



YAMAHA Linear motor single-axis robot

MF75/75D

Variants of the high payload model MF50 are now available with lower costs and higher specs. These new robots will widen linear motion applications.

■ High-speed movement even with a long stroke

The MF75/75D robots use a linear motor, so unlike ball screw type single-axis robots, there is no critical speed to worry about. This means no drop in maximum speed even when moving over long distances.

■ Higher specs yet lower costs

Drastically improved specs! Compared to the previous model MF50, the thrust has been increased by 30%, and the standard payload by 50%. Even with higher performance, streamlining the manufacturing process helped make huge cost cuts.

■ Totally compatible with previous model

YAMAHA develops and produces robot products based on what the customer wants. MF75 outer dimensions and installation footprint are totally identical to the MF50. Customer gets a better cycle time without having to change the equipment layout or design.

■ Multiple carriages available

Double-carriage is available as a standard feature. Also supports multiple carriages including three or more carriages. Use of multiple carriages improves the tact time and allows space-saving, expanding the scope of work applications.

■ Semi-absolute function eliminates return-to-origin operation

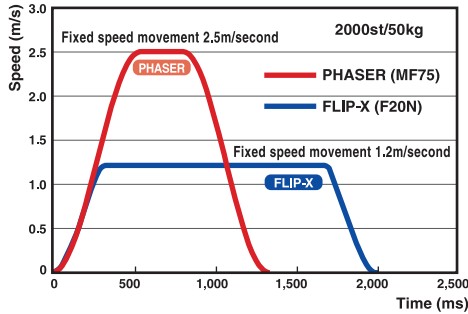
Semi-absolute function drastically cuts time needed to find the origin point on long-stroke robots. After power-on, the current position can be detected by moving just a slight distance. Needs no large movement to return to the origin point.



1 High-speed movement even over long distances

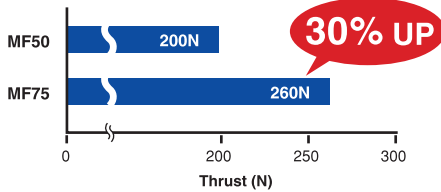
The best feature of linear motor single axis robots is that there is no critical speed to worry about such as on ball screw types. This means no drop in maximum speed, even when moving over long distances. Besides this, the maximum stroke can be set up to 4 meters as a standard feature on MF type robots. Another plus is a vastly improved cycle time over long distances.

■ Movement times: Linear single-axis PHASER vs. single-axis robot FLIP-X



2 Offers lower costs and higher specs

Cycle time is much shorter thanks to vastly improved thrust, yet the MF75/75D still come at a lower cost achieved by measures such as streamlining the manufacturing processes. Keeping the MF75/75D fully compatible with the previous model (MF50) also greatly helps cut equipment costs.

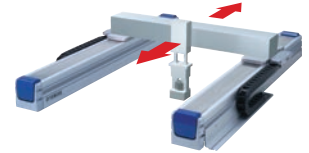


3 Multiple carriages and dual drive available

The MF75/75D possible to have multiple carriages including three or more carriages, as well as double-carriage available as standard.

The MF75/75D can be used in a wider range of applications, for example, in a transport system that flexible responds to system changes.

Dual drive using dual-axis synchronous control allows high-speed conveying over wide areas and transporting heavy loads, etc. Dual drive control methods include torque support control and dual-axis positioning, etc. and we offer optimal control methods that match the intended use and connective rigidity of the robots.



Model	MF50	MF75	MF100
Standard payload (kg)	50	75	100
Maximum payload (kg)	150	160	250
Rated thrust (N)	200	260	400
Maximum stroke	4020	4000	4000
Dual-drive compatibility	○	○	×

4 Dust-proof shutter and easy maintenance

Dust-proof shutter of durable custom-made stainless steel ensures a long service life. The shutter not only blocks out outside dust and contaminants but also prevents flow of internally generated particles and dust. Maintenance is easy because the direct-acting guide can be greased without having to remove the shutter.

