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Operating Instructions www.idec.com

MICROSmart

This sheet provides brief operating instructions of the MicroSmart I/O modules. For details, see the MicroSmart User's Manual.

FC4A-N16B3, FC4A-N32B3, FC4A-T16K3
FC4A-T16S3, FC4A-T32K3, FC4A-T32S3
FC4A-M24BR2, FC4A-L03A1, FC4A-L03AP1
FC4A-J2A1, FC4A-K1A1

● Wiring Example

Use an IEC 60127-approved fuse on the output circuit to meet voltage and current requirements. For details of output module specifications, see the MicroSmart User's Manual.

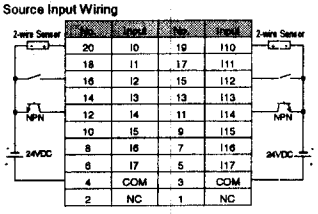
The following symbols represent a fuse and a load.

Fuse Load

Terminal numbers are indicated on the module.

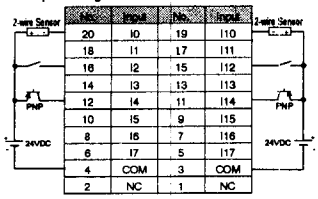
FC4A-N16B3

Source Input Wiring



No.	Input	No.	Input
20	I0	19	I10
18	I1	17	I11
16	I2	15	I12
14	I3	13	I13
12	I4	11	I14
10	I5	9	I15
8	I6	7	I16
6	I7	5	I17
4	COM	3	COM
2	NC	1	NC

Sink Input Wiring

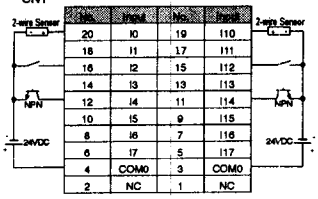


No.	Input	No.	Input
20	I0	19	I10
18	I1	17	I11
16	I2	15	I12
14	I3	13	I13
12	I4	11	I14
10	I5	9	I15
8	I6	7	I16
6	I7	5	I17
4	COM	3	COM
2	NC	1	NC

FC4A-N32B3

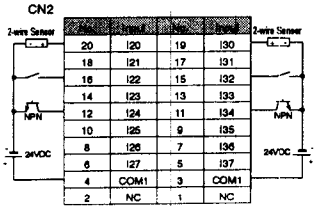
Source Input Wiring

CN1



No.	Input	No.	Input
20	I0	19	I10
18	I1	17	I11
16	I2	15	I12
14	I3	13	I13
12	I4	11	I14
10	I5	9	I15
8	I6	7	I16
6	I7	5	I17
4	COM0	3	COM0
2	NC	1	NC

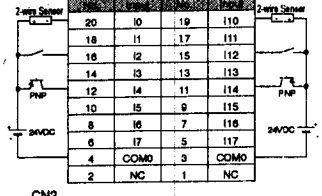
CN2



No.	Input	No.	Input
20	I20	19	I30
18	I21	17	I31
16	I22	15	I32
14	I23	13	I33
12	I24	11	I34
10	I25	9	I35
8	I26	7	I36
6	I27	5	I37
4	COM1	3	COM1
2	NC	1	NC

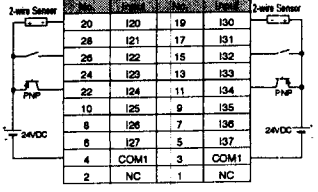
Sink Input Wiring

CN1



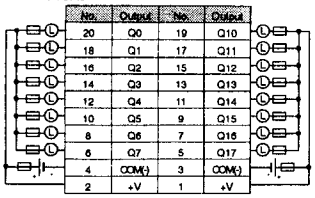
No.	Input	No.	Input
20	I0	19	I10
18	I1	17	I11
16	I2	15	I12
14	I3	13	I13
12	I4	11	I14
10	I5	9	I15
8	I6	7	I16
6	I7	5	I17
4	COM0	3	COM0
2	NC	1	NC

CN2



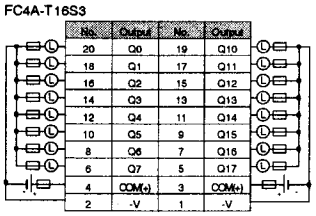
No.	Input	No.	Input
20	I20	19	I30
18	I21	17	I31
16	I22	15	I32
14	I23	13	I33
12	I24	11	I34
10	I25	9	I35
8	I26	7	I36
6	I27	5	I37
4	COM1	3	COM1
2	NC	1	NC

FC4A-T16K3



No.	Output	No.	Output
20	Q0	19	Q10
18	Q1	17	Q11
16	Q2	15	Q12
14	Q3	13	Q13
12	Q4	11	Q14
10	Q5	9	Q15
8	Q6	7	Q16
6	Q7	5	Q17
4	COM(+)	3	COM(-)
2	+V	1	+V

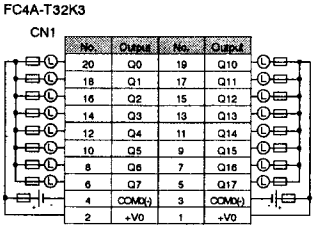
FC4A-T16S3



No.	Output	No.	Output
20	Q0	19	Q10
18	Q1	17	Q11
16	Q2	15	Q12
14	Q3	13	Q13
12	Q4	11	Q14
10	Q5	9	Q15
8	Q6	7	Q16
6	Q7	5	Q17
4	COM(+)	3	COM(+)
2	-V	1	-V

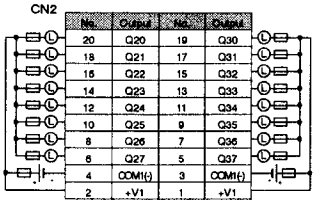
FC4A-T32K3

CN1



No.	Output	No.	Output
20	Q0	19	Q10
18	Q1	17	Q11
16	Q2	15	Q12
14	Q3	13	Q13
12	Q4	11	Q14
10	Q5	9	Q15
8	Q6	7	Q16
6	Q7	5	Q17
4	COM0(+)	3	COM0(-)
2	+V0	1	+V0

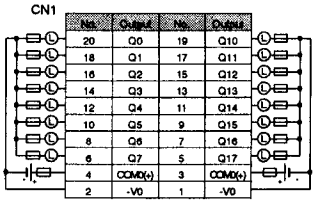
CN2



No.	Output	No.	Output
20	Q20	19	Q30
18	Q21	17	Q31
16	Q22	15	Q32
14	Q23	13	Q33
12	Q24	11	Q34
10	Q25	9	Q35
8	Q26	7	Q36
6	Q27	5	Q37
4	COM1(+)	3	COM1(-)
2	+V1	1	+V1

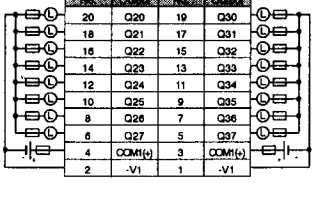
FC4A-T32S3

CN1



No.	Output	No.	Output
20	Q0	19	Q10
18	Q1	17	Q11
16	Q2	15	Q12
14	Q3	13	Q13
12	Q4	11	Q14
10	Q5	9	Q15
8	Q6	7	Q16
6	Q7	5	Q17
4	COM0(+)	3	COM0(+)
2	-V0	1	-V0

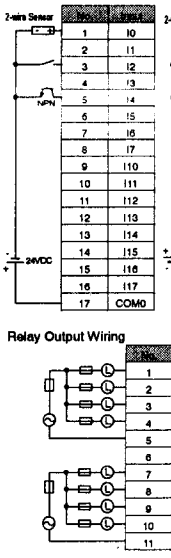
CN2



No.	Output	No.	Output
20	Q20	19	Q30
18	Q21	17	Q31
16	Q22	15	Q32
14	Q23	13	Q33
12	Q24	11	Q34
10	Q25	9	Q35
8	Q26	7	Q36
6	Q27	5	Q37
4	COM1(+)	3	COM1(+)
2	-V1	1	-V1

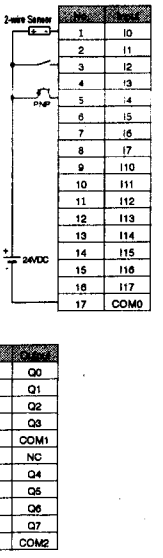
FC4A-M24BR2

Source Input Wiring



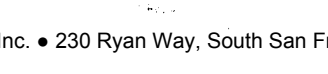
No.	Input
1	I0
2	I1
3	I2
4	I3
5	I4
6	I5
7	I6
8	I7
9	I10
10	I11
11	I12
12	I13
13	I14
14	I15
15	I16
16	I17
17	COM0

Sink Input Wiring



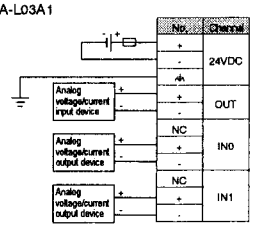
No.	Input
1	I0
2	I1
3	I2
4	I3
5	I4
6	I5
7	I6
8	I7
9	I10
10	I11
11	I12
12	I13
13	I14
14	I15
15	I16
16	I17
17	COM0

Relay Output Wiring



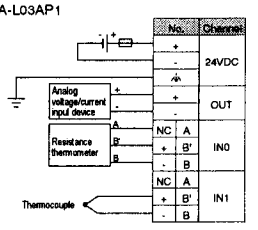
No.	Output
1	Q0
2	Q1
3	Q2
4	Q3
5	COM1
6	NC
7	Q4
8	Q5
9	Q6
10	Q7
11	COM2

FC4A-L03A1



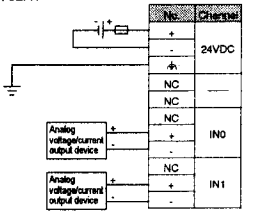
No.	Channel
+	24VDC
-	
+	OUT
-	
NC	
+	IN0
-	
NC	
+	IN1
-	

