Small PLC

FP0

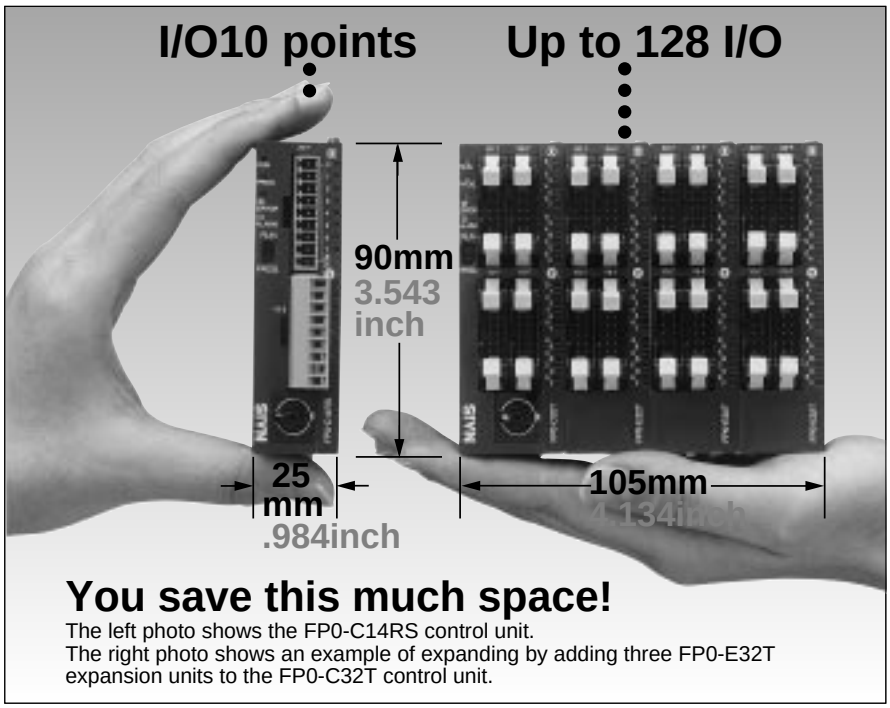
FP1

FP-M (C16T)

FP-M (C20R/C20T/C32T)

FP0

Suitable for installation virtually anywhere.



You save this much space!

The left photo shows the FP0-C14RS control unit.
The right photo shows an example of expanding by adding three FP0-E32T expansion units to the FP0-C32T control unit.

■ Features

1. Measures only W25 × H90 × D60 mm
W.984 × H3.543 × D2.362 inch *
The unit's compact sizing which has never been thought possible on conventional small PLCs makes it very easy for incorporation into equipment and helps reduce the size of control panels.
* C32 series is 30 mm 1.181inch wide.

2. Expandable 128 points by adding three units.
This PLC is a stacking expansion type which requires no cables for expansion. The total width is only 105 mm 4.134inch when three units are added.

3. High-speed operation: Scanning speed is approx. 1 ms.
A 500-step program can be processed only in 1 ms, a speedy processing time for small PLCs.

4. Terminals are designed for tidy styling.
The relay output terminals use European style terminal blocks, so it is possible for the terminals to be connected without terminal blocks. Molex connector type is also available for mass-production equipment. Transistor output type is supplied with wire-pressed terminal cable connectors.

5. New type with programming capacity "10k steps".
Standard equipped with clock/calendar function timer and RS232C port. Operation memory is backed up by secondary battery.

■ Power Supply and I/O Specifications

Item	Description
Power supply	24 V DC
Input	24 V DC ±common
Output	Relay 2 A/Transistor 0.1 A (varies with different models)

■ Performance Specifications

Item		Description (Relay type/Transistor type)
Number of I/O points		10 points, 14 points/16 points, 32 points
Expansion		Max. 3 units Total points: Max. 128
Operation speed		0.9 µs/step
Internal memory		EEPROM
Memory capacity		2.7k steps/5k steps/10k steps (varies with different types)
Operation memory	Internal relay	1,008 points
	Timer/Counter	144 points in total
	Data register	1,660 words/6,144 words/16,384 words (varies with different types)

■ Applicable Functions

Item	Description
Pulse catch/Interrupt input	6 points in total
Analog I/O	Available by adding analog I/O unit
Volume input	None
High-speed counter	1 phase 4 points/ 2 phases 2 points (10 kHz in total) *
Pulse output	2 points (10 kHz in total) *
RS232C port	1 ch is equipped to the models having part numbers which end in C or 10k type. 3P terminal blocks (made by Phoenix Contact Co.)

* Transistor type only

■ Applicable Network

Item	Description
Remote I/O	Available as a slave station of MEWNET-F by adding I/O link unit.
Inter-PLC link	Not available
Computer link	Linkable with tool port or RS232C port (C type)
Modem connection	Available, Type with RS232C port can also send data.

■ Other Built-in Functions

Item	Description
Program block-edit during RUN	Available
Constant scan	Available
Adjustable input time filtering	Not available
Clock/Calendar function	Not available (built-in with 10k type)

FP0

Connects directly to the S-LINK* for reduced wiring and simple installation.

* The S-LINK and S-LINK-related products are products of SUNX, Limited.

■ Features

1. Small size of only W30 x H90 x D60 mm.
W 1.181 × H3.543 × D2.362 inch
Makes use of the T-shaped connectability of the S-LINK for reduced wiring and reduced size of the control panel.

2. Controls 64 input points and 64 output points.
Able to control up to 128 points for S-LINK-related devices.

3. Allows simultaneous use of expansion units.
Similar to other FP0 units, up to three expansion units can be used for efficient I/O wiring.

4. Allows the use of the S-LINK many units.

■ Power Supply Specification

Item	Description
Power supply	24 V DC

■ Performance Specifications

Item		Description
Number of I/O points		S-LINK block: 64 input points/64 output points (fixed)
Expansion		Max. 3 units Expansion section: Max. 96 points
Operation speed		0.9 μs/step
Internal memory		EEPROM
Memory capacity		5k steps
Operation memory	Internal relay	1,008 points
	Timer/Counter	144 points in total
	Data register	6,144 words

■ Applicable Functions

Item	Description
Pulse catch/Interrupt input	None
Analog I/O	Available by adding analog I/O unit
Volume input	None
High-speed counter	None
Pulse output	None
RS232C port	1 ch is equipped. 3P terminal blocks (made by Phoenix Contact Co.)

■ Applicable Network

Item	Description
Remote I/O	Control unit functions as S-LINK master station. Available as a slave station of MEWNET-F by adding I/O link unit.
Inter-PLC link	Not available
Computer link	Linkable with tool port or RS232C port
Modem connection	Available, Type with RS232C port can also send data.

■ Other Built-in Functions

Item	Description
Program block-edit during RUN	Available
Constant scan	Available
Adjustable input time filtering	Not available
Clock/Calendar function	None

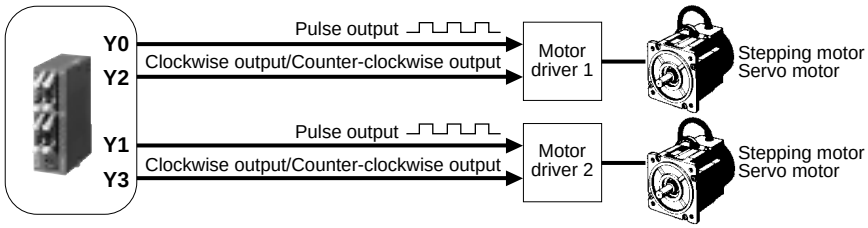
FP0 Functions

Equipped with 2-axis independent positioning and high-speed counter for support of PWM output

● Pulse output function

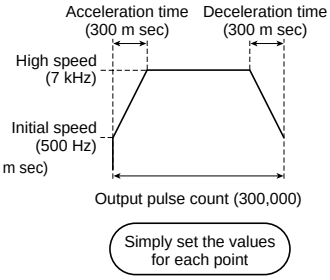
(For transistor output type only *)

The unit comes equipped with 2 channels for the output of up to 10 kHz pulses(5 kHz during 2-channel output). Since these two channels can be separately controlled, the PLC is also suitable for 2-axis independent positioning. Setting for automatic trapezoid control, automatic return to home position and JOG operation are very easy, by using instructions specially worked out for such operations.



