Panasonic

Network Motion System

FP-XH M8N
MINAS A6N

RTEX

Realtime Express

Outstanding real-time performance

One Stop

With one control unit,
freely operate up to 8 axes

High speed processing:
prompt and accurate response to commands.

Instantaneous real-time response

FP-XH M8N

System features

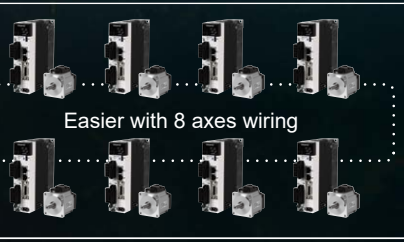
Simple

Simpler wiring: cuts labor time for design and installation.

Motion command

Driver information feedback

Ethernet cable



Easier with 8 axes wiring

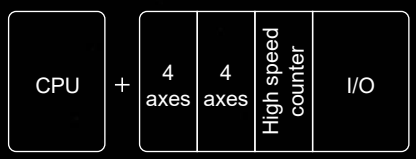
High performance

High speed network and high performance servo bring synchronous control

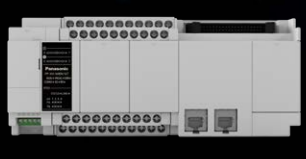
FP-XH M8N	RTEX	MINAS A6N
Position (interpolation): Helical control	Ethernet base	Frequency response: 3.2 kHz
Synchronization: Gantry / Cam control	CAT5e cable	Maximum speed: 6,500 r/min.
Command update period 1 ms	Highly immune to noise	Max. pulse frequency: 4 Gpps Resolution: 23 bits

All-in-one

All-in controller, additional units not required



BEFORE: Additional unit for each function



AFTER: Less costly single unit

Number of max. axes controlled: 8 axes
General-purpose input: 8 points
General-purpose output: 8 points
High speed counter: 4 channels

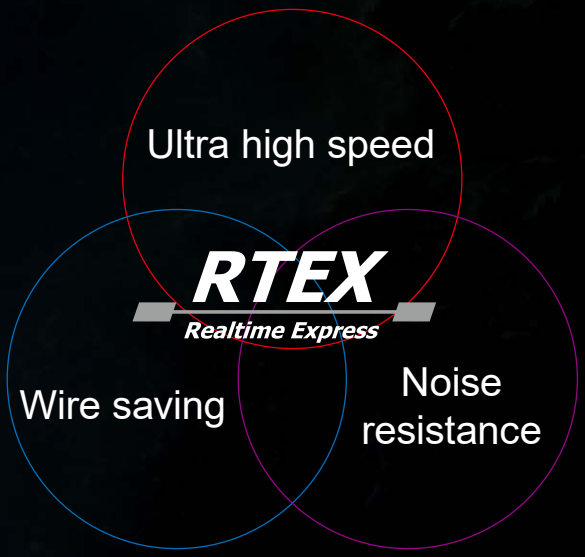
Solution

RTEX
Realtime Express

MINAS A6N

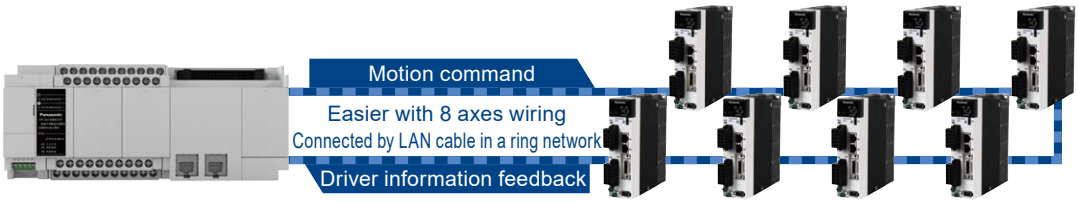
What is RTEX?

Developed independently by Panasonic, the RTEX (RealTime EXpress) network provides what's needed for servo control: advanced real-time performance and synchronism.



Realtime Express
= Ultra high speed network for motions

Easy connection with LAN cable
Reliably resists noise



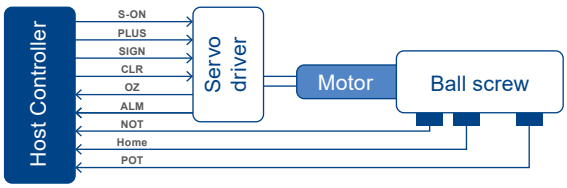
Simpler wiring: cuts labor time for design and installation.

Wire saving and Easy set up

Wire saving

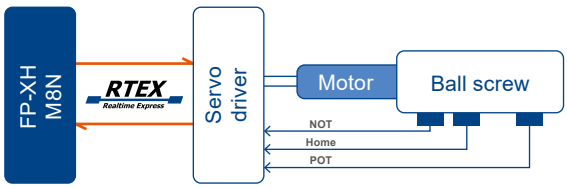
Conventional system (Pulse train control)

Many connections required for control signals



New system (RTEX system)

Simplified wiring and less troubleshooting



Easy set up

Just set the station number of the servo driver!

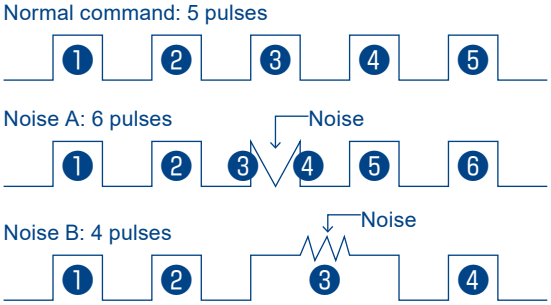
Intricate network-related settings not required!

Noise-resistant transmission method

Conventional system (Pulse train control)

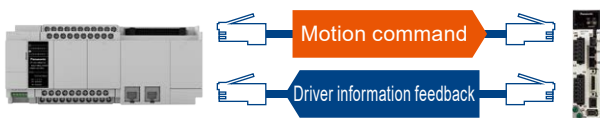
CPU + Positioning unit (Pulse)

Owing to noise, pulse waveforms may shift position.



New system (RTEX system)

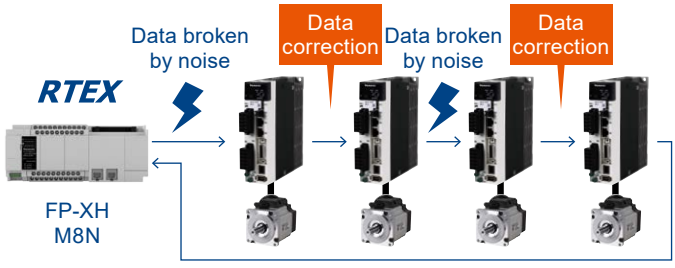
CPU with built-in motion functions



Error correction assures real-time performance

Strong noise immunity

With built-in error correction function, noise immunity exceeds 2.5 kV. This complies with IEC61000-4-4.

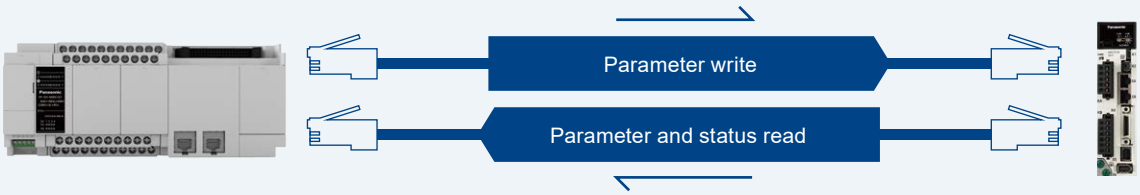


*Error correction function is effective only within limits. If corruption cannot be corrected, communication failure occurs.

Enable system monitoring and preventative maintenance

Implement a highly accurate servo system

Enables both parameter R/W from controller and control and monitoring by status monitor

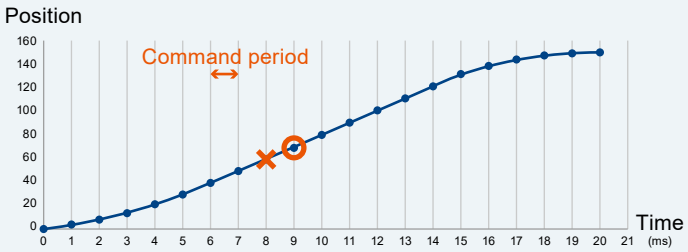


Parameter read/write enabled	Parameter R/W function enables parameter read/write from **FP-XH**. From the host unit, as the need arises, you can change parameters.
Real time monitoring enables	In real time, the **FP-XH** can monitor position, speed, torque, and various other items. If a problem occurs, immediate alarm code read out allows rapid analysis. Position error・Encoder resolution・Internal commanded position (after filtering)・Actual velocity・Torque command・Actual position・Internal commanded position (before filtering)・Latched position 1・Latched position 2・Commanded velocity (after filtering)・Regenerative load factor・Over-load factor・Logic input/output・Inertia ratio・Motor auto-sensing effective state・Non-rotating contributing factor・Warning flag・Mechanical angle (one turn data)・Electrical angle・Multi-turn data・Power-ON time・Temperature (Drive, Encoder)・Inrush resistance relay change count・Dynamic brake relay change count・Fan ON time・Fan life cumulative value・Capacitor life cumulative value・P-N voltage・RTEX communication error count・Encoder communication error count

RTEX system enables highly accurate motion

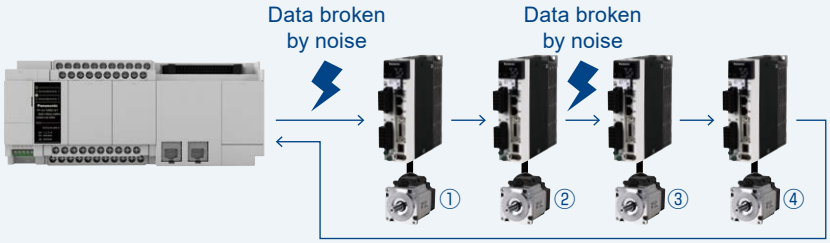
Cyclic position command

Target value command issued for each position command cycle
Optimal interpolation and synchronization control



Absolute position command

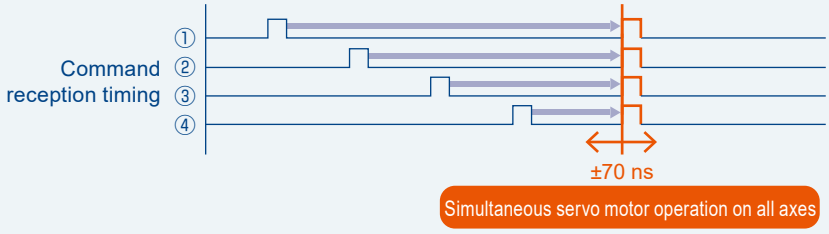
If noise, etc. causes data loss, recovers with next position command.



