

- All-in-one type CPU modules are available with 16, 24, and 40 I/Os, universal AC voltage (100 to 240V AC), 24V DC and 12V DC.
- CPU modules compliant with CAN J1939 communication protocol used are available.
- Full line up of expansion modules: 17 digital I/O modules, 8 types of analog I/O module, 2 temperature control modules, 4 analog cartridges, 2 communication cartridges, and an HMI module.
- Maximum of 520 I/Os can be set up (using 40-I/O all-in-one type CPU module + expansion interface modules + 15 modules of 32-point digital I/O modules).
- Processing time of basic instruction is 42 ns.
- Refresh time of expansion I/O is 0.1ms for four digital I/O modules + one analog I/O module.
- Large 640KB (80,000 steps) max. program size makes it possible to configure more complicated programs.
- Built-in clock function.
- Transistor output model has four pulse outputs. All-in-one type CPU module has four pulse outputs (directional control: 100 kHz × 2 / 5 kHz × 2). CAN J1939 CPU module has four pulse outputs (directional control: 100 kHz × 4).
- CPU is equipped with USB port (mini-B: user program download/upload, monitor). User programs can be downloaded/uploaded from a USB port without supplying power to the CPU module.
- Analog cartridge or communication cartridge can be installed.
- SD card can be used as memory card for rewriting programs and managing data.
- All models are equipped with Ethernet port (RJ45) for easy maintenance and wide range of applications using Modbus communication.
- Removable connectors on all CPU modules and expansion I/O modules for easy wiring.



- Equipped with enhanced functions such as positioning control for multistage control, interruption, zero return, absolute position management to meet the needs of various applications.
- Temperature control is easy with PID monitor screen added to WindLDR and optimized auto tuning.
- Device value can be monitored and settings can be modified on HMI module, which has Ethernet port for web server and e-mail functions.
- WindLDR has status monitor function of CPU modules and expansion I/O modules. Errors or failure of each I/O module can be monitored remotely, and automated recognition of system configuration is available.
- Communication monitor and I/O monitor functions on WindLDR improves maintainability of communication function.



Some models are ANSI/ISA 12.12.01 approved for hazardous locations. All models are pending approval for Lloyd's Register (LR), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Det Norske Veritas (DNV), and NIPPON KAIJI KYOKAI (NK).

<https://hoplongtech.com>

MicroSmart

All-in-One FC6A CPU Modules

Package Quantity: 1

Type	High-speed Counter Pulse Output	Power	Input	Output	Interface	I/O Points	Part No.
All-in-One Type	•High-speed counter - Maximum input frequency: 100 kHz •Pulse output (*1) - Maximum output frequency: 100 kHz	100V to 240V (50/60Hz)	24V DC (Sink/Source)	Relay Output 2A, 240VAC-2A, 30V DC-2A	Port 1 (USB)	16 points (9/7)	FC6A-C16R1AE
		https://hoplong.com		Transistor Source Output 0.5A		24 points (14/10)	FC6A-C24R1AE
				Transistor Sink Output 0.5A	40 points (24/16)	FC6A-C40R1AE	
				Relay Output 2A, 240VAC-2A, 30V DC-2A	16 points (9/7)	FC6A-C16R1CE	
				Transistor Source Output 0.5A	16 points (9/7)	FC6A-C16P1CE	
				Transistor Sink Output 0.5A	16 points (9/7)	FC6A-C16K1CE	
				Port 2 (RS232C/RS485)	24 points (14/10)	FC6A-C24R1CE	
					24 points (14/10)	FC6A-C24P1CE	
					24 points (14/10)	FC6A-C24K1CE	
		Port 3 (Ethernet)		40 points (24/16)	FC6A-C40R1CE		
			40 points (24/16)	FC6A-C40P1CE			
			40 points (24/16)	FC6A-C40K1CE			
			40 points (24/16)	FC6A-C40R1DE			
			40 points (24/16)	FC6A-C40P1DE			
		12V DC	12V DC (Sink/Source)	Relay Output 2A, 240VAC-2A, 30V DC-2A		40 points (24/16)	FC6A-C40K1CE
Transistor Source Output 0.5A	40 points (24/16)			FC6A-C40P1DE			
Transistor Sink Output 0.5A	40 points (24/16)			FC6A-C40K1DE			

CAN J1939 All-in-One FC6A CPU Modules

Package Quantity: 1

Type	High-speed Counter Pulse Output	Power	Input	Output	Interface	I/O Points	Part No.
All-in-One Type	•High-speed counter Maximum input frequency: 100 kHz •Pulse output (*1) Maximum output frequency: 100 kHz	100V to 240V (50/60Hz)	24V DC (Sink/Source)	Relay Output 2A, 240VAC-2A, 30V DC-2A	Port 1 (USB)	40 points (24/16)	FC6A-C40R1AEJ
		24V DC		Relay Output 2A, 240VAC-2A, 30V DC-2A	Port 2 (CAN)	40 points (24/16)	FC6A-C40R1CEJ
				Transistor Source Output 0.5A		40 points (24/16)	FC6A-C40P1CEJ
			Transistor Sink Output 0.5A	40 points (24/16)		FC6A-C40K1CEJ	
			12V DC	Relay Output 2A, 240VAC-2A, 30V DC-2A		Port 3 (Ethernet)	40 points (24/16)
		Transistor Source Output 0.5A		40 points (24/16)	FC6A-C40P1DEJ		
		Transistor Sink Output 0.5A		40 points (24/16)	FC6A-C40K1DEJ		

*1: Transistor output model only

MICROSmart Micro Programmable Logic Controllers

Digital Input Modules

Package Quantity: 1

Input Points	Terminal	Part No.
8 points DC	Removable Terminal Block	FC6A-N08B1
16 points DC		FC6A-N16B1
16 points DC	MIL Connector	FC6A-N16B3
32 points DC		FC6A-N32B3
8 points AC	Removable Terminal Block	FC6A-N08A11

Digital Output Modules

Package Quantity: 1

Output	Terminal	Part No.
8 points Relay Output	Removable Terminal Block	FC6A-R081
16 points Relay Output		FC6A-R161
8 points Transistor Sink Output		FC6A-T08K1
8 points Transistor Source Output		FC6A-T08P1
16 points Transistor Sink Output		FC6A-T16K1
16 points Transistor Sink Output	MIL Connector	FC6A-T16K3
16 points Transistor Source Output	Removable Terminal Block	FC6A-T16P1
32 points Transistor Sink Output	MIL Connector	FC6A-T16P3
32 points Transistor Source Output		FC6A-T32K3
		FC6A-T32P3

Digital Mixed I/O Modules

Package Quantity: 1

Input	Output	I/O Points	Terminal	Part No.
24V DC (Sink/Source)	Relay Output	8 (4 in/4 out)	Removable Terminal Block	FC6A-M08BR1
	24V DC/30V DC, 2A	24 (16 in/8 out)		FC6A-M24BR1

Analog I/O Modules

Package Quantity: 1

Name	Input	Output	I/O Points	Terminal	Part No.
Analog Input Module	Voltage (0 to 10V, -10 to +10V) Current (0 to 20mA, 4 to 20mA)	—	2 inputs	Removable Terminal Block	FC6A-J2C1
	Voltage (0 to 10V, -10 to +10V) Current (0 to 20mA, 4 to 20mA)		4 inputs		FC6A-J4A1
	Voltage (0 to 10V, -10 to +10V) Current (0 to 20mA, 4 to 20mA)		8 inputs		FC6A-J8A1
	Voltage (0 to 10V, -10 to +10V) Current (0 to 20mA, 4 to 20mA) Thermocouple (J, K, R, S, B, T, N) Resistance Thermometer (Ni100, Ni1,000, PT100, PT1,000)		4 inputs		FC6A-J4CN1
	Thermocouple (J, K, R, S, B, T, N) NTC/PTC Thermistor		8 inputs		FC6A-J8CU1
	—		4 outputs		FC6A-K4A1
Analog Output Module	Voltage (0 to 10V, 10 to +10V) Current (0 to 20mA, 4 to 20mA)	Voltage (0 to 10V, -10 to +10V) Current (0 to 20mA, 4 to 20mA)	4 inputs/2 outputs	Removable Terminal Block	FC6A-L06A1
	Voltage (0 to 10V, 10 to +10V) Current (0 to 20mA, 4 to 20mA) Thermocouple Resistance Thermometer	Voltage (0 to 10V, -10 to +10V) Current (0 to 20mA, 4 to 20mA)	2 inputs/ 1 outputs		FC6A-L03CN1
Temperature Control	Voltage (0-1V, 0-5V, 1-5V, 0-10V) Current (0-20mA, 4-20mA) Thermocouple (K, J, R, S, B, E, T, N, PL-II, C) Resistance Thermometer (PT100, JPT100)	Relay	2 inputs 2 relay outputs	Removable Terminal Block	FC6A-F2MR1
	Voltage (0-1V, 0-5V, 1-5V, 0-10V) Current (0-20mA, 4-20mA) Thermocouple (K, J, R, S, B, E, T, N, PL-II, C) Resistance Thermometer (PT100, JPT100)	Voltage (12V) Current (4 to 20mA)	2 inputs/2 outputs		FC6A-F2M1

HMI Module

Package Quantity: 1

Name	Part No.
HMI Module	FC6A-PH1

Expansion Interface Module

Package Quantity: 1

Name	Part No.
Expansion Interface Module	FC6A-EXM2

Programming Software

Package Quantity: 1

Name	Part No.
Application Software Automation Organizer WindLDR V.8 or higher	SW1A-W1C

Communication Cartridges

Package Quantity: 1

Name	Part No.
RS232C Terminal Block	FC6A-PC1
RS485 Terminal Block	FC6A-PC3

Analog Cartridges

Package Quantity: 1

Name	I/O Points	Part No.
Analog Voltage/Current Input	2 inputs	FC6A-PJ2A
Analog Temperature Input		FC6A-PJ2CP
Analog Voltage Output	2 outputs	FC6A-PK2AV
Analog Current Output		FC6A-PK2AW

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Option

Name			Part No.	Package Quantity
All-in-One Type CPU Module Terminal Block Connector	5.08mm pitch, 8-pin, screw fastened type		FC6A-PMTA08PN02	2
	5.08mm pitch, 9-pin, screw fastened type		FC6A-PMTA09PN02	
	5.08mm pitch, 10-pin, screw fastened type		FC6A-PMTA10PN02	
	5.08mm pitch, 12-pin, screw fastened type		FC6A-PMTA12PN02	
	5.08mm pitch, 13-pin, screw fastened type		FC6A-PMTA13PN02	
CAN J1939 All-in-One Type CAN Communication Terminal Block Connector	5.08mm pitch, 5-pin, screw fastened type		FC6A-PMTE05PN02	
Expansion Interface Module Terminal Block Connector	5.08mm pitch, 11-pin, screw fastened type		FC6A-PMTB11PN02	
	5.08mm pitch, 11-pin, spring clamp type		FC6A-PMSB11PN02	
	3.81mm pitch, 10-pin, screw fastened type		FC6A-PMTC10PN02	
	3.81mm pitch, 11-pin, screw fastened type		FC6A-PMTC11PN02	
	3.81mm pitch, 17-pin, screw fastened type		FC6A-PMTC17PN02	
	3.81mm pitch, 10-pin, spring clamp type		FC6A-PMSC10PN02	
	3.81mm pitch, 11-pin, spring clamp type		FC6A-PMSC11PN02	
3.81mm pitch, 17-pin, spring clamp type		FC6A-PMSC17PN02		
MIL Connector for Expansion Module	20-pin		FC4A-PMC20PN02	
CPU Module Power Supply Terminal Block Connector	5.08mm pitch, 3-pin, screw fastened type		FC6A-PMTD03PN02	
Expansion Interface Module Power Supply Terminal Block Connector	5.08mm pitch, 3-pin, screw fastened type		FC6A-PMTB03PN02	
CPU Module Connector with Analog Input Cable, Connector: UL1977 compliant, Wire: UL758 style 1007 compliant			FC4A-PMAC2PN02	
CPU Module Battery Holder			FC6A-BH1PN02	
CPU Module Mounting Hook/HMI Module Mounting Hook			FC6A-PSP1PN05	
Expansion Module Mounting Hook/Expansion Interface Module Mounting Hook			FC6A-PSP2PN05	
35-mm-wide DIN Rail	Aluminium, 1m		BAA1000PN10	
	Steel, 1m		BAP1000PN10	
End Clip			BNL6PN10	
USB Maintenance Cable (2m long, USB-mini B)			HG9Z-XCM42	
USB-mini B Port Extension Cable (1m long, USB-mini B)			HG9Z-XCE21	
I/O Communication Cable	For connecting HG2G/3G to MicroSmart (5m), RJ45 connector, loose wire RJ45 connector: UL1863 compliant Wire: UL758 style 20276 compliant		FC6A-KC1C	
	For connecting HG2G/3G to MicroSmart (5m), RJ45 connector, D-sub 9-pin connector RJ45 connector: UL1863 compliant Wire: UL758 style 20276 compliant D-sub connector plastic: UL94-V0		FC6A-KC2C	
I/O Terminal Cable	20-pin	Shielded Wire: UL758 style 20266 compliant MIL connector plastic: UL94-V0	0.5m	FC9Z-H050A20
			1m	FC9Z-H100A20
			2m	FC9Z-H200A20
			3m	FC9Z-H300A20
		Non-shielded Wire: UL758 style 2651 compliant MIL connector plastic: UL94-V0	0.5m	FC9Z-H050B20
			1m	FC9Z-H100B20
			2m	FC9Z-H200B20
			3m	FC9Z-H300B20
User's Manual	All-in-One Type	Japanese	FC9Y-B1721	
		English	FC9Y-B1722	
		Simplified Chinese (PDF)	FC9Y-B1723	
	Ladder Programming	Japanese	FC9Y-B1725	
		English	FC9Y-B1726	
		Simplified Chinese (PDF)	FC9Y-B1727	
	All-in-One Type Communication	Japanese	FC9Y-B1729	
		English	FC9Y-B1730	
		Simplified Chinese (PDF)	FC9Y-B1731	
	PID Module	Japanese	FC9Y-B1733	
English		FC9Y-B1734		
Simplified Chinese (PDF)		FC9Y-B1735		

* MicroSmart User's manual and other manuals applicable to Automation Organizer can be downloaded from <http://www.idec.com/language>.

