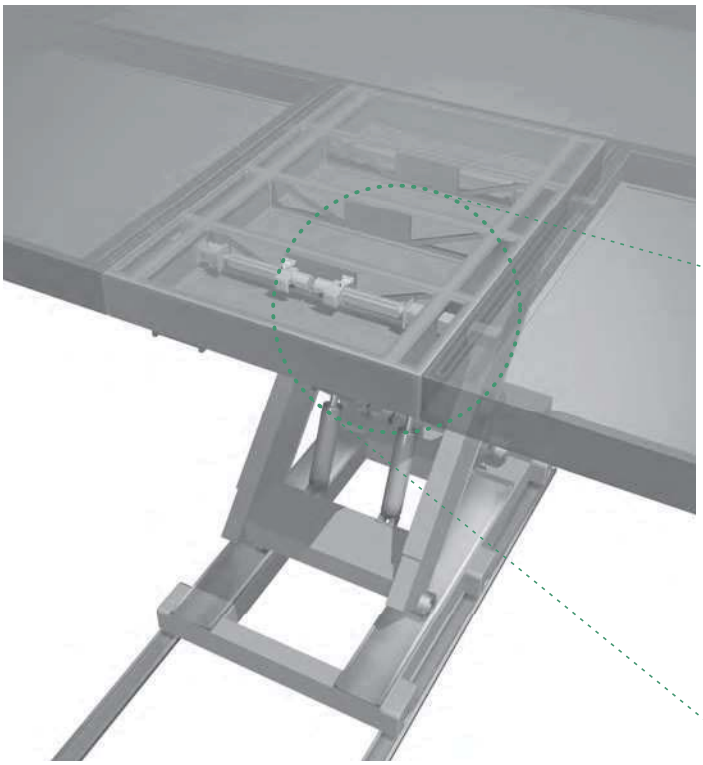
② **Cylinder speed**
The speed, which is faster than that of conventional electric cylinders, cylinders virtually approaches that of pneumatic cylinders.

Application Solution

Lifter <for pin insertion to fix>

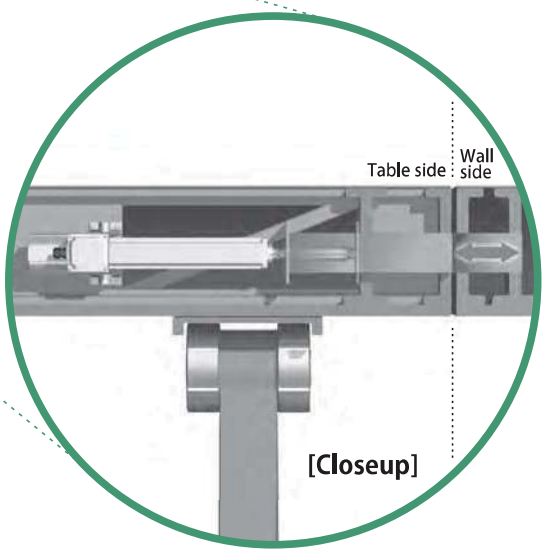
Direct-push structure

● Substitution for hydraulic cylinders



<Table fall prevention>

On the extending side, the cylinder stops automatically when hitting against the wall on the other side. On the retracting side, it stops at the stroke end.
The cylinder rod position is always checked by outputting a signal with the optional magnetic sensor. Also, since the equipment on the other side has no anti-rotation mechanism, the optional rod anti-rotation specification has been adopted.



<Table lifter>

Using a hydraulic cylinder for table elevation, there is danger that the table may fall due to oil leakage from the hydraulic cylinder during an attempt to fix at the ascent position. The SpeedMech has been adopted to fix the table position.

Door opening and closing

Direct-push structure

● Substitution for pneumatic cylinders

Generally, pneumatic cylinders are adopted for opening and closing the automatic doors of machines, such as lathes, but there is an increasing demand for motorization in consideration of environmental aspects.
Also, wiring man-hours can be reduced compared with air piping and wiring.

Points for adoption

① **Environment-friendliness**

Being free from noise and oil mist like pneumatic cylinders, the environmentally-friendly points have been well-recognized.

② **Simplified wiring**

Compared with air piping, extra work and maintenance are not required because it can be actuated by the power line alone.

Cutter

Direct-push structure

● Substitution for pneumatic cylinders

Bread dough in the hopper drops from the discharge spout, and the bread dough is cut by the opposing cylinders. Each cutter-equipped cylinder end stops just before the cutters collide with each other.