Isochronous transmission

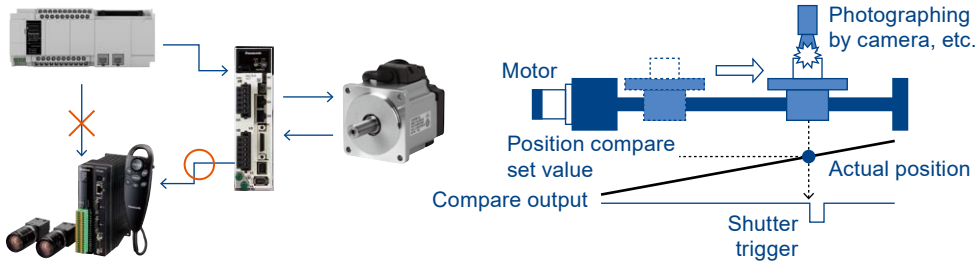
If reception timing discrepancy occurs, the servo driver adjusts timing to simultaneously control all axes.

For 4 axes control, operation time between axes
Error: ±70 ns



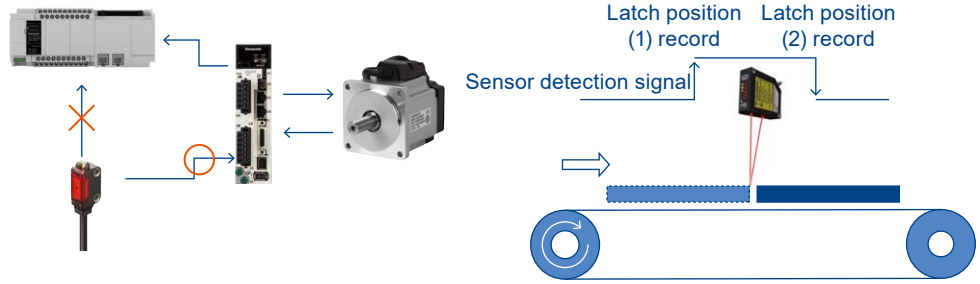
Full complement of other features

Highly accurate position compare



The servo driver can compare the position data from servo motor encoder and output at the point of position compare set value.
This motion control system enables an inspection in the actual position without controller calculation lag or communication delay via the network.

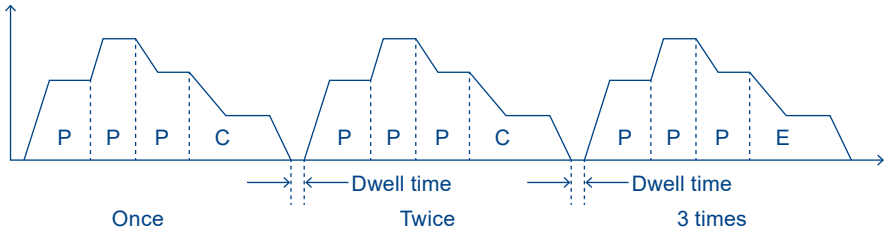
Highly accurate position latch



Servo motor encode position data is acquired by inputting sensor signals, etc., directly to the servo driver.
Positioning can be accurately measured without delays incurred by controller communication and operation via the network.

Position repeat function

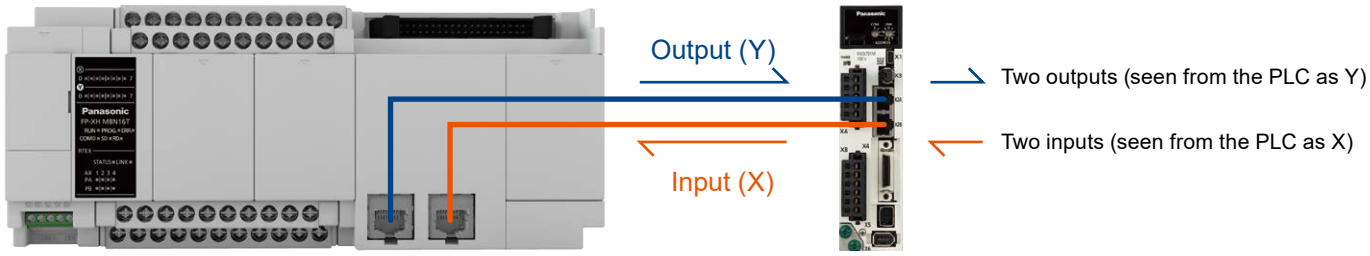
<Example for three consecutive operations>
Write “3” in the count area and simply start-up action to realize the operation shown below.



Repeat count (2 to 254 times) can be specified to repeat the same control pattern operation or the same control pattern can be operated continuously for an indefinite period (pitch feed, etc.).

Servo driver has general-purpose input/output built in.

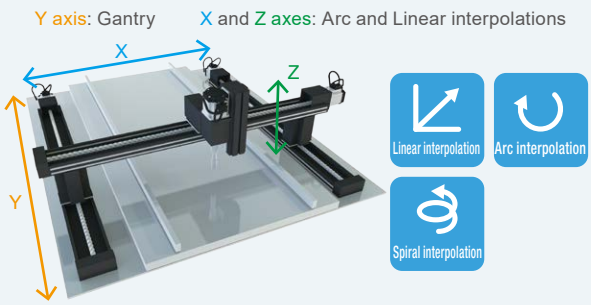
The servo driver comes with two DC inputs and two DC outputs. Through the network, on the PLC, these are recognized as X and Y.
Locally, at the control axis, various sensor signal input and output for lamp light-up can be controlled using the PLC. In this way, you can avoid additional I/O costs.



Suitable for different applications

Control of gantry mechanism

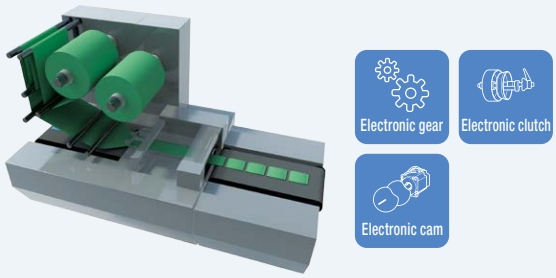
2-axis gantry control together with interpolation control enables smooth and highly accurate stage control.



Main application sectors: Electronic parts, liquid crystal manufacturing, machine tools, etc.
Main application devices: Inspection equipment, coaters, laser scanners, etc.

Control of cam mechanism

Preset cam operation synchronized with the main axis enables control of the rotation of the slave axis motor.



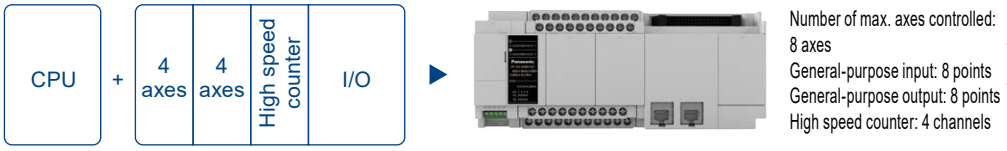
Main application sectors: Packaging equipment, food/chemicals, general machinery, etc.
Main application devices: Rotary cutters, printing machine, inserters, etc.

《All-in-one》

Motion control 8 axes | General-purpose 16 inputs and outputs (Max. 338 points) | High speed counter 4 channels

Compatible pulser | Serial communication Max. 5 channels | Expandable via Ethernet communication | Expandable analog input/output

With an all-in controller, you don't need additional units



BEFORE: Additional unit for each function

AFTER: Less costly single unit

Number of max. axes controlled: 8 axes
General-purpose input: 8 points
General-purpose output: 8 points
High speed counter: 4 channels

Cuts your costs

《High speed processing》

High speed logic CPU	RTEX communication
Basic instruction processing: 0.04 μs / step Control cycle: 0.5 ms / 5 k steps	Command update cycle: 1.0 ms / 8 axes

《Max. 338 points input/output control possible (with **FP0R** expansion units)》

FP-XH M8N | **FP-X** Expansion units | **AFPX -EFP0** **FP0R** Expansion

Main unit 16 points and Cassette 16 points

Max. 7 units 210 points

Max. 3 units 96 points

Max. 338 points

Add-on cassette

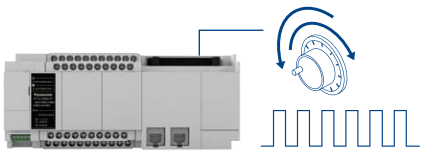
Network (RTEX)

《Pulser input function》

By connecting pulsers, operations on each axis can be controlled manually.

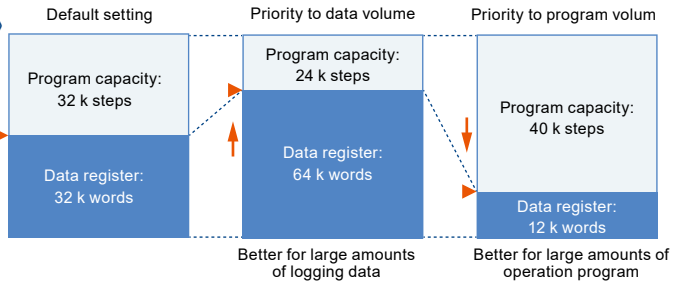
Specifications

- Number of channel: Max. 4 channels (Pulser input and high speed counter combined)
- Counting area: -2,147,483,648 to 2,147,483,647 pulses
- Input mode: Phase input, Direction discrimination input and Individual input (Multiplier function for each mode)

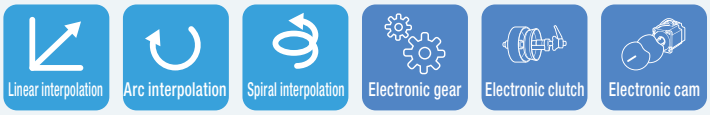


《Adjustable operation memory (three levels switchable)》

Shared data capacity avoids insufficiencies.
Possible to switch levels according to specifications



《Full suite of motion functions》



2-/3-axis interpolation control

Type	Action designation mode	Necessary data
2-axis linear interpolation control	Resultant speed assignment	Resultant speed of the X-axis and Y-axis
	Long-axis speed assignment	Speed of the long-axis (axis with longer moving distance)
2-axis arc interpolation control	Center point assignment / CW direction	X-axis and Y-axis coordinates of center point
	Center point assignment / CCW direction	X-axis and Y-axis coordinates of center point
	Passing point assignment	X-axis and Y-axis coordinates of passing point on the arc
3-axis linear interpolation control	Resultant speed assignment	Resultant speed of the X-axis, Y-axis and Z-axis
	Long-axis speed assignment	Speed of the long-axis (axis with longer moving distance)
3-axis spiral interpolation control	Center point assignment / CW direction / X-axis feeding	Y-axis and Z-axis coordinates of center point
	Center point assignment / CCW direction / X-axis feeding	Y-axis and Z-axis coordinates of center point
	Center point assignment / CW direction / Y-axis feeding	X-axis and Z-axis coordinates of center point
	Center point assignment / CCW direction / Y-axis feeding	X-axis and Z-axis coordinates of center point
	Center point assignment / CW direction / Z-axis feeding	X-axis and Y-axis coordinates of center point
	Center point assignment / CCW direction / Z-axis feeding	X-axis and Y-axis coordinates of center point
	Passing point assignment / X-axis feeding	Y-axis and Z-axis coordinates of passing point on the arc
	Passing point assignment / Y-axis feeding	X-axis and Z-axis coordinates of passing point on the arc
	Passing point assignment / Z-axis feeding	X-axis and Y-axis coordinates of passing point on the arc

Pulse input

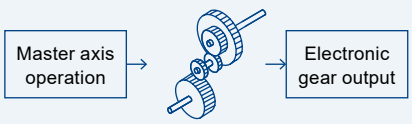
Multi-axis synchronous control

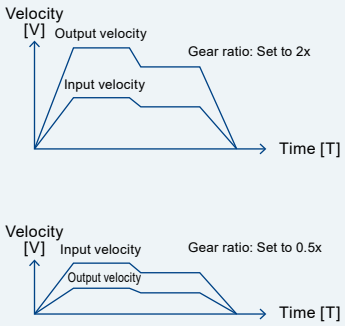
Master axis operation

Slave axis output

Electronic gear

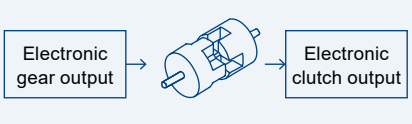
The electronic gear function changes the master axis and slave axis speed ratio.

