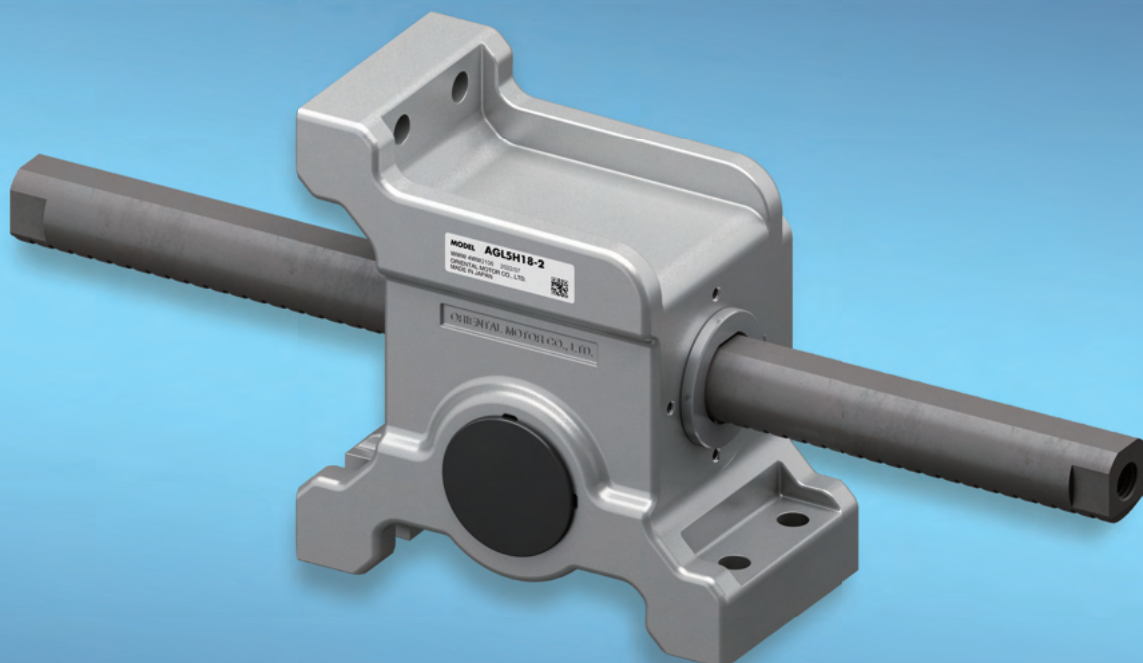


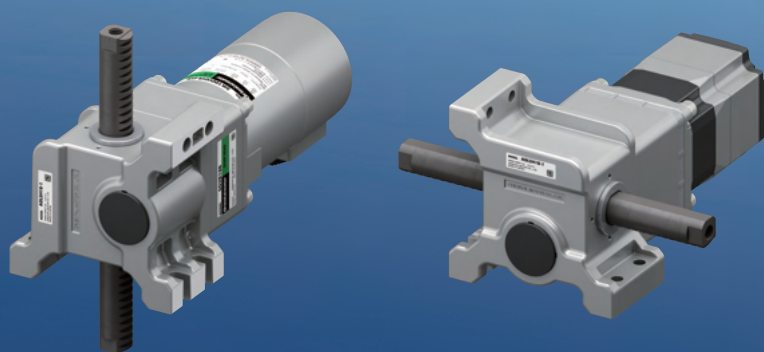
***Orientalmotor***

# LJ Linear Heads

The LJ Linear Head with motor and rack and pinion mechanism has a **maximum transportable mass of 200 kg**



## Combinable Motors



Three-Phase High Efficiency Motor  
with Electromagnetic Brake

***α*STEP AZ Series**

# Product Line of Linear Heads with 200 kg Maximum Transportable Mass

When the **LJ** linear head with rack and pinion mechanism is attached to a parallel shaft gearhead and motor, linear motion such as pushing, pulling, raising and lowering is possible. Perfect for high load or long stroke applications.

## A Maximum Transportable Mass of 200 kg in a Compact Size

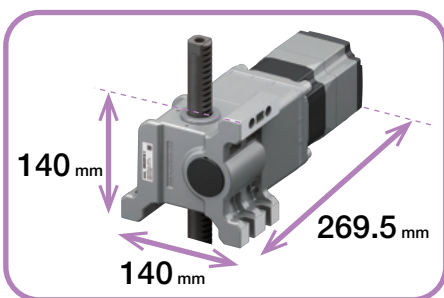
### ● 200 kg Maximum Transportable Mass\*

Large-diameter pinions and stronger gears enable a maximum transportable mass of 200 kg\*.