Points for adoption

① **Simplified piping and wiring**

In the case of air, piping and wiring become complicated because solenoid valves, speed controllers, etc., are required.

② **Emergency stop**

The cylinder brake is intended for holding, but in an emergency, it can urgently be stopped even in the middle of a stroke.

* Cylinder end mounting flanges are not included as options.
Also, centering is required for installation.

Gate opening and closing

Link structure

● Substitution for hydraulic cylinders

When pouring fresh concrete into formwork, the gate (lid) is opened and closed.
The gate is closed by the cylinder in the pulling direction. If the fresh concrete has a high water content, there is a need to close the gate reliably in order to prevent leakage from the hopper.
Conventionally, a hydraulic cylinder would be adopted.

Points for adoption

① **High speed**

There is a need to close the gate quickly in order to secure a specified amount of pouring.

② **Reduction of piping and maintenance work**

The hydraulic method requires time and effort, and cost for piping, and also maintenance should be performed.

Shutter opening and closing

Direct-push structure

● Substitution for pneumatic cylinders

In the process of conveying grains, a fixed amount of raw materials in the tank is dropped down and weighed. At that time, when the shutter is opened and closed, it should quickly be performed because the material drops at a high speed. Also, there is a need to close the shutter reliably and hold the pressing force.

Points for adoption

① **High speed**

The shutter is closed quickly to prevent more than a fixed amount of raw materials from dropping.

② **Holding of pressing force**

After the shutter is closed, the state needs to be held. (Press contact stop)

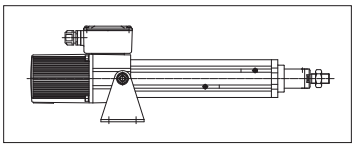
⚠ WARNING

Cautions for selecting

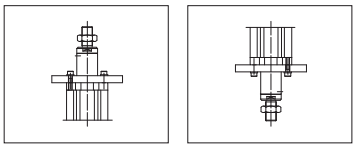
- No anti-rod rotation mechanism is attached to a cylinder with standard specifications. To use the end part freely, select the anti-rod rotation specifications (option).
  And when a magnetic sensor (option) is equipped, anti-rod rotation specifications are required.
- Refer to the allowable number table on page 46 to check that the number of the starts of selected cylinder is within the allowable range.
- If this cylinder is used for press or pull contact stopping, the strength of the equipment side must be 300% or more of the rated thrust.
- Structurally, this power cylinder is an indoor type. Since there are problems, such as rust formation, store in a good indoor environment. Pay sufficient attention to humidity. Be aware that if it is installed in a place where the temperature changes rapidly, condensation will occur, causing failure or rust.
- Do not store or use in a corrosive atmosphere. Also, it cannot be used in a flammable atmosphere.
- Do not use in a place where there is no expectation for heat dissipation, such as in a closed container because doing so will cause failure.

Cautions for installation

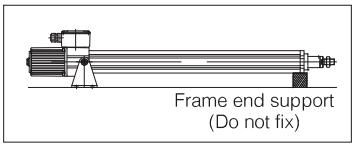
- Install the main body using a trunnion or a flange mount.
  When it is used with oscillation using a trunnion mount, select an I-type or an U-type end fitting.
- If lateral load is applied, provide a guide so as not to receive lateral load or bending moment directly.
- When it is installed with a flange mount, install it in the vertical direction. (Refer to the figure at the right.)
- When it is used horizontally for a long stroke, support the bottom part of the frame end as shown in the figure below. Do not fix the frame and the supporting base.



Trunnion mount



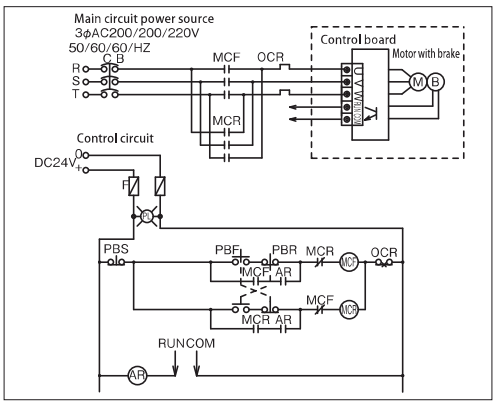
Flange mount



Frame end support
(Do not fix)

Cautions for use

- The motor stops when press or pull contact stops, however, on-the terminal block electricity is still being conducted. Never fail to cut off the main power source before working with the terminal box open.
- When adjusting the stroke manually, remove the cap bolt of the opposite load side of the motor, and turn the manual shaft with a flat-blade screwdriver or the like. However, use this only as an emergency since it is an operation with the brake working. And when operating manually, make sure to remove the load.
- Never use an inverter. This cylinder controls the press contact force by detecting overcurrent with the built-in CDS inside the terminal block and stopping the motor. If an inverter is used, the CDS circuit may be broken.
- Megger testing is prohibited for this cylinder. It may break the built in CDS. Remove all the terminals in the terminal block for megger testing of external circuits.
- Ensure the change over between extend and retract are at an interval of 0.2 seconds or more.
- The temperature around the motor may rapidly increase during operation and immediately after stopping. Do not touch around the motor part.
- Refer to the diagram below for connection and reference circuitry.



