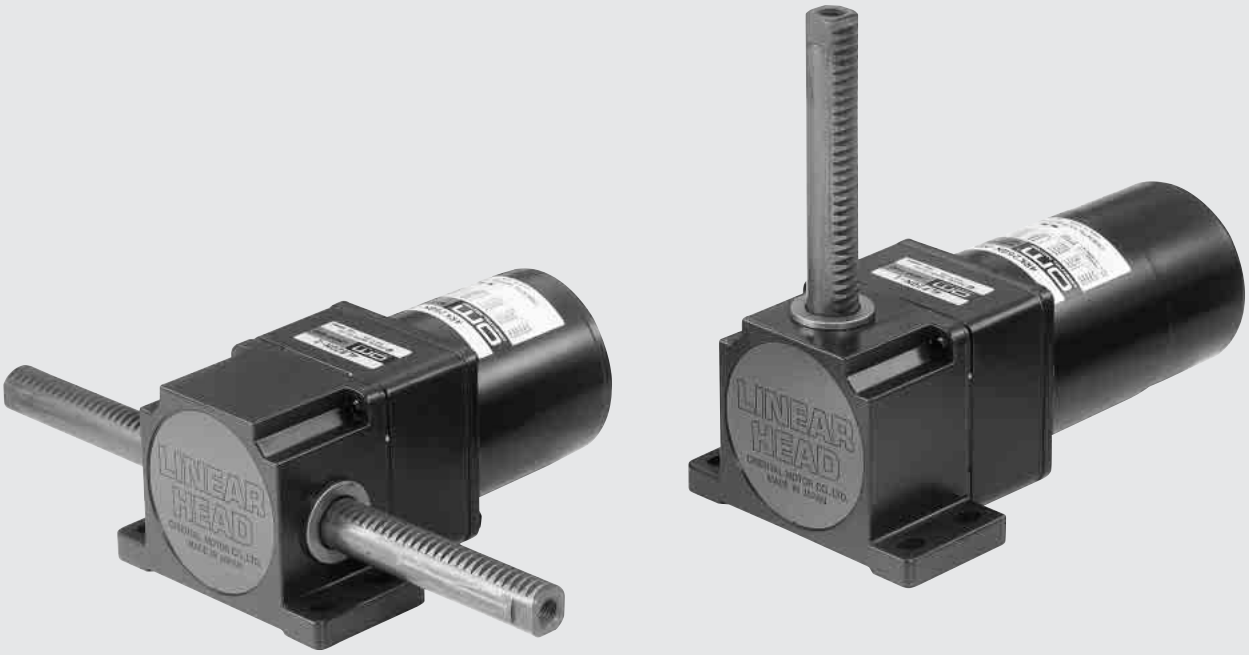



(The motor shown in the photograph is sold separately.)

# Linear Heads
# LH Series

**Additional Information**

## Linear Heads
# LH Series

The **LH** Series of linear heads with a rack-and-pinion mechanism are coupled with standard AC compact motors. They easily produce linear motion such as pressing and reversing.

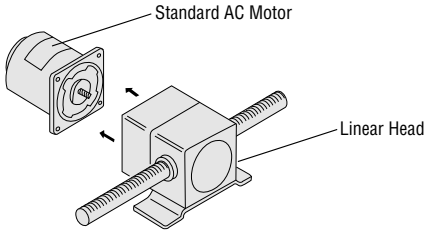
**B** Type
Reversible Motors (horizontal)
(The motor shown in the photograph is sold separately.)

**F** Type
Reversible Motors (vertical)
(With Terminal Box)

Electromagnetic
Brake Motors

### ● Applications and Recommended Motor Combinations
Refer to table on page D-19.

### ● Wide Variety
A wide variety of linear heads are available, depending on basic speed, length of rack, maximum transportable mass, direction of rack movement in respect to the mounting face etc.




## Types of Linear Heads

| Linear Head Type | Basic Speed [inch/s (mm/s)]*2 | | | | Max. Transportable Mass*3 lb. (kg) | Rack Stroke in. (mm) | | | | | | | Page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.24 (6) | 0.47 (12) | 0.94 (24) | 2.13 (54) | | 3.94 (100) | 7.87 (200) | 11.81 (300) | 15.75 (400) | 19.69 (500) | 23.62 (600) | 27.56 (700) | |
| **0L** | ● | ● | ● | — | 22 (10) | ● | ● | — | — | — | — | — | D-20 |
| **2L***1 | — | ● | ● | ● | 44 (20) | ● | ● | ● | ● | ● | — | — | D-22 |
| **4L** | — | ● | ● | ● | 154 (70) | ● | ● | ● | ● | ● | ● | ● | D-26 |
| **5L-U** | — | ● | ● | ● | 308 (140) | ● | ● | ● | ● | ● | ● | ● | D-30 |

*1 The basic speed of **2L** type is 0.47 inch/s (12 mm/s), 1.18 inch/s (30 mm/s), 2.36 inch/s (60 mm/s).
*2 Basic speed is based on the synchronous speed (1800 r/min at 60Hz). The actual speed varies with the load or power supply frequency.
*3 The maximum transportable mass is determined by the strength of the linear head. Just as when connecting a gearhead to a motor, increasing the gear ratio (reducing the speed) generates greater transportable mass, but the motor should always be operated below the maximum permissible transportable mass.
The maximum transportable mass is the value when operating the rack in a horizontal direction. When operating in a vertical direction, subtract the mass of the rack from the value. The maximum transportable mass is the value when combined with a reversible motor. The value varies with basic speed.

## Product Number Code

**4 L F 45 N - 3**

**Linear Heads**

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

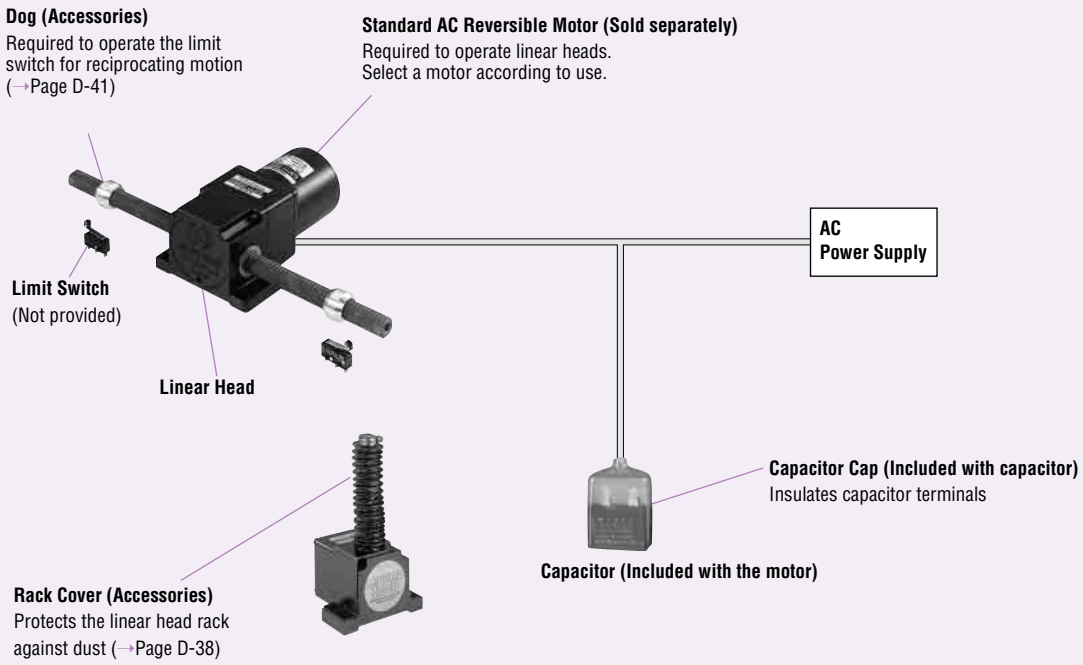
**Speed Indication**
Theoretical rack speed
The basic speed of the linear head is based on the rated speed of the motor at 1,800 (r/min)

**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)

**Rack Stroke**
**1**: 3.94 in. (100 mm)
**2**: 7.87 in. (200 mm)
**3**: 11.81 in. (300 mm)
**4**: 15.75 in. (400 mm)
**5**: 19.69 in. (500 mm)
**6**: 23.62 in. (600 mm)
**7**: 27.56 in. (700 mm)

**0**: is coupled to a motor with 1.65 in. (42 mm) sq. mounting face
**2**: Can be coupled directly to a motor with 2.36 in. (60 mm) sq. mounting face
**4**: Can be coupled directly to a motor with 3.35 in. (80 mm) sq. mounting face
**5**: Can be coupled directly to a motor with 3.54 in. (90 mm) sq. mounting face

## System Configuration




Example of system configuration when a linear head and a standard AC reversible motor is used.

## Applications and Recommended Motor Combinations

| Application | Applicable Motor | **0L** Type | **2L** Type | **4L** Type | **5L-U** Type |
|---|---|---|---|---|---|
| Constant Speed | Reversible Motors | **0RK1GN-AUL** | **2RK6GN-AW(T)U**<br>**2RK6GN-CW(T)E** | **4RK25GN-AW(T)U**<br>**4RK25GN-CW(T)E** | **5RK60GU-AW(T)U**<br>**5RK60GU-CW(T)E**<br>**5RK90GU-AW(T)U**<br>**5RK90GU-CW(T)E** |
| Position Holding | Electromagnetic Brake Motors | — | **2RK6GN-AWMU**<br>**2RK6N-CWME** | **4RK25GN-AWMU**<br>**4RK25GN-CWME**<br>**4IK25GN-SWM** | **5RK60GU-AWMU**<br>**5RK60GU-CWME**<br>**5IK60GU-SWM**<br>**5RK90GU-AWMU**<br>**5RK90GU-CWME**<br>**5IK90GU-SWM** |
| Thrust Linear Motion | Torque Motors | — | — | **4TK10GN-AUL** | — |

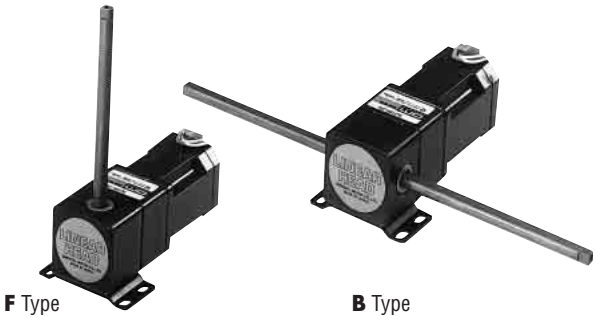
- Torque motors do not have a built-in friction brake. Be sure that a torque motor has no holding brake force even when stopping during vertical operations. When operating a torque motor at high-speed, ensure that the rack does not hit an object and stop, since this can add excessive torque to the linear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

# LH Series

## 0L Type

## Max. Transportable Mass 22 lb. (10 kg)

(The maximum transportable mass varies with basic speed and the motor combination.)



