Product Lineup

PHASER Series

LINEAR MOTOR SINGLE-AXIS ROBOTS

No limit on critical speed even when using a maximum of 4M long stroke!
Delivers superb performance during long distance conveyance!

Two types available with a double carrier as standard

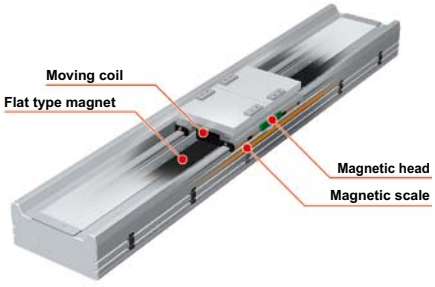
MF type — Long stroke & high-power using flat motor with core

P.134

MR type — Shaft motor drive with the advantages of a light-weight ·compact body · minimal cogging

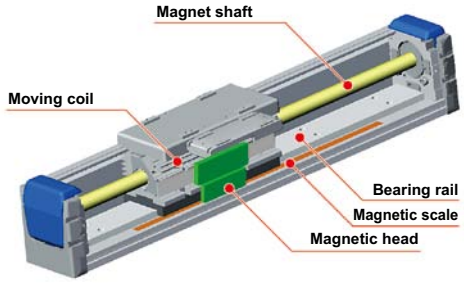
P.150

MF type internal structure



- Maximum stroke: 4050mm
- Maximum speed: 2500mm/s
- Repeated positioning accuracy: +/-5μm
- Maximum payload: 7 to 160kg

MR type internal structure



- Maximum stroke: 1050mm
- Maximum speed: 2500mm/s
- Repeated positioning accuracy: +/-5μm
- Maximum payload: 5kg

Type	Size (mm) Note 1	Model	Carriage	Maximum payload (kg)	Maximum speed (mm/sec)	Stroke (mm)	Detailed info page
MF type Steel cored linear motor with falt magnet	W85.8 × H80	MF7	Single	10 (7) Note 2	2500	100 to 4000	P.134
		MF7D	Double			100 to 3800	
	W100 × H80	MF15	Single	30 (15) Note 2		300 to 4000	P.138
		MF15D	Double			100 to 3800	
	W150 × H80	MF20	Single	40 (20) Note 2		150 to 4050	P.142
		MF20D	Double			150 to 3850	
		MF30	Single	60 (30) Note 2		100 to 4000	P.145
		MF30D	Double			150 to 3750	
	W210 × H100	MF75	Single	160 (75) Note 2		1000 to 4000	P.148
		MF75D	Double			680 to 3680	
MR type Shaft type linear	W60 × H90	MR12	Single	5		50 to 1050	P.150
		MR12D	Double			50 to 1050	

Note 1. Size is the approximate cross sectional size.

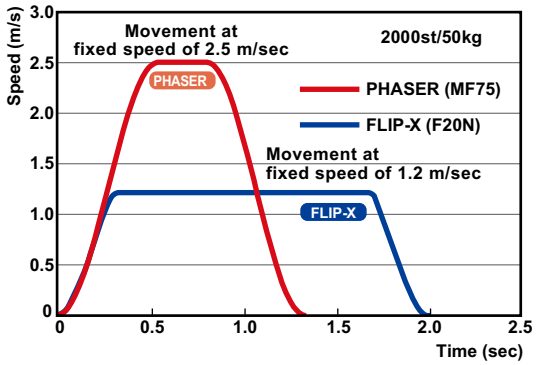
Note 2. If using at maximum speed then the payload will be as shown in the ( ).

Point 1

High speed , Long Travel ,up to 4 meters!

The ultimate appeal of linear motor single-axis robots is that there is no critical speed limits such as with ball screws. There is no reduction in the maximum speed even when traveling long distances. Moreover, the maximum stroke is a standard setting of up to 2m on the MR type and to 4m on the MF type. The cycle time in particular for long distance conveyance has been drastically improved.

■ Movement time comparison of linear single-axis PHASER and single-axis robot FLIP-X



Point 2

High Payload on MF type Maximum payload: 160kg

The MF types which employs flat magnets has a maximum stroke length of 4m. Payloads can be conveyed over long distances. The maximum payload has been increased from 100 up to 160kg and can be conveyed with high accuracy at high speeds. (In the MF types, the maximum speed is limited in some payload ranges. See the page listing data on each model for more information.)