■ Specification

Basic specifications

Model name	MF75	MF75D
Driving method	Steel cored linear motor flat magnet	
Repeated positioning accuracy (μm)	±5	
Scale (μm)	Magnetic method, resolution: 1	
Maximum speed ^{Note 2} (mm/sec)	2500	
Rated thrust (N)	260	
Maximum carrying weight ^{Note 1} (kg)	160	
Stroke (mm)	1000 to 4000 (100mm pitch)	680 to 3680 (100mm pitch)
Bearing method	2 guide rails and 6 blocks (with retainer)	
Linear guide	4 rows of circular arc grooves x 2 rail	
Maximum cross-section outside dimensions (mm)	W210xH100 (excluding cable carrier)	
Overall length (mm)	Stroke length + 360	Stroke length + 680
Cable length (m)	Standard : 3.5 Option: 5/10	
Controller	SR1-P-20-R TS-P220-R	RCX221HP-R
Robot driver	RDP-25-RBR2	RDP-25-RBR2

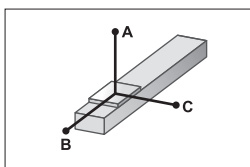
Note. A vertical model (with brake) is not available with the PHASER series.
Note. The basic specifications of semi-absolute model are the same as those of the incremental model.

Note 1. Maximum payload per carriage.

Note 2. See the maximum speed table below.

Payload (kg)	Maximum speed (mm/s)
75 or less	2500
90	2310
100	2200
110	2090
120	2000
130	1920
140	1840
150	1770
160	1700

Allowable overhang^{Note}

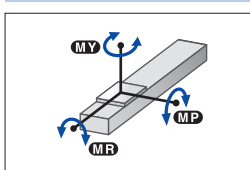


Horizontal installation (Unit: mm)

	A	B	C
20kg	3397	2841	1840
40kg	2795	1389	964
60kg	2200	530	450
80kg	1800	175	150
100kg	1500	130	110
120kg	1250	100	80
140kg	1100	80	65
160kg	950	60	50

Note. Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

Static load moment



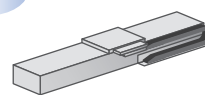
	MY	MP	MR
(Unit: N·m)	830	831	730

Controller

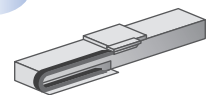
Controller (Regenerative unit)	Operating method
SR1-P-20-R (RGU-2)	Programming / I/O point trace / Remote command /
RCX221HP-R (RG2)	Operation using RS-232C communication
TS-P220-R (RGU-2)	I/O point trace
RDP-25-RBR2	Pulse train control

