B-1845 (0)

IDEC

INSTRUCTION SHEET

MICROSmart

FC6A Series
Functional module
(Analog module / PID module)

This sheet provides brief operating instructions of the MicroSmart programmable controller. For details, see the FC6A Series MicroSmart User's Manual.

Safety Precautions

Special expertise is required to use the MicroSmart.
- Read this instruction sheet and the user's manual to make sure of correct operation before starting installation, wiring, operation, maintenance, and inspection of the MicroSmart. Keep this instruction sheet where it can be accessed by the end user.
- All MicroSmart modules are manufactured under IDEC's rigorous quality control system, but users must add backup or failsafe provisions to control systems use the MicroSmart in applications where heavy damage or personal injury may be caused if the MicroSmart should fail.
- Install the MicroSmart according to the instructions described in this instruction sheet and the user's manual. Improper installation will result in falling, failure, or malfunction of the MicroSmart.
- Make sure that the operating conditions are as described in the user's manual. If you are uncertain about the specifications, contact IDEC before using the MicroSmart.
- In this instruction sheet, safety precautions are categorized in order of importance from Warning and Caution:

⚠ WARNING

Warning notices are used to emphasize that improper operation may cause severe personal injury or death.

⚠ CAUTION

Caution notices are used where inattention might cause personal injury or damage to equipment.

⚠ WARNING
- Turn off the power to the MicroSmart before starting installation, removal, wiring, maintenance, or inspection on the MicroSmart.
- Failure to turn off the power may cause electrical shocks or fire hazard. Emergency stop and interlocking circuits must be configured outside the MicroSmart. If such a circuit is configured inside the MicroSmart, failure of the MicroSmart may cause disorder of the control system, damage, or accidents.
- Suitable for use in Class I,Division 2, Groups A,B,C and D Hazardous Locations, or Non-hazardous locations only.
- Warning - Explosion Hazard - Do not disconnect equipment while the circuit is live or unless the area is known to be free of ignitable concentrations.
- Avertissement: Risque d'explosion. Ne pas débrancher tant que le circuit est sous tension, à moins qu'il ne s'agisse d'un emplacement non dangereux
- Warning - Explosion Hazard - Substitution of any components may impair suitability for Class I, Division 2.
- Avertissement: Risque d'explosion. La substitution de composants peut rendre ce matériel inacceptable pour les emplacements de classe I, division 2
- This equipment is an open -type device meant to be installed in an enclosure suitable for the environment that is only accessible with the use of a tool of key.

⚠ CAUTION
- The MicroSmart is designed for installation in equipment. Do not install the MicroSmart outside of equipment.
- Install the MicroSmart in environments as described in the user's manual. If the MicroSmart is used in places where it is subjected to high-temperature, high-humidity, condensation, corrosive gases, excessive vibrations, or excessive shocks it will result in electrical shocks, fire hazard, or malfunction.
- The environment rating for using the MicroSmart is "Pollution degree 2."
- Prevent metal fragments and pieces of wire from dropping inside the MicroSmart housing. Ingress of such fragments and chips may cause fire hazard, damage, or malfunction.
- Use wires of a proper size to meet voltage and current requirements. Tighten terminal screws to the proper tightening torque of 0.28 N-m or 0.49 N-m.
- Use an IEC60127-approved fuse on the power line and output circuit to meet voltage and current requirements.
  (Recommended fuse: Littelfuse 5x20mm slow-blow type 218000 series/Type T) This is required when exporting equipment containing MicroSmart to Europe.
- Use an EU-approved circuit breaker. This is required when exporting equipment containing MicroSmart to Europe.
- If relays or transistors in the MicroSmart output modules should fail, outputs may remain on or off. For output signals which may cause heavy accidents, provide a monitor circuit outside of the MicroSmart.
- Do not disassemble, repair, or modify MicroSmart modules.