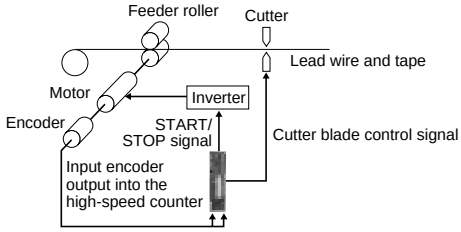
Positioning control is a breeze with the auto trapezoid control command!

```
R0
─┤├(DF)─[F0   MV     H102,DT0]  Control code
      [F0   MV     K500,DT1]  Initial speed (500 Hz)
      [F0   MV     K7000,DT2]  High speed (7 kHz)
      [F0   MV     K300,DT3]  Deceleration/Acceleration time (300 m sec)
      [F1   DMV    K300000,DT4]  Output pulse count (300,000)
      [F0   MV     K0,DT6]
      [F168 SPD1   DT0,K0]  Pulse output starts from Y0
```



● High-speed counter function*

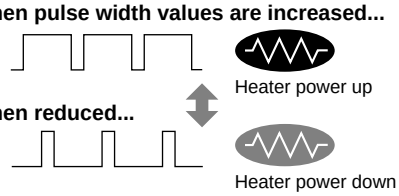
The high-speed counter is prepared for 4 channels in single phase, and 2 channels in 2-phase. In single phase, the 4-channel total is 10 kHz, and in 2-phase the 2-channel total is 2 kHz total speed, making the unit suitable for inverter control, and so forth.



● PWM output function

(For transistor output type only*)

Its PWM output (Pulse Width Modulation output) function makes it possible to provide temperature control with a single compact FP0 unit.



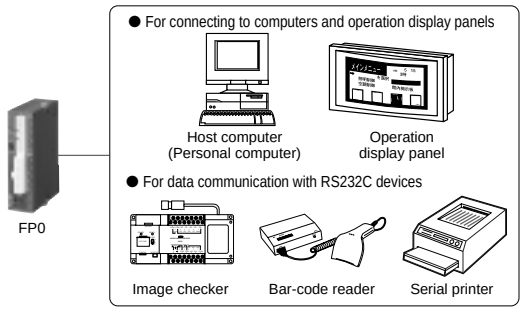
Note: * To use the above-listed control functions, the programming software "FPWIN GR" or hand-held Programmer "FP programmer II" Ver. 2 (Part number AFP1114V2) is necessary.
The previous "FP programmer II" and so forth, cannot be used.

Series of control units with RS232C port (Part No. C10CR, C14CR, C16CT, C16CP, C32CT, C32CP, T32CT, T32CP and SL1)

The RS232C port allows the direct connection to computers and operation display panels. Also, bi-directional data communication with bar-code readers and other RS232C devices is made easy.

The port block is connected by three S.R.G. terminals. Operation display panels can also be connected using the tool port.

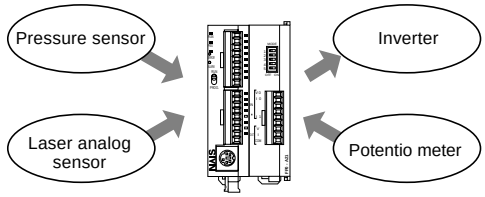
RS232C port is equipped on the control units for both relay types and transistor output types.



Analog control is made simple with the 2-point input and 1-point output

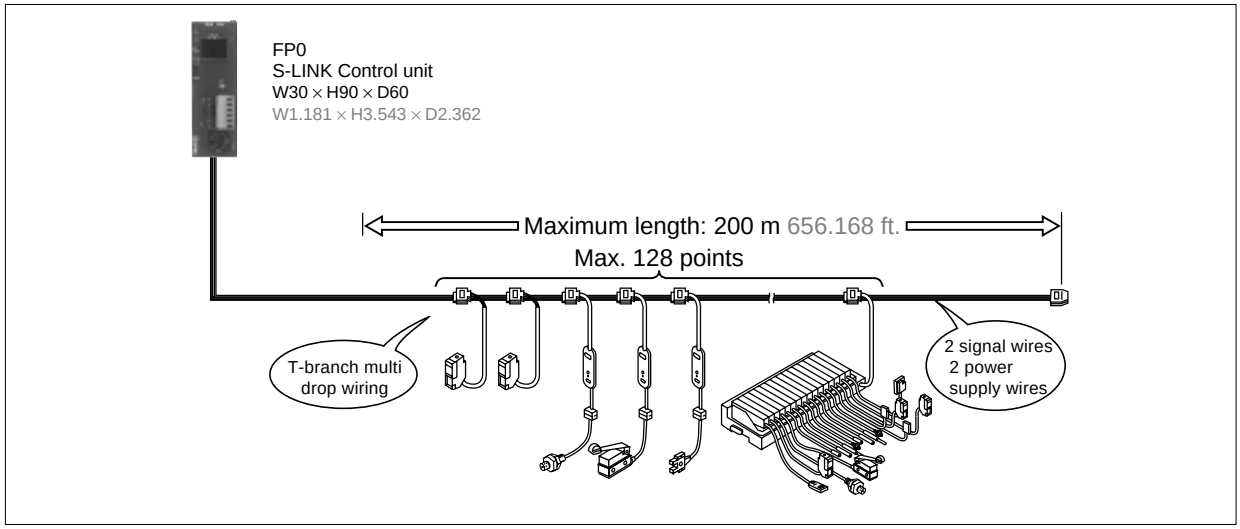
The analog I/O unit is equipped with 2 analog input points and 1 analog output point in a compact body. A small PLC that makes analog control a cinch.

Also, despite the small size, the I/O resolution is a high 1/4000 (12 bits). Support various I/O ranges by setting the DIP switches on the analog I/O unit for simple operation.



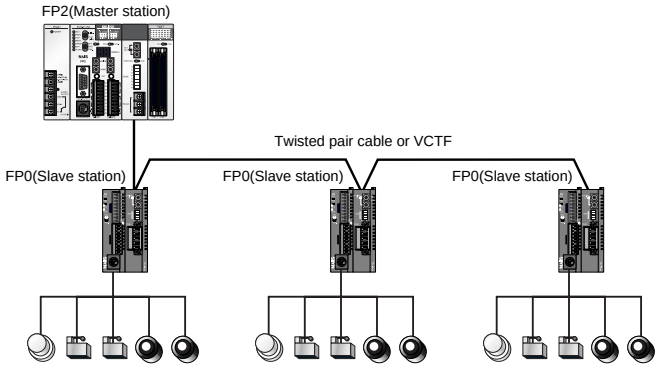
The FP0 that connects directly to SUNX, Limited reduced-wiring system

Makes use of the T-shaped connectability of the S-LINK and its reduced wiring and simple installation for reduced size of the control board. Supports the control S-LINK I/O unit with 64 input points and 64 output points. Allows the use of up to three expansion units for efficient I/O wiring.



The FP0 can be used as a slave station for MEWNET-F (remote I/O system) by adding I/O link unit.

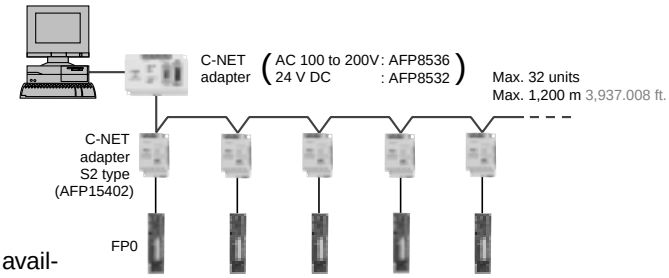
MEWNET-F is a reduced-wiring remote I/O system that connects the separately located PLCs and I/O slave stations with 2-core cabling. By adding an I/O link unit to the FP0, you can link master station PLC and FP0 inputs and outputs via the network.



* The maximum length of the twisted pair cable is 700 m. 2,296.588 ft.
For VCTF, it is 400 m. 1,312.336 ft.

By using C-NET, you can use multiple FP0s as data collection terminals.

By using the C-NET network and exclusive adapters, you can connect multiple FP0s by multi-drop connection with 2-wire cables. You can use computers for separate control or have network terminals for a centralized management system.



● PCWAY

The Excel add-in software "PCWAY" is available for data collection of the networked PLCs. The contents of the PLC bits and data registers can be simply shown and managed on Excel worksheets.

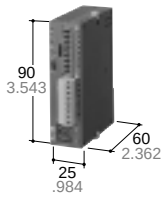
FP0 Table of Units

mm inch

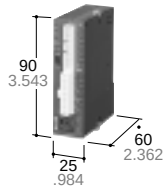
■ Control Units

- 10 to 32-point units are available according to output format.
- Each type is equipped with RS232C ports and available in a series of models.
- Products that connect directly to the SUNX, Limited reduced-wiring network S-LINK are also available.
- The new control unit with 10k-step, clock/calender function and RS232C port is also available.

10 points Input 6 points / Relay output 4 points

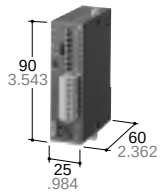


Terminal block type
FP0-C10RS

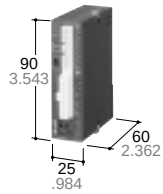


Connector type
FP0-C10RM

14 points Input 8 points / Relay output 6 points

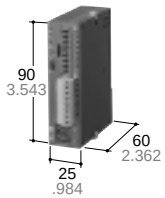


Terminal block type
FP0-C14RS

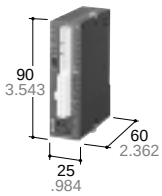


Connector type
FP0-C14RM

10 points (with RS232C) Input 6 points / Relay output 4 points

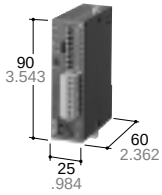


Terminal block type
FP0-C10CRS

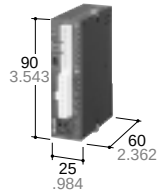


Connector type
FP0-C10CRM

14 points (with RS232C) Input 8 points / Relay output 6 points



Terminal block type
FP0-C14CRS

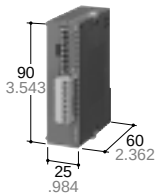


Connector type
FP0-C14CRM

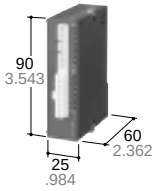
■ Expansion Units

- Our expansion unit series has an I/O dedicated model added to offer an ample selection of I/O points.