**F** Type **B** Type

(The motor shown in the photograph is sold separately.)

## Specifications

| Basic Speed | Linear Head | Rack Stroke |
|---|---|---|
| 0.24 inch/s (6 mm/s) | **0LB5N-1, 0LB5N-2**<br>**0LF5N-1, 0LF5N-2** | **1:** 3.94 inch (100 mm)<br>**2:** 7.87 inch (200 mm) |
| 0.47 inch/s (12 mm/s) | **0LB10N-1, 0LB10N-2**<br>**0LF10N-1, 0LF10N-2** | |
| 0.94 inch/s (24 mm/s) | **0LB20N-1, 0LB20N-2**<br>**0LF20N-1, 0LF20N-2** | |

- Basic speed is based on the synchronous speed (1800 r/min at 60 Hz). The actual speed varies with the load or power supply frequency.
- 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 a reference.
- The maximum load mass that can be driven when operating the mechanism vertically is the maximum transportable mass less the rack mass.
- When operating the mechanism horizontally, using a guide or similar device to bear the load, ensure that the load mass is less than the maximum transportable mass.

## Max. Permissible Overhung Load

| Stroke | Max. Permissible Overhung Load |
|---|---|
| 3.94 inch (100 mm) | 2.7 lb. (12 N) |
| 7.87 inch (200 mm) | 1.8 lb. (8 N) |

## Overrun

| Linear Head | Overrun inch (mm) |
|---|---|
| **0L□5N-□** | 0.06 (1.4) |
| **0L□10N-□** | 0.11 (2.8) |
| **0L□20N-□** | 0.19 (4.7) |

## Product Line

| Rack Stroke inch (mm) | Basic Speed | | |
|---|---|---|---|
| | 0.24 inch/s (6 mm/s) | 0.47 inch/s (12 mm/s) | 0.94 inch/s (24 mm/s) |
| 3.94 (100) | **0LB5N-1**<br>**0LF5N-1** | **0LB10N-1**<br>**0LF10N-1** | **0LB20N-1**<br>**0LF20N-1** |
| 7.87 (200) | **0LB5N-2**<br>**0LF5N-2** | **0LB10N-2**<br>**0LF10N-2** | **0LB20N-2**<br>**0LF20N-2** |

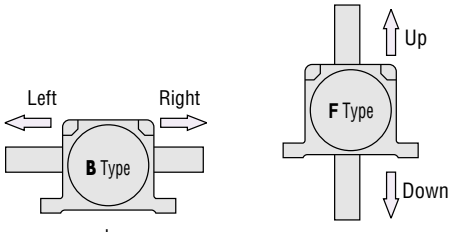
## Connection and Operation

### Direction of Rack Movement

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

| Linear Head | Motor Rotation | |
|---|---|---|
| | CW | CCW |
| **0LB10N-□**<br>**0LB20N-□** | Right | Left |
| **0LF10N-□**<br>**0LF20N-□** | Up | Down |
| **0LB5N-□** | Left | Right |
| **0LF5N-□** | Down | Up |

- Dogs (Accessories, →Page D-41) and limit switches are necessary to stop or reverse rack movement.
- Direction of rack movement is as viewed from the front side of the linear head.

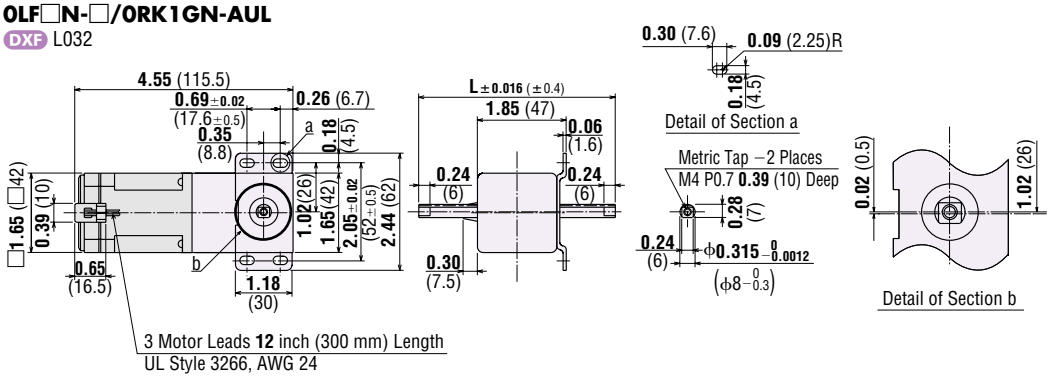


## Dimensions Scale 1/4, Unit = **inch** (mm)

### For **OLF** type (Vertical Stroke) Rack module 0.5, Pressure angle 20°

**OLF□N-□/0RK1GN-AUL**

DXF L032




#### Stroke Length, Rack Length and Weight

| Linear Head | Stroke inch (mm) | Total Length L inch (mm) | Weight lb. (kg) | Rack Weight lb. (kg) | DXF* |
|---|---|---|---|---|---|
| **OLF□N-1** | 3.94 (100) | 6.307 (160.2) | 1.23 (0.56) | 0.11 (0.05) | D026U |
| **OLF□N-2** | 7.87 (200) | 10.264 (260.7) | 1.32 (0.60) | 0.20 (0.09) | |

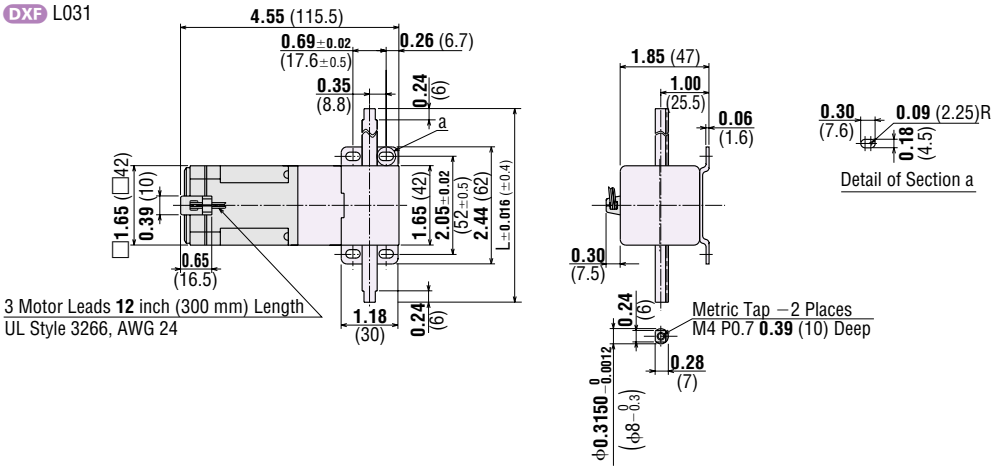
- Enter the number which indicates the basic speed in the box (□) within the model number. (See page D-20)
- The use of a trip dog may change the effective stroke length.

* The DXF file only includes a drawing of the linear head. The motor drawing is not included.

### For **OLB** type (Horizontal Stroke) Rack module 0.5, Pressure angle 20°

**OLB□N-□/0RK1GN-AUL**

DXF L031




#### Stroke Length, Rack Length and Weight

| Linear Head | Stroke inch (mm) | Total Length L inch (mm) | Weight lb. (kg) | Rack Weight lb. (kg) | DXF* |
|---|---|---|---|---|---|
| **OLB□N-1** | 3.94 (100) | 6.307 (160.2) | 1.23 (0.56) | 0.11 (0.05) | D025U |
| **OLB□N-2** | 7.87 (200) | 10.264 (260.7) | 1.32 (0.60) | 0.20 (0.09) | |

- Enter the number which indicates the basic speed in the box (□) within the model number.
- The use of a trip dog may change the effective stroke length.

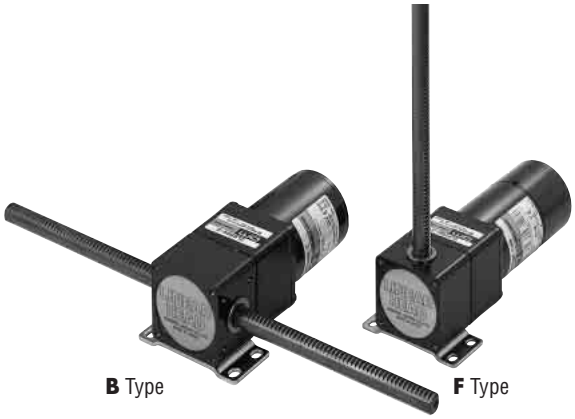
* The DXF file only includes a drawing of the linear head. The motor drawing is not included.

# LH Series

## 2L Type

## Max. Transportable Mass 44 lb. (20 kg)

(The maximum transportable mass varies with basic speed and the motor combination.)



**B** Type **F** Type

(The motor shown in the photograph is sold separately.)

## Specifications

| Basic Speed | Linear Head | Rack Stroke inch (mm) |
|---|---|---|
| 0.47 inch/s (12 mm/s) | **2LB10N-**□<br>**2LF10N-**□ | **1:** 3.94 (100)<br>**2:** 7.87 (200)<br>**3:** 11.81 (300)<br>**4:** 15.75 (400)<br>**5:** 19.69 (500) |
| 1.18 inch/s (30 mm/s) | **2LB25N-**□<br>**2LF25N-**□ | |
| 2.36 inch/s (60 mm/s) | **2LB50N-**□<br>**2LF50N-**□ | |

- Enter the number which indicates the stroke length in the box (□) within the model number.
- Basic speed figures are based on synchronous speed. (60 Hz: 1800 r/min) The actual speed varies with the load or frequency of the power source.

## Max. Permissible Overhung Load

| Stroke inch (mm) | Max. Permissible Overhung Load lb. (N) |
|---|---|
| 3.94 (100) | 12.3 (55) |
| 7.87 (200) | 9 (40) |
| 11.81 (300) | 6.7 (30) |
| 15.75 (400) | 5.6 (25) |
| 19.69 (500) | 4.5 (20) |

## Motor Combinations

| Motor Type | Motor Model | Page |
|---|---|---|
| Reversible Motor | **2RK6GN-AW(T)U**<br>**2RK6GN-CW(T)E** | A-74 |
| Electromagnetic Brake Motor | **2RK6GN-AWMU**<br>**2RK6GN-CWME** | A-132 |

✻ The motors listed are typical combinations. Other motors can be combined if they are 2.36 in. sq. (60 mm sq.), **GN** pinion motors.
The characteristics for different combinations can be found using the "Linear Head Characteristics" formula.
(**Technical Reference** →Page F-50)

## Performance Examples

### Reversible Motor (2RK6GN-AWU)

| Item \ Linear Head | 2LB10N-□ / 2LF10N-□ | 2LB25N-□ / 2LF25N-□ | 2LB50N-□ / 2LF50N-□ |
|---|---|---|---|
| Max. Transportable Mass lb. (kg) | 44 (20) | 31 (14) | 17.4 (7.9) |
| Holding Force lb. (N) | 16.2 (72) | 6.5 (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 a reference.

