MicroSmart FC6A Plus PLC

CPU Module Specifications

PRODUCT DESCRIPTION

This next-generation IDEC MicroSmart FC6A Plus PLC performs beyond micro PLC limits. With its 2,060 I/O capacity, it can control large machines or entire small-scale manufacturing facilities, providing more capabilities for the most demanding applications.
In addition, to give the user flexibility, IDEC offers push-in terminal blocks for quick and reliable connectivity.

KEY FEATURES

- EtherNet/IP
- MQTT and BACnet/IP
- Modbus TCP and RTU
- Dual Ethernet Ports
- iOS & Android App
- Bluetooth Communication
- -25 to 65ºC Operating Temperature
- Screw, Push-in or MIL Connection Terminals

FC6A PLUS CPU MODULES

Part No.	High-speed Counter & Pulse Output	Power	Input	Output	Interface	I/O Points
FC6A-D16R*CEE	• High-speed counter Maximum input frequency: 100kHz • Pulse output (*1) Maximum output frequency: 100kHz	24V DC	24V DC (Sink/ Source)	Relay Output 2A (240V AC-2A, 30V DC-2A)	Port 1 (USB) Port 2 (Ethernet) Port 3 (Ethernet)	16 points (8/8)
FC6A-D16P*CEE				Transistor Source Output 0.5A		
FC6A-K16K*CEE				Transistor Sink Output 0.5A		
FC6A-D32P*CEE				Transistor Source Output 0.1A		32 points (16/16)
FC6A-D32K*CEE				Transistor Sink Output 0.1A		

For the 16 point CPU, in place of *, specify the type of terminals. 1 = Screw or 4 = Push-in
For 32 point CPU, in place of *, specify the type of terminals. 3 = MIL Connector or 4 = Push-in

SPECIFICATIONS

Part No.	FC6A-D16R*CEE FC6A-D16P*CEE FC6A-D16K*CEE	FC6A-D32P*CEE FC6A-D32K*CEE
Rated Power Voltage	24V DC	
Allowable Voltage Range	20.4 to 28.8V DC (including ripple)	
Maximum Power Consumption (CPU module)	FC6A-D16R*CEE: 2.88W (24V DC) FC6A-D16P*CEE: 2.88W (24V DC) FC6A-D16K*CEE: 2.88W (24V DC) FC6A-D32P*CEE: 3.36W (24V DC) FC6A-D32K*CEE: 3.36W (24V DC)	
Inrush Current	35A maximum	
Allowable Momentary Power Interruption	10ms (at rated voltage)	
Operating Temperature	–25 to +65ºC (no freezing)	
Storage Temperature	–25 to + 70ºC (no freezing)	
Relative Humidity	Level RH1 (IEC 61131-2) 10 to 95% (no condensation)	
Altitude	Operation: 0 to 2,000m, 795 to 1,013hPa, Transport: 0 to 3,000m, 701 to 1,013hPa	
Pollution Degree	2 (IEC 60664-1)	
Corrosion Immunity	Free from corrosive gases	
Dielectric Strength	Between power and FE terminals: 500V AC, 1 minute Between transistor output and FE terminals: 500V AC, 1 minute Between power and input terminals: 500V AC, 1 minute Between power and relay output terminals: 2,300V AC, 1 minute Between input and relay output terminals: 2,300V AC, 1 minute	Between input and FE terminals: 500V AC, 1 minute Between relay output and FE terminals: 2,300V AC, 1 minute Between power and transistor output terminals: 500V AC, 1 minute Between input and transistor output terminals: 500V AC, w 1 minute

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Class I Div 2 Hazardous Location

SPECIFICATIONS CONT.