NOTE:

① This is a single acting circuit diagram. The cylinder extends with the PBF and automatically stops with the press contact force at the stroke end or when hitting a wall in the middle of a stroke, etc. For retract, the cylinder retracts with the PBR and stops in the same manner as the extend side. Provide a circuit for allowing MCF and MCR to be turned OFF every time the cylinder stops.

② RUN and COM terminals can take out the output signal of the cylinder action.
Open collector output: 50mA maximum 30V DC
Coil current of the relay AR must be 50mA DC or less.

③ Use an electromagnetic contactor with a contact capacity of SC-0 made of a Fuji Electric or equivalent.

Power Cylinder motor option

Model No. designation

LP T C 4000 L 10 V T1 LJ - TK

- LP: Power cylinder
- T: Series name
- C: Protective device
- 4000: Thrust
- L: Speed
- 10: Stroke
- V: Voltage symbol
- T1: Motor specification symbol
- LJ: Option

	Voltage symbol	Motor specification symbol	Model No. specification
Standard specification	No symbol		200V class
	V		400V class
Different voltage specification	V1		380V, 50Hz
	V2		380V, 60Hz
	V3		415V, 50Hz
	V4		460V, 60Hz
Heat resistance specification		T1	200V class, heat resistance class F, 40℃
		T2	200V class, heat resistance class F, 60℃
		T3	200V class, heat resistance class F, 80℃
		T4	200V class, heat resistance class H, 80℃
	V	T1	400V class, heat resistance class F, 40℃
		T2	400V class, heat resistance class F, 60℃
		T3	400V class, heat resistance class F, 80℃
		T4	400V class, heat resistance class H, 80℃

	Voltage symbol	Motor specification symbol	Model No. specification
Different voltage specification + heat resistance specification	V1	T1	380V 50Hz, heat resistance class F, 40℃
		T2	380V 50Hz, heat resistance class F, 60℃
		T3	380V 50Hz, heat resistance class F, 80℃
		T4	380V 50Hz, heat resistance class H, 80℃
	V2	T1	380V 60Hz, heat resistance class F, 40℃
		T2	380V 60Hz, heat resistance class F, 60℃
		T3	380V 60Hz, heat resistance class F, 80℃
		T4	380V 60Hz, heat resistance class H, 80℃
	V3	T1	415V 50Hz, heat resistance class F, 40℃
		T2	415V 50Hz, heat resistance class F, 60℃
		T3	415V 50Hz, heat resistance class F, 80℃
		T4	415V 50Hz, heat resistance class H, 80℃
	V4	T1	460V 60Hz, heat resistance class F, 40℃
		T2	460V 60Hz, heat resistance class F, 60℃
		T3	460V 60Hz, heat resistance class F, 80℃
		T4	460V 60Hz, heat resistance class H, 80℃

	Voltage symbol	Motor specification symbol	Model No. specification
Inverter specification		Z	200V class inverter drive supported
		ZV	400V class inverter drive supported Note 1
Global specification		N	200V class CE-compliant
		N2	200V class UL-compliant
		N3	200V class CCC-compliant
	V	N	400V class CE-compliant
		N2	400V class UL-compliant
		N3	400V class CCC-compliant
Explosion-proof specification		D	200V class d2G4-compliant
	V	D	400V class d2G4-compliant
Adapter specification		A	Adapter supported

Note 1) ZV only for double voltage with inverter drive supported.

* All special specifications of brake motors other than the above shall be expressed as "X."

Brake motor upgrades

1 Heat resistance specification: T

Compared with conventional products, substantial reductions in delivery time and price reduction have been realized. Also, heat resistance class "H", which would conventionally be unavailable, can be met.

<Common specifications>
- Adaptable models: U series, T series and G series
- Adaptable motor capacity: 0.1kW to 1.5kW
- Totally outdoor type (IP55) with brake (The heat resistance class of the brake is B.)