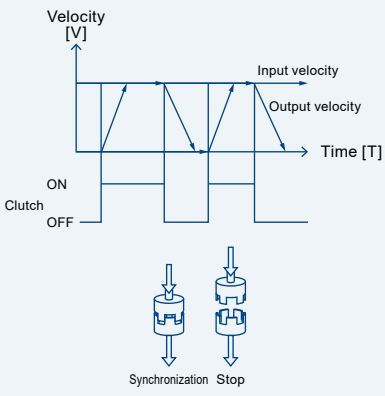




Electronic clutch

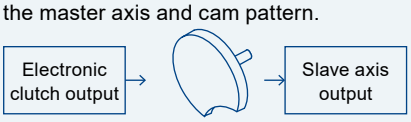
The electronic clutch function is used to engage the clutch.

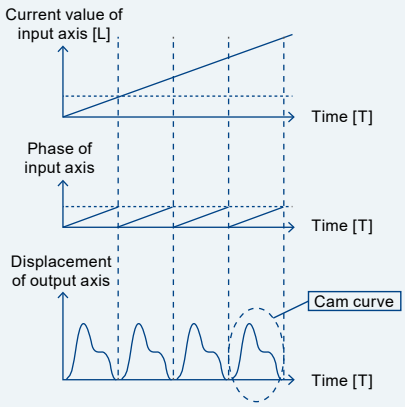




Electronic cam

The electronic cam function determines and outputs the movement amount of the slave axis according to the operation of the master axis and cam pattern.





Communication function

Communication port

●Compatible communication cassettes

AFPX-COM1 (RS232C)
AFPX-COM2 (RS232C+RS232C)
AFPX-COM3 (RS485)
AFPX-COM4 (RS485+RS232C)
AFPX-COM5 (Ethernet+RS232C)
AFPX-COM6 (RS485+RS485)

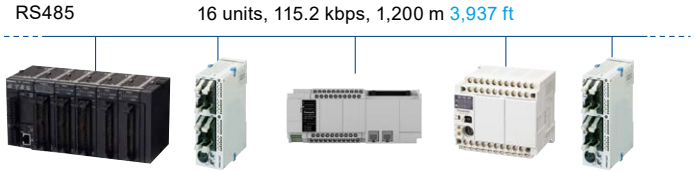
This product has RS232C communication port and USB 2.0 interface, and expansion with up to four channels is possible. (RS232C, RS485 and Ethernet)

PLC link (MEWNET-W0)

FPΣ, **FP-X**, and **FP7** can be used in combination. Moreover, without any programming, up to 16 PLC units can be connected, contact and data can be shared.

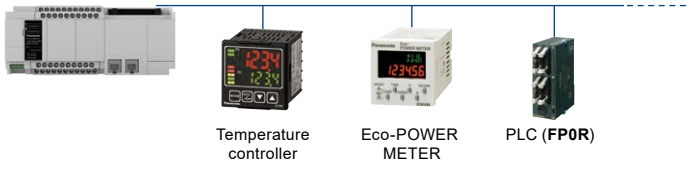
Item	Specifications
Number of station	16 units
Transmission speed	Max. 230 kbps (Note)
Transmission distance	Max. 1,200 m 3,937 ft
Shared data	128 words (Link register) 64 words (Link relay)

Note: Only with **FP-XH**; otherwise, 115 kbps.



Modbus*

Compatible with Modbus* RTU master/slave communications, an industry standard in worldwide use. Dominant in air conditioning, temperature control, and other applications.



Can be used as master
[F145 (SEND), F146 (RECV) instructions]
Easy communications with temperature controller, other PLCs, etc. are possible.

Note: Can also be used as slave

*Communications protocol developed by Modicon Inc. in U.S.

Expansion function

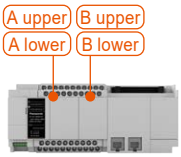
Add-on cassettes (Lineup)

Have you been saying, “We just need a little more expansion”? or “We’d like to add to our current set up”? If so, something from our varied lineup of add-on cassettes is bound to fit your needs.

○: Available
×: Not available

Add-on cassettes		Part No.	Specifications	A lower	A upper	B lower	B upper
Application cassettes	I/O cassette	**AFPX-IN4T3**	4-point input of 24 V DC, bi-directional (sink / source), 3-point output of NPN transistor 0.3 A / 24 V DC	○	×	○	×
	Input cassette	**AFPX-IN8**	8-point input of 24 V DC, bi-directional (sink / source)	○	×	○	×
	Output cassette	**AFPX-TR8**	8-point output of NPN transistor, 0.3 A / 24 V DC	○	×	○	×
		AFPX-TR6P	6-point output of PNP transistor, 0.5 A / 24 V DC	○	×	○	×
	Analog input cassette	**AFPX-AD2**	2-point analog input, 0 to 10 V / 0 to 20 mA, 12-bit, 2 ms / 2 channels	○	×	○	×
	Analog output cassette	**AFPX-DA2**	2-point analog output, 0 to 10 V / 0 to 20 mA, 12-bit, 2 ms / 2 channels	○	×	○	×
	Analog I/O cassette	**AFPX-A21**	2-point analog input, 0 to 5 V / 0 to 10 V or 0 to 20 mA, 12-bit, 2 ms / 2 channels 1 point analog output, 0 to 10 V / 0 to 20 mA, 12-bit, 1 ms / 1 channel	○	×	○	×
	Thermocouple input cassette	**AFPX-TC2**	2-point thermocouple input, K / J type, Resolution: 0.2 °C, 200 ms / 2 channels between channels: insulated	○	×	○	×
	R.T.D. input cassette	**AFPX-RTD2**	2-points R.T.D. input, Pt100, Resolution: 0.1 °C, 200 ms between channels: insulated	○	×	○	×
	Master memory (Only one unit can be installed)	**AFPX-MRTC**	Storage/transfer of 32 k steps program and all comments, Real time clock (RTC)	○	×	○	×
Communication cassette (Only one unit of any of these can be installed)		**AFPX-COM1**	RS232C 1 channel	○	○	○	○
		AFPX-COM2	RS232C 2 channels	○	○	○	○
		AFPX-COM3	RS485 (RS422 selectable) 1 channel	○	○	○	○
		AFPX-COM4	RS485 1 channel and RS232C 1 channel	○	○	○	○
		AFPX-COM5	Ethernet 1 channel and RS232C 1 channel	○	○	○	○
		AFPX-COM6	RS485 2 channels	○	○	○	○

●Mounting position
(See table above)

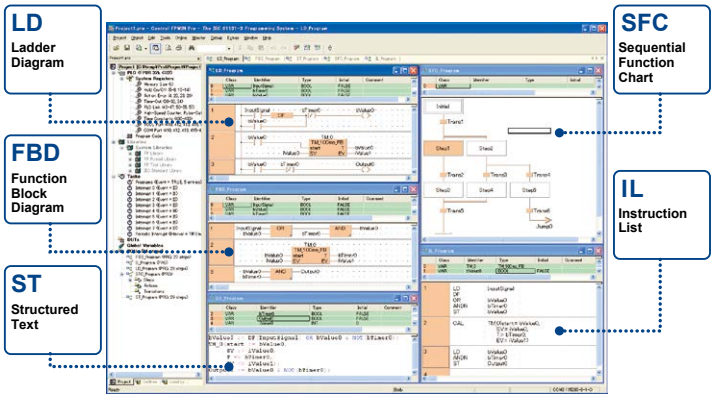


*Up to two each of application cassettes and communication cassettes can be installed.
However, only one master memory cassette can be installed.
*When stacking cassettes, install communication cassettes above application cassettes.
*Not compatible with pulse output cassette

Programming software

Control FPWIN Pro7 (IEC61131-3 compliant Windows version software)

Compliant with international standard IEC61131-3 Programming software approved by PLCopen



Features

1. Five programming languages can be used.
Programming can be done using the language most familiar to the developer or using the language most suited to the process to be performed. High-level (structured text) languages that allow structuring, such as C, are supported.

2. Easy to reuse well-proven programs
Efficiency when writing programs has been greatly increased by being able to split programming up for each function and process using structured programming.

3. Keep know-how from getting out
By "black boxing" a part of a program, you can prevent know-how from leaking out and improve the program's maintainability.

4. Uploading of source programs from PLC possible.
Maintainability increased by being able to load programs and comments from the PLC.

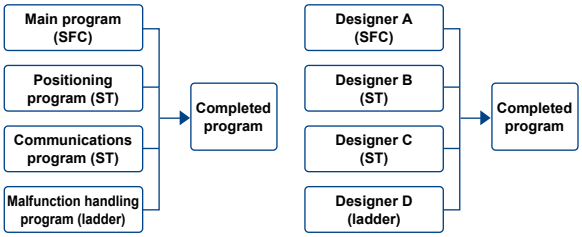
5. Programming for all models in the FP series possible.

- **Programming in the language most suited to the process**

  Easy-to-understand, efficient programs can be created, for example, by using a ladder program for machine control or ST for communications control.

- **Programming in the language you are good at**

  Programming time can be greatly reduced by the easy ability to split and then integrate programming for each function and process.