Insulation Resistance	Between power and FE terminals: 100MΩ or higher (500V DC megger) Between transistor output and FE terminals: 100MΩ or higher (500V DC megger) Between power and input terminals: 100MΩ or higher (500V DC megger) Between power and relay output terminals: 100 MΩ or higher (500V DC megger) Between input and relay output terminals: 100MΩ or higher (500V DC megger)	Between input and FE terminals: 100MΩ or higher (500V DC megger) Between relay output and FE terminals: 100MΩ or higher (500V DC megger) Between power and transistor output terminals: 100 MΩ or higher (500V DC megger) Between input and transistor output terminals: 100 MΩ or higher (500V DC megger)
Noise Resistance	AC/DC power terminals: 1kV, 50ns to 1µs I/O terminals (coupling clamp): 1.5kV, 50ns to 1µs coupling adapter	
Vibration Resistance	5 to 8.4Hz amplitude 3.5mm 8.4 to 150Hz acceleration 9.8m/s2 (1G), 2 hours per axis on each of three mutually perpendicular axes (IEC 61131-2)	
Shock Resistance	147m/s2 (15G), 11ms duration, 3 shocks per axis on three mutually perpendicular axes	
Degree of Protection	IP20 (IEC 60529)	
Power Supply Wire	UL1007 AWG24-16, UL2464 AWG24-16, UL1015 AWG20-16	
Grounding Wire	UL1007 AWG16	
Ground	D-type ground (Class 3 ground)	
Mounting	DIN rail or panel mounting	
Weight (approx.)	FC6A-D16R1CEE: 290g FC6A-D16P1CEE: 275g FC6A-D16K1CEE: 275g FC6A-D16R4CEE: 280g FC6A-D16P4CEE: 265g FC6A-D16K4CEE: 265g	FC6A-D32P3CEE: 255g FC6A-D32K3CEE: 255g FC6A-D32P4CEE: 255g FC6A-D32K4CEE: 255g

FUNCTION SPECIFICATIONS

Part No.		FC6A-D16R*CEE FC6A-D16P*CEE FC6A-D16K*CEE	FC6A-D32P*CEE FC6A-D32K*CEE
Control System		Stored program system	
Instruction Words	**Basic**	42	
	Advanced	130	
Program Capacity (*1)		800KB (100,000 steps)	
User Program Storage		Serial Flash Memory (100,000 times rewritable)	
Processing Time	**Basic Instruction**	21µs/1,000 steps	
	END Processing (*2)	1ms maximum	
I/O Points	**Input**	8 points	16 points
	Output	8 points	16 points
Expandable Modules		7 modules (*3)	
Expandable I/O Points with Expansion Modules		224 points	
Expandable Modules with Unibody Type Expansion Modules		8 modules	
Expandable I/O Points with Unibody Type Expansion Modules		256 points	
Expandable Modules with Separate Type Expansion Modules (*5)		63 modules (separate type master: 1 module maximum, separate type slave: 10 modules maximum)	
Expandable I/O Points with Separate Type Expansion Modules (*5)		2,016 points	
Internal Relay		15,400 points	
Special Internal Relay		1,600 points	
Shift Register		256 points	
Data Register		60,000 points	
Non-Retentive Data Register		200,000 points	
Special Data Register		900 points	
Counter		512 points	
Timer (1ms, 10ms, 100ms,1s)		2,000 points	
Clock		Clock accuracy: ±30 sec/month (typical) at 25°C	
RAM Backup	**Backup Data**	Internal relay, shift register, counter, data register, timer, special data register, special internal relay, clock data	
	Battery	Lithium primary battery (BR2032)	
	Battery Life	Approx. 4 years	
	Replaceability	Possible	
Self-diagnostic Function		Keep data, user program sum check (serial flash memory), user program sum check (RAM), timer/counter preset value sum check, user program syntax check, user program execution check, WDT check, user program write check, power failure, clock error, data ink connection check, I/O bus initialization check	
Input Filter		0 ms (without filter), 3 to 15ms (selectable in increments of 1ms) I14, I15, I16, I17: 3ms	
Catch Input/Interrupt Input		Six inputs I0, I1, I3, I4, I6, I7 (Minimum turn on pulse width: 5µs max./Minimum turn off pulse width: 5µs max.)	

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USB PORT SPECIFICATIONS

USB Type	USB mini-B
USB Standard	USB 2.0
Isolation	Not isolated from the internal circuit
Communication Function	Maintenance communication to PC

ETHERNET PORT 1 SPECIFICATIONS

Communication Type	IEEE802.3 compliant
Communication Speed	10BASE-T, 100BASE-TX
Connector	RJ45
Cable	CAT.5STP
Maximum Cable Length	100m
Isolation	Pulse transformer isolation
Communication Function	Maintenance communication (server), user communication (server/client), user communication UDP, Modbus TCP (server/client), Email, Web Server, PING, SNTP, FTP server/client, BACnet/IP server

ETHERNET PORT 2 SPECIFICATIONS

Communication Type	IEEE802.3 compliant
Communication Speed	10BASE-T, 100BASE-TX
Connector	RJ45
Cable	CAT.5STP
Maximum Cable Length	100m
Isolation	Pulse transformer isolation
Communication Function	Maintenance communication (server), user communication (server/client), user communication UDP, Modbus TCP (server/client), PING

FUNCTION SPECIFICATIONS CONT.