FC4A-L03AP1



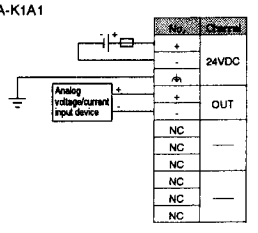
No.	Channel
+	24VDC
-	
+	OUT
-	
NC A	
+ B'	IN0
- B	
NC A	
+ B'	IN1
- B	

FC4A-J2A1



No.	Channel
+	24VDC
-	
NC	—
NC	
NC	
+	IN0
-	
NC	
+	IN1
-	

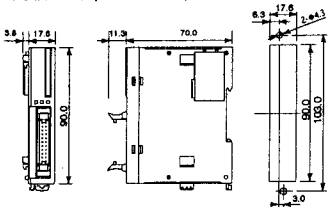
FC4A-K1A1



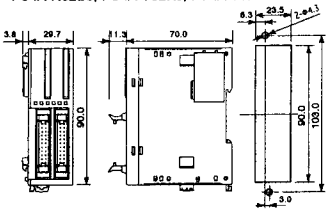
No.	Channel
+	24VDC
-	
+	OUT
-	
NC	—
NC	
NC	
NC	
NC	—
NC	

● Dimensions

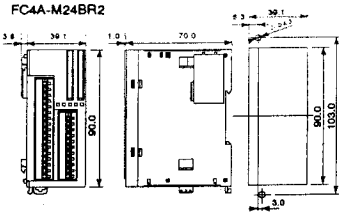
FC4A-N16B3, FC4A-T16K3, FC4A-T16S3



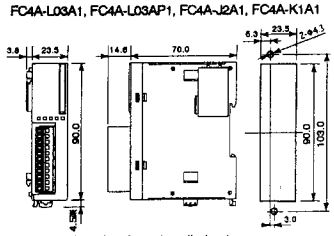
FC4A-N32B3, FC4A-T32K3, FC4A-T32S3



FC4A-M24BR2



FC4A-L03A1, FC4A-L03AP1, FC4A-J2A1, FC4A-K1A1



* 8.5 mm when the clamp is pulled out.

Dimensions in mm.

● Applicable Ferrule Dimensions (mm)

To crimp the ferrules shown below, use a special crimping tool (CRIMPFOX ZA 3).

For 1-cable connection **For 2-cable connection**

(AI 0.5-8 WH) (AI-TWIN 2×0.5-8 WH)

( ) indicates the Type No. of Phoenix Contact.

● Recommended Screwdriver

When wiring the Phoenix Contact terminal block, use the recommended screwdriver.

(Phoenix Contact Type No.: SZS 0.4x2.5)

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 at the end user.
- All MicroSmart modules are manufactured under IDEC's rigorous quality control system, but users must add a backup or failsafe provision to the control system using the MicroSmart in applications where heavy damage or personal injury may be caused in case the MicroSmart should fail.
- Install the MicroSmart according to 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 in advance.
- In this instruction sheet, safety precautions are categorized in order of importance to Warning and Caution:

⚠ Warning

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

- Turn off the power to the MicroSmart before starting installation, removal, wiring, maintenance, and inspection on the MicroSmart. Failure to turn power off 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.
- This equipment is suitable for use in Class I,Division 2, Groups A, B, C, D or non-hazardous locations only.
- Warning - Explosion Hazard - Substitution of components may impair suitability for Class I,Division 2.
- Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

⚠ Caution

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

- The MicroSmart is designed for installation in equipment. Do not install the MicroSmart outside equipment.
- Install the MicroSmart in environments described in the user's manual. If the MicroSmart is used in places where the MicroSmart is subjected to high-temperature, high-humidity, condensation, corrosive gases, excessive vibrations, and excessive shocks, then electrical shocks, fire hazard, or malfunction will result.
- The environment for using the MicroSmart is "Pollution degree 2." The pollution degree refers to a degree of pollution in the micro-environment which determines the effect of pollution on the insulation. Pollution degree 2 defines "Only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation is to be expected." Do not use the MicroSmart in environments inferior to the state specified in IEC60664-1.
- 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 a proper tightening torque of 0.22 to 0.25N·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 the MicroSmart modules.

B–575

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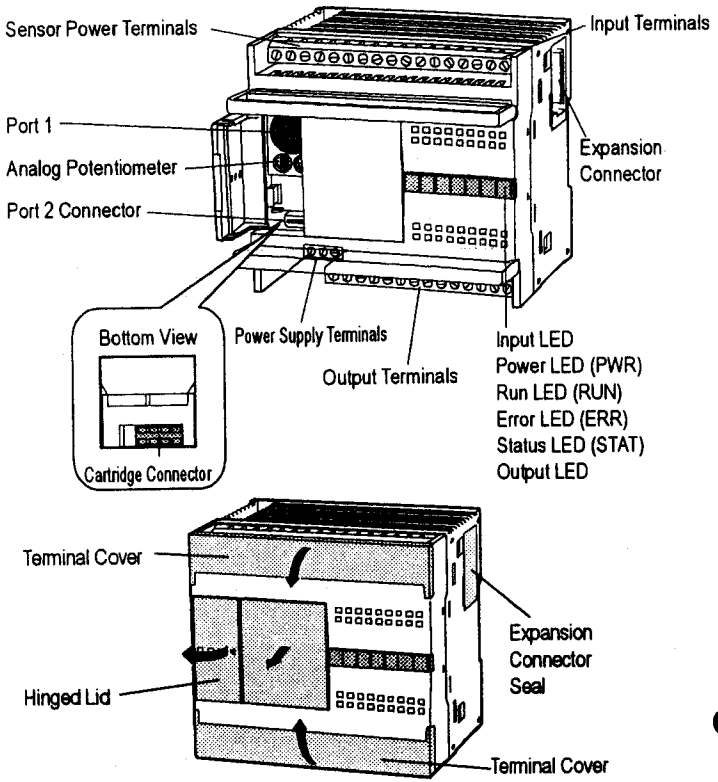
Operating Instructions

MICROSmart

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

FC4A-C10R2, FC4A-C16R2, FC4A-C24R2

Name & Function

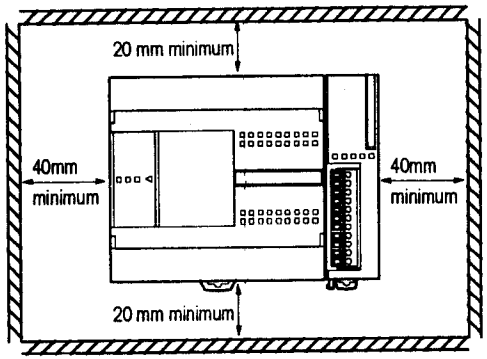


Assembling Modules

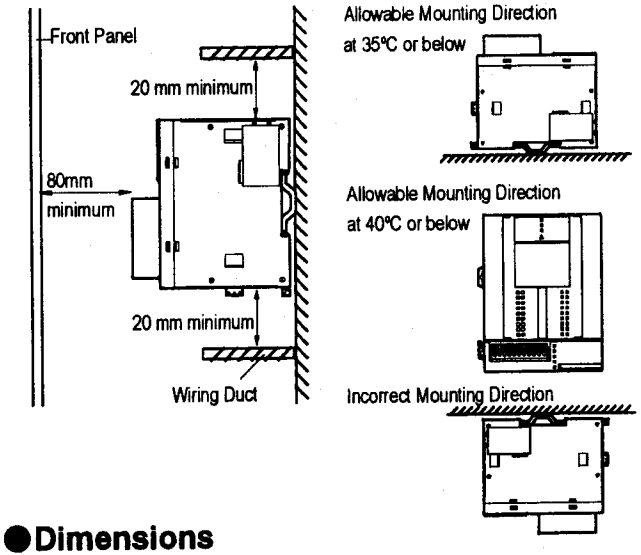
Remove the expansion connector Seal from the 24-I/O type CPU module. With the expansion connectors aligned correctly, press the CPU module and I/O module together, and push in the unlatch button to attach the modules together firmly.

Installation in Control Panel & Mounting Direction

When installing the MicroSmart in a control panel, take the convenience of operation and maintenance, and resistance against environments into consideration.

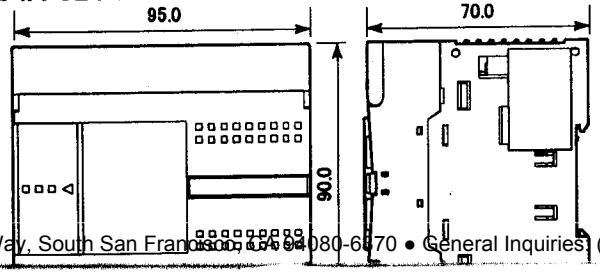


Correct Mounting Direction



Dimensions

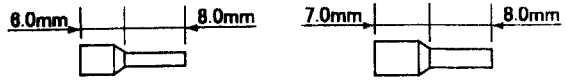
FC4A-C24R2



Applicable Ferrule Dimensions (mm)

To crimp the ferrules shown below, use a special crimping tool (CRIMPFOX ZA 3).

For 1-cable connection **For 2-cable** connection



(AI 1-8 RD, AI 1.5-8 BK) (AI-TWIN 2×0.75-8 GY)

( ) indicates the Type No. of Phoenix Contact.

Recommended Screwdriver

When wiring the Phoenix Contact terminal block, use the recommended screwdriver.

(Phoenix Contact Type No.: SZS 0.6×3.5)

Safety Precautions

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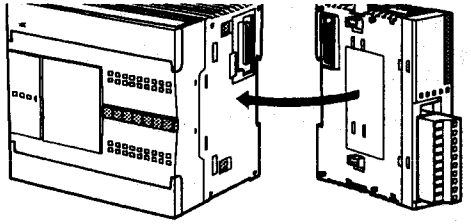
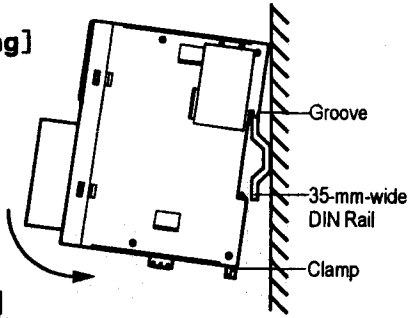


Note: I/O modules cannot be mounted on the 10- and 16-I/O type CPU modules.