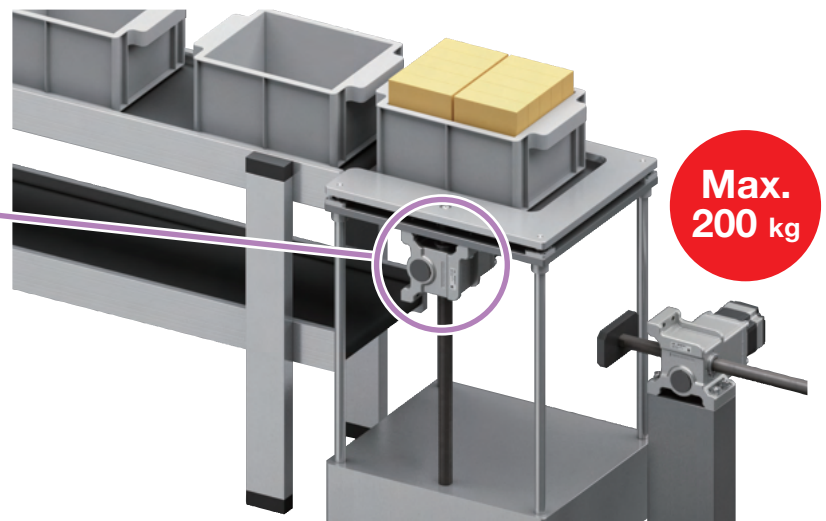
\*The maximum transportable mass depends on the gearhead's gear ratio and the combined motor.

### ● 700 mm Maximum Stroke Length

Product line with strokes from 100 to 700 mm

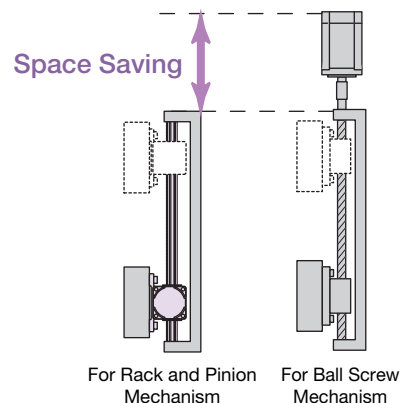


When Combined with an **AZ** Series Electromagnetic Brake Motor

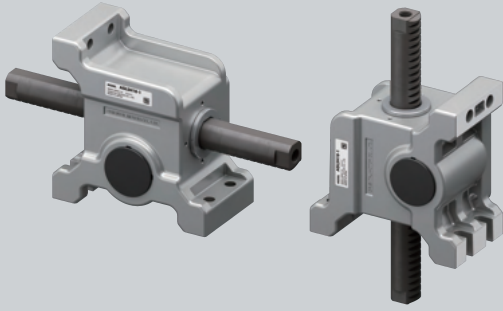


### Fix the Rack for Effective Use of Space

The motor itself can run on its own by fixing both ends of the rack. It is effective for equipment where motor space is difficult to secure.



## LJ Linear Heads



## Combinable Motors



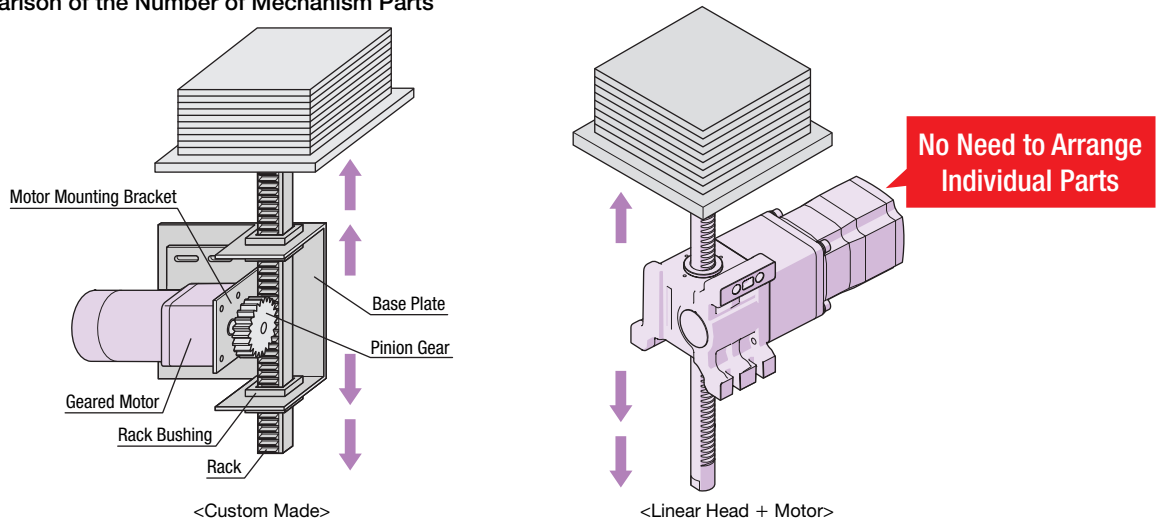
Three-Phase High Efficiency Motor (Electromagnetic Brake Type) ALPHA STEP AZ Series

# Contributes to Improved Design Efficiency

## ● Reduces Time from Design to Startup

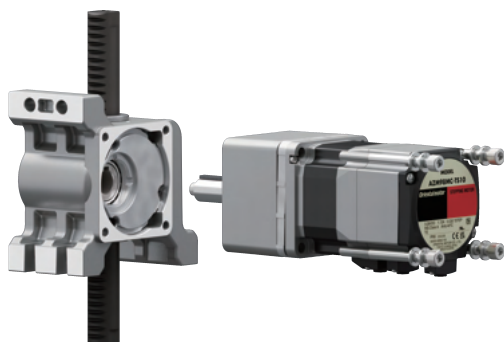
Compared to a self-built rack and pinion mechanism, the number of parts is reduced, and the amount of labor for design and assembly can be reduced.