8 points Input 4 points / Relay output 4 points

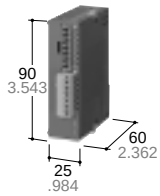


Terminal block type
FP0-E8RS

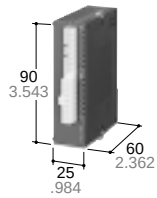


Connector type
FP0-E8RM

16 points Input 8 points / Relay output 8 points

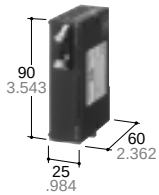


Terminal block type
FP0-E16RS



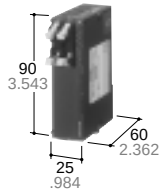
Connector type
FP0-E16RM

8 points Input 8 points



MIL connector
FP0-E8X

16 points Input 16 points

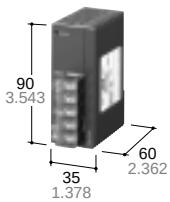


MIL connector
FP0-E16X

■ Power Supply Unit

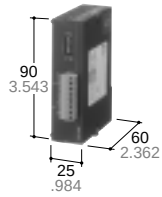
- The height and depth dimensions are unified. Supports AC power supplies.

Power supply
Input 100 V to 240 V AC /Output 24 V DC 0.6 A



FP0-PSA1

Analog Input 2 channels /Output 1 channel



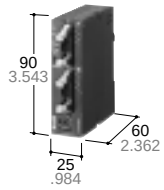
Terminal block
FP0-A21

■ Intelligent Unit

- The addition of analog I/O units to the PLC series makes it possible to perform analog control with the FP0.

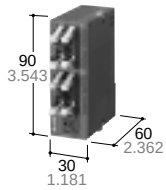
mm inch

16 points Input 8 points / Transistor output 8 points



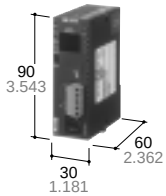
MIL connector
FP0-C16T [NPN]
FP0-C16P [PNP]

32 points Input 16 points / Transistor output 16 points



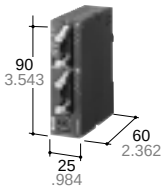
MIL connector
FP0-C32T [NPN]
FP0-C32P [PNP]

S-LINK Input 64 points / Output 64 points



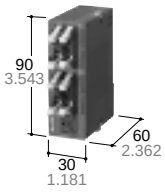
S-LINK exclusive flat cable
(* Equipped with RS232C port.)
FP0-SL1

16 points (with RS232C) Input 8 points / Transistor output 8 points



MIL connector
FP0-C16CT [NPN]
FP0-C16CP [PNP]

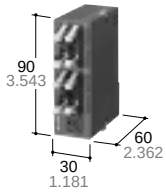
32 points (with RS232C) Input 16 points / Transistor output 16 points



MIL connector
FP0-C32CT [NPN]
FP0-C32CP [PNP]

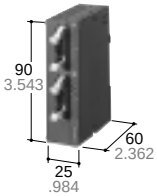
32 points (with RS232C) 10 k type
Input 16 points / Transistor output 16 points

NEW



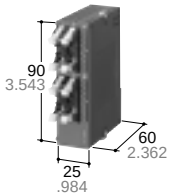
MIL connector
FP0-T32CT [NPN]
FP0-T32CP [PNP]

16 points Input 8 points / Transistor output 8 points



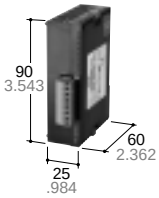
MIL connector
FP0-E16T [NPN]
FP0-E16P [PNP]

32 points Input 16 points / Transistor output 16 points



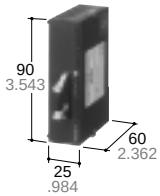
MIL connector
FP0-E32T [NPN]
FP0-E32P [PNP]

8 points Relay output 8 points



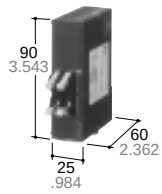
Terminal block
FP0-E8YRS

8 points Transistor output 8 points



MIL connector
FP0-E8YT [NPN]
FP0-E8YP [PNP]

16 points Transistor output 16 points



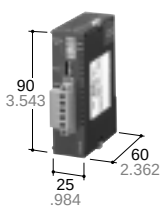
MIL connector
FP0-E16YT [NPN]
FP0-E16YP [PNP]

■ Link Unit

- A series of units that enable I/O linking with the host FP series PLC is now available.
- An adapter for linking with the host computer is also available.

Network

NEW



I/O link
FP0-IOL

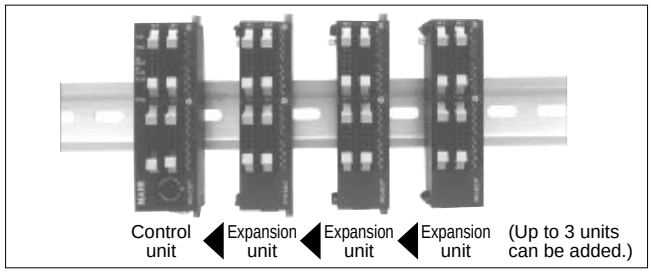
C-NET Adapter S2 type

Adapter for linking to a host computer.
With a 30 cm 11.811inch dedicated cable.
Power supply unnecessary.
AFP15402

FP0 Combination of Units

■ Limitation of Combination of Units

- Up to 3 expansion or intelligent units can be connected to each base control unit.
- There is no restriction on the type and the order in which expansion units are installed.
- The relay output type and transistor type can be used in conjunction with each other.



● Combination with relay output type

(Total number of I/O points)	=	(Control unit)	+ (Expansion unit 1)	+ (Expansion unit 2)	+ (Expansion unit 3)
10 (Input 6 / Output 4)	=	10 (Input 6 / Output 4)			
14 (Input 8 / Output 6)	=	14 (Input 8 / Output 6)			
18 (Input 10 / Output 8)	=	10 (Input 6 / Output 4)	+ 8 (Input 4 / Output 4)		
22 (Input 12 / Output 10)	=	14 (Input 8 / Output 6)	+ 8 (Input 4 / Output 4)		
26 (Input 14 / Output 12)	=	10 (Input 6 / Output 4)	+ 16 (Input 8 / Output 8)		
	=	10 (Input 6 / Output 4)	+ 8 (Input 4 / Output 4)	+ 8 (Input 4 / Output 4)	
30 (Input 16 / Output 14)	=	14 (Input 8 / Output 6)	+ 16 (Input 8 / Output 8)		
	=	14 (Input 8 / Output 6)	+ 8 (Input 4 / Output 4)	+ 8 (Input 4 / Output 4)	
34 (Input 18 / Output 16)	=	10 (Input 6 / Output 4)	+ 16 (Input 8 / Output 8)	+ 8 (Input 4 / Output 4)	
	=	10 (Input 6 / Output 4)	+ 8 (Input 4 / Output 4)	+ 8 (Input 4 / Output 4)	+ 8 (Input 4 / Output 4)
38 (Input 20 / Output 18)	=	14 (Input 8 / Output 6)	+ 16 (Input 8 / Output 8)	+ 8 (Input 4 / Output 4)	
	=	14 (Input 8 / Output 6)	+ 8 (Input 4 / Output 4)	+ 8 (Input 4 / Output 4)	+ 8 (Input 4 / Output 4)
42 (Input 22 / Output 20)	=	10 (Input 6 / Output 4)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	
	=	10 (Input 6 / Output 4)	+ 16 (Input 8 / Output 8)	+ 8 (Input 4 / Output 4)	+ 8 (Input 4 / Output 4)
46 (Input 24 / Output 22)	=	14 (Input 8 / Output 6)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	
	=	14 (Input 8 / Output 6)	+ 16 (Input 8 / Output 8)	+ 8 (Input 4 / Output 4)	+ 8 (Input 4 / Output 4)
50 (Input 26 / Output 24)	=	10 (Input 6 / Output 4)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	+ 8 (Input 4 / Output 4)
54 (Input 28 / Output 26)	=	14 (Input 8 / Output 6)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	+ 8 (Input 4 / Output 4)
58 (Input 30 / Output 28)	=	10 (Input 6 / Output 4)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)
62 (Input 32 / Output 30)	=	14 (Input 8 / Output 6)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)

■ Expansion Method

● No special expansion cables are required as the expansion unit employs a stacking system that uses expansion connectors and lock levers on the unit.

