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General

The Range-free Multi-controller FA-M3 is a next-generation programmable controller, which achieves high performance through its ultra high-speed processing and stable control features. It incorporates a space-saving compact design, supports versatile ranges with cover for up to 8192 input/output points, and is equipped with a variety of advanced modules, which can be used to configure a wide range of applications.

With the FA-M3, decreased total cost of ownership (TCO) can be realized through openness, improved functions and reduction in the size of machines and facilities.

Features

The increased speed of the FA-M3 has been achieved as a result of adopting the concept High Speed IPRS which is based on four factors; Instruction, Process, Response and Scan. This contributed to increased accuracy of instruments and productivity. The FA-M3 has also inherited structured programming and uses an "object ladder*" to create an efficient total design, all the way from planning to maintenance.

*: "Object ladder" is a program development concept aimed at dramatically improving customization efficiency by integrating programs and devices into independent objects (e.g., blocks) on function basis.

● Ultra-high Speed Processing

The high-speed instruction processing capability of the FA-M3 makes it ideal for applications that require high speed and quick response.

- The F3SP28 and F3SP38 CPUs achieve a scan time of 1 ms for a 6K steps program*.
- The F3SP53, F3SP58 and F3SP59 CPUs achieve a scan time of 1 ms for a 20K steps program*.
- The F3SP71 and F3SP76 CPUs achieve a scan time of 1 ms for a 100K steps program*.

*: The scan times mentioned above can only be achieved under specific conditions and vary depending on the contents of the program and system configuration.

● Sensor Control Function

This function allows one CPU to perform a parallel operation at a minimum scan time of 200 μs (100 μs for F3SP7□) while carrying out a main scan during program operation. It enables one block of the program to be executed at high-speed and fixed intervals independently of a main scan, which features high performance and advanced functionalities.

● Built-in Network Function (when using F3SP6□, F3SP7□)

These sequence CPU modules have a built-in network function, which complements high-speed control with fast access and storage of large files. With pre-installed support for a wide range of common communication protocols, it enables transfer of large files.

● Built-in Modbus/TCP Slave (Server) Function (when using F3SP7□)

These sequence CPU modules have a built-in Modbus/TCP slave (server) function, which enables communication with a Modbus master (client) device via the module's communication port without need of programming on the module end.

● Multiple CPUs

The FA-M3 can accommodate up to 4 CPUs in one base module depending on the system size, program size and CPU aptitude. The supported CPU modules include sequence CPU modules, as well as BASIC CPU modules.

● Program Reusability

Object ladder allows integration of programs with devices into components on function basis. This improves the reusability of user software and efficiency of machine custom design.

- Local Device

Devices used as variables in different user blocks or component macros are completely independent, and can be allocated to different devices even if they share the same name so that global analyses and modification of the device structure for reuse of ladders are not necessary.

● Open Network

The FA-M3 supports open network protocols such as Ethernet, FL-net, DeviceNet, AS-interface, PROFIBUS-DP, GP-IB, RS-232-C/422 and Automated Distribution Protocol, and provides a range of modules for use on a variety of networks ranging from field networks to system configuration networks.

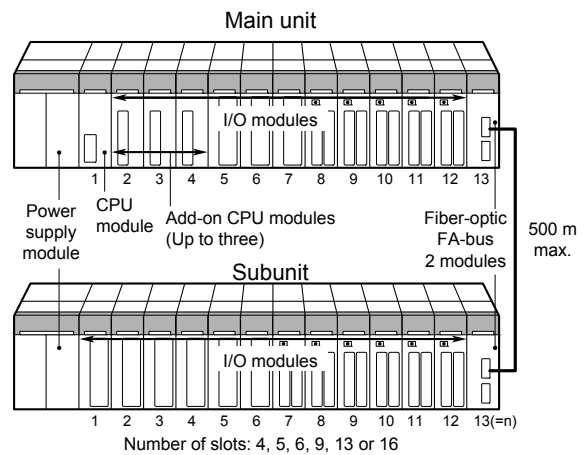


I/O Configuration

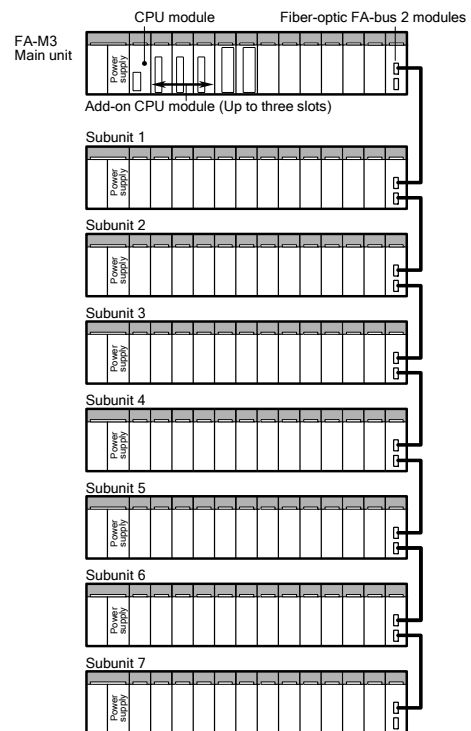
● Up to Seven Additional Subunits for I/O Extension

Up to 8192 inputs and outputs can be processed (for F3SP35, F3SP38, F3SP58, F3SP59 and F3SP76).

● Main Unit and Subunit



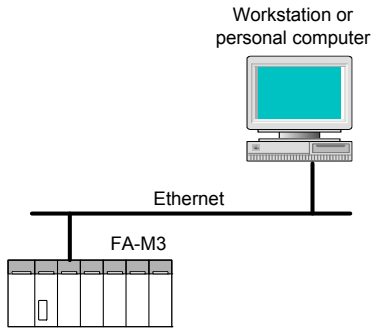
● Subunit Extension



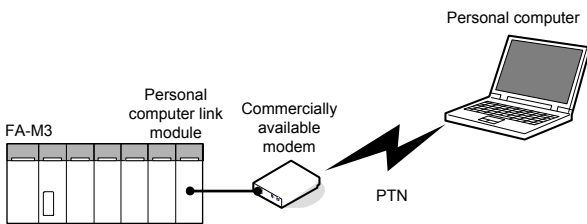
System Configuration

Higher Level Communication

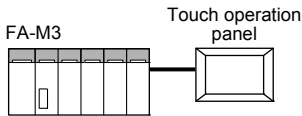
(1) Connecting to a Workstation or PC via Ethernet



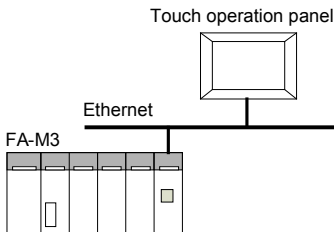
(2) Connecting to a Personal Computer via Public Telephone Network



(3) Connecting to a Touch Operation Panel via Personal Computer Link

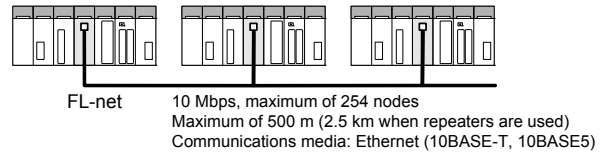


(4) Connecting to a Touch Operation Panel via Ethernet



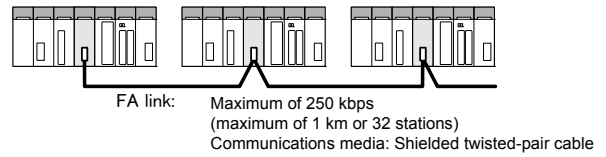
Links between PLCs

(1) Connecting between FA-M3s via FL-net modules



FL-net is an open, multi-vendor network, which not only allows high-speed data transfer between FA-M3 units but also connection to third-party FA controllers.

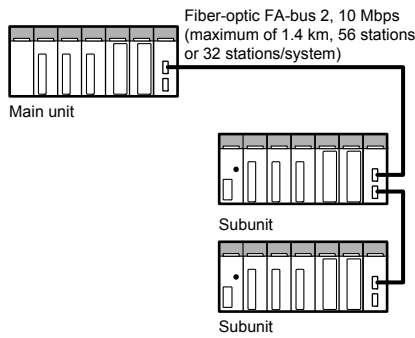
(2) Connecting between FA-M3s via FA link modules



Use the FA link modules for exchanging data between FA-M3s.

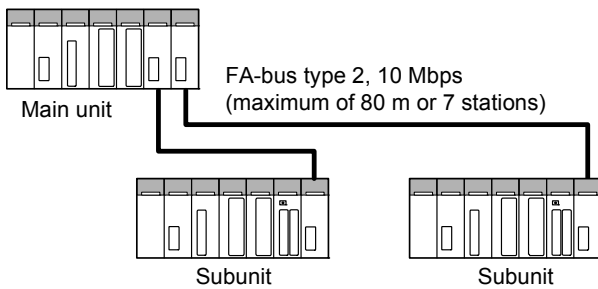
■ PLC Lower Level Communications

(1) Adding FA-M3s via a Fiber-optic FA-bus Type 2 (remote I/O)



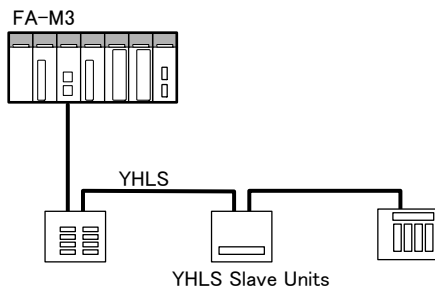
Use a fiber-optic FA-bus Type 2 module when augmenting I/O devices in a multi-station or long distance configuration.

(2) Adding FA-M3s via a FA-bus Type 2 (remote I/O)



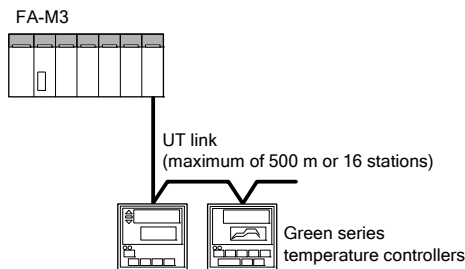
Use a FA-bus Type 2 module when adding subunits.

(3) Connecting to YHLS Slave Units via YHLS

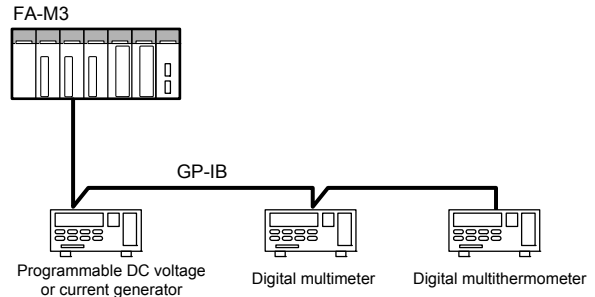


YHLS (Yokogawa Hi-speed Link System) enables easy implementation of high-speed 1:N remote I/O communication systems.

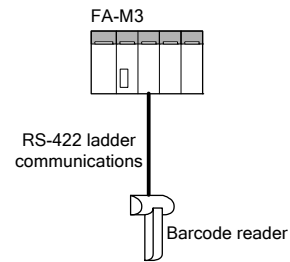
(4) Connecting to a Temperature Controller via a UT Link



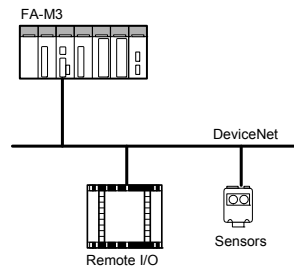
(5) Connecting to Measuring Instruments via a GP-IB



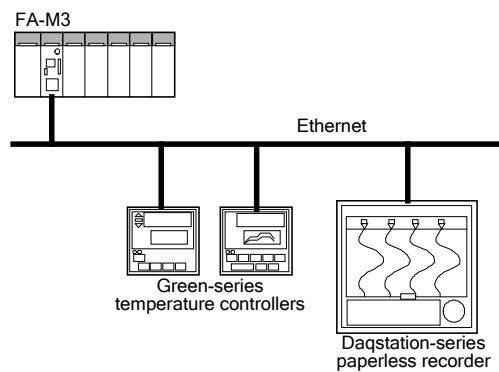
(6) Connecting to a Barcode Reader via RS-422 Ladder Communications



(7) Connecting to Remote I/O and Sensors via DeviceNet



(8) Connecting to Ethernet-enabled Equipment (sequence CPU module with built-in network functions)



Standard Specifications

Common Specifications

Item		Specifications
Environment	Surrounding air temperature range	Operating : 0 to 55°C Storage : -20°C to 75°C
	Surrounding humidity range	Operating : 10 to 90% RH (non-condensing) Storage : 10 to 90% RH (non-condensing)
	Surrounding atmosphere	Must be free of corrosive gases, flammable gases or heavy dust.
	Grounding	JIS Class D grounding
	Noise immunity	Tested using a noise simulator with a noise voltage of 1500 Vp-p, pulse width of 1 μs, rise time of 1 ns, and repetition frequency of 25 to 60 Hz. For CE Marking-compliant modules ² , compliant to EN61326-1, EN61326-2-3 ⁴ and EN61000-6-2
	Vibration resistance	Tested in compliance with JIS C60068-2-6 under the following conditions: - Frequency ranges: 10 to 57 Hz with an amplitude of 0.075 mm 57 to 150 Hz with an acceleration of 9.8 m/s ² (1G) - Direction and sweep cycles: 10 times each in the X, Y, and Z directions
	Shock resistance	Tested in compliance with JIS C60068-2-27 under the following conditions: - Direction and sweep cycles: 3 times each in the X, Y, and Z directions with an acceleration of 147 m/s ² (98 m/s ² with DIN-rail mounting)
Structure & Appearance	Structure	Designed for mounting inside a panel enclosure
	Altitude of installation	Max. of 2000 m above sea level
	Cooling method	Natural-air cooled
	Mounting	Direct mounting with M4-size setscrews ³ or DIN-rail mounting (except for F3BU16-0N module)
	Finish color	Light cobalt blue, equivalent to Munsell 6.2PB 4.6/8.8; Lampblack, equivalent to Munsell 0.8Y 2.5/0.4
	External dimensions	See the dimensional figures in "External Dimensions" of the "Hardware Manual" (IM 34M06C11-01E)

*1: Some FA-M3 modules may have a narrower surrounding air temperature range than 0-55°C. A system incorporating such modules must be used within the narrower surrounding air temperature range for such modules.