### ● Comparison of the Number of Mechanism Parts



## ● Easy Assembly with a Parallel Shaft Gearhead

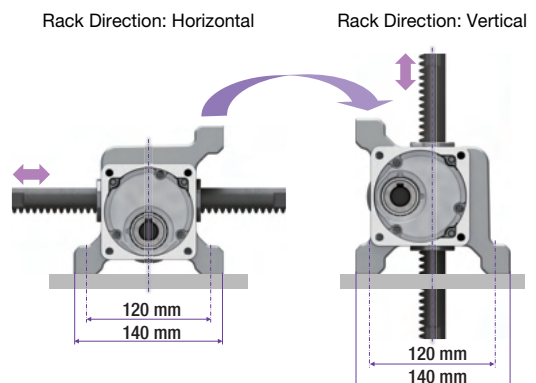
The structure is simple. Just insert the parallel shaft gearhead into the linear head and fix it with screws. This makes both installing to the equipment and performing motor maintenance easy.



## ● Rack Can be Installed in Horizontal or Vertical Orientations

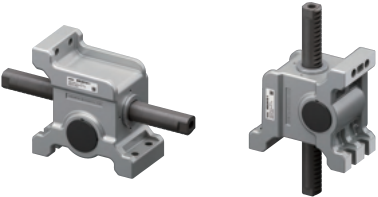
The structure allows for mounting in both horizontal and vertical directions.

The ability to freely select the mounting direction contributes to improved ease of design and cost reductions through the sharing of parts.



# Product Line

## ● Linear Head

Linear Head	Maximum Transportable Mass [kg]	Stroke [mm]
	200	100, 200, 300, 400, 500, 600, 700

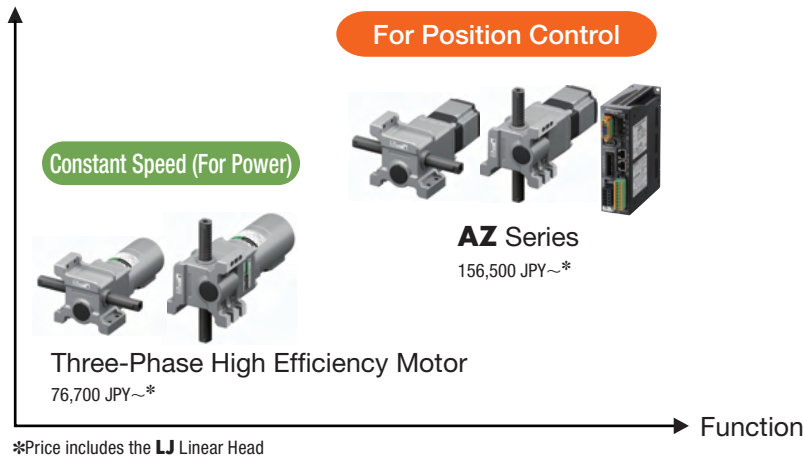
## ● Combined Motors

The motor can be selected according to the linear motion that is needed.

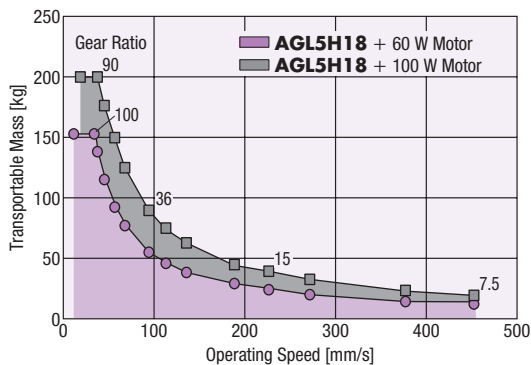
Motor Series	Motor Output Power [W]	Gear Ratio
Three-Phase High Efficiency Motor with Electromagnetic Brake + Parallel Shaft Gearhead	60	7.5~300
	100	7.5~180
<b>αSTEP AZ Series</b> <b>TS</b> Geared Type	—	10, 20, 30

● Use after checking the operating manual for the motor that will be combined.

