ORIENTAL MOTOR GENERAL CATALOG

A

Linear Heads

Linear Heads

(Motors are sold separately.)

Features

Linear heads are linear motion rack-and-pinion units for use with our standard AC motors.

- Depending on the type of motor coupled directly to the linear head, various types of movements are possible.
- A wide range of products are available.
- Motors for direct coupling to the linear heads are sold separately.
- Decimal gearheads which reduce the basic speed by 10:1 are available.

Product Number Code

4 L B 45 N -3

Stroke Length (1~7)
Example 3: 11.81 inch (300mm)

Type of Gear
N: **GN** type (for use with **GN** type pinion shaft motor)
U: **GU** type (for use with **GU** type pinion shaft motor)

Speed Indication: Indicating theoretical rack speed. This speed is calculated using the synchronous speed of the motor used (1800r/min). See the products' specifications for available code.

Direction of Rack Travel
F: Vertical stroke type (Rack travels vertically to mounting face)
B: Horizontal stroke type (Rack travels horizontally to mounting face)

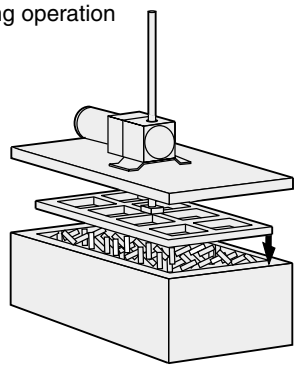
L: Linear Head

Frame size
0: 1.67inch sq. (42mm sq.)
2: 2.36inch sq. (60mm sq.)
4: 3.15inch sq. (80mm sq.)
5: 3.54inch sq. (90mm sq.)

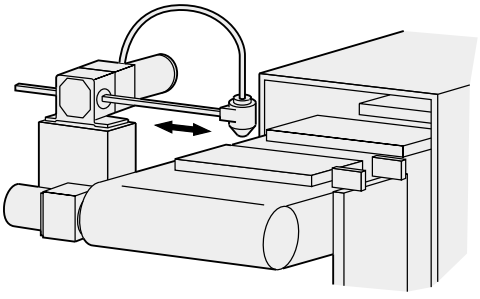
Example Applications

L-line provides a linear drive mechanism in the form of a unit. It can be used in a variety of applications, as shown in the figures, for simpler mechanism design and easier wiring.

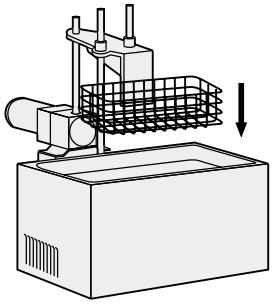
1. Pressing operation



2. Reversing operation

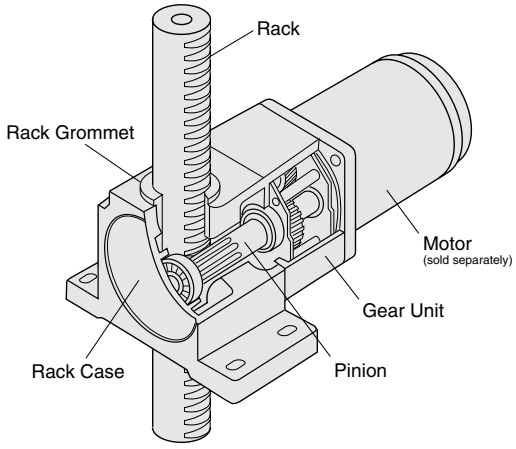


3. Traveling operation



Construction

The linear heads use reduction gears to reduce motor speed and increase motor torque, while the rack-and-pinion converts rotational motion into linear motion.
The rack-and-pinion mechanism is a reliable and low cost method for converting rotational motion into linear motion.



The direction of rack movement is determined by the direction of motor rotation.
When the rack reaches either end, it is necessary to reverse the direction of rack movement by changing the direction of motor rotation. Since the product does not have an automatic stop/reverse mechanism, it is necessary to attach limit switches or sensors to change the motor rotation.

●Motor Unit

The ideal way to change the direction of rack movement instantaneously is to use a reversible motor.

●Rack

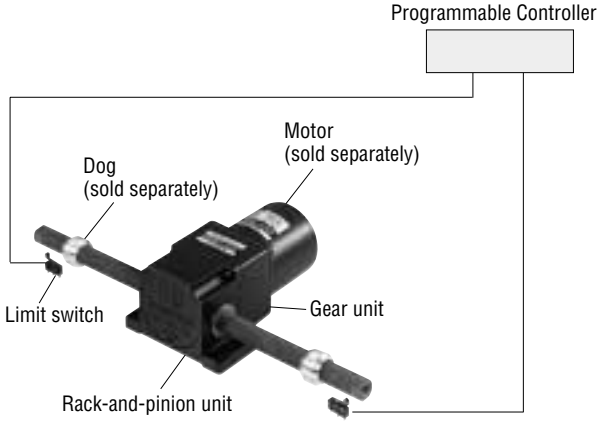
Solid-drawn S45C steel is gear-cut and given a nitride finish to reduce sliding friction and provide rust-resistance.

●Rack Grommet

The rack is supported by two grommets made by an oilless metal.
If the end of the rack should advance into the rack case and the rack is supported by only one grommet, it might cause the mechanism to malfunction. The rack movement should always be reversed before the edge of the rack reaches the rack grommet.

System Composition

●Linear Heads



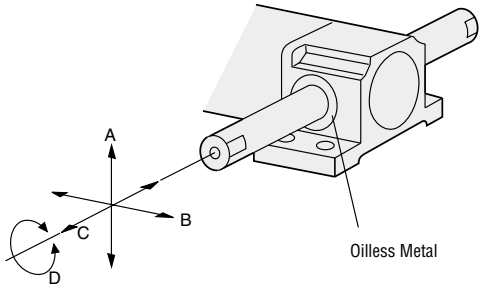
The linear heads come with a rack-and-pinion unit and a reduction gear unit. Motors and dogs are sold separately.
Linear heads may be combined with any standard AC motors.
Any limit switches available on the market can be used.
Three rack speeds are available for a given frame size, by changing on the speed reduction ratio. The rack movement is controlled using a brake pack, programmable controller or relays.

Rack Play

The rack of the linear head is supported at two places by oilless metal grommets in the rack case. Because the rack passes through the inside of the grommets, a slight gap has been left between the grommet and the rack. Therefore, the rack is subject to play as shown in the figure below.

Direction A or B	0.079 inch (2mm) max.
Direction C	0.020 inch (0.5mm) max.

Play in directions A and B has been measured at a point from the case surface.
Since the rack is round-shaped, play in the D direction is large.
The rack play indicates an initial value which will increace during operation. If the rack play becomes problem , install an external guide.



"Characteristics" of Linear Motors and Linear Heads

Rack moving speed, thrust force and holding force are important factors to consider when selecting linear motors or linear heads.

Rack moving speed

The rack speed for the linear motor is given in the table of specifications for each product. Rack speed is expressed as "basic speed".
The basic speed is calculated on the basis of the synchronous speed of the motor (i.e. 1800r/min at 60Hz). In actuality, however, the speed of the motor varies with the load.
The basic speed of a linear head can be calculated from the motor speed, by using the following equation.

$$V = Ns \times \frac{1}{60} \times \frac{1}{i} \times \pi Dp$$

V : Rack moving speed [inch/sec.]
Ns : Speed of motor used [r/min]
i : Ratio of gear unit on the linear head (see table below)
Dp : Pinion pitch circumference [inch] (see table below)

Thrust force

In linear heads, the following equation is used to calculate the thrust force from the torque generated by the motor used.

$$W = Tm \times i \times \eta_1 \times \frac{2}{Dp} \times \eta_2$$

W : Thrust force [lb.]
Tm: Torque of motor used [lb.]
i : Ratio of gear unit on the linear head (see table below)
η_1 : Transmission efficiency as determined by the gear ratio (see table below)
Dp : Pinion pitch circumference [inch] (see table below)
η_2 : Transmission efficiency of rack and pinion (=0.9)

Linear Head Model	Gear Ratio i	Transmission efficiency η_1	Pinion Pitch Diameter D_P inch.(mm)
0LB (F) 20N-□	30	0.66	0.295 (7.5)
0LB (F) 10N-□	50	0.66	
0LB (F) 5N-□	100	0.59	
2LB (F) 50N-□	17.68	0.73	0.472 (12)
2LB (F) 25N-□	35.36	0.66	
2LB (F) 10N-□	86.91	0.59	
4LB (F) 45N-□	36	0.73	0.837 (21.25)
4LB (F) 20N-□	75	0.66	
4LB (F) 10N-□	150	0.66	
5LB (F) 45N-□	36	0.66	0.945 (24)
5LB (F) 20N-□	90	0.59	
5LB (F) 10N-□	180	0.59	
5LB (F) 45U-□	36	0.66	0.945 (24)
5LB (F) 20U-□	90	0.59	
5LB (F) 10U-□	180	0.59	

The value of the load is determined using the equation assumes that the rack is moving horizontally. If it is moving vertically, subtract the mass of the rack from the value contained in the characteristics table.

Holding torque

The following equation is used to calculate the holding force of the linear head when connected to a motor.

$$F_B = T_B \times i \times \frac{2}{Dp}$$

F_B : Holding force [lb.]
T_B : Holding torque of motor used [lb.]
i : Ratio of gear unit on the linear head (see table above)
Dp : Pinion pitch circumference [inch] (see table above)

The holding force is the value when operating the rack in a horizontal direction. The holding load that can be driven when operating the mechanism vertically is the maximum thrust force less the rack weight.

Operation

Controlling motion of rack

Linearheads are essentially alike in that the rack is moved through the control of a motor.
Blocking the operation at the end of the rack in order to stop the motor will not only apply an excessive torque to the gears, but will also result in an inertial shock, reducing the life of the gears substantially. Take special care never to stop the motor in this way.

Use at less than the maximum permissible thrust force

The thrust force of linear heads varies with the basic speed (determined by the gear ratio of the gearhead), with thrust force becoming larger at lower speeds (greater gear ratio). This increase in thrust force is limited, by the mechanical strength of gears or shaft. Permissible thrust force is determined by taking into consideration the motor torque and the mechanical strength of the shafts and gears, then adding a safety margin. If a load greater than this value is applied, or rack movement is locked for a long time, it is likely to result in damage to the rack-and-pinion or gear unit.

Maintain overhung load within permissible level

The amount of overhung load that can be applied to the rack is determined by the total load on the rack bearing. Operate rack at loads within the limits given in the following table.

unit=lb. (kg)

Rack Stroke inch. (mm)	**2L** type	**4L** type	**5L-N** type **5L-U** type
3.9 (100)	12.1 (5.5)	26.4 (12)	28.6 (13)
7.9 (200)	8.8 (4)	19.8 (9)	22 (10)
11.8 (300)	6.6 (3)	15.4 (7)	17.6 (8)
15.7 (400)	5.5 (2.5)	13.2 (6)	13.2 (6)
19.7 (500)	4.4 (2)	11 (5)	11 (5)
23.6 (600)	—	8.8 (4)	11 (5)
27.6 (700)	—	8.8 (4)	8.8 (4)

The table shows the cases in which the entire rack stroke can be used. When the actual usable range is shorter than the rack stroke, a load up to the permissible value for that length stroke can be applied.

Rack Lubrication

Some sort of lubricating agent is necessary to prevent friction when the rack passes through the rack grommet. The surface of the rack and any gears that mesh with the pinion should always be kept lubricated. In our products, since the rack case is filled with a lubrication agent, there is no need to lubricate the rack case. However, ensure that the surface of the rack or gear teeth do not become dry, as operating in this condition will shorten the product's life.

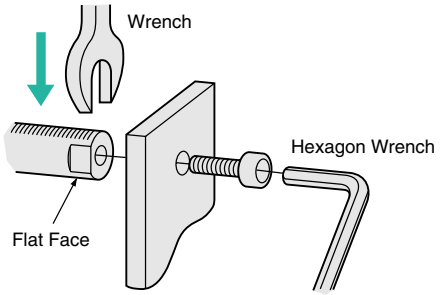
Use an electromagnetic brake motor for vertical operation

Operation using vertical motion, such as in elevators, often requires that the load be held in position at mid-stroke. For such applications, a model equipped with an electromagnetic brake, which offers high holding power, is recommended. The electromagnetic brake motor has the strongest holding power of all standard AC motors.
These electromagnetic brakes are power off brakes that are engaged in the event of a power failure.

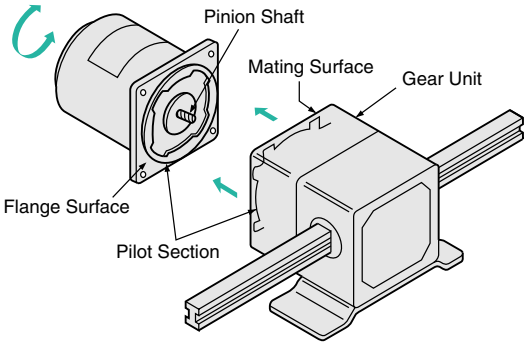
Glossary

Linear Heads

●Installation of the load to the end of the rack
When connecting the load using the tapped hole on the end of the rack, so that a rotational force is not applied to the rack. Hold the rack with a wrench while tightening the screw.



●Connecting Linear Heads
As the figure below shows, a linear head is connected to a motor using the recessed areas on each unit as guides. Gently slide the linear head from side to side without forcing the pinion shaft against the plate on the linear head or against the gear itself.



●Note:
Attempting to put a motor and linear head together by force can result in damage to the linear head.

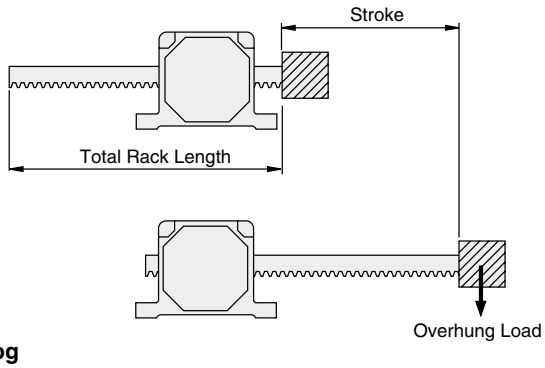
●Permissible Thrust Force
This is the maximum thrust force that can be used when the motor is operating. For example, if there is a thrust force of 154lb. (70kg), objects up to a weight of 154lb. (70kg) can be lifted.

●Holding Force
This is the force required to hold the rack at the position where it has stopped. If the mechanism is being used for vertical movement, this force must be able to hold a load fastened to the end of the rack to prevent it from falling.

●Basic Speed
This is the rack speed that is given as the basis for the selection of linear heads. The values indicated are calculated on the basis of the synchronous speed (i.e. 1800r/min at 60Hz) of the motor. However, the actual speed of the motor fluctuates according to the size of the load and can range from 2% to 20% less than the basic speed.

●Stroke
This is the distance that the rack can move. The full length of the rack is this distance plus the width of the rack case.

●Maximum Overhung Load
This is the load that can be applied to the rack in a direction perpendicular to the rack axis. If a load is applied continuously to the end of the rack, then the weight of that load will be applied to the rack as an overhung load.



●Dog
The function of dogs is to trip limit switches and sensors. Dogs are attached to the rack to set the position where the rack should stop.

●Rack
A gearcut rod is made of S45C or equivalent grade of steel. Racks for linear motors are specially designed and machined, and have special cross sections; those for linear heads have round cross sections.