● Combination with transistor output type

(Total number of I/O points)	=	(Control unit)	+ (Expansion unit 1)	+ (Expansion unit 2)	+ (Expansion unit 3)
16 (Input 8 / Output 8)	=	16 (Input 8 / Output 8)			
32 (Input 16 / Output 16)	=	32 (Input 16 / Output 16)			
	=	16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)		
48 (Input 24 / Output 24)	=	32 (Input 16 / Output 16)	+ 16 (Input 8 / Output 8)		
	=	16 (Input 8 / Output 8)	+ 32 (Input 16 / Output 16)		
	=	16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	
64 (Input 32 / Output 32)	=	32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)		
	=	32 (Input 16 / Output 16)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	
	=	16 (Input 8 / Output 8)	+ 32 (Input 16 / Output 16)	+ 16 (Input 8 / Output 8)	
	=	16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)
80 (Input 40 / Output 40)	=	32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	+ 16 (Input 8 / Output 8)	
	=	32 (Input 16 / Output 16)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)
	=	16 (Input 8 / Output 8)	+ 32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	
	=	16 (Input 8 / Output 8)	+ 32 (Input 16 / Output 16)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)
96 (Input 48 / Output 48)	=	32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	
	=	32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	+ 16 (Input 8 / Output 8)	+ 16 (Input 8 / Output 8)
	=	16 (Input 8 / Output 8)	+ 32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	+ 16 (Input 8 / Output 8)
112 (Input 56 / Output 56)	=	32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	+ 16 (Input 8 / Output 8)
	=	16 (Input 8 / Output 8)	+ 32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)
128 (Input 64 / Output 64)	=	32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)	+ 32 (Input 16 / Output 16)

FP0 Specifications

■ Performance Specifications

Type of control unit			C10 series (Relay output type only)	C14 series (Relay output type only)	C16 series (Transistor output type only)	C32 series (Transistor output type only)	S-LINK type	T32 series (Transistor output type only)
Programming method / Control method			Relay symbol/Cyclic operation					
Number of I/O points	No expansion (control unit only)		Total: 10 (Input: 6, Output: 4)	Total: 14 (Input: 8, Output: 6)	Total: 16 (Input: 8, Output: 8)	Total: 32 (Input: 16, Output: 16)	S-LINK section: max.128points (Input: 64, Output: 64)	Total: 32 (Input:16, Output: 16)
	W/expansion 1 *Same type of control and expansion units		Max. 58	Max. 62	Max. 112	Max. 128	Expansion section: Max.96 points	Max. 128
	W/expansion 2 *Mix type of relay and transistor units		Max. 106	Max. 110	Max. 112	Max. 128		Max. 128
Program memory			EEP-ROM(No back-up battery required)					
Program capacity			2.7k steps			5k steps		10k steps
Number of instructions	Basic		83					
	High-level		115					
Operation speed(central value/step)			0.9 µs (Basic instrction)					
Operation memory	Relay	Internal relay (R)	1,008 points					
		Timer/Counter (T/C)	144 points					
	Memory area	Data register (DT)	1,660 words			6,144 words		16,384 words
		Index register(IX,IY)	2 words					
Master control relay(MCR)			32 points					
Number of labels(JMP and LOOP)			64 labels					255 labels
Differential points			Unlimited number of points					
Number of step ladder			128 stages					704 stages
Number of subroutines			16 subroutines					100 subroutines
Special functions	High speed counter		1 phase/4 points (10kHz in total) or 2 phases / 2 points (2 kHz in total)*				Not available	Available(same as 32 points series)
	Pulse output		Not available		2 points(10 kHz* in total) ,enable to control 2 channels individually*		Not available	Available (same as 32 points series)
	PWM output		Not available		0.15 Hz to 1kHz		Not available	Available(same as 32 points series)
	Pulse catch input/interrupt input		6 points(with high speed counter)				Not available	Available(same as 32 points series)
	Interrupt program		7 programs (external 6 points, internal 1 point)				1 program (internal 1 point)	Available(same as 32 points series)
	Periodical interrupt		0.5 ms to 30s					
	Constant scan		Available					
	RS232C port		One RS232C port is mounted on each of the models FP0- C10CR, C14CR,C16CT, C16CP, C32CT, C32CP, T32CT, T32CP and SL1 type (3P terminal block) Transmission speed (Baud rate): 300 to 19200 bit/s, Transmission distance: 3 m 9.843 ft Communication method: half duplex					
Maintenance	Memory back up	Program and system register	Stored program and system register in EEP-ROM					
		Operation memory	Stored fixed area in EEP-ROM Counter: 4 points Internal relay: 32 points Data register: 8 words			Stored fixed area in EEP-ROM Couner: 16 points Internal relay: 128 points Date register: 32 words		Backup is provided by secondary battery. The holding range for the timers, counters, internal relays, and data registers are specified with the programming tool.
	Self-diagnosis functions		Watchdog timer, program syntax checking					
	Clock/Calender function		Not available					Available
	Other functions		Runtime editing, password setting					

* For the limitations while operating units, see the manual.

■ General Specifications

Item		Description
Rated operating voltage		24 V DC
Operating voltage range		21.6 to 26.4 V DC
Allowable no voltage time	10 points, 14 points type	5 ms (at 21.6 V), 10 ms (at 24 V)
	16 points, 32 points, S-LINK type	10 ms (at 21.6 V / 24 V)
Ambient temperature		0 to +55°C 32 to +131°F
Storage temperature		–20 to +70°C –4 to +158°F
Ambient humidity		30 to 85% RH (Non-condensing)
Storage humidity		30 to 85% RH (Non-condensing)
Breakdown voltage		Between input/output terminals and power/ground terminals: 500 V AC for 1 minute (for the relay output type, 1500 V AC for 1 minute) Between input terminals and output terminals: 500 V AC for 1 minute (for the relay output type, 1500 V AC for 1 minute)
Insulation resistance		Between input/output terminals and power/ground terminals: Over 100 MΩ (using a 500V DC megger) Between input terminals and output terminals: Over 100 MΩ (using a 500V DC megger)
Vibration resistance		10 to 55 Hz, 1 sweep/min., double amplitude of 0.75 mm .030 inch, 10 min. on 3 axes
Shock resistance		98 m/s^2 or more, 4 times on 3 axes
Noise immunity		1,000 V(p-p) with pulse widths 50 ns and 1 µs (using a noise simulator)
Operating condition		Free from corrosive gasses and excessive dust

■ Input Specification (As for the limitation on the number of simultaneous ON points, please refer to the manual.)

Item		Description
Rated input voltage		24 V DC
Operating voltage range		21.6 to 26.4 V DC
Rated input current		Approx. 4.3 mA (at 24 V DC)
Input impedance		Approx. 5.6 kΩ
Input points per common		±common, 4 points/common (E8RS/E8RM), 6 points/common (C10RS/C10RM), 8 points/common (C14RS/C14RM/C16T/C16P/E16T/E16P/E16R/E8X), 16 points/common (C32T/C32P/E32T/E32P/E16X)
Min. ON voltage/ON current		19.2 V / 3 mA
Max. OFF voltage/OFF current		2.4 V / 1 mA
Response time	OFF → ON	50 µs or less (at X0, X1)* (at 24 V DC and under the ambient temperature of 25°C 77°F)
		100 µs or less (at X2 to X5) (at 24 V DC and under the ambient temperature of 25°C 77°F)
		2 ms or less (at X6 onward)
	ON → OFF	Same as above
Insulation method		Optical coupler

Note: *Since the response time of X0 to X5 is very fast (for high-speed counter input), the FP0 happens to catch chattering noise as an input signal. To prevent this, it is recommended that the timer should be put in the ladder program.

