

FP-XH SERIES

Programmable controller

**Compact terminal block
type controller**



Superior performance and great functionality

High-speed operation

- > Basic instructions: 0.04 μ s/step (up to 7k steps)
- > High-level instructions: 0.22 μ s/step (up to 7k steps)
- > 8 x faster than conventional models

Large program capacity

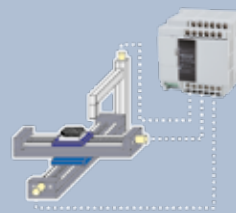
- > Up to 40k steps (for **C14**: 16k steps)
- > 24k / 32k / 40k steps (configurable)

Multi-axis positioning control

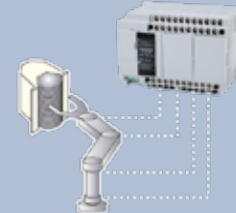
- > Built-in 100kHz high-speed pulse output function for up to 6 axes
- > Transistor output type: built-in pulse output function for 3 axes for **C14**, 4 axes for **C30** and 6 axes for **C60**

X-Y table + Machining head

Semiconductor wafer take-out blade



C14: 3-axis control



C30 / C60: 4-axis control

Expandable to 382 inputs/outputs with FPOR expansion units

- > One control unit can be expanded with up to 8 expansion units
- > Max. number of inputs / outputs: 300 (382 inputs/outputs when using **FPOR** expansion units and add-on cassettes)
- > Up to 4 add-on cassettes can be added (for **C30, C60**)



Max. 8 units

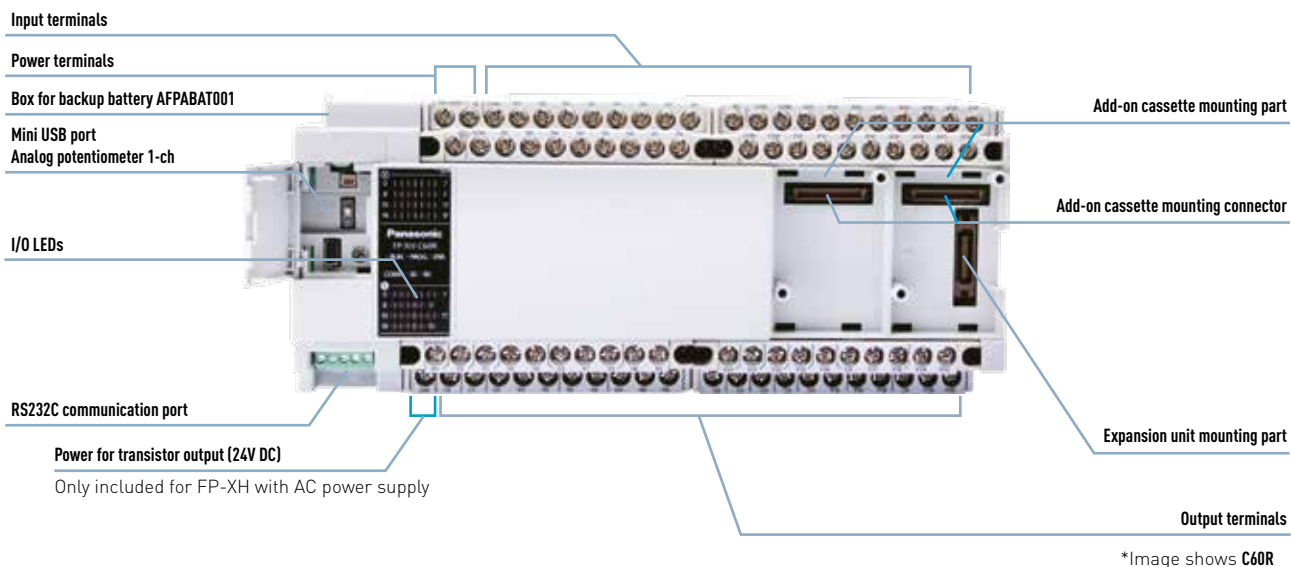
Max. 338
inputs/outputs

382 points when using
FPOR expansion units
and add-on cassettes

Network

- > Communication port: Max. 5 channels
Support for up to 5 channels including 2 communication cassettes (2-channel type) and TOOL port.
- > PLC Link
Bit data and word data can be shared (linked) via connection with **FP-XH** (up to 16 units).
- > Compatible with Modbus-RTU
Modbus-RTU master / slave functionality