Mounting Modules

[DIN Rail Mounting]

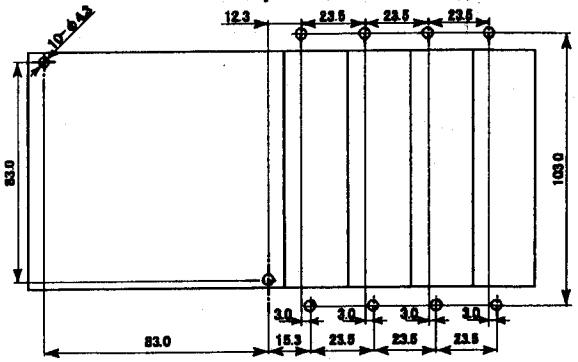
Use a 35-mm-wide DIN rail and BNL6 mounting clips to secure the modules.



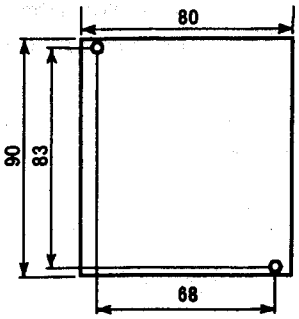
[Direct Mounting]

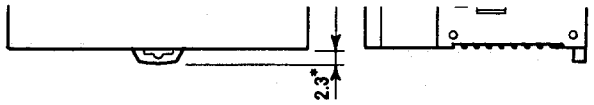
Use M4 mounting screws (6 mm or 8 mm long).

FC4A-C24R2 and Expansion I/O Modules

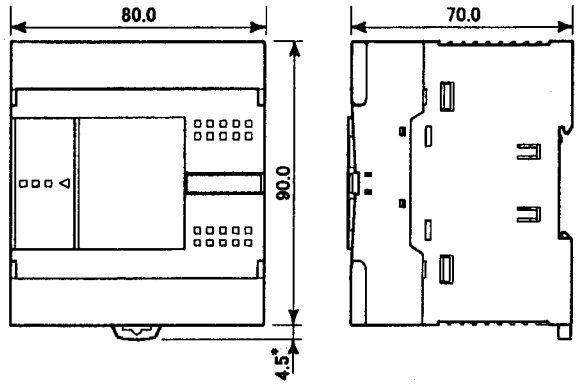


FC4A-C10R2 and FC4A-C16R2





FC4A-C10R2 and FC4A-C16R2

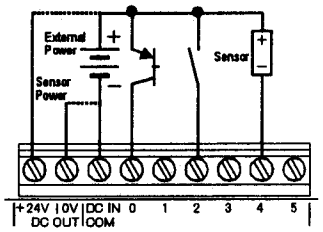


* 8.5 mm when the clamp is pulled out.

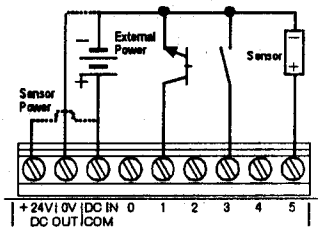
Dimensions in mm.

Wiring

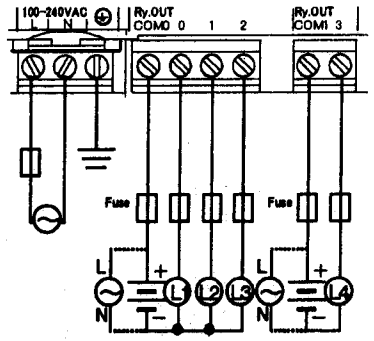
DC Sink Input Wiring



DC Source Input Wiring



AC Power and Relay Output Wiring



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.

- This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.
- Warning - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
- Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

⚠Caution

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

- The MicroSmart is designed for installation in equipment. Do not install the MicroSmart outside equipment.
- Install the MicroSmart in environments described in the user's manual. If the MicroSmart is used in places where the MicroSmart is subjected to high-temperature, high-humidity, condensation, corrosive gases, excessive vibrations, and excessive shocks, then electrical shocks, fire hazard, or malfunction will result.
- The environment 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 a proper tightening torque of 0.5 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.
- Use the sensor power supply only for supplying power to sensors connected to the MicroSmart.
- Do not disassemble, repair, or modify the MicroSmart modules.

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Operating Instructions

B-543B

MICROSmart

This sheet provides brief operating instructions of the MicroSmart optional cartridges. For details, see the MicroSmart User's Manual.

Memory Cartridge (FC4A-PM32) and Clock Cartridge (FC4A-PT1)

●Function

Memory Cartridge

The memory cartridge is used to store a user program. When a memory cartridge is installed on the CPU module, the user program stored on the memory cartridge has priority over the user program in the CPU module EEPROM.

Memory Cartridge	User Program Execution
Installed	The user program stored on the memory cartridge is executed.
Not installed	The user program in the CPU module EEPROM is executed.

Clock Cartridge

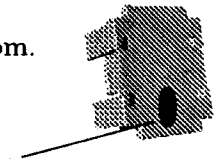
The clock cartridge makes it possible to use the calendar/clock functions in your user program. For details, see the MicroSmart User's Manual.

Notes: Before using the clock cartridge for the first time, set the date and time in the clock cartridge using WindLDR.

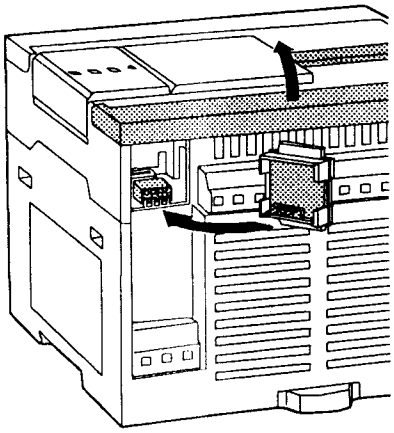
●Installing a Memory or Clock Cartridge

Remove the dummy cartridge from the CPU module. Make sure of correct orientation and install a memory or clock cartridge into the cartridge connector securely.

The protruding potion should be bottom.



protruding potion



●Removing the Memory or Clock Cartridge

Hold the ribs on top and bottom of the cartridge, and pull the cartridge straight out.

⚠Caution Before installing or removing a memory or clock cartridge, turn off the power to the CPU module. If a memory or clock cartridge is installed or removed while the CPU module is powered up, the cartridge may be damaged.

⚠Warning This equipment is suitable for use in Class I,Division2,Groups A,B,C,D or non-hazardous locations only.

Warning - Explosion Hazard - Substitution of components may impair suitability for ClassI,Division2.

Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

B-579

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Operating Instructions

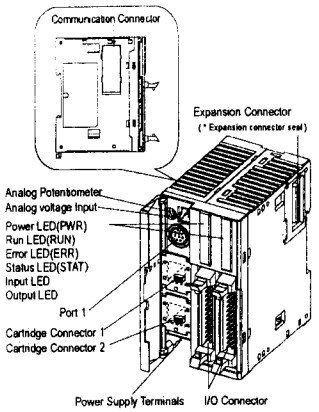
www.idec.com

MICROSmart

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

FC4A-D20K3, FC4A-D20S3, FC4A-D20RK1, FC4A-D20RS1, FC4A-D40K3, FC4A-D40S3

Name & Function



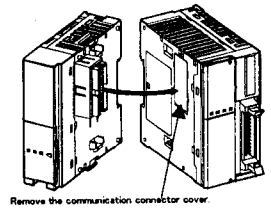
Assembling

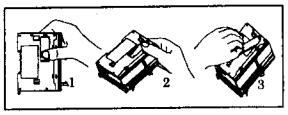
[I/O Modules]

Remove the expansion connector seal (*) from the CPU module. With the expansion connectors aligned correctly, press the CPU module and I/O module together, and push in the unlatch button to attach the modules together firmly.

[Communication Modules]

Remove the communication connector cover from the CPU module. With the communication connectors aligned correctly, press the CPU module and communication module together, and push in the unlatch button to attach the modules together firmly.

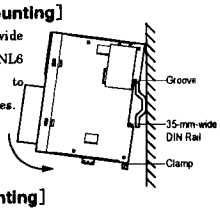




Mounting Modules

[DIN Rail Mounting]

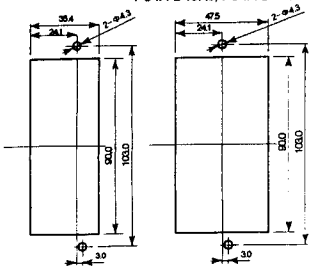
Use a 35-mm-wide DIN rail and BNL6 mounting clips to secure the modules.



[Direct Mounting]

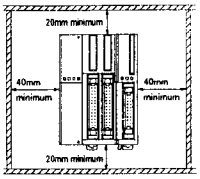
Use M4 mounting screws (6 mm or 8 mm long).

FC4A-D20K3 FC4A-D20RK1
FC4A-D20S3 FC4A-D20RS1
FC4A-D40K3, FC4A-D40S3

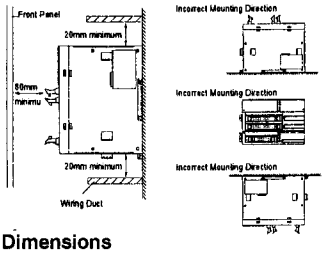


Installation in Control Panel & Mounting Direction

When installing the MicroSmart in a control panel, take the convenience of operation and maintenance, and resistance against environments into consideration.