Installing direction, Cable carrier entry location

RH Horizontal, right

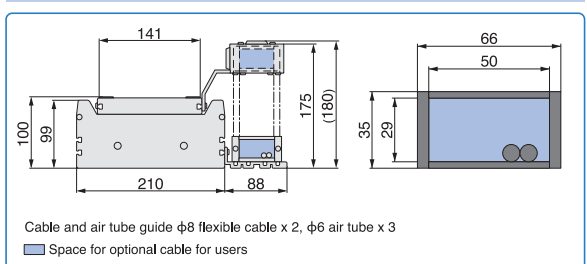


LH Horizontal, left

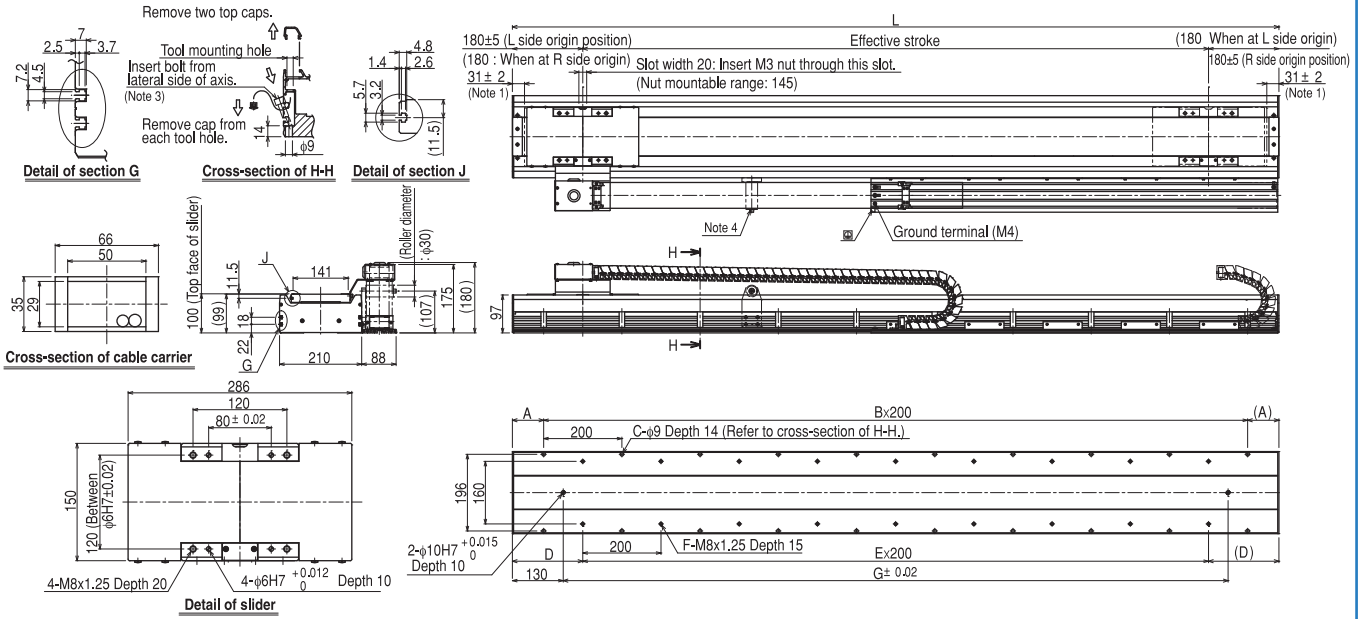


Note. Be sure to install in the direction as specified (in cable carrier take-out direction drawing and various specification drawings) individually.
Installation in any other way will cause a failure. For requirement of installation in any way other than the above standard installation, please consult YAMAMA as special arrangement will be available.

Cross-section of cable carrier



MF75 single carriage horizontal mount model RH



Note 1. Distance from both ends to the mechanical stopper.

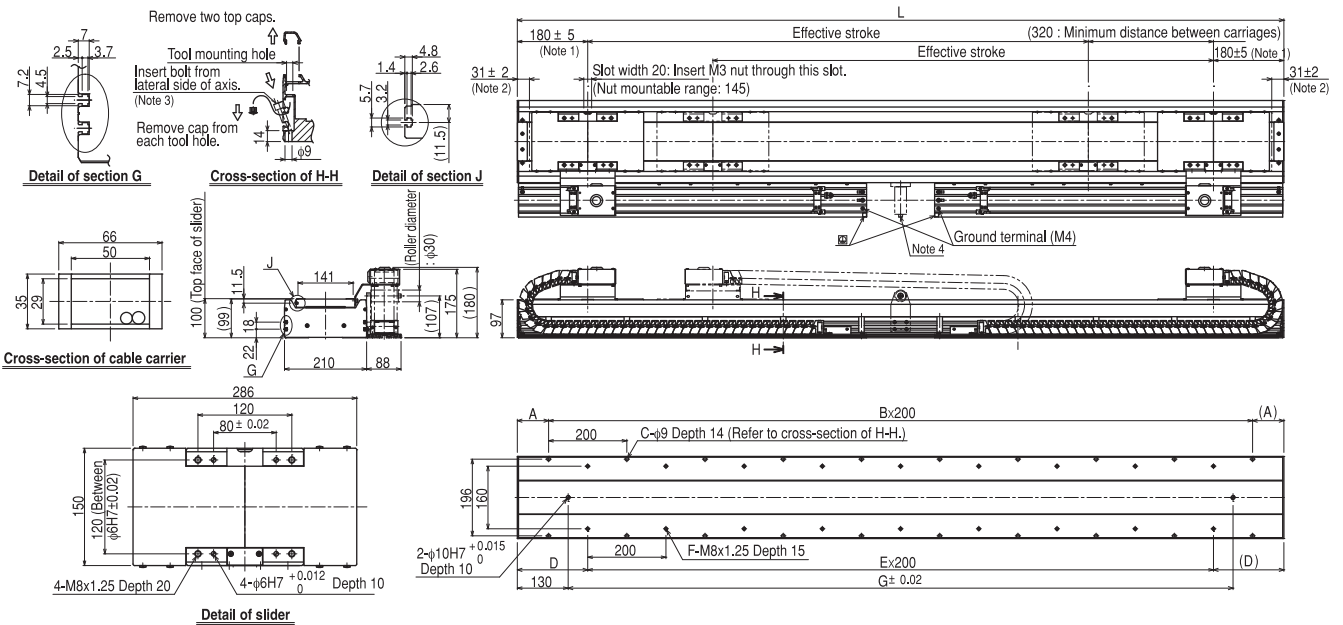
Note 2. The origin is set on the L side (as shown above) at the time of shipment. It can be changed to the R side by parameter setting.