Parts and functions



Improved functionality

Integrated motion controller
No restrictions on combining add-on cassettes

Full compatibility to FP-X

Existing FP-X programs can be reused

Expandability

Expandable with up to 8 expansion units
Up to 4 add-on cassettes possible (C30, C60 only)

Size

Slightly larger footprint than equivalent FP-X

C14: 26mm wider, 3mm deeper
C30 / C60: 30mm wider, 3mm deeper

Function comparison table

Comparison items		FP-XH	FP-X
Operation speed	Basic instruction	0.04 μ s/step (under 7k steps) 0.7 μ s/step (7k steps or more)	0.32 μ s/step
	High-level instruction	0.22 μ s/step (under 7k steps) 1.73 μ s/step (7k steps or more)	7.5 μ s/step
Program capacity	C14	16k steps	16k steps
	C30 / C60	24k / 32k / 40k steps (depending on system register setting)	32k steps
Pulse output performance	Transistor output type	100kHz \times 3 channels / 4 channels / 6 channels	100kHz \times 2 channels + 20kHz \times 2 channels
	Relay output type	100kHz \times 2 channels (when pulse output cassette is used)	100kHz \times 1 channel or 80kHz \times 2 channels (when pulse output cassette is used)
High-speed counter performance	Transistor output type	100kHz \times 4 channels / 6 channels + 10kHz \times 4 channels (6-channel pulse output only for 60-point transistor output type)	50kHz \times 4 channels + 10kHz \times 4 channels
	Relay output type	(Built-in) 10kHz \times 8 channels (Pulse output cassette) 100kHz \times 4 channels	(Built-in) 10kHz \times 8 channels (Pulse output cassette) 50kHz \times 4 channels
Communication	Communication port (control unit)	USB \times 1 (USB 2.0 compatible) + RS232C \times 1	USB \times 1 + RS232C \times 1 *Round-pin RS232C port
	Communication port (add-on cassette)	Max. 4 channels	Max. 2 channels
Others	Positioning control	Dedicated software + Control by new instructions	Control by high-level instructions
	Analog input / potentiometer input	1 channel	C14 / C30: 2 channels, C60: 4 channels
	Cassette combination restrictions	No	Yes
	Programming software	Control FPWIN Pro 7	Control FPWIN Pro 7
	Backup battery	AFPBAT001	AFPX-BATT

Programming software

Control FPCWIN Pro7



Programming software Control FPCWIN Pro with PLC open certification

Control FPCWIN Pro is the Panasonic programming software developed according to the international standard IEC 61131-3. **Control FPCWIN Pro** is the universal software for all Panasonic PLC's and the **ELC500** control unit.

- > Programs written in older versions will run with **Control FPCWIN Pro7**.
- > Programs are compatible across FP series PLCs, e.g. **FP0R** programs will run with minor adjustments on **FPΣ** (Sigma) and **FP7** PLCs.
- > **Control FPCWIN Pro7** offers a choice of editors, thus allowing you to select the programming language you are most familiar with.

Part number list

Product name	Power supply	Specifications	Program capacity	Part number
FP-XH C14R	100 to 240V AC	8-point input of 24V DC, 6-point relay output of 2A	16k steps	AFPXHC14R
FP-XH C14RD	24V DC	8-point input of 24V DC, 6-point relay output of 2A	16k steps	AFPXHC14RD
FP-XH C14T	100 to 240V AC	8-point input of 24V DC, 0.5 A / 5 to 24V DC, 6-point output of transistor (NPN)	16k steps	AFPXHC14T
FP-XH C14TD	24V DC	8-point input of 24V DC, 0.5 A / 5 to 24V DC, 6-point output of transistor (NPN)	16k steps	AFPXHC14TD
FP-XH C30R	100 to 240V AC	16-point input of 24V DC, 14-point relay output of 2A	32k steps	AFPXHC30R
FP-XH C30RD	24V DC	16-point input of 24V DC, 14-point relay output of 2A	32k steps	AFPXHC30RD
FP-XH C30T	100 to 240V AC	16-point input of 24V DC, 0.5 A / 5 to 24V DC, 14-point output of transistor (NPN)	32k steps	AFPXHC30T
FP-XH C30TD	24V DC	16-point input of 24V DC, 0.5 A / 5 to 24V DC, 14-point output of transistor (NPN)	32k steps	AFPXHC30TD
FP-XH C60R	100 to 240V AC	32-point input of 24V DC, 28-point relay output of 2A	32k steps	AFPXHC60R
FP-XH C60RD	24V DC	32-point input of 24V DC, 28-point relay output of 2A	32k steps	AFPXHC60RD
FP-XH C60T	100 to 240V AC	32-point input of 24V DC, 0.5A / 5 to 24V DC, 28-point output of transistor (NPN)	32k steps	AFPXHC60T
FP-XH C60TD	24V DC	32-point input of 24V DC, 0.5A / 5 to 24V DC, 28-point output of transistor (NPN)	32k steps	AFPXHC60TD