MICROSmart Micro Programmable Logic Controllers

Specifications (CPU Modules)

All-in-One Type

Part No.		FC6A-C16R1AE FC6A-C16R1CE FC6A-C16P1CE FC6A-C16K1CE	FC6A-C24R1AE FC6A-C24R1CE FC6A-C24P1CE FC6A-C24K1CE	FC6A-C40R1AE FC6A-C40R1CE FC6A-C40P1CE FC6A-C40K1CE FC6A-C40R1DE FC6A-C40P1DE FC6A-C40K1DE	FC6A-C40R1AEJ FC6A-C40R1CEJ FC6A-C40P1CEJ FC6A-C40K1CEJ FC6A-C40R1DEJ FC6A-C40P1DEJ FC6A-C40K1DEJ
Rated Power Voltage		AC: 100 to 240V AC, DC: 24V DC, 12V DC			
Allowable Voltage Range		AC: 85 to 264V AC 24V DC: 20.4 to 28.8V DC (including ripple), 12V DC: 10.2 to 18.0V			
Rated Frequency		AC: 50/60Hz (47 to 63 Hz)			
Maximum Power Consumption (CPU module)	AC	FC6A-C16R1AE: 100-240V AC, 33VA FC6A-C24R1AE: 100-240V AC, 35VA FC6A-C40R1AE: 100-240V AC, 41VA FC6A-C40R1AEJ: 100-240V AC, 37VA			
	DC	FC6A-C16R1CE: 24V DC 140mA, 3.36W FC6A-C24R1CE: 24V DC 155mA, 3.72W FC6A-C40R1CE: 24V DC 195mA, 4.68W FC6A-C16P1CE: 24V DC 190mA, 4.6W FC6A-C24P1CE: 24V DC 200mA, 4.8W FC6A-C40P1CE: 24V DC 205mA, 5.0W FC6A-C16K1CE: 24V DC 190mA, 4.6W FC6A-C24K1CE: 24V DC 200mA, 4.8W FC6A-C40K1CE: 24V DC 205mA, 5.0W FC6A-C40R1DE: 12V DC 345mA, 4.14W FC6A-C40P1DE: 12V DC 260mA, 3.12W FC6A-C40K1DE: 12V DC 260mA, 3.12W FC6A-C40R1CEJ: 24V DC 205mA, 5.0W FC6A-C40P1CEJ: 24V DC 175mA, 4.2W FC6A-C40K1CEJ: 24V DC 175mA, 4.2W FC6A-C40R1DEJ: 12V DC 340mA, 4.08W FC6A-C40P1DEJ: 12V DC 320mA, 3.9W FC6A-C40K1DEJ: 12V DC 320mA, 3.9W			
Allowable Momentary Power Interruption		10 ms (at rated voltage)			
Dielectric Strength		Between power and ground terminals: 1,500V AC, 1 minute Between I/O and ground terminals: 1,500V AC, 1 minute			
Insulation Resistance		Between power and ground terminals: 100 MΩ minimum (500V DC megger) Between I/O and ground terminals: 100 MΩ minimum (500V DC megger)			
Noise Resistance		AC or DC power terminal: 1.5kV (DC type: 1kV), 50 ns to 1 μs I/O terminals (coupling clamp): 1.5kV, 50ns to 1μs coupling adapter			
Inrush Current		AC: 40A maximum 24V DC: 35A maximum 12V DC: 35A maximum			
Power Supply Wire		AWG22, AWG18			
Operating Temperature		-10 to +55°C (no freezing)			
Storage Temperature		-25 to +70°C (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			
Degree of Protection		IP20 (IEC 60529)			
Ground		D-type ground (Class 3 ground)			
Grounding Wire		AWG16			
Vibration Resistance		5 to 8.4 Hz amplitude 3.5 mm, 8.4 to 150 Hz acceleration 9.8 m/s ² (1G), 2 hours per axis on each of three mutually perpendicular axes (IEC 61131-2)			
Shock Resistance		147 m/s ² (15G), 11 ms duration, 3 shocks per axis on three mutually perpendicular axes			
Mounting		DIN rail or panel mounting			
Weight		AC: 350g DC: 340g	AC: 420g DC: 400g	AC: 560g DC (relay): 530g DC (transistor): 480g	AC: 560g DC (relay/24V DC): 530g DC (relay/12V DC): 560g DC (transistor/24V DC): 480g DC (transistor/12V DC): 530g

MICROSmart Micro Programmable Logic Controllers

All-in-One Type Function Specifications

Part No.		FC6A-C16R1AE FC6A-C16R1CE FC6A-C16P1CE (*5) FC6A-C16K1CE (*5)	FC6A-C24R1AE FC6A-C24R1CE FC6A-C24P1CE (*5) FC6A-C24K1CE (*5)	FC6A-C40R1AE FC6A-C40R1CE FC6A-C40P1CE (*5) FC6A-C40K1CE (*5) FC6A-C40R1DE FC6A-C40P1DE (*5) FC6A-C40K1DE (*5)	FC6A-C40R1AEJ FC6A-C40R1CEJ FC6A-C40P1CEJ (*5) FC6A-C40K1CEJ (*5) FC6A-C40R1DEJ FC6A-C40P1DEJ (*5) FC6A-C40K1DEJ (*5)
Control System		Stored program system			
Instruction Words	Basic	42			
	Advanced	124			
Program Capacity (*1)		384KB (48,000 steps)/72KB (9,000 steps) (*2)			640KB (80,000) 72KB (9,000 steps) (*2)
User Program Storage		Serial Flash Memory (100,000 times rewritable)			
Processing Time	Basic Instruction	42μs/1,000 steps			
	END Processing (*3)	1ms maximum			
I/O Points	Input	9 points	14 points	24 points	
	Output	7 points	10 points	16 points	
Expandable Modules		4 modules	7 modules		
Expandable I/O Points with Expansion Modules		128 points	224 points		
Expandable Modules with Expansion Interface Modules		8 modules			
Expandable I/O Points with Expansion Interface Modules		256 points			
Internal Relay		12,400 points			
Special Internal Relay		256 points			
Shift Register		256 points			
Data Register		54,000 points			
Special Data Register		500 points			
Counter		512 points			
Timer (1ms, 10ms, 100ms,1s)		1,024 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 (EEPROM), 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 link connection check, I/O bus initialization check			
Input Filter		0 ms (without filter), 3 to 15ms (selectable in increments of 1ms)			
Catch Input/Interrupt Input		Six inputs I0, I1, I6, I7 Minimum turn on pulse width: 5μs max. Minimum turn off pulse width: 5μs max. I3, I4 Minimum turn on pulse width: 35μs max. Minimum turn off pulse width: 35μs max.			
High-speed Counter	Maximum Counting Frequency and High-speed Counter Points	Total 6 points Single/two-phase selectable: 100 kHz (single-phase: 4 points, two-phase: 2 points) Single-phase: 5 kHz (2 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. 1,000 steps (10 bits)			—
					—
Pulse Output (transistor output model only)	Quantity	4 points			
	Maximum Output Pulse Frequency	Q0, Q1: 100 kHz Q2, Q3: 5 kHz			Q0, Q2, Q4, Q6: 100 kHz
	Reversible Control	Single-pulse output mode: 2 axis (Q0-Q3) Dual-pulse output mode: 1 axis (Q0-Q1)			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 (increments of 1 Hz) : 4 points (Q0-Q3) *Q0, Q1: Adjust 5μs minimum as ON time and 15μs minimum as OFF time. *Q2, Q3: Adjust 100μs minimum as ON/OFF time.			Dual cycle: 0.1 to 100.0% (increments of 0.1%) Output pulse frequency: 15 to 5,000 (increments of 1 Hz) : 4 points (Q0, Q2, Q4, Q6) * Adjust 5μs minimum as ON time and 15μs minimum as OFF time.
External Power Supply for Sensor (AC only)	Output Voltage/Current	24V (+10%, -15%) / 250mA			
	Overload Detection	Not possible			
	Isolation from the internal circuit	Transformer-isolated			
USB Port		USB mini-B (maintenance communication)			
Serial Port 1, CAN Port		RS232C or RS485 (*4)			CAN J1939
Ethernet Port 1		Ethernet (maintenance communication, user communication, Modbus TCP server/client)			
SD Card Slot		Embedded			
Cartridge (option)		One cartridge can be added		Two cartridges can be added	
HMI Module (option)		Yes	Yes	Yes	Yes

Note: The maximum number of relay outputs that can be turned on simultaneously is limited.

*1: 1 step equals 8 bytes.

*2: When 72KB is selected, download function can be used during RUN.

*3: Not including expansion I/O service time, counter timer processing time, data link processing time, and interrupt processing time.

*4: Maintenance communication, user communication, data link, Modbus RTU master/slave communication.

*5: Transistor output model

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USB Port Specifications

Part No.	FC6A-C16R1AE FC6A-C16R1CE FC6A-C16P1CE FC6A-C16K1CE	FC6A-C24R1AE FC6A-C24R1CE FC6A-C24P1CE FC6A-C24K1CE	FC6A-C40R1AE FC6A-C40R1CE FC6A-C40P1CE FC6A-C40K1CE FC6A-C40R1DE FC6A-C40P1DE FC6A-C40K1DE	FC6A-C40R1AEJ FC6A-C40R1CEJ FC6A-C40P1CEJ FC6A-C40K1CEJ FC6A-C40R1DEJ FC6A-C40P1DEJ FC6A-C40K1DEJ
USB Type	USB mini-B			
USB Standard	USB 2.0 full speed			
Isolation	Not isolated from the internal circuit			
Communication Function	Maintenance communication to PC			

Serial Port 1, CAN Port Specifications

Part No.	FC6A-C16R1AE FC6A-C16R1CE FC6A-C16P1CE FC6A-C16K1CE	FC6A-C24R1AE FC6A-C24R1CE FC6A-C24P1CE FC6A-C24K1CE	FC6A-C40R1AE FC6A-C40R1CE FC6A-C40P1CE FC6A-C40K1CE FC6A-C40R1DE FC6A-C40P1DE FC6A-C40K1DE	FC6A-C40R1AEJ FC6A-C40R1CEJ FC6A-C40P1CEJ FC6A-C40K1CEJ FC6A-C40R1DEJ FC6A-C40P1DEJ FC6A-C40K1DEJ
Port Type	Serial port 1			CAN port
Communication Type	RS232C or RS485 selectable			CAN
Connector	RJ45			Terminal Block (5-pole)
Cable	CAT. 5STP			SAE J1939-11/SAE J1939-15
Maximum Baud Rate	115,200 bps			SAE J1939-11: 250 kbps:
Maximum Cable Length	RS232C: 5m, RS485: 200m			40m, stubs, 1m maximum
Isolation	Not isolated from the internal circuit			SAE J1939-15: 250 kbps:
Communication Function	Maintenance communication, user communication, Modbus RTU (master/slave)			40m, stubs, 3m maximum
				Isolated from the internal circuit
				J1939