Specifications

Type of Linear Head	Basic Speed in./s	Basic Speed mm/s	Max. Permissible Thrust Force lbs.	Max. Permissible Thrust Force kg	Stroke Length in. (mm)	Page
0L type	0.94	24	8.4	3.8	3.9, 7.9 (100, 200)	A-233
	0.47	12	14	6.3		
	0.24	6	22	10		
2L type	2.4	60	19	8.7	3.9, 7.9, 11.8, 15.7, 19.7 (100, 200, 300, 400, 500)	A-234
	1.2	30	33	15		
	0.47	12	44	20		
4L type	2.1	54	68	31	3.9, 7.9, 11.8, 15.7, 19.7, 23.6, 27.6 (100, 200, 300, 400, 500, 600, 700)	A-238
	0.94	24	128	58		
	0.47	12	154	70		
5L-N type	2.1	54	229	104	3.9, 7.9, 11.8, 15.7, 19.7, 23.6, 27.6 (100, 200, 300, 400, 500, 600, 700)	A-243
	0.94	24	308	140		
	0.47	12	308	140		
5L-U type	2.1	54	229	104	3.9, 7.9, 11.8, 15.7, 19.7, 23.6, 27.6 (100, 200, 300, 400, 500, 600, 700)	A-248
	0.94	24	308	140		
	0.47	12	308	104		

- Basic speed is based on the synchronous speed (1800r/min at 60Hz). The actual speed varies with the load or power supply frequency.
- The permissible thrust force is determined by the strength of the linear head. Just as when connecting a gearhead to the motor, increasing the gear ratio generates greater thrust force, but the motor should always be operated below the maximum permissible thrust force.
- The thrust force is the value when operating the rack in a horizontal direction.
- The thrust force given is for when combined with a reversible motor.

Applications and Recommended Motor Combinations

Application	Applicable Motor	**0L** type	**2L** type	**4L** type	**5L-N** type	**5L-U** type
Constant Speed	Reversible Motors	**0RK1GN-AUL**	**2RK6GN-AW(T)U** **2RK6GN-CW(T)E** **2RK6GN-AUL**	**4RK25GN-AW(T)U** **4RK25GN-CW(T)E** **4RK25GN-AUL**	**5RK40GN-AW(T)U** **5RK40GN-CW(T)E** **5RK40GN-AUL**	**5RK60GU-AW(T)U** **5RK60GU-CW(T)E** **5RK60GU-AUL** **5RK90GU-AW(T)U** **5RK90GU-CW(T)E** **5RK90GU-AUL**
	Synchronous Motors	—	**2SK4GN-AUL**	**4SK15GN-AUL**	**5SK25GN-AUL**	—
Position Holding	Electromagnetic Brake Motors	—	**2RK6GN-AWMU** **2RK6GN-CWME** **2RK6GN-AMUL**	**4RK25GN-AWMU** **4RK25GN-CWME** **4IK25GN-SWM** **4RK25GN-AMUL**	**5RK40GN-AWMU** **5RK40GN-CWME** **5IK40GN-SWM** **5RK40GN-AMUL** —	**5RK60GU-AWMU** **5RK60GU-CWME** **5IK60GU-SWM** **5RK60GU-AMUL** **5RK90GU-AWMU** **5RK90GU-CWME** **5IK90GU-SWM** **5RK90GU-AMUL**
Thrust Linear Motion	Torque Motors	—	—	**4TK10GN-AUL**	**5TK20GN-AUL**	—

- The torque motor does not have a built-in friction brake. Be sure that the torque motor has no holding brake force even when stopping during vertical operations. When operating a torque motor at high-speed, ensure that the rack does not hit an object and stop, since this can add excessive torque to the linear head and subject it to inertial shock which can significantly shorten its life.

OL *type Linear Head*

Max. Thrust Force

22lb.(10kg)

■ Max. Thrust Force

22 lb. (10 kg) Thrust force varies with basic speed.

■ Specifications

Basic Speed	Model	Rack Stroke
0.24in/s (6mm/s)	**OLB5N-1, OLB5N-2** **OLF5N-1, OLF5N-2**	3.9 inch (100mm) 7.9 inch (200mm)
0.47in/s (12mm/s)	**OLB10N-1, OLB10N-2** **OLF10N-1, OLF10N-2**	
0.94in/s (24mm/s)	**OLB20N-1, OLB20N-2** **OLF20N-1, OLF20N-2**	

- Basic speed figures are based on synchronous speed. The actual speed varies with the load or frequency of the power source.
- The box (□) represents the code for stroke length.

■ Direction of Rack Movement

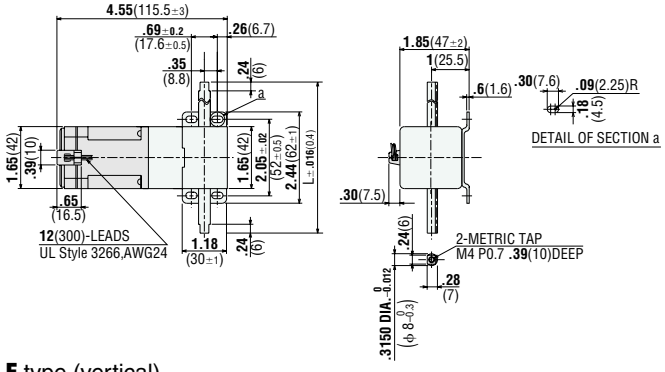
The direction of rack movement is determined by the direction of motor rotation.

Model	Motor Rotation	
	CW	CCW
OLB10N-□ **OLB20N-□**	Right	Left
OLF10N-□ **OLF20N-□**	Up	Down
OLB5N-□	Left	Right
OLF5N-□	Down	Up

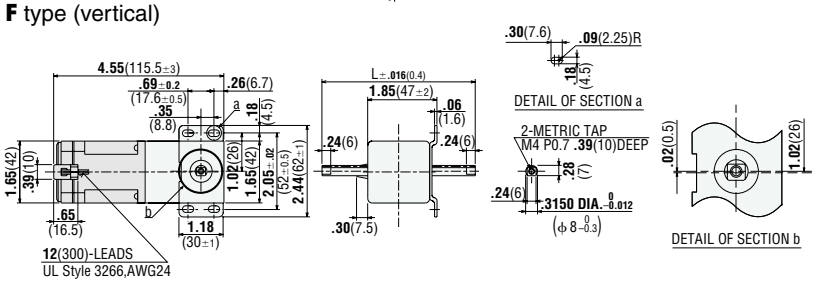
- Trip dogs and limit switches are necessary to stop or reverse the rack movement.
- Direction of rack movement is as viewed from the front side of the linear head.

■ Dimensions Scale 1/4, Unit = inch (mm)

B type (horizontal)



F type (vertical)



■ Max. Permissible Overhung Load

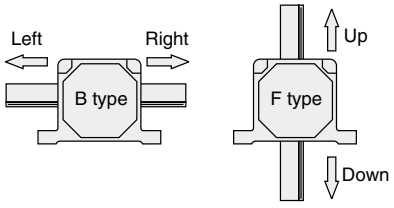
Stroke	Max. Permissible Overhung Load
3.9 inch (100mm)	2.6lb. (1.2kg)
7.9 inch (200mm)	1.8lb. (0.8kg)

■ Motor Combination

Motor type	Motor Model	Page
Reversible Motor	**ORK1GN-AUL**	A-78

●Overrun
Overrun is the value when operating the rack in a horizontal direction.

Model	Overrun inch (mm)
OL□5N-□	0.06 (1.4)
OL□10N-□	0.11 (2.8)
OL□20N-□	0.19 (4.7)



●Weight, Stroke Length and Rack Length

Model	Stroke inch (mm)	Total Length L inch (mm)	Weight(Mass) lb. (kg)	Rack Weight(Mass) lb. (kg)
OLB□N-1	3.9 (100)	6.31 (160.2)	1.23 (0.56)	0.11 (0.05)
OLF□N-1	3.9 (100)	6.31 (160.2)	1.23 (0.56)	0.11 (0.05)
OLB□N-2	7.9 (200)	10.26 (260.7)	1.32 (0.60)	0.20 (0.09)
OLF□N-2	7.9 (200)	10.26 (260.7)	1.32 (0.60)	0.20 (0.09)

2L *type Linear Head*

Max. Thrust Force

44lb.(20kg)

■ Max. Thrust Force

44 lb. (20 kg). Thrust force varies with basic speed and the motor combined.

■ Specifications

Basic Speed	Model	Rack Stroke inch (mm)
0.47 in/s (12 mm/s)	**2LB10N-□** **2LF10N-□**	3.9 (100) 7.9 (200) 11.8 (300) 15.7 (400) 19.7 (500)
1.2 in/s (30 mm/s)	**2LB25N-□** **2LF25N-□**	
2.4 in/s (60 mm/s)	**2LB50N-□** **2LF50N-□**	

- Basic speed figures are based on synchronous speed. (60Hz : 1800r/min) The actual speed varies with the load or frequency of the power source.
- The box (□) represents the code for stroke length.

■ Max. Permissible Overhung Load

Stroke inch (mm)	Max. Permissible Overhung Load lb. (kg)
3.9 (100)	12.1 (5.5)
7.9 (200)	8.8 (4)
11.8 (300)	6.6 (3)
15.7 (400)	5.5 (2.5)
19.7 (500)	4.4 (2)

■ Motor Combination

Motor type	Motor Model	Page
Reversible Motor	**2RK6GN-AW(T)U** **2RK6GN-CW(T)E**	A-82
Electromagnetic Brake Motor	**2RK6GN-AWMU** **2RK6GN-CWME**	A-182

■ Models

Rack Stroke inch (mm)	Basic Speed		
	0.47in/s (12mm/s)	1.2in/s (30mm/s)	2.4in/s (60mm/s)
3.9(100)	**2LB10N-1** **2LF10N-1**	**2LB25N-1** **2LF25N-1**	**2LB50N-1** **2LF50N-1**
7.9(200)	**2LB10N-2** **2LF10N-2**	**2LB25N-2** **2LF25N-2**	**2LB50N-2** **2LF50N-2**
11.8(300)	**2LB10N-3** **2LF10N-3**	**2LB25N-3** **2LF25N-3**	**2LB50N-3** **2LF50N-3**
15.7(400)	**2LB10N-4** **2LF10N-4**	**2LB25N-4** **2LF25N-4**	**2LB50N-4** **2LF50N-4**
19.7(500)	**2LB10N-5** **2LF10N-5**	**2LB25N-5** **2LF25N-5**	**2LB50N-5** **2LF50N-5**

- Longer mounting screws are required if a decimal gearhead is used.

■ Performance Examples with Several Motor Combinations

●Overrun Unit = inch (mm)

Motor \ Linear Head	2LB10N-□ 2LF10N-□	2LB25N-□ 2LF25N-□	2LB50N-□ 2LF50N-□
2RK6GN-AWU	0.10 (2.6)	0.25 (6.4)	0.51 (13)
2RK6GN-AWMU	0.05 (1.3)	0.13 (3.2)	0.25 (6.4)

Overrun at motor shaft is estimated to be 6 revolutions for reversible motors and 3 revolutions for electromagnetic brake motors.

- The maximum thrust load that can be driven when operating the mechanism vertically is the maximum thrust force less the rack weight.
- When operating the mechanism horizontally using a guide or similar device to bear the load, ensure that the load weight is less than the maximum thrust force.

●Reversible Motor (2RK6GN-AWU)

Item \ Model	2LB10N-□ 2LF10N-□	2LB25N-□ 2LF25N-□	2LB50N-□ 2LF50N-□
Max. Thrust Force lb. (kg)	44 (20)	30.8 (14)	17.4 (7.9)
Holding Force lb. (N)	15.8 (72)	6.4 (29)	3.1 (14)

- Holding force is provided by the built-in friction brake of the reversible motor. The values given in the table vary depending on the temperature and the time of operation, and thus should only be used as reference.

●Electromagnetic Brake Motor (2RK6GN-AWMU)

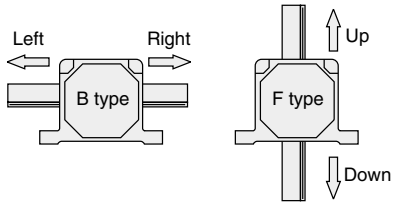
Item \ Model	2LB10N-□ 2LF10N-□	2LB25N-□ 2LF25N-□	2LB50N-□ 2LF50N-□
Max. Thrust Force lb. (kg)	44 (20)	30.8 (14)	17.4 (7.9)
Holding Force lb. (N)	44 (200)	37.4 (170)	19.4 (88)

■ Direction of Rack Movement

The direction of rack movement is determined by the direction of motor rotation.

Model	Motor Rotation	
	CW	CCW
2LB10N-□ 2LB50N-□	Right	Left
2LF10N-□ 2LF50N-□	Down	Up
2LB25N-□	Left	Right
2LF25N-□	Up	Down

- Direction of rack movement is as viewed from the front side of the linear head.
- A dog mounted on the rack (optional) and limit switch are required to stop or reverse a rack. Dogs are available as optional accessories. Use dogs for stop and reverse operation.

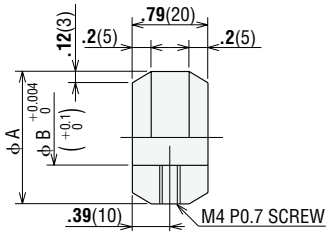


■ Accessories (sold separately)

●Dog

A dog should be mounted on the rack to stop or reverse a rack.
For details, see page A-273

●Dimensions Unit = inch (mm)



	Model	A inch (mm)	B inch (mm)
For 2L type Linear Head	LXD2C	0.94 (24)	0.54 (13.8)

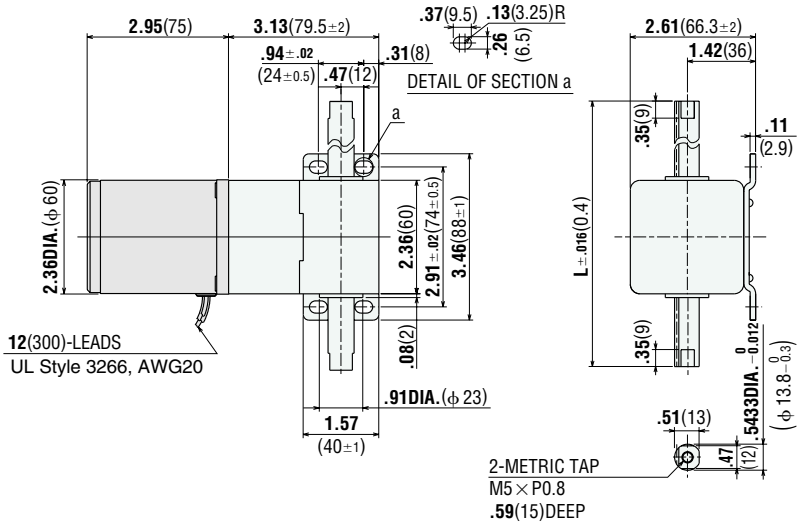
●Rack Cover

Rack covers for rack protection and dustproofing are available.
For details, see Page A-256.