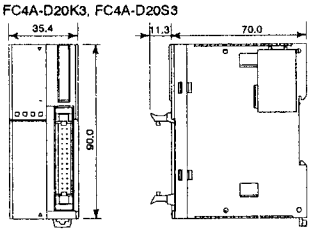


Correct Mounting Direction

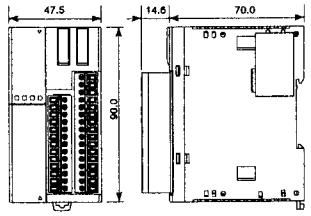


Dimensions

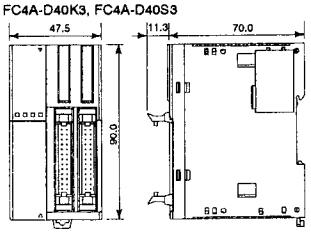
FC4A-D20K3, FC4A-D20S3



FC4A-D20RK1, FC4A-D20RS1



FC4A-D40K3, FC4A-D40S3

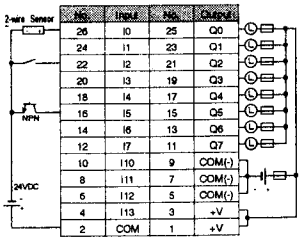


* 8.5 mm when the clamp is pulled out.

Dimensions in mm.

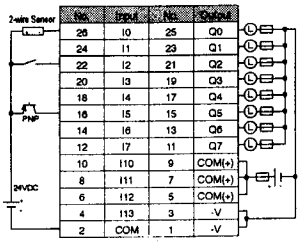
I/O Wiring

FC4A-D20K3



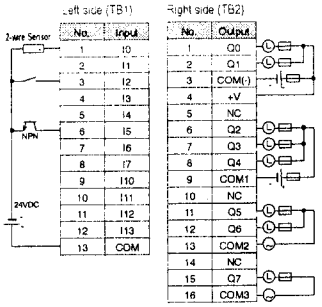
No.	Input	No.	Output
26	I0	25	Q0
24	I1	23	Q1
22	I2	21	Q2
20	I3	19	Q3
18	I4	17	Q4
16	I5	15	Q5
14	I6	13	Q6
12	I7	11	Q7
10	I10	9	COM(-)
8	I11	7	COM(-)
6	I12	5	COM(-)
4	I13	3	+V
2	COM	1	+V

FC4A-D20S3



No.	Input	No.	Output
26	I0	25	Q0
24	I1	23	Q1
22	I2	21	Q2
20	I3	19	Q3
18	I4	17	Q4
16	I5	15	Q5
14	I6	13	Q6
12	I7	11	Q7
10	I10	9	COM(+)
8	I11	7	COM(+)
6	I12	5	COM(+)
4	I13	3	-V
2	COM	1	-V

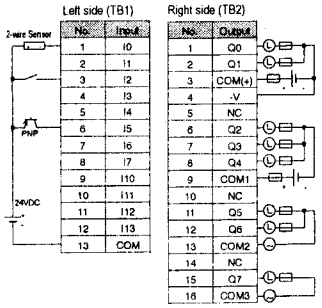
FC4A-D20RK1



No.	Input
1	I0
2	I1
3	I2
4	I3
5	I4
6	I5
7	I6
8	I7
9	I10
10	I11
11	I12
12	I13
13	COM

No.	Output
1	Q0
2	Q1
3	COM(-)
4	+V
5	NC
6	Q2
7	Q3
8	Q4
9	COM1
10	NC
11	Q5
12	Q6
13	COM2
14	NC
15	Q7
16	COM3

FC4A-D20RS1

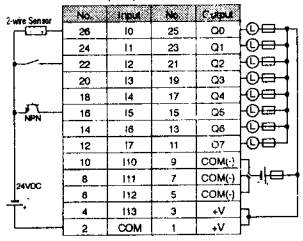


No.	Input
1	I0
2	I1
3	I2
4	I3
5	I4
6	I5
7	I6
8	I7
9	I10
10	I11
11	I12
12	I13
13	COM

No.	Output
1	Q0
2	Q1
3	COM(+)
4	-V
5	NC
6	Q2
7	Q3
8	Q4
9	COM1
10	NC
11	Q5
12	Q6
13	COM2
14	NC
15	Q7
16	COM3

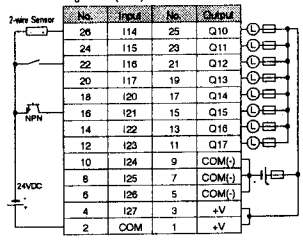
FC4A-D40K3

Left side (CN1)



No.	Input	No.	Output
26	I0	25	Q0
24	I1	23	Q1
22	I2	21	Q2
20	I3	19	Q3
18	I4	17	Q4
16	I5	15	Q5
14	I6	13	Q6
12	I7	11	Q7
10	I10	9	COM(-)
8	I11	7	COM(-)
6	I12	5	COM(-)
4	I13	3	+V
2	COM	1	+V

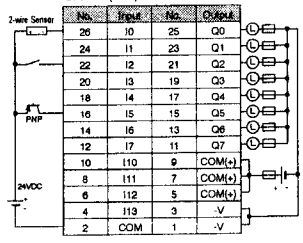
Right side (CN2)



No.	Input	No.	Output
26	I14	25	Q10
24	I15	23	Q11
22	I16	21	Q12
20	I17	19	Q13
18	I20	17	Q14
16	I21	15	Q15
14	I22	13	Q16
12	I23	11	Q17
10	I24	9	COM(-)
8	I25	7	COM(-)
6	I26	5	COM(-)
4	I27	3	+V
2	COM	1	+V

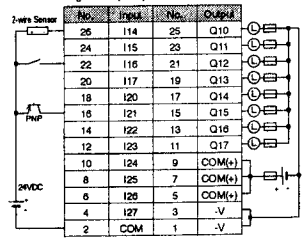
FC4A-D40S3

Left side (CN1)



No.	Input	No.	Output
26	I0	25	Q0
24	I1	23	Q1
22	I2	21	Q2
20	I3	19	Q3
18	I4	17	Q4
16	I5	15	Q5
14	I6	13	Q6
12	I7	11	Q7
10	I10	9	COM(+)
8	I11	7	COM(+)
6	I12	5	COM(+)
4	I13	3	-V
2	COM	1	-V

Right side (CN2)



No.	Input	No.	Output
26	I14	25	Q10
24	I15	23	Q11
22	I16	21	Q12
20	I17	19	Q13
18	I20	17	Q14
16	I21	15	Q15
14	I22	13	Q16
12	I23	11	Q17
10	I24	9	COM(+)
8	I25	7	COM(+)
6	I26	5	COM(+)
4	I27	3	-V
2	COM	1	-V

The following symbols represent a fuse and a load.

Fuse Load

Applicable Ferrule Dimensions (mm)

To crimp the ferrules shown below, use a special crimping tool (CRIMPFOX ZA-3).

For 1-cable connection	For 2-cable connection
	
(AI 1-8 RD , AI 1.5-8 BK)	(AI-TWIN 2×0.75-8 GY)
(AI 0.5-8 WH)	(AI-TWIN 2×0.5-8 WH)

( ) indicates the Type No. of Phoenix Contact.

Recommended Screwdriver

When wiring the Phoenix Contact terminal block, use the recommended screwdriver.

(Phoenix Contact Type No.: SZS 0.6×3.5; SZS 0.4×2.5)

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 at the end user.
- All MicroSmart modules are manufactured under IDEC's rigorous quality control system, but users must add a backup or failsafe provision to the control system using the MicroSmart in applications where heavy damage or personal injury may be caused in case the MicroSmart should fail.
- Install the MicroSmart according to 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 in advance.
- In this instruction sheet, safety precautions are categorized in order of importance to Warning and Caution:

⚠ Warning

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

- Turn off the power to the MicroSmart before starting installation, removal, wiring, maintenance, and inspection on the MicroSmart. Failure to turn power off 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.
- This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.
- Warning - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
- Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

⚠ Caution

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

- The MicroSmart is designed for installation in equipment. Do not install the MicroSmart outside equipment.
- Install the MicroSmart in environments described in the user's manual. If the MicroSmart is used in places where the MicroSmart is subjected to high-temperature, high-humidity, condensation, corrosive gases, excessive vibrations, and excessive shocks, then electrical shocks, fire hazard, or malfunction will result.
- The environment 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 a proper tightening torque of 0.5 N-m (power supply terminals) or 0.22 to 0.25 N-m.(I/O terminals)
- 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.
- Use the sensor power supply only for supplying power to sensors connected to the MicroSmart.
- Do not disassemble, repair, or modify the MicroSmart modules.

IDEC

B-980 (0)

INSTRUCTION SHEET

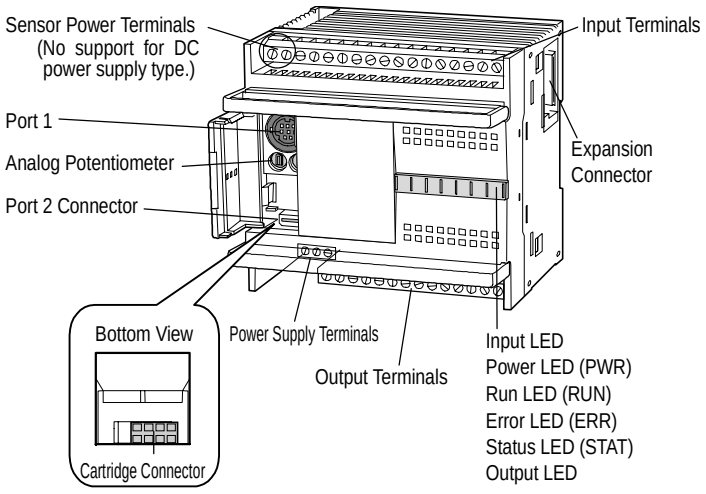
MICROSmart pentra

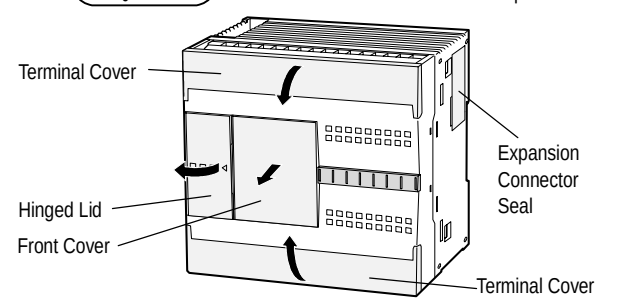
FC5A Series

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

FC5A-C10R2, FC5A-C16R2, FC5A-C24R2 (AC power supply)
FC5A-C10R2C, FC5A-C16R2C, FC5A-C24R2C (DC power supply)

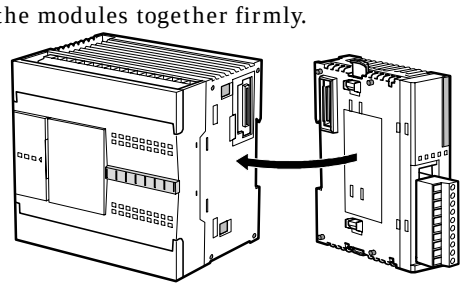
●Name & Function





●Assembling Modules

Remove the expansion connector Seal from the 24-I/O type CPU module. With the expansion connectors aligned correctly, press the CPU module and I/O module together, and push in the unlatch button to attach the modules together firmly.

