

General Specifications

FA-M3
F3YP14-0N, F3YP18-0N
Positioning Module
(with Multi-channel Pulse Output)

FA-M3

GS34M6H51-02E

General

The F3YP14-0N and F3YP18-0N modules are positioning module with multi-channel pulse outputs. A single module can control four or eight motors (axes). As these modules output pulses, they are well-suited for position command type servo motors and drivers, or pulse motors and drivers.

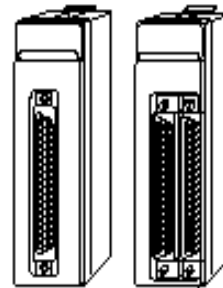
- A short startup time of 0.09 ms maximum enables the modules to start at high speed and synchronize their operation with peripheral devices.
- The modules can output command pulses at high speed to control high speed, high precision linear motors and DD motors.
The maximum output pulse speed is 3.998 Mpps for servo motors, or 499.75 kpps for pulse motors.
- An S-shape acceleration/deceleration speed control function allows the module to move a work piece smoothly at high speed.
- One F3YP18-0N module can control up to eight axes. By using a maximum of 36 F3YP18-0N modules to expand the base unit, you can build a multi-axis positioning system that controls up to 288 axes.

Specifications

Item	Specifications		
	F3YP14-0N	F3YP18-0N	
Number of controlled axes	4	8	
Number of axes controlled simultaneously	4	8	
Control system	Open-loop position control using position command pulse output		
Position control	PTP movement, multi-axis linear interpolation, change in velocity during movement, change in target position during movement		
Output pulse system	RS-422A compliant difference signal. Either forward/reverse pulse output or direction/travel pulse output selectable for each axis		
Maximum speed	3,998,000 pps (for servo motor) 499,750 pps (for pulse motor)		
Acceleration/deceleration system	Automatic trapezoidal acceleration/deceleration (starting velocity programmable) Automatic S-shape acceleration/deceleration (starting velocity fixed)		
Acceleration/deceleration time	0 to 32,767 ms (independently programmable for acceleration and deceleration)		
Command pulse range	-2,147,483,648 to 2,147,483,647 pulses		
Command speed	0.1 to 3,998,000 pps (for servo motor) 0.1 to 499,750 pps (for pulse motor)		
Home position search mode	User-definable using a combination of home position and limit switch inputs Encoder Z-phase input available Automatic home position search mode available		
Home position search speed	Arbitrarily programmable		
External contact input	Positive and negative limit switches, home position switch, encoder Z-phase		
External contact output	Deviation pulse clear signal		
Data backup	Backup using the CPU module Backup using the flash ROM		
Start up time*1	1 axis	0.09 ms	0.09 ms
	4 axes	0.25 ms	0.25 ms
	8 axes	-	0.5 ms
Current consumption	320 mA		380 mA
External power supply	5 V DC, 350 mA		5 V DC, 700 mA
External connection	One 48-pin connector		Two 48-pin connectors
External dimensions	28.9 (W) × 100 (H) × 83.2 (D) mm ^{*2}		
Weight	125 g		145 g

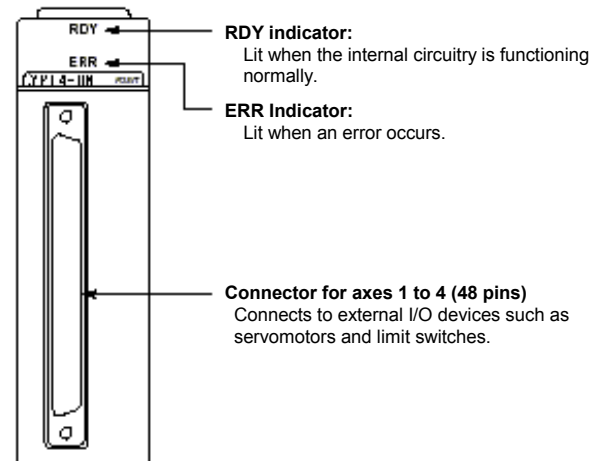
*1: Up to 1 ms delay may be added if another axis is in motion.

*2: Not including protrusions. (See the external dimension diagram for more details).