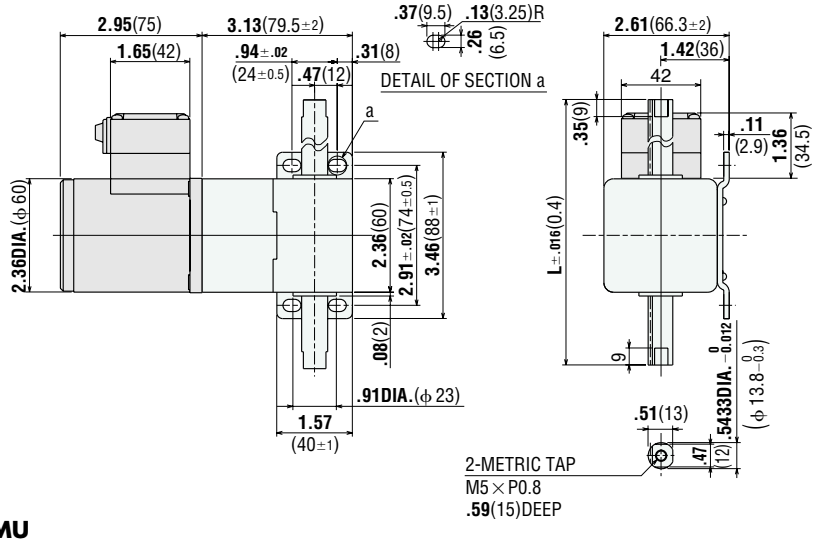
Dimensions Scale 1/4, Unit = inch (mm)

2LB type (horizontal)

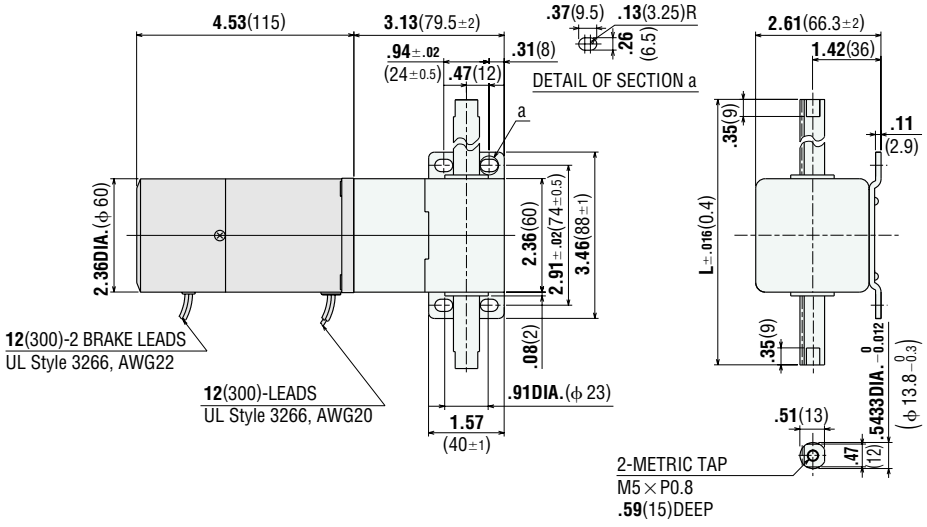
2LB□N-□/2RK6GN-AWU
2RK6GN-CWE
2RK6GN-AUL



2LB□N-□/2RK6GN-AWTU
2RK6GN-CWTE

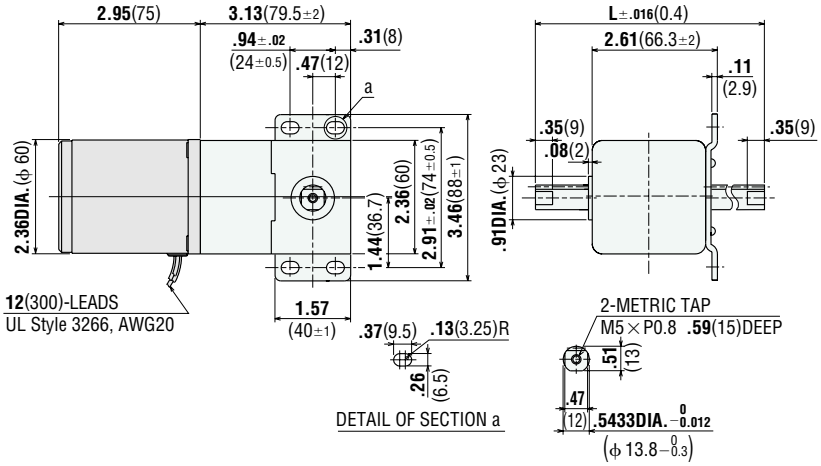


2LB□N-□/2RK6GN-AWMU
2RK6GN-CWME
2RK6GN-AMUL

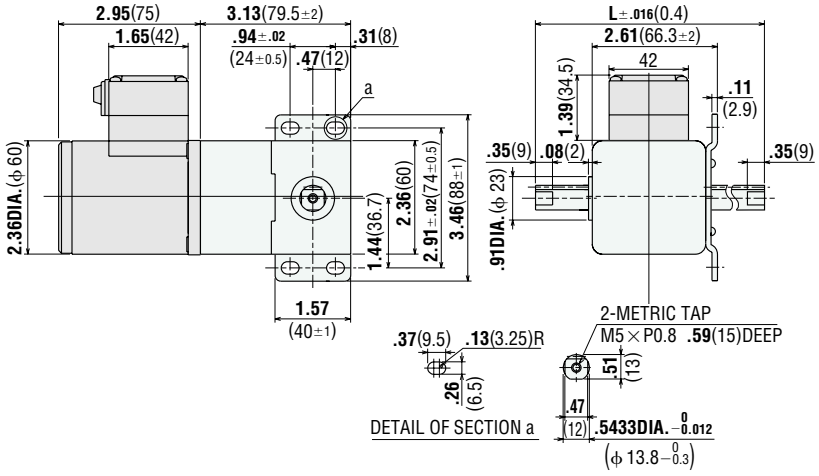


2LF type (vertical)

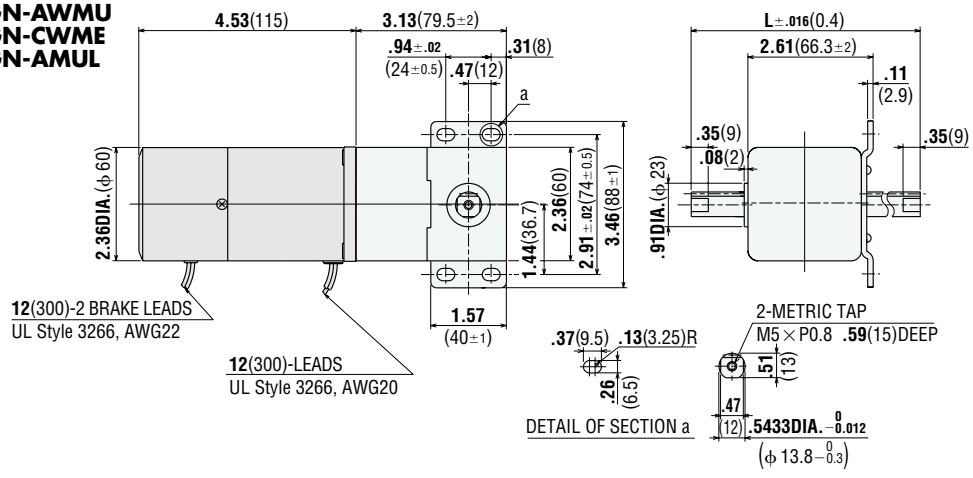
2LF□N-□/2RK6GN-AWU
2RK6GN-CWE
2RK6GN-AUL



2LF□N-□/2RK6GN-AWTU
2RK6GN-CWTE



2LF□N-□/2RK6GN-AWMU
2RK6GN-CWME
2RK6GN-AMUL



●Weight, Stroke Length and Rack Length

Model	Stroke inch (mm)	Total Length L inch (mm)	Weight (Mass) lb. (kg)	Rack Weight (Mass) lb. (kg)
2LB□N-1, 2LF□N-1	3.9 (100)	6.93 (175.9)	1.98 (0.9)	0.44 (0.2)
2LB□N-2, 2LF□N-2	7.9 (200)	10.89 (276.5)	2.20 (1.0)	0.66 (0.3)
2LB□N-3, 2LF□N-3	11.8 (300)	14.84 (377.0)	2.42 (1.1)	0.88 (0.4)
2LB□N-4, 2LF□N-4	15.7 (400)	18.80 (477.5)	2.64 (1.2)	1.10 (0.5)
2LB□N-5, 2LF□N-5	19.7 (500)	22.76 (578.0)	2.86 (1.3)	1.32 (0.6)

4L *type Linear Head*

Max. Thrust Force

154lb.(70kg)

■ Max. Thrust Force

154lb. (70 kg). Thrust force varies with basic speed and the motor combined.

■ Specifications

Basic Speed	Model	Rack Stroke inch (mm)
0.47 in/s (12 mm/s)	**4LB10N-□**	3.9 (100)
	4LF10N-□	7.9 (200)
		11.8 (300)
1.2 in/s (30 mm/s)	**4LB20N-□**	15.7 (400)
	4LF20N-□	19.7 (500)
2.4 in/s (60 mm/s)	**4LB45N-□**	23.6 (600)
	4LF45N-□	27.6 (700)

- Basic speed figures are based on synchronous speed (60Hz : 1800r/min). The actual speed varies with the load or frequency of the power source.
- The box (□) represents the code for stroke length.

■ Max. Permissible Overhung Load

Stroke inch (mm)	Max. Permissible Overhung Load lb. (kg)
3.9 (100)	26.4 (12)
7.9 (200)	19.8 (9)
11.8 (300)	15.4 (7)
15.7 (400)	13.2 (6)
19.7 (500)	11.0 (5)
23.6 (600)	8.8 (4)
27.6 (700)	8.8 (4)

■ Motor Combination

Motor type	Motor Model	Page
Reversible Motor	**4RK25GN-AW(T)U**	A-90
	4RK25GN-CW(T)E	
Electromagnetic Brake Motor	**4RK25GN-AWMU**	A-182
	4RK25GN-CWME	
	4IK25GN-SWM	
Torque Motor	**4TK10GN-AUL**	A-108

■ Models

Rack Stroke inch (mm)	Basic Speed		
	0.47in/s (12mm/s)	1.2in/s (30mm/s)	2.4in/s (60mm/s)
3.9 (100)	**4LB10N-1**	**4LB20N-1**	**4LB45N-1**
	4LF10N-1	**4LF20N-1**	**4LF45N-1**
7.9 (200)	**4LB10N-2**	**4LB20N-2**	**4LB45N-2**
	4LF10N-2	**4LF20N-2**	**4LF45N-2**
11.8 (300)	**4LB10N-3**	**4LB20N-3**	**4LB45N-3**
	4LF10N-3	**4LF20N-3**	**4LF45N-3**
15.7 (400)	**4LB10N-4**	**4LB20N-4**	**4LB45N-4**
	4LF10N-4	**4LF20N-4**	**4LF45N-4**
19.7 (500)	**4LB10N-5**	**4LB20N-5**	**4LB45N-5**
	4LF10N-5	**4LF20N-5**	**4LF45N-5**
23.6 (600)	**4LB10N-6**	**4LB20N-6**	**4LB45N-6**
	4LF10N-6	**4LF20N-6**	**4LF45N-6**
27.6 (700)	**4LB10N-7**	**4LB20N-7**	**4LB45N-7**
	4LF10N-7	**4LF20N-7**	**4LF45N-7**

■ Performance Examples with Several Motor Combinations

●Overrun Unit = inch (mm)

Linear Head / Motor	4LB10N-□ / 4LF10N-□	4LB20N-□ / 4LF20N-□	4LB45N-□ / 4LF45N-□
4RK25GN-AWU	0.11 (2.7)	0.21 (5.4)	0.43 (11)
4RK25GN-AWMU	0.05 (1.3)	0.11 (2.7)	0.22 (5.6)

Overrun at motor shaft is estimated to be 6 revolutions for reversible motors and 3 revolutions for electromagnetic brake motor.

- The maximum thrust load that can be driven when operating the mechanism vertically is the maximum thrust force less the rack weight.
- When operating the mechanism horizontally using a guide or similar device to bear the load, ensure that the load weight is less than the maximum thrust force.

●Reversible Motor (4RK25GN-AWU)

Item \ Model	4LB10N-□ / 4LF10N-□	4LB20N-□ / 4LF20N-□	4LB45N-□ / 4LF45N-□
Max. Thrust Force lb. (kg)	154 (70)	128 (58)	68.2 (31)
Holding Force lb. (N)	46.2 (210)	22.0 (100)	11.0 (50)

●Electromagnetic Brake Motor (4RK25GN-AWMU)

Item \ Model	4LB10N-□ / 4LF10N-□	4LB20N-□ / 4LF20N-□	4LB45N-□ / 4LF45N-□
Max. Thrust Force lb. (kg)	154 (70)	128 (58)	68.2 (31)
Holding Force lb. (N)	154 (700)	154 (700)	72.6 (330)

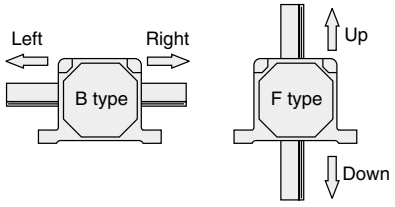
- Holding force is provided by the built-in friction brake of the reversible motor. The values given in the table vary depending on the temperature and the time of operation, and thus should only be used as reference.
- The maximum thrust load that can be driven when operating the mechanism vertically is the maximum thrust force less the rack weight.
- When operating the mechanism horizontally using a guide or similar device to bear the load, ensure that the load weight is less than the maximum thrust force.

■ Direction of Rack Movement

The direction of rack movement is determined by the direction of motor rotation.

Model	Motor Rotation	
	CW	CCW
4LB10N-□ 4LB20N-□	Left	Right
4LF10N-□ 4LF20N-□	Up	Down
4LB45N-□	Right	Left
4LF45N-□	Down	Up

- Direction of rack movement is as viewed from the front side of the linear head.
- A dog mounted on the rack (optional) and limit switch are required to stop or reverse a rack. Dogs are available as optional accessories. Use dogs for stop and reverse operation.

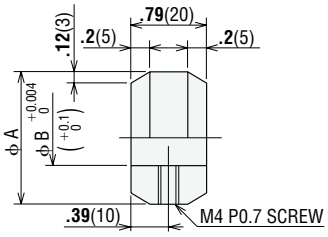


■ Accessories (sold separately)

●Dog

A dog should be mounted on the rack to stop or reverse a rack.
For details, see page A-273

●Dimensions Unit = inch. (mm)



	Model	A inch (mm)	B inch (mm)
For 4L type Linear Head	LXD4C	1.18 (30)	0.78 (19.8)

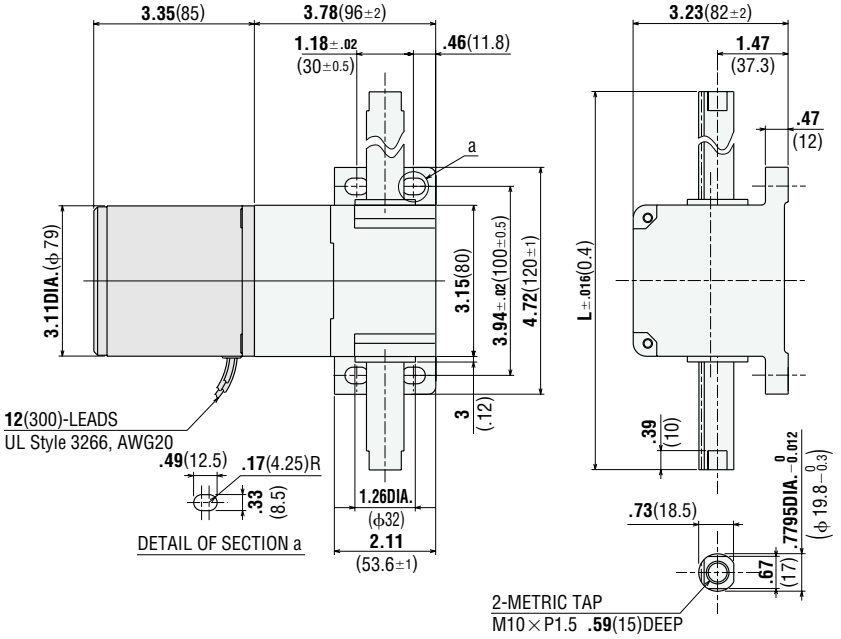
●Rack Cover

Rack covers for rack protection and dustproofing are available.
For details, see Page A-256

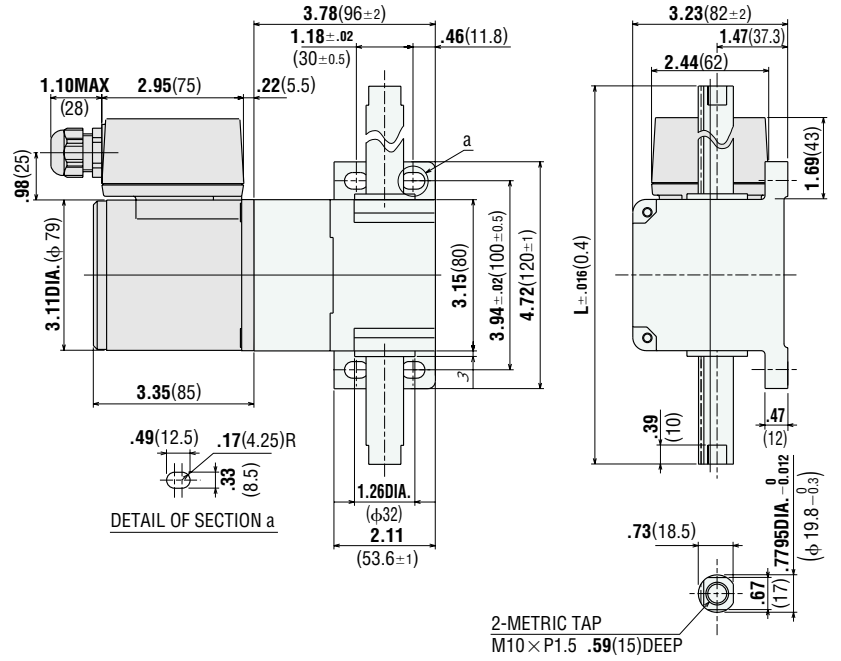
■ Dimensions Scale 1/4, Unit = inch (mm)