Heat resistance class "F" supported

40℃

■Model No.: T1 (200V class), VT1 (400V class), V1T1 (380V, 50Hz), V2T1 (380V, 60Hz), V3T1 (415V, 50Hz), V4T1 (460V, 60Hz)
Usable temperature range: 0 to 40°C (non-condensing)
Duty factor: 25%ED
Rating: S2 30min.
Brake power supply module: Built into the terminal box

60°C

■Model No.: T2 (200V class), VT2 (400V class), V1T2 (380V, 50Hz), V2T2 (380V, 60Hz), V3T2 (415V, 50Hz), V4T2 (460V, 60Hz)
Usable temperature range: 0 to 60°C (non-condensing)
Duty factor: 15%ED
Rating: S2 15min.
Brake power supply module: Separate placement (standard DC module) * Install in a 40°C or lower environment.
* If being built into the terminal box is desired, contact us.

80°C

■Model No.: T3 (200V class), VT3 (400V class), V1T3 (380V, 50Hz), V2T3 (380V, 60Hz), V3T3 (415V, 50Hz), V4T3 (460V, 60Hz)
Usable temperature range: 0 to 80°C (non-condensing)
Duty factor: 5%ED
Rating: S2 5min.
Brake power supply module: Separate placement (standard DC module) * Install in a 40°C or lower environment.
* If being built into the terminal box is desired, contact us.

Heat resistance class "H" supported

■Model No.: T4 (200V class), VT4 (400V class), V1T4 (380V, 50Hz), V2T4 (380V, 60Hz), V3T4 (415V, 50Hz), V4T4 (460V, 60Hz)
Usable temperature range: 0 to 80°C (non-condensing)* We will confirm the duty factor and rating in each case.
Duty factor: 15%ED
Rating: S2 15min.
Brake power supply module: Separate placement (special DC module) * Install in a 40°C or lower environment.
* The motor terminal is a lug type.

2 Different voltage specification: V

We will deliver conventionally-available different voltage motors in a short period of time. Also, an estimation request and arrangements can be made smoothly through model-numbering of each voltage.

<Common specifications>
- Adaptable models: U series, T series and G series
- Adaptable motor capacity: 0.1kW to 1.5kW
- Totally outdoor type (IP55) with brake
- Heat resistance class B

Different voltage supported

■Model No.: V1 (380V, 50Hz), V2 (380V, 60Hz), V3 (415V, 50Hz), V4 (460V, 60Hz)
Usable temperature range: -15 to 40°C (non-condensing)
Duty factor: 25%ED
Rating: S2 30min.
Brake power supply module: Built into the terminal box
■Note
- For using the brakes by external wiring, contact us.

3 Inverter specification: Z

realized. The controllability of power cylinders has been improved as speed control including acceleration and deceleration and speed variations can be performed easily. Also, outdoor type with brake is standard.

<Common specifications>
- Adaptable models: U series, T series and G series
- Adaptable motor capacity: 0.1kW to 1.5kW
- Totally outdoor type (IP55) with brake (The heat resistance class of the brake is B.)
- Heat resistance class F
- Constant torque operation can be performed in the range of 6 to 60Hz.

Inverter drive supported

■Model No.: Z (200V class), ZV (400V class)
Usable temperature range: 0 to 40°C (non-condensing)
Duty factor: 25%ED
Rating: S2 30min.
Brake power supply module: Built into the terminal box * Apply not inverter output but normal power supply voltage to the brake power supply module.
Applicable power supply voltage is 200 to 220V for 200V class and 400 to 440V for 400V class.

4 N

and CCC) are available.

They can be used for equipment to be exported abroad.

<Common specifications>
- Adaptable models: U series, T series and G series
- Adaptable motor capacity: 0.1kW to 0.4kW
- Usable temperature range: -15 to 40°C (non-condensing)
- Totally indoor type with brake

■Note
- Only brake motors are compliant with the standards. If limit switches, etc., are required, contact us.

CE-compliant

■Model No.: Z (200V class), VN (400V class)
■Specifications (both N and VN)
Protection class: IP20
Heat resistance class: B

Target directive and standard
Target directive: Low Voltage Directive 73/23/EEC
Target standard: EN60034-1 (general motor regulations)

Products to be exported to the European market must be CE-marked to prove conformity with safety requirements provided by EC Directives. (Being "CE-compliant" is to affix a "CE mark" to products to prove conformity with EC Directives.)