*2: For details on conforming modules, see "UL-approved, CE marking and C-Tick mark-compliant Modules" (GS 34M06C11-21E) general specification brochure.

For questions about "UL, CE and C-Tick" of Discontinued modules, please contact to YHQ.

*3: F3BU04, F3BU05, F3BU06, F3BU09 and F3BU13 each uses four mounting screws while F3BU16 uses six mounting screws..

*4: EN61326-2-3 is applicable only to F3CU04-0S and F3CU04-1S.

Power Supply Specifications

Item	Specification		
	F3PU10-0N	F3PU20-0N	F3PU30-0N
Supply voltage	100 V to 240 V AC, single phase, 50/60 Hz		
Supply voltage fluctuation range	85 V to 264 V AC, 50/60 Hz ±3 Hz		
Power consumption	35 VA	85 VA	100VA
Inrush current	20 A max. (120 V AC, Ta = 25°C) 45 A max. (240 V AC, Ta = 25°C)		
Rated output voltage	5 V DC		
Rated output current	2.0 A	4.3 A	6.0A
Allowable momentary power failure time	20 ms		
FAIL-signal contact output	Provided on the front terminal block on the power supply module; contact rating: 24 V DC, 0.3 A (both normally-open and normally-closed terminals available)		
Leakage current	3.5 mA max.		
Insulation resistance	5 MΩ or greater at 500 V DC (between external AC terminals and FG terminal)		5 MΩ or greater at 500 V DC (between external DC terminals and FG terminal)
Dielectric strength	1500 V AC for 1 minute (between external AC terminals and FG terminal)		1500 V AC for 1 minute (between external DC terminals and FG terminal)

Note: F3PU□□-0S has the same dimensions, internal circuitry and other specifications as its respective F3PU□□-0N counterpart but uses screw size M4.0 instead of M3.5.

■ Functional Specifications

Item	Specification							
	F3SP21	F3SP25	F3SP35	F3SP28-3N	F3SP38-6N	F3SP53-4H	F3SP58-6H	
Control mode	Repetitive computation based on stored programs							
I/O control mode	Refresh method/Direct I/O instructions							
Programming language	Structured ladder language, mnemonic language			Object ladder language				
Number of I/O points	2048 max	4096 max	8192 max (incl. remote I/O)	4096 max	8192 max	4096 max	8192 max	
Number of instructions	Basic instructions	25 types			33 types			
	Application instructions	227 types	307 types		312 types			
Instruction processing speed	Basic instructions	0.18-0.36 μs /instruction	0.12-0.24 μs /instruction	0.09-0.18 μs /instruction	0.045-0.18 μs /instruction		0.0175-0.07 μs /instruction	
	Application instructions	From 0.36 μs /instruction	From 0.36 μs /instruction	From 0.18 μs /instruction	From 0.18 μs /instruction		From 0.07 μs /instruction	
Program size	10K steps (can be written to ROM)	20K steps (can be written to ROM)	100K steps (can be written to ROM)	30K steps (can be written to ROM)	120K steps (can be written to ROM)	56K steps (can be written to ROM)	120K steps (can be written to ROM)	
Number of program blocks	32 max	128 max	1024 max	1024 max				
Sampling trace	No	Yes	Yes	Yes				
Link to personal computer	Yes			Yes				
Scan monitoring time	10 to 200 ms variable			10 to 200 ms variable				
Device	Internal relay	I: 4096 max. (4096 max. for internal and shared relays combined)	I: 8192 max. (8192 max. for internal and shared relays combined)	I: 16384 max. (32768 max. for internal and shared relays combined)	I: 16384 max.	I: 32768 max.	I: 16384 max.	I: 32768 max.
	Shared relay	E: 2048 max. (4096 max. for internal and shared relays combined)	E: 2048 max. (8192 max. for internal and shared relays combined)	E: 2048 max. (16384 max. for internal and shared relays combined)	E: 2048 max.			
	Extended shared relay	E: 2048						
	Link relay	L: 2048	L: 8192	L: 8192	L: 8192	L: 16384	L: 8192	L: 16384
	Special relay	M: 9984						
	Timer	T: 512 max. (512 max. for timers and counters combined)	T: 2048 max. (2048 max. for timers and counters combined)	T: 3072 max. (3072 max. for timers and counters combined)	T: 2048 max. (2048 max. for timers and counters combined)	T: 3072 max. (3072 max. for timers and counters combined)	T: 2048 max. (2048 max. for timers and counters combined)	T: 3072 max. (3072 max. for timers and counters combined)
	Counter	C: 512 max. (512 max. for timers and counters combined)	C: 2048 max. (2048 max. for timers and counters combined)	C: 3072 max. (3072 max. for timers and counters combined)	C: 2048 max. (2048 max. for timers and counters combined)	C: 3072 max. (3072 max. for timers and counters combined)	C: 2048 max. (2048 max. for timers and counters combined)	C: 3072 max. (3072 max. for timers and counters combined)
	Data register	D: 5120 max. (5120 max. for data and shared registers combined)	D: 8192 max. (8192 max. for data and shared registers combined)		D: 16384 max.	D: 32768 max.	D: 16384 max.	D: 32768 max.
	File register	B: 32768						
	Link register	W: 2048	W: 8192	W: 8192	W: 8192	W: 16384	W: 8192	W: 16384
	Special register	Z: 512			Z: 1024			
	Index register	V: 32			V: 256			
	Shared register	R: 1024 max. (5120 max. for data and shared registers combined)	R: 1024 max. (8192 max. for data and shared registers combined)		R: 1024 max.			
Extended shared register	R: 3072 max.			R: 3072 max.				

■ Functional Specifications

Item	Specification					
	F3SP28-3S	F3SP38-6S	F3SP53-4S	F3SP58-6S	F3SP59-7S	
Control mode	Repetitive computation based on stored programs					
I/O control mode	Refresh method/Direct I/O instructions					
Programming language	Object ladder language, mnemonic language					
Number of I/O points	4096 max	8192 max	4096 max	8192 max		
Number of instructions	Basic instructions	37 types				
	Application instructions	324 types				
Instruction processing speed	Basic instructions	0.045-0.18 μ s/instruction	0.0175-0.07 μ s/instruction			
	Application instructions	From 0.18 μ s/instruction	From 0.07 μ s/instruction			
Program size	30K steps (can be written to ROM)	120K steps (can be written to ROM)	56K steps (can be written to ROM)	120K steps (can be written to ROM)	254K steps (can be written to ROM)	
Number of program blocks	1024 max					
Sampling trace	Yes					
Link to personal computer	Yes					
Scan monitoring time	10 to 200 ms variable					
Device	Internal relay	I: 16384 max.	I: 32768 max.	I: 16384 max.	I: 32768 max.	I: 65535 max.
	Shared relay	E: 2048 max.				
	Extended shared relay	E: 2048				
	Link relay	L: 8192	L: 16384	L: 8192	L: 16384	
	Special relay	M: 9984				
	Timer	T: 2048 max. (2048 max. for timers and counters combined)	T: 3072 max. (3072 max. for timers and counters combined)	T: 2048 max. (2048 max. for timers and counters combined)	T: 3072 max. (3072 max. for timers and counters combined)	
	Counter	C: 2048 max. (2048 max. for timers and counters combined)	C: 3072 max. (3072 max. for timers and counters combined)	C: 2048 max. (2048 max. for timers and counters combined)	C: 3072 max. (3072 max. for timers and counters combined)	
	Data register	D: 16384 max.	D: 32768 max.	D: 16384 max.	D: 32768 max.	D: 65535 max.
	File register	B: 32768	B: 262144	B: 32768		
	Link register	W: 8192	W: 16384	W: 8192	W: 16384	
	Special register	Z: 1024				
	Index register	V: 256				
	Shared register	R: 1024 max.				
	Extended shared register	R: 3072 max.				

Item	Specification		
	F3SP71-4N	F3SP76-7N	
Control mode	Repetitive computation based on stored programs		
I/O control mode	Refresh method/Direct I/O instructions		
Programming language	Object ladder language		
Number of I/O points	4096 max	8192 max	
Number of instructions	Basic instructions	40 types	
	Application instructions	432 types	
Instruction processing speed	Basic instructions	From 0.00375 μ s/instruction	
	Application instructions	From 0.0075 μ s/instruction	
Program size	60K steps (can be written to ROM)	260K steps (can be written to ROM)	
Number of program blocks	1024 max	1024 max	
Sampling trace	Yes	Yes	
Link to personal computer	Yes (by Ethernet only)	Yes (by Ethernet only)	
Scan monitoring time	10 to 200 ms variable	10 to 200 ms variable	
Device	Internal relay	I: 16384 max.	
	Shared relay	E: 2048 max.	
	Extended shared relay	E: 2048	
	Link relay	L: 8192	
	Special relay	M: 9984	
	Timer	T: 2048 max. (2048 max. for timers and counters combined)	T: 3072 max. (3072 max. for timers and counters combined)
		C: 2048 max. (2048 max. for timers and counters combined)	C: 3072 max. (3072 max. for timers and counters combined)
	Data register	D: 16384 max.	
	File register	B: 32768	
	Cache register	F: 131072	
	Link register	W: 8192	
	Special register	Z: 1024	
	Index register	V: 256	
	Shared register	R: 1024 max.	
	Extended shared register	R: 3072 max.	

■ Sequence CPU Module Specifications for FA-M3 Value *2

Item		Specification	
		F3SP05-0P *1	
Power supply specifications	Power supply	100 V to 240 V AC, single phase, 50/60Hz	
	Power supply fluctuation range	85 V to 264 V AC, 50/60Hz ±3 Hz	
	Power consumption	35 VA	
	Inrush current	20 A max. (120 V AC, Ta = 25°C), 45 A max. (240 V AC, Ta = 25°C)	
	Rated output voltage	5 V DC	
	Rated output current	2.0 A	
	Insulation resistance	5 MΩ or greater at 500 V DC (between external AC terminals and FG terminal)	
	Withstand voltage	1500 V AC for 1 minute (between external AC terminals and FG terminal)	
	FAIL-signal contact output	Provided on the front terminal block on the power supply module; contact rating: 24 V DC, 0.3 A (both normally-open and normally-closed terminals available)	
	Leakage current	3.5 mA max.	
	Allowable momentary power failure time	20 ms	
Performance Specifications	Control mode	Repetitive computation based on stored programs	
	I/O control mode	Refresh method/Direct input-output instructions	
	Programming language	Structured ladder language, mnemonic language	
	Number of instructions	Basic instructions	25 types
		Application instructions	227 types
	Instruction processing speed	Basic instructions	0.18 to 0.36 μs/instruction
		Application instructions	From 0.36 μs/instruction
	Program size	5K steps (can be written to ROM)	
	Number of I/O points	2048 max.	
	Number of program blocks	32 max.	
	Sampling trace	No	
	Link to personal computer	Yes	
	Scan monitoring time	10 to 200 ms variable	
	Device	Internal relay	I: 4096 max.
		Shared relay	—
		Extended shared relay	—
		Link relay	L: 2048
		Special relay	M: 2048
		Timer	T: 512 max. (512 max. for timers and counters combined)
		Counter	C: 512 max. (512 max. for timers and counters combined)
		Data register	D: 5120 max.
File register		—	
Link register		W: 2048	
Special register		Z: 512	
Index register		V: 32	
Shared register		—	
Extended shared register	—		

*1: The F3SP05-0P is a dedicated sequence CPU module for the FA-M3 Value (F3SC21-1N).

*2: FA-M3 Value shares the common specifications given on page 6.