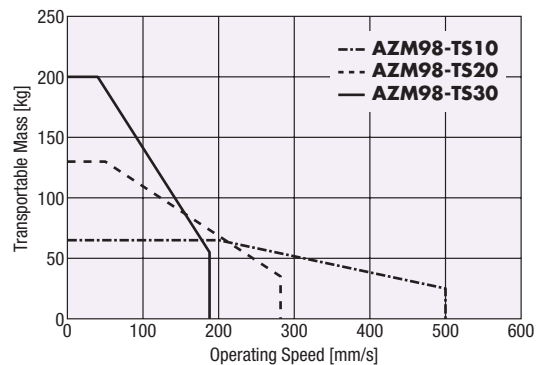
Prices



## ● Example Characteristics when Combined with Various Motors (Operating Speed–Transportable Mass Characteristics)



<Characteristics of a Combination of **LJ** Linear Head + Three-Phase High Efficiency Motor (60 Hz)>



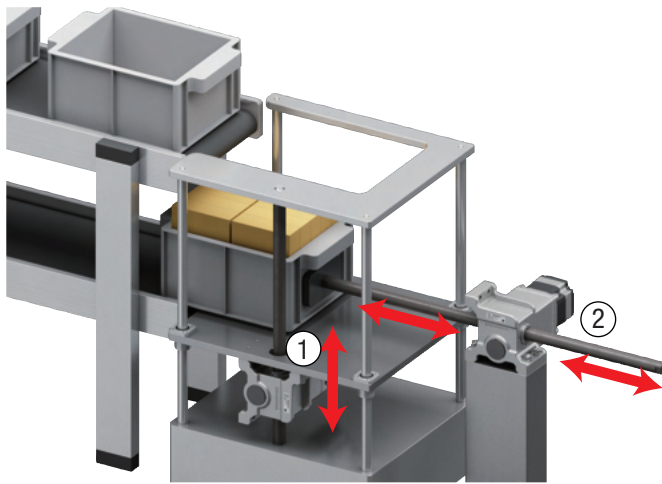
<Characteristics of a Combination of **LJ** Linear Head + **AZ** Series>

# Applications

The rack and pinion mechanism, which can be used in a variety of applications, is a product that can be selected just like a component, and is easy to use.

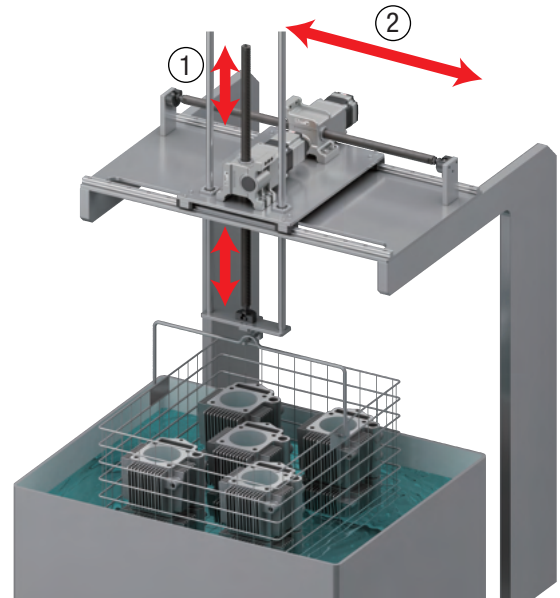
## ● Application Example 1 Bucket Transporting Belt Conveyor

- ① Fix the rack and drive the motor vertically
- ② Fix the motor and drive the rack horizontally



## ● Application Example 2 Machine Parts Cleaning Equipment

- ① Fix the motor and drive the rack vertically
- ② Fix the rack and drive the motor horizontally



## Product Number

# AGL 5 H 18 - 1

①    ②    ③    ④    ⑤

①	Product Line	<b>AGL: LJ</b> Linear Heads
②	Gearhead Frame Size	<b>5:</b> 90 mm
③	Shaft Type	<b>H:</b> Hollow
④	Hole Diameter	<b>18:</b> $\phi$ 18 mm
⑤	Stroke	<b>1:</b> 100 mm <b>2:</b> 200 mm <b>3:</b> 300 mm <b>4:</b> 400 mm <b>5:</b> 500 mm <b>6:</b> 600 mm <b>7:</b> 700 mm

## Product Line

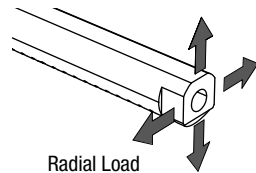
Stroke mm	Product Name
100	<b>AGL5H18-1</b>
200	<b>AGL5H18-2</b>
300	<b>AGL5H18-3</b>
400	<b>AGL5H18-4</b>
500	<b>AGL5H18-5</b>
600	<b>AGL5H18-6</b>
700	<b>AGL5H18-7</b>

