Multi-robot MULTI-FLIP/MULTI-PHASER

This robot has multi specifications that control multiple robots using one controller.

Advantages of control with multi-axis controller

- Sequence control is easy. System upgrades are easy at less expensive price.
- Compact and space saving when compared to the operation with multiple single-axis controllers.
- More advanced control is possible.
- RCX320, RCX340 provide mixed control of the FLIP-X series and PHASER series (linear single-axis).

Multi-robot ordering method

MLTX Note 1	–	1st unit Note 2	–	2nd unit Note 2	–	3rd unit Note 2	• • •	–		–		–	
Multi-robot model prefix	–	1st unit robot type	–	2nd unit robot type	–	3rd unit robot type		–	Cable length 3K: 3.5m 5K: 5m 10K: 10m	–	Controller RCX320 RCX340	–	Controller option

Up to 16 units can be controlled.

Note 1. When ordering a multi-robot, prefix "MLTX" to the top of the order model.
Note 2. Select either MULTI-FLIP or MULTI-PHASER shown below.
Note 3. For details about the controller and controller option models, please refer to relevant page of each controller.

Robot settings

Multiple-robot setting

Multiple-robot setting and multi-task program allow for asynchronous independent movements. As the auxiliary axis setting is used together, more free axis assignment can be made.

Main auxiliary axis setting

This auxiliary axis setting is used when it is inconvenient that two axes move simultaneously by the MOVE command. The axis set for the main auxiliary axis does not operate by the MOVE command and it operates only by the DRIVE command (movement command in axis units). This setting is recommended for the axis that needs to be operated asynchronously from the main robot.

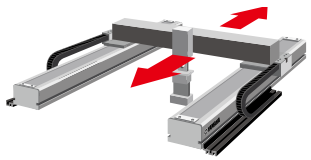
Double-carrier

In robot types that the motor runs separately, such as linear motor single-axis PHASER series or N type (nut rotation type) of FLIP-X series, two motors can be added to one axis.

PHASER is available for 3 or more carriers by special order.

Dual setting

This setting is used when performing the dual drive (2-axis synchronous control). This setting is used when the gantry type Cartesian robot with a long Y-axis stroke stabilizes the high acceleration/deceleration or when a high load or high thrust is needed.



Applicable controllers

Name		1 to 2 axes controller RCX320	1 to 4 axes controller RCX340
Appearance		 P.121	 P.121
Position detection		Incremental/Absolute	
Control model		FLIP-X and PHASER can be mixed.	
Maximum number of programs		100 programs	
Maximum number of points		30,000 points	
Number of input/output points	Standard	Dedicated input 8 points/dedicated output 9 points General-purpose input 16 points/general-purpose output 8 points	
	Expansion	24 general-purpose inputs and 16 general-purpose outputs (per board. Up to 3 boards can be expanded.)	
Network option		CC-Link, DeviceNet™, EtherNet/IP™, Ethernet, PROFIBUS, PROFINET, EtherCAT	

MULTI-FLIP

Type	Model	Lead (mm)	Stroke (mm)
T type Frame-less structure model	T4L/T4LH	12	50 to 400
		6	
		2	
	T5L/T5LH	20	50 to 800
		12	
		6	
	T6L	20	50 to 800
		12	
		6	
	T9 (Standard)	30	150 to 1050
		20	
		10	
		5	
	T9H (High thrust)	30	150 to 1050
		20	
		10	
		5	
F type Model with high rigidity frame	F8	20	150 to 800
		12	
		6	
	F8L	30	150 to 1050
		20	
		10	
		5	
	F8LH	20	150 to 1050
		10	
		5	
	F10 (Standard)	30	150 to 1050
		20	
		10	
		5	
	F10H (High thrust)	30	150 to 1000
		20	
		10	
		5	
	F14 (Standard)	30	150 to 1050
		20	
		10	
		5	
	F14H (High thrust)	30	
		20	
		10	
		5	
	F17L	50	1100 to 2050
	F17	40	200 to 1450
		20	200 to 1250
		10	
	F20	40	200 to 1450
		20	200 to 1250
		10	
	F20N	20	1150 to 2050
GF type	GF14XL	20	750 to 2000
	GF17XL	20	850 to 2500
N type Nut rotation type model	N15 (Single-carrier)	20	500 to 2000
	N15D (Double-carrier)		250 to 1750
	N18 (Single-carrier)		500 to 2500
	N18D (Double-carrier)		250 to 2250
B type Timing belt drive model	B10	Belt drive	150 to 2550
	B14 (Standard)	Belt drive	150 to 3050
	B14H (High thrust)	Belt drive	
R type Rotation axis model	R5	-	360°
	R10		
	R20		