Ethernet Port 1 Specifications

Part No.	FC6A-C16R1AE FC6A-C16R1CE FC6A-C16P1CE FC6A-C16K1CE	FC6A-C24R1AE FC6A-C24R1CE FC6A-C24P1CE FC6A-C24K1CE	FC6A-C40R1AE FC6A-C40R1CE FC6A-C40P1CE FC6A-C40K1CE FC6A-C40R1DE FC6A-C40P1DE FC6A-C40K1DE	FC6A-C40R1AEJ FC6A-C40R1CEJ FC6A-C40P1CEJ FC6A-C40K1CEJ FC6A-C40R1DEJ FC6A-C40P1DEJ FC6A-C40K1DEJ
Communication Type	IEEE802.3 compliant			
Data Transfer	10BASE-T, 100BASE-TX			
Connector	RJ45			
Cable	CAT.5STP			
Maximum Cable Length	100m			
Isolation	Pulse trans isolation			
Communication Function	Maintenance communication server, user communication server, Modbus TCP (server/client), PING, SNMP			

CAN J1939 Specifications

Part No.	FC6A-C40P1CEJ FC6A-C40K1CEJ FC6A-C40P1DEJ FC6A-C40K1DEJ	FC6A-C40R1AEJ FC6A-C40R1CEJ FC6A-C40R1DEJ
Supported SAE J1939	SAE J1939-11: Physical Layer, 250K bits/s, Twisted Shielded Pair SAE J1939-15: Reduced Physical Layer, 250K bits/s, Unshielded Twisted Pair SAE J1939-21: Data Link Layer SAE J1939-71: Vehicle Application Layer SAE J1939-73: Application Layer - Diagnostics SAE J1939-75: Application Layer - Generator Sets and Industrial SAE J1939-81: Network Management	
Transmit/Receive Message	Maximum No. of Send Message	100
	Maximum No. of Receive Message	200
	Transmittable PGN	Optional
	Maximum Length of Transmit/Receive Message	1 to 252 bytes/message
Transmission Function	Transmission Type	Event transmission/periodical transmission
	Event Transmission	Transmission Method
	Cycle Transmission	Transmission Method
		Transmission Cycle (*1)
Receive Function	Receive Method	Polling reception (*2)
	Receive Cycle Monitor	0, 10 to 655,350 ms (disabled at 0)
Request Function	Yes	
Network Management Function	Static address/dynamic address management	
	NAME	Optional (automatic switching of static address /dynamic address management at highest-order bit)
	Number of Nodes Manageable	128 nodes
PGNs used Internally	00EA00h: Request PGN	
	00E800h: Acknowledgement	
	00EB00h: TP.DT	
	00EC00h: TP.CM	
	00EE00h: Address claim	

*1: Message is transmitted in END processing. Actual transmission cycle is affected by the ladder execution cycle.

*2: Receive message is transferred from internal buffer to data register in END processing.

MICROSmart Micro Programmable Logic Controllers

All-in-One Type Input Specifications

Part No.	FC6A-C16R1AE FC6A-C16R1CE FC6A-C16P1CE FC6A-C16K1CE	FC6A-C24R1AE FC6A-C24R1CE FC6A-C24P1CE FC6A-C24K1CE	FC6A-C40R1AE FC6A-C40R1CE FC6A-C40P1CE FC6A-C40K1CE FC6A-C40R1DE FC6A-C40P1DE FC6A-C40K1DE	FC6A-C40R1AEJ FC6A-C40R1CEJ FC6A-C40P1CEJ FC6A-C40K1CEJ FC6A-C40R1DEJ FC6A-C40P1DEJ FC6A-C40K1DEJ
Input Points	9 (9/1 common)	14 (14/1 common)	24 (24/1 common)	
Rated Input Voltage	AC, 24V DC: 24V DC sink/source input signal 12V DC: 12V DC sink/source input signal			
Input Voltage Range	AC, 24V DC: 0 to 28.8V DC 12V DC: 0 to 18.0V DC			
Rated Input Current	AC, 24V DC: high speed input port 5mA/pt, middle/normal speed input port 7mA/pt 12V DC: high speed input port 5mA/pt, middle/normal speed input port 6mA/pt			
Input Impedance	AC, 24V DC: high speed input port 4.9kΩ, middle/normal speed input port: 3.4kΩ 12V DC: high speed input port 1.8kΩ, middle/normal speed input port: 2.0kΩ			
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: 5us + filter value Middle speed input port: 35us + filter value Normal speed input port: 100us + filter value			
Isolation	Between input terminals: Not isolated Internal circuit: Photocoupler-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 2x0.5-8 WH (Phoenix Contact)		

Transistor Output Specifications

Part No.		FC6A-C16P1CE FC6A-C16K1CE	FC6A-C24P1CE FC6A-C24K1CE	FC6A-C40P1CE FC6A-C40K1CE FC6A-C40P1DE FC6A-C40K1DE	FC6A-C40P1CEJ FC6A-C40K1CEJ FC6A-C40P1DEJ FC6A-C40K1DEJ
Transistor Output Points		7 (7/1 common)		10 (10/1 common)	
Output Type	Transistor Sink	FC6A-C16K1CE/FC6A-C24K1CE/FC6A-C40K1CE/FC6A-C40K1DE/FC6A-C40K1CEJ/FC6A-C40K1DEJ			
	Transistor Source	FC6A-C16P1CE/FC6A-C24P1CE/FC6A-C40P1CE/FC6A-C40P1DE/FC6A-C40P1CEJ/FC6A-C40P1DEJ			
Rated Load Voltage		24V DC: 24V DC 12V DC: 12V DC			
Voltage Tolerance		24V DC: 19.2 to 28.8V DC 12V DC: 10.2 to 18.0V DC			24V DC: 19.2 to 28.8V DC 12V DC: 10.2 to 16.0V DC
Rated Load Current	Per Point	0.5A			
	Per Common	3.5A	5A	4A	
Voltage Drop (ON Voltage)		1V max (voltage between COM and output terminal when output is on.)			
Inrush Current		1A			
Leakage Current		0.1mA maximum			
Clamping Voltage		24V DC: 39V ±1V 12V DC: 27V ±1V			
Maximum Lamp Load		12W			
Inductive Load		24V DC: L/R=10ms (28.8V DC, 1Hz) 12V DC: FC6A-C40P1DE/FC6A-C40K1DE, L/R=10ms (18.0V DC 1Hz), FC6A-C40P1DEJ/FC6A-C40K1DEJ, L/R=10ms (16.0V DC, 1Hz)			
Overcurrent Protection		Transistor Sink Output: No Transistor Source Output: Overcurrent is detected by current limit resistance. (*1)			
External Current Draw		24V DC: 100mA maximum, 24V DC (power voltage at the +V terminal, -V terminal at source) 12V DC: 100mA maximum, 12V DC (power voltage at the +V terminal, -V terminal at source)			
Isolation		Between output terminal and Internal circuit: Photocoupler-isolated Between output terminals: Not isolated			
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)			
Output Delay	Turn ON Time	High speed input port: 5μs Middle speed input port: 30μs Normal speed input port: 300μs			High speed input port: 5μs Normal speed input port: 300μs
	Turn OFF Time	High speed input port: 5μs Middle speed input port: 30μs Normal speed input port: 300μs			High speed input port: 5μs Normal speed input port: 300μs

*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).

Relay Output Specifications

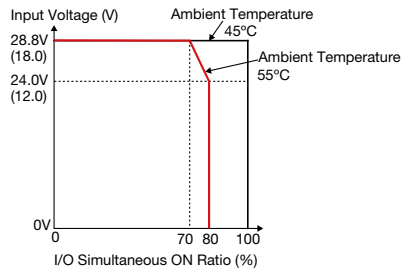
Part No.		FC6A-C16R1AE FC6A-C16R1CE	FC6A-C24R1AE FC6A-C24R1CE	FC6A-C40R1AE FC6A-C40R1CE FC6A-C40R1DE	FC6A-C40R1AEJ FC6A-C40R1CEJ FC6A-C40R1DEJ
Relay Output Points		7	10	16	
Output Points per Common Line	COM1	4	4	4	
	COM2	3	4	4	
	COM3	—	2	4	
	COM4	—	—	4	
Output Type		1NO			
Maximum Load Current	Per Point	2A			
	Per Common	COM1: 7A COM2: 6A	COM1: 7A COM2: 7A COM3: 4A	COM1: 7A COM2: 7A COM3: 7A COM4: 7A	
Minimum Switching Load		1mA/5V DC (reference value)			
Initial Contact Resistance		30 mΩ maximum			
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 φ = 0.4), 30V DC 2A (L/R =7 ms)			
Dielectric Strength		Between output and ground terminals: 1,500V AC, 1 minute Between output terminal and internal circuit: 1,500V AC, 1 minute Between output terminals (COMs): 1,500V AC, 1 minute			
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)			

<https://hoplongtech.com>

Temperature derating curves: Input voltage vs. I/O Simultaneous ON Ratio (%)

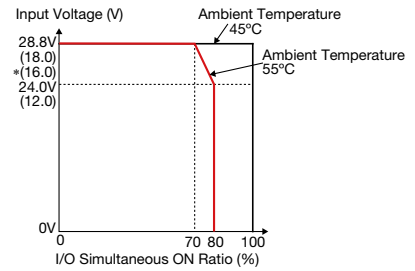
Input (with cartridge)

FC6A-C16K1CE
FC6A-C24K1CE
FC6A-C40K1CE
FC6A-C40K1DE
FC6A-C40K1CEJ
FC6A-C40K1DEJ



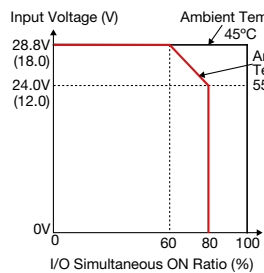
Output (with cartridge)

FC6A-C16K1CE
FC6A-C24K1CE
FC6A-C40K1CE
FC6A-C40K1DE
FC6A-C40K1CEJ
FC6A-C40K1DEJ



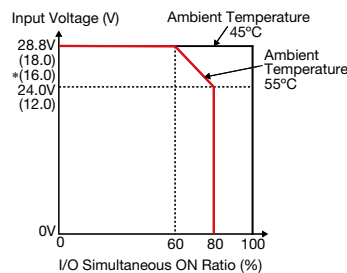
Input (w/o cartridge)

FC6A-C24P1CE
FC6A-C40P1CE
FC6A-C40P1DE
FC6A-C40P1CEJ
FC6A-C40P1DEJ



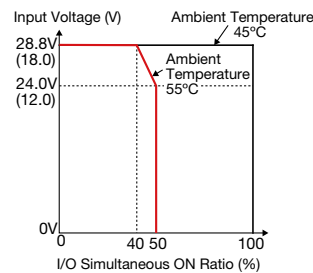
Output (w/o cartridge)

FC6A-C24P1CE
FC6A-C40P1CE
FC6A-C40P1DE
FC6A-C40P1CEJ
FC6A-C40P1DEJ



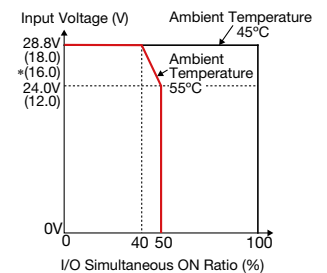
Input (with cartridge)

FC6A-C24P1CE
FC6A-C40P1CE
FC6A-C40P1DE
FC6A-C40P1CEJ
FC6A-C40P1DEJ



Output (with cartridge)

FC6A-C24P1CE
FC6A-C40P1CE
FC6A-C40P1DE
FC6A-C40P1CEJ
FC6A-C40P1DEJ



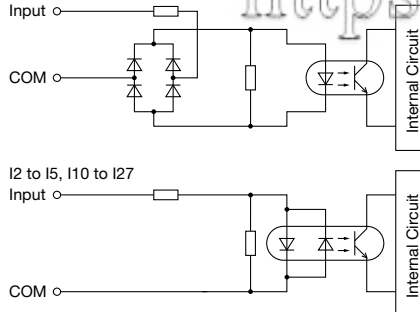
Notes

- Values in () are for 12V DC model.
- Values shown in * () are for CAN J1939 all-in-one model.

