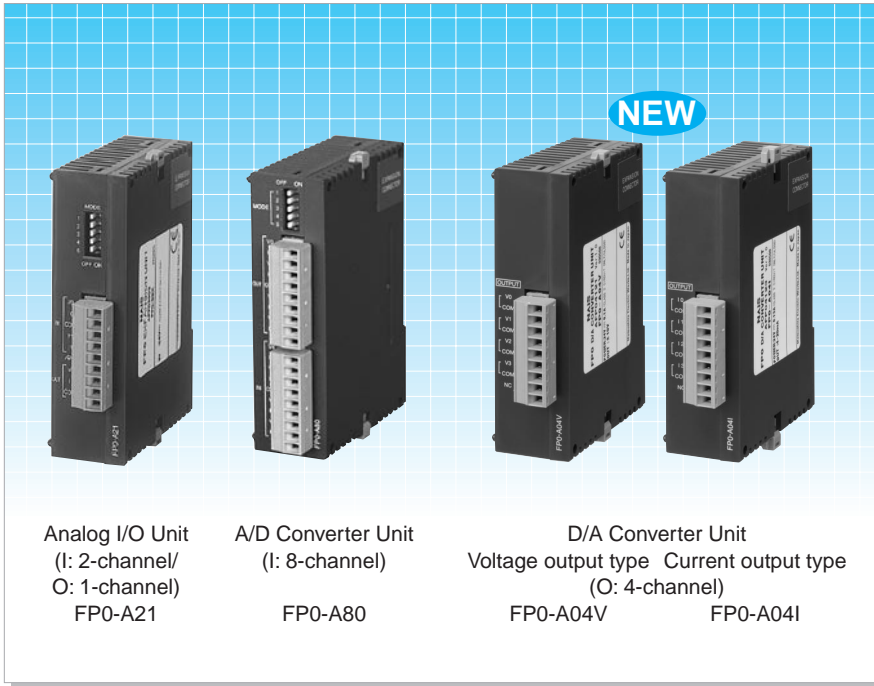


FP0 Analog I/O Units

Multi-channel analog control possible of current and voltage ranges



Analog I/O Unit (I: 2-channel/ O: 1-channel) **FP0-A21**
 A/D Converter Unit (I: 8-channel) **FP0-A80**
 D/A Converter Unit Voltage output type **FP0-A04V**
 Current output type (O: 4-channel) **FP0-A04I**

Features

Can be used with FP0 and FPΣ in a wide range of applications from compact machines to large-scale equipment.

Adding to the existing 8-channel analog input type and the 2-channel-input/1-channel-output analog I/O unit, a new 4-channel analog output type has been made available to widen the breadth of analog control even further.

Multi-channel analog control is possible with FP0 and FPΣ.

Eight input channels or four output channels are contained in one unit. With a maximum of three connected units, multi-channel analog control is possible.

High-speed conversion of 500 μs per channel (D/A converter unit)

The D/A converter unit is capable of high-speed processing with a current/voltage output conversion time of 500 μs.

Performance Specifications

● FP0-A21

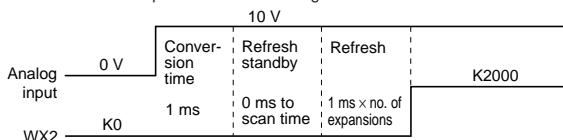
1. Analog input specifications

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 K 0 to K 4000*1
	-10 to +10 V K -2000 to K +2000*1
Resolution	1/4000 (12 bits)
Conversion speed	1 ms/channel*2
Accuracy	±1% F.S. or less (0 to 55°C/32 to 131°F), ±0.6% F.S. or less (25°C/77°F)
Input impedance	Voltage range 1 MΩ or more
	Current range 250 Ω
Absolute maximum input	Voltage range ±15 V
	Current range +30 mA
Isolation method	Between analog input terminal and FP0 internal circuit: photocoupler isolation (non-isolated between channels) Between analog input terminal and analog I/O unit external power supply: based on isolation-type DC/DC converter Between analog input terminal and analog output terminal: based on isolation-type DC/DC converter
Number of FP0 input contact points	32 input contact points

Notes)

*1: If the analog input value exceeds the upper/lower limit, the digital value is held at the upper/lower limit.

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



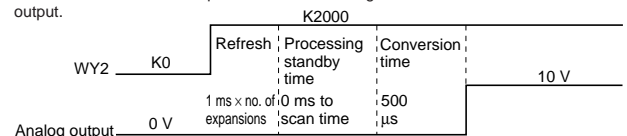
2. Analog output specifications

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 K -2000 to K +2000*1
	0 to 20 mA K0 to K 4000*1
Resolution	1/4000 (12 bits)
Conversion speed	500 μs*2
Accuracy	±1% F.S. or less (0 to 55°C/32 to 131°F), ±0.6% F.S. or less (25°C/77°F)
Output impedance	Voltage range: 0.5 Ω
Maximum output current	Voltage range: ±10 mA
Allowable output load resistance	Current range: 300 Ω or less
Isolation method	Between analog output terminal and FP0 internal circuit: photocoupler isolation Between analog output terminal and analog I/O unit external power supply: based on isolation-type DC/DC converter Between analog output terminal and analog input terminal: based on isolation-type DC/DC converter
Number of FP0 output contact points	16 output contact points

Notes)

*1: If the digital input value exceeds the upper/lower limit, D/A conversion is not executed. (For analog output, the previous data remains unchanged.)