■ Sequence CPU Module Specifications for FA-M3 Value II *3

Item		Specification	
		F3SP08-0P*1/F3SP08-SP*2	
Power supply specifications	Power supply	100 V to 240 V AC, single phase, 50/60Hz	
	Power supply fluctuation range	85 V to 264 V AC, 50/60Hz ±3 Hz	
	Power consumption	35 VA	
	Inrush current	20 A max. (120 V AC, Ta = 25°C), 45 A max. (240 V AC, Ta = 25°C)	
	Rated output voltage	5 V DC	
	Rated output current	2.0 A	
	Insulation resistance	5 MΩ or greater at 500 V DC (between external AC terminals and FG terminal)	
	Withstand voltage	1500 V AC for 1 minute (between external AC terminals and FG terminal)	
	FAIL-signal contact output	Provided on the front terminal block on the power supply module; contact rating: 24 V DC, 0.3 A (both normally-open and normally-closed terminals available)	
	Leakage current	3.5 mA max.	
	Allowable momentary power failure time	20 ms	
Performance specifications	Control mode	Repetitive computation based on stored programs	
	I/O control mode	Refresh method/Direct I/O instructions	
	Programming language	Structured ladder language, mnemonic language	
	Number of instructions	Basic instructions	25 types
		Application instructions	227 types
	Instruction processing speed	Basic instructions	0.18 to 0.36 μs/instruction
		Application instructions	From 0.36 μs/instruction
	Program size	10 K steps (can be written to ROM)	
	Number of I/O points	2048 points max.	
	Number of program blocks	32 max.	
	Sampling trace	No	
	Link to personal computer	Yes	
	Scan monitoring time	10 to 200 ms variable	
	Device	Internal relay	I: 4096 max.
		Shared relay	—
		Extended shared relay	—
		Link relay	L: 2048
		Special relay	M: 2048
		Timer	T: 512 max. (512 max. for timers and counters combined)
		Counter	C: 512 max. (512 max. for timers and counters combined)
		Data register	D: 5120 max.
File register		—	
Link register		W: 2048	
Special register		Z: 512	
Index register		V: 32	
Shared register	—		
Extended shared register	—		

*1: The F3SP08-0P is a dedicated sequence CPU module for the FA-M3 Value II (F3SC22-□□).

*2: The F3SP08-SP is a dedicated sequence CPU module for the FA-M3 Value II (F3SC23-□□).

*3: FA-M3 Value II shares the common specifications given on page 6.

*Note:

F3SP08-0P and F3SP08-SP have exactly the same dimensions, internal circuitry and other characteristics, except that F3SP08-0P uses M3.5-screw terminals while F3SP08-SP uses M4-screw terminals.

■ Ladder Sequence Basic Instructions

FUNC No	Instruction	Mnemonic	Symbol	Function	Applicable CPU			
					F3SP05 F3SP08 F3SP21	F3SP25 F3SP35	F3SP28-3N F3SP38-6N F3SP53-4H F3SP58-6H	F3SP28-3S F3SP38-6S F3SP53-4S F3SP58-6S F3SP59-7S F3SP71-4N F3SP76-7N
—	Load	LD		Starts a logic operation (contact a).	●	●	●	●
—	Load Not	LDN		Starts a logic NOT operation (contact b).	●	●	●	●
—	And	AND		Performs an AND (serial contact a) connection.	●	●	●	●
—	And Not	ANDN		Performs an AND NOT (serial contact b) connection.	●	●	●	●
—	Or	OR		Performs an OR (parallel contact a) connection.	●	●	●	●
—	Or Not	ORN		Performs an OR NOT (parallel contact b) connection.	●	●	●	●
—	And Load	ANDLD		Performs an AND with the preceding condition.	●	●	●	●
—	Or Load	ORLD		Performs an OR with the preceding condition.	●	●	●	●
—	Out	OUT		Generates a relay output.	●	●	●	●
07	Out Not	OUTN		Generates a NOT output.	●	●	●	●
—	Push	PUSH		Starts a branch.	●	●	●	●
—	Stack	STCRD		Branch.	●	●	●	●
—	Pop	POP		Terminates a branch.	●	●	●	●
01 / 01P	Set	SET		Set a device.	●	●	●	●
02 / 02P	Reset	RST		Resets a device.	●	●	●	●
—	Timer	TIM		Count-down timer.	●	●	●	●
—	Counter	CNT		Count-down counter.	●	●	●	●
03	Differential Up	DIFU		Causes a relay to turn on for 1 scan on the rising edge of the input signal (result of logical operation).	●	●	●	●
04	Differential Down	DIFD		Causes a relay to turn on for 1 scan on the falling edge of the input signal (result of logical operation).	●	●	●	●
05	Interlock	IL		Starts interlock.	●	●	●	●
06	Interlock Clear	ILC		Resets interlock.	●	●	●	●
00	Nop	NOP		Does nothing.	●	●	●	●
999	End	END		Terminates a scan.	●	●	●	●
301	Load Differential Up	LDU		Causes the result signal of a logical operation to turn on for 1 scan on the rising edge of the signal of a specified device.	—	—	●	●
302	Load Differential Down	LDD		Causes the result signal of a logical operation to turn on for 1 scan on the falling edge of the signal of a specified device.	—	—	●	●
303	Logical Differential Up	UP		Causes the result signal of a logical operation to turn on for 1 scan on the rising edge of the input signal (result of logical operation).	—	—	●	●
304	Logical Differential Down	DWN		Causes the result signal of a logical operation to turn on for 1 scan on the falling edge of the input signal (result of logical operation).	—	—	●	●
305	Logical Differential Up Using Specified Device	UPX		Causes the result signal of a logical operation to turn on for 1 scan on the rising edge of the input signal (result of logical operation). A specified device is used for differential operation.	—	—	●	●
306	Logical Differential Down Using Specified Device	DWNX		Causes the result signal of a logical operation to turn on for 1 scan on the falling edge of the input signal (result of logical operation). A specified device is used for differential operation.	—	—	●	●
307	Inverter	INV		Outputs inverted input signal (result of logical operation).	—	—	●	●
308	Flip-Flop	FF		Causes a relay to invert on every rising edge of an input signal.	—	—	●	●
311	Load Specified Bit	LDW		Outputs the status of a specified bit of a 16-bit data item as contact a.	—	—	—	●
311L	Load Specified Bit Long	LDW L		Outputs the status of a specified bit of a 32-bit data item as contact a.	—	—	—	●
312 / 312P	Out Specified Bit	OUTW		Outputs the result of the logical operations performed so far to a specified bit of a 16-bit data item.	—	—	—	●
312L / 312LP	Out Specified Bit Long	OUTW L		Outputs the result of the logical operations performed so far to a specified bit of a 32-bit data item.	—	—	—	●
313 / 313P	Set Specified Bit	SETW		Sets the specified bit of a 16-bit data item to ON.	—	—	—	●
313L / 313LP	Set Specified Bit Long	SETW L		Sets the specified bit of a 32-bit data item to ON.	—	—	—	●
314 / 314P	Reset Specified Bit	RSTW		Sets the specified bit of a 16-bit data item to OFF.	—	—	—	●
314L / 314LP	Reset Specified Bit Long	RSTW L		Sets the specified bit of a 32-bit data item to OFF.	—	—	—	●

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FUNC No	Instruction	Mnemonic	Symbol	Function	Applicable CPU
					F3SP71-4N F3SP76-7N
—	Off Delay	OFDLY L		Outputs OFF-delay timer operation result for a specified device	●
—	On Delay	ONDLY L		Outputs ON-delay timer operation result for a specified device	●
—	Pulse	PULSE L		Outputs pulse timer operation result for a specified device	●

■ Ladder Sequence Application Instructions

Classification	FUNC No.	Instruction	Processing Unit	Mnemonic	Symbol	Function	Applicable CPU				
							F3SP05 F3SP08 F3SP21	F3SP25 F3SP35	F3SP28-3N F3SP38-6N F3SP53-4H F3SP58-6H	F3SP28-3S F3SP38-6S F3SP53-4S F3SP58-6S F3SP59-7S F3SP71-4N F3SP76-7N	
Comparison	10	Compare	=	16 bits	CMP		Compares 1-word data.	●	●	●	●
			< >	16 bits				●	●	●	●
			>	16 bits				●	●	●	●
			> =	16 bits				●	●	●	●
			<	16 bits				●	●	●	●
			< =	16 bits				●	●	●	●
	10L	Compare Long	=	32 bits	CMP L		Compares 2-word data.	●	●	●	●
			< >	32 bits				●	●	●	●
			>	32 bits				●	●	●	●
			> =	32 bits				●	●	●	●
			<	32 bits				●	●	●	●
			< =	32 bits				●	●	●	●
	904	Compare Float	=	32 bits	FCMP		Compares floating point data.	—	●	●	●
			< >	32 bits				—	●	●	●
			>	32 bits				—	●	●	●
			> =	32 bits				—	●	●	●
			<	32 bits				—	●	●	●
			< =	32 bits				—	●	●	●
	111/111P	Table Compare	16 bits	BCMP		Compares 1-word data against range table.	●	●	●	●	
	111L/111LP	Table Compare Long	32 bits	BCMP L		Compares 2-word data against range table.	●	●	●	●	
919/919P	Table Compare Float	32 bits	FBCP L		Compares floating-point data against range table.	●	●	●	●		
112/112P	Table Search	16 bits	TSRCH		Searches for 1-word data in table.	●	●	●	●		
112L/112LP	Table Search Long	32 bits	TSRCH L		Searches for 2-word data in table.	●	●	●	●		
Arithmetic	20 /20P	Add	16 bits	CAL		Adds 1-word data.	●	●	●	●	
		Subtract	16 bits			Subtracts 1-word data.	●	●	●	●	
		Multiply	16 bits			Multiplies 1-word data.	●	●	●	●	
		Divide	16 bits			Divides 1-word data.	●	●	●	●	
	20L /20LP	Add Long	32 bits	CAL L		Adds 2-word data.	●	●	●	●	
		Subtract Long	32 bits			Subtracts 2-word data.	●	●	●	●	
		Multiply Long	32 bits			Multiplies 2-word data.	●	●	●	●	
		Divide Long	32 bits			Divides 2-word data.	●	●	●	●	
	903/903P	Add Float	32 bits	FCAL L		Adds floating-point data.	—	●	●	●	
		Subtract Float	32 bits			Subtracts floating-point data.	—	●	●	●	
		Multiply Float	32 bits			Multiplies floating-point data.	—	●	●	●	
		Divide Float	32 bits			Divides floating-point data.	—	●	●	●	

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Classification	FUNC No.	Instruction	Processing Unit	Mnemonic	Symbol	Function	Applicable CPU			
							F3SP05 F3SP08 F3SP21	F3SP25 F3SP35	F3SP28-3N F3SP38-6N F3SP53-4H F3SP58-6H	F3SP28-3S F3SP38-6S F3SP53-4S F3SP58-6S F3SP59-7S F3SP71-4N F3SP76-7N
Arithmetic (cont.)	120/120P	Increment	16 bits	INC		Adds 1 to 1-word data.	●	●	●	●
	120L/120LP	Increment Long	32 bits	INC L		Adds 1 to 2-word data.	●	●	●	●
	121/121P	Decrement	16 bits	DEC		Subtracts 1 from 1-word data.	●	●	●	●
	121L/121LP	Decrement Long	32 bits	DEC L		Subtracts 1 from 2-word data.	●	●	●	●
	122/122P	Square Root	16 bits	SQR		Computes square root of 1-word data.	●	●	●	●
	122L/122LP	Square Root Long	32 bits	SQR L		Computes square root of 2-word data.	●	●	●	●
	915/915P	Square Root Float	32 bits	FSQR		Computes square root of floating-point data.	—	●	●	●
	907/907P	SIN	32 bits	FSIN L		Computes the sine of a radian angle as a floating-point (SIN) number.	—	●	●	●
	908/908P	COS	32 bits	FCOS L		Computes the cosine of a radian angle as a floating-point (COS) number.	—	●	●	●
	909/909P	TAN	32 bits	FTAN L		Computes the tangent of a radian angle as a floating-point (TAN) number.	—	●	●	●
	910/910P	SIN ⁻¹	32 bits	FASIN L		Computes the arc sine of a floating-point number in radians (SIN ⁻¹).	—	●	●	●
	911/911P	COS ⁻¹	32 bits	FACOS L		Computes the arc cosine of a floating-point number in radians (COS ⁻¹).	—	●	●	●
	912/912P	TAN ⁻¹	32 bits	FATAN L		Computes the arc tangent of a floating-point number in radians (TAN ⁻¹).	—	●	●	●
	913/908P	LOG	32 bits	FLOG L		Computes the logarithm of floating-point data.	—	●	●	●
914/914P	EXP	32 bits	FEXP L		Computes the exponential of floating-point data.	—	●	●	●	
Logical	20 /20P	Logical AND	16 bits	CAL		Performs AND operation on 1-word data.	●	●	●	●
		Logical OR	16 bits			Performs OR operation on 1-word data.	●	●	●	●
		Logical XOR	16 bits			Performs XOR operation on 1-word data.	●	●	●	●
		Logical NXOR	16 bits			Performs NXOR operation on 1-word data.	●	●	●	●
	20L /20LP	Logical AND Long	32 bits	CAL L		Performs AND operation on 2-word data.	●	●	●	●
		Logical OR Long	32 bits			Performs OR operation on 2-word data.	●	●	●	●
		Logical XOR Long	32 bits			Performs XOR operation on 2-word data.	●	●	●	●
		Logical NXOR Long	32 bits			Performs NXOR operation on 2-word data.	●	●	●	●
	21 /21P	Two's Complement	16 bits	NEG		Calculate two's complement of 1-word data (inverts sign).	●	●	●	●
	21L /21LP	Two's Complement Long	32 bits	NEG L		Calculate two's complement of 2-word data (inverts sign).	●	●	●	●
22 /22P	NOT	16 bits	NOT		Inverts all bits of 1-word data.	●	●	●	●	
22L /22LP	NOT Long	32 bits	NOT L		Inverts all bits of 2-word data.	●	●	●	●	
Rotate	30 /30P	Right Rotate	16 bits	RROT		Rotates 1 word right by 1 bit.	●	●	●	●
	30L /30LP	Right Rotate Long	32 bits	RROT L		Rotates 2 words right by 1 bit.	●	●	●	●
	130 /130P	Right Rotate with Carry	16 bits	RROTC		Rotates 1 word right by 1 bit (with carry).	●	●	●	●
	130L /130LP	Right Rotate with Carry Long	32 bits	RROTC L		Rotates 2 words right by 1 bit (with carry).	●	●	●	●
	31 /31P	Left Rotate	16 bits	LROT		Rotates 1 word left by 1 bit.	●	●	●	●
	31L /31LP	Left Rotate Long	32 bits	LROT L		Rotates 2 words left by 1 bit.	●	●	●	●
	131/131P	Left Rotate with Carry	16 bits	LROTC		Rotates 1 words left by 1 bit (with carry).	●	●	●	●
	131L/131LP	Left Rotate with Carry Long	32 bits	LROTC L		Rotates 2 words left by 1 bit (with carry).	●	●	●	●