### Electromagnetic Brake Motor (2RK6GN-AWMU)

| Item \ Linear Head | 2LB10N-□ / 2LF10N-□ | 2LB25N-□ / 2LF25N-□ | 2LB50N-□ / 2LF50N-□ |
|---|---|---|---|
| Max. Transportable Mass lb. (kg) | 44 (20) | 31 (14) | 17.4 (7.9) |
| Holding Force lb. (N) | 45 (200) | 38 (170) | 19.8 (88) |

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

**Note:**

- When a motor other than the ones shown above is used, the characteristics may be different. The characteristics can be found using the "Linear Head Characteristics" formula.

(**Technical Reference** →Page F-50)

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

## Product Line

| Rack Stroke inch (mm) | Basic Speed 0.47 inch/s (12 mm/s) | 1.18 inch/s (30 mm/s) | 2.36 inch/s (60 mm/s) |
|---|---|---|---|
| 3.94 (100) | **2LB10N-1** / **2LF10N-1** | **2LB25N-1** / **2LF25N-1** | **2LB50N-1** / **2LF50N-1** |
| 7.87 (200) | **2LB10N-2** / **2LF10N-2** | **2LB25N-2** / **2LF25N-2** | **2LB50N-2** / **2LF50N-2** |
| 11.81 (300) | **2LB10N-3** / **2LF10N-3** | **2LB25N-3** / **2LF25N-3** | **2LB50N-3** / **2LF50N-3** |
| 15.75 (400) | **2LB10N-4** / **2LF10N-4** | **2LB25N-4** / **2LF25N-4** | **2LB50N-4** / **2LF50N-4** |
| 19.69 (500) | **2LB10N-5** / **2LF10N-5** | **2LB25N-5** / **2LF25N-5** | **2LB50N-5** / **2LF50N-5** |

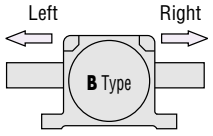
## Connection and Operation

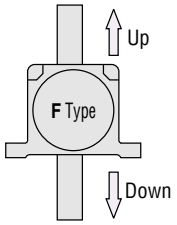
### Direction of Rack Movement

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

| Linear Head | Motor Rotation CW | CCW |
|---|---|---|
| **2LB10N-□** **2LB50N-□** | Left | Right |
| **2LF10N-□** **2LF50N-□** | Down | Up |
| **2LB25N-□** | Right | Left |
| **2LF25N-□** | Up | Down |

- Enter the number which indicates the stroke length in the box (□) within the model number. (See page D-22)
- Dogs (Accessories, →Page D-41) and limit switches are required to stop or reverse rack movement.
- Direction of rack movement is as viewed from the front side of the linear head.

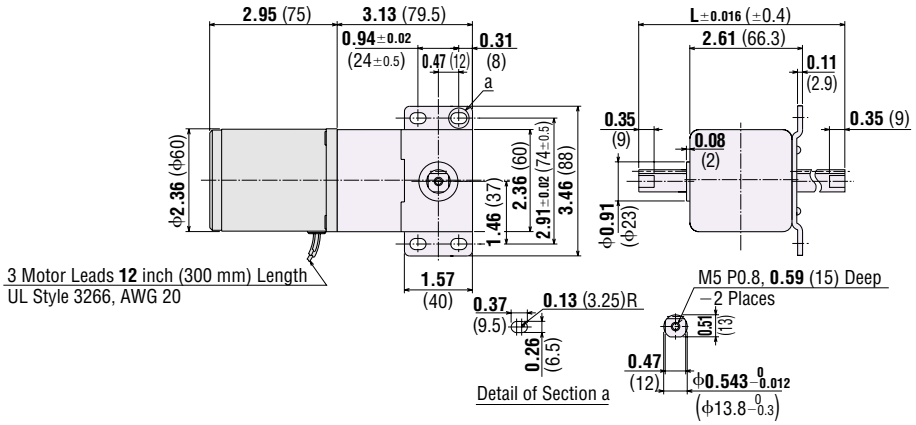


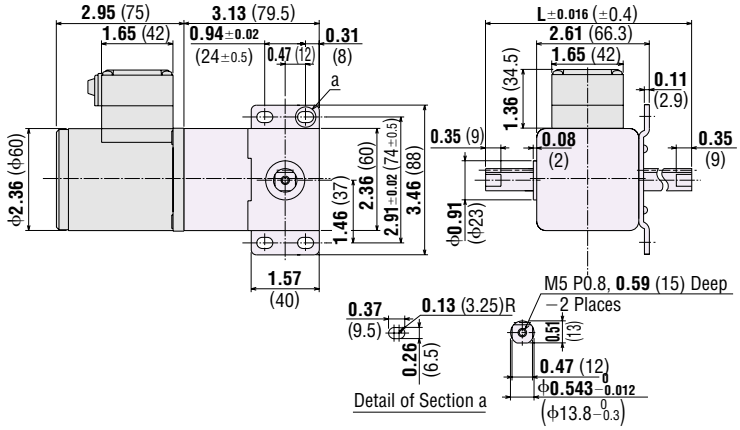
## Dimensions Scale 1/4, Unit = **inch** (mm)

For **2LF** type (Vertical Stroke) Rack module 1, Pressure angle 20°

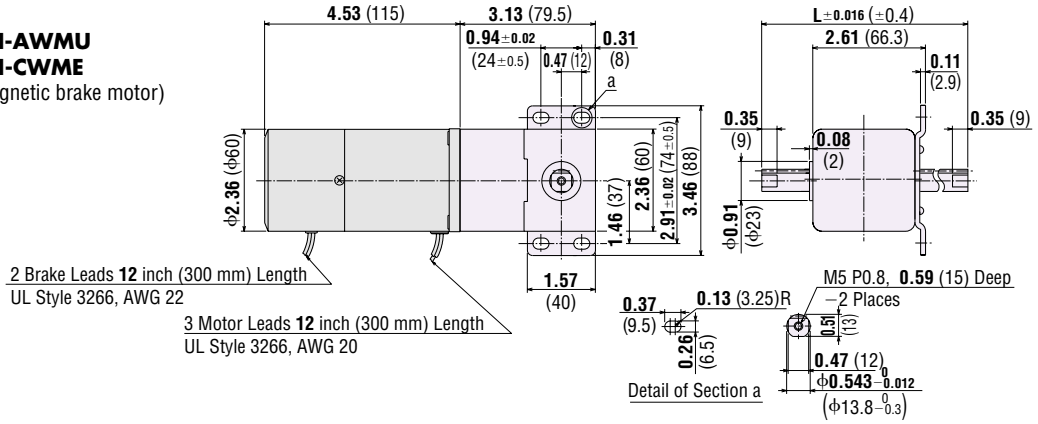
**2LF□N-□/2RK6GN-AWU**
**2RK6GN-CWE**
(Reversible motor)
DXF L004




**2LF□N-□/2RK6GN-AWTU**
**2RK6GN-CWTE**
(Terminal box motor)
DXF L005




**2LF□N-□/2RK6GN-AWMU**
**2RK6GN-CWME**
(Electromagnetic brake motor)
DXF L006




### Stroke Length, Rack Length and Weight

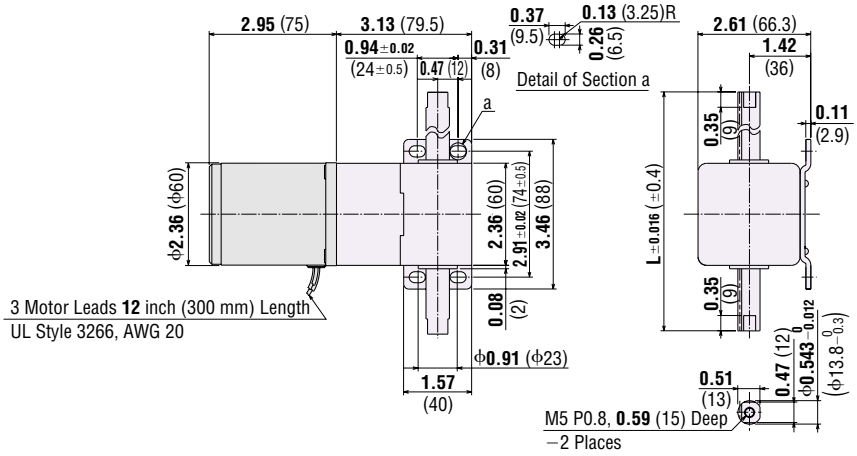
| Linear Head | Stroke inch (mm) | Total Length L inch (mm) | Weight lb. (kg) | Rack Weight lb. (kg) | DXF* |
|---|---|---|---|---|---|
| **2LF□N-1** | 3.94 (100) | 6.925 (175.9) | 2.0 (0.9) | 0.44 (0.2) | D028 |
| **2LF□N-2** | 7.87 (200) | 10.886 (276.5) | 2.2 (1.0) | 0.66 (0.3) | |
| **2LF□N-3** | 11.81 (300) | 14.843 (377.0) | 2.4 (1.1) | 0.88 (0.4) | |
| **2LF□N-4** | 15.75 (400) | 18.799 (477.5) | 2.6 (1.2) | 1.10 (0.5) | |
| **2LF□N-5** | 19.69 (500) | 22.756 (578.0) | 2.9 (1.3) | 1.32 (0.6) | |

- Enter the number which indicates the basic speed in the box (□) within the model number.
- The use of a dog may change the effective stroke length.