Product name	Type	Specifications	Part No.
Programming software for Windows® Control FPCWIN Pro7	English, German, French, Italian, Spanisch	FP series all models (for FP7 series, supports only CPU unit without encryption function)	AFPSPR7A
	Security enhanced type	FP series all models (for FP7 series, supports CPUs without encryption function (the encryption function will be offered in the future).	AFPSPR7AS

Note: Windows is trademarks or registered trademarks of Microsoft Corporation in the United States and other countries.

Option

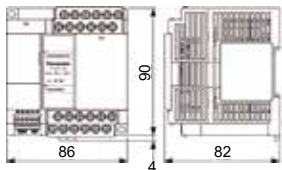
Product name	Specifications	Part No.
FP-XH backup battery	Required when expanding the hold area of the operation memory or when using the clock / calendar function	AFPBAT001

General specifications

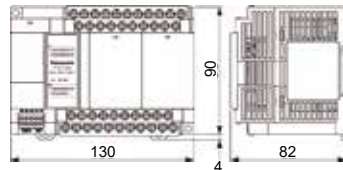
Item	Specifications			
Ambient temperature	0 to +55°C			
Storage temperature	-40 to +70°C			
Operating humidity	10 to 95% RH (at +25°C, non-condensing)			
Storage humidity	10 to 95% RH (at +25°C, non-condensing)			
Breakdown voltage (initial value at shipment: cutoff current 5mA)	Relay output	Between power supply terminal and earth terminal	1500V AC for 1 minute	500V AC for 1 minute
		Between power supply terminal and service power supply terminal	1500V AC for 1 minute	-
		Between input terminal and earth terminal	1500V AC for 1 minute	500V AC for 1 minute
	Transistor output	Between output terminal and earth terminal	1500V AC for 1 minute	1500V AC for 1 minute
		Between power supply terminal and earth terminal	1500V AC for 1 minute	500V AC for 1 minute
		Between power supply terminal and service power supply terminal	1500V AC for 1 minute	-
		Between input terminal and earth terminal	1500V AC for 1 minute	500V AC for 1 minute
		Between output terminal and earth terminal	500V AC for 1 minute	500V AC for 1 minute
		Between output terminal and earth terminal	500V AC for 1 minute	500V AC for 1 minute
Insulation resistance	Between power supply terminal and earth terminal	Min. 100MΩ (500V DC using an insulation resistance meter)		
	Between power supply terminal and service power supply terminal			
	Between input terminal and earth terminal			
	Between output terminal and earth terminal			
Vibration resistance	5 to 8.4Hz, 3.5mm single amplitude 8.4 to 150Hz, acceleration 9.8m/s ² 10 minutes every X-, Y-, and Z-axis [1 octave/min]			
Shock resistance	147m/s ² , 4 times every X-, Y-, and Z-axis			
Noise resistance	1,000V [P-P] with pulse widths of 50ns and 1μs (using a noise simulator) [Power supply terminal]			
Operation conditions	Free from corrosive gases and excessive dust			
CE conformity	EMC directive: EN 61131-2			
Overvoltage category	Category II			
Pollution degree	2			

Dimensions (Unit: mm)

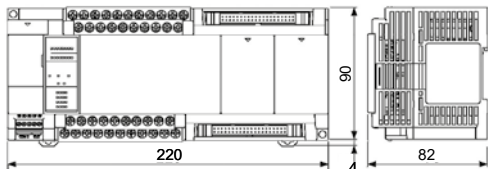
AFPXHC14



AFPXHC30



AFPXHC60



The CAD data can be downloaded from our website.