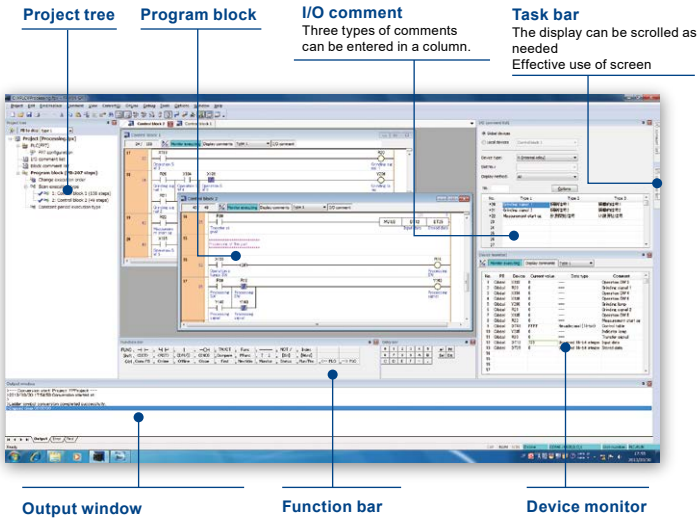
Operational Environment

OS	Windows® 7 SP1 or later (32-bit / 64-bit) / Windows®8 (32-bit / 64-bit) / Windows®8.1 (32-bit / 64-bit) / Windows®10 (32-bit / 64-bit) (Note)
Available hard disk space	More than 400 MB
Recommended CPU	Intel®Core™ 2 Duo 2 GHz or better
Recommended system RAM	More than 1 GB
Recommended display resolution	1,280 × 800 or more
Applicable PLCs	All **FP** series

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

Control FPWIN GR7 (Windows version software)

The ladder programming software for **FP** series -- highly operational software tool for maximizing convenience in the field



Features

1. To minimize effort and maximize ease of use, keyboard operability has been improved.

2. Programs can be created in block segments.

3. Wizard makes it easy to create positioning program.

Operational Environment

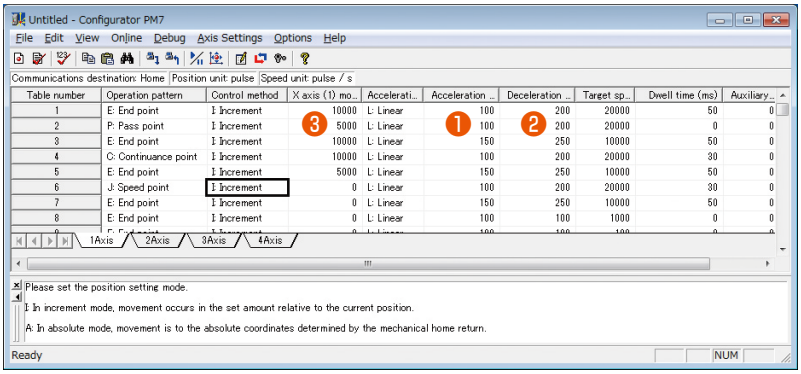
OS	Windows® XP SP3 / Windows Vista® SP2 / Windows® 7 SP1 or later (32-bit / 64-bit) / Windows®8 (32-bit / 64-bit) / Windows®8.1 (32-bit / 64-bit) / Windows®10 (32-bit / 64-bit) (Note 1)
Available hard disk space	More than 120 MB
Recommended CPU	Intel® Core™2 Duo 2 GHz or better
Recommended system RAM	More than 1 GB
Recommended display resolution	1,280 × 800 or more
Applicable PLCs	**FP7** / **FP0H** / **FP-XH** / **FP0R** / **FP-X** / **FP-X0** / **FPΣ** / **FP2SH** (Note 2)

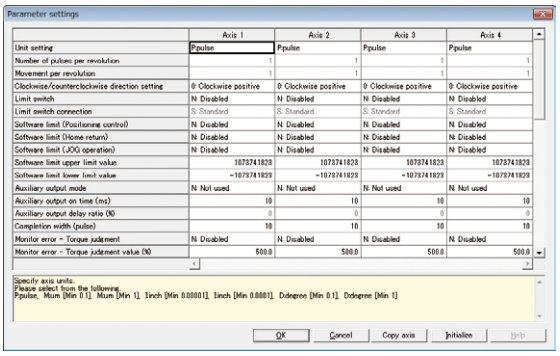
Notes: 1) Windows® is trademarks or registered trademarks of Microsoft Corporation in the United States and other countries.
2) For **FP0H**, supported from Ver. 2.18.
For **FP-XH**, supported from Ver. 2.16.
For **FP0R**, supported from Ver. 2.9 (For creating divided programs, **FP0R** version 1.20 or later is required.) For **FP-X** / **FP-X0** / **FPΣ** / **FP2SH**, supported from Ver. 2.14

After launching **Configurator PM7**, from programming software menus,
you can enter control information and parameter settings needed for positioning control.

Positioning control configuration

Positioning control is achieved by adjusting entries in the positioning table (Note 1) and by setting parameters for each axis (Note 2).

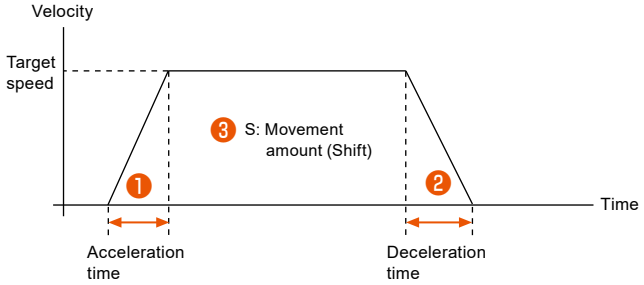




Data table is axis by axis, and settings are made depending on operating mode.

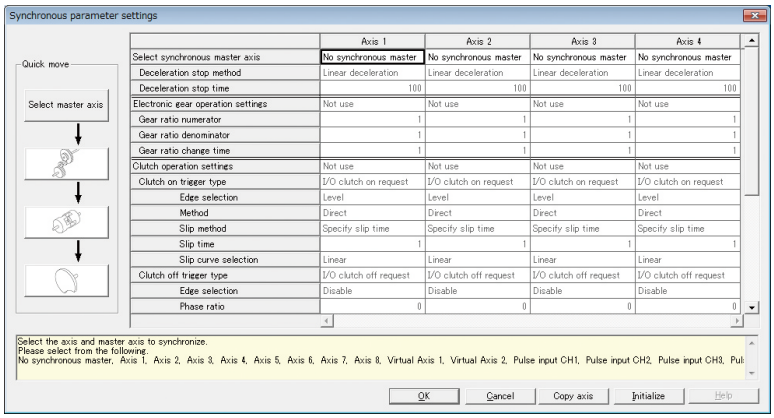
●Parameters that must be set according to application.

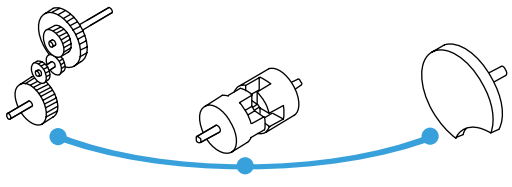
Notes: 1) The positioning table separately shows movement amount, target speed, acceleration and deceleration time, operation mode, and other information for positing control operations.
2) For each axis parameters are shown for limit input logic, deceleration time to stop, and operation conditions for JOG operation and return to point, etc.



Synchronous parameter configuration

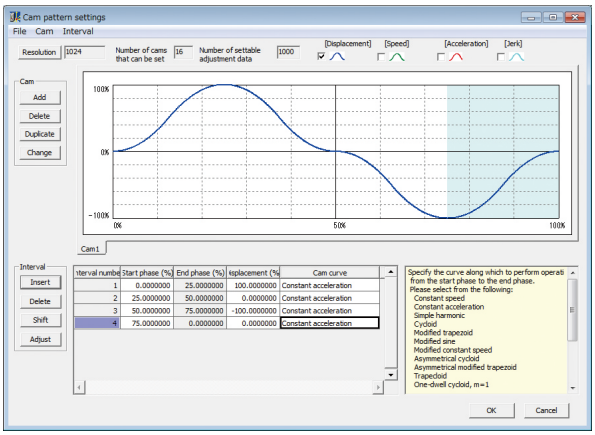
Select the axis and master axis to synchronize according to the purpose and set parameters for the selected axis.
Simultaneous control will be achieved.

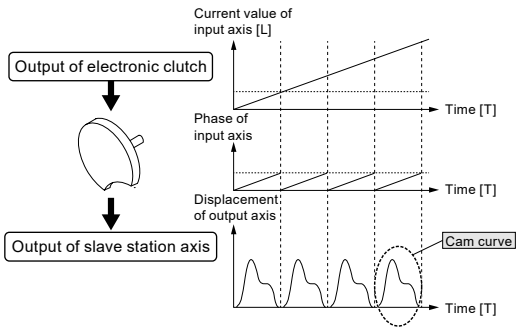




Cam curve (Note 3) configuration

If an electronic cam is selected as the slave axis, relevant parameters must be set.





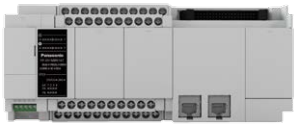
Note: 3) Set the cam curve based on a single rotation of the master axis.
On the setting screen, set the shift of slave axis for each phase (angle of rotation) of the master axis.

FP-XH Series Lineup

Control units

16 points type

Program capacity:
24 k / 32 k / 40 k steps



AFPXHM8N16T AC power supply / Transistor output (NPN)
AFPXHM8N16PD DC power supply / Transistor output (PNP)

Expansion units (FP-X)

16 points mixed type

AFPX-E16R Power supply not required / Relay output
AFPX-E16T Power supply not required / Transistor output (NPN)
AFPX-E16P Power supply not required / Transistor output (PNP)

30 points mixed type

AFPX-E30R AC power supply / Relay output
AFPX-E30T AC power supply / Transistor output (NPN)
AFPX-E30RD DC power supply / Relay output
AFPX-E30TD DC power supply / Transistor output (NPN)
AFPX-E30P AC Power supply / Transistor output (PNP)
AFPX-E30PD DC Power supply / Transistor output (PNP)

14 points output type

AFPX-E14YR Power supply not required / Relay output

16 points input type

AFPX-E16X Power supply not required / For input

Expansion FP0 adapter

AFPX-EFP0 Up to three **FP0** expansion units can be connected.