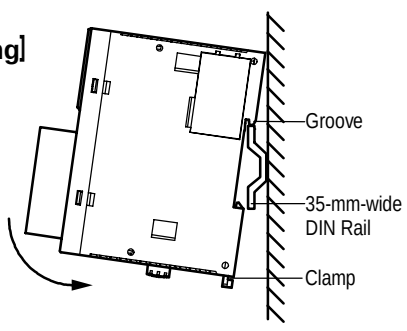


Note: I/O modules cannot be mounted on the 10- and 16-I/O type CPU modules.

●Mounting Modules

[DIN Rail Mounting]

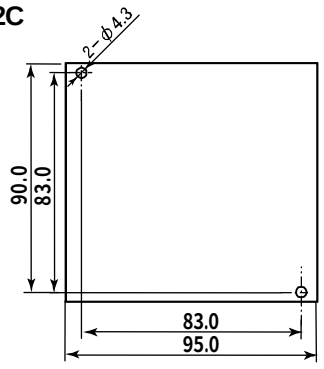
Use a 35-mm-wide DIN rail and BNL6 mounting clips to secure the modules.



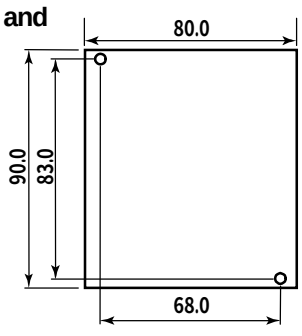
[Direct Mounting]

Use M4 mounting screws (6 mm or 8 mm long).

FC5A-C24R2, -C24R2C

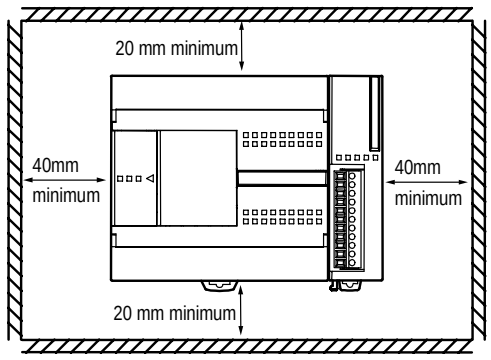


FC5A-C10R2, -C16R2, and -C10R2C, -C16R2C

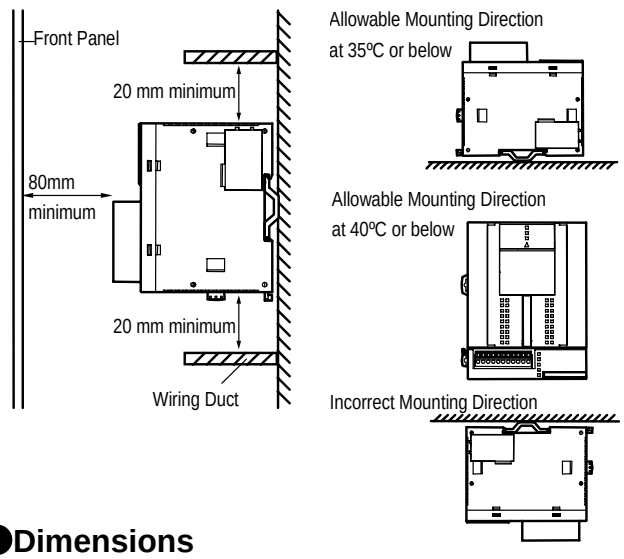


●Installation in Control Panel & Mounting Direction

When installing the MicroSmart in a control panel, take the convenience of operation and maintenance, and resistance against environments into consideration.

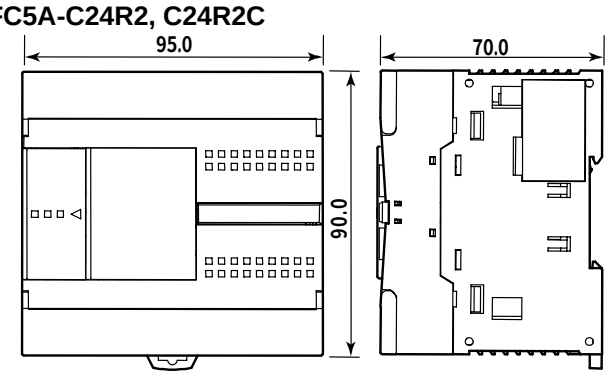


Correct Mounting Direction (at 55℃ or below)

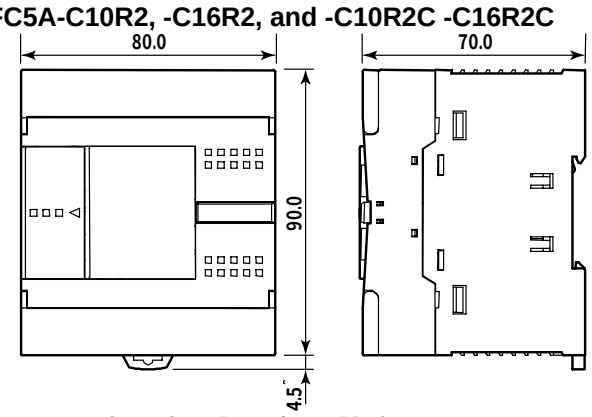


●Dimensions

FC5A-C24R2, C24R2C



FC5A-C10R2, -C16R2, and -C10R2C -C16R2C

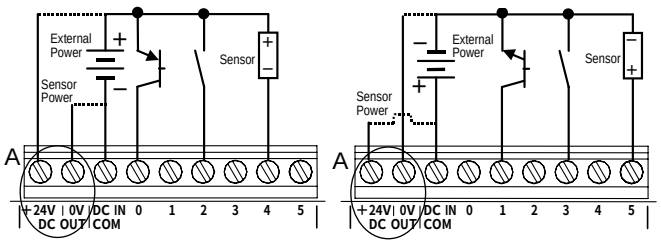


*** 8.5 mm when the clamp is pulled out.**

Dimensions in mm.

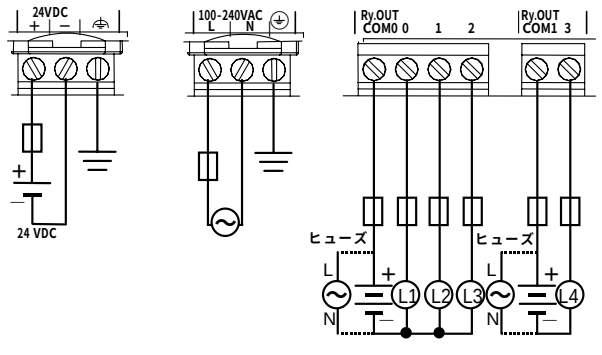
●Wiring

DC Sink Input Wiring **DC Source Input Wiring**



AC power supply type: Support of sensor power which is A-section of above figure is able to use instead of external power.
DC power supply type: No support of sensor power. Therefore external power is required.

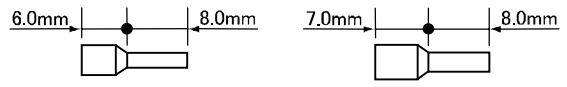
DC Power Wiring **AC Power Wiring** **Relay Output Wiring**



●Applicable Ferrule Dimensions (mm)

To crimp the ferrules shown below, use a special crimping tool (CRIMPFOX ZA 3).

For 1-cable connection **For 2-cable** connection



(AI 1-8 RD、AI 1.5-8 BK) (AI-TWIN 2×0.75-8 GY)

( ) indicates the Type No. of Phoenix Contact.

●Recommended Screwdriver

When wiring the Phoenix Contact terminal block, use the recommended screwdriver.
(Phoenix Contact Type No.: SZS 0.6×3.5)

SAFETY NOTE

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 at the end user.
- All MicroSmart modules are manufactured under IDEC's rigorous quality control system, but users must add a backup or failsafe provision to the control system using the MicroSmart in applications where heavy damage or personal injury may be caused in case the MicroSmart should fail.
- Install the MicroSmart according to 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 in advance.
- In this instruction sheet, safety precautions are categorized in order of importance to Warning and Caution:

⚠ WARNING

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

- Turn power off to the MicroSmart before starting installation, removal, wiring, maintenance, and inspection on the MicroSmart.
- Failure to turn power off 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.
- This equipment is suitable for use in Class I,Division2,Groups A,B,C,D or non-hazardous locations only.
- Warning - Explosion Hazard - Substitution of components may impair suitability for ClassI,Division2.
- Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

⚠ CAUTION

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

- The MicroSmart is designed for installation in equipment. Do not install the MicroSmart outside equipment.
- Install the MicroSmart in environments described in the user's manual. If the MicroSmart is used in places where the MicroSmart is subjected to high-temperature, high-humidity, condensation, corrosive gases, excessive vibrations, and excessive shocks, then electrical shocks, fire hazard, or malfunction will result.
- The environment 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 a proper tightening torque of 0.5 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.
- Use the sensor power supply only for supplying power to sensors connected to the MicroSmart.
- Do not disassemble, repair, or modify the MicroSmart modules.