4LB type (horizontal)

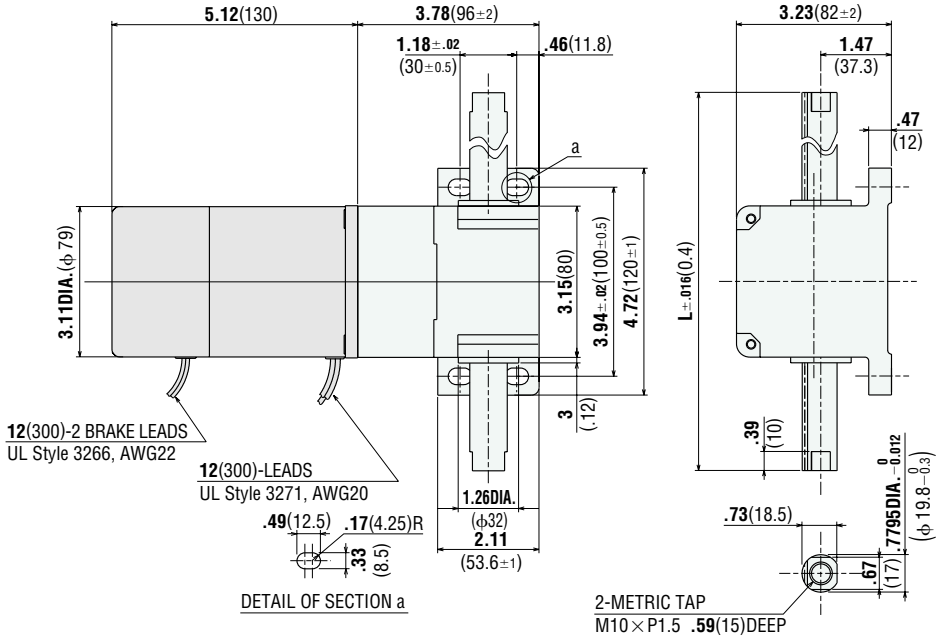
4LB□N-□/4RK25GN-AWU
4RK25GN-CWE
4RK25GN-AUL



4LB□N-□/4RK25GN-AWTU
4RK25GN-CWTE

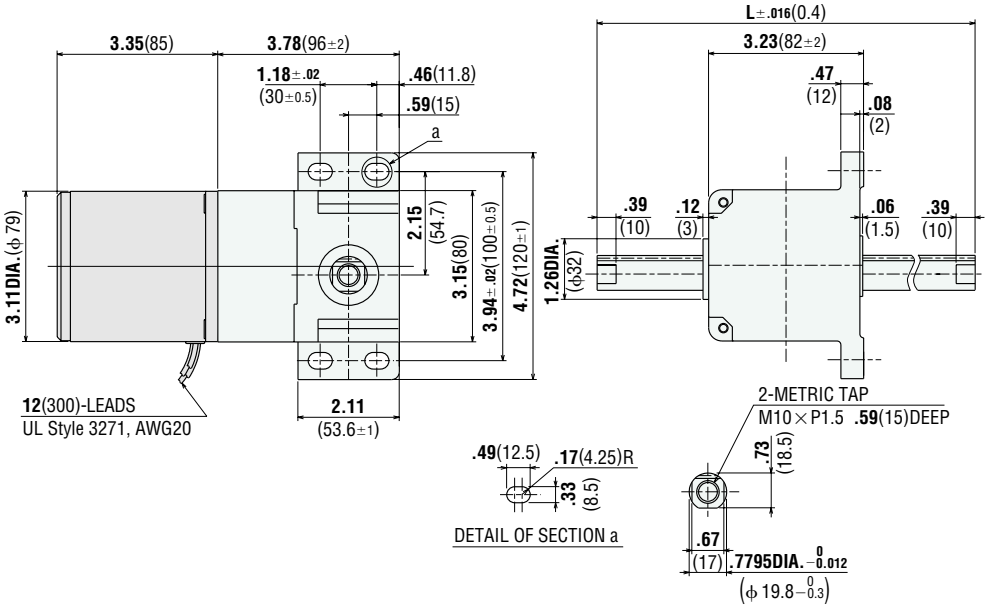


4LB□N-□/4RK25GN-AWMU
4RK25GN-CWME
4IK25GN-SWM
4RK25GN-AMUL

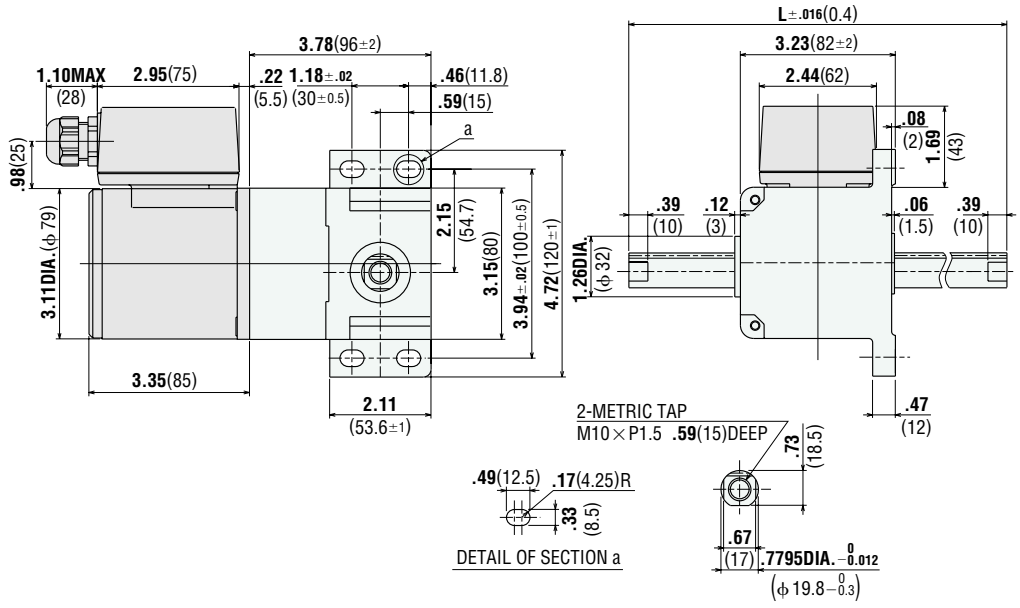


4LF type (vertical)

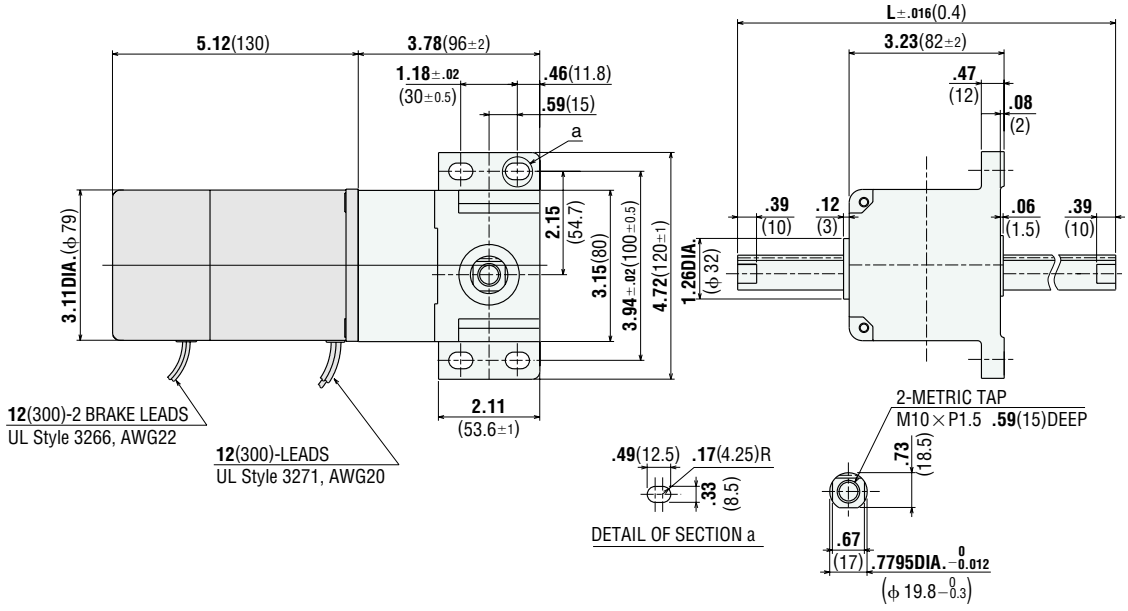
4LF□N-□/4RK25GN-AWU
4RK25GN-CWE
4RK25GN-AUL



4LF□N-□/4RK25GN-AWTU
4RK25GN-CWTE



4LF□N-□/4RK25GN-AWMU
4RK25GN-CWME
4IK25GN-SWM
4RK25GN-AMUL



●Weight, Stroke Length and Rack Length

Model	Stroke inch (mm)	Total Length L inch (mm)	Weight (Mass) lb. (kg)	Rack Weight (Mass) lb. (kg)
4LB□N-1, 4LF□N-1	3.9 (100)	7.89 (200.4)	3.52 (1.6)	0.88 (0.4)
4LB□N-2, 4LF□N-2	7.9 (200)	11.91 (302.5)	3.96 (1.8)	1.54 (0.7)
4LB□N-3, 4LF□N-3	11.8 (300)	15.78 (400.7)	4.40 (2.0)	1.98 (0.9)
4LB□N-4, 4LF□N-4	15.7 (400)	19.80 (502.8)	4.84 (2.2)	2.42 (1.1)
4LB□N-5, 4LF□N-5	19.7 (500)	23.66 (601.0)	5.28 (2.4)	2.86 (1.3)
4LB□N-6, 4LF□N-6	23.6 (600)	27.68 (703.1)	5.72 (2.6)	3.52 (1.6)
4LB□N-7, 4LF□N-7	27.6 (700)	31.55 (801.3)	6.16 (2.8)	3.96 (1.8)

5L-N *type Linear Head*

Max. Thrust Force

198lb.(90kg)

■ Max. Thrust Force

198lb. (90kg) Thrust force varies with basic speed and the motor combined.

■ Specifications

Basic Speed	Model	Rack Stroke inch (mm)
0.47 in/s(12mm/s)	**5LB10N-□**	3.9 (100)
	5LB10N-□	7.9 (200)
1.2 in/s(30mm/s)	**5LB20N-□**	11.8 (300)
	5LB20N-□	15.7 (400)
2.4 in/s(60mm/s)	**5LB45N-□**	19.7 (500)
	5LB45N-□	23.6 (600)
		27.6 (700)

●Basic speed figures are based on synchronous speed(60Hz : 1800r/min). The actual speed varies with the load or frequency of the power source.
●The box (□) represents the code for stroke length.

■ Max. Permissible Overhung Load

Rack Stroke inch (mm)	Max. Permissible Overhung Load lb. (kg)
3.9 (100)	28.6 (13)
7.9 (200)	22.0 (10)
11.8 (300)	17.6 (8)
15.7 (400)	13.2 (6)
19.7 (500)	11.0 (5)
23.6 (600)	11.0 (5)
27.6 (700)	8.8 (4)

■ Motor Combination

Motor type	Motor Model	Page
Reversible Motor	**5RK40GN-AW(T)U**	A-93
	5RK40GN-CW(T)E	
Electromagnetic Brake Motor	**5RK40GN-AWMU**	A-182
	5RK40GN-CWME	
	5IK40GN-SWM	
Torque Motors	**5TK20GN-AUL**	A-108

■ Models

Rack Stroke inch (mm)	Basic Speed		
	0.47in/s (12mm/s)	1.2in/s (30mm/s)	2.4in/s (60mm/s)
3.9 (100)	**5LB10N-1**	**5LB20N-1**	**5LB45N-1**
	5LF10N-1	**5LF20N-1**	**5LF45N-1**
7.9 (200)	**5LB10N-2**	**5LB20N-2**	**5LB45N-2**
	5LF10N-2	**5LF20N-2**	**5LF45N-2**
11.8 (300)	**5LB10N-3**	**5LB20N-3**	**5LB45N-3**
	5LF10N-3	**5LF20N-3**	**5LF45N-3**
15.7 (400)	**5LB10N-4**	**5LB20N-4**	**5LB45N-4**
	5LF10N-4	**5LF20N-4**	**5LF45N-4**
19.7 (500)	**5LB10N-5**	**5LB20N-5**	**5LB45N-5**
	5LF10N-5	**5LF20N-5**	**5LF45N-5**
23.6 (600)	**5LB10N-6**	**5LB20N-6**	**5LB45N-6**
	5LF10N-6	**5LF20N-6**	**5LF45N-6**
27.6 (700)	**5LB10N-7**	**5LB20N-7**	**5LB45N-7**
	5LF10N-7	**5LF20N-7**	**5LF45N-7**

●Longer mounting screws are required if a decimal gearhead is used.

■ Performance Examples with Several Motor Combinations

●Overrun Unit = inch (mm)

Motor \ Linear Head	5LB10N-□ 5LF10N-□	5LB20N-□ 5LF20N-□	5LB45N-□ 5LF45N-□
5RK40GN-AWU	0.10 (2.6)	0.20 (5.1)	0.51 (13)
5RK40GN-AWMU	0.05 (1.3)	0.10 (2.6)	0.25 (6.3)

Overrun at motor shaft is estimated to be 6 revolutions for reversible motors and 3 revolutions for electromagnetic brake motors.

- The maximum thrust load that can be driven when operating the mechanism vertically is the maximum thrust force less the rack weight.
- When operating the mechanism horizontally using a guide or similar device to bear the load, ensure that the load weight is less than the maximum thrust force.

■ Direction of Rack Movement

The direction of rack movement is determined by the direction of motor rotation.

Model	Motor Rotation CW	Motor Rotation CCW
5LB10N-□ 5LB20N-□	Right	Left
5LF10N-□ 5LF20N-□	Up	Down
5LB45N-□	Left	Right
5LF45N-□	Down	Up

- Direction of rack movement is as viewed from the front side of the linear head.
- A dog mounted on the rack (optional) and limit switch are required to stop or reverse a rack. Dogs are available as optional accessories. Use dogs for stop and reverse operation.

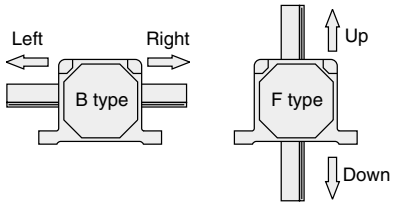
●Reversible Motor (5RK40GN-AWU)

Item \ Model	5LB10N-□ 5LF10N-□	5LB20N-□ 5LF20N-□	5LB45N-□ 5LF45N-□
Max. Thrust Force lb. (kg)	198 (90)	198 (90)	112.2 (51)
Holding Force lb. (N)	1320 (600)	660 (300)	264 (120)

●Electromagnetic Brake Motor (5RK40GN-AWMU)

Item \ Model	5LB10N-□ 5LF10N-□	5LB20N-□ 5LF20N-□	5LB45N-□ 5LF45N-□
Max. Thrust Force lb. (kg)	198 (90)	198 (90)	112.2 (51)
Holding Force lb. (N)	1980 (900)	1980 (900)	1122 (510)

- Holding force is provided by the built-in friction brake of the reversible motor. The values given in the table vary depending on the temperature and the time of operation, and thus should only be used as reference.
- The maximum thrust load that can be driven when operating the mechanism vertically is the maximum thrust force less the rack weight.
- When operating the mechanism horizontally using a guide or similar device to bear the load, ensure that the load weight is less than the maximum thrust force.

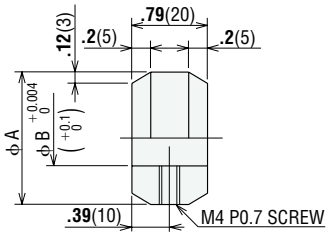


■ Accessories (sold separately)

●Dog

A dog should be mounted on the rack to stop or reverse a rack.
For details, see page A-273.