Add-on cassettes

Application cassettes

AFPX-IN4T3 I/O cassette
AFPX-IN8 Input cassette
AFPX-TR8 Output cassette (NPN)
AFPX-TR6P Output cassette (PNP)
AFPX-AD2 Analog input cassette
AFPX-A21 Analog I/O cassette
AFPX-DA2 Analog output cassette
AFPX-TC2 Thermocouple input cassette
AFPX-RTD2 R.T.D. input cassette

AFPX-MRTC Master memory cassette with a real-time clock

Communication cassettes

AFPX-COM1 RS232C, 1 channel
AFPX-COM2 RS232C, 2 channels
AFPX-COM3 RS485 (insulated) / RS422 selectable, 1 channel
AFPX-COM4 RS485 (insulated), 1 channel and RS232C, 1 channel
AFPX-COM6 RS485 (insulated), 2 channels

AFPX-COM5 Ethernet, 1 channel and RS232C, 1 channel

Part Number List

Control units

Product name	Power supply	Specifications	Program capacity	RS232C port	USB port	Part No.
FP-XH M8N Control units	100-240 V AC	24 V DC input 8 points, 0.5 A / 24 V DC transistor output 8 points (NPN) RTEX I/F (8 axes) for motion control 4-channel pulse input	24 k / 32 k / 40 k steps	1 port	1 port	**AFPXHM8N16T**
	24 V DC	24 V DC input 8 points, 0.5 A / 24 V DC transistor output 8 points (PNP) RTEX I/F (8 axes) for motion control 4-channel pulse input				**AFPXHM8N16PD**

Part Number List

Expansion units

Product name	Power supply	Specifications	Part No.
FP-X E16R expansion I/O unit	——— (Power is supplied from the left-side unit.)	8-point input of 24 V DC, 8-point relay output of 2 A Note: Two or more units can't be connected serially because it can't supply the power to other units. With an 8 cm extension cable	**AFPX-E16R**
FP-X E30R expansion I/O unit	100-240 V AC	16-point input of 24 V DC, 14-point relay output of 2 A Note: Possible to connect up to 8 units including **E16R** and **AFPX-EFP0**. With an 8 cm extension cable	**AFPX-E30R**
FP-X E30RD expansion I/O unit	24 V DC	16-point input of 24 V DC, 14-point relay output of 2 A Note: Possible to connect up to 8 units including **E16** and **AFPX-EFP0**. With an 8 cm extension cable	**AFPX-E30RD**
FP-X E14YR expansion output unit	——— (Power is supplied from the left-side unit.)	14-point relay output of 2 A Note: Two or more units can't be connected serially because it can't supply the power to other units. With an 8 cm extension cable	**AFPX-E14YR**
FP-X E16T expansion I/O unit	——— (Power is supplied from the left-side unit.)	8-point input of 24 V DC, 0.5 A / 5 to 24 V DC, 8-point output of transistor (NPN) Note: Two or more units can't be connected serially because it can't supply the power to other units. With an 8 cm extension cable	**AFPX-E16T**
FP-X E16P Expansion I/O unit	——— (Power is supplied from the left-side unit.)	8-point input of 24 V DC, 8-point transistor (PNP) output of 0.5 A Note: Two or more E16T cannot be connected serially because it cannot supply the power to other units. With an 8 cm extension cable	**AFPX-E16P**
FP-X E30TD expansion I/O unit	24 V DC	16-point input of 24 V DC, 0.5 A / 5 to 24 V DC, 14-point output of transistor (NPN) Note: Possible to connect up to 8 units including **E16** and **AFPX-EFP0**. With an 8 cm extension cable	**AFPX-E30TD**
FP-X E30T expansion I/O unit	100-240 V AC	16-point input of 24 V DC, 0.5 A / 5 to 24 V DC, 14-point output of transistor (NPN) Note: Possible to connect up to 8 units including **E16** and **AFPX-EFP0**. With an 8 cm extension cable	**AFPX-E30T**
FP-X E30PD Expansion I/O unit	24 V DC	16-point input of 24 V DC, 14-point transistor (PNP) output of 0.5 A Note: Possible to connect up to 8 units including E16, EFP0. With an 8 cm extension cable	**AFPX-E30PD**
FP-X E30P Expansion I/O unit	100-240V AC	16-point input of 24 V DC, 14-point transistor (PNP) output of 0.5 A Note: Possible to connect up to 8 units including E16, EFP0. With an 8 cm extension cable	**AFPX-E30P**
FP-X E16X expansion input unit	24 V DC	16-point input of 24 V DC Note: Two or more units can't be connected serially because it can't supply the power to other units. With an 8 cm extension cable	**AFPX-E16X**
Expansion **FP0** adapter	24 V DC	Up to three **FP0** expansion units can be connected via an adapter. With an 8 cm extension cable and power cable	**AFPX-EFP0**

Add-on cassettes

Product name	Specifications	Part No.
FP-X I/O cassette	4-point input of 24 V DC, bi-directional (sink / source), 3-point output of NPN transistor 0.3 A / 24 V DC	**AFPX-IN4T3**
FP-X input cassette	8-point input of 24 V DC, bi-directional (sink / source)	**AFPX-IN8**
FP-X output cassette	8-point output of NPN transistor, 0.3 A / 24 V DC	**AFPX-TR8**
	6-point output of PNP transistor, 0.5 A / 24 V DC	**AFPX-TR6P**
FP-X analog input cassette	2-point analog input, 0 to 10 V or 0 to 20 mA, 12-bit, 2 ms / 2 channels (non-insulated)	**AFPX-AD2**
FP-X analog output cassette	2-point analog output, 0 to 10 V or 0 to 20 mA, 12-bit, 2 ms / 2 channels (insulated)	**AFPX-DA2**
FP-X analog I/O cassette	2-point analog input, 0 to 5 V, 0 to 10 V or 0 to 20 mA, 12-bit, 2 ms / 2 channels 1 point analog output, 0 to 10 V or 0 to 20 mA, 12-bit, 1 ms / 1 channel (insulated)	**AFPX-A21**
FP-X thermocouple input cassette	2-point thermocouple input, K / J type, Resolution: 0.2 °C, 200 ms / 2 channels (between channels: insulated)	**AFPX-TC2**
FP-X R.T.D. input cassette	2-points R.T.D. input, Pt100, Resolution: 0.1 °C (between channels: insulated)	**AFPX-RTD2**
FP-X master memory with a real time clock	Master memory: Capable of storing all program steps and comments simultaneously. Storage of FPWIN Pro source files Real time clock: Year, month, day, hour, minute, second, day of week (optional battery required)	**AFPX-MRTC**
FP-X COM1 communication cassette	RS232C / 1 channel, RS and CS control signal equipped (non-insulated)	**AFPX-COM1**
FP-X COM2 communication cassette	RS232C / 2 channels (non-insulated)	**AFPX-COM2**
FP-X COM3 communication cassette	RS485 or RS422 selectable / 1 channel (insulated)	**AFPX-COM3**
FP-X COM4 communication cassette	RS485 / 1 channel (insulated) and RS232C / 1 channel (non-insulated)	**AFPX-COM4**
FP-X COM5 communication cassette	Ethernet / 1 channel (10BASE-T, 100BASE-TX) and RS232C / 1 channel (non-insulated)	**AFPX-COM5**
FP-X COM6 communication cassette	RS485 / 2 channels (insulated)	**AFPX-COM6**
Control Configurator WD	Tool software for setting the Ethernet port of the COM5 communication cassette (Can be downloaded free of charge from http://device.panasonic.cn/ac/e)	

Options and maintenance parts

Product name	Specifications	Part No.
FP–XH backup battery	Battery for backing up the operation memory and real time clock	**AFPABAT001**
FP–XH expansion cable (Note 1) (Note 2)	Expansion unit connection cable, 8 cm	**AFPX–EC08**
	Expansion unit connection cable, 30 cm	**AFPX–EC30**
	Expansion unit connection cable, 80 cm	**AFPX–EC80**
FP0 power cable	Cable for expansion **FP0** adapter, 1m	**AFP0581**

Notes: 1) The **FP-X** expansion unit include 8 cm expansion cables. The total length of the expansion cables should be within 160 cm.
2) When using long expansion cables, I/O checking error may occur due to noises and other effects. In this case, it is recommended to take measures such as using ferrite cores.

Programming tools

Product name			Type	Specifications	Part No.
Programming software for Windows® **Control FPWIN GR7**	Japanese version		Supports only CPU without encryption function	Windows®10 (32-bit / 64-bit) / Windows®8.1 (32-bit / 64-bit) / Windows®8 (32-bit / 64-bit) / Windows®7 SP1 or higher (32-bit / 64-bit) / Windows®Vista SP2 / Windows®XP SP3	**AFPSGR7JP**
		Security enhanced type	Supports both CPU with / without encryption function		**AFPSGR7JPS**
	English version		Supports only CPU without encryption function		**AFPSGR7EN**
		Security enhanced type	Supports both CPU with / without encryption function		**AFPSGR7ENS**
Programming software for Windows® **Control FPWIN Pro7**	English, Japanese, Korean and Chinese		Supports only CPU without encryption function	Windows®10 (32-bit / 64-bit) / Windows®8.1 (32-bit / 64-bit) / Windows®8 (32-bit / 64-bit) / Windows®7 SP1 or higher (32-bit / 64-bit) / Windows®Vista SP2 / Windows®XP SP3	**AFPSPR7A**
		Security enhanced type	Supports only CPU with encryption function * The encryption function will be offered in the future.		**AFPSPR7AS**

Notes: 1) Windows are trademarks or registered trademarks of Microsoft Corporation in the United States and other countries.
2) When exporting to China, CPU without encryption function is required.