Input Internal Circuit

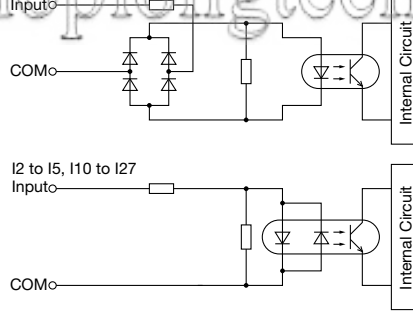
100V to 240V AC, 24V DC

I0, I1, I6, I7



12V DC

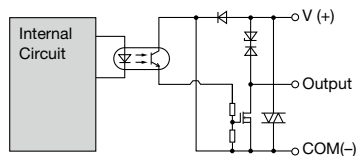
I0, I1, I6, I7



Output Internal Circuit

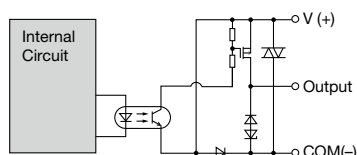
100 to 240V AC, 24V DC

Transistor Sink Output



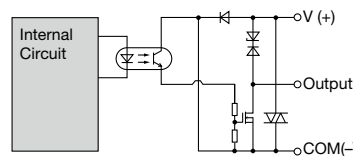
100 to 240V AC, 24V DC

Transistor Source Output



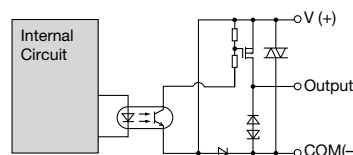
12V DC

Transistor Sink Output



12V DC

Transistor Source Output



MICROSmart Micro Programmable Logic Controllers

Specifications (I/O Modules)

Input Module Specifications

Part No.		FC6A-N08B1	FC6A-N16B1	FC6A-N16B3	FC6A-N32B3	FC6A-N08A11
Input Points		8 (8/1 common)	16 (16/1 common)		32 (16/1 common)	8 (4/1 common)
Rated Input Voltage		24V DC sink/source input signal				100 to 120V AC
Input Voltage Range		0 to 28.8V DC				0 to 132V AC (50/60 Hz)
Rated Input Current		7 mA/point (24V DC)		5 mA/point (24V DC)		17 mA/point (120V AC, 60 Hz)
Input Impedance		3.4 kΩ		4.4 kΩ		0.8 kΩ (60 Hz)
OFF Voltage		5V maximum				20V maximum
ON Voltage		15V minimum				79V minimum
OFF Current		1.2 mA maximum		0.9 mA maximum		—
ON Current		4.2 mA minimum (at 15V DC)		3.2 mA minimum (at 15V DC)		
Input Delay Time (24V DC)		Turn ON: 4.1ms, Turn OFF: 4.1ms				Turn ON: 25ms, Turn OFF: 30ms
Isolation		Between input terminals: Not isolated Internal circuit: Photocoupler-isolated				Between input terminals in the same common: Not isolated Between input terminals in different commons: Isolated Between input terminals and internal circuits: Photocoupler-isolated
External Load for I/O Interconnection		Not needed				
Signal Determination Method		Static				
Effect of Improper Input Connection		Both sink and source input signals can be connected. If any input exceeding the rated value is applied, permanent damage may be caused.				If any input exceeding the rated value is applied, permanent damage may be caused.
Cable Length		3m in compliance with electromagnetic immunity				—
Connector Insertion/Removal Durability		100 times minimum				
Applicable Ferrule		1-wire: AI 0.5-8 WH (Phoenix Contact) 2-wire: AI-TWIN 2x0.5-10 (Phoenix Contact)		—		
Internal Current Draw	All Inputs ON	30mA (5V DC) 0mA (24V DC)	40mA (5V DC) 0mA (24V DC)	40mA (5V DC) 0mA (24V DC)	65mA (5V DC) 0mA (24V DC)	40mA (5V DC) 0mA (24V DC)
	All Inputs OFF	17mA (5V DC) 0mA (24V DC)	17mA (5V DC) 0mA (24V DC)	17mA (5V DC) 0mA (24V DC)	17mA (5V DC) 0mA (24V DC)	17mA (5V DC) 0mA (24V DC)
Internal Power Consumption (at 24V DC while all inputs ON)		0.20W	0.27W	0.27W	0.44W	0.27W
Weight (approx.)		110g	105g	75g	110g	110g

Relay Output Module Specifications

Part No.	FC6A-R081	FC6A-R161
Output Points	8 (4/1 common)	16 (8/1 common)
Output Type	1NO	
Maximum Load Current	2A per point	8A per common
Minimum Switching Load	1 mA/ 5V DC (reference value)	
Initial Contact Resistance	30 m Ω maximum	
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 ϕ = 0.4) 30V DC 2A (L/R = 7 ms)	
Dielectric Strength	Between output and ground terminals: 1,500V AC, 1 minute Between output terminal and internal circuit: 1,500V AC, 1 minute Between output terminals (COMs): 1,500V AC, 1 minute	
Connector Insertion/Removal Durability	100 times minimum	
Applicable Ferrule	1-wire: AI 0.5-10 (Phoenix Contact) 2-wire: AI-TWIN 2x0.5-10 (Phoenix Contact)	
Internal Current Draw	All outputs ON	35mA (5V DC) 50mA (24V DC)
	All outputs OFF	17mA (5V DC) 0mA (24V DC)
Internal Power Consumption (at 24V DC while all outputs ON)	1.44W	2.74W
Weight (approx.)	130g	140g

Transistor Output Module Specifications

Part No.		FC6A-T08K1 FC6A-T08P1	FC6A-T16K1 FC6A-T16P1	FC6A-T16K3 FC6A-T16P3	FC6A-T32K3 FC6A-T32P3
Output Points		8 (8/1 common) 16 (16/1 common)			32 (16/1 common)
Output Type		FC6A-T□K□: Transistor sink output FC6A-T□P□: Transistor source output			
Rated Load Voltage		24V DC			
Operating Load Voltage Range		19.2 to 28.8V DC			
Maximum Load Current		0.5A per point		0.1A per point	
		3A per common		1A per common	
Voltage Drop (ON Voltage)		1V maximum (voltage between COM and output terminals when output is on)			
Inrush Current		1A maximum			
Leakage Current		0.1mA maximum			
Clamping Voltage		Approx. 50V			
Maximum Lamp Load		12W		2.4W	
Inductive Load		L/R = 10ms (28.8V DC 1Hz)			
External Current Draw		FC6A-T□K□: 100 mA maximum, 24V DC (power voltage at the +V terminal) FC6A-T□P□: 100 mA maximum, 24V DC (power voltage at the -V terminal)			
Overcurrent Protection		Transistor Sink Output: No Transistor Source Output: Yes			
Isolation		Between output terminal and internal circuit: Photocoupler-isolated Between output terminals: Not isolated			
Connector Insertion/ Removal Durability		100 times minimum			
Applicable Ferrule		1-wire: AI 0.5-10 (Phoenix Contact) 2-wire: AI-TWIN 2x0.5-10 (Phoenix Contact)			
Internal Current Draw	All outputs ON	25mA (5V DC) 15mA (24V DC)	30mA (5V DC) 25mA (24V DC)	45mA (5V DC) 50mA (24V DC)	
	All outputs OFF	17mA (5V DC) 0mA (24V DC)	17mA (5V DC) 0mA (24V DC)	17mA (5V DC) 0mA (24V DC)	17mA (5V DC) 0mA (24V DC)
Internal Power Consumption (at 24V DC while all outputs ON)		0.53W	0.80W		1.50W
Output Delay	Turn ON Time	400 μs maximum			
	Turn OFF Time	450 μs maximum			
Weight (approx)		110g	105g	75g	115g

MICROSmart Micro Programmable Logic Controllers

Mixed I/O Module Specifications

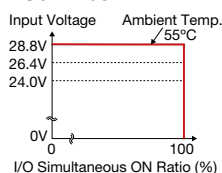
Part No.		FC6A-M08BR1	FC6A-M24BR1
Input Specification	Input Points	4 (4/1 common)	16 (16/1 common)
	Rated Input Voltage	24V DC sink/source input signal	
	Input Voltage Range	0 to 28.8V DC	
	Rated Input Current	7 mA/point (24V DC)	
	Input Impedance	3.4 kΩ	
	OFF Voltage	5V maximum	
	ON Voltage	15V minimum	
	OFF Current	1.2 mA maximum	
	ON Current	4.2 mA minimum (at 15V DC)	
	Input Delay Time (24V DC)	Turn ON Time: 4.1ms, Turn OFF Time: 4.1ms	
	Isolation	Between input terminals: Not isolated Internal circuit: Photocoupler-isolated	
	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. If any input exceeding the rated value is applied, permanent damage may be caused.	
Output Specification	Cable Length	3m in compliance with electromagnetic immunity	
	Output Points	4 (4/1 common)	8 (4/1 common)
	Output Type	1NO	
	Maximum Load Current	2A per point 7A per common	
	Minimum Switching Load	1 mA/ 5V DC (reference value)	
	Initial Contact Resistance	30 mΩ maximum	
	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 φ = 0.4), 30V DC 2A (L/R = 7 ms)	
	Dielectric Strength	Between output and ground terminals: 1,500V AC, 1 minute Between output terminal and internal circuit: 1,500V AC, 1 minute Between output terminals (COMs): 1,500V AC, 1 minute	
	Connector Insertion/Removal Durability	100 times minimum	
	Applicable Ferrule	1-wire: AI 0.5-10 (Phoenix Contact), 2-wire: AI-TWIN 2×0.5-10 (Phoenix Contact)	
	Internal Current Draw	All I/Os ON: 30mA (5V DC), 25mA (24V DC) All I/Os OFF: 1.7mA (5V DC), 0mA (24V DC)	55mA (5V DC), 25mA (24V DC) 17mA (5V DC), 0mA (24V DC)
	Internal Power Consumption (at 24V DC while all I/Os are ON)	0.80W	0.97W
	Weight (approx.)	120g	165g

Temperature derating curves:

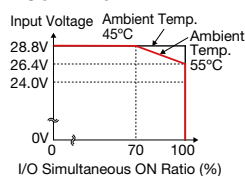
Input voltage vs.

I/O Simultaneous ON Ratio (%)

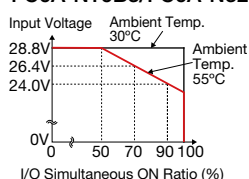
FC6A-N08B1



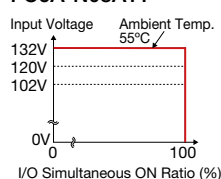
FC6A-N16B1



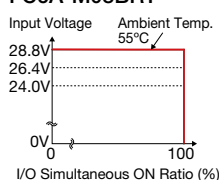
FC6A-N16B3/FC6A-N32B3



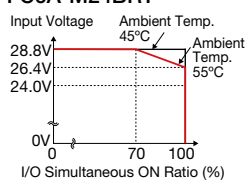
FC6A-N08A11



FC6A-M08BR1

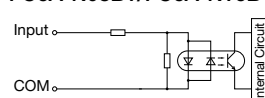


FC6A-M24BR1

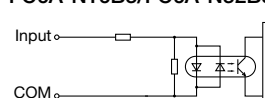


Input Internal Circuit

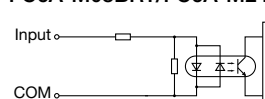
FC6A-N08B1/FC6A-N16B1



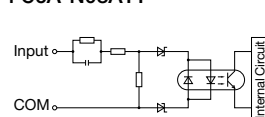
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FC6A-M08BR1/FC6A-M24BR1

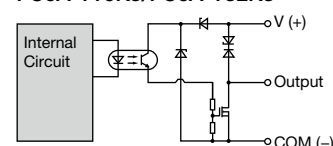


FC6A-N08A11

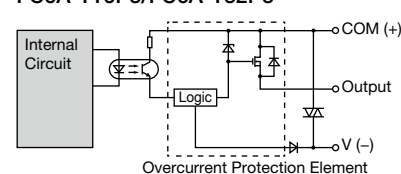


Output Internal Circuit

FC6A-T08K1/FC6A-T16K1 FC6A-T16K3/FC6A-T32K3



FC6A-T08P1/FC6A-T16P1 FC6A-T16P3/FC6A-T32P3



Specifications (Analog I/O Modules)

Analog I/O Module Specifications

Part No.	FC6A-J2C1	FC6A-J4A1	FC6A-J8A1	FC6A-L06A1	FC6A-L03CN1	FC6A-J4CN1	FC6A-J8CU1	FC6A-K4A1
Input Points	2	4	8	4	2	4	8	–
Input Signal Type	Voltage (0 to 10V) Voltage (–10 to +10V) Current (0 to 20mA) Current (4 to 20mA)	Voltage (0 to 10V) Voltage (–10 to +10V) Current (0 to 20mA) Current (4 to 20mA)	Voltage (0 to 10V) Voltage (–10 to +10V) Current (0 to 20mA) Current (4 to 20mA)	Voltage (0 to 10V) Voltage (–10 to +10V) Current (0 to 20mA) Current (4 to 20mA)	Voltage (0 to 10V) Voltage (–10 to +10V) Current (0 to 20mA) Current (4 to 20mA) Thermocouple Resistance Thermometer	Voltage (0 to 10V) Voltage (–10 to +10V) Current (0 to 20mA) Current (4 to 20mA) Thermocouple Resistance Thermometer	Thermocouple Thermistor (NTC, PTC)	–
Output Points	–	–	–	2	1	–	–	4
Output Signal Style	–	–	–	Voltage (0 to 10V) Voltage (–10 to +10V) Current (0 to 20mA) Current (4 to 20mA)	Voltage (0 to 10V) Voltage (–10 to +10V) Current (0 to 20mA) Current (4 to 20mA)	–	–	Voltage (0 to 10V) Voltage (–10 to +10V) Current (0 to 20mA) Current (4 to 20mA)
External Power Supply	Rated Power Voltage 24V DC, Allowable Voltage Range 20.4 to 28.8V DC							
External Current Draw (24V DC) (*1)	25mA	30mA	40mA	100mA	80mA	40mA	30mA	125mA
Connector Insertion/ Removal Durability	100 times minimum							
Applicable Ferrule	1-wire: AI 0.5-10 (Phoenix Contact), 2-wire: AI-TWIN 2×0.5-10 (Phoenix Contact)							
Internal Power Consumption (5V DC)	40mA max.	45mA max.	40mA max.	55mA max.	55mA max.	50mA max.	45mA max.	50mA max.
Internal Power Consumption (at 24V DC while all I/Os are ON)	0.27W	0.30W	0.27W	0.37W	0.37W	0.34W	0.30W	0.34W
Weight (approx.)	115g	110g	110g	110g	115g	110g	110g	115g

*1: The external current draw is the value when all the analog inputs are used and the analog output value is at 100%.