## Included Items

Item	Quantity
Key Retaining Screws	1 set
Safety Cover	1 Piece

## Permissible Radial Load

Stroke mm	Permissible Radial Load* N
100	12
200	9
300	7
400	5
500	4
600	3
700	3



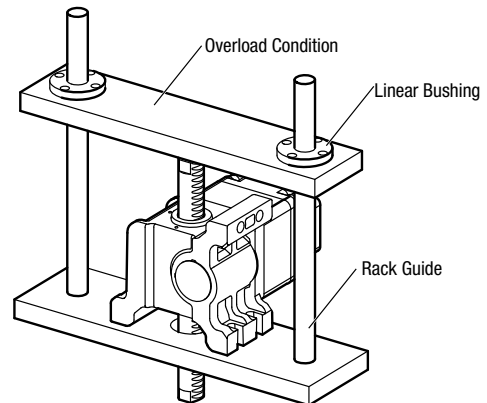
\*The values are for an operating speed of up to 45 mm/s. When operating at speeds exceeding 45 mm/s, guides or other devices should be installed to prevent radial loads from being applied to the rack.

## Specifications

Product Name	<b>AGL5H18-□</b>	
Maximum Speed	mm/s	500
Maximum Transportable Mass	kg	200
Maximum Input Speed	r/min	265.3
Maximum Input Torque	N·m	39.3
Transfer Efficiency		90%
Stroke	mm	100, 200, 300, 400, 500, 600, 700

- A number indicating the stroke is specified where the box □ is located in the product name.
- Maximum speed and maximum transportable mass depend on the gear ratio of the motor it is combined with.
- When moving a rack in the vertical direction, the drivable load mass is the maximum transportable mass minus the rack mass.

## Example Guide Installation



## General Specifications

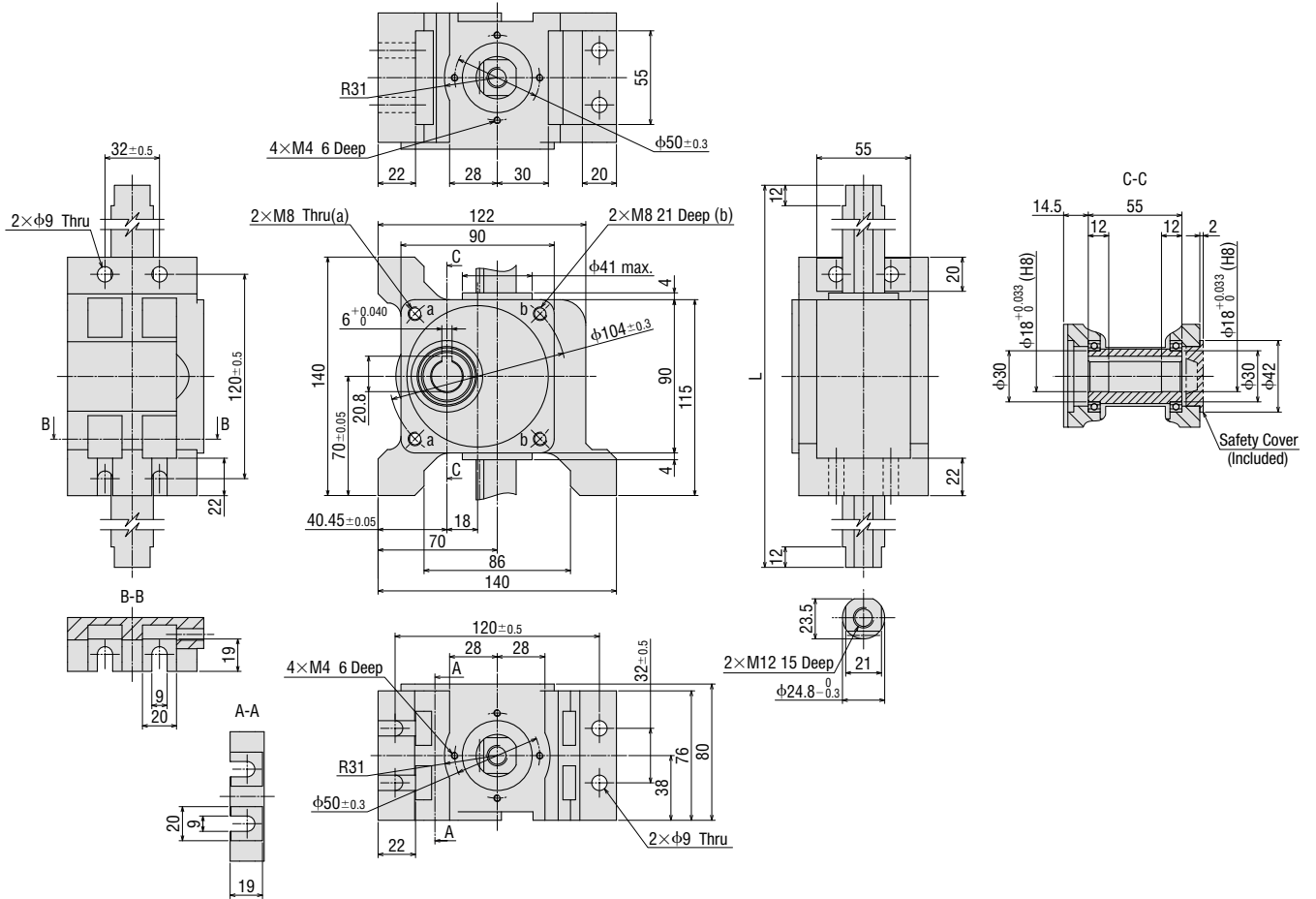
Operating Environment	Ambient Temperature	-10 ~ 50°C (Non-freezing)
	Ambient Humidity	85% or less (Non-condensing)
	Altitude	Up to 1000 m above sea level
	Atmosphere	No corrosive gases or dust. Do not expose to water or oil.
Storage Conditions*	Ambient Temperature	-20 ~ 70°C (Non-freezing)
	Ambient Humidity	85% or less (Non-condensing)
	Altitude	Up to 3000 m above sea level
	Atmosphere	No corrosive gases or dust. Do not expose to water or oil.