Note 3. The length under head of M8 hex socket head bolts for installing the robot body must not be longer than 30mm.

Note 4. For models with a 3,000mm or longer stroke, a roller is installed to prevent the cable carrier from sagging.

Effective stroke	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3100	3200	3300	3400	3500	3600	3700	3800	3900	4000
L	1360	1460	1560	1660	1760	1860	1960	2060	2160	2260	2360	2460	2560	2660	2760	2860	2960	3060	3160	3260	3360	3460	3560	3660	3760	3860	3960	4060	4160	4260	4360
A	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80
B	5	5	7	7	7	7	9	9	9	9	11	11	11	11	13	13	13	13	15	15	15	15	17	17	17	17	19	19	19	19	21
C	12	12	16	16	16	16	20	20	20	20	24	24	24	24	28	28	28	28	32	32	32	32	36	36	36	36	40	40	40	40	44
D	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180
E	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16	16	18	18	18	18	20	20	20
F	14	14	14	14	18	18	18	18	22	22	22	22	26	26	26	26	30	30	30	30	34	34	34	34	38	38	38	38	42	42	42
G	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3100	3200	3300	3400	3500	3600	3700	3800	3900	4000	4100
Weight (kg)	46	49	51	54	56	59	61	64	66	69	71	74	76	79	81	84	86	89	91	94	96	99	101	104	106	109	111	114	116	119	121

MF75D double carriage horizontal mount model H



Note 1. Position of the table slider when returned to the origin.

Note 2. Distance from both ends to the mechanical stopper.

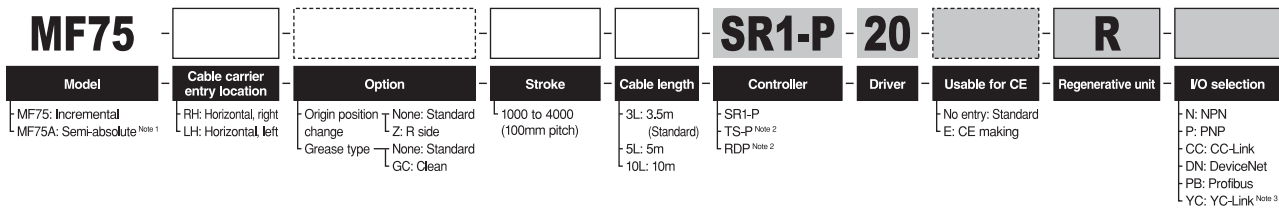
Note 3. The length under head of M8 hex socket head bolts for installing the robot body must not be longer than 30mm.

Note 4. For models with a 3,080mm or longer stroke, a roller is installed to prevent the cable carrier from sagging.