■ Output Specification

1. Relay output type

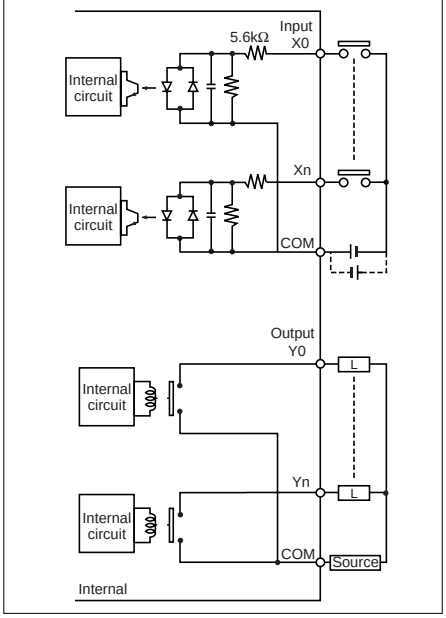
Item		Description
Output type		Normally open (1 Form A)
Rated control capacity		2 A 250 V AC, 2 A 30 V DC (4.5 A/common)
Response time	OFF → ON	Approx. 10 ms
	ON → OFF	Approx. 8 ms
Life	Mechanical	Min. 2×10^7
	Electrical	Min. 10^5
Surge absorber		None
Operation indicator		LED display

2. Transistor output type

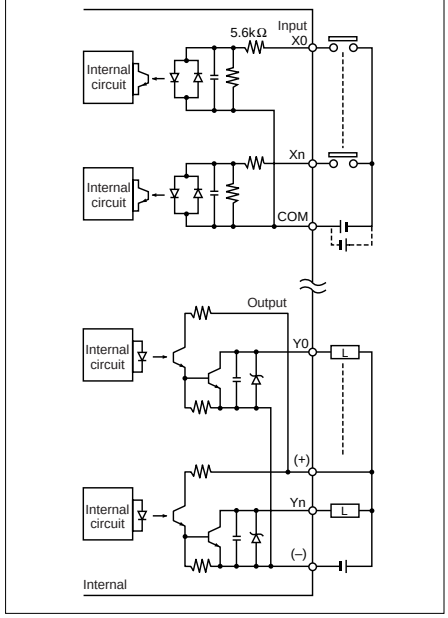
Item		Description
Output type		Open collector
Rated load voltage		NPN type: 5 to 24 V DC, PNP type: 24 V DC
Load voltage allowable range		NPN type: 4.75 to 26.4 V DC PNP type: 21.6 to 26.4 V DC
Max. load current		0.1 A/point (1 A/common)
Max. inrush current		0.3 A
OFF state leakage current		100 µA or less
ON state voltage drop		1.5 V or less
Response time	OFF → ON	1 ms or less (50 µs or less at Y0 and Y1 only)
	ON → OFF	
Voltage range for external power supply		21.6 to 26.4 V DC
Surge absorber		Zener diode
Output points per common		8 points/common (C16T, C16P, C16CT, C16CP, E16T, E16P, E8YT, E8YP) 16 points/common (C32T, C32P, C32CT, C32CP, E32T, E32P, E16YT, E16YP)
Insulation method		Optical coupler

■ I/O Circuit Diagram

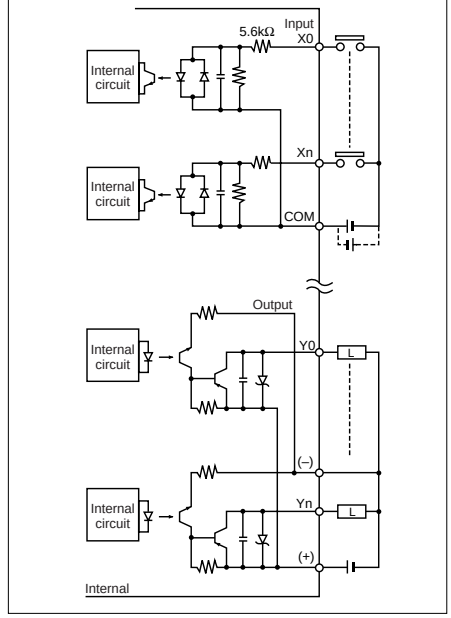
Relay output



Transistor output (NPN)



Transistor output (PNP)



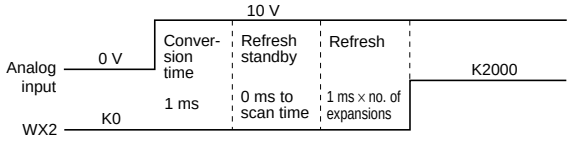
Note: For transistor output types, make sure that the externally supplied voltage between the (+) and (–) terminal is between 21.6 and 26.4 V DC.

■ Analog I/O Unit Specifications

1. Analog input specifications

Item		Description
Number of input points		2 channels/unit
Input range	Voltage range	0 to 5 V/–10 to +10 V
	Current range	0 to 20 mA
Digital output	0 to 5 V or 0 to 20 mA range	K 0 to K 4000 (H0 to H0FA0)
	–10 to +10 V range	K –2000 to K +2000 (H F830 to H 07D0)
Resolution		1/4000 (12 bits)
Conversion speed		1 ms/channel *1
Overall precision		±1% F.S. or less (0 to 55°C), ±0.6% F.S. or less (25°C)
Input impedance	Voltage range	1 MΩ or more
	Current range	250 Ω
Absolute maximum input	Voltage range	±15 V
	Current range	+30 mA
Insulation method		Between analog input terminal and FP0 internal circuit: optical coupler insulation (non-insulated between analog inputs) Between analog input terminal and analog I/O unit external power supply: based on insulation-type DC/DC converter Between analog input terminal and analog output terminal: based on insulation-type DC/DC converter
Number of FP0 input contact points		32 input contact points 16 for 1st half: analog input CH0 data (WX2) *2 16 for last half: analog input CH1 data (WX3) *2

Notes:
*1) The time noted below is required before the analog data is reflected in the control unit input.

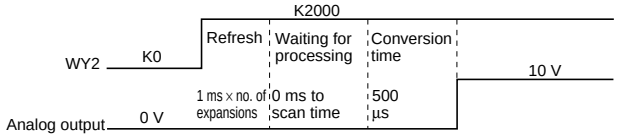


*2) The number for the input contact point being used varies depending on the expansion position.

2. Analog output specifications

Item		Description
Number of output points		1 channel/unit
Output range	Voltage range	–10 to +10 V
	Current range	0 to 20 mA
Digital input	–10 to +10 V range	K –2000 to K +2000 (H F830 to H 07D0)
	0 to 20 mA range	K0 to K 4000 (H0 to H 0FA0)
Resolution		1/4000 (12 bits)
Conversion speed		500 µs *1
Overall precision		±1% F.S. or less (0 to 55°C), ±0.6% F.S. or less (25°C)
Output impedance		Voltage range: 0.5 Ω
Maximum output current		Voltage range : ±10 mA
Allowable output load resistance		Current range: 300 Ω or less
Insulation method *2		Between analog output terminal and FP0 internal circuit: optical coupler insulation Between analog output terminal and analog I/O unit external power supply: based on insulation-type DC/DC converter Between analog output terminal and analog input terminal: based on insulation-type DC/DC converter
Number of FP0 output contact points		16 output contact points (WY2) *2 Analog output data

Notes:
*1) The time noted below is required before the analog data is reflected in the control unit output.



*2) The number for the output contact point being used varies depending on the expansion position.

3. General specifications

Item	Description
Rated voltage	24 V DC
Allowable voltage fluctuation range	21.6 to 26.4 V DC
Rated current consumption	100 mA or less*

Notes:
* If the analog I/O unit is connected to the control unit, the current consumption on the control unit side increases by not more than 20 mA for each analog I/O unit.

■ I/O Link Unit Specifications

Item	Description
Communication method	Two-wire, half duplex transmission
Synchronous system	Start stop synchronous system
Transmission line	2-wire cable (Twisted-pair cable or VCTF 0.75 mm^2 × 2C equivalent)
Transmission distance (Total distance)	Max. 700 m 2,296.588 ft. (using twisted pair cable) Max. 400 m 1,312.336 ft. (using VCTF cable)
Transmission speed (Baud rate)	0.5 Mbit/s
Number of control I/O point per an I/O link unit	64 points (Input: 32 points and Output: 32 points)*
Remote I/O map allocation	32X/32Y
Interface	Conforming to RS485
Transmission error check	CRC (Cyclic Redumdancy Check) method

* This point number is the number of points that can be linked for inputting and outputting via the host PLC and network MEWNET-F. If the output for the I/O link unit error flag is set to ON, this number becomes 63 points (31 input points and 32 output points).

■ Weight

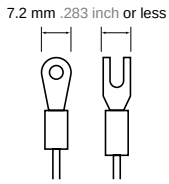
Unit	Part number	Weight
Control unit	FP0-C10	Approx. 100 g 3.527 oz
	FP0-C14	Approx. 105 g 3.704 oz
	FP0-C16	Approx. 85 g 2.998 oz
	FP0-C32	Approx. 115 g 4.057 oz
	FP0-T32	Approx. 125 g 4.409 oz
	FP0-SL1	Approx. 120 g 4.233 oz
Expansion unit	FP0-E8X	Approx. 65 g 2.293 oz
	FP0-E8R	Approx. 90 g 3.175 oz
	FP0-E8YR	Approx. 90 g 3.175 oz
	FP0-E8YT FP0-E8YP	Approx. 65 g 2.293 oz
	FP0-E16X	Approx. 70 g 2.469 oz
	FP0-E16R	Approx. 105 g 3.704 oz
	FP0-E16T FP0-E16P	Approx. 70 g 2.469 oz
	FP0-E16YT FP0-E16YP	Approx. 70 g 2.469 oz
	FP0-E32T FP0-E32P	Approx. 85 g 2.998 oz
Intelligent unit	FP0-A21	Approx. 80 g 2.822 oz
	FP0-IOL	Approx. 85 g 2.998 oz
Power supply unit	FP0-PSA1	Approx. 150 g 5.291 oz