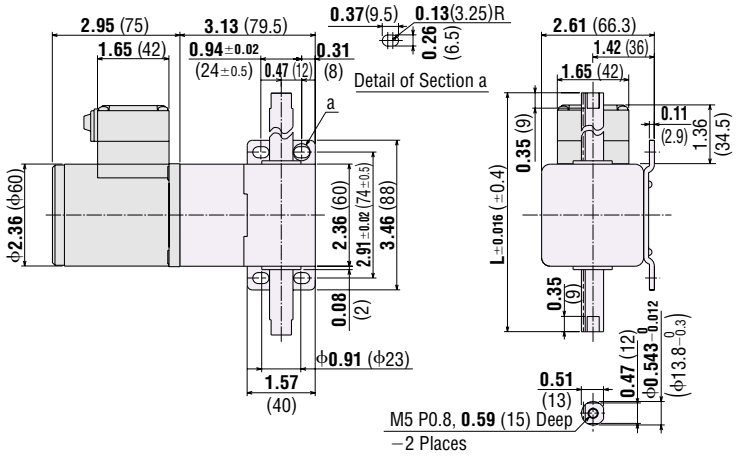
* The DXF file only includes a drawing of the linear head. The motor drawing is not included.

## For **2LB** type (Horizontal Stroke) Rack module 1, Pressure angle 20°

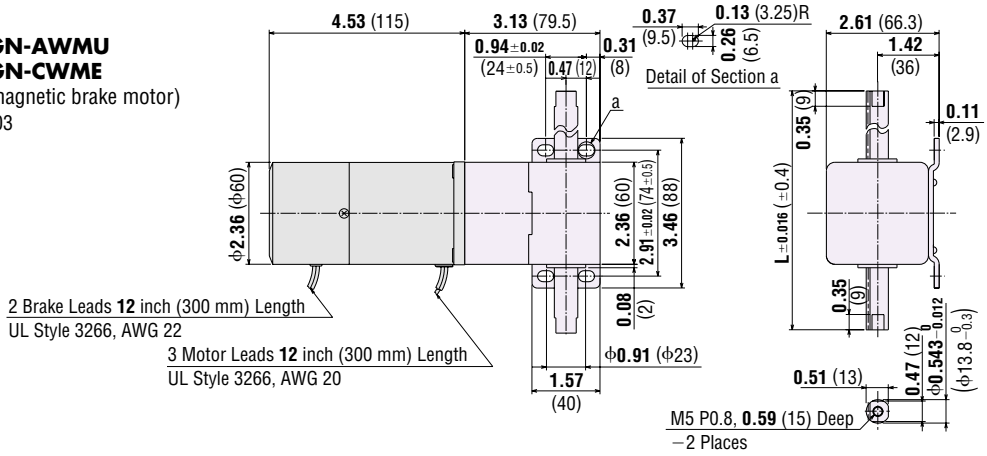
**2LB□N-□/2RK6GN-AWU**
**2RK6GN-CWE**
(Reversible motor)
DXF L001




**2LB□N-□/2RK6GN-AWTU**
**2RK6GN-CWTE**
(Terminal box motor)
DXF L002




**2LB□N-□/2RK6GN-AWMU**
**2RK6GN-CWME**
(Electromagnetic brake motor)
DXF L003




### Stroke Length, Rack Length and Weight

| Linear Head | Stroke inch (mm) | Total Length L inch (mm) | Weight lb. (kg) | Rack Weight lb. (kg) | DXF* |
|---|---|---|---|---|---|
| **2LB□N-1** | 3.94 (100) | 6.925 (175.9) | 2.0 (0.9) | 0.44 (0.2) | D027 |
| **2LB□N-2** | 7.87 (200) | 10.886 (276.5) | 2.2 (1.0) | 0.66 (0.3) | |
| **2LB□N-3** | 11.81 (300) | 14.843 (377.0) | 2.4 (1.1) | 0.88 (0.4) | |
| **2LB□N-4** | 15.75 (400) | 18.799 (477.5) | 2.6 (1.2) | 1.10 (0.5) | |
| **2LB□N-5** | 19.69 (500) | 22.756 (578.0) | 2.9 (1.3) | 1.32 (0.6) | |

- Enter the number which indicates the basic speed in the box (□) within the model number.
- The use of a dog may change the effective stroke length.

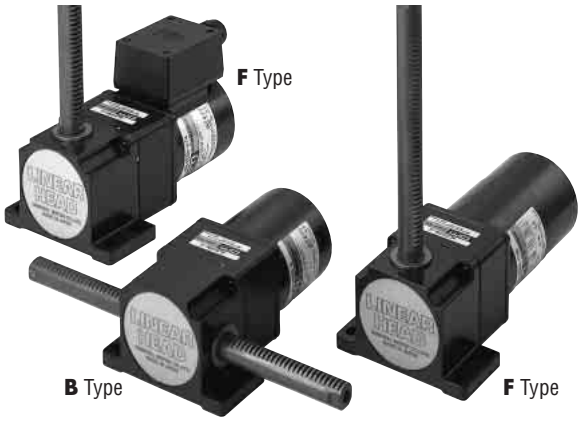
* The DXF file only includes a drawing of the linear head. The motor drawing is not included.

# LH Series

## 4L Type

## Max. Transportable Mass 154 lb. (70 kg)

(The maximum transportable mass varies with basic speed and the motor combination.)




(The motor shown in the photograph is sold separately.)

## Specifications

| Basic Speed | Linear Head | Rack Stroke inch (mm) |
|---|---|---|
| 0.47 inch/s (12 mm/s) | **4LB10N-**□<br>**4LF10N-**□ | **1:** 3.94 (100)<br>**2:** 7.87 (200)<br>**3:** 11.81 (300)<br>**4:** 15.75 (400)<br>**5:** 19.69 (500)<br>**6:** 23.62 (600)<br>**7:** 27.56 (700) |
| 0.94 inch/s (24 mm/s) | **4LB20N-**□<br>**4LF20N-**□ | |
| 2.13 inch/s (54 mm/s) | **4LB45N-**□<br>**4LF45N-**□ | |

- Enter the number which indicates the stroke length in the box (□) within the model number.
- Basic speed figures are based on synchronous speed (60 Hz : 1800 r/min). The actual speed varies with the load or frequency of the power source.

## Max. Permissible Overhung Load

| Stroke inch (mm) | Max. Permissible Overhung Load lb. (N) |
|---|---|
| 3.94 (100) | 27 (120) |
| 7.87 (200) | 20 (90) |
| 11.81 (300) | 15.7 (70) |
| 15.75 (400) | 13.5 (60) |
| 19.69 (500) | 11.2 (50) |
| 23.62 (600) | 9 (40) |
| 27.56 (700) | 9 (40) |

## Motor Combinations

| Motor Type | Motor Model | Page |
|---|---|---|
| Reversible Motor | **4RK25GN-AW(T)U**<br>**4RK25GN-CW(T)E** | A-82 |
| Electromagnetic Brake Motor | **4RK25GN-AWMU**<br>**4RK25GN-CWME**<br>**4IK25GN-SWM** | A-142 |
| Torque Motor | **4TK10GN-AUL** | A-111 |

The motors listed are typical combinations. Other motors can be combined if they are 3.15 inch sq. (80 mm sq.), **GN** pinion motors. The characteristics for different combinations can be found using the "Linear Head Characteristics" formula.

(**Technical Reference** →Page F-50)

## Performance Examples

### Reversible Motor (4RK25GN-AWU)

| Item \ Linear Head | 4LB10N-□ / 4LF10N-□ | 4LB20N-□ / 4LF20N-□ | 4LB45N-□ / 4LF45N-□ |
|---|---|---|---|
| Max. Transportable Mass lb. (kg) | 154 (70) | 128 (58) | 68.2 (31) |
| Holding Force lb. (N) | 47 (210) | 22 (100) | 11.2 (50) |

- 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 (4RK25GN-AWMU)

| Item \ Linear Head | 4LB10N-□ / 4LF10N-□ | 4LB20N-□ / 4LF20N-□ | 4LB45N-□ / 4LF45N-□ |
|---|---|---|---|
| Max. Transportable Mass lb. (kg) | 154 (70) | 128 (58) | 68.2 (31) |
| Holding Force lb. (N) | 157 (700) | 157 (700) | 74 (330) |

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

**Note:**

- When a motor other than the ones shown above is used, the characteristics may be different. The characteristics can be found using the "Linear Head Characteristics" formula.

(**Technical Reference** →Page F-50)

### Overrun Unit = inch (mm)

| Motor \ Linear Head | 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 load mass that can be driven when operating the mechanism vertically is the maximum transportable mass less the rack mass.
- When operating the mechanism horizontally using a guide or similar device to bear the load, ensure that the load mass is less than the maximum transportable mass.

## Product Line

| Rack Stroke inch (mm) | Basic Speed 0.47 inch/s (12 mm/s) | 0.94 inch/s (24 mm/s) | 2.13 inch/s (54 mm/s) |
|---|---|---|---|
| 3.94 (100) | 4LB10N-1 / 4LF10N-1 | 4LB20N-1 / 4LF20N-1 | 4LB45N-1 / 4LF45N-1 |
| 7.87 (200) | 4LB10N-2 / 4LF10N-2 | 4LB20N-2 / 4LF20N-2 | 4LB45N-2 / 4LF45N-2 |
| 11.81 (300) | 4LB10N-3 / 4LF10N-3 | 4LB20N-3 / 4LF20N-3 | 4LB45N-3 / 4LF45N-3 |
| 15.75 (400) | 4LB10N-4 / 4LF10N-4 | 4LB20N-4 / 4LF20N-4 | 4LB45N-4 / 4LF45N-4 |
| 19.69 (500) | 4LB10N-5 / 4LF10N-5 | 4LB20N-5 / 4LF20N-5 | 4LB45N-5 / 4LF45N-5 |
| 23.62 (600) | 4LB10N-6 / 4LF10N-6 | 4LB20N-6 / 4LF20N-6 | 4LB45N-6 / 4LF45N-6 |
| 27.56 (700) | 4LB10N-7 / 4LF10N-7 | 4LB20N-7 / 4LF20N-7 | 4LB45N-7 / 4LF45N-7 |

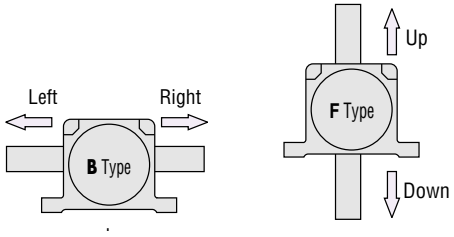
## Connection and Operation

### Direction of Rack Movement

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

| Linear Head | Motor Rotation CW | CCW |
|---|---|---|
| 4LB10N-□ / 4LB20N-□ | Right | Left |
| 4LF10N-□ / 4LF20N-□ | Up | Down |
| 4LB45N-□ | Left | Right |
| 4LF45N-□ | Down | Up |

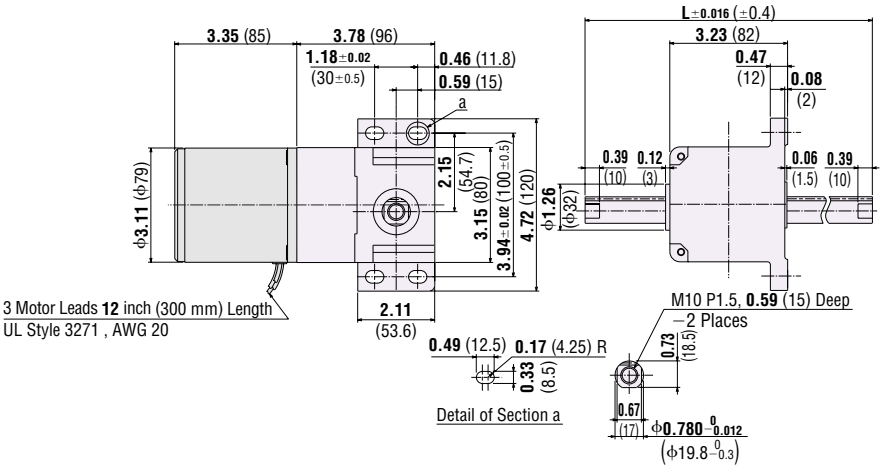
- Enter the number which indicates the stroke length in the box (□) within the model number. (See page D-26)
- Dogs (Accessories, →Page D-41) and limit switches are required to stop or reverse rack movement.
- Direction of rack movement is as viewed from the front side of the linear head.