Analog Input Specifications (1)

Part No.		FC6A-J2C1		FC6A-J4A1/FC6A-J8A1/FC6A-L06A1	
Input Signal Type		Voltage Input	Current Input	Voltage Input	Current Input
Input Range		0 to 10V -10 to +10V	0 to 20mA 4 to 20mA	0 to 10V -10 to +10V	0 to 20mA 4 to 20mA
Input Impedance		1MΩ maximum	50Ω maximum	1MΩ maximum	50Ω maximum
Input Detection Current		-	-	-	-
AD Conversion	Sampling Duration Time	1ms		1ms or 10ms (selectable with application software)	
	Sampling Repetition Time	Sampling time × valid input channels			
	Total Input System Transfer Time	Sampling time + sampling interval + 1 scan time			
	Type of Input	Single-ended input			
	Operating Mode	Self-scan			
	Conversion Method	Σ Δ type ADC			
Input Error	Maximum Error at 25°C	±0.1% of full scale		±0.2% of full scale	
	Cold Junction Compensation Error	-	-	-	-
	Temperature Coefficient	±0.006% of full scale/°C		±0.01% of full scale/°C	
Data	Digital Resolution	65,536 increments (16 bits)		4,096 increments (12 bits)	
	Input per Resolution	0 to 10V: 0.15mV -10 to +10V: 0.30mV	0 to 20mA: 0.30μA 4 to 20mA: 0.244μA	0 to 10V: 2.44mV -10 to +10V: 4.88mV	0 to 20mA: 4.88μA 4 to 20mA: 3.91μA
	Data Type in Application Program	Optional: -32,768 to 32,767 (selectable for each channel) (*1)			
	Monotonicity	Yes			
	Input Data Out of Range	Detectable (*2)			
Noise Resistance	Input Filter	Soft filter (0 to 10 s, selectable in increments of 0.1 s)			
	Recommended Cable for Noise Immunity	Pair shielded cable			
	Crosstalk	1LSB maximum			
Isolation		Between input and power circuit: Transformer-isolated Between input and internal circuit: Photocoupler-isolated			
Effect of Improper Input Connection		No damage			
Maximum Permanent Allowed Overload (No Damage)		13V DC	40mA	13V DC	40mA
Selection of Analog Input Signal Type		Using programming software			
Calibration or Verification to Maintain Rated Accuracy		Not possible			

*1: The data processed in the analog I/O module can be linear-converted to a value between –32,768 and 32,767. The optional range designation, and analog I/O data minimum and maximum values can be selected using data registers allocated to analog I/O modules.

*2: When an error is detected, a corresponding error code is stored to a data register allocated to analog I/O operating status.

Analog Input Specifications (2)

Part No.		FC6A-L03CN1/FC6A-J4CN1				FC6A-J8CU1		
Input Signal Type		Voltage Input	Current Input	Resistance Thermometer	Thermocouple	Thermocouple	NTC Thermistor	PTC Thermistor
Input Range		0 to 10V DC -10 to +10V	0 to 20mA 4 to 20mA	Pt100, Pt1000 3-wire type (-200 to 850°C) Ni100, Ni1000 3-wire type (-60 to 180°C)	Type K (-200 to +1,300°C) Type J (-200 to +1,000°C) Type R (0 to 1,760°C) Type S (0 to 1,760°C) Type B (0 to 1,820°C) Type E (-200 to +800°C) Type T (-200 to +400°C) Type N (-200 to +1,300°C) Type C (0 to 2,315°C)	Type K (-200 to +1,300°C) Type J (-200 to +1,000°C) Type R (0 to 1,760°C) Type S (0 to 1,760°C) Type B (0 to 1,820°C) Type E (-200 to +800°C) Type T (-200 to +400°C) Type N (-200 to +1,300°C) Type C (0 to 2,315°C)	-90 to +150°C	100 to 10,000Ω
Input Impedance		1 MΩ minimum	50Ω maximum	1 MΩ minimum	1 MΩ minimum	1 MΩ minimum	1 MΩ minimum	
Input Detection Current		—	—	0.1mA maximum	0.1mA maximum	0.1mA maximum	0.1mA maximum	
AD Conversion	Sampling Duration Time	10ms, 100ms or 104ms (selectable using application software)				104ms		
	Sampling Repetition Time	Sampling time × valid input channels						
	Total Input System Transfer Time	Sampling time + sampling interval + 1 scan time						
	Type of Input	Single-ended input						
	Operating Mode	Self-scan						
Conversion Method		Σ Δ type ADC						
Input Error	Maximum Error at 25°C	±0.2% of full scale		FC6A-L03CN1: ±0.1% of full scale + cold junction compensation error FC6A-J4CN1: ±0.2% of full scale + cold junction compensation error (*3)		±0.2% of full scale + cold junction compensation error (*3)		
	Cold Junction Compensation Error	—	—	±4°C maximum		±4°C maximum		
	Temperature Coefficient	FC6A-L03CN1: 0.006%/°C of full scale FC6A-J4CN1: 0.01%/°C of full scale				0.01%/°C of full scale		
Data	Digital Resolution	65,536 increments (16 bits)		Pt100: approx. 10,500 increments (14 bits) Pt1,000: approx. 8,000 increments (13 bits) Ni100: approx. 2,400 increments (12 bits) Ni1,000: approx. 2,400 increments (12 bits)	Type K: approx. 15,000 increments (14 bits) Type J: approx. 12,000 increments (14 bits) Type R: approx. 17,600 increments (15 bits) Type S: approx. 17,600 increments (15 bits) Type B: approx. 18,200 increments (15 bits) Type E: approx. 10,000 increments (14 bits) Type T: approx. 6,000 increments (13 bits) Type N: approx. 15,000 increments (14 bits) Type C: approx. 23,150 increments (15 bits)	Type K: approx. 15,000 increments (14 bits) Type J: approx. 12,000 increments (14 bits) Type R: approx. 17,600 increments (15 bits) Type S: approx. 17,600 increments (15 bits) Type B: approx. 18,200 increments (15 bits) Type E: approx. 10,000 increments (14 bits) Type T: approx. 6,000 increments (13 bits) Type N: approx. 15,000 increments (14 bits) Type C: approx. 23,150 increments (15 bits)	NTC: approx. 2,400 increments (12 bits) PTC: approx. 9,900 increments (14 bits)	
	Input Value of LSB	0 to 10V: 0.15mV -10 to +10V: 0.30mV	0 to 20mA: 0.30μA 4 to 20mA: 0.244μA	0.1°C	0.1°C	0.1°C	0.1°C	1Ω
	Data Type in Application Program	Optional: selectable for each channel from -32,768 to 32,767 (*1)						
	Monotonicity	Yes						
	Input Data Out of Range	Detectable (*2)						
Noise Resistance	Input Filter	Software						
	Recommended Cable for Noise Immunity	Pair shielded cable		Pair cable				
	Crosstalk	1 LSB maximum						
Isolation		Between input and power circuit: Transformer-isolated Between input and internal circuit: Photocoupler-isolated						
Effect of Improper Input Connection		No damage						
Maximum Permanent Allowed Overload (No Damage)		13V DC 40mA						
Selection of Input Signal Type and Input Range		Using programming software						
Calibration or Verification to Maintain Rated Accuracy		Not possible						

*1: The data processed in the analog I/O module can be linear-converted to a value between -32,768 and 32,767. The optional range designation, and analog I/O data minimum and maximum values can be selected using data registers allocated to analog I/O modules.

*2: When an error is detected, a corresponding error code is stored to a data register allocated to analog I/O operating status.

*3: R, S: ±6 (0 to 200°C)

B: no compensation

K, J, E, T, N: ±0.4% of full scale (0°C maximum)

MICROSmart Micro Programmable Logic Controllers

Analog Output Specifications

Part No.			FC6A-K4A1		FC6A-L06A1		FC6A-L03CN1	
Output Signal Style/Output Range			Voltage	0 to 10V DC -10 to +10VDC				
			Current	0 to 20mA 4 to 20mA				
Load	Impedance		Voltage output: 1 kΩ minimum Current output: 300Ω maximum					
	Load Type		Resistive load					
DA Conversion	DA Conversion Time		1ms					
	Output Update Interval		1ms					
	Total Output System Transfer Time		DA Conversion Time +Output Update Interval + 1 scan time					
Output Error	Maximum Error at 25°C		±0.2% of full scale		±0.1% of full scale		±0.2% of full scale	
	Temperature Coefficient		±0.01%/°C of full scale		±0.006%/°C of full scale		±0.01%/°C of full scale	
	Repeatability after Stabilization Time		±0.4% of full scale					
	Output Voltage Drop		No damage					
	Non-linearity		±0.2% of full scale		±0.01%/°C of full scale		±0.2% of full scale	
	Output Ripple		20mV maximum					
	Overshoot		0%					
Total Error			±1% of full scale					
Data	Digital Resolution		4,096 increments (12 bits)					
	Output Value of LSB	Voltage	0 to 10V DC: 2.44mV -10 to +10V DC: 4.88mV					
		Current	0 to 20mA: 4.88μA 4 to 20mA: 3.91μA					
	Data Type in Application Program		Optional: -32,768 to 32,767 (selected for each channel)					
	Monotonicity		Yes					
	Current Loop Open		Undetectable					
Noise Resistance	Recommended Cable for Noise Immunity		Pair shielded cable					
	Crosstalk		1LSB					
Isolation	Between output and power circuit		Transformer-isolated					
	Between output and internal circuit		Photocoupler-isolated					
Effect of Improper Output Connection			No damage					
Selection of Analog Output Signal Type			Using software programming					
Calibration or Verification to Maintain Rated Accuracy			Not possible					

Specifications (PID Module)

Input Range

Part No.	FC6A-F2MR1 FC6A-F2M1		
Input	Input Range (Digital Resolution)		Input Value per Step
K	-200 to 1,370°C	-328 to 2,498°F	1°C (°F)
	-200.0 to 400.0°C	-328.0 to 752.0°F	0.1°C (°F)
J	-200 to 1,000°C	-328 to 1,832°F	1°C (°F)
R	0 to 1,760°C	32 to 3,200°F	1°C (°F)
S	0 to 1,760°C	32 to 3,200°F	1°C (°F)
B	0 to 1,820°C	32 to 3,308°F	1°C (°F)
E	-200 to 800°C	-328 to 1,472°F	1°C (°F)
T	-200.0 to 400.0°C	-328.0 to 752.0°F	0.1°C (°F)
N	-200 to 1,300°C	-328 to 2,372°F	1°C (°F)
PL-II	0 to 1,390°C	32 to 2,534°F	1°C (°F)
C (W/Re5-26)	0 to 2,315°C	32 to 4,199°F	1°C (°F)
Pt100	-200 to 850°C	-328 to 1,562°F	1°C (°F)
	-200.0 to 850.0°C	-328.0 to 1,562.0°F	0.1°C (°F)
JPt100	-200 to 500°C	-328 to 932°F	1°C (°F)
	-200.0 to 500.0°C	-328.0 to 932.0°F	0.1°C (°F)
DC 4 to 20mA	-2,000 to 10,000 (12,000 increments) (*1)		1.333 μ A
DC 0 to 20mA	-2,000 to 10,000 (12,000 increments) (*1)		1.666 μ A
DC 0 to 1V	-2,000 to 10,000 (12,000 increments) (*1)		0.083mA
DC 0 to 5V	-2,000 to 10,000 (12,000 increments) (*1)		0.416mA
DC 1 to 5V	-2,000 to 10,000 (12,000 increments) (*1)		0.333mA
DC 0 to 10V	-2,000 to 10,000 (12,000 increments) (*1)		0.833mA

*1: Linear-conversion is possible.