■ Power Supply Unit Specifications

Input	Rated input voltage	100 to 240 V AC
	Variable input voltage range	85 to 264 V AC
	Rated frequency	50/60 Hz
	Frequency range	47 to 63 Hz
	Number of phases	Single-phase
	Surge current	30 A (0 - P) or less, with cold start
	Leakage current	0.75 mA or less
	Allowable momentary power off time	10 ms or more
Output	Rated voltage	24 V DC
	Voltage accuracy	±5%
	Rated current	0.6 A
	Output current range	0 to 0.6 A
	Ripple voltage	500 mV or less
Protective functions	Over-current protection	0.63 A or more
	Over-voltage protection	Available

Applicable crimp terminals

Manufacturer	Part number	Applicable wiring
JST Mfg.Co.,Ltd.	V1.25-M3 (round type) V1.25-S3A (fork type)	0.35 to 1.65 mm^2 AWG #22 to #15
	V2-M3 (round type) V2-S3A (fork type)	1.04 to 2.00 mm^2 AWG #17 to #14



■ Current Consumption List

Type of unit	Part number	Current Consumption	
		Supply to the power supply connector of the control unit *1	Supply to the power supply connector of the expansion and intelligent units *2
Control unit	C10 series, C14 series	100 mA or less	—
	C16 series	40 mA or less	—
	C32 series, T32 series	60 mA or less	—
	SL1	150 mA or less	—
Expansion unit	E8X	10 mA or less	—
	E8YRS	10 mA or less	100 mA or less
	E8YT, E8YP	15 mA or less	—
	E8R	20 mA or less	50 mA or less
	E16R	20 mA or less	100 mA or less
	E16X	20 mA or less	—
	E16T, E16P, E16YT, E16YP	25 mA or less	—
	E32T, E32P	40 mA or less	—
Intelligent unit	A21	20 mA or less	100 mA or less
	IOL	30 mA or less	40 mA or less
FP programmer	AFP1114V2	50 mA or less	—
C-NET adapter	AFP15402	50 mA or less	—

Notes:
*1) The current consumption from the power supply connector block of the control unit. Calculate the total current consumption based on the combination of the units.
*2) The current consumption from the power supply connector block of the expansion unit and intelligent unit.

■ Similarities and Differences Between the 10k Steps Type FP0 and the Conventional 32-point Type

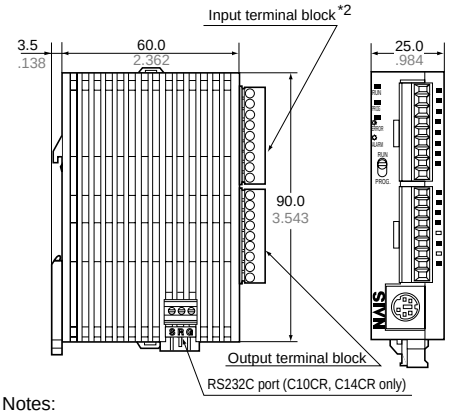
Item being compared \ Type		New 32-point type (Part No. FP0-T32CT, FP0-T32CP)	Conventional 32-point type (Part No. FP0-C32CT, FP0-C32CP)
Program capacity		10k steps	5k steps
Data register		16,384 words	6,144 words
Special data register		From DT90000	From DT9000
Memory backup	Program and system register	EEPROM	EEPROM
	Operation memory	The operation memory is backed up using built-in chargeable (secondary) battery, so the hold type memory areas can be specified using the FPWIN GR programming tools. Memory areas which can be specified: Timers/counters <T/C>, Internal relays <R>, Data registers <DT>	Areas which are held if the power supply fails are fixed, and are retained by the EEPROM. Number of points/words of the fixed hold areas in the various memories Counters <C>: 16 points, Internal relays <R>: 128 points, Data registers <DT>: 32 words
Reading and writing for EEPROM	F12 (ICRD) and P13 (PICWT) instructions	Available 16,384 words	Available 6,144 words
Programming tools	FPWIN GR software	Available	Available
	FP programmer II	Not available	Available

FP0 Dimensions

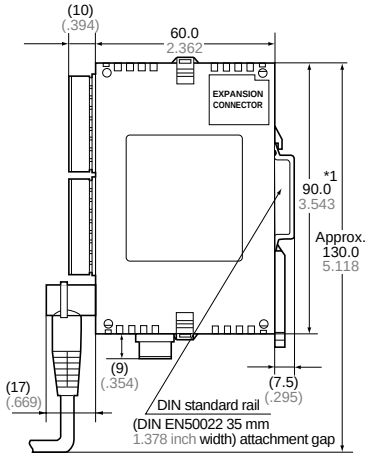
■ Control Units and Expansion Units * For the relay output type, the terminal block type is listed as the representative type.

FP0-C10RS/C10RM/C10CRS/C10CRM/C14RS/C14RM/C14CRS/C14CRM
FP0-E8RS/E8RM/E8YRS/E16RS/E16RM

● **External dimensions** (unit: mm inch)



<Reference measuring for wiring>



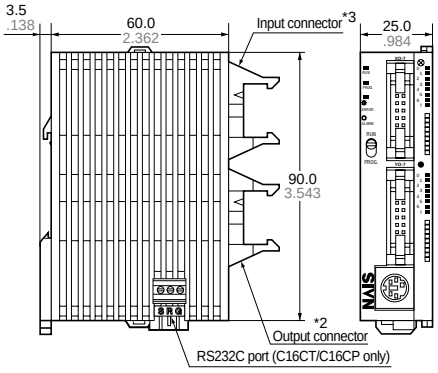
Notes:
*1) DIN rail is attached on the center of the unit.
*2) The FP0-E8YRS is not equipped with an input terminal block.

● **Terminal array**

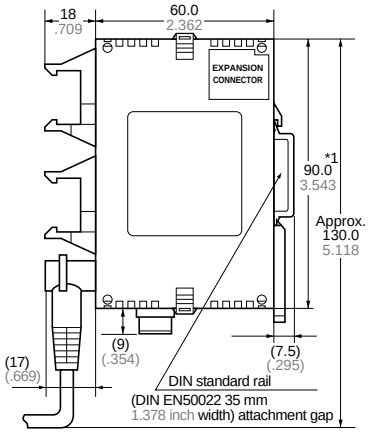
	C10RS/C10RM/ C10CRS/C10CRM	C14RS/C14RM/ C14CRS/C14CRM	E8RS/E8RM	E16RS/E16RM/E8YRS
Input	X0	X0	X0	X0
	X1	X1	X1	X1
	X2	X2	X2	X2
	X3	X3	X3	X3
	X4	X4	(NC)	X4
	X5	X5	(NC)	X5
	(NC)	X6	(NC)	X6
	(NC)	X7	(NC)	X7
	COM	COM	COM	COM
Output	Y0	Y0	Y0	Y0
	Y1	Y1	Y1	Y1
	(NC)	Y2	Y2	Y2
	(NC)	Y3	Y3	Y3
	COM	COM	(NC)	Y4
	Y2	Y4	(NC)	Y5
	COM	COM	(NC)	Y6
	Y3	Y5	(NC)	Y7
	COM	COM	COM	COM

FP0-C16T/C16P/C16CT/C16CP/E16T/E16P/E8X/E8YT/E8YP

● **External dimensions** (unit: mm inch)



<Reference measuring for wiring>



Notes:
*1) DIN rail is attached on the center of the unit.
*2) The FP0-E8X has no output connector.
*3) The FP0-E8YT and E8YP has no input connector.

● **Terminal array**

Input (8 points/common)

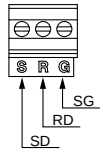
X0	X1
X2	X3
X4	X5
X6	X7
COM	COM

Output (8 points/common)

Y0	Y1
Y2	Y3
Y4	Y5
Y6	Y7
(+)	(–)

● **RS232C port**

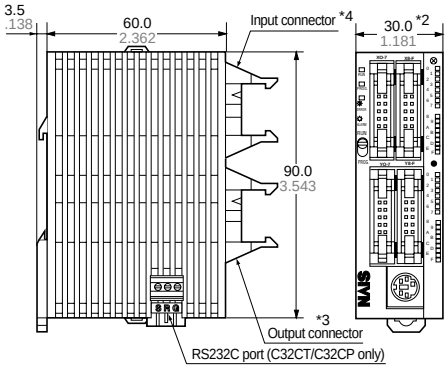
Terminal array



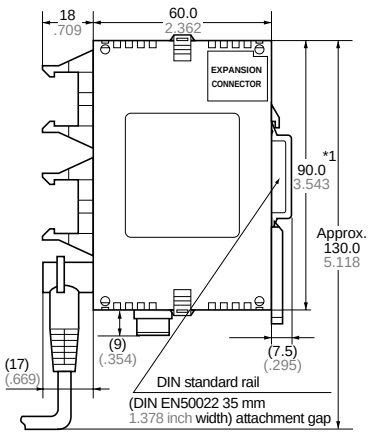
Note: Two COM terminals on the input circuit are connected inside the unit.