Functional specifications

Item	Specifications		
Control method	Cyclic operation		
Program memory	Built-in flash ROM		
Program capacity	C14 : 16k steps, C30 / C60 : 24k / 32k / 40k steps (depending on system register setting)		
Basic instructions	Approx. 110		
High-level instructions	Approx. 220		
Operation speed	Basic instruction (ST): Approx. 0.04μs/step (under 7k steps)		
	Approx. 0.7μs/step (7k steps or more) High-level instruction: Approx. 0.22μs/step (under 7k steps) Approx. 1.73μs/step (7k steps or more)		
Operation memory	Link relay	External input (X)	1760 points (X0 to X109F)
		External output (Y)	1760 points (Y0 to Y109F)
		Internal relay (R)	Default: 8192 points (R0 to R511F) FP-X compatible specifications: 4096 points
		Special internal relay (R)	240 points
		Timer / Counter (T / C)	1024 points (initial setting: timer 1008 points, counter 16 points)
		Link relay (L)	2048 points (L0 to L127F)
	Memory area	Data register (DT)	C14 : 12k words, C30 / C60 : 64k, 32k, 12k words <small>*For C30 / C60, DT capacity varies according to the program capacity</small>
		Special data register DT	500 words
		Link data register (LD)	256 words (LD0 to LD255)
		File register (FL)	None
		Index register (I)	14 words (I0 to I13)
Master control relay points (MCR)	256 points		
Number of labels (JMP + LOOP)	256 points		
Number of SFC steps	1000 steps		
Number of subroutines	500 subroutines		
Number of interrupt program	Transistor output type: input 8, constant 1 Relay output type: input 11 (for C30 / C60 : 14), constant 1		
High-speed counter	CPU input	Transistor output type: Single-phase 8 channels (100kHz × 4, 10kHz × 4) or 2-phase 4 channels (50kHz × 2, 10kHz × 2) Relay output type: Single-phase 8 channels (10kHz × 8) or 2-phase 4 channels (10kHz × 4)	
	Pulse I/O with cassette installed	Transistor output type: installation not possible Relay output type: C14 : Single-phase 2 channels (100kHz × 2) or 2-phase 1 channel (50 Hz × 1) C30 / C60 : Single-phase 4 channels (100kHz × 4) or 2-phase 2 channels (50kHz × 2) *with two cassettes installed	
Pulse output / PWM output	Control unit output	Transistor output type: C14 : 3 channels, C30 : 4 channels, C60 : 6 channels Pulse output: each 100kHz PWM output: 3 channels (C14), 4 channels (other than C14) 1Hz to 70kHz [Resolution of 1000] 70.001kHz to 100kHz [Resolution of 100]	
	Pulse I/O with cassette installed	Relay output type: C14 : 1 channel, C30 / C60 : 2 channels (with two cassettes installed) Pulse output: each 100kHz PWM output: 1 channel (C14), 2 channels (other than C14) (with two cassettes installed) 1Hz to 70kHz [resolution of 1000] 70.001kHz to 100kHz [resolution of 100]	
Pulse catch input	Transistor output type: 8 points (CPU input: 8 points)		
Interrupt input	Relay output type: 14 points (CPU input: 8 points, pulse I/O cassette: 3 points × 2)		
Periodical interrupt	0.1ms to 30s		
Potentiometer input	1 channel (0 to 4000)		
Input time constant processing	Available		
Clock / calendar	Available (only when the master memory cassette AFPX-MRTC and battery are installed)		
Automatic flash ROM backup when power is off	Counter: 16 points, internal relay: 128 points, data register: 315 words		
Battery backup	Memory set in hold area of system register (only when battery is installed)		
Battery lifetime	Min. 5 years when operating 8 hours a day (depending on conditions of use)		
Password	Yes (4 digits, 8 digits or 32 digits)		
Self-diagnostic function	Watchdog timer, program syntax check, etc.		
PLC link function	Max. 16 units, link flag: 1024 points, link register: 128 words (data transfer, no remote programming)		
Rewriting in RUN mode	Max. 512 steps (downloading in RUN mode, program rewriting in RUN mode)		



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