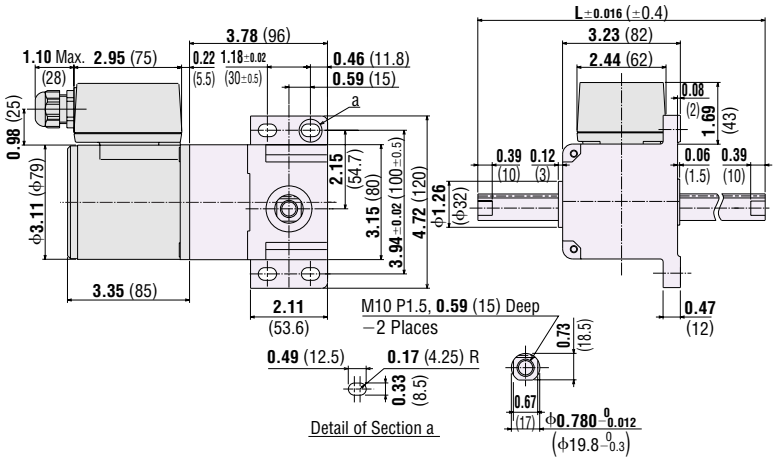
## Dimensions Scale 1/4, Unit = **inch** (mm)

For **4LF** type (Vertical Stroke) Rack module 1.25, Pressure angle 20°

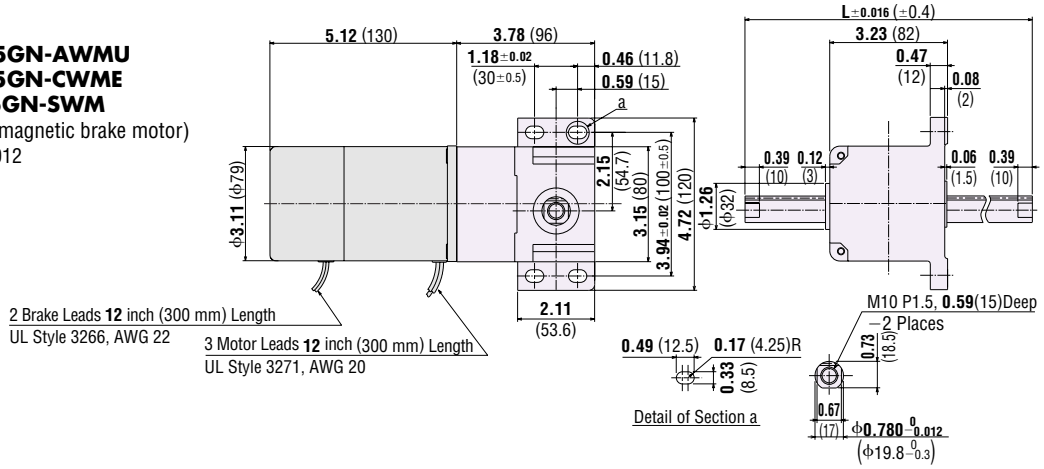
**4LF□N-□/4RK25GN-AWU**
**4RK25GN-CWE**
(Reversible motor)
DXF L010




**4LF□N-□/4RK25GN-AWTU**
**4RK25GN-CWTE**
(Terminal box motor)
DXF L011




**4LF□N-□/4RK25GN-AWMU**
**4RK25GN-CWME**
**4IK25GN-SWM**
(Electromagnetic brake motor)
DXF L012




### Stroke Length, Rack Length and Weight

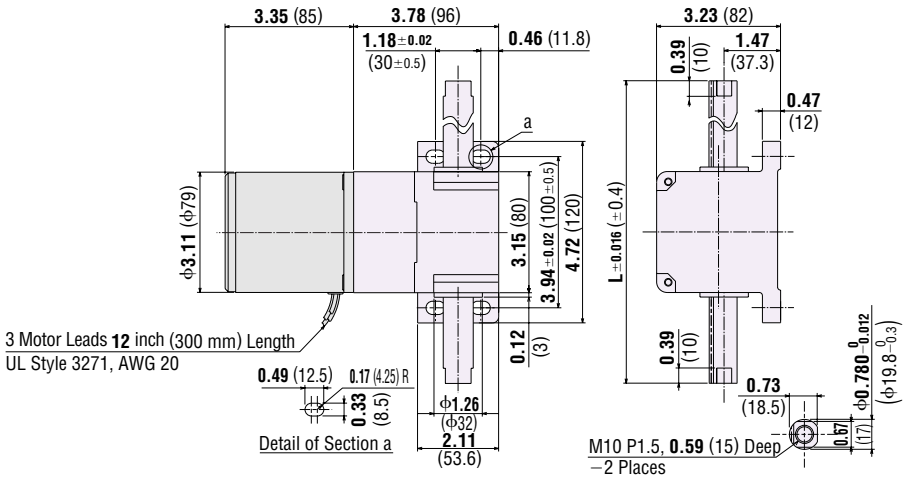
| Linear Head | Stroke inch (mm) | Total Length L inch (mm) | Weight lb. (kg) | Rack Weight lb. (kg) | DXF* |
|---|---|---|---|---|---|
| **4LF□N-1** | 3.94 (100) | 7.890 (200.4) | 3.5 (1.6) | 0.9 (0.4) | D030 |
| **4LF□N-2** | 7.87 (200) | 11.909 (302.5) | 4.0 (1.8) | 1.5 (0.7) | |
| **4LF□N-3** | 11.81 (300) | 15.776 (400.7) | 4.4 (2.0) | 2.0 (0.9) | |
| **4LF□N-4** | 15.75 (400) | 19.795 (502.8) | 4.8 (2.2) | 2.4 (1.1) | |
| **4LF□N-5** | 19.69 (500) | 23.661 (601.0) | 5.3 (2.4) | 2.9 (1.3) | |
| **4LF□N-6** | 23.62 (600) | 27.681 (703.1) | 5.7 (2.6) | 3.5 (1.6) | |
| **4LF□N-7** | 27.56 (700) | 31.547 (801.3) | 6.2 (2.8) | 4.0 (1.8) | |

- Enter the number which indicates the basic speed in the box (□) within the model number. (See page D-26)
- The use of a dog may change the effective stroke length.

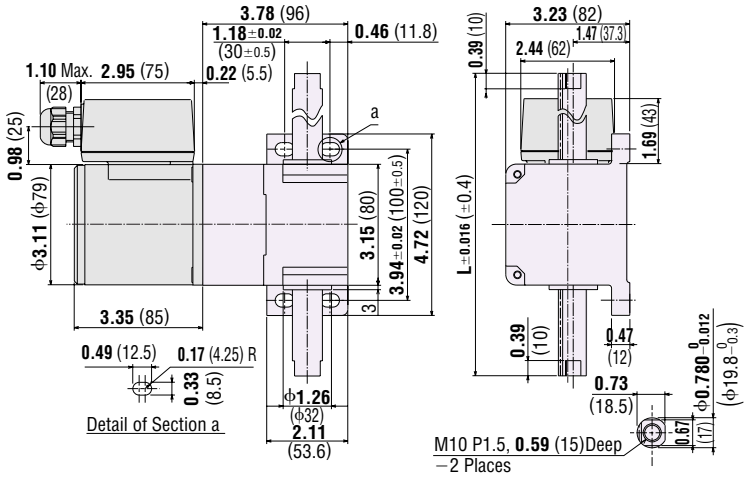
* The DXF file only includes a drawing of the linear head. The motor drawing is not included.

## For **4LB** type (Horizontal Stroke) Rack module 1.25, Pressure angle 20°

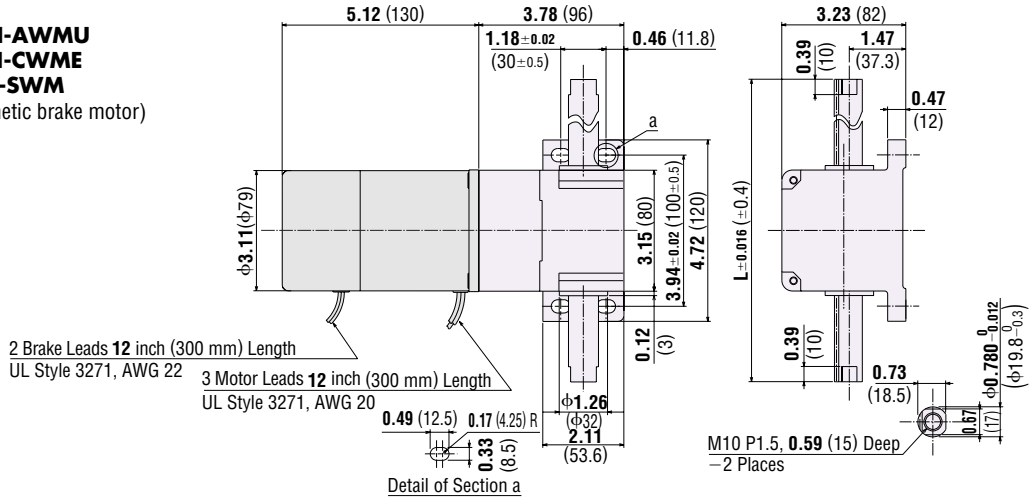
**4LB□N-□/4RK25GN-AWU**
**4RK25GN-CWE**
(Reversible motor)
DXF L007




**4LB□N-□/4RK25GN-AWTU**
**4RK25GN-CWTE**
(Terminal box motor)
DXF L008




**4LB□N-□/4RK25GN-AWMU**
**4RK25GN-CWME**
**4IK25GN-SWM**
(Electromagnetic brake motor)
DXF L009




### Stroke Length, Rack Length and Weight

| Linear Head | Stroke inch (mm) | Total Length L inch (mm) | Weight lb. (kg) | Rack Weight lb. (kg) | DXF* |
|---|---|---|---|---|---|
| **4LB□N-1** | 3.94 (100) | 7.890 (200.4) | 3.5 (1.6) | 0.9 (0.4) | |
| **4LB□N-2** | 7.87 (200) | 11.909 (302.5) | 4.0 (1.8) | 1.5 (0.7) | |
| **4LB□N-3** | 11.81 (300) | 15.776 (400.7) | 4.4 (2.0) | 2.0 (0.9) | |
| **4LB□N-4** | 15.75 (400) | 19.795 (502.8) | 4.8 (2.2) | 2.4 (1.1) | D029 |
| **4LB□N-5** | 19.69 (500) | 23.661 (601.0) | 5.3 (2.4) | 2.9 (1.3) | |
| **4LB□N-6** | 23.62 (600) | 27.681 (703.1) | 5.7 (2.6) | 3.5 (1.6) | |
| **4LB□N-7** | 27.56 (700) | 31.547 (801.3) | 6.2 (2.8) | 4.0 (1.8) | |

- Enter the number which indicates the basic speed in the box (□) within the model number. (See page D-26)
- The use of a dog may change the effective stroke length.