FP0-C32T/C32P/C32CT/C32CP/E32T/E32P/E16X/E16YT/E16YP

● **External dimensions** (unit: mm inch)



<Reference measuring for wiring>



Notes:
*1) DIN rail is attached on the center of the unit.
*2) The FP0-E32T, E32P, E16X, E16YT and E16YP are 25 mm .984 inch each.
*3) The FP0-E16X has no output connector.
*4) The FP0-E16YT and E16YP have no input connector.

● **Terminal array**

Input (16 points/common)

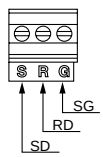
X0	X1	X8	X9
X2	X3	XA	XB
X4	X5	XC	XD
X6	X7	XE	XF
COM	COM	COM	COM

Output (16 points/common)

Y0	Y1	Y8	Y9
Y2	Y3	YA	YB
Y4	Y5	YC	YD
Y6	Y7	YE	YF
(+)	(–)	(+)	(–)

● **RS232C port**

Terminal array

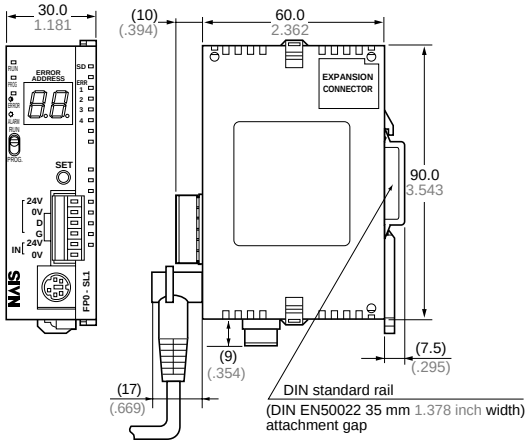


Notes:
1) Four COM terminals on the input circuit are connected inside the unit.
2) Two (+) terminals and two (–) terminals on the output circuit are connected respectively inside the unit.

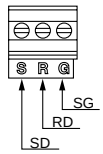
■ FP0 S-LINK Control Unit

● **External dimensions (unit: mm inch)**

<Reference measuring for wiring>



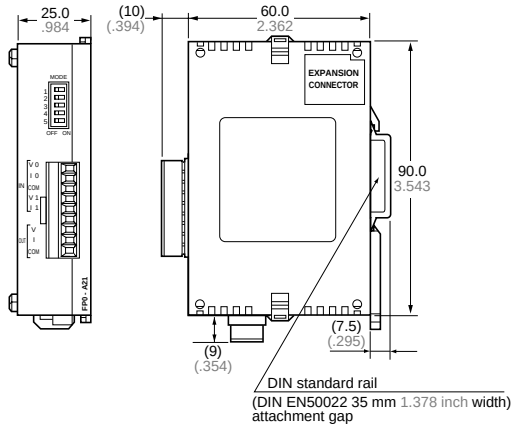
● **RS232C port Terminal array**



■ FP0 Analog I/O Unit

● **External dimensions (unit: mm inch)**

<Reference measuring for wiring>

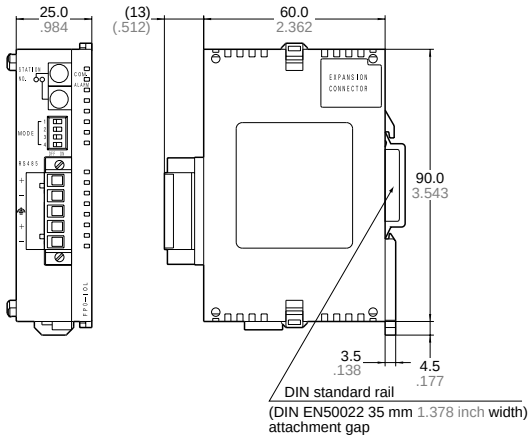


Note: DIN rail is attached on the center of the unit.

■ FP0 I/O Link Unit

● **External dimensions (unit: mm inch)**

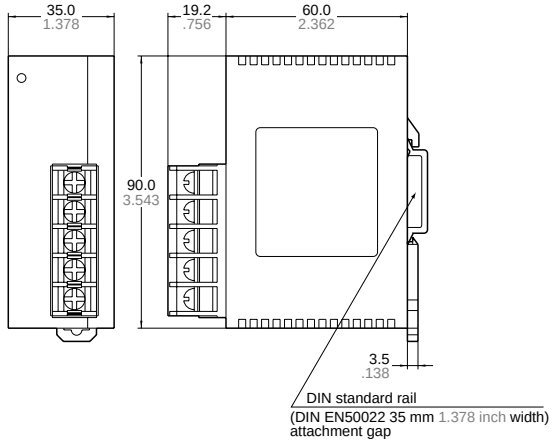
<Reference measuring for wiring>



■ FP0 Power Supply Unit

● **External dimensions (unit: mm inch)**

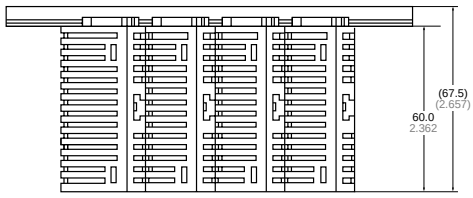
<Reference measuring for wiring>



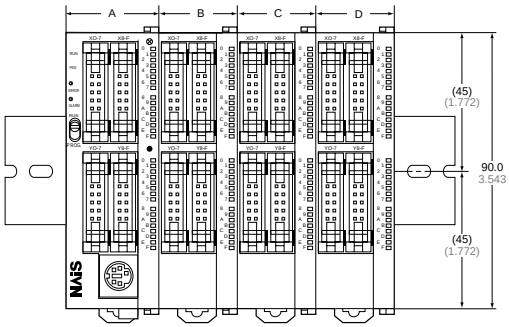
Note: DIN rail is attached on the center of the unit.

■ External Dimensions During Expansions

● **Top view (with DIN rail attached)**



● **Front view**



A+B+C+D dimensions

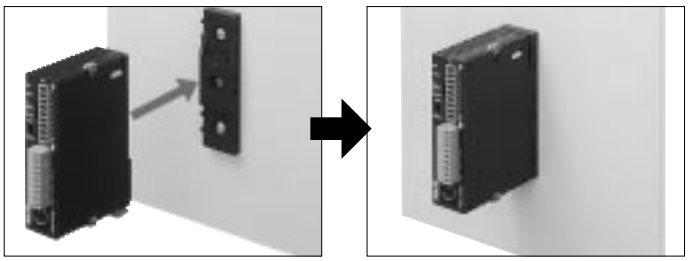
Control unit type	A Control unit only	A+B 1 expansion unit connected	A+B+C 2 expansion units connected	A+B+C+D 3 expansion units connected
FP0-C10CRS	25 mm .984 inch	50 mm 1.969 inch	75 mm 2.953 inch	100 mm 3.937 inch
FP0-C10CRS				
FP0-C10RM				
FP0-C10CRM				
FP0-C14RS				
FP0-C14CRS				
FP0-C14RM				
FP0-C14CRM				
FP0-C16T				
FP0-C16P				
FP0-C16CT				
FP0-C16CP				
FP0-C32T	30 mm 1.181 inch	55 mm 2.165 inch	80 mm 3.150 inch	105 mm 4.134 inch
FP0-C32P				
FP0-C32CT				
FP0-C32CP				
FP0-SL1				
FP0-T32CT				
FP0-T32CP				

FP0 Mounting Plate

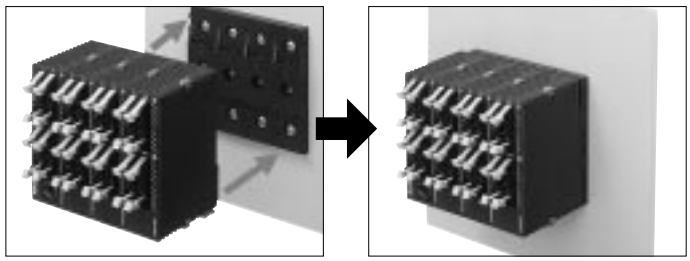
■ Dimensions and Mounting

● When mounting directly to the panel surface (1), use the slim type mounting plate.
The control unit and expansion unit can be directly mounted to the panel surface using the optional “slim type mounting plate”.