High-speed Counter	Maximum Counting Frequency and High-speed Counter Points	Total 6 points Single/two-phase selectable: 100kHz (single-phase: 6 points, two-phase: 3 points)
	Counting Range	0 to 4,294,967,295 (32 bits)
	Operation Mode	Rotary encoder mode, adding counter mode, frequency measurement mode
Analog Potentiometer	Quantity	1 point
	Data Range	0 to 1,000
Analog Voltage Input	Quantity	1 point
	Input Voltage Range	0 to 10V
	Input Impedance	Approx. 100KΩ
	Digital Resolution	Approx. 4,000 steps (12 bits)
Pulse Output (transistor output model only)	Quantity	4 points
	Maximum Output Pulse Frequency	Q0, Q2, Q4, Q6: 100kHz
	Reversible Control	Single-pulse output mode: 4 axis (Q0-Q7), Dual-pulse output mode: 4 axis (Q0-Q7)
	PWM Output	Duty cycle 0.1 to 100.0% (increments of 0.1%), Output pulse frequency 15 to 5,000 Hz (increments of 1 Hz): 4 points (Q0, Q2, Q4, Q6) (Adjust 5μs minimum as ON time and 15μs minimum as OFF time.)
USB Port		USB mini-B (maintenance communication)
Ethernet Port 1		Maintenance communication (server), user communication TCP (server/client), user communication UDP, Modbus TCP (server/client), Email, Web Server, PING, SNTP, FTP server/client
Ethernet Port 2		Maintenance communication (server), user communication TCP (server/client), user communication UDP, Modbus TCP (server/client), PING
Cartridge (option)		Two cartridges can be added (when using FC6A–HPH1)/One cartridge can be added (when using FC6A–PH1)
SD Card Slot		Embedded
HMI Module (option)		Yes

*1: 1 step equals 8 bytes.
*2: Not including expansion I/O service time, counter timer processing time, data link processing time, and interrupt processing time.
*3: A maximum of 5 modules can be connected when using the expansion interface module separate type master.
*4: Transistor output model
*5: Communication module cannot be connected.

INPUT SPECIFICATIONS

Part No.		FC6A-D16R*CEE FC6A-D16P*CEE FC6A-D16K*CEE	FC6A-D32P*CEE FC6A-D32K*CEE
Input Points		8 (8/1 common)	16 (16/1 common)
Rated Input Voltage		24V DC: 24V DC sink/source input signal	
Input Voltage Range		0 to 28.8V DC	
Rated Input Current		High speed input port 5mA/pt, middle/normal speed input port 7mA/pt	
Input Impedance		High speed input port 4.9kΩ, middle/normal speed input port: 3.4kΩ	
Input Delay	Turn ON Time	High speed input port: 5μs + filter value Middle speed input port: 35μs + filter value Normal speed input port: 35μs + filter value	
	Turn OFF Time	High speed input port: 5μs + filter value Middle speed input port: 35μs + filter value Normal speed input port: 100μs + filter value	
Isolation		Between input terminals: Not isolated Internal circuit: Optocoupler-isolated	
Input Type		Type1 (IEC 61131-2)	
External Load for I/O Interconnection		Not needed	
Signal Determination Method		Static	
Effect of Improper Input Connection		Both sinking and sourcing input signals can be connected, therefore reverse connection does not cause damage. If any input exceeding the rated value is applied, permanent damage may be caused.	
Cable Length		3m in compliance with electromagnetic immunity	
Connector	Insertion Durability	100 times minimum	
	Applicable Ferrule	1-wire: AI 0.5-8 WH (Phoenix Contact) 2-wire: AI-TWIN 2×0.5-8 WH (Phoenix Contact)	

RELAY OUTPUT SPECIFICATIONS

Part No.		FC6A-D16R*CEE
Relay Output Points		8
Output Points per Common Line	COM1	4
	COM2	4
Output Type		1NO
Maximum Load Current	Per Point	2A
	Per Common	COM1: 7A COM2: 7A
Minimum Switching Load		1mA/5V DC (reference value)
Initial Contact Resistance		30mΩ maximum

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RELAY OUTPUT SPECIFICATIONS CONT.