1 TYPE

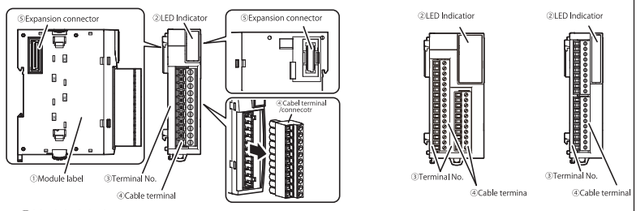
Analog input mdoule
FC6A-J2C1, FC6A-J4A1, FC6A-J8A1, FC6A-J4CN1, FC6A-J8CU1
Analog output module
FC6A-K4A1
Analog I/O module
FC6A-L03CN1, FC6A-L06A1
PID module
FC6A-F2M1, FC6A-F2MR1

Applicable model
FC6A Series MicroSmart CPU module

2 Specification

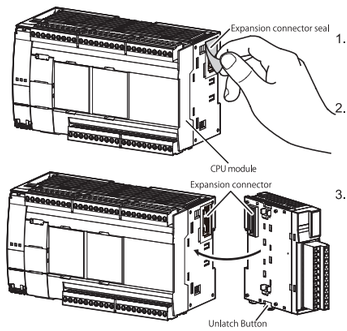
Operating Temperature: -10 to +55℃, Storage Temperature: -25 to +70℃ (no freezing)
Relative/Storage Humidity: 10 to 95%RH (no condensation),
Altitude: 1013 to 795hPa (0 to 2,000 m) during operation 1013 to 701hPa (0 to 3,000 m) during transport,
Vibration Resistance: 5 to 8.4 Hz half amplitude 3.5 mm, 8.4 to 150 Hz, acceleration 9.8 m/s^2 (1 G), X, Y, Z directions, 2 hours,
Shock Resistance: 147 m/s^2 (15 G), 11 ms, X, Y, Z directions, 3 times
*See the user's manual for more details on the product specifications.

3 Parts Description



①Module label
Indicates the module Type No. and specifications.
②LED Indicator
Turns on when power is supplied to the analog I/O module./ For PID modules ony, turns on in conjuction with the status.
③Terminal No.
Indicates terminal numbers.
④Cable Terminal
These terminals connect output devices, input devices or power.
⑤Expansion Connector
Connects to the CPU and other I/O modules.

4 Connecting Modules

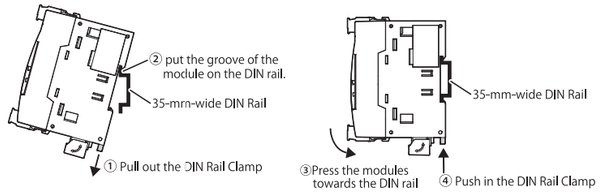


1. When connecting an input or output module, remove the expansion connector seal from the CPU module.
2. Place the CPU module and Functional module side by side. Put the expansion connectors together for easy alignment.
3. With the expansion connectors aligned correctly and the unlatch button in the down position, press the CPU module and Functional module together until the latches click to attach the modules together firmly. If the unlatch button is in the up position, push down the button to engage the latches.

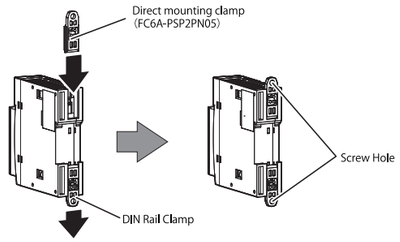
5 Mounting Modules

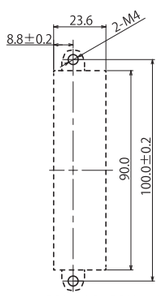
For details about mounting and removing modules, see the user's manual.

[Mounting on DIN Rail]
Use a 35-mm-wide DIN rail and BNL6 mounting clips to secure the modules.