\*The storage conditions apply to short periods such as during transportation.

# Dimensions

2D & 3D CAD

Stroke mm	Product Name	Rack Total Length L mm	Mass (Including rack mass) kg	Rack Mass kg	2D CAD
100	<b>AGL5H18-1</b>	257.6	2.8	0.9	D7918
200	<b>AGL5H18-2</b>	358.1	3.1	1.2	
300	<b>AGL5H18-3</b>	458.6	3.5	1.6	
400	<b>AGL5H18-4</b>	559.2	3.8	1.9	
500	<b>AGL5H18-5</b>	659.7	4.2	2.3	
600	<b>AGL5H18-6</b>	760.3	4.6	2.7	
700	<b>AGL5H18-7</b>	860.8	4.9	3.0	



# Combination with Three-Phase High Efficiency Motors

When using together with the **LJ** linear head, check the gearhead output shaft torque and speed from the required transportable mass and the rack speed and select the motor and gearhead to be combined.

## Combinable Motors and Gearheads

Motor Output Power W	Voltage V	Motor Product Name	Gearhead Product Name	Gearhead Gear Ratio
60	Three-Phase 200	<b>5IK60GVH-JSM</b> ■	<b>5GVH</b> □B	<b>7.5, 9, 12.5, 15, 18, 25, 30, 36, 50, 60, 75, 90, 100, 120, 150, 180, 250, 300</b>
	Three-phase 220/230	<b>5IK60GVH-ESM</b> ■		
100	Three-Phase 200	<b>5IK100VGR-JSM</b> ■	<b>5GVR</b> □B	<b>7.5, 9, 12.5, 15, 18, 25, 30, 36, 50, 60, 75, 90, 100, 120, 150, 180</b>
	Three-Phase 220/230	<b>5IK100VGR-ESM</b> ■		

- A code (**T2**) indicating the terminal box type is specified where the box ■ is located in the product name.
- A number indicating the gear ratio is specified where the box □ is located in the product name.
- For details on the three-phase high efficiency motors, refer to the “Electromagnetic Brake Motor (A-92)” product catalog or check the Oriental Motor website.

### Note

- Do not use gearhead gear ratios of **5** or **6** with the **LJ** linear head.
- When used in combination with a three-phase high efficiency motor, do not carry out push-motion operation.

## Motor Selection Flow

**Example: When selecting a motor and gearhead to move a transportable mass of 170 kg at an operating speed of 40 mm/s**

The motor and gearhead to be combined with the linear head is selected using the following process.

### (1) Select the Motor

In Figure 1, check the motor output power that can move a transportable mass of 170 kg at an operating speed of 40 mm/s.

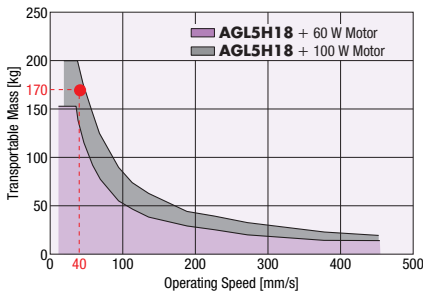


Figure 1: Operating Speed–Transportable Mass (Reference)

Based on the results of the check, we see that an output power of 100 W is required.

Motor: The **5IK100VGR-JSM** is selected.  
(For three-phase 200 VAC, 50 Hz/60 Hz, lead wire type)

### (2) Select the Gearhead

Check the gearhead's output shaft torque and speed in Figure 2 and 3.