MICROSmart Micro Programmable Logic Controllers

Specifications (PID Module)

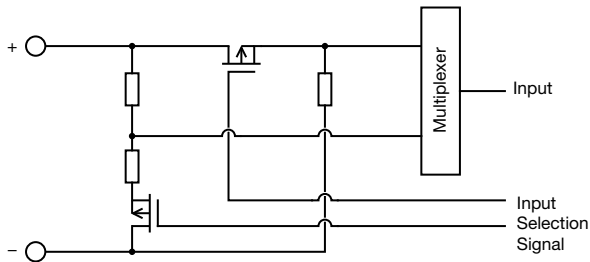
Ratings

Part No.		FC6A-F2MR1	FC6A-F2M1
Control Mode	Independent PID Control	Possible	
	Heating/Cooling Control	Possible (overlapping deadband settings available) (*1)	
	Difference Input Temperature Control	Possible (*1)	
	Cascade Control	Possible (*1)	
Input Points		2ch	
Input Type Input Range	Thermocouple	K, J, R, S, B, E, T, N, PL-II, C (W/Re5-26) External resistance: 100Ω maximum	
	Resistance Thermometer	Pt100, JPt100, 3-wire type	
	Current Input	0 to 20 mA DC, 4 to 20 mA DC Input impedance: 50Ω	
	Voltage Input	0 to 1V DC Input impedance: 1MΩ minimum 0 to 5V DC, 1 to 5V DC, 0 to 10V DC Input impedance: 100kΩ minimum	
AD Conversion	Sampling Duration Time	100 ms	
	Sampling Repetition Time	100 ms	
	Total Input System Transfer Time	Sampling time + sampling interval + 1 scan time	
	Type of Input	Differential input	
	Conversion Method	Σ Δ type ADC	
Maximum Error at 25°C	Thermocouple Input	±0.2% of full scale or ±2°C (4°F), whichever is greater However, R, S inputs: 0 to 200°C (0 to 400°F): ±6°C (12°F) B input: 0 to 300°C (0 to 600°F) Accuracy is not guaranteed. K, J, E, T, N inputs: Less than 0°C (32°F): ±0.4% of full scale	
	Resistance Thermometer Input	±0.1% of full scale or ±1°C (2°F), whichever is greater	
	Voltage/Current Inputs	±0.2% of full scale	
Cold Junction Temperature Compensation Accuracy		±1°C at 0 to 55°C	
Temperature Coefficient		±0.005%/°C of full scale	
Noise Resistance	Input Filter	Yes	
	Recommended Cable for Noise Immunity	Pair shielded cable (current/voltage)/Pair cable (temperature input)	
	Cross Talk	None	
Isolation	Between input and power circuit	Transformer-isolated	
	Between input and internal circuit	Photocoupler-isolated	
Output Points		2ch	
Output		Relay output 1NO Rated load 5A 250V AC/30V DC (resistive load) 3A 250V AC (inductive load cos φ=0.4) 3A 30V DC (inductive load VR=7ms) Minimum open/closed load: 10 mA 5V DC (reference value) Electrical life: 100,000 cycles (at the maximum rating of resistive load)	Non-contact voltage output (for SSR drive) 12V DC±15% Maximum 40 mA (short circuit protected)
			Analog current output 4 to 20 mA DC Load resistance: 550Ω maximum Analog output digital resolution: 1,000 LSB input value: 0.016 mA
Noise Resistance	Recommended Cable for Noise Immunity	—	Pair shielded cable
	Cross Talk	—	None
Isolation		Between input and power circuit: Transformer-isolated Between input/output and internal circuits: Photocoupler-isolated Between input circuits: Photocoupler-isolated	
Power Voltage		24V DC (External power), 5V DC (Internal power)	
Allowable Voltage Range		20.4 to 28.8V DC	
Maximum Power Consumption		3.6W	
Internal Power Consumption		65mA (5V DC)	
Weight (approx.)		140g	

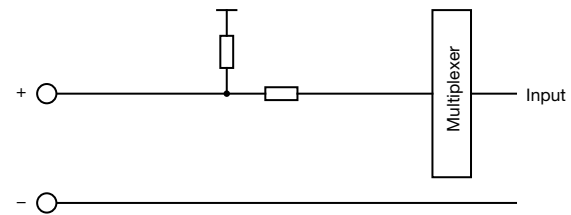
*1: Dual channel input is required for one loop control.

Input Circuit

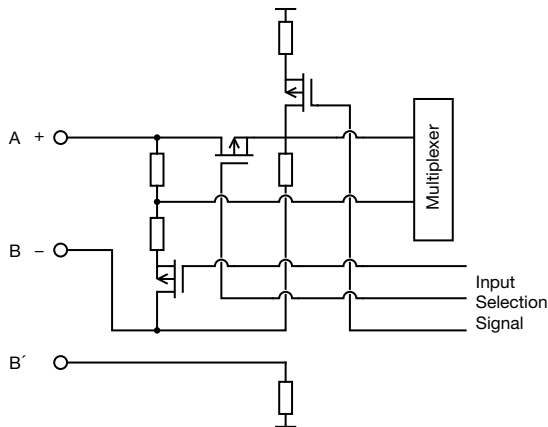
FC6A-J2C1/FC6A-J4A1/FC6A-J8A1/FC6A-L06A1



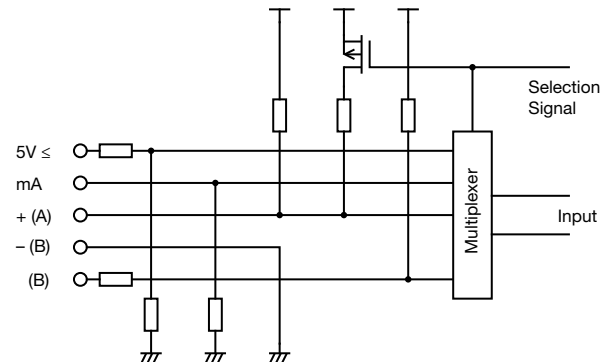
FC6A-J8CU1



FC6A-J4CN1/FC6A-L03CN1

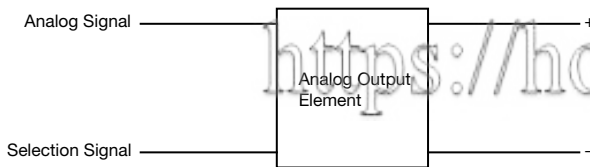


FC6A-F2M1/FC6A-F2MR1

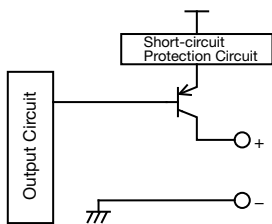


Output Circuit

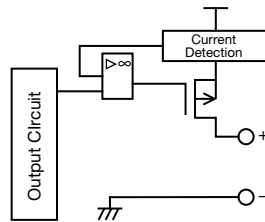
FC6A-L03CN1/FC6A-L06A1/FC6A-K4A1



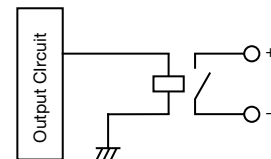
FC6A-F2M1
(Non-contact voltage output for SSR drive)



FC6A-F2M1 (current output)



FC6A-F2MR1



HMI Module Specifications

General Specifications

Part No.	FC6A-PH1
Power Consumption Inside Module (without connection cartridge)	100mA (5V) 15mA (24V)
Cartridge (option)	One analog cartridge can be added
Weight (approx.)	170g

Operation Specifications

Part No.	FC6A-PH1
Operation Method	Rubber Switch
Operating Force	2.0N minimum
Mechanical Life	10,000 operations
Multiple Operation	Possible

Display Specifications

Part No.	FC6A-PH1
Display	STN Monochrome LCD
Color/Shade	Monochrome
Effective Display Area	47.98W × 8.22H mm
Display Resolution	192W × 64H pixels
View Angle	Right and left 30°, up 20°, down 40°
Contrast adjustment	Not possible
Backlight	LED (green)
Brightness	45 cd/m ²
Brightness Adjustment	Not possible
Backlight Control	ON/OFF
Backlight Replacement	Not possible
Display Character Size	1/2 size 8 × 16 pixels (JIS 8-bit code, Western European language ISO 8859-1, Cyrillic ANSI1251) Full size 16 × 16 pixels (Japanese JIS first level characters, simplified Chinese)
Quantity of Characters	1/2 size 24 characters × 4 lines Full size 12 characters × 4 lines
Character Attribute	Blink, reverse.

Communication Adapter

Part No.	FC6A-PC1	FC6A-PC3
Standards	EIA RS232C	EIA RS485
Maximum Baud Rate	115,200 bps	
Maintenance Communication	Possible	Possible
User Communication	Possible	Possible
Data Link Communication	Possible	Possible
Modbus RTU	Possible	Possible
Half-duplex Communication	—	Possible
Maximum Cable Length	5m	200m
Quantity of Slave Stations	—	31
Isolation between Internal Circuit and Communication Port	Not isolated	
RS485 Cable	Cable	3-core shielded cable with a minimum core wire of 0.3 mm ²
	Conductor Resistance	85 Ω/km maximum
	Shield Resistance	20 Ω/km maximum

Analog Cartridge

General Specifications

Part No.	FC6A-PJ2A	FC6A-PJ2CP	FC6A-PK2AV	FC6A-PK2AW
Type	Voltage/Current Input	Temperature Input	Voltage Output	Current Output
No. of Points	2	2	2	2
Rated Voltage	5.0V, 3.3V (supplied from the CPU module)			
Power Consumption	5.0V: — 3.3V: 30mA		5.0V: 70mA 3.3V: 30mA	5.0V: 185mA 3.3V: 30mA
Weight (approx.)	15g			

HMI Ethernet Port Specifications

Part No.		FC6A-PH1
Communication		Complies with IEEE802.3
Transmission speed		10BASE-T, 100BASE-TX
Protocol		Datalink layer: IP/ARP Network layer: TCP/UDP, ICMP Application layer: DHCP, DNS, HTTP, SMTP
Connector		RJ45
Cable		CAT 5. STP
Maximum Cable Length		100m
Isolation from Internal Circuit		Pulse transformer isolation
Major Functions	Remote Maintenance	Uploading, downloading and monitoring using WindLDR Number of connections: 8
	Web Server	5MB max. total size of system web page and user web page (system web page: about 500KB)
	HMI Module System Software V1.20 and later	Number of connections: 8 maximum Authentic method: digest authentication
	Send E-mail	Sends preregistered e-mails. Up to 255 types of e-mails can be sent. Authentic method: SMTP-Auth (login), SMTP-Auth (CRAM-MD5), SMTPs Encoding method: BASE64
	E-mail Size	The maximum size of texts for To or Cc is 512 bytes. (*1) E-mail subject: 255 bytes maximum E-mail body: 4096 bytes maximum Attached CSV file: 4096 bytes maximum (includes spaces, separator characters, and newlines)

*1: Comma (,) is inserted as a separating character between e-mail addresses.