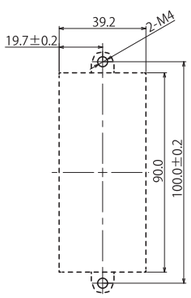
[Direct Mounting on Panel Surface]
Pull out the DIN rail clamp on the back of the module and insert the direct mounting clamp (FC6A-PSP2PN05) into the slot.
Attach the module to the mounting plate using the screw holes.
Attach the module to the mounting plate using M4 tapping screws, as shown below, or make 5 to 6mm mounting holes and secure the module using M4 pan head screws.
Always give sufficient consideration to operability, ease-of-maintenance, and environmental resistance when deciding on the mounting position.





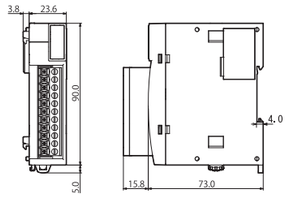
FC6A-J2C1, FC6A-J4A1, FC6A-J8A1, FC6A-J4CN1, FC6A-J8CU1, FC6A-K4A1, FC6A-L03CN1, FC6A-L06A1

All dimensions in mm.

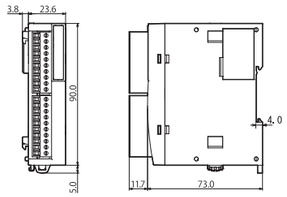


FC6A-F2M1, FC6A-F2MR1

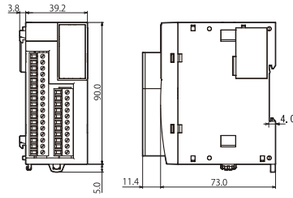
6 Dimensions



FC6A-J2C1, FC6A-K4A1, FC6A-L03CN1



FC6A-J4A1, FC6A-J8A1, FC6A-J4CN1, FC6A-J8CU1, FC6A-L06A1



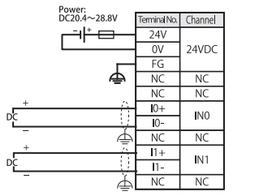
FC6A-F2M1, FC6A-F2MR1

All dimensions in mm.

7 Wiring

: Fuse

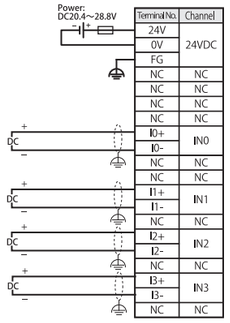
FC6A-J2C1



Terminal No.	Channel
24V	24VDC
0V	
FG	
NC	NC
NC	NC
I0+	IN0
I0-	
NC	NC
I1+	IN1
I1-	
NC	NC

DC: Anlog output device, Range：0-10V, ±10V, 0-20mA, 4-20mA

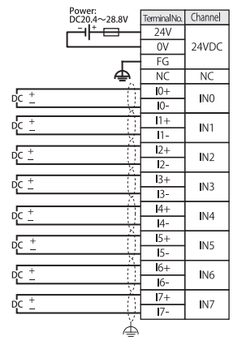
FC6A-J4A1



Terminal No.	Channel
24V	24VDC
0V	
FG	
NC	NC
NC	NC
NC	NC
NC	NC
I0+	IN0
I0-	
NC	NC
NC	NC
I1+	IN1
I1-	
NC	NC
I2+	IN2
I2-	
NC	NC
I3+	IN3
I3-	
NC	NC

DC: Anlog output device, Range：0-10V, ±10V, 0-20mA, 4-20mA

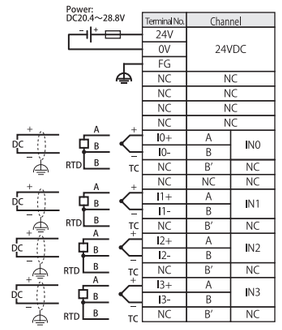
FC6A-J8A1



Terminal No.	Channel
24V	24VDC
0V	
FG	
NC	NC
I0+	IN0
I0-	
I1+	IN1
I1-	
I2+	IN2
I2-	
I3+	IN3
I3-	
I4+	IN4
I4-	
I5+	IN5
I5-	
I6+	IN6
I6-	
I7+	IN7
I7-	