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Classification	FUNC No.	Instruction	Processing Unit	Mnemonic	Symbol	Function	Applicable CPU			
							F3SP05 F3SP08 F3SP21	F3SP25 F3SP35	F3SP28-3N F3SP38-6N F3SP53-4H F3SP58-6H	F3SP28-3S F3SP38-6S F3SP53-4S F3SP58-6S F3SP59-7S F3SP71-4N F3SP76-7N
Shift	32 /32P	Right Shift	16 bits	RSFT		Shifts 1 word right by 1 bit.	●	●	●	●
	32L /32LP	Right Shift Long	32 bits	RSFT L		Shifts 2 words right by 1 bit.	●	●	●	●
	132/132P	Right Shift m-bit Data by n bits	—	RSFTN		Shifts data of specified bit length right by a specified number of bits.	●	●	●	●
	33 /33P	Left Shift	16 bits	LSFT		Shifts 1 word left by 1 bit.	●	●	●	●
	33L /33LP	Left Shift Long	32 bits	LSFT L		Shifts 2 words left by 1 bit.	●	●	●	●
	133/133P	Left Shift m-bit Data by n bits	—	LSFTN		Shifts data of specified bit length left by a specified number of bits.	●	●	●	●
Data Transfer	34	Shift Register	—	SFTR		Shifts data of specified bit length left and right by 1-bit position.	○	○	○	○
	40 /40P	Move	16 bits	MOV		Moves 1-word data.	●	●	●	●
	40L /40LP	Move Long	32 bits	MOV L		Moves 2-word data.	●	●	●	●
	41 /41P	Partial Move	16 bits	PMOV		Moves specified part of 1-word data.	●	●	●	●
	42 /42P	Block Move	16 bits	BMOV		Moves n-word data.	●	●	●	●
	43 /43P	Block Set	16 bits	BSET		Sets data into n words.	●	●	●	●
	44 /44P	Right word Shift	16 bits	RWS		Shifts word right.	●	●	●	●
	45 /45P	Left Word Shift	16 bits	LWS		Shifts word left.	●	●	●	●
Data Transfer	46 /46P	Indexed Move	16 bits	IXMOV		Moves 1-word data with index.	●	●	●	●
	46L /46LP	Indexed Move Long	32 bits	IXMOV L		Moves 2-word data with index.	●	●	●	●
	47 /47P	Exchange	16 bits	XCHG		Exchanges 1-word data.	●	●	●	●
	47L /47LP	Exchange Long	32 bits	XCHG L		Exchanges 2-word data.	●	●	●	●
	140/140P	Negated Move	16 bits	NMOV		Moves 1-word data with inversion.	●	●	●	●
	140L/140LP	Negated Move Long-word	32 bits	NMOV L		Moves 2-word data with inversion.	●	●	●	●
	141/141P	Extended Partial Move	16 bits max.	PMOVX		Moves specified part of 1-word data.	●	●	●	●
Data Processing	142/142P	Bit Move	16 bits	BITM		Moves 1 bit.	●	●	●	●
	143/143P	Digit Move	16 bits	DGTM		Moves a specified digit of 1-word data.	●	●	●	●
	50 /50P	FIFO Read	16 bits	FIFRD		Reads FIFO table.	●	●	●	●
	51 /51P	FIFO Write	16 bits	FIFWR		Writes FIFO table.	●	●	●	●
	52 /52P	Binary Conversion	16 bits	BIN		Converts 1-word data from BCD code to BIN code.	●	●	●	●
	52L /52LP	Binary Conversion Long	32 bits	BIN L		Converts 2-word data from BCD code to BIN code.	●	●	●	●
	53 /53P	BCD Conversion	16 bits	BCD		Converts 1-word data from BIN code to BCD code.	●	●	●	●
	53L /53LP	BCD Conversion Long	32 bits	BCD L		Converts 2-word data from BIN code to BCD code.	●	●	●	●
	916/916P	Float to BCD	32 bits	FBCD L		Converts floating-point data to BCD.	—	●	●	●
	917/917P	BCD to Float	32 bits	BCDF L		Converts BCD to floating-point data.	—	●	●	●
	901/901P	Integer to Float	16 bits	ITOF		Converts 1-word integer to floating-point data.	—	●	●	●
	901L/901LP	Long Integer to Float	32 bits	ITOF L		Converts 2-word integer to floating-point data.	—	●	●	●
902/902P	Float to Integer	16 bits	FTOI		Converts floating-point data to 1-word integer.	—	●	●	●	
902L/902LP	Float to Long Integer	32 bits	FTOI L		Converts floating-point data to 2-word integer.	—	●	●	●	

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An instruction indicated with "○" is executed only once when its input condition is ON

Classification	FUNC No.	Instruction	Processing Unit	Mnemonic	Symbol	Function	Applicable CPU			
							F3SP05 F3SP08 F3SP21	F3SP25 F3SP35	F3SP28-3N F3SP38-6N F3SP53-4H F3SP58-6H	F3SP28-3S F3SP38-6S F3SP53-4S F3SP58-6S F3SP59-7S F3SP71-4N F3SP76-7N
Data Processing (cont.)	905/905P	Convert Degree to Radian	32 bits	FRAD L		Converts degree (floating-point) data to radian (floating-point) data.	—	●	●	●
	906/906P	Convert Radian to Degree	32 bits	FDEG L		Converts radian (floating-point) data to degree (floating-point) data.	—	●	●	●
	54 /54P	7-Segment Decoder	16 bits	SEG		Decodes to 7-segment LED data.	●	●	●	●
	55 /55P	Convert ASCII	16 bits	ASC		Converts to ASCII data.	●	●	●	●
	56 /56P	Bit set	16 bits	BITS		Sets bit of 1-word data.	●	●	●	●
	56L/56LP	Bit Set Long	32 bits	BITS L		Sets bit of 2-word data.	●	●	●	●
	57 /57P	Bit Reset	16 bits	BITR		Resets bit of 1-word data.	●	●	●	●
	57L /57LP	Bit Reset Long	32 bits	BITR L		Resets bit of 2-word data.	●	●	●	●
	151/151P	Carry Set	—	CSET		Sets carry flag.	●	●	●	●
	152/152P	Carry Reset	—	CRST		Resets carry flag.	●	●	●	●
	153/153P	Distribute Data	16 bits	DIST		Distributes 1-word data into 4-bit segments.	●	●	●	●
	153L/153LP	Distribute Data Long	32 bits	DIST L		Distributes 2-word data into 4-bit segments.	●	●	●	●
	154/154P	Unit Data	16 bits	UNIT		Extracts 4-bit data from 4-word data.	●	●	●	●
	154L/154LP	Unit Data Long	32 bits	UNIT L		Extracts 4-bit data from 8-word data.	●	●	●	●
	155/155P	Decode	16 bits	DECO		Decodes 8-bit data into 256-bit data.	●	●	●	●
	156/156P	Encode	16 bits	ENCO		Decodes 256-bit data into 8-bit data.	●	●	●	●
	157/157P	Bit Counter	16 bits	BCNT		1-word bit counter	●	●	●	●
	157L/157LP	Bit Counter Long	32 bits	BCNT L		2-word bit counter	●	●	●	●
	158/158P	Approximate Broken Line	16 bits	APR		Approximates 1-word line segment.	●	●	●	●
	158L/158LP	Approximate Broken Line Long	32 bits	APR L		Approximates 2-word line segment.	●	●	●	●
918/918P	Float Approximate Broken Line	32 bits	FAPR L		Approximates floating-point line segment.	—	●	●	●	
951/951P	Extend Sign	32 bits	SIGN L		Provides sign extension.	—	●	●	●	
Refresh	60 /60P	Direct Refresh	16 bits	DREF		Refreshes I/O relay.	●	●	●	●
Program Control	61 /61P	Jump	—	JMP		Causes a jump to a specified location.	●	●	●	●
	62 /62P	Subroutine Call	—	CALL		Calls a subroutine.	●	●	●	●
	63	Subroutine Entry	—	SUB		Begins a subroutine.	●	●	●	●
	64	Subroutine Return	—	RET		Ends a subroutine.	●	●	●	●
	65	Interrupt	—	INTP		Starts interrupt processing.	●	●	●	●
	66	Interrupt Return	—	IRET		Returns from interrupt processing.	●	●	●	●
	67	Disable Interrupt	—	DI		Disables interrupts.	●	●	●	●
	68	Enable Interrupt	—	EI		Enables interrupts.	●	●	●	●
	69 /69P	Activate Block	—	ACT		Activates a block.	●	●	●	●
	70 /70P	Inactivate Block	—	INACT		Inactivates a block.	●	●	●	●
	71 /71P	Activate Sensor Control Block	—	CBACT		Activates a sensor control block.	—	—	●	●
	72 /72P	Inactivate Sensor Control Block	—	CBINA		Inactivates a sensor control block.	—	—	●	●
	73	Disable Sensor Control Block	—	CBD		Disables a sensor control block.	—	—	●	●
	74	Enable Sensor Control Block	—	CBE		Enables a sensor control block.	—	—	●	●

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Program Control (contt.)	160	For Loop	—	FOR	FOR	Begins a loop.	●	●	●	●
	161	Next Loop	—	NEXT	NEXT	Ends a loop.	●	●	●	●
	162	Break Loop	—	BRK	BRK	Breaks a FOR-NEXT loop.	●	●	●	●
	280P	Signal to BASIC	—	SIG	SIG	Signals an interrupt to BASIC.	○	○	○	○
Special Module	81 /81P	Read	16 bits	READ	READ	Reads a special module in 1-word units.	●	●	●	●
	81L /81LP	Read Long	32 bits	READ L	L READ	Reads a special module in 2-word units.	●	●	●	●
	82 /82P	Write	16 bits	WRITE	WRITE	Writes a special module in 1-word units.	●	●	●	●
	82L /82LP	Write Long	32 bits	WRITE L	L WRITE	Writes a special module in 2-word units.	●	●	●	●
	83 /83P	High-speed Read	16 bits	HRD	HRD	Reads a special module in 1-word units at high speed.	●	●	●	●
	83L /83LP	High-speed Read Long	32 bits	HRD L	L HRD	Reads a special module in 2-word units at high speed.	●	●	●	●
	84 /84P	High-speed Write	16 bits	HWR	HWR	Writes a special module in 1-word units at high speed.	●	●	●	●
	84L /84LP	High-speed Write Long	32 bits	HWR L	L HWR	Writes a special module in 2-word units at high speed.	●	●	●	●
String Manipulation	931/931P	String to Number	16 bits	VAL	VAL	Converts character string data into numeric data.	—	●	●	●
	931L/931LP	String to Long Number	32 bits	VAL L	L VAL	Converts character string data into long-word numeric data.	—	●	●	●
	932/932P	Number to String	16 bits	STR	STR	Converts numeric data into character string data.	—	●	●	●
	932L/932LP	Long Number to String	32 bits	STR L	L STR	Converts long-word numeric data into character string data.	—	●	●	●
	933/933P	String Chain	8 bits	SCHN	SCHN	Concatenates character strings.	—	●	●	●
	934/934P	String Move	8 bits	SMOV L	L SMOV	Moves character strings.	—	●	●	●
	935/935P	String Length Count	8 bits	SLEN	SLEN	Counts the length of a character string.	—	●	●	●
	936/936P	Compare String	8 bits	SCMP	SCMP	Compares character strings.	—	●	●	●
	937/937P	String Middle	8 bits	SMID	SMID	Extracts a substring from a character string.	—	●	●	●
	938/938P	String Left	8 bits	SLFT	SLFT	Extracts a substring from the left of a character string.	—	●	●	●
	939/939P	String Right	8 bits	SRIT	SRIT	Extracts a substring from the right of a character string.	—	●	●	●
	940/940P	String Search	8 bits	SIST	SIST	Searches for a character string.	—	●	●	●
Structure and Macro	986	Structure Pointer Declaration	—	STRCT	STRCT	Declares the type of structures to be passed.	—	—	—	●
	987	Structure Move	—	STMOV	STMOV	Moves structures.	—	—	—	●
	982/982P	Structure Macro Instruction Call	1/16	SCALL	S cccccccc	Executes a registered structure macro instruction.	—	—	—	●
	996/996P	Macro Call	1/16/32	MCALL	M cccccccc	Transfers control to a specified macro instruction.	—	●	●	●
	995/995P	Parameter	1/16/32	PARA	PARA	Passes parameters to a macro instruction or an input macro.	—	●	●	●
	998	Macro Return	—	MRET	MRET	Designates the end of a macro instruction, input macro instruction, or structure macro instruction.	—	●	●	●
	981	Input Macro Instruction Call	1/16/32	NCALL	N cccccccc	Executes a registered macro instruction.	—	—	—	●
	309/309P	Output of Input Macro	1/16	NMOUT	NMOUT	Specifies the logical operation result of an input macro instruction.	—	—	—	●