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B-981 (0)

INSTRUCTION SHEET

MICRO Smart pentra

FC5A Series

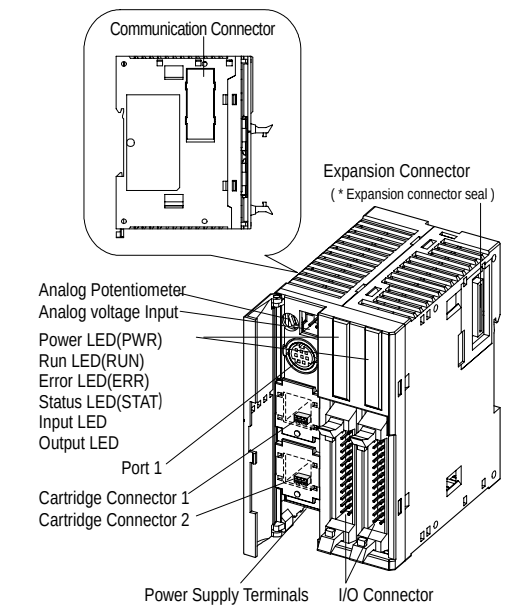
This sheet provides brief operating instructions of the MicroSmart programmable controller. For details, see the MicroSmart User's Manual(FC9Y-B927).

1 Type

FC5A-D16RK1, FC5A-D16RS1

FC5A-D32K3, FC5A-D32S3

2 Name & Function



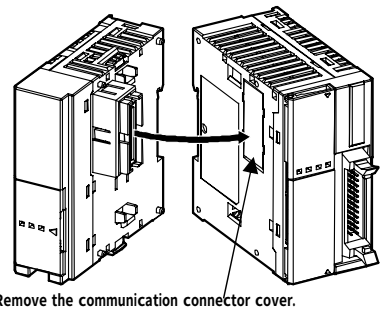
3 Assembling

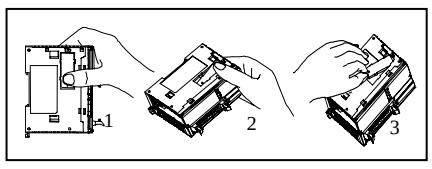
[I/O Modules]

Remove the expansion connector seal (*) from the CPU module. With the expansion connectors aligned correctly, press the CPU module and I/O module together, and push in the unlatch button to attach the modules together firmly.

[Communication Modules]

Remove the communication connector cover from the CPU module. With the communication connectors aligned correctly, press the CPU module and communication module together, and push in the unlatch button to attach the modules together firmly.

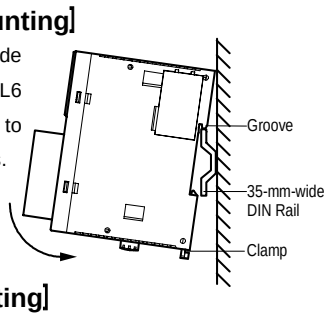




4 Mounting Modules

[DIN Rail Mounting]

Use a 35-mm-wide DIN rail and BNL6 mounting clips to secure the modules.

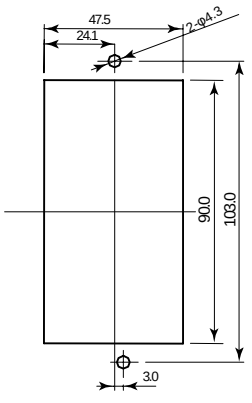


[Direct Mounting]

Use optional direct mounting strip FC4A-PSP1P and M4 mounting screws (6 mm or 8 mm long).

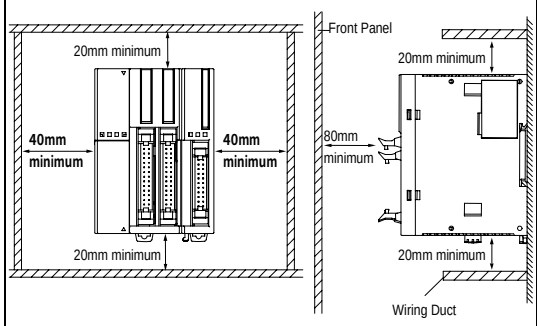
FC5A-D16RK1, FC5A-D16RS1

FC5A-D32K3, FC5A-D32S3

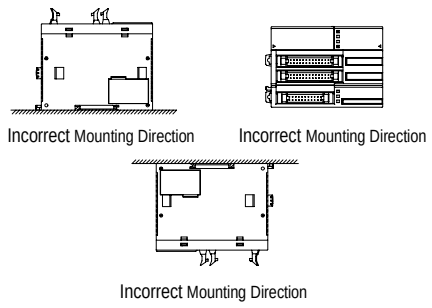


5 Installation in Control Panel & Mounting Direction

When installing the MicroSmart in a control panel, take the convenience of operation and maintenance, and resistance against environments into consideration.

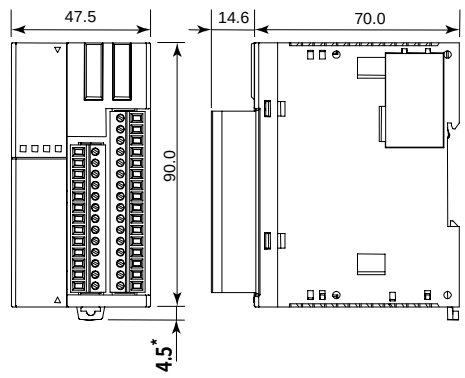


Always mount the slim type CPU modules horizontally on a vertical plane as shown above. Any other mounting directions are not allowed.

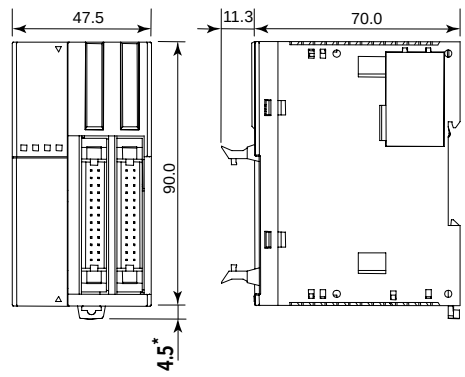


6 Dimensions

FC5A-D16RK1, FC5A-D16RS1



FC5A-D32K3, FC5A-D32S3



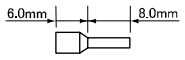
* 8.5 mm when the clamp is pulled out.

Dimensions in mm.

7 Applicable Ferrule Dimensions

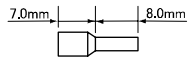
To crimp the ferrules shown below, use a special crimping tool (CRIMPFOX ZA3).

For 1-cable connection



(AI 1-8 RD , AI 1.5-8 BK)
(AI 0.5-8 WH)

For 2-cable connection



(AI-TWIN 2×0.75-8 GY)
(AI-TWIN 2×0.5-8 WH)

( ) indicates the Type No. of Phoenix Contact.

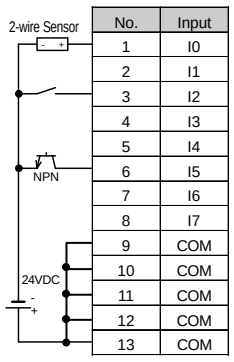
8 Recommended Screwdriver

When wiring the Phoenix Contact terminal block, use the recommended screwdriver.
(Phoenix Contact Type No. : SZS 0.6×3.5, SZS 0.4×2.5)

9 I/O Wiring

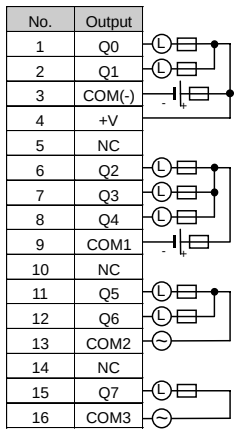
FC5A-D16RK1

Left side (TB1)



No.	Input
1	I0
2	I1
3	I2
4	I3
5	I4
6	I5
7	I6
8	I7
9	COM
10	COM
11	COM
12	COM
13	COM

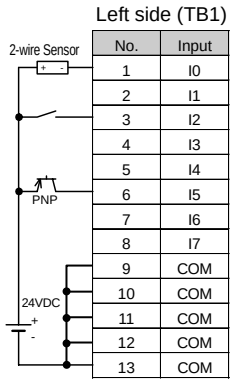
Right side (TB2)



No.	Output
1	Q0
2	Q1
3	COM(-)
4	+V
5	NC
6	Q2
7	Q3
8	Q4
9	COM1
10	NC
11	Q5
12	Q6
13	COM2
14	NC
15	Q7
16	COM3

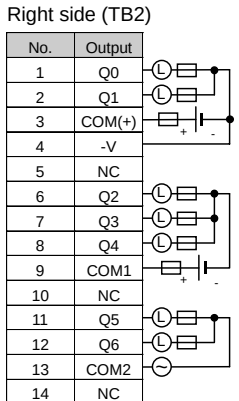
FC5A-D16RS1

Left side (TB1)



No.	Input
1	I0
2	I1
3	I2
4	I3
5	I4
6	I5
7	I6
8	I7
9	COM
10	COM
11	COM
12	COM
13	COM

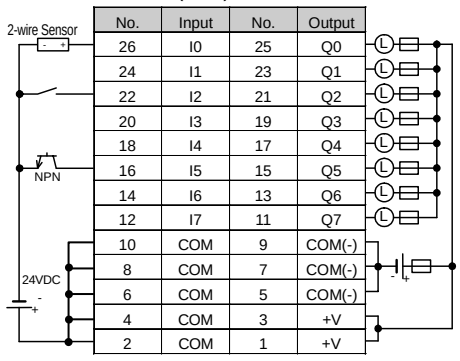
Right side (TB2)