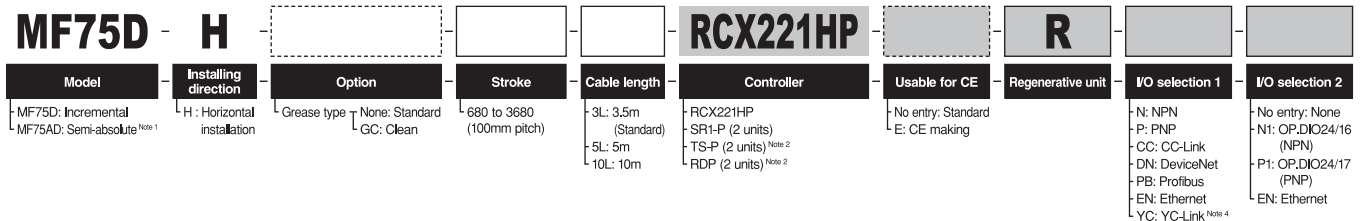
Effective stroke	680	780	880	980	1080	1180	1280	1380	1480	1580	1680	1780	1880	1980	2080	2180	2280	2380	2480	2580	2680	2780	2880	2980	3080	3180	3280	3380	3480	3580	3680
L	1360	1460	1560	1660	1760	1860	1960	2060	2160	2260	2360	2460	2560	2660	2760	2860	2960	3060	3160	3260	3360	3460	3560	3660	3760	3860	3960	4060	4160	4260	4360
A	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80
B	5	5	7	7	7	7	9	9	9	9	11	11	11	11	13	13	13	13	15	15	15	15	17	17	17	17	19	19	19	19	21
C	12	12	16	16	16	16	20	20	20	20	24	24	24	24	28	28	28	28	32	32	32	32	36	36	36	36	40	40	40	40	44
D	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180	230	80	130	180
E	6	6	6	6	8	8	8	8	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16	16	18	18	18	18	20	20	20
F	14	14	14	14	18	18	18	18	22	22	22	22	26	26	26	26	30	30	30	30	34	34	34	34	38	38	38	38	42	42	42
G	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600	2700	2800	2900	3000	3100	3200	3300	3400	3500	3600	3700	3800	3900	4000	4100
Weight (kg)	57	60	62	65	67	70	73	75	78	81	83	86	88	91	94	96	99	101	104	107	109	112	114	117	120	122	125	127	130	133	135

Ordering method

Single carriage model



Double carriage model







Note 1. Semi-absolute models are supported by the SR1-P, TS-P and RCX221. RDP has an incremental model only.

Note 2. For information on options selectable for the TS-P and RDP, refer to the ordering method shown on each controller page of our general catalog (TS-P: P.357, RDP: P.365).

Note 3. Available only for the slave.

Note 4. Available only for the master.

Note. Models without cable carriers are also available. For wiring in the cable carrier (cable terminals), refer to page 427 of our general catalog or contact us.

Name	For single carriage model (One unit is required per carriage)			For double carriage model
	RDP-25	TS-P	SR1-P	RCX221HP
External view				
Operating method	Pulse train control	I/O point tracing	Programming	
			I/O point tracing	
			Remote command	
Position detection method	Incremental		Incremental / Semi-absolute	
Maximum number of programs	—	—	100 programs	
Points	—	255 points	1,000 points	10,000 points
Programming Box	—	HT1 / HT1-D	HPB / HPB-D	RPB / RPB-E
Support software for PC	TOP	TS-Manager	POPCOM	VIP+
Field networks	—	CC-Link	CC-Link	CC-Link
		DeviceNet	DeviceNet	DeviceNet
		—	Profibus	Profibus
		—	—	Ethernet

Precautions for use

Handling

- Please be sure to read "PHASER Series Instruction Manual" carefully to have full understanding of its contents before using this product and strictly observe each instruction.
- Dropping or hitting this product may cause it to break. Always handle it carefully.
- Never disassemble this product. Entry of a foreign object will cause deterioration of accuracy.
- This product uses a magnetic type linear scale. Do not bring anything that generates a strong magnetic field near the robot itself as it may cause damage to the linear scale.

Installation place and environment

When installing this product, avoid the place where any of the following conditions applies.

- The ambient temperature is outside of the 0°C to 40°C range.
- Dewing occurs, or corrosive gas or combustible gas is generated.
- Dielectric powder such as iron powder, dust, moist, salt or organic solvent is produced and flies in the air.
- The product is exposed to direct sun or radiant heat.
- Strong electric field, strong magnetic field, etc. occur.
- A noise source exists in the surrounding area.
- The product is affected by vibration or impact.
- Inspection and cleaning cannot be performed.

Safety precaution

- A high performance rare earth magnets are used in the motor section of this product. For this reason, bringing a magnetic response type device or a medical device such as a heart pace maker close to the robot may cause it to malfunction. Be careful not to bring such a device close to the robot.

● Specifications and appearance are subject to change without prior notice.

201002-AE



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