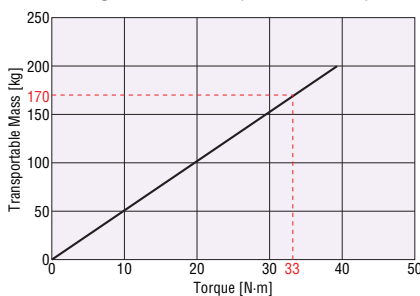


Figure 2: Gearhead Output Shaft Torque–Transportable Mass

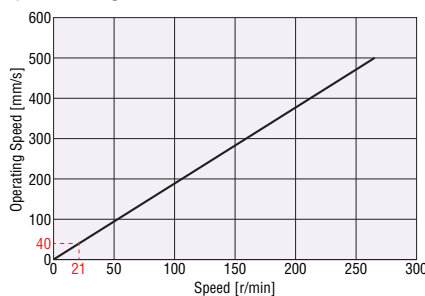


Figure 3: Gearhead Output Shaft Speed–Operating Speed

Based on the results of these checks, we see that gearhead output shaft torque must be **33 N·m or more** and the operating speed must be **21 r/min or more**.



Using the conditions from the results of the checks in Step 1 and Step 2, the gearhead and motor that satisfy the gearhead specification is selected.

The three-phase high efficiency motor “Permissible Torque” table is consulted and the product is selected.

Conditions: Gearhead output shaft torque 33 N·m or more

Gearhead output shaft speed 21 r/min or more

◇ Permissible Torque (100 W)

● 50 Hz

Unit: N·m

Product Name	Speed r/min	200	166	120	100	83	60	50	41	30	25	20	16.6	15	12.5	10	8.3
Motor/Gearhead	Gear Ratio	<b>7.5</b>	<b>9</b>	<b>12.5</b>	<b>15</b>	<b>18</b>	<b>25</b>	<b>30</b>	<b>36</b>	<b>50</b>	<b>60</b>	<b>75</b>	<b>90</b>	<b>100</b>	<b>120</b>	<b>150</b>	<b>180</b>
<b>5IK100VGVR- JSM</b> ■ <b>5IK100VGVR- ESM</b> ■	<b>5GVR</b> □ <b>B</b>	4.7	5.6	7.8	9.3	10.7	14.8	17.8	21.4	29.7	35.6	40	40	40	40	40	40

▶ For 50 Hz  
Gearhead: **5GVR60B**

● 60 Hz

Unit: N·m

Product Name	Speed r/min	240	200	144	120	100	72	60	50	36	30	24	20	18	15	12	10
Motor/Gearhead	Gear Ratio	<b>7.5</b>	<b>9</b>	<b>12.5</b>	<b>15</b>	<b>18</b>	<b>25</b>	<b>30</b>	<b>36</b>	<b>50</b>	<b>60</b>	<b>75</b>	<b>90</b>	<b>100</b>	<b>120</b>	<b>150</b>	<b>180</b>
<b>5IK100VGVR- JSM</b> ■ <b>5IK100VGVR- ESM</b> ■	<b>5GVR</b> □ <b>B</b>	3.8	4.6	6.4	7.7	8.8	12.3	14.7	17.6	24.5	29.4	34.6	40	40	40	40	40

▶ For 60 Hz  
Gearhead: **5GVR75B**

To calculate specific values, use the following formulas.

◇ Gearhead output shaft speed

$$N_G = V \times \frac{60}{\pi \times D_p}$$

◇ Gearhead output shaft torque

$$T_G = W \times 9.807 \times \frac{D_p \times 10^{-3}}{2 \times \eta}$$

$N_G$ : Gearhead output shaft speed [r/min]

$V$ : Rack operating speed [mm/s]

$D_p$ : Pitch circle diameter of pinion [mm] (Constant=36)

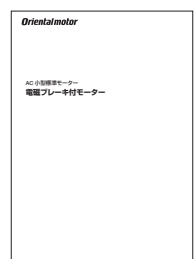
$T_G$ : Gearhead output shaft torque [N·m]

$W$ : Transportable mass [kg]

$\eta$ : Rack and pinion transmission efficiency (Constant=0.9)

- A symbol (T2) indicating the terminal box specified where the box ■ is located in the product name
- A number indicating the gear ratio is specified where the box □ is located in the product name.

For details on the three-phase high efficiency motors and the 60 W permissible torque table, refer to the “Electromagnetic Brake Motor” product catalog or check the Oriental Motor website.



# Combination with the AZ Series

## Specifications

Linear Head Product Name		AGL5H18-□		
Motor Product Name	Standard	AZM98AC-TS10■	AZM98AC-TS20■	AZM98AC-TS30■
	With Electromagnetic Brake	AZM98MC-TS10■	AZM98MC-TS20■	AZM98MC-TS30■
Maximum Speed	mm/s	500	282	188
Transportable Mass	kg	65 (200 mm/s)	130 (50 mm/s)	200 (40 mm/s)
		25 (500 mm/s)	35 (282 mm/s)	55 (188 mm/s)
Maximum Acceleration	m/s <sup>2</sup>	1	0.3	0.1
Push Force	N	637	1274	1961
Thrust*	N	637 (200 mm/s)	1274 (50 mm/s)	1961 (40 mm/s)
		245 (500 mm/s)	343 (282 mm/s)	539 (188 mm/s)
Holding Force	Power ON	N	637	1274
	With Electromagnetic Brake	N	637	1274
Stroke	mm	100, 200, 300, 400, 500, 600, 700		