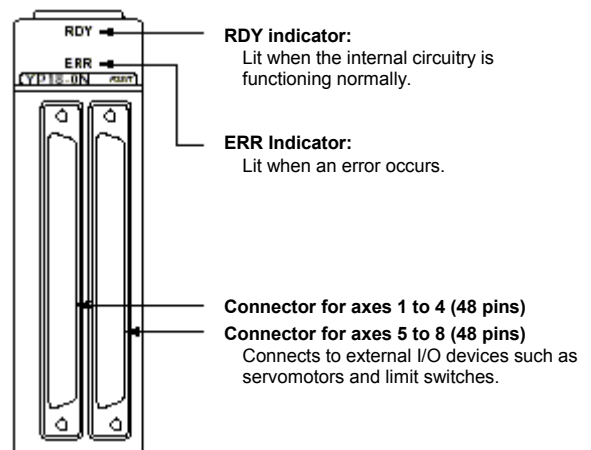


Components and Functions

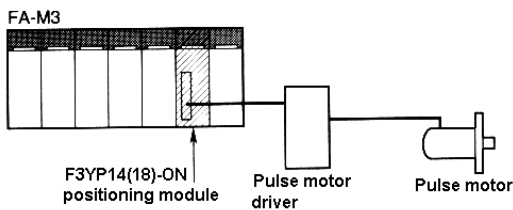
F3YP14-0N (4-axis model)



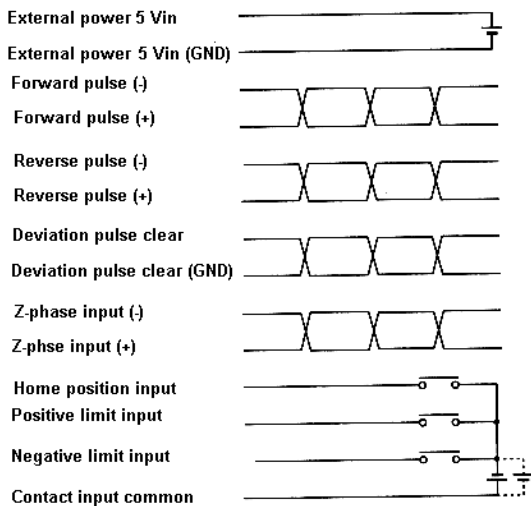
F3YP18-0N (8-axis model)



■ Configuration Example



■ External Connection Diagram



24b	Axis 4 Z-phase input (-)	24a	Axis 2 Z-phase input (-)
23b	Axis 4 Z-phase input (+)	23a	Axis 2 Z-phase input (+)
22b	Axis 4 forward pulse (+)	22a	Axis 2 forward pulse (+)
21b	Axis 4 forward pulse (-)	21a	Axis 2 forward pulse (-)
20b	Axis 4 reverse pulse (+)	20a	Axis 2 reverse pulse (+)
19b	Axis 4 reverse pulse (-)	19a	Axis 2 reverse pulse (-)
18b	Axis 4 deviation pulse clear	18a	Axis 2 deviation pulse clear
17b	Axis 4 deviation pulse clear (GND)	17a	Axis 2 deviation pulse clear (GND)
16b	Axis 3 Z-phase input (-)	16a	Axis 1 Z-phase input (-)
15b	Axis 3 Z-phase input (+)	15a	Axis 1 Z-phase input (+)
14b	Axis 3 forward pulse (+)	14a	Axis 1 forward pulse (+)
13b	Axis 3 forward pulse (-)	13a	Axis 1 forward pulse (-)
12b	Axis 3 reverse pulse (+)	12a	Axis 1 reverse pulse (+)
11b	Axis 3 reverse pulse (-)	11a	Axis 1 reverse pulse (-)
10b	Axis 3 deviation pulse clear	10a	Axis 1 deviation pulse clear
9b	Axis 3 deviation pulse clear (GND)	9a	Axis 1 deviation pulse clear (GND)
8b	External power 5 Vin	8a	External power 5 Vin (GND)
7b	Axis 4 home position input	7a	Axis 2 home position input
6b	Axis 4 positive limit input	6a	Axis 2 positive limit input
5b	Axis 4 negative limit input	5a	Axis 2 negative limit input
4b	Axis 3 home position input	4a	Axis 1 home position input
3b	Axis 3 positive limit input	3a	Axis 1 positive limit input
2b	Axis 3 negative limit input	2a	Axis 1 negative limit input
1b	Contact input common	1a	Contact input common