List of Related Products Programmable display GT series

Product name	Description						Part No.
	LCD	Screen size	Power supply	Communication port	Color of front panel	SD memory card slot	
Tough GT03M-E	TFT monochrome LCD	3.5 inch	24 V DC	RS232C	Silver	Not available	AIG03MQ03DE
				RS422 / RS485			AIG03MQ05DE
Tough GT03T-E	TFT color LCD			RS232C	Silver	Available	AIG03TQ13DE
				RS422 / RS485			AIG03TQ15DE
Tough GT32M-E	TFT monochrome LCD	5.7 inch		RS232C	Silver	Available	AIG32MQ03DE
				RS422 / RS485			AIG32MQ05DE
Tough GT32T-E	TFT color LCD			RS232C	Silver	Available	AIG32TQ03DE
				RS422 / RS485			AIG32TQ05DE
GT02L	STN monochrome LCD (white backlight)	3.7 inch	5 V DC	RS232C	Black	Not available	AIG02LQ02D
				RS422 / RS485			AIG02LQ04D
GT02M	TFT monochrome LCD (white/pink/red backlight)	3.8 inch	5 V DC	RS232C	Pure black	Not available	AIG02MQ02D
					Hairline silver		AIG02MQ03D
				RS422 / RS485	Pure black		AIG02MQ04D
					Hairline silver		AIG02MQ05D
			24 V DC	RS232C	Pure black		AIG02MQ12D
					Hairline silver		AIG02MQ13D
				RS422 / RS485	Pure black		AIG02MQ14D
					Hairline silver		AIG02MQ15D
				RS232C	Pure black	Available	AIG02MQ22D
					Hairline silver		AIG02MQ23D
				RS422 / RS485	Pure black		AIG02MQ24D
					Hairline silver		AIG02MQ25D
GT02G	TFT monochrome LCD (green/orange/red backlight)	3.8 inch	5 V DC	RS232C	Pure black	Not available	AIG02GQ02D
					Hairline silver		AIG02GQ03D
				RS422 / RS485	Pure black		AIG02GQ04D
					Hairline silver		AIG02GQ05D
			24 V DC	RS232C	Pure black		AIG02GQ12D
					Hairline silver		AIG02GQ13D
				RS422 / RS485	Pure black		AIG02GQ14D
					Hairline silver		AIG02GQ15D
				RS232C	Pure black	Available	AIG02GQ22D
					Hairline silver		AIG02GQ23D
				RS422 / RS485	Pure black		AIG02GQ24D
					Hairline silver		AIG02GQ25D
GT05M	TFT monochrome LCD (white/pink/red backlight)	3.5 inch	24 V DC	RS232C	Pure black	Available	AIG05MQ02D
					Hairline silver		AIG05MQ03D
				RS422 / RS485	Pure black	Available	AIG05MQ04D
					Hairline silver		AIG05MQ05D
GT05G	TFT monochrome LCD (green/orange/red backlight)	3.5 inch	24 V DC	RS232C	Pure black	Available	AIG05GQ02D
					Hairline silver		AIG05GQ03D
				RS422 / RS485	Pure black	Available	AIG05GQ04D
					Hairline silver		AIG05GQ05D
GT05S	TFT color LCD	3.5 inch	24 V DC	RS232C	Pure black	Available	AIG05SQ02D
					Hairline silver		AIG05SQ03D
				RS422 / RS485	Pure black	Available	AIG05SQ04D
					Hairline silver		AIG05SQ05D
GT703M	TFT monochrome LCD (white/pink/red backlight)	3.8 inch	5 V DC	RS232C	Pure black	Available	AIG703WMN1B5
					Silver		AIG703WMN1S5
				RS422 / RS485	Pure black	Available	AIG703WMNMB5
					Silver		AIG703WMNMS5
			24 V DC	RS232C	Pure black	Available	AIG703WMN1B2
					Silver		AIG703WMN1S2
				RS422 / RS485	Pure black	Available	AIG703WMNMB2
					Silver		AIG703WMNMS2
GT703G	TFT monochrome LCD (green/orange/red backlight)	3.8 inch	5 V DC	RS232C	Pure black	Available	AIG703WGN1B5
					Silver		AIG703WGN1S5
				RS422 / RS485	Pure black	Available	AIG703WGNMB5
					Silver		AIG703WGNMS5
			24 V DC	RS232C	Pure black	Available	AIG703WGN1B2
					Silver		AIG703WGN1S2
				RS422 / RS485	Pure black	Available	AIG703WGNMB2
					Silver		AIG703WGNMS2
GT12M	TFT monochrome LCD (white/pink/red backlight)	4.6 inch	24 V DC	RS232C	Pure black	Not available	AIG12MQ02D
					Hairline silver		AIG12MQ03D
				RS422 / RS485	Pure black	Not available	AIG12MQ04D
					Hairline silver		AIG12MQ05D
				RS232C	Pure black	Available	AIG12MQ12D
					Hairline silver		AIG12MQ13D
				RS422 / RS485	Pure black	Available	AIG12MQ14D
					Hairline silver		AIG12MQ15D
GT12G	TFT monochrome LCD (green/orange/red backlight)	4.6 inch	24 V DC	RS232C	Pure black	Not available	AIG12GQ02D
					Hairline silver		AIG12GQ03D
				RS422 / RS485	Pure black	Not available	AIG12GQ04D
					Hairline silver		AIG12GQ05D
				RS232C	Pure black	Available	AIG12GQ12D
					Hairline silver		AIG12GQ13D
				RS422 / RS485	Pure black	Available	AIG12GQ14D
					Hairline silver		AIG12GQ15D

List of Related Products Programmable display GT series

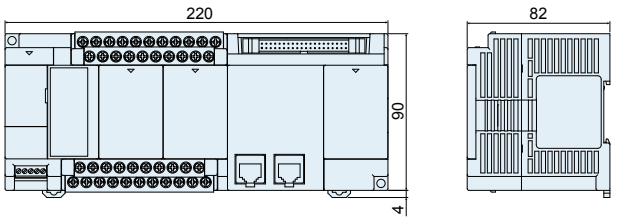
Product name	Description						Part No.
	LCD	Screen size	Power supply	Communication port	Color of front panel	SD memory card slot	
GT704M	TFT monochrome LCD (white/pink/red backlight)	4.6 inch	24 V DC	RS232C	Pure black	Available	**AIG704WMN1B2**
					Silver		**AIG704WMN1S2**
				RS422 / RS485	Pure black	Available	**AIG704WMNMB2**
					Silver		**AIG704WMNMS2**
GT704G	TFT monochrome LCD (green/orange/red backlight)	4.6 inch	24 V DC	RS232C	Pure black	Available	**AIG704WGN1B2**
					Silver		**AIG704WGN1S2**
				RS422 / RS485	Pure black	Available	**AIG704WGNMB2**
					Silver		**AIG704WGNMS2**
GT32M-R	TFT monochrome LCD	5.7 inch	24 V DC	RS232C	Pure black	Available	**AIG32MQ02DR**
					Hairline silver		**AIG32MQ03DR**
				RS422 / RS485	Pure black	Available	**AIG32MQ04DR**
					Hairline silver		**AIG32MQ05DR**
GT32T-R	TFT color LCD	5.7 inch	24 V DC	RS232C	Pure black	Available	**AIG32TQ02DR**
					Hairline silver		**AIG32TQ03DR**
				RS422 / RS485	Pure black	Available	**AIG32TQ04DR**
					Hairline silver		**AIG32TQ05DR**
GT707	TFT color LCD	7 inch	24 V DC	RS232C	Black	Available	**AIG707WCL1G2**
Terminal GTWIN Ver.2	Japanese version	**Terminal GTWIN** CD-ROM					**AIGT8000V2**
	English version	**Terminal GTWIN** CD-ROM					**AIGT8001V2**
Terminal GTWIN Ver.2 (Note)	Japanese version	**Terminal GTWIN** CD-ROM					**AIGT8000V2R**
	English version	**Terminal GTWIN** CD-ROM					**AIGT8001V2R**
Terminal GTWIN Ver.3	Japanese version	**Terminal GTWIN** CD-ROM					**AIGSGT7JP**
	English version	**Terminal GTWIN** CD-ROM					**AIGSGT7EN**

Note: It enables to upgrade from **Terminal GTWIN** Ver. 1 to Ver. 2.

Dimensions (Unit: mm)

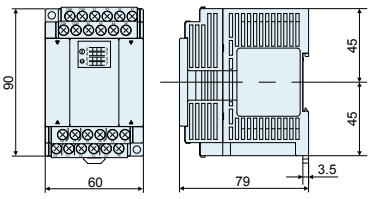
Control unit

AFPXHM8N16**

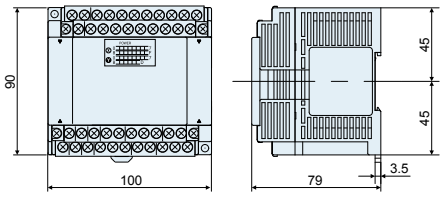


Expansion units

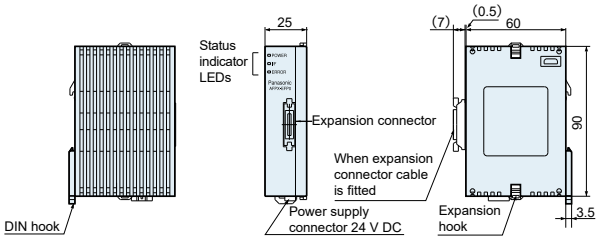
AFPX-E16* / E14*



AFPX-E30**



Expansion FP0 adapter



Small, light, high torque and speedy

Highest speed in the industry and high torque in a compact lightweight body *1

Max. speed
6500 r/min*2
Fast
(A5 Family*3 5000 r/min)

Max. torque
Approx.350 %*2
High
(A5 Family*3 Approx.300 %)

Overall length
67.5 mm*2
Short
(A5 Family*3 99.0 mm)

Weight
750 g*2
Light
(A5 Family*3 960 g)

*1 Middle and high inertia types only *2 MHMF200 W *3 MSMD200 W

Low maintenance

★Safeguarded to IP67 *4 class, ensures high level of protection

★Protective lip increases oil seal heat resistance and improves durability.

Robustness Improved

★Uses new connector with one-touch locking *5
Cable connection has been made easier (conventional mounting compatible)

*4 Connector type *5 Flange size: Motor with 100 mm sq. or more

●Size of a typical business card (W90 mm × H55 mm)

Motors shorter than a business card
(MHMF type 60 mm sq. 200 W)

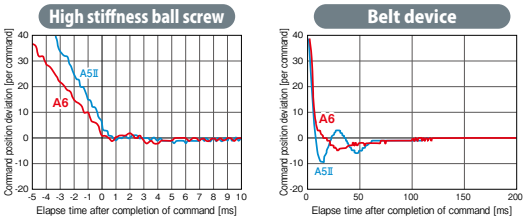
Full-scale

Swifter, smarter and easier to use

High-speed response, high-precision positioning for quick and accurate movement

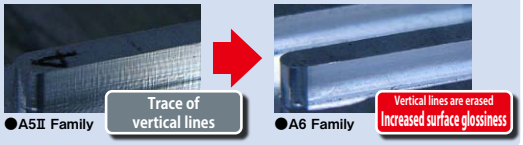
Our proprietary algorithm in addition to upgraded CPU and other hardware realized further high-speed response. Furthermore, high-precision positioning is achieved by automatically eliminating micro vibrations and machine oscillation caused by the resonance.

●Comparison of position setting waveforms



Example of operation with processing machine

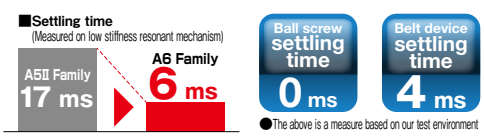
A mirror finish is obtained even if a process that tends to cause streaking.

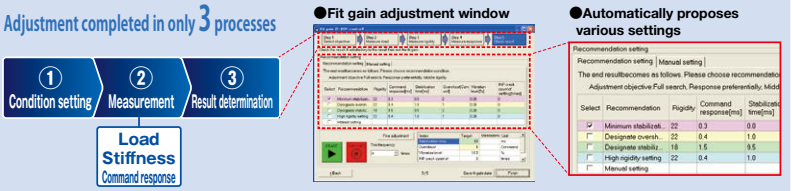


Easy and quick setting, shortening conventional settling time by approx. 64%*1.

Newly developed fit gain function substantially reduces adjustment time. Adaptive notch filter and various gains can be automatically set and adjusted.