No.	Output
1	Q0
2	Q1
3	COM(+)
4	-V
5	NC
6	Q2
7	Q3
8	Q4
9	COM1
10	NC
11	Q5
12	Q6
13	COM2
14	NC
15	Q7
16	COM3

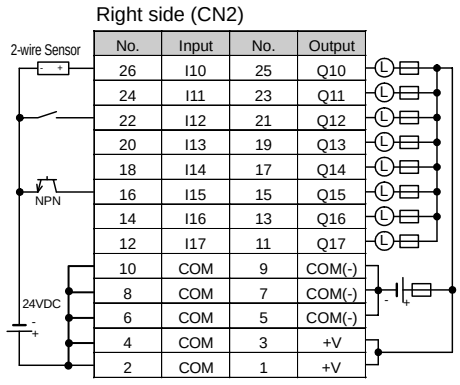
FC5A-D32K3

Left side (CN1)



No.	Input	No.	Output
26	I0	25	Q0
24	I1	23	Q1
22	I2	21	Q2
20	I3	19	Q3
18	I4	17	Q4
16	I5	15	Q5
14	I6	13	Q6
12	I7	11	Q7
10	COM	9	COM(-)
8	COM	7	COM(-)
6	COM	5	COM(-)
4	COM	3	+V
2	COM	1	+V

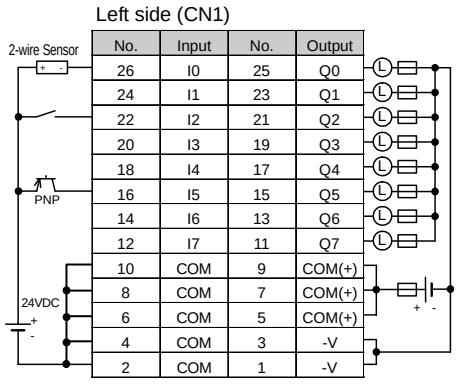
Right side (CN2)



No.	Input	No.	Output
26	I10	25	Q10
24	I11	23	Q11
22	I12	21	Q12
20	I13	19	Q13
18	I14	17	Q14
16	I15	15	Q15
14	I16	13	Q16
12	I17	11	Q17
10	COM	9	COM(-)
8	COM	7	COM(-)
6	COM	5	COM(-)
4	COM	3	+V
2	COM	1	+V

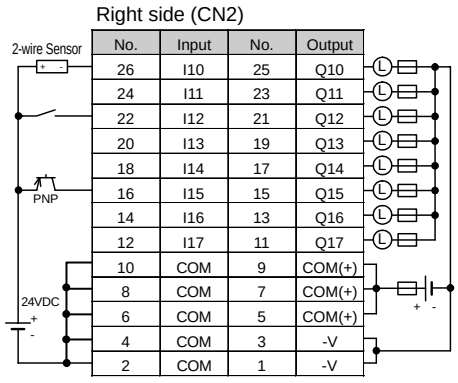
FC4A-D32S3

Left side (CN1)



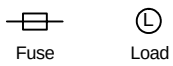
No.	Input	No.	Output
26	I0	25	Q0
24	I1	23	Q1
22	I2	21	Q2
20	I3	19	Q3
18	I4	17	Q4
16	I5	15	Q5
14	I6	13	Q6
12	I7	11	Q7
10	COM	9	COM(+)
8	COM	7	COM(+)
6	COM	5	COM(+)
4	COM	3	-V
2	COM	1	-V

Right side (CN2)



No.	Input	No.	Output
26	I10	25	Q10
24	I11	23	Q11
22	I12	21	Q12
20	I13	19	Q13
18	I14	17	Q14
16	I15	15	Q15
14	I16	13	Q16
12	I17	11	Q17
10	COM	9	COM(+)
8	COM	7	COM(+)
6	COM	5	COM(+)
4	COM	3	-V
2	COM	1	-V

The following symbols represent a fuse and a load.



COM, COM(-), COM(+), COM1, COM2, and COM3 terminals are not interconnected.
COM terminals are interconnected.

10 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 at the end user.
- All MicroSmart modules are manufactured under IDEC's rigorous quality control system, but users must add a backup or failsafe provision to the control system using the MicroSmart in applications where heavy damage or personal injury may be caused in case the MicroSmart should fail.
- Install the MicroSmart according to 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 in advance.
- In this instruction sheet, safety precautions are categorized in order of importance to Warning and Caution:

⚠ WARNING

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

- Turn off the power to the MicroSmart before starting installation, removal, wiring, maintenance, and inspection on the MicroSmart. Failure to turn power off 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.
- This equipment is suitable for use in Class I, Division 2, Groups A, B, C, D or non-hazardous locations only.
- Warning - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
- Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.

⚠ CAUTION

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

- The MicroSmart is designed for installation in equipment. Do not install the MicroSmart outside equipment.
- Install the MicroSmart in environments described in the user's manual. If the MicroSmart is used in places where the MicroSmart is subjected to high-temperature, high-humidity, condensation, corrosive gases, excessive vibrations, and excessive shocks, then electrical shocks, fire hazard, or malfunction will result.
- The environment 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 a proper tightening torque of 0.5 N·m (power supply terminals) or 0.22 to 0.25 N·m (I/O terminals).
- 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 the MicroSmart modules.

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IDEC IZUMI CORPORATION

Operating Instruction

OpenNet Controller

Made in Japan

Read this instruction sheet and the OpenNet Controller user's manual to make sure of correct operation. Keep this instruction sheet at the end user.

FC3A-R161, FC3A-R162, FC3A-T16K1, FC3A-T16K3, FC3A-T32K4, FC3A-T32K5, FC3A-DA1221

● Terminal Arrangement

Connect an IEC60127-approved fuse at the position indicated in the circuit diagram below to meet voltage and current requirements. For details about output modules, see the OpenNet Controller user's manual.

The following symbols represent a fuse and a load.

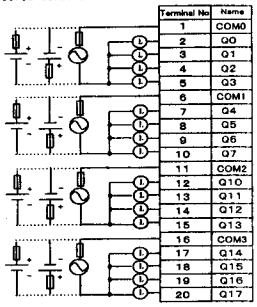
Fuse Load

16-point Relay Output Module

COM terminals are not connected together internally.

FC3A-R161

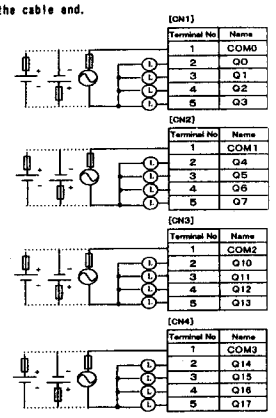
Terminal No. are indicated on the terminal label on the screw terminal block.



Terminal No	Name
1	COM0
2	Q0
3	Q1
4	Q2
5	Q3
6	COM1
7	Q4
8	Q5
9	Q6
10	Q7
11	COM2
12	Q10
13	Q11
14	Q12
15	Q13
16	COM3
17	Q14
18	Q15
19	Q16
20	Q17

FC3A-R162

Terminal No. are indicated on the female connector at the cable end.



[CN1]

Terminal No	Name
1	COM0
2	Q0
3	Q1
4	Q2
5	Q3

[CN2]

Terminal No	Name
1	COM1
2	Q4
3	Q5
4	Q6
5	Q7

[CN3]

Terminal No	Name
1	COM2
2	Q10
3	Q11
4	Q12
5	Q13

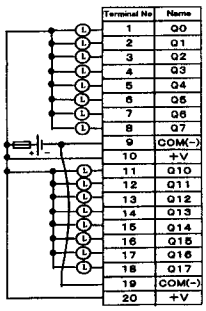
[CN4]

Terminal No	Name
1	COM3
2	Q14
3	Q15
4	Q16
5	Q17

16-point Transistor Sink Output Module

FC3A-T16K1

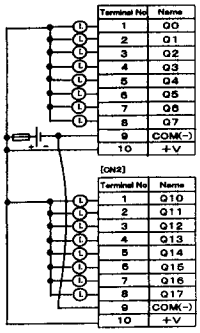
Terminal No. are indicated on the terminal label on the screw terminal block.



Terminal No	Name
1	Q0
2	Q1
3	Q2
4	Q3
5	Q4
6	Q5
7	Q6
8	Q7
9	COM(-)
10	+V
11	Q10
12	Q11
13	Q12
14	Q13
15	Q14
16	Q15
17	Q16
18	Q17
19	COM(-)
20	+V

FC3A-T16K3

Terminal No. are indicated on the female connector at the cable end.



[CN1]

Terminal No	Name
1	Q0
2	Q1
3	Q2
4	Q3
5	Q4
6	Q5
7	Q6
8	Q7
9	COM(-)
10	+V

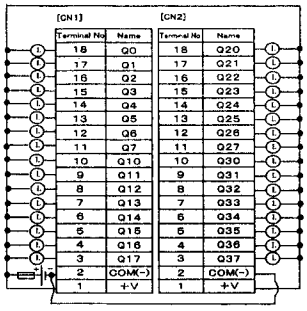
[CN2]

Terminal No	Name
1	Q10
2	Q11
3	Q12
4	Q13
5	Q14
6	Q15
7	Q16
8	Q17
9	COM(-)
10	+V

32-point Transistor Sink Output Module

FC3A-T32K4

Terminal No. are indicated on the female connector at the cable end.



[CN1]

Terminal No	Name
18	Q0
17	Q1
16	Q2
15	Q3
14	Q4
13	Q5
12	Q6
11	Q7
10	Q10
9	Q11
8	Q12
7	Q13
6	Q14
5	Q15
4	Q16
3	Q17
2	COM(-)
1	+V

[CN2]

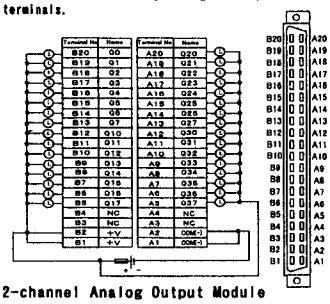
Terminal No	Name
18	Q20
17	Q21
16	Q22
15	Q23
14	Q24
13	Q25
12	Q26
11	Q27
10	Q30
9	Q31
8	Q32
7	Q33
6	Q34
5	Q35
4	Q36
3	Q37
2	COM(-)
1	+V

FC3A-T32K5

Terminal No. represent the pin arrangement of the male connector on the module as shown in the diagram.