24b	Axis 8 Z-phase input (-)	24a	Axis 6 Z-phase input (-)
23b	Axis 8 Z-phase input (+)	23a	Axis 6 Z-phase input (+)
22b	Axis 8 forward pulse (+)	22a	Axis 6 forward pulse (+)
21b	Axis 8 forward pulse (-)	21a	Axis 6 forward pulse (-)
20b	Axis 8 reverse pulse (+)	20a	Axis 6 reverse pulse (+)
19b	Axis 8 reverse pulse (-)	19a	Axis 6 reverse pulse (-)
18b	Axis 8 deviation pulse clear	18a	Axis 6 deviation pulse clear
17b	Axis 8 deviation pulse clear (GND)	17a	Axis 6 deviation pulse clear (GND)
16b	Axis 7 Z-phase input (-)	16a	Axis 5 Z-phase input (-)
15b	Axis 7 Z-phase input (+)	15a	Axis 5 Z-phase input (+)
14b	Axis 7 forward pulse (+)	14a	Axis 5 forward pulse (+)
13b	Axis 7 forward pulse (-)	13a	Axis 5 forward pulse (-)
12b	Axis 7 reverse pulse (+)	12a	Axis 5 reverse pulse (+)
11b	Axis 7 reverse pulse (-)	11a	Axis 5 reverse pulse (-)
10b	Axis 7 deviation pulse clear	10a	Axis 5 deviation pulse clear
9b	Axis 7 deviation pulse clear (GND)	9a	Axis 5 deviation pulse clear (GND)
8b	External power 5 Vin	8a	External power 5 Vin (GND)
7b	Axis 8 home position input	7a	Axis 6 home position input
6b	Axis 8 positive limit input	6a	Axis 6 positive limit input
5b	Axis 8 negative limit input	5a	Axis 6 negative limit input
4b	Axis 7 home position input	4a	Axis 5 home position input
3b	Axis 7 positive limit input	3a	Axis 5 positive limit input
2b	Axis 7 negative limit input	2a	Axis 5 negative limit input
1b	Contact input common	1a	Contact input common

- All axes are connected to the external devices in the same manner.
- The external power 5 V is common to all axes. Connect the power cable to one of the two modules connectors, or connect the same power supply to both module connectors.
- All four contact input common pins are internally connected.
- The deviation pulse clear and Z-phase input signals are independently available for each axis.
- The F3YP14-0N model supports only four axes, and thus has only one module connector (left side).

■ Applicable External Connectors

Connection Method	Applicable Connector	Remarks
Soldered	Fujitsu: FCN-361J048-AU connector	Supplied by the user
	FCN-360C048-B connector cover	
Solderless	Fujitsu: FCN-363J048 housing	
	FCN-363J-AU contacts	
	FCN-360C048-B connector cover	
Pressure-welded	Fujitsu: FCN-367J048-AU/F	

■ Operating Environment

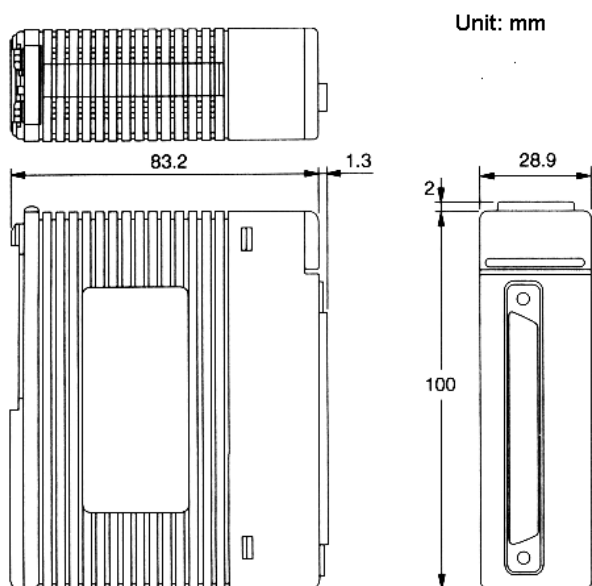
There is no restriction on the type of CPU modules that can be used with these positioning modules.

■ Model and Suffix Codes

Model	Suffix Code	Style Code	Option Code	Description
F3YP14	-0N	4-axis, multi-channel pulse output 3,998,000 pps max. (for servomotor) or 499,750 pps max. (for pulse motor)
F3YP18	-0N	8-axis, multi-channel pulse output 3,998,000 pps max. (for servomotor) or 499,750 pps max. (for pulse motor)

Note: For information on connectors, see the section on spare parts in the FA-M3 Range-free Multi-controller (GS 34M6A01-01E).

External Dimensions



Note: External dimension diagram for the F3Y14-ON model.

Electrical Data

1. Input Signals

Signal	Input	Rated Input Voltage (Operating Voltage Range)	Rated Input Current	Operating voltage/current	
				ON	OFF
External contact input	DC voltage	24 V DC (20.4 to 26.4 V DC)	3.1 mA	19.2 V DC min. 2.4 mA min.	5.8 V DC max. 0.9 mA max.
Encoder Z-phase input	DC voltage	5 V DC (4.25 to 5.5 V DC)	15.3 mA	3.5 V DC min. 9 mA min.	1.5 V DC max. 2 mA max.

2. Output signals

Signal		Output	Rated Load Voltage (Max. Load Voltage)	Max. Load Current	ON-time Residual Voltage	OFF-time Leakage Current
Deviation pulse clear	Open collector	Transistor contact	24V DC (26.4V DC)	100 mA/ point	1.5 V DC max.	0.1 mA max.
Pulse output	Line driver	RS422-compliant difference signal	—	—	—	—