Analog Cartridge Specifications

Function Specifications

Part No.		FC6A-PJ2A	FC6A-PJ2CP	FC6A-PK2AV	FC6A-PK2AW
Input Points		2	2	—	—
Types of Inputs	Voltage Input	0-10V	—	—	—
	Current Input	0-20mA, 4-20mA	—	—	—
Input Range	Thermocouple	—	K, J, R, S, B, E, T, N, C	—	—
	Resistance Thermometer	—	Pt100, Pt1000, NI100, NI1000 3-wire type	—	—
Input Impedance	Voltage Input	1M Ω minimum	—	—	—
	Current Input	250 Ω maximum	—	—	—
	Thermocouple	—	1M Ω minimum	—	—
	Resistance Thermometer	—	1M Ω minimum	—	—
Allowable Conductor Resistance (per wire)	Resistance Thermometer	N/A	10 Ω maximum	—	—
Type of Input		Single-ended input		—	—
Sampling Duration Time		10ms	250ms	—	—
Sampling Repetition Time		20ms	500ms	—	—
Total Input System Transfer Time		Sampling duration time + sampling repetition time + 1 scan time		—	—
Operation Mode		Self-scan		—	—
Conversion Method		SAR		—	—
Input Error	Maximum Error at 25°C	±0.1% of full scale	±0.1%/°C of full scale Cold junction compensation error: 4.0°C maximum. However, R, S inputs: ±6°C (0 to 200°C) B: 0 to 300°C. Accuracy is not guaranteed. K, J, E, T, N inputs: less than ±0.4% of full scale (0°C)	—	—
	Temperature Coefficient	±0.02%/°C of full scale	±0.02%/°C of full scale	—	—
Output Points		—	—	2	2
Types of Outputs	Voltage Output	—	—	0-10V	—
	Current Output	—	—	—	4-20mA
Types of Output Load	Impedance	—	—	2k Ω minimum	500 Ω minimum
	Load Type	—	—	Resistive load	Resistive load
DA Conversion Time		—	—	40ms maximum	20ms maximum
Output Update Interval		—	—	20ms	20ms
Total Output Delay		—	—	DA conversion time + output update time + 1 scan time	
Output Error	Maximum Error at 25°C	—	—	±0.3% of full scale	±0.3% of full scale
	Temperature Coefficient	—	—	±0.02%/°C of full scale	±0.02%/°C of full scale
	Output Ripple	—	—	30mV maximum	30mV maximum
	Overshoot	—	—	0%	0%
Data	Digital Resolution	4,096 increments (12 bits)	Thermocouple input K: approx. 15,000 (14 bits) J: approx. 12,000 (14 bits) R: approx. 17,600 (15 bits) S: approx. 17,600 (15 bits) B: approx. 18,200 (15 bits) E: approx. 10,000 (14 bits) T: approx. 6,000 (13 bits) N: approx. 15,000 (14 bits) C: approx. 23,150 (15 bits) Resistance thermometer input Pt100: approx. 1,0500 (14 bits) Pt1000: approx. 8,000 (13 bits) NI100: approx. 2,400 (12 bits) NI1000: approx. 2,400 (12 bits)	4,096 increments (12 bits)	4,096 increments (12 bits)
	Output Value of LSB	2.44 mV (0-10V) 4.88 μ A (0-20mA) 3.91 μ A (4-20mA)	0.1°C or 0.18°F (thermocouple input) 0.1°C or 0.18°F (resistor thermometer input)	2.44 mV (0-10V)	3.91 μ A (4-20mA)
	Data Type in Application Program	–32768 to 32773 (selectable for each channel) (*2)	–32768 to 32773 (selectable for each channel) (*2)	0 to 4095 (0-10V)	0 to 4095 (4-20mA)
	Monotonicity	Yes	Yes	Yes	Yes
	Current Loop Open	—	—	—	Not detectable
	Input Data Out of Range	Detectable (*1)	Detectable (*1)	—	—
Noise Resistance	Recommended Cable	Pair shielded cable	Pair cable	Pair shielded cable	Pair shielded cable
	Crosstalk	1LSB maximum	1LSB maximum	1LSB	1LSB
Others	Selection of Output Signal Type	—	—	Voltage output only	Current output only
	Calibration to Maintain Rated Accuracy	Not possible			
	Effect of Improper Input Connection	No damage	No damage	—	—
	Effect of Improper Output Connection	—	—	No damage	No damage

*1: When an error is detected, a corresponding error code is stored to a data register allocated to analog I/O operating status.

*2: The data processed in the analog I/O module can be linear-converted to a value between -32768 and 32767. The optional range designation, and analog I/O data minimum and maximum values can be selected using data registers allocated to analog I/O modules.

Expansion Interface Module Specifications

Part No.	FC6A-EXM2	
Rated Power Voltage	24V DC	
Allowable Voltage Range	20.4 to 28.8V DC	
Power Consumption	Internal power (supplied from CPU module): 20 mA (5V DC), 0 mA (24V DC) External power: With I/O modules (*1) 750 mA (26.4V DC)	
Maximum Power Consumption (External Power) (*1)	0.5W (24V DC)	
Allowable Momentary Power Interruption	10ms minimum (24V DC)	
I/O Expansion	Between CPU module and expansion interface module Connectable I/O modules: 7 maximum (224 I/Os maximum) Beyond the expansion interface module Connectable I/O modules: 8 maximum (256 I/Os maximum)	
Isolation from Internal Circuit	Not isolated	
Connector	Insertion/ Removal Durability	100 times minimum
	Applicable Ferrules	1-wire: AI 0.5-10 (Phoenix Contact) 2-wire: AI-TWIN 2×0.5-10 (Phoenix Contact)
Weight (approx.)	150g	

*1: Power consumption by the expansion interface module and eight I/O modules.

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Instructions

Basic Instructions

Symbol	Function	Instruction Length (byte) (*1)	
		When using bit device	When using data register
AND	Series connection of NO contact	8	2
AND·LOD	Series connection of circuit blocks	8	
ANDN	Series connection of NC contact	12	
BPP	Restores the result of bit logical operation which was saved temporarily	4	
BPS	Saves the result of bit logical operation temporarily	4	
BRD	Reads the result of bit logical operation which was saved temporarily	4	
CC=	Equal to comparison of counter current value	12	
CC≥	Greater than or equal to comparison of counter current value	12	
CDP	Dual pulse reversible counter (0 to 65,535)	12	
CDPD	Double-word dual pulse reversible counter (0 to 4,294,967,295)	12	
CNT	Adding counter (0 to 65,535)	12	
CNTD	Double-word adding counter (0 to 4,294,967,295)	12	
CUD	Up/down selection reversible counter (0 to 65,535)	12	
CUDD	Double-word up/down selection reversible counter (0 to 4,294,967,295)	12	
DC=	Equal to comparison of data register value	12 to 16	
DC≥	Greater than or equal to comparison of data register value	12 to 16	
END	Ends a program	4	
JEND	Ends a jump instruction	4	
JMP	Jumps a designated program area	12	
LOD	Stores intermediate results and reads contact status	8	12
LODN	Stores intermediate results and reads inverted contact status	12	
MCR	Ends a master control	4	
MCS	Starts a master control	4	
OR	Parallel connection of NO contact	8	12
OR·LOD	Parallel connection of circuit blocks	8	
ORN	Parallel connection of NC contact	12	
OUT	Outputs the result of bit logical operation	8	
OUTN	Output the inverted result of bit logical operation	8	
RST	Reset	8	
SET	Set	8	
SFR	Forward shift register	12	
SFRN	Reverse shift register	12	
SOTD	Falling-edge differentiation output	8	
SOTU	Rising-edge differentiation output	8	
TIM	Subtracting 100-ms timer (0 to 6553.5 sec)	12	
TIMO	Subtracting 100-ms off-delay timer (0 to 6553.5 sec)	12	
TMH	Subtracting 10-ms timer (0 to 655.35 sec)	12	
TMHO	Subtracting 10-ms off-delay timer (0 to 655.35 sec)	12	
TML	Subtracting 1-sec timer (0 to 65535 sec)	12	
TMLO	Subtracting 1-sec off-delay timer (0 to 65535 sec)	12	
TMS	Subtracting 1-ms timer (0 to 65.535 sec)	12	
TMSO	Subtracting 1-ms off-delay timer (0 to 65.535 sec)	12	

*1: 1 step = 8 bytes

MICROSmart Micro Programmable Logic Controllers

Advanced Instructions

Symbol	Function
NOP	No Operation
MOV	Move
MOVN	Move Not
IMOV	Indirect Move
IMOVN	Indirect Move Not
BMOV	Block Move
IBMV	Indirect Bit Move
IBMVN	Indirect Bit Move Not
NSET	N Data Set
NRS	N Data Repeat Set
XCHG	Exchange
TCCST	Timer/Counter Current Value Store
CMP=	Compare Equal To
CMP<>	Compare Unequal To
CMP<	Compare Less Than
CMP>	Compare Greater Than
CMP<=	Compare Less Than or Equal To
CMP>=	Compare Greater Than or Equal To
ICMP>=	Interval Compare Greater Than or Equal
LC=	Load Compare Equal To
LC<>	Load Compare Unequal To
LC<	Load Compare Less Than
LC>	Load Compare Greater Than
LC<=	Load Compare Less Than or Equal To
LC>=	Load Compare Greater Than or Equal To
ADD	Addition
SUB	Subtraction
MUL	Multiplication
DIV	Division
INC	Increment
DEC	Decrement
ROOT	Root
SUM	Sum
RNDM	Random
ANDW	AND Word
ORW	OR Word
XORW	Exclusive OR Word
SFTL	Shift Left
SFTR	Shift Right
BCDLS	BCD Left Shift
WSFT	Word Shift
ROTL	Rotate Left
ROTR	Rotate Right
HTOB	Hex to BCD
BTOH	BCD to Hex
HTOA	Hex to ASCII
ATOH	ASCII to Hex
BTOA	BCD to ASCII
ATOB	ASCII to BCD
ENCO	Encode
DECO	Decode
BCNT	Bit Count
ALT	Alternate Output
CVDT	Convert Data Type
DTDV	Data Divide
DTCB	Data Combine
SWAP	Data Swap
WEEK	Weekly Timer
YEAR	Yearly Timer
WKTIM	Week Timer
WKTBL	Week Table
MSG	Message
DISP	Display
DGRD	Digital Read
TXD	Transmit
ETXD	Transmit over Ethernet

Symbol	Function
RXD	Receive
ERXD	Transmit over Ethernet
LABEL	Label
LJMP	Label Jump
LCAL	Label Call
LRET	Label Return
DJNZ	Decrement Jump Non-zero
DI	Disable Interrupt
EI	Enable Interrupt
IOREF	I/O Refresh
HSCRf	High-speed Counter Refresh
FRQRf	Frequency Measurement Refresh
COMRF	Communication Refresh
XYFS	XY Format Set
CVXTY	Convert X to Y
CVYTX	Convert Y to X
AVRG	Average
PULS	Pulse Output
PWM	Pulse Width Modulation
RAMP	Ramp Pulse Output
ZRN	Zero Return
ARAMP	Advanced Ramp
ABS	Set the origin
JOG	Pulse with direction
PID	PID Control (FC5A compatible)
PIDA	PID Control
DTML	1-sec Dual Timer
DTIM	100-ms Dual Timer
DTMH	10-ms Dual Timer
DTMS	1-ms Dual Timer
TTIM	Teaching Timer
RAD	Degree to Radian
DEG	Radian to Degree
SIN	Sine
COS	Cosine
TAN	Tangent
ASIN	Arc Sine
ACOS	Arc Cosine
ATAN	Arc Tangent
LOGE	Natural Logarithm
LOG10	Common Logarithm
EXP	Exponent
POW	Power
FIFO	FIFO Format
FIEX	First-In Execute
FOEX	First-Out Execute
NDSRC	N Data Search
TADD	Time Addition
TSUB	Time Subtraction
HTOS	HMS to Sec
STOH	Sec to HMS
HOUR	Hour Meter
SCRPT	Script
SCALE	Convert Analog Input
FLWA	Analog Flow Totalizer
FLWP	Pulse Flow Totalizer
PING	Ping
EMAIL	Send Email (*1)
DLOG	Data Logging
TRACE	Data Trace

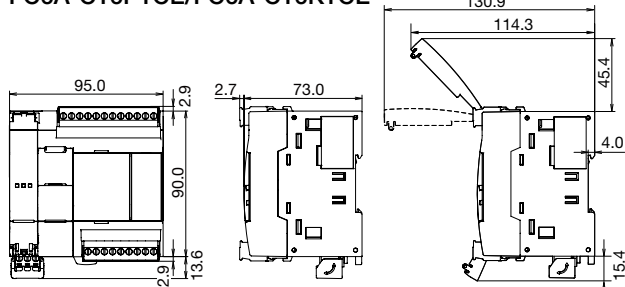
*1: HMI module is necessary to use on all-in-one type.

MICROSmart Micro Programmable Logic Controllers

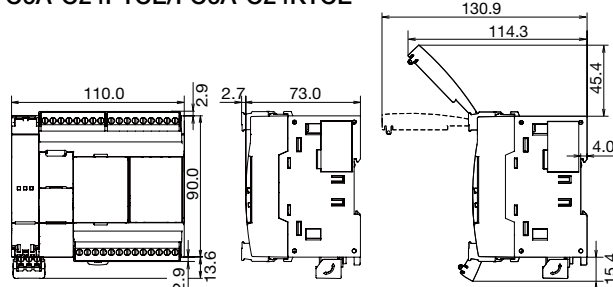
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(All dimensions in mm.)