●Dimensions Unit = inch (mm)



	Model	A inch (mm)	B inch (mm)
For 5L type Linear Head	LXD5C	1.38 (35)	0.98 (24.8)

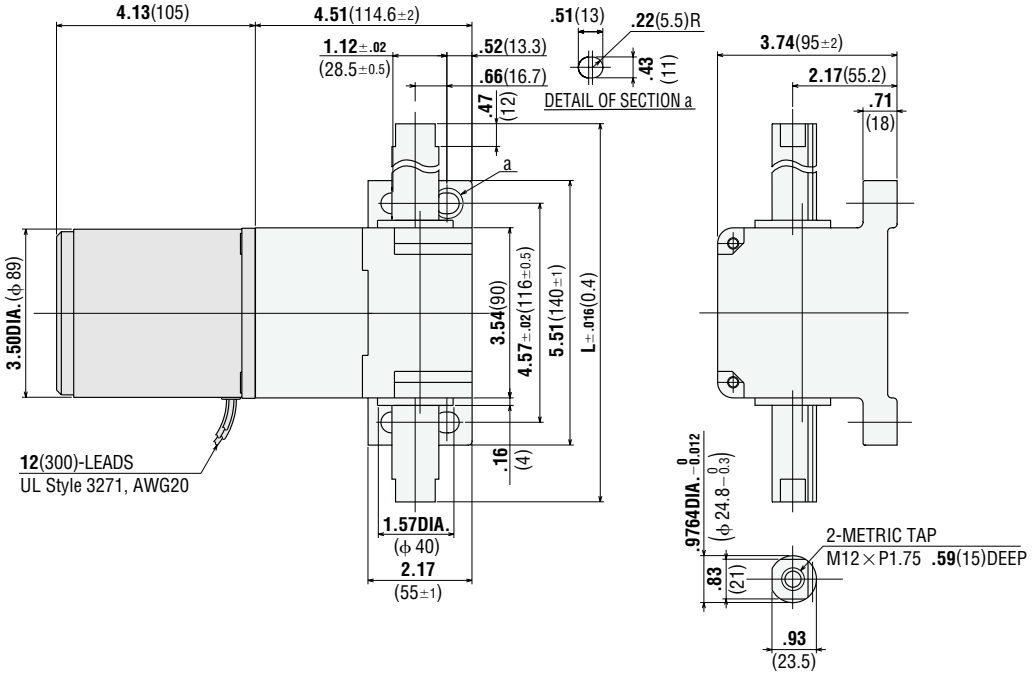
●Rack Cover

Rack covers for rack protection and dustproofing are available.
For details, see Page A-256.

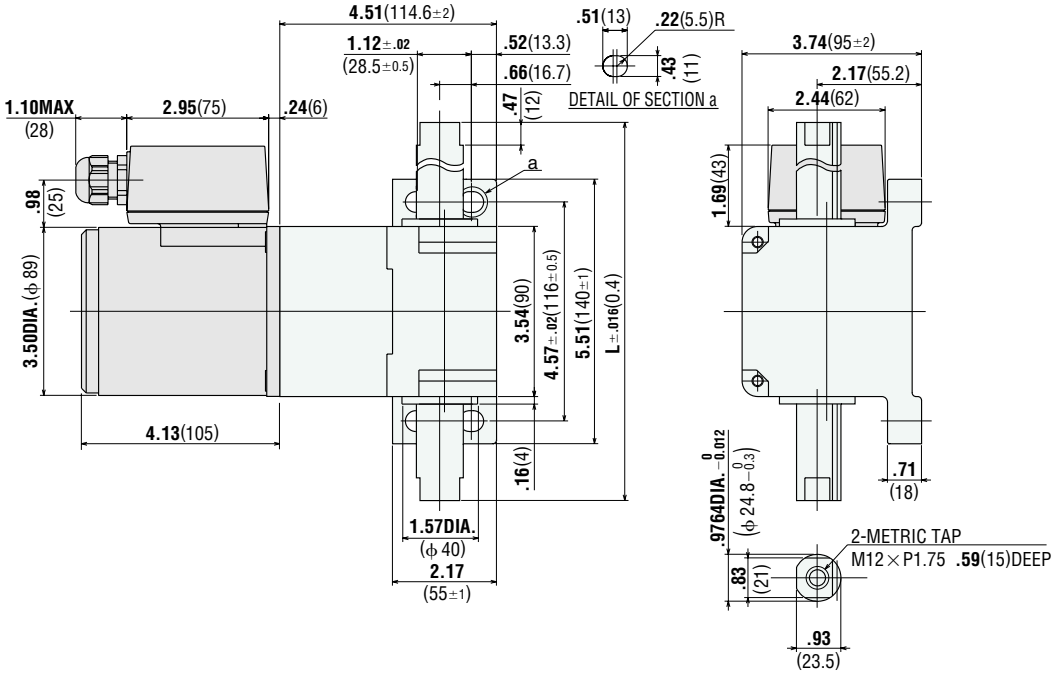
Dimensions Scale 1/4, Unit = inch (mm)

5LB type (horizontal)

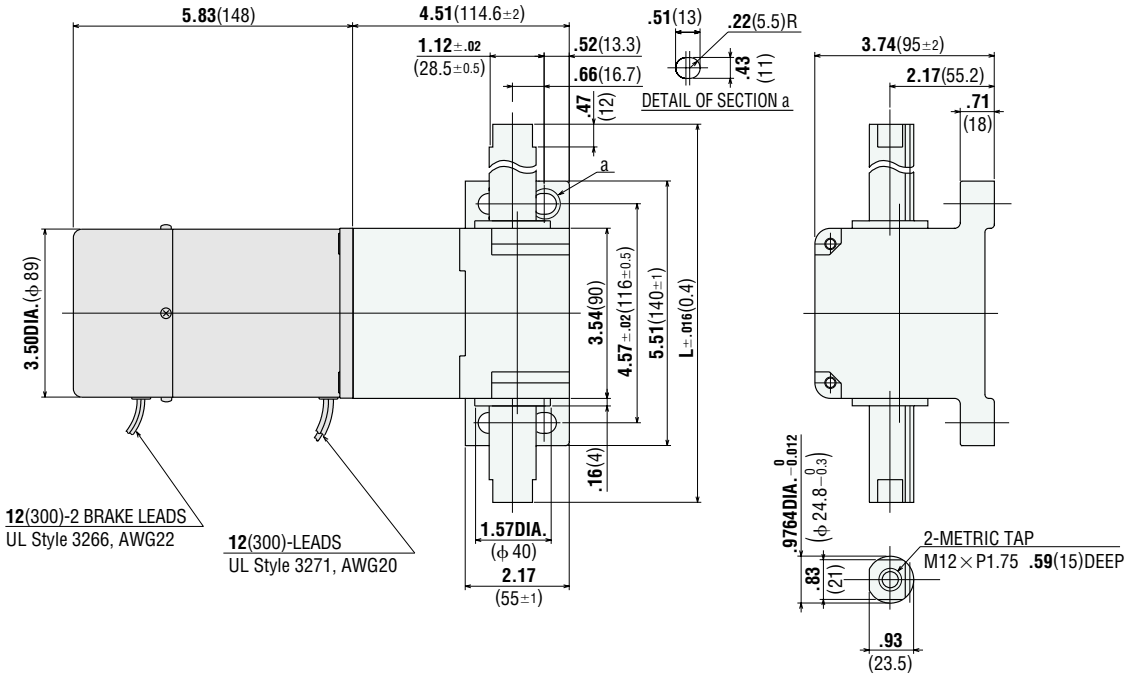
5LB□N-□/5RK40GN-AWU
5RK40GN-CWE
5RK40GN-AUL



5LB□N-□/5RK40GN-AWTU
5RK40GN-CWTE

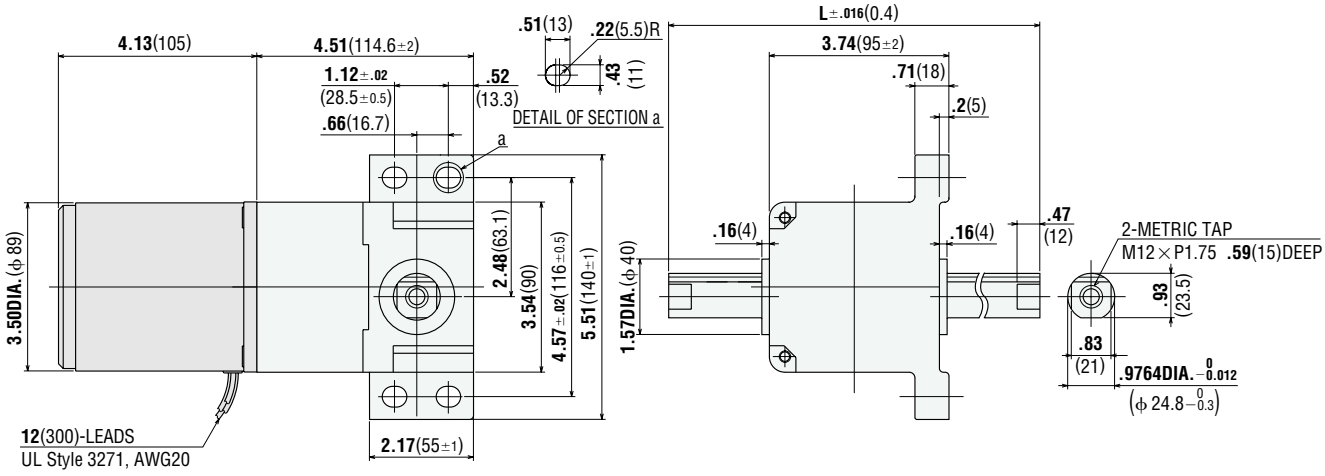


5LB□N-□/5RK40GN-AWMU
5RK40GN-CWME
5IK40GN-SWM
5RK40GN-AMUL

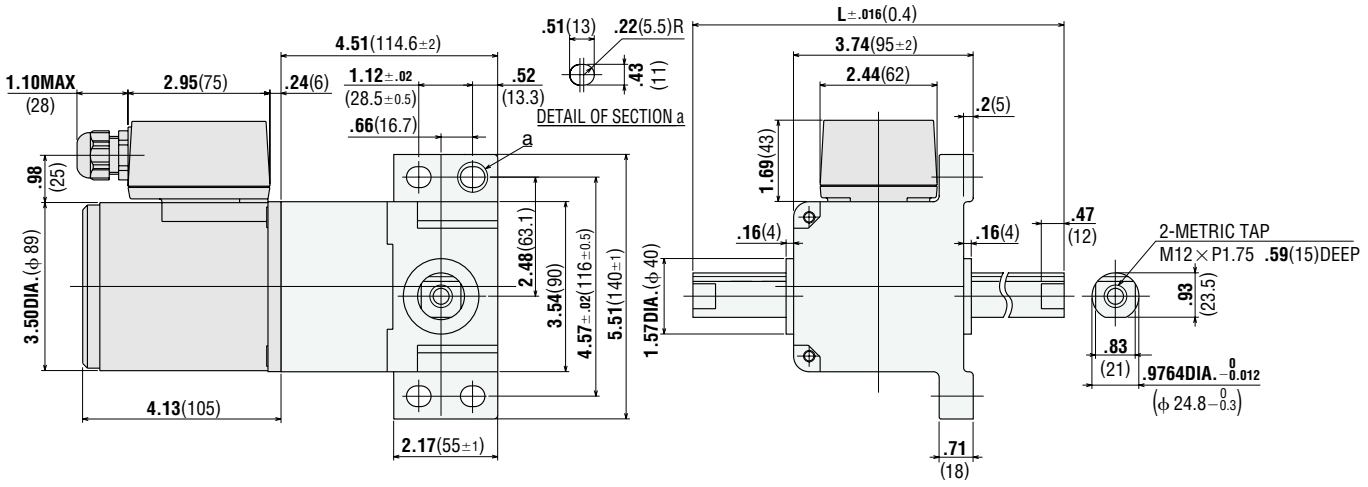


5LF type (vertical)

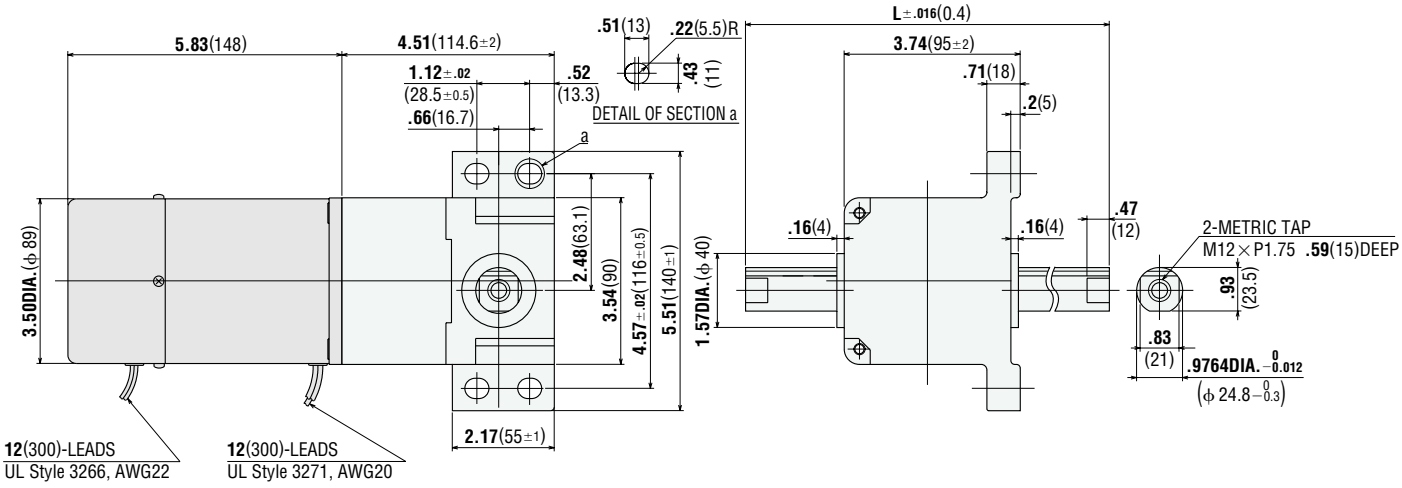
5LF□N-□/5RK40GN-AWU
5RK40GN-CWE
5RK40GN-AUL



5LF□N-□/5RK40GN-AWTU
5RK40GN-CWTE



5LF□N-□/5RK40GN-AWMU
5RK40GN-CWME
5IK40GN-SWM
5RK40GN-AMUL



●Weight, Stroke Length and Rack Length

Model	Rack Stroke inch (mm)	Rack Length L inch (mm)	Weight (Mass) lb. (kg)	Rack Weight (Mass) lb. (kg)
5LB□N-1, 5LF□N-1	3.9 (100)	10.14 (257.6)	6.38 (2.9)	1.98 (0.9)
5LB□N-2, 5LF□N-2	7.9 (200)	14.10 (358.1)	7.04 (3.2)	2.64 (1.2)
5LB□N-3, 5LF□N-3	11.8 (300)	18.06 (458.6)	7.92 (3.6)	3.52 (1.6)
5LB□N-4, 5LF□N-4	15.7 (400)	22.02 (559.2)	8.58 (3.9)	4.18 (1.9)
5LB□N-5, 5LF□N-5	19.7 (500)	25.97 (659.7)	9.46 (4.3)	5.06 (2.3)
5LB□N-6, 5LF□N-6	23.6 (600)	29.93 (760.3)	10.34 (4.7)	5.94 (2.7)
5LB□N-7, 5LF□N-7	27.6 (700)	33.89 (860.8)	11.0 (5.0)	6.6 (3.0)

5L-U *type Linear Head*

Max. Thrust Force

308lb.(140kg)

■ Max. Thrust Force

308 lb. (140 kg). Thrust force varies with basic speed and the motor combined.