Note: An instruction indicated with two FUNC Nos. can be either executed one or more times while its input condition is ON or executed only once when its input condition is ON (pulse instruction).
An instruction indicated with "○" is executed only once when its input condition is ON

Classification	FUNC No.	Instruction	Processing Unit	Mnemonic	Symbol	Function	Applicable CPU			
							F3SP05 F3SP08 F3SP21	F3SP25 F3SP35	F3SP28-3N F3SP38-6N F3SP53-4H F3SP58-6H	F3SP28-3S F3SP38-6S F3SP53-4S F3SP58-6S F3SP59-7S F3SP71-4N F3SP76-7N
Indirect Specification	510/510P	Indirect Address Set	3 bits	SET@	— SET@ [] []	Stores the value representing a device address as three-word data.	—	—	—	●
	511/511P	Indirect Address Add	2 bits	ADD@	— L ADD@ [] []	Adds a long-word value to an address and stores the result as 3-word data.	—	—	—	●
	512/512P	Indirect Address Move	3 bits	MOV@	— MOV@ [] []	Transfers an indirect address stored as 3-word data.	—	—	—	●
Watchdog	85 /85P	Refresh Watchdog Timer	—	WDT	— WDT []	Refreshes a watchdog timer.	●	●	●	●
Free Run Timer	186/186P	Read Free Run Timer	16 bits	FTMR	— FTMR [] []	Reads free-run timer of CPU module	—	—	●	●
Trace	181/181P	Sampling Trace	1 bit 16 bits	TRC	— TRC []	Acquires sampling trace data.	—	●	●	●
User Log	961/961P	Save User Log	8 bits	ULOG	— ULOG [] []	Stores user log.	●	●	●	●
	962/962P	Read User Log	8 bits	ULOGR	— ULOGR [] [] []	Reads user log.	●	●	●	●
	963/963P	Clear User Log	8 bits	UCLR	— UCLR []	Clears user log.	●	●	●	●
Date and Time	520P	Set Date	3 bits	DATE	— DATE [] []	Sets the date of the sequence CPU module.	—	—	—	○
	521P	Set Time	3 bits	TIME	— TIME [] []	Sets the time of the sequence CPU module.	—	—	—	○
	522P	Set Date String	8 bits	SDATE	— SDATE [] []	Sets the date of the sequence CPU module using a specified date string.	—	—	—	○
	523P	Set Time String	8 bits	STIME	— STIME [] []	Sets the time of the sequence CPU module using a specified time string.	—	—	—	○

Note: An instruction indicated with two FUNC Nos. can be either executed one or more times while its input condition is ON or executed only once when its input condition is ON (pulse instruction).
An instruction indicated with "○" is executed only once when its input condition is ON.

■ Ladder Sequence Continuous Type Application Instructions

Classification	FUNC No.	Instruction	Processing Unit	Mnemonic	Symbol	Function	Applicable CPU
							F3SP71-4N F3SP76-7N
Disk Operation	—	Mount Memory Card	—	MOUNT		Mounts a memory card.	●
	—	Unmount Memory Card	—	UNMOUNT		Unmounts a memory card.	●
	—	Format Disk	—	FORMAT		Formats a memory card or RAM disk.	●
	—	Disk Info	—	DISKINFO		Gets information about a specified disk.	●
File Access	—	Open File	16 bits	FOPEN		Opens a file.	●
	—	Close File	16 bits	FCLOSE		Closes a file.	●
	—	Read File Line	8 bits	FGETS		Reads one line from a file.	●
	—	Write File Line	8 bits	FPUTS		Writes one line to a file.	●
	—	Read File Block	8 bits	FREAD		Reads data of specified size from a file.	●
	—	Write File Block	8 bits	FWRITE		Writes data of specified size to a file.	●
	—	File Seek	8 bits	FSEEK		Moves the file pointer of a file.	●
	—	File Text Search	8 bits	FSEARCHT		Finds a specified string in a file.	●
	—	File Binary Search	8 bits	FSEARCHB		Finds specified binary data in a file.	●
	—	Convert CSV File to Device	—	F2DCSV		Converts a CSV formatted file into device data.	●
	—	Convert Device to CSV File	—	D2FCSV		Converts device data into a CSV formatted file.	●
	—	Convert Binary File to Device	—	F2DBIN		Converts a binary file into device data.	●
	—	Convert Device to Binary File	—	D2FBIN		Converts device data into a binary file.	●
File Operation	—	Copy File	—	FCOPY		Copies one or more files.	●
	—	Move File	—	FMOVE		Moves one or more files.	●
	—	Delete File	—	FDEL		Deletes one or more files.	●
	—	Make Directory	—	FMKDIR		Creates a directory.	●
	—	Remove Directory	—	FRMDIR		Deletes a directory.	●
	—	Rename File	—	FREN		Renames a file or directory.	●
	—	File Status	—	FSTAT		Gets status information of a file or directory.	●
	—	File List Start	—	FLSFIRST		Declares a file list operation for getting file status information.	●
	—	File List Next	—	FLS		Gets status of the next file in a file list operation.	●
	—	File List End	—	FLSFIN		Declares the end of a file list operation.	●
	—	Change Directory	—	FCD		Changes the current directory.	●
	—	Concatenate File	—	FCAT		Concatenates two files.	●
	—	Change File Attribute	—	FATRW		Changes the attribute of a specified file or directory.	●

Classification	FUNC No.	Instruction	Processing Unit	Mnemonic	Symbol	Function	Applicable CPU
							F3SP71-4N F3SP76-7N
UDP/IP Socket Communications	—	UDP/IP Open	—	UDPOPEN		Opens a UDP/IP socket.	●
	—	UDP/IP Close	—	UDPCLOSE		Closes a UDP/IP socket.	●
	—	UDP/IP Send Request	8 bits	UDPSND		Sends data from a using UDP/IP socket.	●
	—	UDP/IP Receive Request	8 bits	UDPRCV		Receives data from a UDP/IP socket to device.	●
TCP/IP Socket Communications	—	TCP/IP Open	—	TCPOPEN		Opens a TCP/IP socket.	●
	—	TCP/IP Close	—	TCPCLOSE		Closes a TCP/IP socket.	●
	—	TCP/IP Connect Request	—	TCPCNCT		Issues a connection request to a TCP/IP server.	●
	—	TCP/IP Listen Request	—	TCPLISN		Waits for a connection request from a TCP/IP client.	●
	—	TCP/IP Send Request	8 bits	TCPSND		Sends data using TCP/IP socket.	●
	—	TCP/IP Receive Request	8 bits	TCPRCV		Receives data from a TCP/IP socket to device.	●
FTP Client	—	FTP Client Open	—	FTPOPEN		Runs FTP client.	●
	—	FTP Client Quit	—	FTPQUIT		Exits from FTP client.	●
	—	FTP Client Put File	—	FTPPUT		Transfers a file to FTP server.	●
	—	FTP Client Put Unique File	—	FTPPUTU		Transfers a file to FTP server to be stored with a unique filename determined automatically by the server.	●
	—	FTP Client Append File	—	FTPAPEND		Transfers a file to FTP server to be appended to a specified file.	●
	—	FTP Client Get File	—	FTPGET		Gets a file from FTP server.	●
	—	FTP Client Change Directory	—	FTPCD		Changes current directory on FTP server.	●
	—	FTP Client Change Local Directory	—	FTPLCD		Changes local current directory on FTP client.	●
	—	FTP Client Current Directory Info	—	FTPPWD		Gets information about current directory of FTP server.	●
	—	FTP Client Get File List	—	FTPLS		Gets directory/file information from FTP server.	●
	—	FTP Client Delete File	—	FTPDEL		Deletes one or more files on FTP server.	●
	—	FTP Client Rename File	—	FTPREN		Renames a file on FTP server.	●
	—	FTP Client Make Directory	—	FTPMKDIR		Creates a directory on FTP server.	●
	—	FTP Client Remove Directory	—	FTPRMDIR		Deletes a directory on FTP server.	●
—	FTP Client Representation Type	—	FTPTYPE		Selects ASCII or binary for FTP data transfer.	●	
FTP Server	—	FTP Server Run Request Service	—	FTPSRUN		Resumes FTP server request service.	●
	—	FTP Server Stop Request Service	—	FTPSSTOP		Stops FTP server request service.	●
Miscellaneous	—	Write CPU Properties	—	PWRITE		Writes CPU property values.	●
	—	Read CPU Properties	—	PREAD		Reads CPU property values.	●

■ 64-bit Arithmetic and Comparison Instructions

Classification	FUNC No.	Instruction	Processing Unit	Mnemonic	Symbol	Function	Applicable CPU	
							F3SP71-4N F3SP76-7N	
Comparison	10D	Compare Double	=	64 bits	CMP D		Compares 4-word data.	●
			<>	64 bits				●
			>	64 bits				●
			>=	64 bits				●
			<	64 bits				●
			<=	64 bits				●
	904E	Compare Float Double	=	64 bits	FCMP E		Compares double-precision floating point data.	●
			<>	64 bits				●
			>	64 bits				●
			>=	64 bits				●
			<	64 bits				●
			<=	64 bits				●
Arithmetic	20D	Add Double	64 bits	CAL D		Adds 4-word data.	●	
		Subtract Double	64 bits			Subtracts 4-word data.	●	
		Multiply Double	64 bits			Multiplies 4-word data.	●	
		Divide Double	64 bits			Divides 4-word data.	●	
	903E	Add Double Float	64 bits	FCAL E		Adds double-precision floating-point data.	●	
		Subtract Double Double	64 bits			Subtracts double-precision floating-point data.	●	
		Multiply Double Float	64 bits			Multiplies double-precision floating-point data.	●	
		Divide Double Float	64 bits			Divides double-precision floating-point data.	●	
	122D	Square Root Double	64 bits	SQR D		Computes square root of 4-word data.	●	
	915E	Square Root Double Float	64 bits	FSQR E		Computes square root of double-precision floating-point data.	●	
Data Transfer	40D	Move Double	64 bits	MOV D		Moves 4-word data.	●	
Data Processing	951D	Extend Sign Double	64 bits	SIGN D		Extends sign of long-word data to double-word data	●	
	920L	Long Integer to Double Float	32 bits	ITOE L		Converts 2-word integer to double-precision floating-point data.	●	
	921D	Double Long Integer to Double Float	64 bits	ITOE D		Converts 4-word integer to double-precision floating-point data.	●	
	922L	Double Float to Long Integer	32 bits	ETOI L		Converts double-precision floating-point data to 2-word integer	●	
	923D	Double Float to Double Long Integer	64 bits	ETOI D		Converts double-precision floating-point data to 4-word integer	●	
	925F	Float to Double Float	32 bits	FTOE		Converts floating-point data to double-precision floating-point data.	●	
	926E	Double Float to Float	64 bits	ETOF E		Converts double-precision floating-point data to floating-point data.	●	
Elapsed Timer	965	Start Elapsed Timer (TMS)	32 bits	TMS L		Start elapsed timer and stores the free-run timer value into a specified device	●	
	966	Elapsed Time (TME)	32 bits	TME L		Stores result of elapsed time since timer is started by TMS into a specified device	●	

Module Specifications

■ I/O Modules

● Input Modules

Model	Input Type	Number of Points	Isolation Method	Rated Input Voltage	Rated Input Current	Operating Voltage/Current		Input Response Time		External Connection	Number of Points/Common
						ON	OFF	OFF→ON	ON→OFF		
F3XD08-6N	DC voltage (sink/source)	8	Photocoupler isolation	12-24V DC	4.1 mA/point (12 V DC) 8.5 mA/point (24 V DC)	8.0 V DC min. 2.6 mA min.	3.4 V DC max. 1.0 mA max.	2.0 ms max. or 17 ms, selectable	3.5 ms max. or 18.5 ms, selectable	10-point terminal block M3.5 screw	8 points/common
F3XD16-3N		16		24V DC	4.1 mA/point 24 V DC	16.0 V DC min. 3.2 mA min.	5.8 V DC max. 0.9 mA max.			18-point terminal block M3.5 screw	
F3XD16-4N				12V DC	4.1 mA/point 12 V DC	8.0 V DC min. 2.6 mA min.	3.4 V DC max. 1.0 mA max.				
F3XD32-3N		32		24V DC	4.1 mA/point 24 V DC	16.0 V DC min. 3.2 mA min.	5.8 V DC max. 0.9 mA max.			One 40-pin connector	
F3XD32-4N				12V DC	4.1 mA/point 12 V DC	8.0 V DC min. 2.6 mA min.	3.4 V DC max. 1.0 mA max.				
F3XD32-5N				5V DC	4.1 mA/point 5 V DC	3.5 V DC min. 2.0 mA min.	1.0 V DC max. 0.2 mA max.				
F3XD64-3N		64		24V DC	4.1 mA/point 24 V DC	16.0 V DC min. 3.2 mA min.	5.8 V DC max. 0.9 mA max.			Two 40-pin connectors	
F3XD64-4N				12V DC	4.1 mA/point 12 V DC	8.0 V DC min. 2.6 mA min.	3.4 V DC max. 1.0 mA max.				