Control unit only

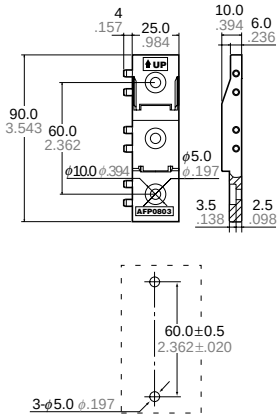


Control unit and expansion unit

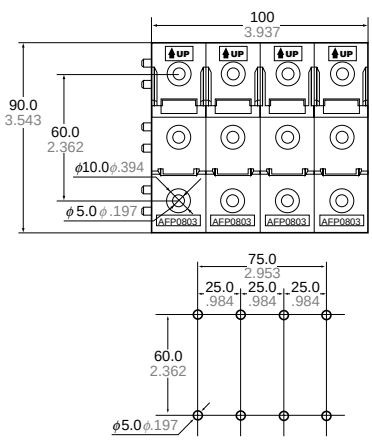


● Mounting dimensions (unit: mm inch)
Slim type mounting plate

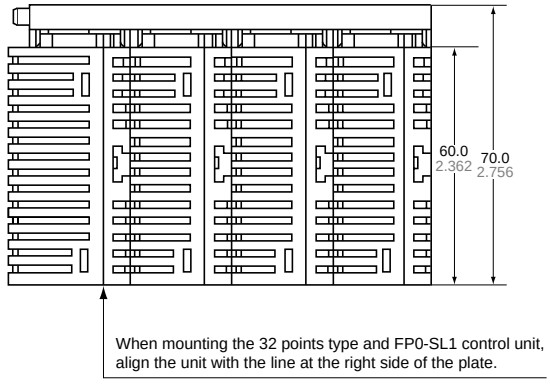
1 plate



4 plates in series



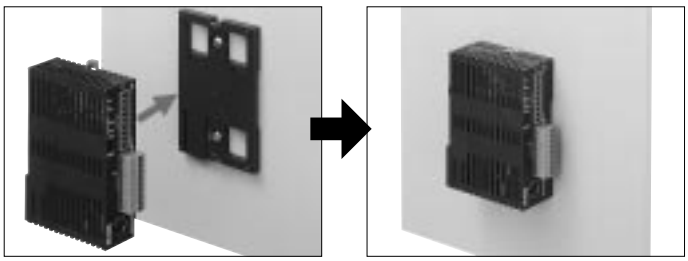
Dimensions when using slim type mounting plate



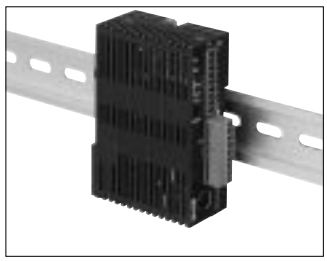
When mounting the 32 points type and FP0-SL1 control unit, align the unit with the line at the right side of the plate.

● When mounting directly to the panel surface (2), use the flat type mounting plate. (Note: Cannot be used with expansions)
The control unit can be directly mounted to the panel surface using the optional “flat type mounting plate”.

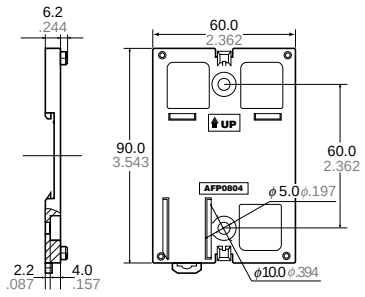
Mounting to the panel surface

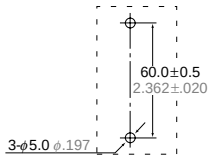


Attaching to the DIN rail also OK!

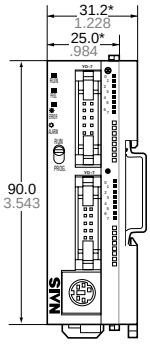


● Mounting dimensions (unit: mm inch)
Flat type mounting plate





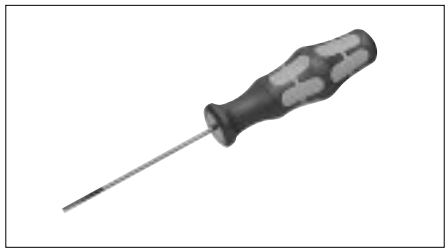
Dimensions when using flat type mounting plate



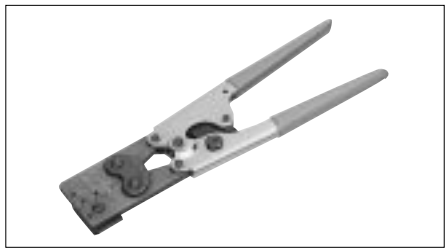
* When using the 32 points type and FP0-SL1 control unit, add 5 mm .197 inch to each dimension.

FP0 Options

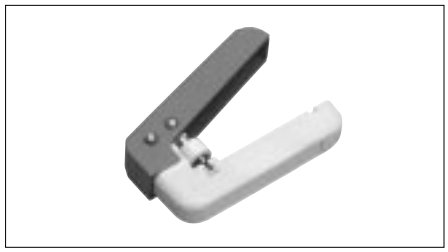
■ Wiring Tools



Terminal screwdriver
Necessary when wiring relay output type and terminals block (Phoenix).
Part number: AFP0806

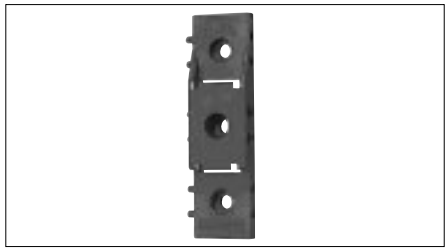


Molex connector pressure contact tool
Necessary when wiring relay output type and Molex connectors.
Part number: AFP0805



Multi-wire connector pressure contact tool
Necessary when wiring transistor output type connectors.
Part number: AXY52000

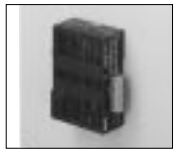
■ Parts For Mounting



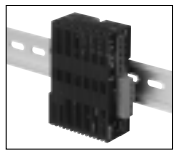
Slim type mounting plate
Screw-stop attachment plate. Slim model.
Part number: AFP0803 (set of 10)

Mounting example

Flat type mounting plate
Screw-stop attachment plate. Flat model.
Part number: AFP0804 (set of 10)

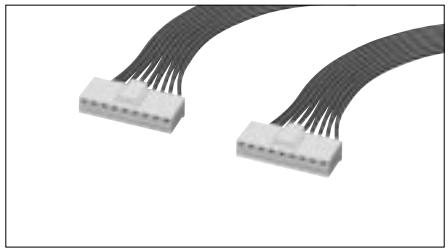


Mounting example



DIN rail mounting example

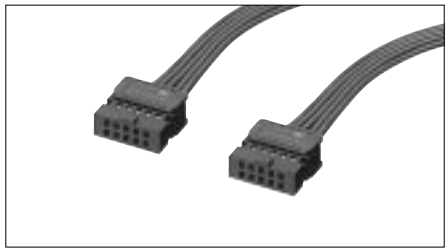
■ I/O Cables



Relay output Molex type I/O cable
Loose-wiring cable (9 leads) AWG20, with Molex socket attached at one end, 0.5 mm², 1 set: 2 cables (blue & white).

<Length: 1 m 3.281 ft.>
2 cable set
Part number: AFP0551

<Length: 3 m 9.843 ft.>
2 cable set
Part number: AFP0553



Transistor output type I/O cable
Wire-pressed terminal cable (10 leads) AWG22, 0.3 mm² with connectors attached at one end, 1 set: 2 cables (blue & white).

<Length: 1 m 3.281 ft.>
2 cable set
Part number: AFP0521

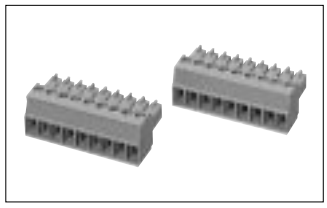
<Length: 3 m 9.843 ft.>
2 cable set
Part number: AFP0523

■ Flat Cable Connector

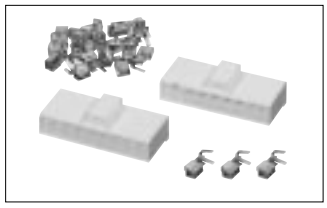
If you are using flat cable connector, request the part specified below for a connector with an asymmetrical design to prevent mistaken polarity.
Part number: AXM110915

Notes:
- One I/O cable set (2 cables) is necessary with the following models: FP0-C10RS/C10RM, C14RS/C14RM, E8RS/E8RM, E16RS/E16RM
- One I/O cable set (2 cables) is necessary with the following models: FP0-C16T/C16P/E16X/E16T/E16P/E16YT/E16YP
- Two I/O cable sets (total 4 cables) are necessary with the following models: FP0-C32T/C32P/E32T/E32P

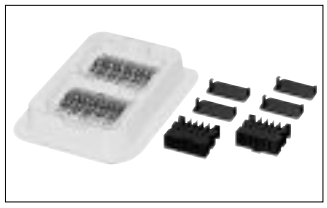
■ Additional Parts



Terminal socket
Attaches to relay output and terminal block type. Additional part
Part number: AFP0802
(2 sockets per pack)



Molex socket
Attaches to relay output and Molex connector types. Additional part
Part number: AFP0801
(2 sockets per pack)



FP0 Wire-press socket
Attaches to transistor output type. Additional part
Part number: AFP0807
(2 sockets per pack)

Power cable
Attaches to control unit and relay output type expansion unit. Additional part Length: 1 m 3.281ft.
Part number: AFP0581
(1 socket per pack)