DC: Anlog output device, Range：0-10V, ±10V, 0-20mA, 4-20mA

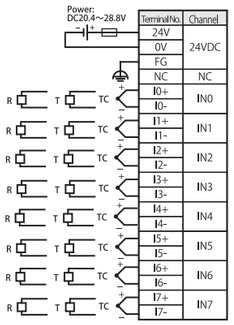
FC6A-J4CN1



Terminal No.	Channel
24V	24VDC
0V	
FG	
NC	NC
NC	NC
NC	NC
NC	NC
I0+	IN0
I0-	
NC	B′	NC
NC	NC	NC
I1+	IN1
I1-	
NC	B′	NC
I2+	IN2
I2-	
NC	B′	NC
I3+	IN3
I3-	
NC	B′	NC

DC: Anlog output device, Range：0-10V, ±10V, 0-20mA, 4-20mA
RTD：Resistance temperature detector, Range：Pt100, Pt1000, Ni100,Ni1000
TC：Thermocouple, Range：K, J, R, S, B, E, T, N, C

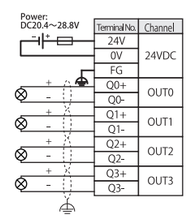
FC6A-J8CU1



Terminal No.	Channel
24V	24VDC
0V	
FG	
NC	NC
I0+	IN0
I0-	
I1+	IN1
I1-	
I2+	IN2
I2-	
I3+	IN3
I3-	
I4+	IN4
I4-	
I5+	IN5
I5-	
I6+	IN6
I6-	
I7+	IN7
I7-	

R：Resistance, Range：100-32kΩ
T：Thermocouple, Range：NTC, PTC
TC：Thermocouple, Range：K, J, R, S, B, E, T, N, C

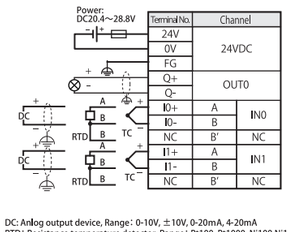
FC6A-K4A1



Terminal No.	Channel
24V	24VDC
0V	
FG	
Q0+	OUT0
Q0-	
Q1+	OUT1
Q1-	
Q2+	OUT2
Q2-	
Q3+	OUT3
Q3-	

⊗ : Anlog intput device, Range：0-10V, ±10V, 0-20mA, 4-20mA

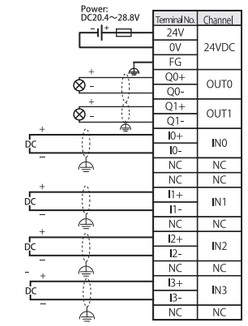
FC6A-L03CN1



Terminal No.	Channel
24V	24VDC
0V	
FG	
Q+	OUT0
Q-	
I0+	IN0
I0-	
NC	B′	NC
I1+	IN1
I1-	
NC	B′	NC

DC: Anlog output device, Range：0-10V, ±10V, 0-20mA, 4-20mA
RTD：Resistance temperature detector, Range：Pt100, Pt1000, Ni100,Ni1000
TC：Thermocouple, Range：K, J, R, S, B, E, T, N, C
⊗ : Anlog intput device, Range：0-10V, ±10V, 0-20mA, 4-20mA

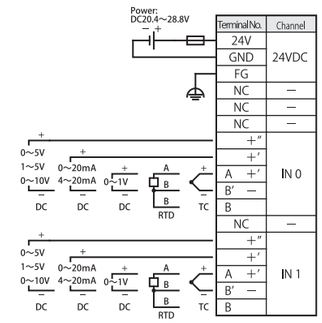
FC6A-L06A1



Terminal No.	Channel
24V	24VDC
0V	
FG	
Q0+	OUT0
Q0-	
Q1+	OUT1
Q1-	
I0+	IN0
I0-	
NC	NC
NC	NC
I1+	IN1
I1-	
NC	NC
I2+	IN2
I2-	
NC	NC
I3+	IN3
I3-	
NC	NC