■ Specifications

Basic Speed	Model	Rack Stroke inch (mm)
0.47 in/s (12 mm/s)	**5LB10U-□**	3.9 (100)
	5LF10U-□	7.9 (200)
0.94 in/s (24mm/s)	**5LB20U-□**	11.8 (300)
	5LF20U-□	15.7 (400)
2.4 in/s (60 mm/s)	**5LB45U-□**	19.7 (500)
	5LF45U-□	23.6 (600)
		27.6 (700)

- Basic speed figures are based on synchronous speed (60Hz : 1800r/min). The actual speed varies with the load or frequency of the power source.
- The box (□) represents the code for stroke length.

■ Max. Permissible Overhung Load

Stroke inch (mm)	Max. Permissible Overhung Load lb. (kg)
3.9 (100)	28.6 (13)
7.9 (200)	22.0 (10)
11.8 (300)	17.6 (8)
15.7 (400)	13.2 (6)
19.7 (500)	11.0 (5)
23.6 (600)	11.0 (5)
27.6 (700)	8.8 (4)

■ Motor Combination

Motor type	Motor Model	Page
Reversible Motor	**5RK60GU-AW(T)U**	A-96
	5RK60GU-CW(T)E	
	5RK90GU-AW(T)U	A-99
	5RK90GU-CW(T)E	
Electromagnetic Brake Motor	**5RK60GU-AWMU**	A-182
	5RK60GU-CWME	
	5IK60GU-SWM	
	5RK90GU-AWMU	A-182
	5RK90GU-CWME	
	5IK90GU-SWM	

■ Models

Rack Stroke inch (mm)	Basic Speed		
	0.47in/s (12mm/s)	0.94in/s (24mm/s)	2.4in/s (60mm/s)
3.9 (100)	**5LB10U-1**	**5LB20U-1**	**5LB45U-1**
	5LF10U-1	**5LF20U-1**	**5LF45U-1**
7.9 (200)	**5LB10U-2**	**5LB20U-2**	**5LB45U-2**
	5LF10U-2	**5LF20U-2**	**5LF45U-2**
11.8 (300)	**5LB10U-3**	**5LB20U-3**	**5LB45U-3**
	5LF10U-3	**5LF20U-3**	**5LF45U-3**
15.7 (400)	**5LB10U-4**	**5LB20U-4**	**5LB45U-4**
	5LF10U-4	**5LF20U-4**	**5LF45U-4**
19.7 (500)	**5LB10U-5**	**5LB20U-5**	**5LB45U-5**
	5LF10U-5	**5LF20U-5**	**5LF45U-5**
23.6 (600)	**5LB10U-6**	**5LB20U-6**	**5LB45U-6**
	5LF10U-6	**5LF20U-6**	**5LF45U-6**
27.6 (700)	**5LB10U-7**	**5LB20U-7**	**5LB45U-7**
	5LF10U-7	**5LF20U-7**	**5LF45U-7**

- Longer mounting screws are required if a decimal gearhead is used.

■ Performance Example with Several Motor Combinations

●Reversible Motors

Model / Motor	5LB10U-□ 5LF10U-□		5LB20U-□ 5LF20U-□		5LB45U-□ 5LF45U-□	
	Max. Thrust Force lb. (kg)	Holding Force lb. (N)	Max. Thrust Force lb. (kg)	Holding Force lb. (N)	Max. Thrust Force lb. (kg)	Holding Force lb. (N)
5RK60GU-AWU	308 (140)	132 (600)	308 (140)	66 (300)	147 (67)	26.4 (120)
5RK90GU-AWU	308 (140)	132 (600)	308 (140)	66 (300)	229 (104)	26.4 (120)

●Holding force is provided by the built-in friction brake of the reversible motor. The values given in the table vary depending on the temperature and the time of operation, and thus should only be used as reference.

●Electromagnetic Brake Motors

Model / Motor	5LB10U-□ 5LF10U-□		5LB20U-□ 5LF20U-□		5LB45U-□ 5LF45U-□	
	Max. Thrust Force lb. (kg)	Holding Force lb. (N)	Max. Thrust Force lb. (kg)	Holding Force lb. (N)	Max. Thrust Force lb. (kg)	Holding Force lb. (N)
5RK60GU-AWMU	308 (140)	308 (1400)	308 (140)	308 (1400)	147 (67)	147 (670)
5RK90GU-AWMU	308 (140)	308 (1400)	308 (140)	308 (1400)	229 (104)	229 (1040)

●The maximum thrust load that can be driven when operating the mechanism vertically is the maximum thrust force less the rack weight.
●When operating the mechanism horizontally using a guide or similar device to bear the load, ensure that the load weight is less than the maxmum thrust force.

●Overrun Unit = inch (mm)

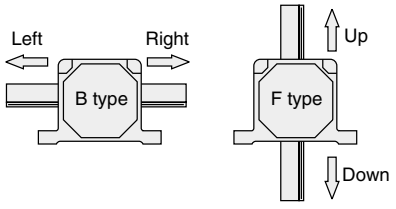
Motor / Linear Head	5LB10U-□ 5LF10U-□	5LB20U-□ 5LF20U-□	5LB45U-□ 5LF45U-□
5RK60GU-AWU **5RK90GU-AWU**	0.10 (2.6)	0.20 (5.1)	0.51 (13)
5RK60GU-AWMU **5RK90GU-AWMU**	0.05 (1.3)	0.10 (2.6)	0.25 (6.3)

Overrun at motor shaft is estimated to be 6 revolutions for reversible motors and 3 revolutions for electromagnetic brake motors.
●The maximum thrust load that can be driven when operating the mechanism vertically is the maximum thrust force less the rack weight.
●When operating the mechanism horizontally using a guide or similar device to bear the load, ensure that the load weight is less than the maximum thrust force.

■ Direction of Rack Movement

The direction of rack movement is determined by the direction of motor rotation.

Model	Motor Rotation	
	CW	CCW
5LB10U-□ **5LB20U-□**	Left	Right
5LF10U-□ **5LF20U-□**	Down	Up
5LB45U-□	Right	Left
5LF45U-□	Up	Down



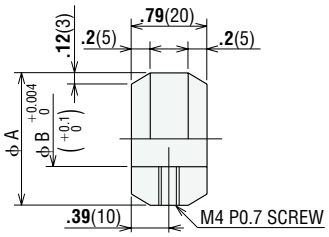
●Direction of rack movement is as viewed from the front side of the linear head.
●A dog mounted on the rack (optional) and limit switch are required to stop or reverse a rack. Dogs are available as optional accessories. Use dogs for stop and reverse operation.□

■ Accessories (sold separately)

●Dog

A dog should be mounted on the rack to stop or reverse a rack.
For details, see page A-273

●Dimensions Unit = inch (mm)



	Model	A inch (mm)	B inch (mm)
For **5L** type Linear Head	**LXD5C**	1.38 (35)	0.98 (24.8)

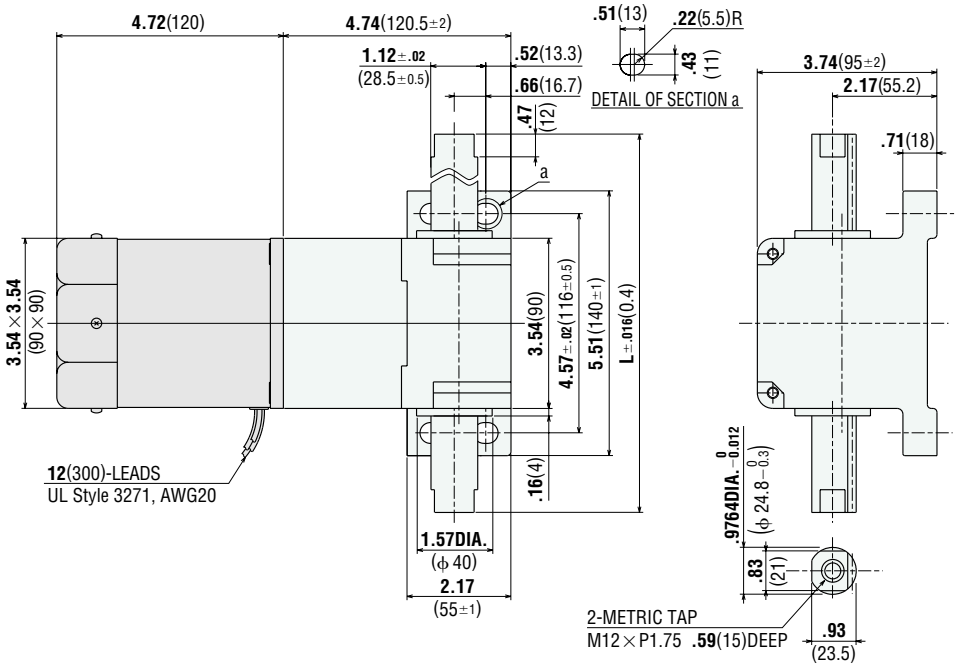
●Rack Cover

Rack covers for rack protection and dustproofing are available.
For details, see Page A-256

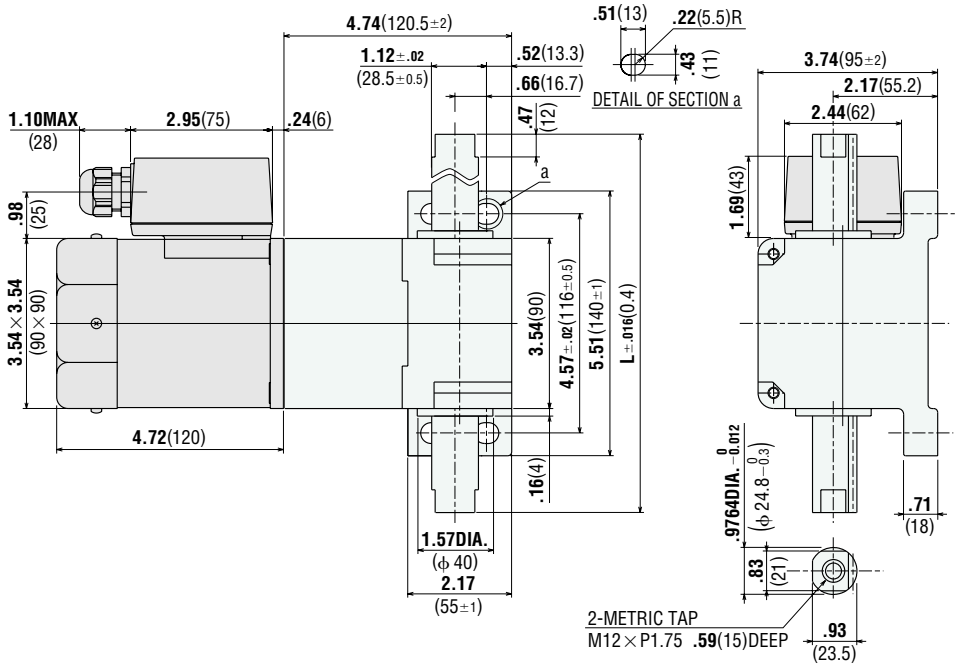
Dimensions Scale 1/4, Unit = inch (mm)

5LB type (horizontal)

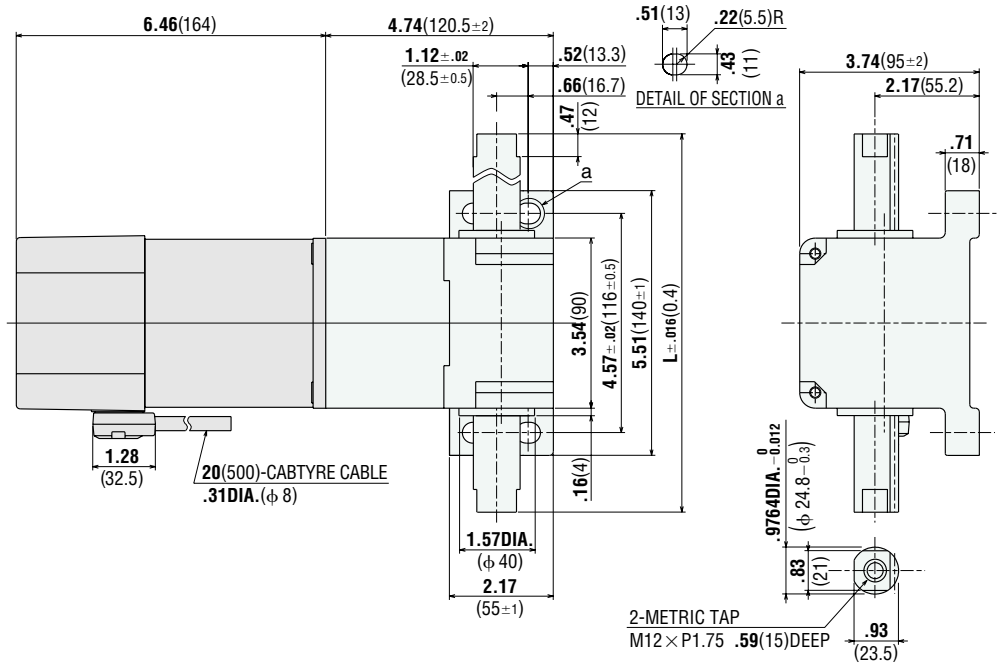
5LB□U-□/5RK60GU-AWU
5RK60GU-CWE
5RK60GU-AFUL



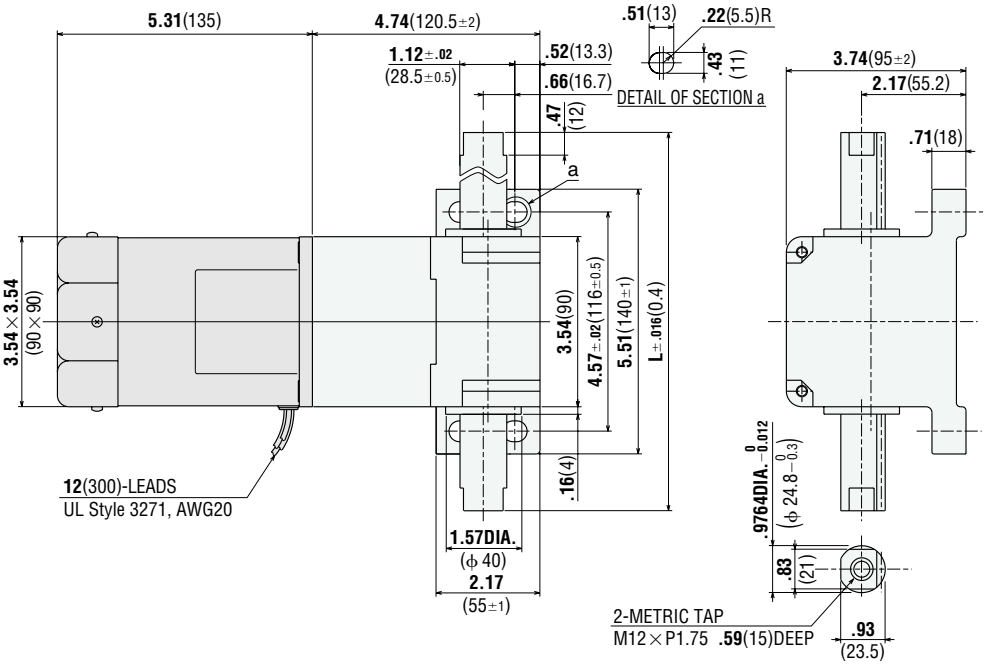
5LB□U-□/5RK60GU-AWTU
5RK60GU-CWTE



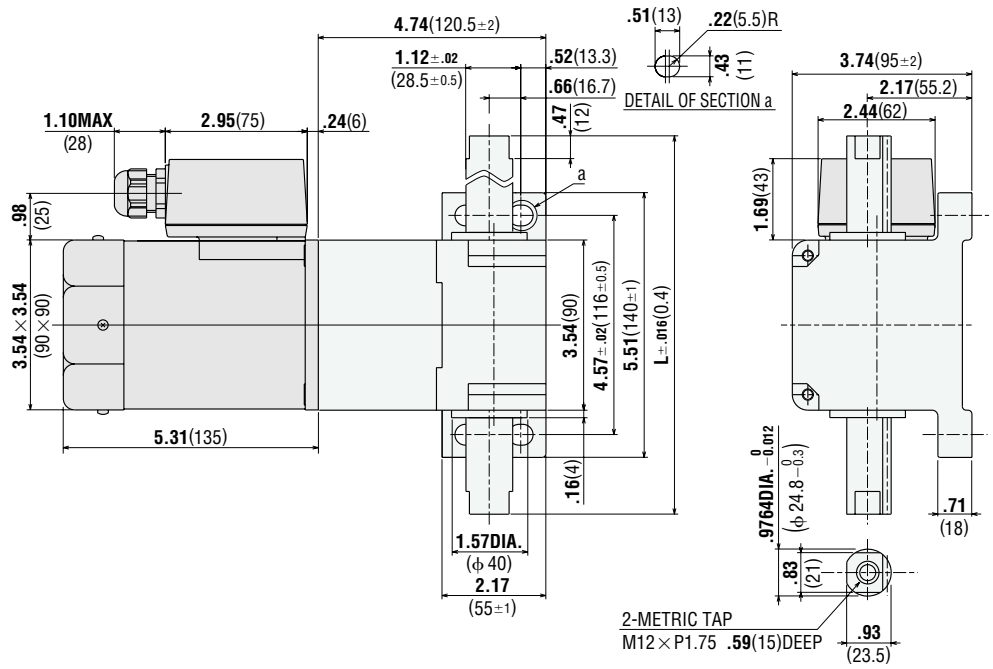
5LB□U-□/5RK60GU-AWMU
5RK60GU-CWME
5IK60GU-SWM
5RK60GU-AMUL