*1 Comparison with conventional product A5Ⅱ family

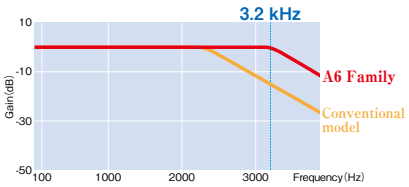


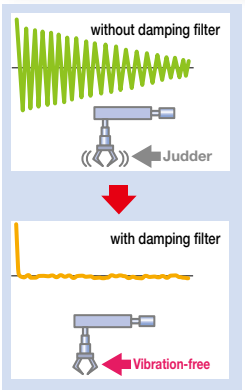


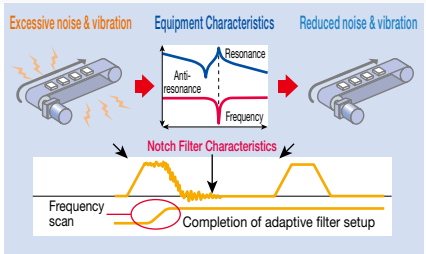
Realized 3.2 kHz frequency response to improve productivity

Realizes 3.2 kHz frequency response. At 139% that of conventional models *1, it enables high-speed operation and improves productivity.

*1 Comparison with conventional product A5Ⅱ family







Full-scale

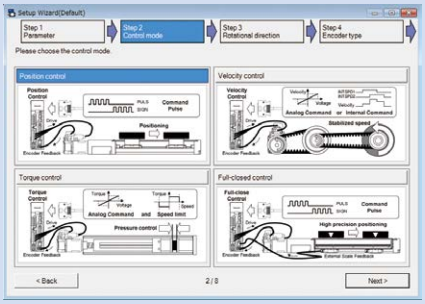
Multifunctional software for quick adjustment support

"PANATERM" set-up support software

The "PANATERM" set-up support software, with many added features. The "PANATERM" assists users in setting parameters, monitoring control conditions, setup support, and analyzing mechanical operation data on the PC screen, when installed in a commercially available personal computer, and connected to the MINAS A6 Family through the USB interface. Choose either English, Japanese, Chinese-language display.

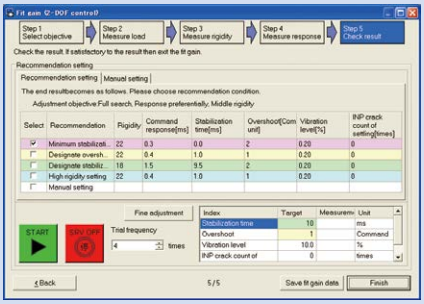
Setup wizard

This wizard supports fundamental settings in each control mode step by step, including reading of default setting. In On-line condition, Input data related to each step can be monitored in real time.



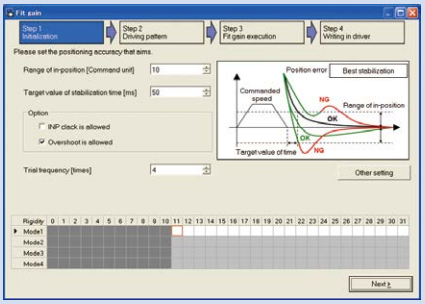
The fit gain function for setting Two-degree-of-freedom control

1) Select the adjustment method 2) Load measurement
3) Confirming results Adjust gain to meet your needs



Fit gain

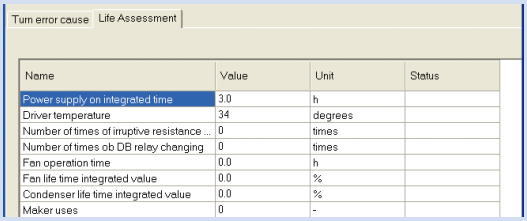
This function automatically searches the best suitable stiffness setting and mode and adjusts the gain once the target in-position range and setting time are set.



Service life prediction

The service life prediction function considers the internal temperature for main components such as the fan and condenser. If the rated value is exceeded, an alarm is displayed. This approach prevents unexpected suspension of operation and allows for planning of systemized maintenance.

Note: The life span prediction value should be considered as a guide only.



Name	Value	Unit	Status
Power supply on integrated time	3.0	h	
Driver temperature	34	degrees	
Number of times of irruptive resistance ...	0	times	
Number of times ob DB relay changing	0	times	
Fan operation time	0.0	h	
Fan life time integrated value	0.0	%	
Condenser life time integrated value	0.0	%	
Maker uses	0	-	

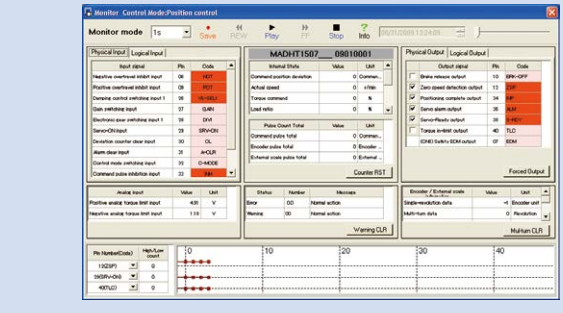
Encoder temperature monitor

The Encoder Temperature Monitor is a new function capable of real-time measurement of the interior temperature of the encoder, something that has been difficult to achieve in the past. It is valuable for monitoring the motor and can be used as a diagnostic in the event of a malfunction .

Other New Function

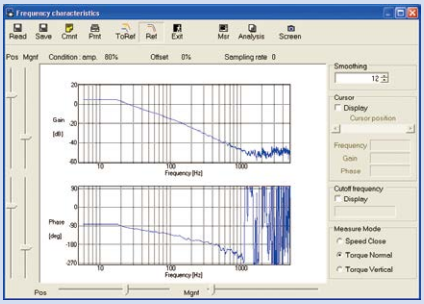
The software offers a wide range of convenient features including motor and driver data such as load factor, voltage, and driver temperature. Moreover, the logging function records the interface history. As well, a non-rotating contributing factor display function.

●Deterioration diagnosis ●Block motion editor / monitor (for A6SE, A6SG and A6SF series) ●Battery refresh ●Object editor (for A6BE and A6BF series)



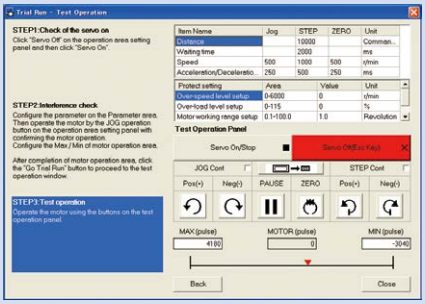
Frequency characteristics measurement function

Can check frequency response characteristics of the mechanism and motor. Since resonance frequency of the mechanism is measurable, it is effective for start-up time reduction.

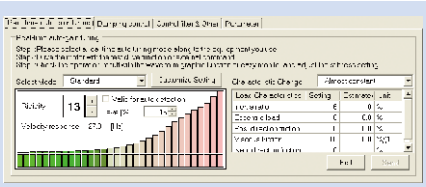


Trial run

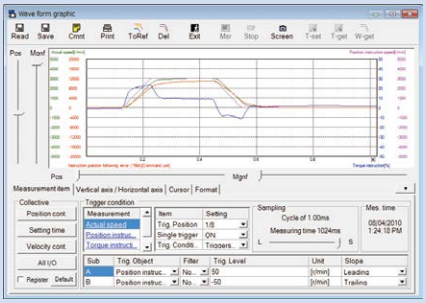
This function supports positioning with the Z-phase search and software limit.



Added New screen for gain adjustment, equipped with stiffness oscillation auto-reduction function



Significant increase of measuring objects Multi-functional waveform graphic



• Hardware configuration

Personal computer	CPU	800 MHz or more
	Memory	System memory 512MB or more, Graphics memory 32MB or more
	Hard disk capacity	Vacancy of 512MB or more recommended
	OS	Windows® Vista SP1(32 bit) , Windows® 7(32 bit, 64 bit) , Windows® 8(32 bit, 64 bit), Windows® 10(32 bit, 64 bit), Japanese, English, Chinese (Simplified), Korean ver
	Serial communication function	USB port, COM port (Communication speeds: 2400 to 115200 bps) * A COM port is required to use RS232 communications. A 9600 bps or higher baud rate is recommended.
Display	Resolution	1024 × 768 pix or more
	Number of colors	24 bit colors (TrueColor) or more

• This software is applicable only to A5 family, A6 family. To apply this software to A, AⅢ, E or A4 series, consult our distributors.

Please download from our web site and use after install to the PC.
https://industrial.panasonic.com/ww/products/motors-compressors/fa-motors

Motor Line-up

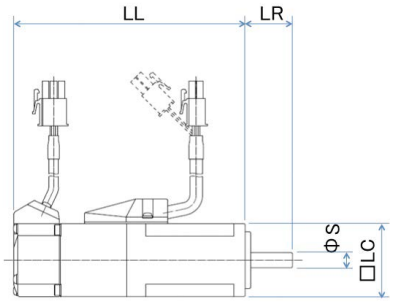
Motor			Rated output (kW)	Rated rotational speed (Max. speed) (r/min)	Rotary encoder 23-bit absolute	Enclosure (*1)	Motor lead-out configuration	Features	Applications
Low inertia	MSMF	 80 mm sq. or less	0.05 0.1 0.2 0.4 0.75 1.0	3000 (6000)	○	IP65	Leadwire	· Small capacity · Suitable for high speed application · Suitable for all applications	· Bonder · Semiconductor production equipment · Packing machines etc
		 80 mm sq. or less	0.05 0.1 0.2 0.4 0.75 1.0	3000 (6000)	○	IP67	Connector		
		 100 mm sq. or more	1.0 1.5 2.0 3.0	3000 (5000)	○	IP67	Connector	· Middle capacity · Suitable for the machines directly coupled with ball screw and high stiffness and high repetitive application	· SMT machines · Food machines · LCD production equipment etc
			4.0 5.0	3000 (4500)					
Middle inertia	MQMF (Flat type)	 80 mm sq. or less	0.1 0.2 0.4	3000 (6500)	○	IP65	Leadwire	· Small capacity · Flat type and suitable for low stiffness machines with belt driven	· SMT machines · Inserter machines · Belt drive machines · Unloading robot
		 80 mm sq. or less	0.1 0.2 0.4	3000 (6500)	○	IP67	Connector		
	MDMF	 130 mm sq. or more	1.0 1.5 2.0 3.0 4.0 5.0	2000 (3000)	○	IP67	Connector	· Middle capacity · Suitable for low stiffness machines with belt driven	· Conveyors · Robots · Machine tool etc
	MGMF (Low speed/High torque type)	 130 mm sq. or more	0.85 1.3 1.8 2.4 2.9 4.4	1500 (3000)	○	IP67	Connector	· Middle capacity · Suitable for low speed and high torque application	· Conveyors · Robots · Textile machines etc
High inertia	MHMF	 80 mm sq. or less	0.05 0.1 0.2 0.4	3000 (6500)	○	IP65	Leadwire	· Small capacity · Suitable for low stiffness machines with belt driven	· Conveyors · Robots etc
			0.75 1.0	3000 (6000)					
		 80 mm sq. or less	0.05 0.1 0.2 0.4	3000 (6500)	○	IP67	Connector		
			0.75 1.0	3000 (6000)					
		 130 mm sq. or more	1.0 1.5 2.0 3.0 4.0 5.0	2000 (3000)	○	IP67	Connector	· Middle capacity · Suitable for low stiffness machines with belt driven, and large load moment of inertia	· Conveyors · Robots · LCD manufacturing equipment etc

*1 IP65 motor (MSMF, MQMF, MHMF lead wire types) (except rotation output shaft and lead wire tip)
IP67 motor (except rotation output shaft and motor connector/encoder connector connecting pins)

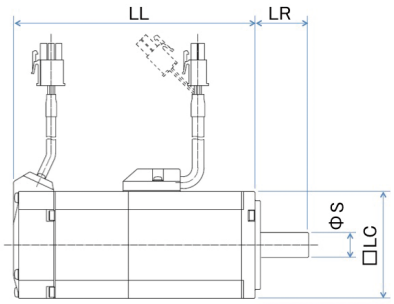
- When using a rotary encoder as an absolute system (using multi-turn data), connect a battery to the absolute encoder.
- When using a rotary encoder as an incremental system (not using multi-turn data), do not connect a battery for absolute encoder.