Electrical Life		100,000 operations minimum (rated resistive load 1,800 operations/hour)
Mechanical Life		20,000,000 operations minimum (no load 18,000 operations/hour)
Rated Load		Resistive load: 240V AC 2A, 30V DC 2A Inductive load: 240V AC 2A (cos ø = 0.4), 30V DC 2A (L/R =7 ms)
Connector	**Insertion/Removal Durability**	100 times minimum
	Applicable Ferrule	1-wire: AI 0.5-8 WH (Phoenix Contact) 2-wire: AI-TWIN 2×0.5-8 WH (Phoenix Contact)

TRANSISTOR OUTPUT SPECIFICATIONS

Part No.		FC6A-D16P*CEE FC6A-D16K*CEE	FC6A-D32P*CEE FC6A-D32K*CEE
Transistor Output Points		8 (8/1 common)	16 (16/1 common)
Output Type	**Transistor Sink**	FC6A-D16K1CEE/FC6A-D32K3CEE	
	Transistor Source	FC6A-D16P1CEE/FC6A-D32P3CEE	
Rated Load Voltage		24V DC	
Voltage Tolerance		19.2 to 28.8V DC	
Rated Load Current	**Per Point**	0.5A	0.1A
	Per Common	4.0A	1.6A
Output Delay	**Turn ON Time**	High speed input port: 5µs Normal speed input port: 300µs	
	Turn OFF Time	High speed input port: 5µs Normal speed input port: 300µs	
Isolation		Between output terminal and Internal circuit: Optocoupler-isolated Between output terminals: Not isolated	
Voltage Drop (ON Voltage)		1V max (voltage between COM and output terminal when output is on.)	
Inrush Current		1A	0.2A
Leakage Current		0.1mA maximum	
Clamping Voltage		39V ±1V	
Maximum Lamp Load		12W	2.4W
Inductive Load		L/R=10ms (28.8V DC, 1Hz)	
Overcurrent Protection		Transistor Sink Output: No Transistor Source Output: Overcurrent is detected by current limit resistance. (*1)	
External Current Draw		100mA maximum, 24V DC (power voltage at the +V terminal, -V terminal at source)	
Connector	**Insertion Durability**	100 times minimum	
	Applicable Ferrule	1-wire: AI 0.5-8 WH (Phoenix Contact) 2-wire: AI-TWIN 2×0.5-8 WH (Phoenix Contact)	—

*1: This overcurrent signals consist of one signal per 4 point outputs. When microprocessor gets this overcurrent signal by interrupt input, microprocessor turns off 4pt outputs of this category at fixed time (approx. 1sec).
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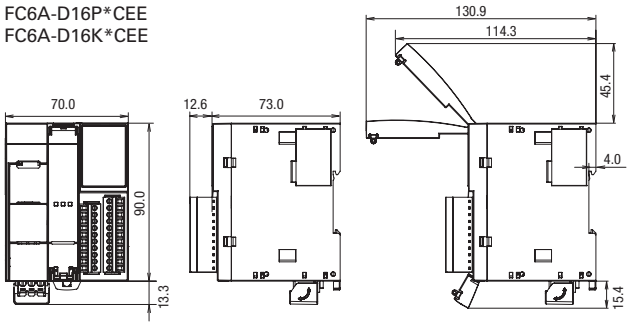
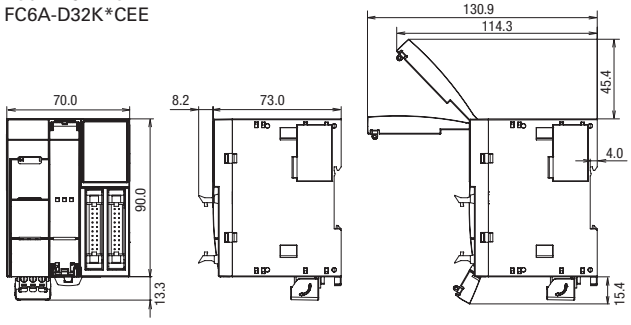
DIMENSIONS (MM)

FC6A-D16R*CEE
FC6A-D16P*CEE
FC6A-D16K*CEE



FC6A-D32P*CEE
FC6A-D32K*CEE



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