UL-compliant

■Model No.: N2 (230/240V, 60/60Hz),
VN2 (460V, 60Hz)
■Specifications (both N2 and VN2)
Protection class: IP20
Heat resistance class: A

Target standard and file No.
Target standard: UL1004
UL file No.: E225995

UL is an abbreviation for "Underwriters Laboratories" which represents safety standards for testing in the U.S. (Being "UL-compliant" is to affix a "UL mark" to products to prove UL standard certification with use of UL-standard-accredited motors.) Our certification in C-UR model conforms with both UL and CSA standards.

CCC-compliant

■Model No.: N3 (200/220/200/220V, 50/50 60/60Hz)
* Only 200/220V, 50/60Hz for 0.4kW.
VN3 (380V/50Hz)
■Specifications (both N3 and VN3)
Protection class: IP23
Heat resistance class: E

National standard: GB12350

CCC is the China Compulsory Certification system, and for exporting 1.1kW or smaller motors to China, it is necessary to indicate a "CCC mark" to prove compulsory certification.
We have received certification from the CQC (China Quality Certification Center).

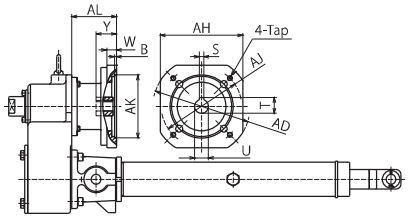
5 Adapter specification: A

be prepared for customer-desired manufacturer, IEC, NEMA, overseas standards, and other special flange motors, adapters are available from us to facilitate installation. Also, they are available for other special flange sizes and motor shaft diameters. Contact us.

<Common specifications>
- Adaptable models: U series, T series and G series
- Adaptable motor capacity: 0.1kW to 7.5kW

Adapter supported

■Model No.: A (adaptable to all brake motors)
■Standards use environment of power cylinder
Usable temperature range: -15 to 40°C (non-condensing) *40°C or higher is also supported.
Duty factor: Within 25%ED
■Note
- The brake motor starting torque should be 200% or more of the rated torque.
- Make sure to prepare power cylinders with brakes because they are highly efficient.
- The brake torque should be 150% or more of the rated torque.



Adapter type interface dimensions list (IEC standard motor)

Unit: mm

Model No.		Speed	Motor capacity	Frame No.	AL	AD	AH	AK	B	AJ	S	T	U	W	Y	Tap dia.
LPTB LPTC	250	S	0.1	63	80	ϕ160	—	ϕ110G7	4	ϕ130	4Js9	12.8	ϕ11F7	15	25	4-M8
		L	0.1		72		—		5					14		
		M	0.2				—									
		H	0.4	71			—				5Js9	16.3	ϕ14F7		32	
LPTB LPTC	500	S	0.1	63	80	ϕ160	—	ϕ110G7	4	ϕ130	4Js9	12.8	ϕ11F7	15	25	4-M8
		L	0.2		72		—		5					14		
		M	0.4	71			—				5Js9	16.3	ϕ14F7		32	
		H	0.75	80	92	ϕ200	□170	ϕ130H7	4	ϕ165	6Js9	21.8	ϕ19F7	20	42	4-M10
LPTB LPTC	1000	S	0.2	63	80	ϕ160	—	ϕ110G7	4	ϕ130	4Js9	12.8	ϕ11F7	15	25	4-M8
		L	0.4	71	72		—		5		5Js9	16.3	ϕ14F7	14	32	
		M	0.75	80	92	ϕ200	□170	ϕ130H7	4	ϕ165	6Js9	21.8	ϕ19F7	20	42	4-M10
		H	1.5	90L							8Js9	27.3	ϕ24F7		52	
LPTB LPTC	2000	S	0.4	71	85	ϕ160	—	ϕ110G7	4	ϕ130	5Js9	16.3	ϕ14F7	15	32	4-M8
		L	0.75	80	72	ϕ200	—	ϕ130G7	5	ϕ165	6Js9	21.8	ϕ19F7	16	42	4-M10
		M	1.5	90L			—				8Js9	27.3	ϕ24F7		52	
		H	2.2	100L	116	ϕ250	□200	ϕ180H7	4.5	ϕ215		31.3	ϕ28F7	20	62	4-M12
LPTB LPTC	4000	S	0.75	80	90	ϕ200	—	ϕ130G7	4	ϕ165	6Js9	21.8	ϕ19F7	20	42	4-M10
		L	1.5	90L	72		—		5		8Js9	27.3	ϕ24F7	16	52	
		M	2.2	100L	116	ϕ250	□200	ϕ180H7	4.5	ϕ215		31.3	ϕ28F7	20	62	4-M12
		H	3.7	112M												

MEMO