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



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 (24 V DC)*

Note)

*: 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.

● FP0-A80

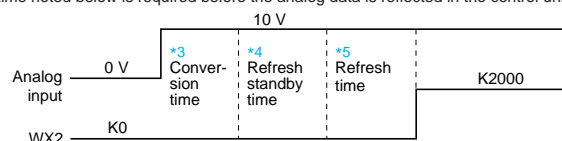
1. Analog input specifications

Item		Description
Number of input points		8 channels/unit (the number of input points can be switched to 2, 4, 6 or 8 channels)
Input range	Voltage range	0 to 5 V, -10 to +10 V, -100 to +100 mV
	Current range	0 to 20 mA
Digital output	0 to 5 V or 0 to 20 mA	K 0 to K 4000*1
	-10 to +10 V or -100 to +100 mV	K -2000 to K +2000*1
Resolution	Voltage/Current range	1/4000 (12 bits)
	Voltage/Current range	1 ms/channel*2
Conversion speed	Voltage/Current range	1 ms/channel*2
Accuracy	Voltage/Current range	±1% F.S. or less (0 to 55°C/32 to 131°F), ±0.6% F.S. or less (25°C/77°F)
	Voltage range	1 MΩ or more
Input impedance	Voltage range	1 MΩ or more
	Current range	250 Ω
Absolute maximum input	Voltage range	±15 V
	Current range	+30 mA
Isolation method		Between analog input terminal and FP0 internal circuit: photocoupler isolation (non-isolated between channels) Between analog input terminal and A/D converter unit external power supply: isolation-type DC/DC converter
Number of FP0 input contact points		32 input contact points
Averaging function		Can be switched on and off

Notes)

*1: If the analog input value exceeds the upper/lower limit, the digital value is held at the upper/lower limit.

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



*3: Conversion time: 1 ms to 1 ms x number of input channels*6

*4: Refresh standby time: 0 ms to scan time x (number of input channels*7 / 2)

*5: Refresh time: 1 ms x number of expansion units

*6: Setting value switch for the number of input channels.

*7: If the control unit loads two channels worth of data at each control unit scan. In other words, if the switch for the number of input channels is set to eight channels, the control unit data is updated once every four scans.

2. General specifications

Item	Description
Rated voltage	24 V DC
Allowable voltage fluctuation range	21.6 to 26.4 V DC
Rated current consumption	60 mA or less (24 V DC)

Note)

*: If the A/D converter unit is connected to the control unit, the current consumption on the control unit side increases by 20 mA (max.) for each A/D converter unit.

● FP0-A04V and FP0-A04I

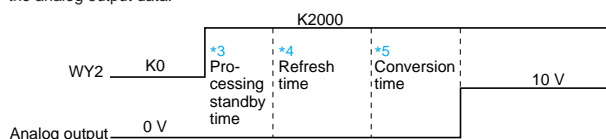
1. Analog output specifications

Item	Description	
	FP0-A04V (Voltage output type)	FP0-A04I (Current output type)
Number of output points	4 channels/unit	4 channels/unit
Output range	-10 to +10 V	4 to 20 mA
Digital input	K -2000 to K +2000*1	K 0 to K 4000*1
Resolution	1/4000	
Conversion speed	500 μs/CH*2	
Accuracy	±1% F.S. or less (0 to 55°C/32 to 131°F), ±0.6% F.S. or less (25°C/77°F)	
Output impedance	0.5 Ω or less	—
Maximum output current	±10 mA	—
Allowable output load resistance	1000 Ω or less	500 Ω or less
Isolation method		Between analog output terminals and FP0 internal circuit: photocoupler isolation (Non isolated between channels) Between analog output terminals and D/A Converter unit external power supply: isolation-type DC/DC converter
Number of FP0 I/O contact points	Input: 16 points Output: 32 points*6	

Notes)

*1: If the digital input value exceeds the upper/lower limit, an error flag is written in WX2 and D/A conversion is not executed. (For analog output, the previous data remains unchanged.)

*2: The time noted below is required when the data output from the control unit is reflected to the analog output data.



*3: Processing standby time: 0 ms to scan time

*4: Refresh time: 1 ms x number of expansion units

*5: Conversion time: 500 μs/1 CH, 1 ms/2 CH

*6: The control unit outputs two channels worth of data to the D/A Converter Unit at each control unit scan.

2. General specifications

Item	Description	
	FP0-A04V (Voltage output type)	FP0-A04I (Current output type)
Rated voltage	24 V DC	
Allowable voltage fluctuation range	21.6 to 26.4 V DC	
Rated current consumption	100 mA or less (24 V DC)	130 mA or less (24 V DC)