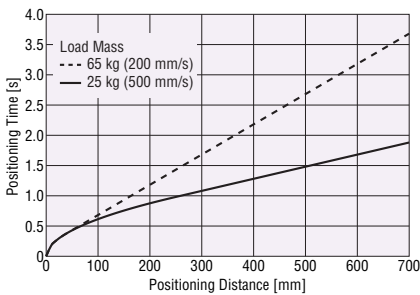
- A number indicating the stroke is specified where the box □ is located in the product name.  
A letter indicating the cable outlet direction, either **R** (to the right), **U** (upwards) or **L** (to the left) where the box ■ is located in the product name. If the outlet direction is down, there is no letter in the ■ box.
- When moving a rack in the vertical direction, the drivable load mass is the transportable mass minus the rack mass. For the rack mass, refer to the dimension diagram.
- \*The sum of the load thrust and the load acceleration thrust should not exceed the thrust value.

## Positioning Distance–Positioning Time

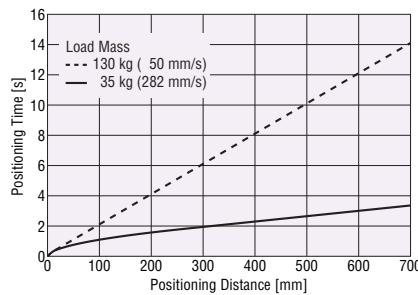
Check the positioning time (reference) from the positioning distance.  
The positioning time differs according to the load mass.

- The product names are listed such that the product names are distinguishable.

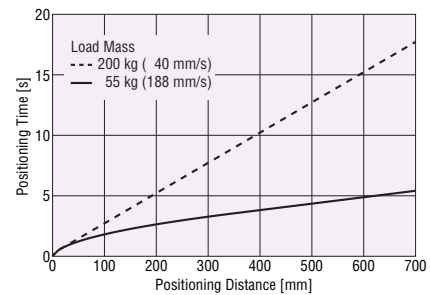
AGL5H18+AZM98-TS10



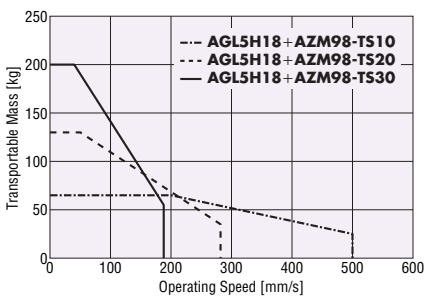
AGL5H18+AZM98-TS20



AGL5H18+AZM98-TS30



## Operating Speed–Transportable Mass



<Characteristics of LJ Linear Head + AZ Series Combination>

### Note

- The operating speed–transportable mass characteristics are based on data using Oriental Motor's measurement conditions. Conditions such as power supply voltage and ambient temperature may cause these characteristics to change.
- Depending on the driving conditions, a considerable amount of heat may be generated by the motor. To protect the absolute sensor, be sure to keep the temperature of the motor case at 80°C or less.  
(When conforming to the UL or CSA Standards, the temperature of the motor case must be kept at 75°C or less since the motor is recognized as heat-resistant class A.)

## Repetitive Positioning Accuracy (Reference value)

Transportable mass is the actual measurement value. This will change based on load, driving condition and installation direction.

Linear Head Product Name	Motor Product Name	Repetitive Positioning Accuracy [mm]	
		Rack Traveling Direction: Horizontal	Rack Traveling Direction: Vertical
AGL5H18	AZM98-TS10	±0.35	±0.07
	AZM98-TS20		
	AZM98-TS30		

- The product names are listed such that the product names are distinguishable.

### αSTEP About the AZ Series

For details about the AZ Series motors and drivers, refer to the product catalog or the Oriental Motor website.

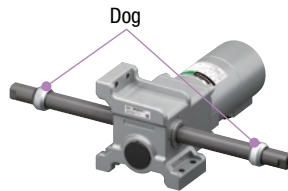
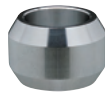


# Peripheral Equipment

## Dog

When an external limit switch is used, these are installed on the rack in order to turn the switch ON or OFF.

Product Name
<b>LXD5C</b>



Application Example

## Rack-and-Pinion Related Products

Series Name	Maximum Transportable Mass (kg)	Stroke	Motor Type	Combinable Motor/Motor
<b>LH</b> Linear Heads 	~70	100~700	Standard AC Motors	[Combinable Motor] • Reversible Motor • Electromagnetic Brake Motor
Rack-and-Pinion System <b>DSC</b> Series equipped <b>L</b> Series 	~67	100~1000	AC Speed Control Motors	[On-Board Motor] <b>DSC</b> Series
Rack-and-Pinion System <b>AZ</b> Series equipped <b>L</b> Series 	~100	100~1000	<b>αSTEP</b>	[On-Board Motor] <b>AZ</b> Series

# ***Oriental motor***

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