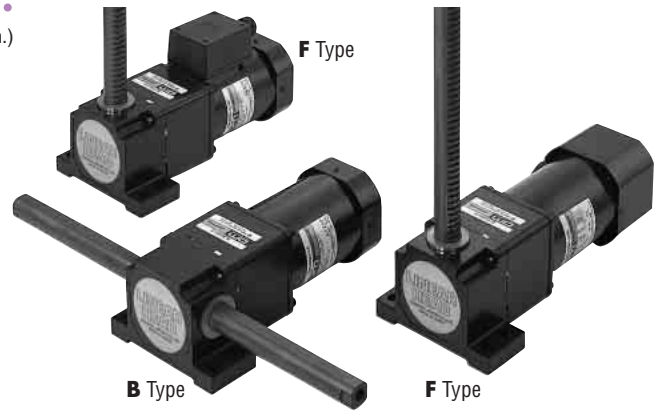
* The DXF file only includes a drawing of the linear head. The motor drawing is not included.

# LH Series

## 5L-U Type

## Max. Transportable Mass 308 lb. (140 kg)

(The maximum transportable mass varies with basic speed and the motor combination.)




(The motor shown in the photograph is sold separately.)

## Specifications

| Basic Speed | Linear Head | Rack Stroke inch (mm) |
|---|---|---|
| 0.47 inch/s (12 mm/s) | **5LB10U-**□<br>**5LF10U-**□ | **1:** 3.94 (100)<br>**2:** 7.87 (200)<br>**3:** 11.81 (300)<br>**4:** 15.75 (400)<br>**5:** 19.69 (500)<br>**6:** 23.62 (600)<br>**7:** 27.56 (700) |
| 0.94 inch/s (24mm/s) | **5LB20U-**□<br>**5LF20U-**□ | |
| 2.13 inch/s (54 mm/s) | **5LB45U-**□<br>**5LF45U-**□ | |

- Enter the number which indicates the stroke length in the box (□) within the model number.
- Basic speed figures are based on synchronous speed (60 Hz: 1800 r/min). The actual speed varies with the load or frequency of the power source.

## Motor Combinations

| Motor Type | Motor Model | Page |
|---|---|---|
| Reversible Motor | **5RK60GU-AW(T)U**<br>**5RK60GU-CW(T)E** | A-92 |
| | **5RK90GU-AW(T)U**<br>**5RK90GU-CW(T)E** | A-97 |
| Electromagnetic Brake Motor | **5RK60GU-AWMU**<br>**5RK60GU-CWME**<br>**5IK60GU-SWM** | A-152 |
| | **5RK90GU-AWMU**<br>**5RK90GU-CWME**<br>**5IK90GU-SWM** | A-157 |

✻ The motors listed are typical combinations. Other motors can be combined if they are 3.54 inch sq. (90 mm sq.), **GU** pinion motors. The characteristics for different combinations can be found using the "Linear Head Characteristics" formula.
(**Technical Reference** →Page F-50)

## Max. Permissible Overhung Load

| Stroke inch (mm) | Max. Permissible Overhung Load lb. (N) |
|---|---|
| 3.94 (100) | 29 (130) |
| 7.87 (200) | 22 (100) |
| 11.81 (300) | 18 (80) |
| 15.75 (400) | 13.5 (60) |
| 19.69 (500) | 11.2 (50) |
| 23.62 (600) | 11.2 (50) |
| 27.56 (700) | 9 (40) |

# Performance Examples

## Reversible Motors

| Motor \ Linear Head | 5LB10U-□ 5LF10U-□ | | 5LB20U-□ 5LF20U-□ | | 5LB45U-□ 5LF45U-□ | |
|---|---|---|---|---|---|---|
| | Max. Transportable Mass lb. (kg) | Holding Force lb. (N) | Max. Transportable Mass lb. (kg) | Holding Force lb. (N) | Max. Transportable Mass lb. (kg) | Holding Force lb. (N) |
| **5RK60GU-AWU** | 308 (140) | 135 (600) | 308 (140) | 67 (300) | 156 (71) | 27 (120) |
| **5RK90GU-AWU** | 308 (140) | 135 (600) | 308 (140) | 67 (300) | 226 (103) | 27 (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

| Motor \ Linear Head | 5LB10U-□ 5LF10U-□ | | 5LB20U-□ 5LF20U-□ | | 5LB45U-□ 5LF45U-□ | |
|---|---|---|---|---|---|---|
| | Max. Transportable Mass lb. (kg) | Holding Force lb. (N) | Max. Transportable Mass lb. (kg) | Holding Force lb. (N) | Max. Transportable Mass lb. (kg) | Holding Force lb. (N) |
| **5RK60GU-AWMU** | 308 (140) | 310 (1400) | 308 (140) | 310 (1400) | 156 (71) | 71 (790 ) |
| **5RK90GU-AWMU** | 308 (140) | 310 (1400) | 308 (140) | 310 (1400) | 226 (103) | 258 (1150) |

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

**Note:**

- When a motor other than the ones shown above is used, the characteristics may be different. The characteristics can be found using the "Linear Head Characteristics" formula.

(**Technical Reference** →Page F-50)

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

# Product Line

| Rack Stroke inch (mm) | Basic Speed | | |
|---|---|---|---|
| | 0.47 inch/s (12 mm/s) | 0.94 inch/s (24 mm/s) | 2.13 inch/s (54 mm/s) |
| 3.94 (100) | **5LB10U-1** **5LF10U-1** | **5LB20U-1** **5LF20U-1** | **5LB45U-1** **5LF45U-1** |
| 7.87 (200) | **5LB10U-2** **5LF10U-2** | **5LB20U-2** **5LF20U-2** | **5LB45U-2** **5LF45U-2** |
| 11.81 (300) | **5LB10U-3** **5LF10U-3** | **5LB20U-3** **5LF20U-3** | **5LB45U-3** **5LF45U-3** |
| 15.75 (400) | **5LB10U-4** **5LF10U-4** | **5LB20U-4** **5LF20U-4** | **5LB45U-4** **5LF45U-4** |
| 19.69 (500) | **5LB10U-5** **5LF10U-5** | **5LB20U-5** **5LF20U-5** | **5LB45U-5** **5LF45U-5** |
| 23.62 (600) | **5LB10U-6** **5LF10U-6** | **5LB20U-6** **5LF20U-6** | **5LB45U-6** **5LF45U-6** |
| 27.56 (700) | **5LB10U-7** **5LF10U-7** | **5LB20U-7** **5LF20U-7** | **5LB45U-7** **5LF45U-7** |

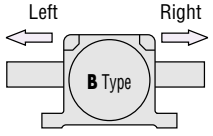
# Connection and Operation

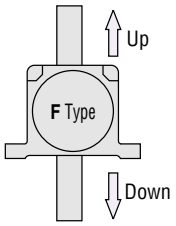
## Direction of Rack Movement

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

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

- Enter the number which indicates the stroke length in the box (□) within the model number. (See page D-30)
- Dogs (Accessories, →Page D-41) and limit switches are required to stop or reverse rack movement.
- Direction of rack movement is as viewed from the front side of the linear head.

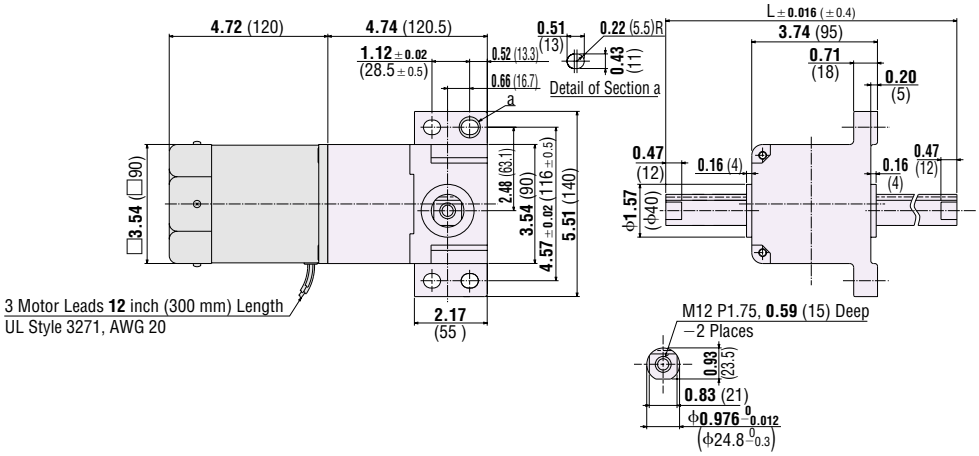


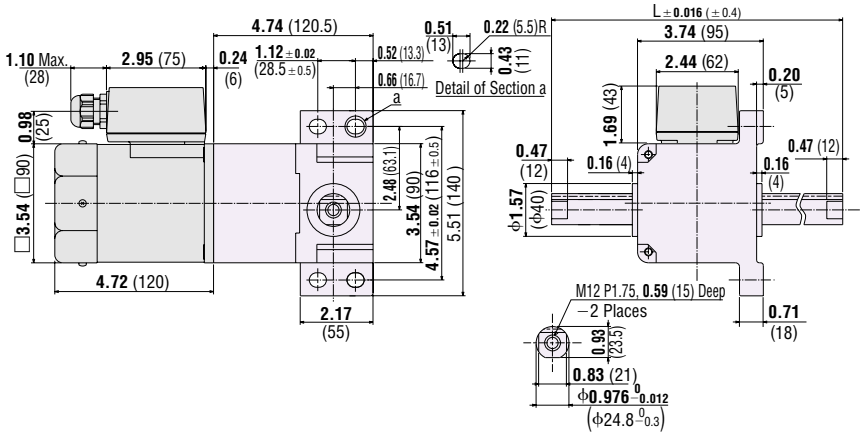
## Dimensions Unit = **inch** (mm)