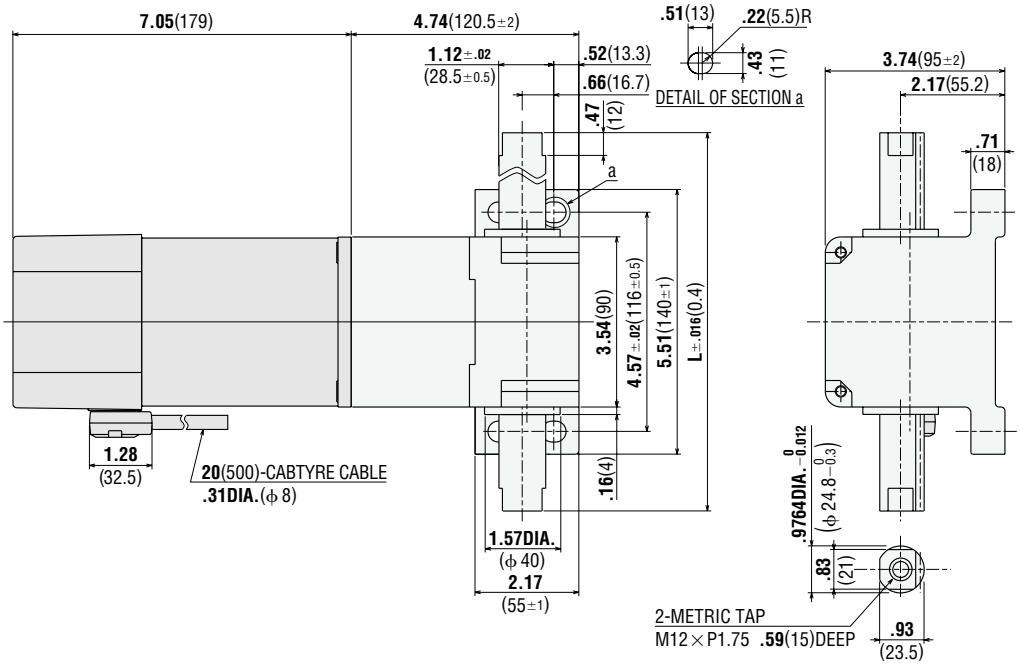
5LB□U-□/5RK90GU-AWU
5RK90GU-CWE
5RK90GU-AFUL



5LB□U-□/5RK90GU-AWTU
5RK90GU-CWTE



5LB□U-□/5RK90GU-AWMU
5RK90GU-CWME
5IK90GU-SWM
5RK90GU-AMUL

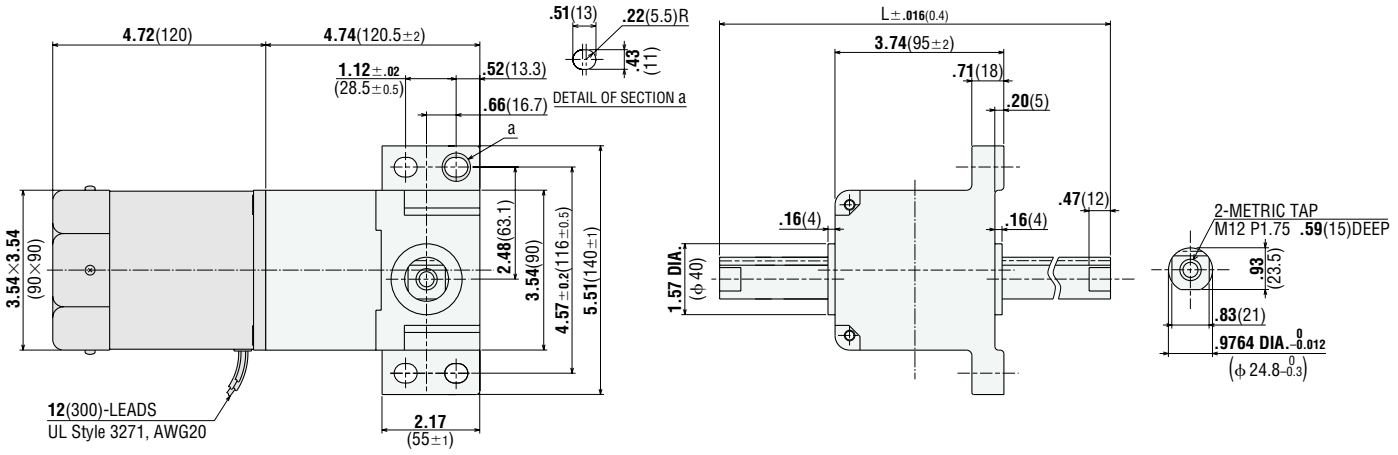


Weight, Stroke Length and Rack Length

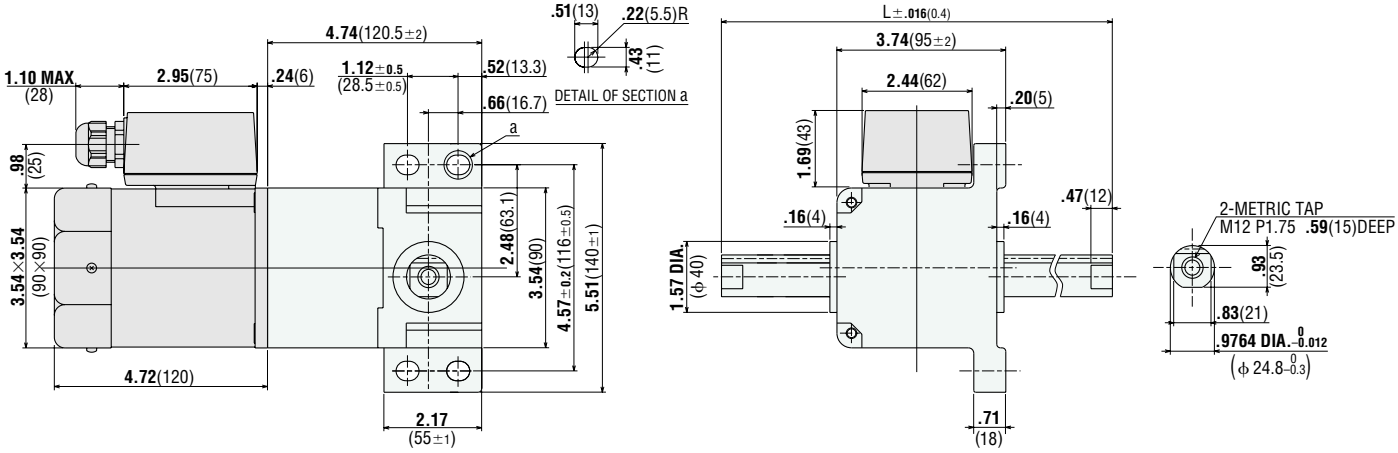
Model	Stroke inch (mm)	Total Length L inch (mm)	Weight (Mass) lb. (kg)	Rack Weight (Mass) lb. (kg)
5LB□U-1, 5LF□U-1	3.9 (100)	10.14 (257.6)	7.04 (3.2)	1.98 (0.9)
5LB□U-2, 5LF□U-2	7.9 (200)	14.10 (358.1)	7.92 (3.6)	2.64 (1.2)
5LB□U-3, 5LF□U-3	11.8 (300)	18.06 (458.6)	8.58 (3.9)	3.52 (1.6)
5LB□U-4, 5LF□U-4	15.7 (400)	22.02 (559.2)	9.46 (4.3)	4.18 (1.9)
5LB□U-5, 5LF□U-5	19.7 (500)	25.97 (659.7)	10.12 (4.6)	5.06 (2.3)
5LB□U-6, 5LF□U-6	23.6 (600)	29.93 (760.3)	11.0 (5.0)	5.94 (2.7)
5LB□U-7, 5LF□U-7	27.6 (700)	33.89 (860.8)	11.88 (5.4)	6.6 (3.0)

5LF type (vertical)

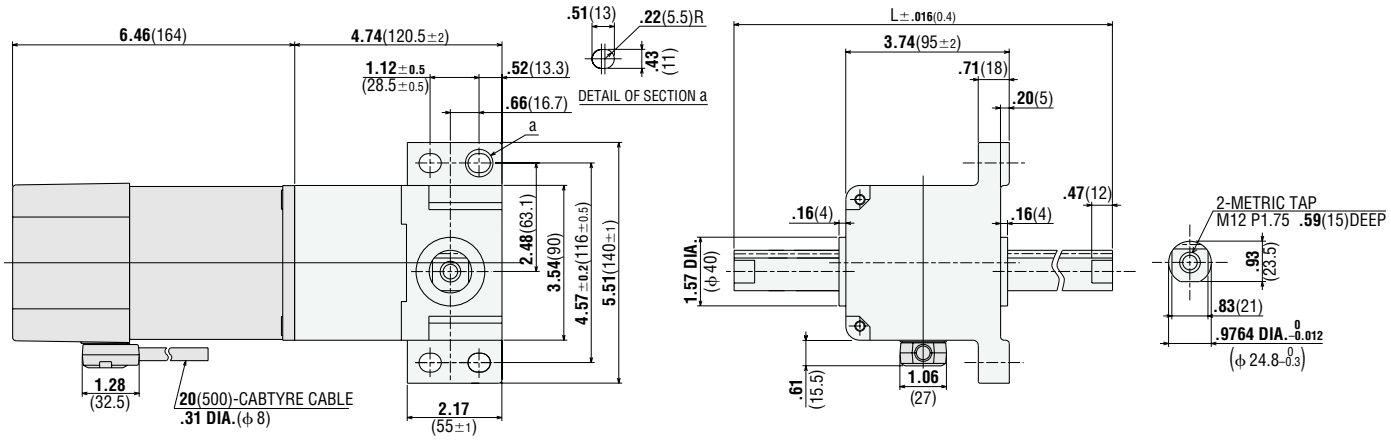
5LF□U-□/5RK60GU-AWU
5RK60GU-CWE
5RK60GU-AFUL



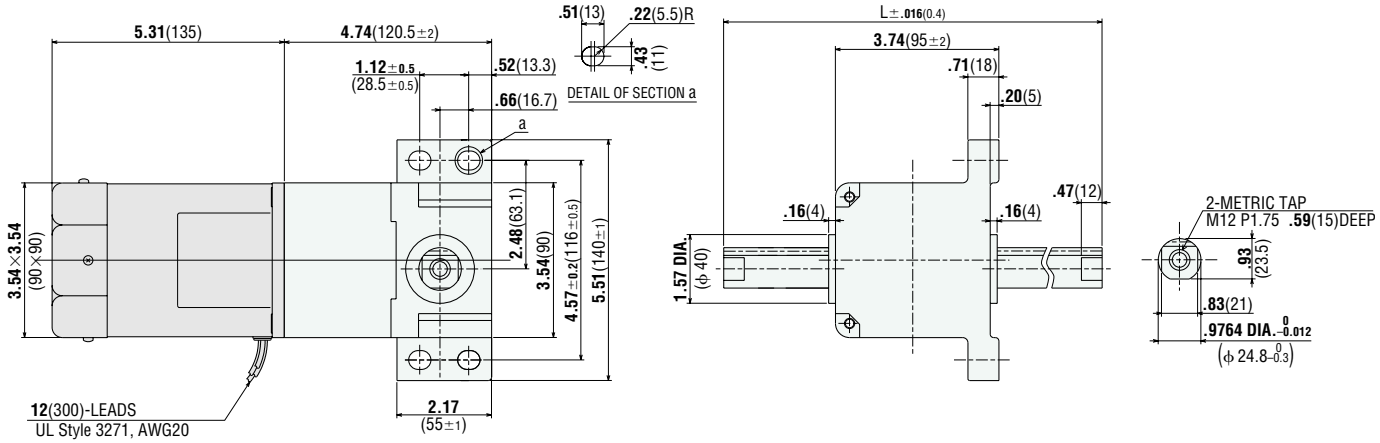
5LF□U-□/5RK60GU-AWTU
5RK60GU-CWTE



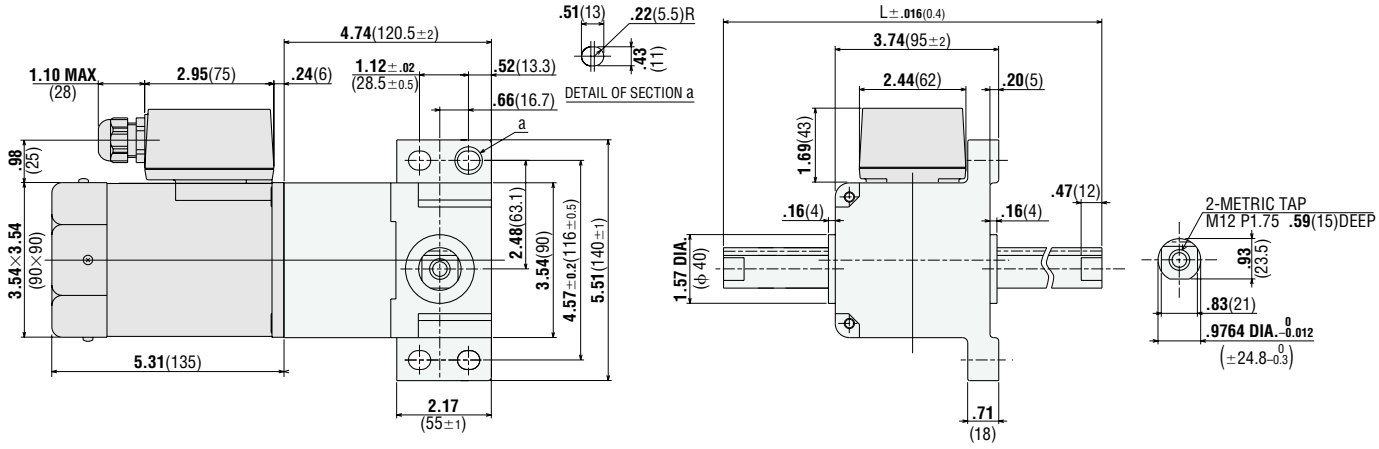
5LF□U-□/5RK60GU-AWMU
5RK60GU-CWME
5IK60GU-SWM
5RK60GU-AMUL