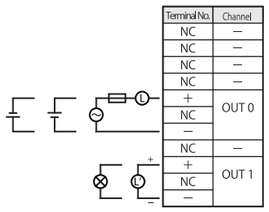
DC: Anlog output device, Range：0-10V, ±10V, 0-20mA, 4-20mA
⊗ : Anlog intput device, Range：0-10V, ±10V, 0-20mA, 4-20mA

FC6A-F2M1/FC6A-F2MR1



Terminal No.	Channel
24V	24VDC
GND	
FG	
NC	—
NC	—
NC	—
+″	IN 0
+′	
A +′	
B′ —	
B	
NC	—
+″	IN 1
+′	
A +′	
B′ —	
B	

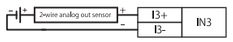
DC: Anlog output device
RTD：Resistance temperature detector, Range：Pt100, jPt100
TC：Thermocouple, Range：K, J, R, S, B, E, T, N, PL- II , C
⊗ : Analog input device, Range：4-20mA
Ⓛ : Load for Relay, Range：5A 250V AC (RES)
5A 30V DC (RES)
3A 250V AC (GEN)
3A 30V DC (GEN)
Ⓛ :Load for Digital output, Range：12VDC output, MAX40mA



Terminal No.	Channel
NC	—
NC	—
NC	—
NC	—
+	OUT 0
NC	
—	
NC	—
+	OUT 1
NC	
—	

OUT0 shows an example of connecting a relay output.
OUT1 shows an example of connecting non-contact voltage/current outputs. There is no PID module available with both outputs.

Wiring for 2-wire analog out sensor



8 Applicable Ferrule

The recommended ferrule is made by Phoenix Contact. To crimp the ferrules shown below, use a special crimping tool （CRIMPFOX 6（1212034））

F6A-J4A1, FC6A-J8A1, FC6A-J4CN1, FC6A-J8CU1, FC6A-L06A1, FC6A-F2M1, FC6A-F2MR1
AI 0,25- 8（3203037）, AI 0,25-10（3241128）,AI 0,34- 8（3203066）,
AI 0,34-10（3241129）,AI 0,5- 8（3200014）, AI 0,5- 8 GB（1208966）,
AI 0,5-10（3201275）, AI 0,5-10 GB（3203150）AI-TWIN 2 × 0,5-10（3203309）

FC6A-J2C1, FC6A-K4A1, FC6A-L03CN1
AI 0,25-10（3241128）, AI 0,34-10（3241129）, AI 0,5-10（3201275）,
AI 0,5-10 GB（3203150）, AI-TWIN 2 × 0,5-10（3203309）, AI 0,75-10（3201288）,
AI 1-10（3200182）, AI-TWIN 2 × 0,75-10（3200975）, AI 1,5-10（3200195）

（ ）indicates the Type No. of PHOENIX CONTACT GmbH & Co. KG

9 Recommended Screwdriver / Tighting torque

To wire the terminal block, use the recommended screwdriver made by Phoenix Contact and tighten terminal screws to the proper tightening torque.

F6A-J4A1, FC6A-J8A1, FC6A-J4CN1, FC6A-J8CU1, FC6A-L06A1, FC6A-F2M1, FC6A-F2MR1
Screwdriver：SZS 0,4×2,5（1205037）/ Tighten torque：0.28 N-m

FC6A-J2C1, FC6A-K4A1, FC6A-L03CN1
Screwdriver：SZS 0,6×3,5（1205053）/ Tighten torque：0.49 N-m

（ ）indicates the Type No. of PHOENIX CONTACT GmbH & Co. KG

MicroSmart User's manual can be downloaded from http://www.idec.com/download

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2015.12