For **5LF** type (Vertical Stroke) Rack module 2, Pressure angle 20°

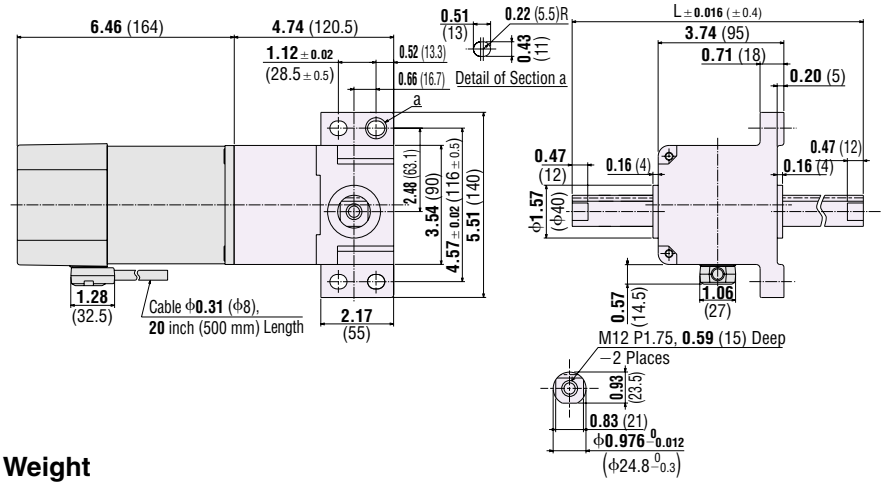
**5LF□U-□/5RK60GU-AWU**
**5RK60GU-CWE**
(Reversible motor)
DXF L025




**5LF□U-□/5RK60GU-AWTU**
**5RK60GU-CWTE**
(Terminal box motor)
DXF L026




**5LF□U-□/5RK60GU-AWMU**
**5RK60GU-CWME**
**5IK60GU-SWM**
(Electromagnetic brake motor)
DXF L027




### Stroke Length, Rack Length and Weight

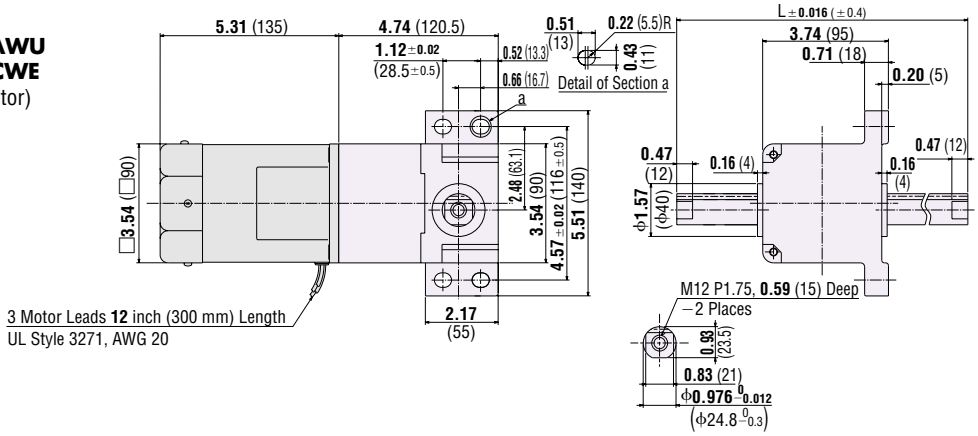
| Linear Head | Stroke inch (mm) | Total Length L inch (mm) | Weight lb. (kg) | Rack Weight lb. (kg) | DXF* |
|---|---|---|---|---|---|
| **5LF□U-1** | 3.94 (100) | 10.141 (257.6) | 7.0 (3.2) | 2.0 (0.9) | |
| **5LF□U-2** | 7.87 (200) | 14.098 (358.1) | 7.9 (3.6) | 2.6 (1.2) | |
| **5LF□U-3** | 11.81 (300) | 18.055 (458.6) | 8.6 (3.9) | 3.5 (1.6) | |
| **5LF□U-4** | 15.75 (400) | 22.016 (559.2) | 9.5 (4.3) | 4.2 (1.9) | D032 |
| **5LF□U-5** | 19.69 (500) | 25.972 (659.7) | 10.1 (4.6) | 5.1 (2.3) | |
| **5LF□U-6** | 23.62 (600) | 29.933 (760.3) | 11.0 (5.0) | 6.0 (2.7) | |
| **5LF□U-7** | 27.56 (700) | 33.890 (860.8) | 11.9 (5.4) | 6.6 (3.0) | |

- Enter the number which indicates the basic speed in the box (□) within the model number. (See page D-30)
- The use of a dog may change the effective stroke length.

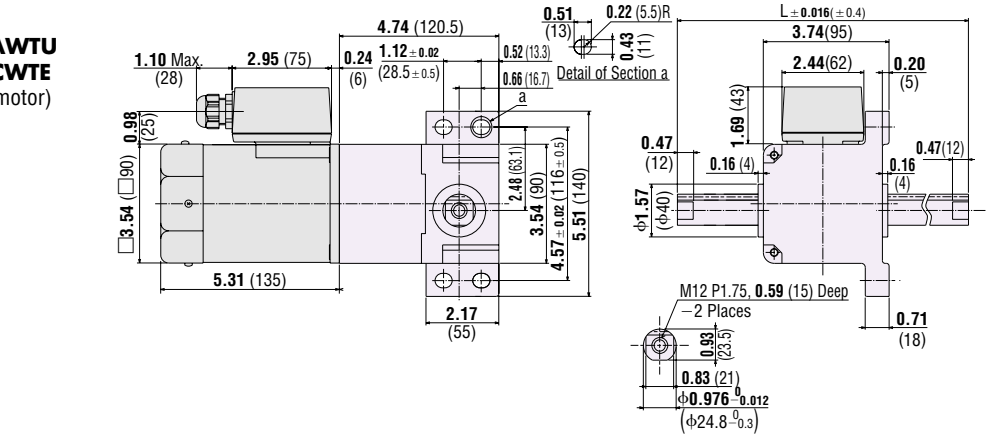
* The DXF file only includes a drawing of the linear head. The motor drawing is not included.

## For **5LF** type (Vertical Stroke) Rack module 2, Pressure angle 20°

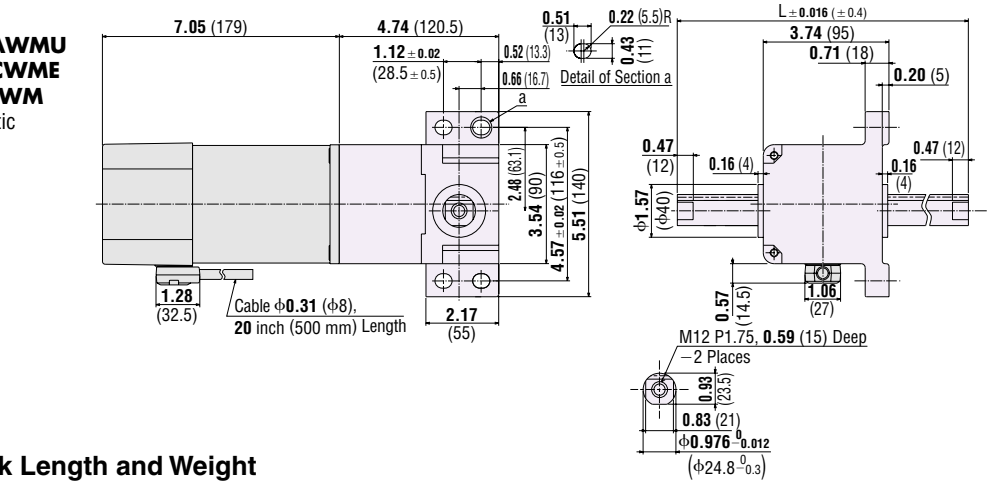
**5LF□U-□/5RK90GU-AWU**
**5RK90GU-CWE**
(Reversible motor)
DXF L028




**5LF□U-□/5RK90GU-AWTU**
**5RK90GU-CWTE**
(Terminal box motor)
DXF L029




**5LF□U-□/5RK90GU-AWMU**
**5RK90GU-CWME**
**5IK90GU-SWM**
(Electromagnetic brake motor)
DXF L030




### Stroke Length, Rack Length and Weight

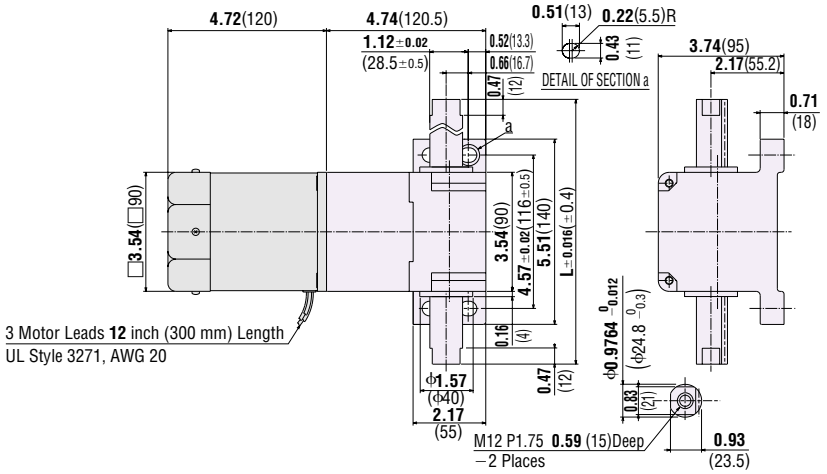
| Linear Head | Stroke inch (mm) | Total Length L inch (mm) | Weight lb. (kg) | Rack Weight lb. (kg) | DXF* |
|---|---|---|---|---|---|
| **5LF□U-1** | 3.94 (100) | 10.141 (257.6) | 7.0 (3.2) | 2.0 (0.9) | |
| **5LF□U-2** | 7.87 (200) | 14.098 (358.1) | 7.9 (3.6) | 2.6 (1.2) | |
| **5LF□U-3** | 11.81 (300) | 18.055 (458.6) | 8.6 (3.9) | 3.5 (1.6) | |
| **5LF□U-4** | 15.75 (400) | 22.016 (559.2) | 9.5 (4.3) | 4.2 (1.9) | D032 |
| **5LF□U-5** | 19.69 (500) | 25.972 (659.7) | 10.1 (4.6) | 5.1 (2.3) | |
| **5LF□U-6** | 23.62 (600) | 29.933 (760.3) | 11.0 (5.0) | 6.0 (2.7) | |
| **5LF□U-7** | 27.56 (700) | 33.890 (860.8) | 11.9 (5.4) | 6.6 (3.0) | |

- Enter the number which indicates the basic speed in the box (□) within the model number. (See page D-30)
- The use of a dog may change the effective stroke length.