Motor Line-up

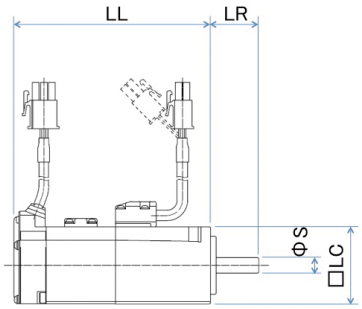
Dimensions of Motor (Unit: mm)



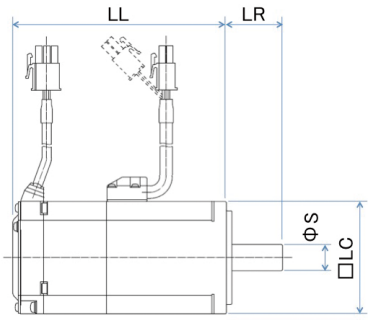
Dimension 1



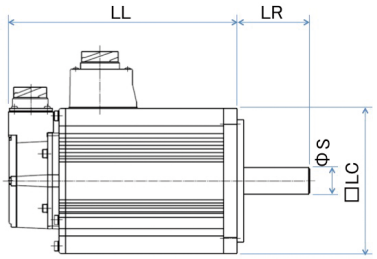
Dimension 2



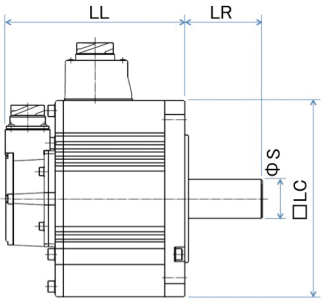
Dimension 3



Dimension 4



Dimension 5



Dimension 6

Motor type	Part No.	Output	Dimension No.	□LC	LL				LR	ΦS	Mass (kg)	
					Without Brake		With Brake				Without Brake	With Brake
					Without Oil seal	With Oil seal	Without Oil seal	With Oil seal				
MSMF Low inertia 3000 r/min	**MSMF5AZL1□2**	50 W	1	38	72	72	102	102	25	8	0.32	0.53
	MSMF012L1□2	100 W	1	38	92	92	122	122	25	8	0.47	0.68
	MSMF022L1□2	200 W	2	60	79.5	79.5	116	116	30	11	0.82	1.3
	MSMF042L1□2	400 W	2	60	99	99	135.5	135.5	30	14	1.2	1.7
	MSMF082L1□2	750 W	2	80	112.2	112.2	149.2	149.2	35	19	2.3	3.1
	MSMF092L1□2	1.0 kW	2	80	127.2	127.2	164.2	164.2	35	19	2.8	3.6
MHMF High inertia 3000 r/min	**MHMF5AZL1□2**	50 W	3	40	53.5	57.5	87.4	91.4	25	8	0.29	0.51
	MHMF012L1□2	100 W	3	40	67.5	71.5	101.4	105.4	25	8	0.4	0.62
	MHMF022L1□2	200 W	4	60	67.5	71	96.8	100.3	30	11	0.75	1.1
	MHMF042L1□2	400 W	4	60	84.5	88	113.8	117.8	30	14	1.1	1.5
	MHMF082L1□2	750 W	4	80	91.9	95.4	125.5	129	35	19	2.2	2.9
	MHMF092L1□2	1.0 kW	4	80	104.7	108.2	138.3	141.8	35	19	2.6	3.4
MSMF Low inertia 3000 r/min	**MSMF102L1□6**	1.0 kW	5	100	137	137	164	164	55	19	3.6	4.7
	MSMF152L1□6	1.5 kW	5	100	155.5	155.5	182.5	182.5	55	19	4.6	5.6
	MSMF202L1□6	2.0 kW	5	100	174.5	174.5	201.5	201.5	55	19	5.6	6.6
	MSMF302L1□6	3.0 kW	5	120	186	186	211	211	55	22	8.7	9.9
	MSMF402L1□6	4.0 kW	5	130	205	205	233	233	65	24	11.5	13.2
	MSMF502L1□6	5.0 kW	5	130	240	240	268	268	65	24	14.5	16.1
MDMF Middle inertia 2000 r/min	**MDMF102L1□6**	1.0 kW	5	130	122	122	150	150	55	22	4.6	6.1
	MDMF152L1□6	1.5 kW	5	130	136	136	164	164	55	22	5.7	7.2
	MDMF202L1□6	2.0 kW	5	130	150	150	178	178	55	22	6.9	8.4
	MDMF302L1□6	3.0 kW	5	130	178	178	206	206	65	24	9.3	10.9
	MDMF402L1□6	4.0 kW	6	176	161	161	190	190	70	35	13.4	16.8
	MDMF502L1□6	5.0 kW	6	176	176	176	205	205	70	35	15.6	19

Motor Line-up

Motor type	Part No.	Output	Dimension No.	□LC	LL				LR	ΦS	Mass (kg)	
					Without Brake		With Brake				Without Brake	With Brake
					Without Oil seal	With Oil seal	Without Oil seal	With Oil seal				
MHMF High inertia 2000 r/min	**MHMF102L1□6**	1.0 kW	5	130	150	150	178	178	70	22	6.1	7.6
	MHMF152L1□6	1.5 kW	5	130	164	164	192	192	70	22	7.7	9.2
	MHMF202L1□6	2.0 kW	6	176	161	161	190	190	80	35	11.3	14.6
	MHMF302L1□6	3.0 kW	6	176	176	176	205	205	80	35	13.8	17.2
	MHMF402L1□6	4.0 kW	6	176	190.5	190.5	219.5	219.5	80	35	16.2	19.4
	MHMF502L1□6	5.0 kW	6	176	206.5	206.5	235.5	235.5	80	35	19.6	22.8
MGMF Middle inertia/ Low speed/ High torque type 1500 r/min	**MGMF092L1□6**	0.85 kW	5	130	122	122	150	150	55	22	4.6	6.1
	MGMF132L1□6	1.3 kW	5	130	136	136	164	164	55	22	5.7	7.5
	MGMF182L1□6	1.8 kW	5	130	150	150	178	178	55	22	6.9	8.4
	MGMF242L1□6	2.4 kW	6	176	161	161	190	190	70	35	13.4	16.8
	MGMF292L1□6	2.9 kW	6	176	161	161	190	190	70	35	13.4	16.8
	MGMF442L1□6	4.4 kW	6	176	176	176	205	205	70	35	15.6	19

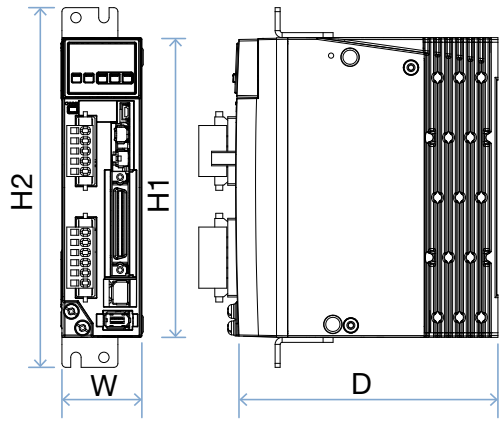
*MHMF5AZ(50 W)~MHMF092(1.0 kW) with protective lip, Motor is special order product. Different drawing. Request the necessary information separately.

Driver Line-up

Motor		Motor Rated output									
		50 W	100 W	200 W	400 W	750 W	1 kW	1.5 kW	2 kW	3 kW	4 kW to 5 kW
Single phase AC 100 to 200V	Frame symbol	A	A	B	C						
	Part No.	MADLT 01NF	MADLT 11NF	MBDLT 21NF	MCDLT 31NF						
Single phase / 3-phase AC 200 to 240V	Frame symbol	A		A	B	C	D	D			
	Part No.	MADLT 05NF		MADLT 15NF	MBDLT 25NF	MCDLT 35NF	MDDLT 45NF	MDDLT 55NF			
Single phase / 3-phase AC 200 to 230V	Frame symbol								E	F	F
	Part No.								MEDLT 83NF	MFDLT A3NF	MFDLT B3NF

*1: Selection is necessary for Motor, Cable, Options and so on.

Dimensions of Driver (Unit: mm)



Rack mount type

	W(mm)	H1(mm)	H2(mm)	D(mm)	Mass(kg)
A-frame	40	150	180	130	0.8
B-frame	55	150	180	130	1.0
C-frame	65	150	180	170	1.6
D-frame	85	150	180	170	2.1
E-frame	85	168	198	193	2.7
F-frame	130	220	250	219.5	5.2

Panasonic Network Motion

○: Available, ×: Not available

Network name	EtherCAT	RTEX	RTEX	Modbus-RTU
	FP7	FPΣ / FP2SH	FP-XH M8N	
Compatible PLC				**FP** series all model
Compatible AC servo	MINAS-A6B / A5B	MINAS-A6N / A5N	MINAS-A6N / A5N	MINAS-A6SF
Max. number of axes controlled/unit	16 / 32 / 64	2 / 4 / 8	8	31 (per port)
Max. number of synchronous axes/unit	16 / 32 / 64	2 / 2 / 2	8	0
Control axis expansion	○	○	×	○
Interpolation control	Linear, Arc and Spiral	Linear, Arc and Spiral	Linear, Arc and Spiral	×
Operation command	Position control	Position control	Position control	Block operation
Synchronous operation	Synchronous, Electronic cam, Electronic clutch and Electronic gear	Synchronous	Synchronous, Electronic cam, Electronic clutch and Electronic gear	×
Servo driver Parameter R/W	○	○	○	○
Servo driver Real time monitor	○	×	○	○
System scale	Large ←			Small

Disclaimer

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