Note: Be sure to connect two COM(-) terminals and two +V terminals, respectively.

Note: Do not connect any wiring to NC (no connection) terminals.

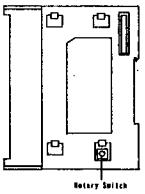


B20	Q0	A20	Q20
B19	Q1	A19	Q21
B18	Q2	A18	Q22
B17	Q3	A17	Q23
B16	Q4	A16	Q24
B15	Q5	A15	Q25
B14	Q6	A14	Q26
B13	Q7	A13	Q27
B12	Q10	A12	Q30
B11	Q11	A11	Q31
B10	Q12	A10	Q32
B9	Q13	A9	Q33
B8	Q14	A8	Q34
B7	Q15	A7	Q35
B6	Q16	A6	Q36
B5	Q17	A5	Q37
B4	NC	A4	NC
B3	NC	A3	NC
B2	+V	A2	COM(-)
B1	+V	A1	COM(-)

2-channel Analog Output Module

FC3A-DA1221

Analog output module can select an output signal range using the rotary switch on the side of the module.



Rotary Switch

Rotary Switch

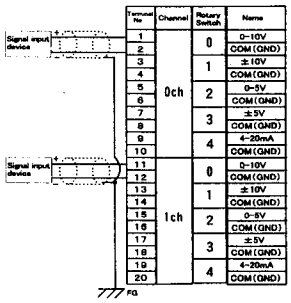
Rotary Switch Position	Output Signal Range
0	0 to 10V DC
1	±10V DC
2	0 to 5V DC
3	±5V DC
4	4 to 20mA DC

Note: After changing the rotary switch setting while the CPU module is powered up, press the communication enable button on the CPU module for more than 4 seconds until the ERROR LED blinks once; then the new output signal range takes effect.

Terminal Arrangement

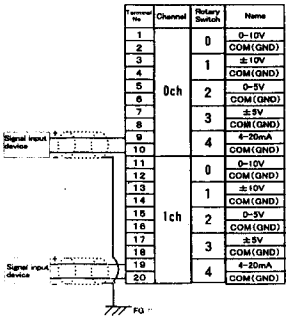
Terminal No. are indicated on the terminal label on the screw terminal block. Use a two-core twisted pair shielded cable with a minimum core diameter of 0.9mm. Connect the shield wire to a proper frame ground (FG). Ten COM (GND) terminals are connected together internally.

When using voltage output (with the rotary switch set to 0)



Terminal No	Channel	Rotary Switch	Name
1	0ch	0	0-10V
2			COM(GND)
3		1	±10V
4			COM(GND)
5		2	0-5V
6			COM(GND)
7		3	±5V
8			COM(GND)
9		4	4-20mA
10			COM(GND)
11	1ch	0	0-10V
12			COM(GND)
13		1	±10V
14			COM(GND)
15		2	0-5V
16			COM(GND)
17		3	±5V
18			COM(GND)
19		4	4-20mA
20			COM(GND)

When using current output (with the rotary switch set to 4)

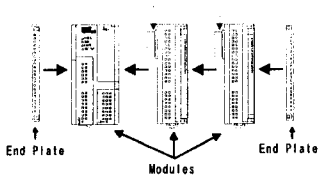


Terminal No	Channel	Rotary Switch	Name
1	0ch	0	0-10V
2			COM(GND)
3		1	±10V
4			COM(GND)
5		2	0-5V
6			COM(GND)
7		3	±5V
8			COM(GND)
9		4	4-20mA
10			COM(GND)
11	1ch	0	0-10V
12			COM(GND)
13		1	±10V
14			COM(GND)
15		2	0-5V
16			COM(GND)
17		3	±5V
18			COM(GND)
19		4	4-20mA
20			COM(GND)

● Assembling and Disassembling Modules

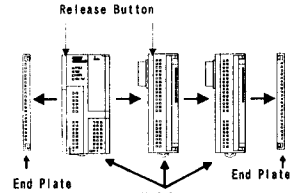
Assembling Modules

Place the expansion connectors of two modules together and press the modules together until the latch clicks to combine the modules securely. Improper connection between modules will cause malfunction or damage when power is turned on. Attach end plates to both sides of the module row.



Disassembling Modules

Keep the blue release button on top of the module depressed to disengage the latch, and pull the modules apart.

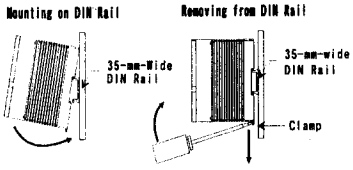


For details about assembling and disassembling modules, see the OpenNet Controller user's manual.

Note: Turn power off to the OpenNet Controller before assembling or disassembling, otherwise modules may be damaged.

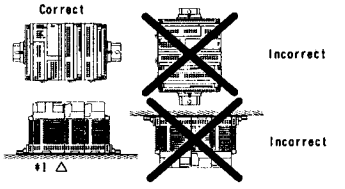
● Mounting Modules

For details about mounting and removing modules, see the OpenNet Controller user's manual.
Use the 35-mm-wide DIN rail for mounting the modules, and secure the modules using the BNL6 mounting clips on both sides of the module row.



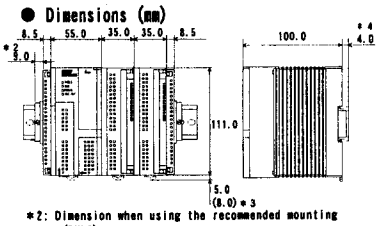
● Mounting Direction

Mount the OpenNet Controller modules horizontally on a vertical plane as shown below. Do not mount the modules vertically or upside down.



*1 : When the ambient temperature is 40℃ or below, the modules can also be mounted upright.

● Dimensions (mm)



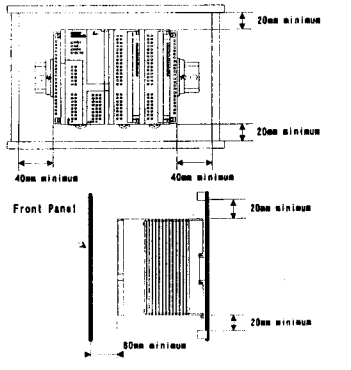
*2: Dimension when using the recommended mounting clip (BNL6).

*3: Dimension when the latch is pulled out.

*4: Dimension when using the recommended DIN rail (BAA1000).

● Installation in Control Panel

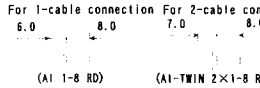
When installing the OpenNet Controller modules in a control panel, take the convenience of operation and maintenance, and resistance against environments into consideration.



● Applicable Ferrule Dimensions (mm)

To crimp the ferrules shown below, use special crimping tool (CRIMPFOX UD6).

For 1-cable connection For 2-cable connection



( ) indicates the Type No. of Phoenix Contact.

● Recommended Screwdriver

When wiring the terminal block, use the recommended screwdriver.

(Phoenix Contact's Type No. : SZS0,6x3,5)

⚠Safety Precautions

●Special expertise is required to use the OpenNet Controller.

- ●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 OpenNet Controller. Keep this instruction sheet at the end user.
- ●All OpenNet Controller modules are manufactured under IDEC's rigorous quality control system, but users must add a backup or failsafe provision to the control system using the OpenNet Controller in applications where heavy damage or personal injury may be caused in case the OpenNet Controller should fail.
- ●Install the OpenNet Controller according to instructions described in this instruction sheet and the user's manual. Improper installation will result in failing, failure, or malfunction of the OpenNet Controller.
- ●Make sure that the operating conditions are as described in the user's manual. If you are uncertain about the specifications, contact IDEC in advance.
- ●In this instruction sheet, safety precautions are categorized in order of importance to 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 power off to the OpenNet Controller before starting installation, removal, wiring, maintenance, and inspection on the OpenNet Controller. Failure to turn power off may cause electrical shocks or fire hazard.
- ●Emergency stop and interlocking circuits must be configured outside the OpenNet Controller. If such a circuit is configured inside the OpenNet Controller, failure of the OpenNet Controller may cause disorder of the control system, damage, or accidents.

⚠Caution

●The OpenNet Controller is designed for installation in equipment. Do not install the OpenNet Controller outside equipment.

- ●Install the OpenNet Controller in environments described in the user's manual. If the OpenNet Controller is used in places where the OpenNet Controller is subjected to high-temperature, high-humidity, condensation, corrosive gases, excessive vibrations, and excessive shocks, then electrical shocks, fire hazard, or malfunction will result.
- ●The environment for using the OpenNet Controller is "Pollution degree 2." The pollution degree refers to a degree of pollution in the micro-environment which determines the effect of pollution on the insulation. Pollution degree 2 defines "Only non-conductive pollution occurs except that occasionally a temporary conductivity caused by condensation is to be expected." Do not use the OpenNet Controller in environments inferior to the state specified in IEC60664-1.
- ●The DC power applicable to the OpenNet Controller is "PS2." PS2 refers to a power supply that has a momentary power failure duration of 10 msec at the maximum and an interval between power failures of 1 second at the minimum.
- ●Prevent metal fragments and pieces of wire from dropping inside the OpenNet Controller 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 a proper tightening torque of 0.5 to 0.6 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 OpenNet Controller to Europe.
- ●Use an EU-approved circuit breaker. This is required when exporting equipment containing OpenNet Controller to Europe.
- ●If relays or transistors in the OpenNet Controller 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 OpenNet Controller.
- ●Do not disassemble, repair, or modify the OpenNet Controller modules.