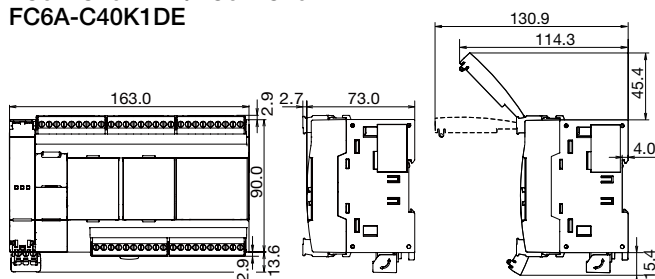
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FC6A-C16P1CE/FC6A-C16K1CE



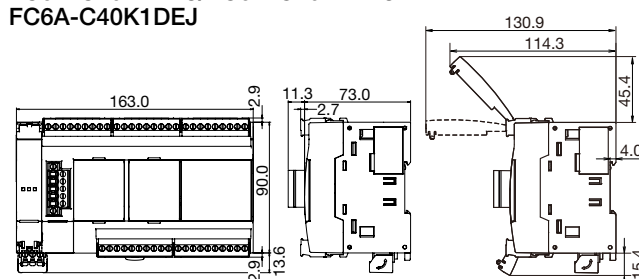
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FC6A-C24P1CE/FC6A-C24K1CE



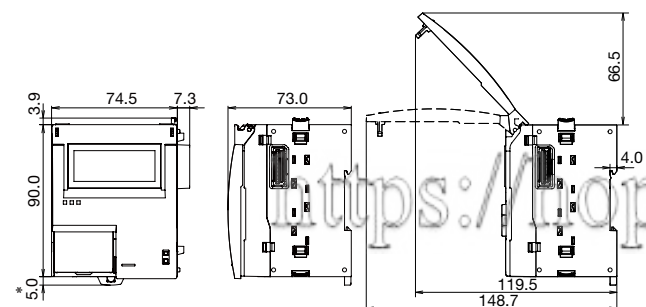
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FC6A-C40K1DE



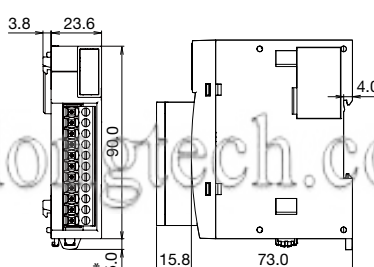
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FC6A-C40K1DEJ



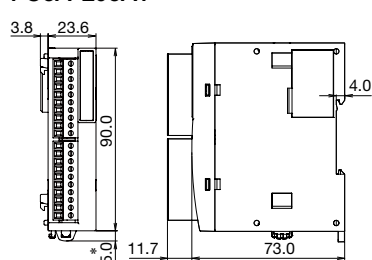
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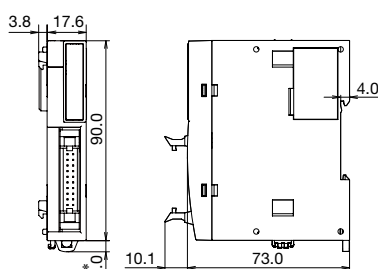
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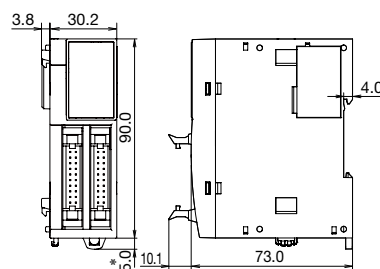
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FC6A-T16K1/FC6A-T16P1
FC6A-J4A1/FC6A-J8A1
FC6A-J4CN1/FC6A-J8CU1
FC6A-L06A1



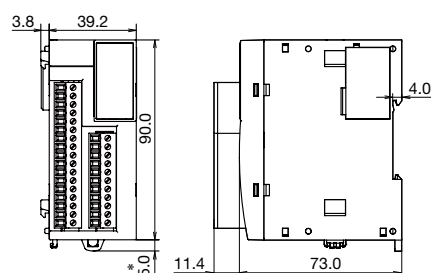
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FC6A-T16P3



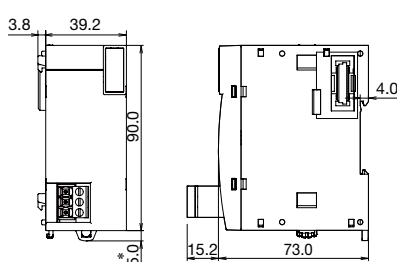
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FC6A-T32P3



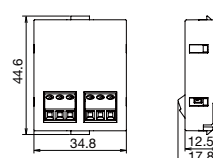
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FC6A-F2MR1



FC6A-EXM2



FC6A-PC1/FC6A-PC3
FC6A-PJ2A/FC6A-PK2AV
FC6A-PK2AW/FC6A-PJ2CP



* 9.3 mm when the clamp is pulled out.

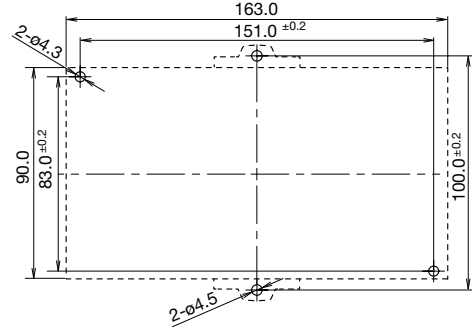
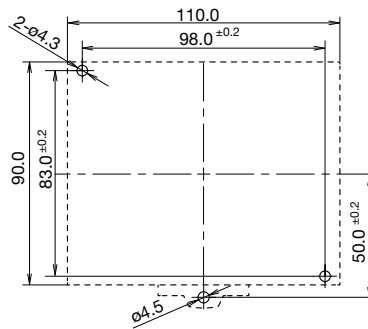
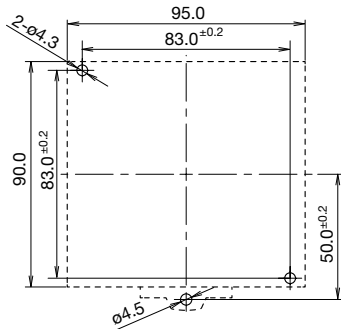
Mounting Hole Layout

Install FC6A directly to a flat panel using M4 pan head screws.

FC6A-C16R1AE
FC6A-C16R1CE
FC6A-C16K1CE
FC6A-C16P1CE

FC6A-C24R1AE
FC6A-C24R1CE
FC6A-C24K1CE
FC6A-C24P1CE

FC6A-C40R1CE/FC6A-C40K1CE/FC6A-C40P1CE
FC6A-C40R1DE/FC6A-C40K1DE/FC6A-C40P1DE
FC6A-C40R1AEJ/FC6A-C40R1CEJ/FC6A-C40K1CEJ
FC6A-C40P1CEJ/FC6A-C40R1DEJ/FC6A-C40K1DEJ
FC6A-C40P1DEJ



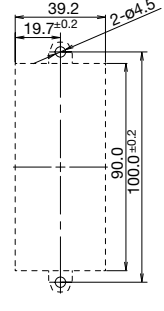
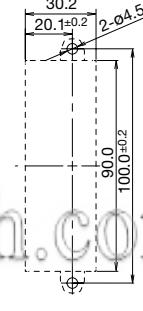
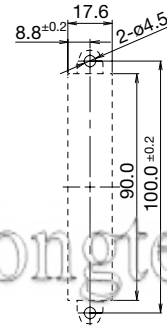
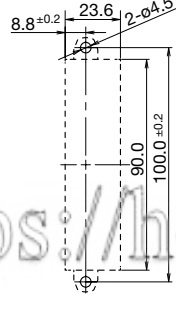
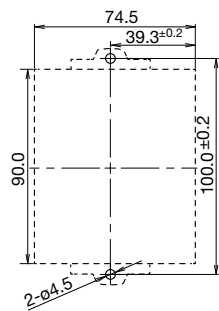
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FC6A-T16P1/FC6A-J2C1/FC6A-K4A1
FC6A-L03CN1/FC6A-J4A1/FC6A-J8A1
FC6A-J4CN1/FC6A-J8CU1/FC6A-L06A1

FC6A-HMI

FC6A-N16B3
FC6A-T16K3
FC6A-T16P3

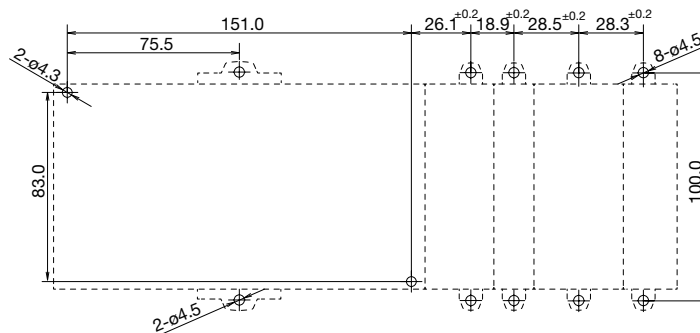
FC6A-N32B3
FC6A-T32K3
FC6A-T32P3

FC6A-F2M1
FC6A-F2MR1



Reference

When mounting FC6A-C40R1AE, FC6A-N32B3, FC6A-T16K3, FC6A-F2MR1 and FC6A-L06A1 directly on a panel.



All dimensions in mm.

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IDEC CORPORATION

6-64, Nishi-Miyahara 2-Chome, Yodogawa-ku, Osaka 532-0004, Japan
Tel: +81-6-6398-2527, Fax: +81-6-6398-2547
E-mail: marketing@idec.co.jp

IDEC CORPORATION (USA)

1175 Elko Drive, Sunnyvale, CA 94089-2209, USA
Tel: +1-408-747-0550 / (800) 262-IDECE (4332)
Fax: +1-408-744-9055 / (800) 635-6246
E-mail: opencontact@idec.com

IDEC CANADA LIMITED

3155 Pepper Mill Court, Unit 4
Mississauga, Ontario, L5L 4X7, Canada
Tel: +1-905-890-8561, Toll Free: (888) 317-IDECE (4332)
Fax: +1-905-890-8562
E-mail: sales@ca.idec.com

IDEC AUSTRALIA PTY. LTD.

Unit 17, 104 Ferntree Gully Road,
Oakleigh, Victoria 3166, Australia
Tel: +61-3-8523-5900, Toll Free: 1800-68-4332
Fax: +61-3-8523-5999
E-mail: sales@au.idec.com

IDEC ELEKTROTECHNIK GmbH

Heselerstrucken 8, 22453 Hamburg, Germany
Tel: +49-40-25 30 54 - 0, Fax: +49-40-25 30 54 - 24
E-mail: service@eu.idec.com

IDEC (SHANGHAI) CORPORATION

Room 701-702 Chong Hing Finance Center,
No. 288 Nanjing Road West, Shanghai 200003, PRC
Tel: +86-21-6135-1515
Fax: +86-21-6135-6225 / +86-21-6135-6226
E-mail: idec@cn.idec.com

IDEC (BEIJING) CORPORATION

Room 211B, Tower B, The Grand Pacific Building,
8A Guanghua Road, Chaoyang District,
Beijing 100026, PRC
Tel: +86-10-6581-6131, Fax: +86-10-6581-5119

IDEC (SHENZHEN) CORPORATION

Unit AB-3B2, Tian Xiang Building, Tian'an Cyber Park,
Fu Tian District, Shenzhen, Guang Dong 518040, PRC
Tel: +86-755-8356-2977, Fax: +86-755-8356-2944

IDEC IZUMI (H.K.) CO., LTD.

Unit G & H, 26/F., MG Tower, No. 133 Hoi Bun Road,
Kwun Tong, Kowloon, Hong Kong
Tel: +852-2803-8989, Fax: +852-2565-0171
E-mail: info@hk.idec.com

IDEC TAIWAN CORPORATION

8F-1, No. 79, Hsin Tai Wu Road, Sec. 1,
Hsi-Chih District, 22101 New Taipei City, Taiwan
Tel: +886-2-2698-3929, Fax: +886-2-2698-3931
E-mail: service@tw.idec.com

IDEC IZUMI ASIA PTE. LTD.

No. 31, Tannery Lane #05-01,
HB Centre 2, Singapore 347788
Tel: +65-6746-1155, Fax: +65-6844-5995
E-mail: info@sg.idec.com

IDEC ASIA (THAILAND) CO., LTD.

20th Fl., Sorachai Bldg., No.23/78,
Soi Sukhumvit 63, Sukhumvit Rd.,
Klongton-nua, Wattana, Bangkok 10110
Tel: +662-392-9765, Fax: +662-392-9768
E-mail: sales@th.idec.com