● Output Modules

Model	Output Type	Number of Points	Isolation Method	Rated Load Voltage	Maximum Load Current	Output Response Time		Surge Protector	External Connection	External Power Supply	Number of Points/Common	HOLD/RESET Output When Program Stops ³
						OFF→ON	ON→OFF					
F3YD32-1A	Transistor contact (sink type)	32	Photocoupler isolation	12-24V DC	0.1 A/point 0.5 A/common	1 ms max.	1 ms max.	Zener diode	One 40-pin connector	12-24 V DC 115 mA	8 points/common	When a sequence CPU is used: Initial value: RESET Configurable on module basis ² . When a BASIC CPU is used: No setup function is enabled; always HOLD.
F3YD32-1B	Transistor contact (source type)											
F3YD64-1A	Transistor contact (sink type)	64	Photocoupler isolation	24V DC	0.1 A/point 0.4A/common	1 ms max.	1 ms max.	Zener diode	Two 40-pin connectors	24 V DC 150 mA	8 points/common	When a sequence CPU is used: Initial value: RESET Configurable on module basis ² . When a BASIC CPU is used: No setup function is enabled; always HOLD.
F3YD64-1F ¹	Transistor contact (sink type)											

*1: Can be configured to HOLD or RESET output in the event of a fatal failure when F3SP22, F3SP28, F3SP38, F3SP53, F3SP58, F3SP59, F3SP66, F3SP67, F3SP71 or F3SP76 is used.

*2: Configurable on 16-terminal basis when F3SP22, F3SP28, F3SP38, F3SP53, F3SP58, F3SP59, F3SP66, F3SP67, F3SP71 or F3SP76 is used.

*3: For details on the operation in the event of a CPU error, see "Severity of Failures and LED Display."

● I/O Modules

Model	Input Type	Number of Points	Isolation Method	Rated Input Voltage	Rated Input Current	Operating Voltage/Current		Input Response Time		External Connection	Number of Points /Common	HOLD/RESET Output When Program Stops ⁴
						ON	OFF	OFF → ON	OFF → ON			
F3WD64-3F ¹	DC voltage	32	Photo-Coupler isolation	24 V DC	4.1 mA/point	16 V DC min 3.2 mA min.	5.8 V DC max. 0.9 mA max.	Input sampling time can be specified for 4 steps : Always (0µs),62.5µs, 250µs and 1ms. *1*2	Input sampling time can be specified for 4 steps : Always (0µs),62.5µs, 250µs and 1ms. *1*2	One 40-pin connector	8 points/ common	—
	Output Type	Number of Points		Rated Load Voltage	Maximum Load Current	Output Response Time		Surge Protector	External Power Supply	External Connection	Number of Points /Common	When a sequence CPU is used: Initial value: RESET Configurable on module basis ³ .
	Transistor contact (sink type)	32		24 V DC	0.1 A/point 0.4 A/common	1 ms max.	1 ms max.	Zener diode	24 V DC 60 mA	One 40-pin connector	8 points/ common	When a BASIC CPU is used: No setup function is enabled; always HOLD

Model	Input Type	Number of Points	Isolation Method	Rated Input Voltage	Rated Input Current	Operating Voltage/Current		Input Response Time		External Connection	Number of Points /Common	HOLD/RESET Output When Program Stops ⁴
						ON	OFF	OFF → ON	OFF → ON			
F3WD64-4F ¹	DC voltage	32	Photo-coupler isolation	12 V DC	4.1 mA/point	8 V DC min. 2.6 mA min.	3.4 V DC max. 1 mA max.	Input sampling time can be specified for 4 steps : Always (0µs),62.5µs, 250µs and 1ms. *1*2	Input sampling time can be specified for 4 steps : Always (0µs),62.5µs, 250µs and 1ms. *1*2	One 40-pin connector	8 points/ common	—
	Output Type	Number of Points		Rated Load Voltage	Maximum Load Current	Output Response Time		Surge Protector	External Power Supply	External Connection	Number of Points /Common	When a sequence CPU is used: Initial value: RESET Configurable on module basis ³ .
	Transistor contact (sink type)	32		12 V DC	0.1 A/point 0.4 A/common	1 ms max.	1 ms max.	Zener diode	12 V DC 60 mA	One 40-pin connector	8 points/ common	When a BASIC CPU is used: No setup function is enabled; always HOLD

*1: Can be configured to HOLD or RESET output in the event of a fatal failure when F3SP22, F3SP28, F3SP38, F3SP53, F3SP58, F3SP59, F3SP66, F3SP67, F3SP71 or F3SP76 is used.

*2: Indicated values apply to F3SP22, F3SP28, F3SP38, F3SP53, F3SP58, F3SP59, F3SP66, F3SP67, F3SP71 and F3SP76. When other CPU modules are used, the specifications are the same as F3XD□□-□□. The actual response time can be obtained by adding the following values:

100 µs (OFF → ON)

300 µs (ON → OFF)

If the input interrupt is to be used, set the input sampling period to at least 62.5 µs.

*3: Configurable on 16-terminal basis when F3SP28, F3SP38, F3SP53, F3SP58, F3SP59, F3SP66, F3SP67, F3SP71 or F3SP76 is used.

*4: For details on the operation in the event of a CPU error, see "Severity of Failures and LED Display."

Model	Input Type	Number of Points	Isolation Method	Rated Input Voltage	Rated Input Current	Operating Voltage/Current		Input Response Time		External Connection	Number of Points /Common	HOLD/RESET Output When Program Stops ⁴
						ON	OFF	OFF → ON	OFF → ON			
F3WD64-3N	DC voltage	32	Photo-coupler isolation	24 V DC	4.1 mA/point	16 V DC min. 3.2 mA min.	5.8 V DC max. 0.9 mA max.	1.0 ms max.	2.5 ms max.	One 40-pin connector	8 points/ common	—
	Output Type	Number of Points		Rated Load Voltage	Maximum Load Current	Output Response Time		Surge Protector	External Power Supply	External Connection	Number of Points /Common	When a sequence CPU is used: RESET Configurable on module basis ³ .
	Transistor contact (sink type)	32		24 V DC	0.1 A/point 0.4 A/common	1 ms max.	1 ms max.	Zener diode	24 V DC 60 mA	One 40-pin connector	8 points/ common	When a BASIC CPU is used: No setup function is enabled; always HOLD

Model	Input Type	Number of Points	Isolation Method	Rated Input Voltage	Rated Input Current	Operating Voltage/Current		Input Response Time		External Connection	Number of Points /Common	HOLD/RESET Output When Program Stops ⁴
						ON	OFF	OFF → ON	ON → OFF			
F3WD64-4N	DC voltage	32	Photo-coupler isolation	12 V DC	4.1 mA/point	8 V DC min. 2.6 mA min.	3.4 V DC max. 1 mA max.	1.0 ms max.	2.5 ms max.	One 40-pin connector	8 points/ common	—
	Output Type	Number of Points		Rated Load Voltage	Maximum Load Current	Output Response Time		Surge Protector	External Power Supply	External Connection	Number of Points /Common	When a sequence CPU is used: Initial value: RESET Configurable on module basis ³ .
	Transistor contact (sink type)	32		12 V DC	0.1 A/point 0.4 A/common	1 ms max.	1 ms max.	Zener diode	12 V DC 60 mA	One 40-pin connector	8 points/ common	When a BASIC CPU is used: No setup function is enabled; always HOLD

*3: Configurable on 16-terminal basis when F3SP28, F3SP38, F3SP53, F3SP58, F3SP59, F3SP66, F3SP67, F3SP71 or F3SP76 is used.

*4: For details on the operation in the event of a CPU error, see "Severity of Failures and LED Display."

■ Special Modules

● Analog Input Modules

Model	I/O Type	Number of Points	Isolation Method	Input	Output	Resolution (12-bit A/D)	Total Accuracy	Conversion Speed	External Connection	External Power Supply
F3AD04-0N	Analog Input	4	Photocoupler isolation	0 to 5 V DC 1 to 5 V DC -10 V to 10 V DC	-20,000 to 20,000	0 to 5 V/1 to 5 V DC: 1.4 mV -10 V to 10 V DC: 5.7 mV (12-bit A/D)	23 ±2°C ±0.2% (full scale) 0 to 55°C: ±0.5% (full scale)	1 ms × (number of inputs)	10-point terminal block M3.5 screws	—
F3AD08-1N		8							18-point terminal block M3.5 screws	
F3AD04-0V		4							10-point terminal block M3.5 screws	
F3AD08-1V		8							18-point terminal block M3.5 screws	
F3AD04-0R	Analog Input Module (High resolution type)	4	Photocoupler isolation	0 to 5 V DC 1 to 5 V DC -10 to 10 V DC	-20,000 to 20,000	0 to 5 V DC/1 to 5 V DC: 0.175 mV -10 to 10 V DC: 0.72 mV (16bit A/D)	23 ±2°C: ±0.1% (full scale) 0 to 55°C: ±0.3% (full scale)	1 ms × (number of inputs)	10-point terminal block M3.5 screw	—
F3AD08-1R		8								

● Analog Output Modules

Model	I/O Type	Number of Points	Isolation Method	Input	Output	Resolution (12-bit A/D)	Total Accuracy	Conversion Speed	External Connection	External Power Supply
F3DA02-0N	Analog output	2	Photocoupler isolation	-20,000 to 20,000	-10 to 10 V DC 4 to 20 mA DC	Voltage output mode: 5.7 mV Current output mode: 5.7 μA (12-bit ADC)	23 ±2°C: ±0.2% (full scale) 0 to 55°C: ±0.5% (full scale)	2 ms fixed	10-point terminal block M3.5 screws	24 V DC ±10% 150 mA
F3DA04-1N		4						4 ms fixed	18-point terminal block M3.5 screws	24 V DC ±10% 180 mA
F3DA08-5N		8						4 ms fixed		24 V DC ±10% 100 mA

● Positioning Modules

Model	Type	Number Of Axes	Control Mode	Positioning Command Range	Speed Command Range	Acceleration/Deceleration	Interpolation Function	Data Backup	External Connection	External Power Supply					
F3NC11-0N	Advanced mode with pulse output	1	Position control, speed control	-8,388,608 to 8,388,608	0.1 to 249,750 pps	Automatic trapezoidal ACC/DEC	Multiaxial linear Interpolation, 2-axis arc interpolation as specified by CPU instructions	Carried out by CPU module	One 40-pin connector	5 V DC 200 mA					
F3NC12-0N		2													
F3YP04-0N	With multi-channel pulse output	4	Position control	-134,217,728 to 134,217,727	0.1 to 250 kpps	Automatic trapezoidal ACC/DEC	—	Carried out by CPU module	One 48-pin connector	5 V DC 350 mA					
F3YP08-0N		8							Two 48-pin connectors	5 V DC 700 mA					
F3YP14-0N		4							-2,147,483,648 to 2,147,483,647	0.1 to 3,998,000 pps (by servo otor) 0.1 to 499,750 pps (by pulse otor)	Automatic trapezoidal ACC/DEC (starting speed programmable) Automatic S-shape ACC/DEC (starting speed fixed)	—	Carried out by flash memory or CPU module	One 48-pin connector	5 V DC 350 mA
F3YP18-0N		8												Two 48-pin connectors	5 V DC 700 mA

● Communication Modules

Model	Type	Transmission Specification					Protocol	External Power Supply
		Access Control Mode	Transmission Speed	Transmission System	Maximum Segment Length	Maximum Number of Nodes		
F3LE01-5T	Ethernet	CSMA/CD System	10 Mbps	Baseband	10BASE5: 500 m (2.5 km max. with a repeater) 10BASE-T: 100 m	100 segments (10BASE5) 2/segment (10BASE-T)	TCP/IP UDP/IP ICMP ARP	12 V DC, 500 mA (when 10BASE5 is used)
F3NX01-0N	Ethernet (Autonomous Distribution)	CSMA/CD system	10 Mbps	Baseband	10BASE5: 500 m (2.5 km max. with a repeater) 10BASE-T: 100 m	100 segments (10BASE5) 2/segment (10BASE-T)	UDP/IP ICMP ARP	12 V DC, 500 mA (when 10BASE5 is used)

Model	Type	Number of Ports	Insulation	Communication Mode	Transmission Speed	Synchronization	Maximum Transmission Distance	External Connection
F3LC11-1N	Personal computer link (RS-232-C)	1	No	Half-duplex	19200 bps max.	Start-stop synchronization	15 m	Dsub 9-pin connector
F3LC11-2N	Personal computer link (RS-422-A/RS-485)	1	Yes		19200 bps max.		1200 m	6-point terminal block M3.5 screw
F3RZ81-0N	Ladder communication ² (RS-232-C)	1	No	Full-duplex, Half-duplex	19200 bps max.	Start-stop synchronization	15 m	Dsub 9-pin connectors
F3RZ91-0N	Ladder communication ² (RS-422-A/RS-485)	1	Yes		19200 bps max.		1200 m	6-point terminal block M3.5 screw

²: Compatible with sequence CPUs.