MULTI-PHASER

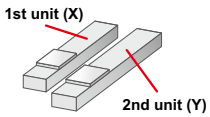
Type	Model	Carrier	Stroke (mm)
MF type Flat type with core Linear motor specifications	MF7	Single	100 to 4000
	MF7D	Double	100 to 3800
	MF15	Single	300 to 4000
	MF15D	Double	100 to 3800
	MF20	Single	150 to 4050
	MF20D	Double	150 to 3850
	MF30	Single	100 to 4000
	MF30D	Double	150 to 3750
	MF75	Single	1000 to 4000
	MF75D	Double	680 to 3680

Examples of multi-robot ordering methods

Separate single axes

<Example> F14H and F10 are installed separately.

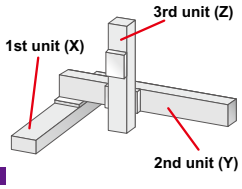
MLTX - F14H - 20 - U - 500 (1st unit)
- F10 - 20 - 300 (2nd unit)
- 5K - RCX340 - 2 - N - NS - 2 (Controller)



3 axes combination

<Example> C17L, C14H, and C14H are used for the X-axis, Y-axis, and Z-axis, respectively to form a 3-axis XYZ combination.

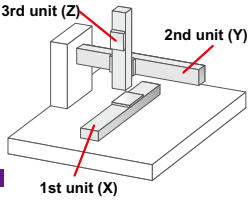
MLTX - C17L - 50 - Z - 1500 (1st unit)
- C14H - 20 - 450 (2nd unit)
- C14H - 10 - BK - 150 (3rd unit)
- 3K - RCX340 - 3 - N - NS - 3 (Controller)



2 axes + 1 axis

<Example> T6 is installed on the base for the 1st axis, C6 is secured to the upper portion for the 2nd axis, and CH4 is secured to the upper portion for the 3rd axis to assemble the C6 and C4H to the XZ. (Either 2 axes + 1 axis or 3 axes simultaneous control can be made by the setting.)

MLTX - T6L - 6 - 300 (1st unit)
- C6L - 6 - 300 (2nd unit)
- C4HL - 6 - BK - 100 (3rd unit)
- 3K - RCX340 - 3 - N - NS - 3 (Controller)



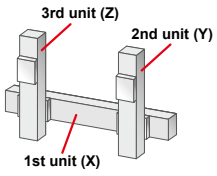
Note. When the customer combines each axis, it is recommended to use the cable terminal (relay cable) for the wiring among axes. For details about cable terminal, please contact YAMAHA.

Double-carrier

Example of 4-axis control

<Example> Two T6 are assembled to the double-carrier of the MF20A, and they are used as XZ type and controlled using one controller.

MLTX - MF20AD - W - M - 850 (1st unit)
- T6 - 12 - BK - 100 (2nd unit)
- T6 - 12 - BK - 100 (3rd unit)
- 3K - RCX240S - N1 - B (Controller)



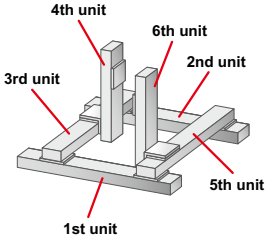
Note. For the double-carrier, since one robot occupies two axes of the controller, the number of robots may differ from the number of controllable axes.

Double-carrier/dual drive (2-axis simultaneous control)

Example of 8-axis control

<Example> Two double-carriers of the MF30 are arranged in parallel and two MF20 installed on the top are moved by the dual-drive.
T6 is attached to each tip of the MF20 and the robots are controlled using two controllers.

MLTX - MF30D - H - L - 950 (1st unit)
- MF30D - H - L - 950 (2nd unit)
- MF20 - H - 1350 (3rd unit)
- T6L - 6 - BK - 100 (4th unit)
- MF20 - H - 1350 (5th unit)
- T6L - 6 - BK - 100 (6th unit)
- 3K - RCX340 - 4 - N - YM1 - NS - 0 - RCX340 - 4 - N - YS - 2 (Controller)



CAUTION

RCX340 requires no regenerative unit.

Conditions needing regenerative unit on multi-robot

- The total motor capacity exceeds 450 W.
- The total motor capacity of the vertical axis exceeds 240 W.
- The B14H performs the operation at a maximum speed of more than 1250 mm/s.
- When the vertical axis is 240 W or less, the conditions shown below are satisfied.
  - There is a 200 W-vertical axis.
  - A 100 W-vertical axis has a stroke of 700 mm or more.
  - There are two 100 W-vertical axes with a 5 mm-lead.