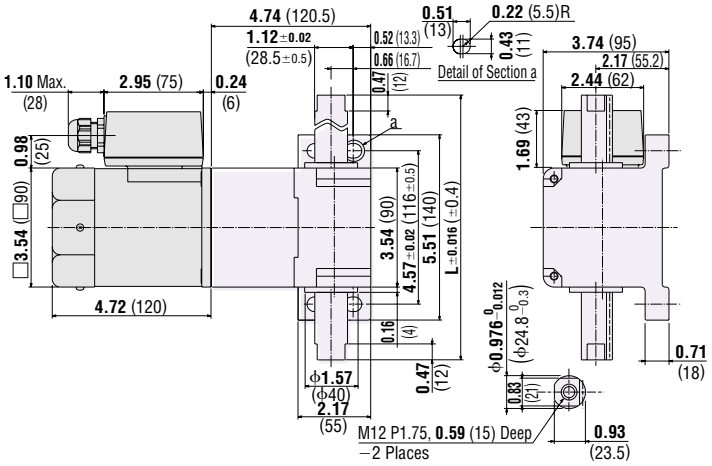
* The DXF file only includes a drawing of the linear head. The motor drawing is not included.

## For **5LB** type (Horizontal Stroke) Rack module 2, Pressure angle 20°

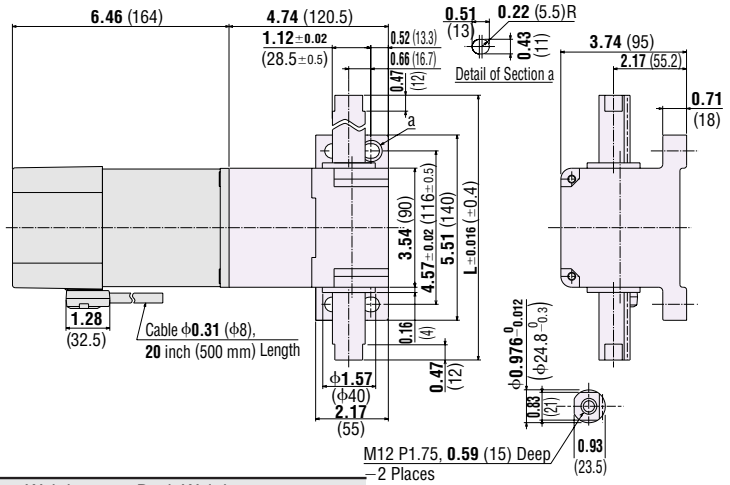
**5LB□U-□/5RK60GU-AWU**
**5RK60GU-CWE**
(Reversible motor)
DXF L019




**5LB□U-□/5RK60GU-AWTU**
**5RK60GU-CWTE**
(Terminal box motor)
DXF L020




**5LB□U-□/5RK60GU-AWMU**
**5RK60GU-CWME**
**5IK60GU-SWM**
(Electromagnetic brake motor)
DXF L021




### Stroke Length, Rack Length and Weight

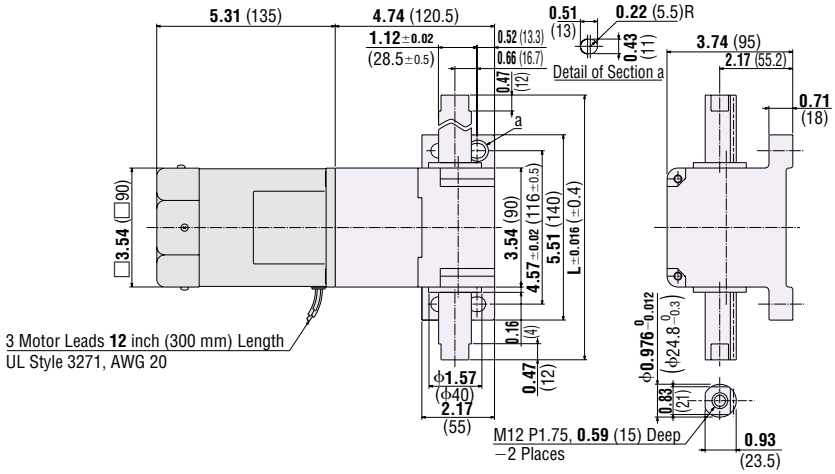
| Linear Head | Stroke inch (mm) | Total Length L inch (mm) | Weight lb. (kg) | Rack Weight lb. (kg) | DXF* |
|---|---|---|---|---|---|
| **5LB□U-1** | 3.94 (100) | 10.141 (257.6) | 7.0 (3.2) | 2.0 (0.9) | |
| **5LB□U-2** | 7.87 (200) | 14.098 (358.1) | 7.9 (3.6) | 2.6 (1.2) | |
| **5LB□U-3** | 11.81 (300) | 18.055 (458.6) | 8.6 (3.9) | 3.5 (1.6) | |
| **5LB□U-4** | 15.75 (400) | 22.016 (559.2) | 9.5 (4.3) | 4.2 (1.9) | D031 |
| **5LB□U-5** | 19.69 (500) | 25.972 (659.7) | 10.1 (4.6) | 5.1 (2.3) | |
| **5LB□U-6** | 23.62 (600) | 29.933 (760.3) | 11.0 (5.0) | 6.0 (2.7) | |
| **5LB□U-7** | 27.56 (700) | 33.890 (860.8) | 11.9 (5.4) | 6.6 (3.0) | |

- Enter the number which indicates the basic speed in the box (□) within the model number. (See page D-30)
- The use of a dog may change the effective stroke length.

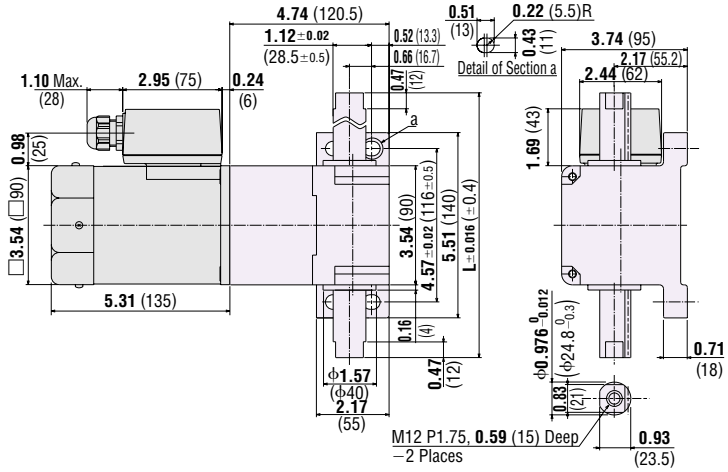
* The DXF file only includes a drawing of the linear head. The motor drawing is not included.

## For **5LB** type (Horizontal Stroke) Rack module 2, Pressure angle 20°

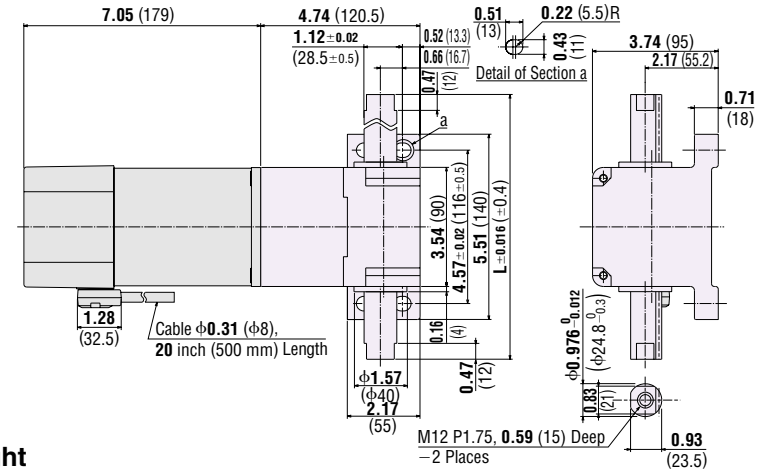
**5LB□U-□/5RK90GU-AWU**
**5RK90GU-CWE**
(Reversible motor)
DXF L022




**5LB□U-□/5RK90GU-AWTU**
**5RK90GU-CWTE**
(Terminal box motor)
DXF L023




**5LB□U-□/5RK90GU-AWMU**
**5RK90GU-CWME**
**5IK90GU-SWM**
(Electromagnetic brake motor)
DXF L024




### Stroke Length, Rack Length and Weight

| Linear Head | Stroke inch (mm) | Total Length L inch (mm) | Weight lb. (kg) | Rack Weight lb. (kg) | DXF* |
|---|---|---|---|---|---|
| **5LB□U-1** | 3.94 (100) | 10.141 (257.6) | 7.0 (3.2) | 2.0 (0.9) | |
| **5LB□U-2** | 7.87 (200) | 14.098 (358.1) | 7.9 (3.6) | 2.6 (1.2) | |
| **5LB□U-3** | 11.81 (300) | 18.055 (458.6) | 8.6 (3.9) | 3.5 (1.6) | |
| **5LB□U-4** | 15.75 (400) | 22.016 (559.2) | 9.5 (4.3) | 4.2 (1.9) | D031 |
| **5LB□U-5** | 19.69 (500) | 25.972 (659.7) | 10.1 (4.6) | 5.1 (2.3) | |
| **5LB□U-6** | 23.62 (600) | 29.933 (760.3) | 11.0 (5.0) | 6.0 (2.7) | |
| **5LB□U-7** | 27.56 (700) | 33.890 (860.8) | 11.9 (5.4) | 6.6 (3.0) | |

- Enter the number which indicates the basic speed in the box (□) within the model number. (See page D-30)
- The use of a dog may change the effective stroke length.

* The DXF file only includes a drawing of the linear head. The motor drawing is not included.