● Temperature Control and Monitoring Modules/PID Control Module/Temperature Control and PID Module/Temperature Monitoring Module

Model	Number of Loops	Isolation Method	Input	Output	Sampling Interval	Control Mode	External Connection	External Power Supply
F3CT04-0N	4	Photocoupler Isolation*	Thermocouple: K, J, T, E, R, B, S, N, W, L, U, Platinel 2 DC voltage: 0 to 10 mV, 0 to 100 mV	Time proportional output (open collector/voltage pulse)	0.5 s	PID or ON/OFF	18-point terminal block	24 V DC 200 mA
F3CT04-1N				Time proportional output (open collector/voltage pulse) Continuous output (4 to 20 mA)				
F3CR04-0N				Time proportional output (open collector/voltage pulse)				
F3CR04-1N			Time proportional output (open collector/voltage pulse) Continuous output (4 to 20 mA)					
F3CV04-1N			DC voltage: 0 to 1 V, -1 V to 1 V 0 to 5 V, 1 to 5 V 0 to 10 V	Continuous output (4 to 20 mA) Time proportional output (open collector/voltage pulse)				
F3CU04-0N		Photocoupler* and transformer isolation	Thermocouple: K, J, T, B, S, R, N, E, L, U, W, Platinel 2 RTD: JPt 100, Pt 100 DC voltage: 0 to 10 mV, 0 to 1 V, 0 to 5 V, 1 to 5 V, 0 to 10 V,	Time-proportional PID output (open collector)	0.2 s	PID, ON/OFF, Heating/cooling	18-point terminal block M3.5 screw	24 V DC 10 mA
F3CU04-1N				Continuous PID output (4 to 20 mA) Time-proportional PID output (open collector)				24 V DC 250 mA

*: - Input and output lines are photocoupler-isolated from internal circuitry.
 - Input channels are photocoupler-isolated from each other.
 - Output channels are not isolated from each other (shared by a common line, which is floating).

● Memory card module

Model	Memory Media	CF File System	Number of CF that can be inserted	Temperature range	Current Consumption
F3EM01-0N	Compact Flash (Type 1)	FAT 16 (long file names supported)	1	0°C to 55°C (but without exceeding the maximum temperature rated for the CF less 15°C)	300 mA (excluding the CF)

● Terminal Block Unit

Model	Number of Points	Rated Voltage	Operating Voltage Range	Maximum Current	Cable	Terminal Block Screw	Mounting Screw
TA50-1N	40	5-24 V DC	4.5 to 26.4 V DC	0.5 A DC/point	1.25 mm ² max.	M3	M4 (2 points)
TA60-0N	40	5-24 V DC	4.5 to 26.4 V DC	0.5 A DC/point	2 mm ² max.	M2	M4 (2 points)

■ YHLS Slave Units (TAC Series)

● Input Units

Model	Input Type	Number of Points	Isolation Method	Rated Input Voltage	Rated Input Current	Operating Voltage/Current		Input Response Time		External Connection	Number of Points /Common	External Power Supply
						ON	OFF	OFF→ON	ON→OFF			
TACXD08-3AE	DC voltage (sink type)	8	Not isolated	24 V DC	4.3 mA/point	16.0 VDC min. (between the input and 24V+ terminals)	5.8 V DC max. (between the input and 24V+ terminals)	1.0 ms max.	1.0 ms max.	e-CON, 4 pins	8 points/ common	20.4-26.4 V DC 80mA
TACXD16-3AM		16								MIL, 20 pins	16 points/ common	20.4-26.4 V DC 140mA

● Output Units

Model	Output Type	Number of Points	Isolation Method	Rated Load Voltage	Maximum Load Current	Output Response Time		HOLD/RESET Output on YHLS Communication Error or when Program Stops	External Connection	Number of Points /Common	External Power Supply
						OFF→ON	ON→OFF				
TACYD08-1AE	Transistor contact	8	Not isolated	24 V DC	0.1 A/point	0.05 ms max.	0.5 ms max.	Configurable by DIP switch bit3 (H or R) H:HOLD R:RESET	e-CON, 4 pins	8 points/ common	20.4-26.4 V DC 30 mA
TACYD16-1AM		16							MIL, 20 pins	16 points/ common	20.4-26.4 V DC 30 mA
TACYC04-0NB	Relay contact	4	Physical isolation	24 V DC 250 V AC	1 A/point	10 ms max.	5.0 ms max.		European terminal block, 7 pins	2 points/ common	20.4-26.4 V DC 70 mA

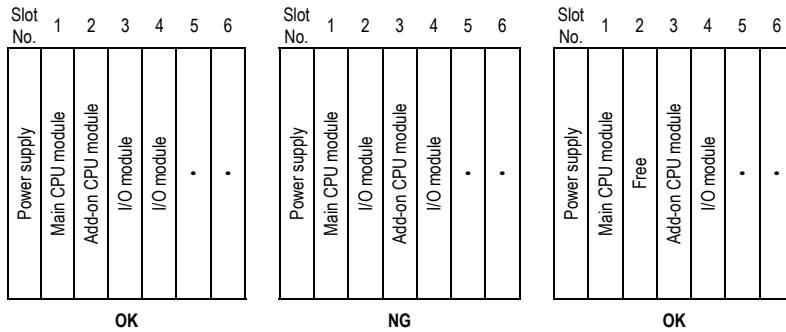
● I/O Units

Model	Input Type	Number of Points	Isolation Method	Rated Input Voltage	Rated Input Current	Operating Voltage/Current		Input Response Time		External Connection	Number of Points /Common	External Power Supply						
						ON	OFF	OFF→ON	ON→OFF									
TACWD08-3NE	DC voltage (sink type)	4	Not isolated	24 V DC	4.3 mA/point	16.0 VDC min. (between the input and 24V+ terminals)	5.8 VDC max. (between the input and 24V+ terminals)	1.0 ms max.	1.0 ms max.	e-CON, 4 pins	4 points/ common	20.4-26.4 V DC 60 mA						
	Output Type	Number of Points								Isolation Method	Rated Load Voltage		Maximum Load Current	Output Response Time		HOLD/RESET Output on YHLS Communication Error or when Program Stops	External Connection	Number of Points /Common
	Transistor contact	4								Not isolated	24 V DC		0.1 A/point	0.05 ms max.	0.5 ms max.			

Model	Input Type	Number of Points	Isolation Method	Rated Input Voltage	Rated Input Current	Operating Voltage/Current		Input Response Time		External Connection	Number of Points /Common	External Power Supply						
						ON	OFF	OFF→ON	ON→OFF									
TACWD16-3NM	DC voltage (sink type)	8	Not isolated	24 V DC	4.3 mA/point	16.0 VDC min. (between the input and 24V+ terminals)	5.8 VDC max. (between the input and 24V+ terminals)	1.0 ms max.	1.0 ms max.	MIL, 20 pins	8 points/ common	20.4-26.4 V DC 90mA						
	Output Type	Number of Points								Isolation Method	Rated Load Voltage		Maximum Load Current	Output Response Time		HOLD/RESET Output on YHLS Communication Error or when Program Stops	External Connection	Number of Points /Common
	Transistor contact	8								Not isolated	24 V DC		0.1 A/point	0.05 ms max.	0.5 ms max.			

■ Restrictions on Module Location

- The CPU module installed in slot 1 serves as the main CPU module.
- The CPU modules installed in slots 2 to 4 serve as add-on CPU modules.
- I/O modules may be installed in slots 2 to 4. Neither add-on sequence CPU modules nor add-on BASIC CPU modules can be installed in any slots whose slot number is greater than that of the installed I/O modules.
- When two or more CPU modules are to be used, no I/O modules can be installed between CPU modules.



- For the F3SC21-1N FA-M3 Value, install the F3SP05-0P sequence CPU module in the leftmost slot of the 4-slot base module and the F3WD64-3N 64-point I/O module in slot No. 2.
- For the FA-M3 Value 2 of F3SC22-1F, F3SC22-2F or F3SC22-1A, install the F3SP08-□P Sequence CPU module in the leftmost slot of the 4 slot base module. For the F3SC22-1F or F3SC22-2F, install F3WD32-3F (with 32 I/O points) or F3WD64-3F (with 64 I/O points) in slot 2 respectively. For the F3SC22-1A, install the F3XD16-3F input module and the F3YD14-5A output module in slot 2 and slot 3 respectively.
- For the FA-M3 Value 2 of F3SC23-1F, F3SC23-2F, F3SC23-2P, F3SC23-6P or F3SC23-1A, install the F3SP08-□P Sequence CPU module in the leftmost slot of the 4 slot base module. For the F3SC23-1F or F3SC23-2F, install F3WD32-3F (with 32 I/O points) or F3WD64-3F (with 64 I/O points) in slot 2 respectively. For the F3SC23-1A, install the F3XD16-3F input module and the F3YD14-5A output module in slot 2 and slot 3 respectively.

■ Restrictions on CPU Module Installation

- A maximum of four CPU modules can be installed in slots 1 to 4 of the main unit.

Model	Maximum Qty. ^{*1}	Add-on CPU Module										
		F3SP21-0N	F3SP25-2N	F3SP35-5N	F3SP28-3□	F3SP38-6□	F3SP53-4□	F3SP58-6□	F3SP59-7S	F3SP7□-□N	F3FP36-3N	
Main CPU Module	F3SP21-0N	4	✓	✓	✓	✓	✓	✓	✓	✓	✓ ^{*2}	✓
	F3SP25-2N	4	✓	✓	✓	✓	✓	✓	✓	✓	✓ ^{*2}	✓
	F3SP35-5N	4	✓	✓	✓	✓	✓	✓	✓	✓	✓ ^{*2}	✓
	F3SP28-3□	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3SP38-6□	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3SP53-4□	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3SP58-6□	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3SP59-7S	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3SP7□-□N	4	✓ ^{*2}	✓ ^{*2}	✓ ^{*2}	✓	✓	✓	✓	✓	✓	✓
	F3FP36-3N	1	✓	✓	✓	✓	✓	✓	✓	✓	✓	—

*1: Indicates the maximum number of modules that can be used in total including the main CPU module when CPU modules with the same model name as the main CPU module are used as add-on CPU modules.
 *2: A maximum of two modules can be installed in this combination.

■ Restrictions on the Number of I/O Modules

- The table below summarizes the number of modules that a CPU module can gain direct access to and the number of modules that can be installed. The number of modules that can be installed here refers to I/O modules of the same type.
 - A circle denotes an I/O module that has no restriction as to the number of modules that can be installed.
 - An "x" denotes an I/O module to which the associated CPU module can gain no direct access.
 - A number indicates the number of I/O modules of the same type that can be installed.
- The restrictions to which I/O modules are subject to include those on the number of a particular type that can be installed and those on the total number of I/O modules of all types that can be installed in the entire system.

Modules that Each CPU can Access Directly and the Maximum Number that can be Installed (1/2)

Module Name	Model	Sequence CPU										
		F3SP21-0N	F3SP25-2N	F3SP35-5N	F3SP28-3□	F3SP38-6□	F3SP53-4□	F3SP58-6□	F3SP59-7S	F3SP71-4N	F3SP76-7N	F3FP36-3N
Memory card module	F3EM01-0N	2 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹
Input module	F3XA□□-□N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3XH04-3N	16	16	16	16	16	16	16	16	16	16	16
	F3XC08-0□	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3XD08-6F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3XD08-6N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3XD16-□F	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3XD16-3H	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3XD32-□F	64	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3XD16-□N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3XD32-□N	64	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3XD64-□□	32	64	✓	64	✓	64	✓	✓	64	✓	64
Output module	F3YA08-2N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3YC08-0C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3YC08-0N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3YC16-0N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3YD04-7N	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3YD08-□□	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3YD14-5□	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3YD32-1□	64	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	F3YD64-1□	32	64	✓	64	✓	64	✓	✓	64	✓	64
I/O module	F3WD64-□□	32	64	✓	64	✓	64	✓	✓	64	✓	64
Analog input module	F3AD04-□□	36	36	36	36	36	36	36	36	36	36	36
	F3AD08-□□	36	36	36	36	36	36	36	36	36	36	36
Analog output module	F3DA02-0N	36	36	36	36	36	36	36	36	36	36	36
	F3DA04-1N	36	36	36	36	36	36	36	36	36	36	36
	F3DA08-5N	36	36	36	36	36	36	36	36	36	36	36
High-speed data acquisition module	F3HA08-0N	8	8	8	8	8	8	8	8	8	8	8
	F3HA□□-1R	8	8	8	8	8	8	8	8	8	8	8
Temperature control and monitoring module	F3CT04-□N	28	28	28	28	28	28	28	28	28	28	28
	F3CR04-□N	28	28	28	28	28	28	28	28	28	28	28
PID control module	F3CV04-1N	28	28	28	28	28	28	28	28	28	28	28
Temperature control and PID module	F3CU04-□□	36	36	36	36	36	36	36	36	36	36	36
Temperature monitoring module	F3CX04-0N	36	36	36	36	36	36	36	36	36	36	36
ASi Master module	F3LA01-0N	32	36	36	36	36	36	36	36	36	36	36
PROFIBUS-DP Interface module	F3LB01-0N	16	16	16	16	16	16	16	16	16	16	16
Personal computer link module	F3LC11-1F	2 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹	6 ¹
	F3LC11-1N											
	F3LC11-2□											
	F3LC12-1F											

Modules That Each CPU Can Access Directly and the Maximum Number of Them That Can Be Installed (2/2)