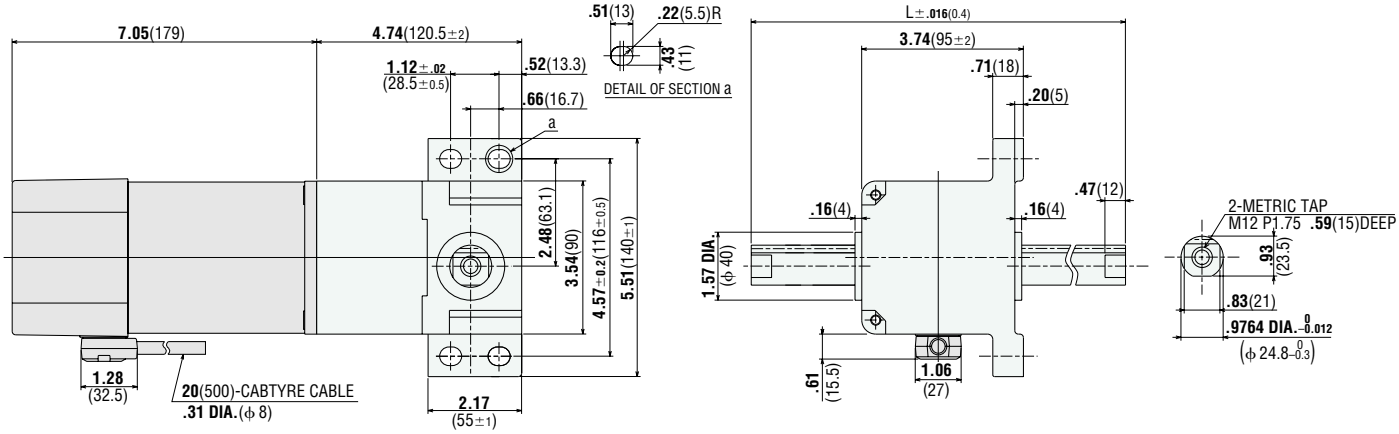
5LF□U-□/5RK90GU-AWU
5RK90GU-CWE
5RK90GU-AFUL



5LF□U-□/5RK90GU-AWTU
5RK90GU-CWTE



5LF□U-□/5RK90GU-AWMU
5RK90GU-CWME
5IK90GU-SWM
5RK90GU-AMUL



Weight, Stroke Length and Rack Length

Model	Stroke inch (mm)	Total Length L inch (mm)	Weight (Mass) lb. (kg)	Rack Weight (Mass) lb. (kg)
5LB□U-1, 5LF□U-1	3.9 (100)	10.14 (257.6)	7.04 (3.2)	1.98 (0.9)
5LB□U-2, 5LF□U-2	7.9 (200)	14.10 (358.1)	7.92 (3.6)	2.64 (1.2)
5LB□U-3, 5LFv□U-3	11.8 (300)	18.06 (458.6)	8.58 (3.9)	3.52 (1.6)
5LB□U-4, 5LF□U-4	15.7 (400)	22.02 (559.2)	9.46 (4.3)	4.18 (1.9)
5LB□U-5, 5LF□U-5	19.7 (500)	25.97 (659.7)	10.12 (4.6)	5.06 (2.3)
5LB□U-6, 5LF□U-6	23.6 (600)	29.93 (760.3)	11.0 (5.0)	5.94 (2.7)
5LB□U-7, 5LF□U-7	27.6 (700)	33.89 (860.8)	11.88 (5.4)	6.6 (3.0)

■ Rack cover for linear head

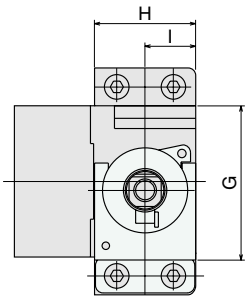
This is for dustproofing the linear head rack section. After passing the rack cover over the rack, you can use the accessory installation fittings to easily install the rack cover. When using rack covers installed on both sides, please purchase the stand-alone rack cover together with this rack cover.

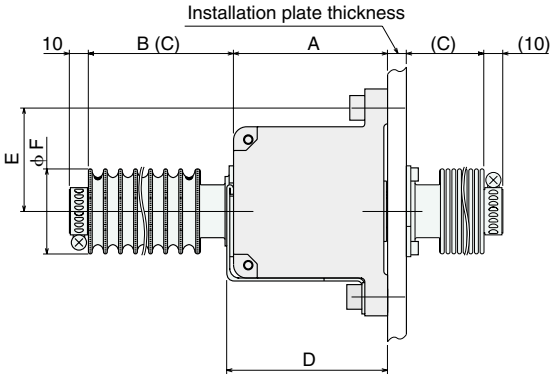
F type
(Vertical Stroke type)

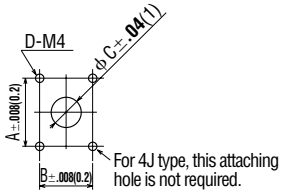
B type
(Horizontal Stroke type)

F type

●Dimensions Unit = inch (mm)







Type	A	B	ϕC	D
2JF-□A2	1.42(36)	1.10(28)	.91(23)	4
4JF-□A2	1.54(39)	1.54(39)	1.26(32)	3
5JF-□A	1.69(43)	1.69(43)	1.57(40)	4

Material
Rack cover: Nylon
Installation fittings: SPCC
Accessories: Installation fittings, stainless steel band

Note:

- When a rack cover is installed, the effective rack stroke is shortened. Refer to the table below for the operable stroke.
- The installation fittings are fastened together with the main unit using the screws (sold separately) : **2JF** type: M6; **4JF** type: M8; **5JF** type: M10
- When installing the linear head fixed side rack cover, drill installation holes in the linear head installation plate using the diagram on the right for reference, then fasten with screws at the rack cover flange. Screws must be purchased separately.

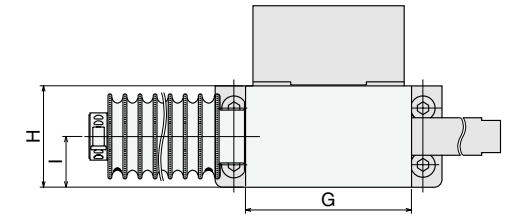
Unit = inch (mm)

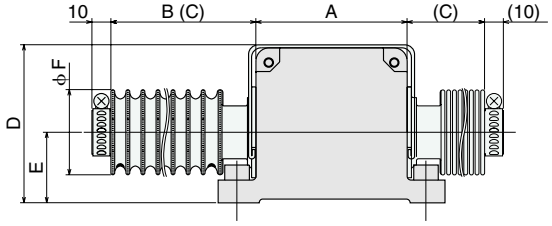
Model	Applicable Linear Head	A	For single side rack cover		For both sides rack covers*		D	E	F	G	H (Fitting width)	I
			B	Operable stroke	(C)	Operable stroke						
2JF-1A2	**2LF□N-1**	2.61 (66.3)	.98~3.94 (25~100)	2.95 (75)	.98~2.52 (25~64)	1.54 (39)	2.76 (70)	1.47 (37.3)	1.65 (42)	2.41 (61.2)	1.57 (40)	.79 (20)
2JF-2A2	**2LF□N-2**		1.57~7.87 (40~200)	6.3 (160)	1.57~5.51 (40~140)	3.94 (100)						
2JF-3A2	**2LF□N-3**		2.36~11.81 (60~300)	9.45 (240)	2.36~8.66 (60~220)	6.3 (160)						
4JF-1A2	**4LF□N-1**	3.23 (82)	1.57~3.94 (40~100)	2.36 (60)	1.57~1.89 (40~48)	.31 (8)	3.38 (85.9)	2.15 (54.7)	1.77 (45)	3.21 (81.6)	2.11 (53.6)	1.06 (26.8)
4JF-2A2	**4LF□N-2**		2.17~7.87 (55~200)	5.71 (145)	2.17~5.31 (55~135)	3.15 (80)						
4JF-3A2	**4LF□N-3**		2.36~11.81 (60~300)	9.45 (240)	2.36~8.98 (60~228)	6.61 (168)						
4JF-4A2	**4LF□N-4**		3.15~15.75 (80~400)	12.6 (320)	3.15~12.30 (80~310)	9.06 (230)						
4JF-5A2	**4LF□N-5**		3.94~19.69 (100~500)	15.75 (400)	3.94~15.31 (100~389)	11.38 (289)						
5JF-1A	**5LF□N(U)-1**	3.74 (95)	.98~3.94 (25~100)	2.95 (75)	1.26~3.94 (32~100)	2.68 (68)	3.9 (99.1)	2.48 (63.1)	1.77 (45)	3.61 (91.6)	2.13 (54)	1.18 (30)
5JF-2A	**5LF□N(U)-2**		1.57~7.87 (40~200)	6.3 (160)	1.57~7.60 (40~193)	6.02 (153)						
5JF-3A	**5LF□N(U)-3**		2.36~11.81 (60~300)	9.45 (240)	2.36~10.75 (60~273)	8.39 (213)						
5JF-4A	**5LF□N(U)-4**		3.15~15.75 (80~400)	12.6 (320)	3.15~13.94 (80~354)	10.79 (274)						
5JF-5A	**5LF□N(U)-5**		3.94~19.69 (100~500)	15.75 (400)	3.94~17.09 (100~434)	13.15 (334)						

* When rack covers are used on both sides, the "operable stroke" and "C" are values when a 0.39inch (10mm) thick installation is used.

B type

Dimensions Unit = inch (mm)





Material
Rack cover: Nylon
Installation fittings: SPCC
Accessories: Installation fittings, Plugs, stainless steel band

Notes:
When rack covers are installed on both sides of the rack a supplemental rack cover must also be purchased.

Unit = inch (mm)

Model	Applicable Linear Head	A	For single side rack cover		For both sides rack covers*		D	E	F	G	H (Fitting width)	I
			B	Operable stroke	(C)	Operable stroke						
2JB-1A2	**2LB□N-1**	2.36 (66)	.98~3.94 (25~100)	2.95 (75)	.98~2.76 (25~70)	1.77 (45)	2.66 (67.5)	1.42 (36)	1.65 (42)	2.67 (67.9)	1.57 (40)	.79 (20)
2JB-2A2	**2LB□N-2**		1.57~7.87 (40~200)	6.3 (160)	1.57~4.57 (40~116)	2.99 (76)						
2JB-3A2	**2LB□N-3**		2.36~11.81 (60~300)	9.45 (240)	2.36~9.33 (60~237)	6.97 (177)						
4JB-1A2	**4LB□N-1**	3.15 (80)	1.57~3.94 (40~100)	2.36 (60)	1.57~ 2.36 (40~60)	.79 (20)	3.29 (83.6)	1.47 (37.3)	1.77 (45)	3.46 (87.8)	2.11 (53.6)	1.06 (26.8)
4JB-2A2	**4LB□N-2**		2.17~7.87 (55~200)	5.71 (145)	2.17~5.79 (55~147)	3.62 (92)						
4JB-3A2	**4LB□N-3**		2.36~11.81 (60~300)	9.45 (240)	2.36~9.45 (60~240)	7.09 (180)						
4JB-4A2	**4LB□N-4**		3.15~15.75 (80~400)	12.6 (320)	3.15~12.68 (80~322)	9.53 (242)						
4JB-5A2	**4LB□N-5**		3.94~19.69 (100~500)	15.75 (400)	3.94~15.79 (100~401)	11.85 (301)						
5JB-1A	**5LB□N(U)-1**	3.54 (90)	.98~3.94 (25~100)	2.95 (75)	1.85~3.94 (47~100)	2.05 (52)	3.8 (96.6)	2.17 (55.2)	1.77 (45)	3.89 (98.7)	2.13 (54)	1.18 (30)
5JB-2A	**5LB□N(U)-2**		1.57~7.87 (40~200)	6.3 (160)	1.89~7.87 (40~200)	5.94 (151)						
5JB-3A	**5LB□N(U)-3**		2.36~11.81 (60~300)	9.45 (240)	2.36~11.34 (60~288)	8.98 (228)						
5JB-4A	**5LB□N(U)-4**		3.15~15.75 (80~400)	12.6 (320)	3.15~14.53 (80~369)	11.38 (289)						
5JB-5A	**5LB□N(U)-5**		3.94~19.69 (100~500)	15.75 (400)	3.94~17.68 (100~449)	13.74 (349)						

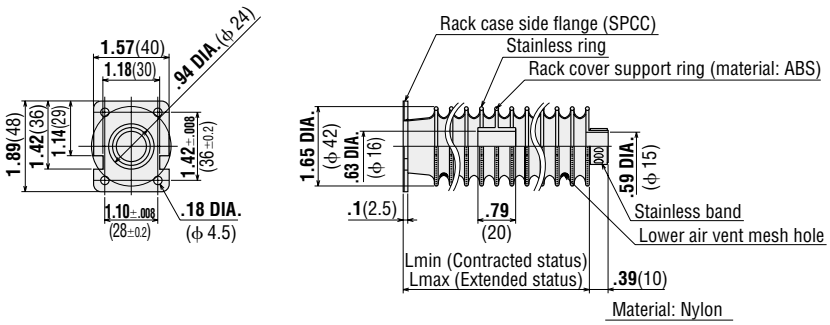
* When rack covers are used on both sides, the "operable stroke" and "C" are values when a 0.39inch (10mm) thick installation is used.

Supplemental rack cover

When rack covers are installed on both sides of the rack, a supplemental rack cover must also be purchased.

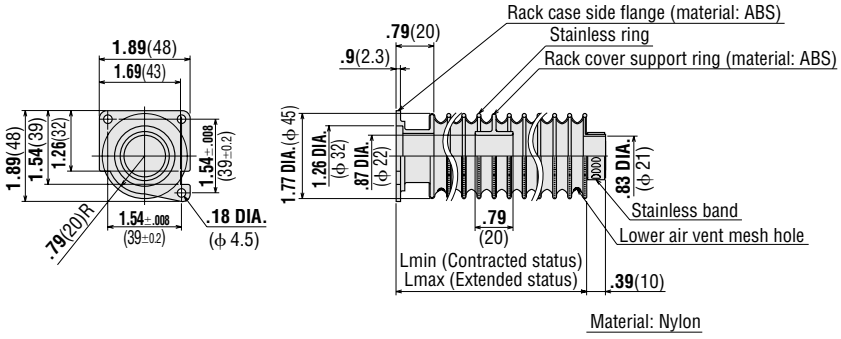
Rack Cover Dimensions Unit = inch (mm)

For **2L** type



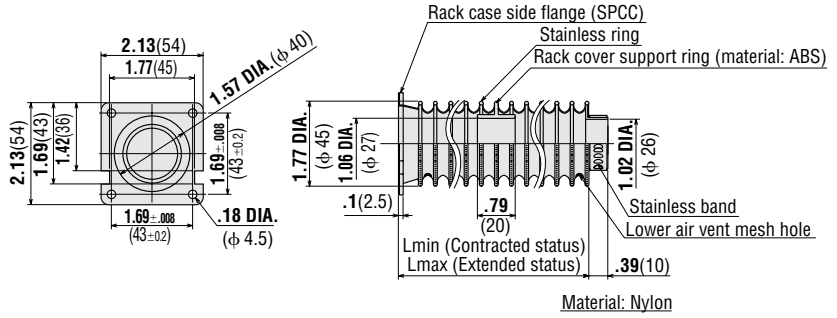
Model	L max (Extended status)	L min (Contracted status)	Number of support rings	Compression Ratio	Weight (Mass) lb. (kg)
2J-1A2	3.94 (100)	.98 (25)	0	1/4	0.099 (0.045)
2J-2A2	7.87 (200)	1.57 (40)	1	1/5	0.132 (0.060)
2J-3A2	11.81 (300)	2.36 (60)	1	1/5	0.154 (0.070)

For **4L** type



Model	L max (Extended status)	L min (Contracted status)	Number of support rings	Compression Ratio	Weight (Mass) lb. (kg)
4J-1A2	3.94 (100)	1.57 (40)	0	1/2.5	0.066 (0.030)
4J-2A2	7.87 (200)	2.17 (55)	1	1/3.6	0.099 (0.045)
4J-3A2	11.81 (300)	2.36 (60)	1	1/5	0.121 (0.055)
4J-4A2	15.75 (400)	3.15 (80)	2	1/5	0.154 (0.070)
4J-5A2	19.69 (500)	3.94 (100)	3	1/5	0.198 (0.090)

For **5L** type



Model	L max (Extended status)	L min (Contracted status)	Number of support rings	Compression Ratio	Weight (Mass) lb. (kg)
5J-1A	3.94 (100)	.98 (25)	0	1/4	0.110 (0.050)
5J-2A	7.87 (200)	1.57 (40)	1	1/5	0.154 (0.070)
5J-3A	11.81 (300)	2.36 (60)	1	1/5	0.176 (0.080)
5J-4A	15.75 (400)	3.15 (80)	2	1/5	0.209 (0.095)
5J-5A	19.69 (500)	3.94 (100)	3	1/5	0.253 (0.115)