Point 3

Lower Application Cost Due to Linear Motor Features

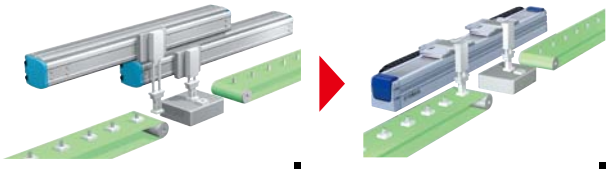
Linear motor types are more effective in lowering costs when coveying payloads at high speeds, over long distances with greater repeatability.

Systeme feedback is provided by proprietary magnetic scale developed by Yamaha.

Point 4

Double Carriges Standard on all Modules

The MF series supports double carriers as a standard feature which allows configuring a system with space-saving efficiency.
This arrangement yields lower costs and better tact time as compared to using 2 single axis robot units.
Benefits are shorter setup times, addtional axis combinations are no longer needed, and tools can be jointly used, etc. (Collision prevention program can also be utilized on RCX series controllers.)



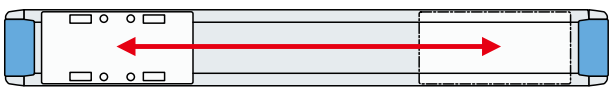
Layout using 2 units of ball screw type single axis robots

Space saving layout using a double carriage

Point 5

Effective use of stroke

Linear motor type single-axis robots also contain an internal coil inside the table as a drive unit component that eliminates inner dead space and maximizes the stroke. The unit is also bilaterally symmetrical so there is a higher degree of freedom in the robot layout.



Point 6

Quiet with a long service life

Unlike ball screw type robots, there are few sliding and rotating sections so the operation is amazingly quiet. Moreover the coil and magnet do not make contact so there is no wear and the robot can be used for extended periods.

Point 7

Linear scale made by YAMAHA

YAMAHA used its own superb magnetic signal detection linear scale technology.

Magnetic type scale is ideal for harsh environments

Yamaha's magnetic scale is resistant to dirt and grime and can be used in places partially exposed to grease and cutting oil.

Semi-absolute specifications

Using semi-absolute specs eliminates the need to make a large return to origin movement after turning on the power (carriage moves a maximum of about 76mm when loading the signals). The semi-absolute scale acquires the current position by loading signals recorded on the linear scale.

High resolution to 1µm

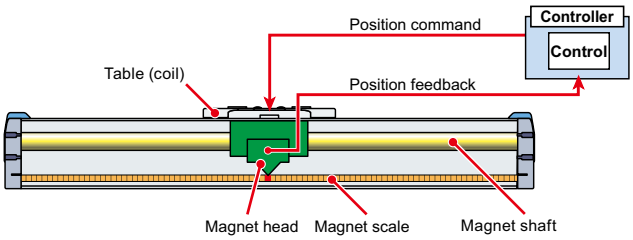
Magnetic signals recorded from the magnetic scale are detected and interpolated to achieve a highly accurate of resolution 1µm.

Lower costs

Making the scale in-house and internalizing it in the robot provides long travel position feedback at reasonable cost.

Repeated positioning accuracy +/-5µm

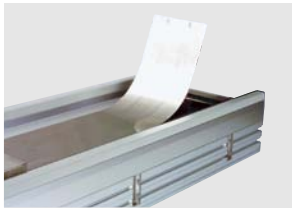
A fully-closed control system provides constant feedback of the carriage position to attain highly accurate and stable positioning. Backlash is eliminated because there are no mechanical components such as ball screws or drive belts.



Point 8

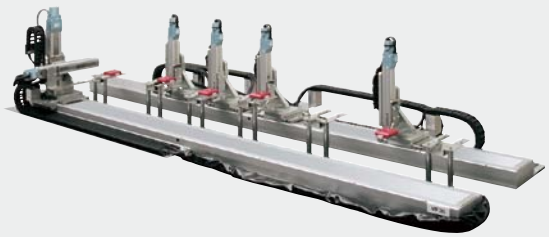
Dust preventive structure

All YAMAHA linear motor robots use a stainless steel shutter to prevent dirt and foreign objects from penetrating inside. These shutters are made of tough stainless steel especially designed to withstand an extremely high degree of metal fatigue and made to support long-stroke and high-speed operation.



Supports multi-carrier operation

The PHASER series also supports “multi-carrier” operation that allows using 3 or more carriers on one robot.
This “multi-carrier” operation is drastically expanding the current range of applications due to its effect in improving tact time and saving space.



Supports dual-drive

Using dual-drive to simultaneously run 2 axes allows highspeed conveyance over a wide area as well as conveying heavy payloads .Yamaha can provide an optimal control system that matches the linkage rigidity of your robot, such as torque support control or bi-axial positioning control.