Module Name	Model	Sequence CPU											
		F3SP21-0N	F3SP25-2N	F3SP35-5N	F3SP28-3□	F3SP38-6□	F3SP53-4□	F3SP58-6□	F3SP59-7S	F3SP71-4N	F3SP76-7N	F3FP36-3N	
UT link module	F3LC51-2N	4	4	4	4	4	4	4	4	4	4	4	
DeviceNet interface module	F3LD01-0N	16	16	16	16	16	16	16	16	16	16	16	
Ethernet interface module	F3LE01-0T	2 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	
	F3LE01-5T	2 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	
	F3LE11-0T	2 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	
	F3LE12-0T	2 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	
YHLS master module	F3LH0□-0N	15	15	15	15	15	15	15	15	15	15	15	
	F3LH01-1N	28	28	28	28	28	28	28	28	28	28	28	
	F3LH02-1N	28	28	28	28	28	28	28	28	28	28	28	
FL-net (OPCN-2) interface module	F3LX02-1N	-	-	-	1 ^{*9}	2 ^{*9}	1 ^{*9}	2 ^{*9}	2 ^{*9}	1	2	-	
NX interface module	F3NX01-□N	2 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	6 ^{*1}	
GP-IB communication module	F3GB01-0N ^{*7}	8	8	8	8	8	8	8	8	8	8	8	
RS-232-C communication	F3RS22-0N	-	-	-	-	-	-	-	-	-	-	-	
RS-422-A communication	F3RS41-0N	-	-	-	-	-	-	-	-	-	-	-	
Ladder communication module	F3RZ81-0N	32	36	36	36	36	36	36	36	36	36	36	
	F3RZ81-0F	28	28	28	28	28	28	28	28	28	28	28	
	F3RZ82-0F	28	28	28	28	28	28	28	28	28	28	28	
	F3RZ91-0□	32	36	36	36	36	36	36	36	36	36	36	
FA link H module	F3LP02-0N	2 ^{*3} _{*6}	8 ^{*3} _{*6}	8 ^{*3} _{*6}	8 ^{*3} _{*10}	8 ^{*3} _{*10}	8 ^{*3} _{*10}	8 ^{*3} _{*10}	8 ^{*3} _{*10}	- ^{*10}	- ^{*10}	8 ^{*3} _{*6}	
Fiber-optic FA link H module	F3LP12-0N												
Fiber-optic FA-bus module	F3LR01-0N	7 ^{*5} _{*6}	7 ^{*5} _{*6}	7 ^{*5} _{*6}	7 ^{*5}	7 ^{*5}	7 ^{*5}	7 ^{*5}	7 ^{*5}	7 ^{*5}	7 ^{*5}	7 ^{*5} _{*6}	
Fiber-optic FA-bus type 2	F3LR02-0N												
FA-bus type 2 module	F3LR02-1W	7 ^{*5} _{*6}	7 ^{*5} _{*6}	7 ^{*5} _{*6}	7 ^{*5}	7 ^{*5}	7 ^{*5}	7 ^{*5}	7 ^{*5}	7 ^{*5}	7 ^{*5}	7 ^{*5} _{*6}	
High-speed counter module	F3XP01-0H	32	64	✓	64	✓	64	✓	✓	64	✓	64	
	F3XP02-0H	32	64	✓	64	✓	64	✓	✓	64	✓	64	
Pulse input module	F3XS04-□N	32	36	36	36	36	36	36	36	36	36	36	
Positioning module	(with multi-channel pulse output)	F3YP04-0N	32	36	36	36	36	36	36	36	36	36	36
		F3YP08-0N	32	36	36	36	36	36	36	36	36	36	36
		F3YP14-0N	32	36	36	36	36	36	36	36	36	36	36
		F3YP18-0N	32	36	36	36	36	36	36	36	36	36	36
		F3YP22-0N	16	16	16	16	16	16	16	16	16	16	16
		F3YP24-0N	16	16	16	16	16	16	16	16	16	16	16
		F3YP28-0N	16	16	16	16	16	16	16	16	16	16	16
	(advanced model with pulse output)	F3NC11-0N	32	36	36	36	36	36	36	36	36	36	36
		F3NC12-0N	32	36	36	36	36	36	36	36	36	36	36
	(with pulse output)	F3NC32-0N	16	16	16	16	16	16	16	16	16	16	16
		F3NC34-0N	16	16	16	16	16	16	16	16	16	16	16
	(with analog voltage output)	F3NC51-0N	32	36	36	36	36	36	36	36	36	36	36
		F3NC52-0N	32	36	36	36	36	36	36	36	36	36	36
	(MECHATROLIN K-II)	F3NC96-0N	8	8	8	8	8	8	8	8	8	8	8
(MECHATROLINK-III)	F3NC97-0N	8	8	8	8	8	8	8	8	8	8	8	

Modules with shaded module names and models must be installed in main units.

- *1: Each number denotes the largest combined number of personal computer link modules, Ethernet interface modules, GP-IB communication modules (when in slave mode), FL-net interface modules and memory card modules that can be installed. If two or more CPU modules having different maximum limits are installed, the smallest limit applies.
- *3: Each number denotes the largest combined number of FA link H modules and fiber-optic FA link H modules that can be installed. If two or more CPU modules having different maximum limits are installed, the smallest limit applies.
- *5: Each number denotes the largest combined number of fiber-optic FA-bus, fiber-optic FA-bus type 2 and FA-bus type 2 modules that can be installed in a main unit. If two or more CPU modules having different maximum limits are installed, the smallest limit applies. If subunits are grouped using fiber-optic FA-bus type 2 modules, the maximum limit may be increased depending on the grouping pattern. For more information, see the Fiber-optic FA-bus Module and Fiber-optic FA-bus Type 2 Module, FA-bus Type 2 Module (IM 34M06H45-01E).
- *6: FA link H, fiber-optic FA link H, fiber-optic FA-bus type 2 and FA-bus type 2 modules must be used with sequence CPU modules version 8 or later. For information on the version of a sequence CPU module, refer to the mark on its side. There is no usage limitation, however, for F3SP□□-□S.
- *7: The maximum number of each module that can be installed depends on the operating mode. The left number and right number in each cell apply when the module is in master mode and slave mode respectively.
- *8: Up to 7 modules can be installed if used with FL-net (OPCN-2) interface module, provided link device capacities are not exceeded.
- *9: FL-net (OPCN-2) interface module can be used with sequence CPU modules rev. 5 or higher. There is no restriction when used with F3SP□□-□S modules.
- *10: FA link, FA link H and fiber-optic FA link H modules cannot coexist with F3SP7□-□N.

Current Consumption

Make sure that the total current consumption (at 5 V DC) in the installed modules does not exceed the 5 V power capacity of the power supply module used. Prepare an appropriate external power supply according to the specifications of the modules used.

■ Power Supply Modules

Model	Internal 5 V Source (mA)	Power Supplied to External Devices (mA)
F3PU10-0N	2000	No
F3PU16-0N	2000	No
F3PU20-0 N	4300	No
F3PU26-0N	4300	No
F3PU30-0N	6000	No
F3PU36-0N	6000	No

■ Basic Modules

Module Name	Model	Maximum Current Consumption (mA) at 5 V DC	External Power Supply	
			Voltage (V DC)	Current (mA)
CPU module	F3SP21-0N	350	—	—
	F3SP25-2N	420	—	—
	F3SP35-5N	560	—	—
	F3SP28-3□	450	—	—
	F3SP38-6□	450	—	—
	F3SP53-4□	890	—	—
	F3SP58-6□	890	—	—
	F3SP59-7S	890	—	—
	F3SP71-4N	460	—	—
	F3SP76-7N	460	—	—
F3FP36-3N	560	—	—	

■ FA-M3 Value and Value II

Module Name	Model	Power Supply			Sequence CPU	
		Internal 5 V Power Supply (mA)	Power Supplied to External Devices (mA)	Maximum Current Consumption (mA) at 5 V DC	External Power Supply	
					Voltage (V DC)	Current (mA)
FA-M3 Value Sequence CPU	F3SP05-0P	2000	No	350	—	—
FA-M3 Value 2 Sequence CPU	F3SP08-0P F3SP08-SP	2000	No	350	—	—

■ I/O Modules

Module Name	Model	Maximum Current Consumption (mA) at 5 V DC	External Power Supply	
			Voltage (V DC)	Current (mA)
DC input module	F3XD08-6N	40	—	—
	F3XD16-3N	65	—	—
	F3XD16-4N	65	—	—
	F3XD32-3N	75	—	—
	F3XD32-4N	75	—	—
	F3XD32-5N	75	—	—
	F3XD64-3N	100	—	—
	F3XD64-4N	100	—	—
Transistor output module	F3YD32-1A	210	12-24	115
	F3YD64-1A	275	24	150
	F3YD64-1F	275	24	150
I/O module	F3WD64-3F	200	24	60
	F3WD64-4F	200	12	60
	F3WD64-3N	200	24	60
	F3WD64-4N	200	12	60

■ Special Modules

Module Name	Model	Maximum Current Consumption (mA) at 5 V DC	External Power Supply	
			Voltage (V DC)	Current (mA)
Analog input module	F3AD04-0N	210	—	—
	F3AD08-1N	210	—	—
	F3AD04-0V	210	—	—
	F3AD08-1V	210	—	—
	F3AD08-4V	210	—	—
	F3AD04-0R	210	—	—
	F3AD08-1R	210	—	—
Analog output module	F3DA02-0N	100	24	150
	F3DA04-1N	100	24	180
	F3DA08-5N	100	24	100
Temperature control and monitoring module	F3CT04-0N	250	24	200
	F3CT04-1N	250	24	200
	F3CR04-0N	250	24	200
	F3CR04-1N	250	24	200
PID control module	F3CV04-1N	250	24	200
Temperature control and PID module	F3CU04-0N	460	24	10
	F3CU04-1N	470	24	250
Personal computer link module	F3LC11-1N	100	—	—
	F3LC11-2N	170	—	—
Ethernet interface module	F3LE01-5T	330	12	500
NX interface module	F3NX01-0N	330	12	500
Ladder communications module	F3RZ91-0N	210	—	—
Positioning module (advanced model with pulse output)	F3NC11-0N	180	5	200
	F3NC12-0N	180	5	200
Positioning module (with multi-channel pulse output)	F3YP04-0N	300	5	350
	F3YP08-0N	350	5	700
	F3YP14-0N	320	5	350
	F3YP18-0N	380	5	700
Memory card module	F3EM01-0N	300	—	—

Severity of Failures and LED Display

■ Severity of Failures and LED Display (For F3SP21, F3SP25, F3SP35 and F3FP36 CPU modules)

Error Severity	LED Display	Description	Error Item	FAIL-signal Contact Output		Status of Output Module	
				Between FAIL 1 and COM	Between FAIL 2 and COM	Modules with 32 or less output points	Modules with 64 output points *2
Major	RDY (green) off	The core hardware is disabled.	- CPU error - Memory error	Shorted	Open	Initial value: RESET Configurable on module basis.	All settings are invalid; always HOLD
Moderate	ERR (red) lit	The user program cannot be started or run any further.	- Program error - I/O comparison error*1 - I/O module error*1 - Memory error - SPU error - Instruction processing error*1 - Scan timeout*1 - Startup error - Invalid instruction found - Too many I/O points - ROM pack error - Subroutine error*1 - Interrupt error*1 - Sub-unit communication error*1	Shorted	Open	Initial value: RESET Configurable on module basis.	Initial value: RESET Configurable on module basis.
Minor	ALM (yellow) lit	The program can still run in spite of a failure.	- Momentary power failure - Inter-CPU communication error - Subunit line switchover	Open	Shorted	Operation continues.	Operation continues.

*1: Can be configured as minor failure or moderate failure.

*2: Including F3WD64 and advanced modules that have output relays (Y□□□□□).

■ Severity of Failures and LED Display (For F3SP28, F3SP38, F3SP5□, and F3SP7□ CPU modules)

Error Severity	LED Display	Description	Error Item	FAIL-signal Contact Output		Status of Output Module	
				Between FAIL 1 and COM	Between FAIL 2 and COM	Output modules with 32 or fewer outputs, F3YD64-1F, F3YD64-1P, F3YD64-1R, F3WD64-□F and F3WD64-□P	F3YD64-1A, F3YD64-1M, F3WD64-□N, and Y□□□□□*2
Major	RDY (green) off	The core hardware is disabled.	- CPU error - Memory error	Shorted	Open	Initial value: RESET Configurable on 16-point basis.	All settings are invalid; always HOLD
Moderate	ERR (red) lit	The user program cannot be started or run any further.	- Program error - I/O comparison error*1 - I/O module error*1 - Memory error - SPU error - Instruction processing error*1 - Scan timeout*1 - Startup error - Invalid instruction found - Too many I/O points - ROM pack error - Subroutine error*1 - Interrupt error*1 - Subunit communication error*1 - Sensor control scan timeout*1	Shorted	Open	Initial value: RESET Configurable on 16-terminal basis.	Initial value: RESET Configurable on 16-terminal basis.
Minor	ALM (yellow) lit	The program can still run in spite of a failure.	- Momentary power failure - Inter-CPU communication error - Subunit line switchover	Open	Shorted	Operation continues.	Operation continues.

*1: Can be configured as minor failure or moderate failure.

*2: Output relays (Y□□□□□) of advanced modules.

FA-M3 Approved / Compliant Standard:

For the UL-approved / CE Mark-compliant modules of FA-M3, see the General Specifications (GS 34M06C11-21E).

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