# General Specifications

GS 34M06G01-01E

FA-M3
Basic Input/Output Modules

FA-M3

## Contents





18th Edition Mar. 2025 (YK)

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# General Specifications

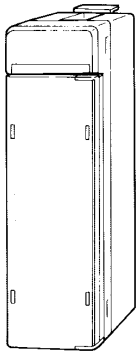
F3XH04
High-speed Input Module

FA-M3

## General

*The F3XH04 is a high-speed input module which incorporates the pulse-capture features of the FA-M3.*

- The pulse-capture features facilitate detection of pulse inputs with shorter on-time than the scan period, which allows the F3XH04 to carry out photo-micro switch input for high-speed sensing.
- The interrupt mechanism ensures reliable interrupt processing using a short on-time pulse input.
- The minimum pulse width is as short as 50 µs.
- The four-independent input system permits connection from different signal systems.
- The terminal block is provided with terminals for shielded cables.

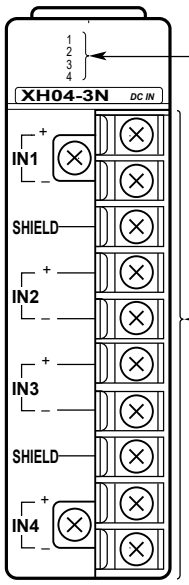


## Specifications

| Item | | Specification |
|---|---|---|
| Input type | | DC voltage |
| Number of inputs | | 4 |
| Common system | | 4 independent inputs |
| Isolation method | | Photocoupler isolation |
| Rated input voltage | | 24 V DC |
| Operating voltage range | | 20.4 - 26.4 V DC |
| Rated input current | | 11.2 mA/point (24 V DC) |
| Input impedance | | 2.1 KΩ |
| Operating voltage/ current | ON | 16.0 V DC min. 7.2 mA min. |
| | OFF | 6.0 V DC max. 2.5 mA max. |
| Input response time | OFF → ON | 50 µs max. |
| | ON → OFF | 50 µs max. |
| Minimum input pulse width | | 50 µs |
| Pulse capture features* | Selection | By DIP switches. |
| Interrupt features* | Selection | By DIP switches. |
| | Setting | Set for each point through FA-M3 Programming Tool Wide Fierd3 |
| | Input hold time | The input signal is held for 512 µs after detection of an off-to-on transition. |
| Current consumption | | 30 mA (5 V DC) |
| External connection | | 10-point terminal block, M3.5 screw |
| Weight | | 130 g |
| Surrounding air temperature range | | Operating : 0 to 55°C |
| | | Storage : -20°C to 75°C |
| Surrounding humidity range | | Operating : 10 to 90% RH (non-condensing) |
| | | Storage : 10 to 90% RH (non-condensing) |
| Surrounding atmosphere | | Must be free of corrosive gases, flammable gases or heavy dust. |

*: The pulse-catch and interrupt features are not available at the same time.

## Components and Functions

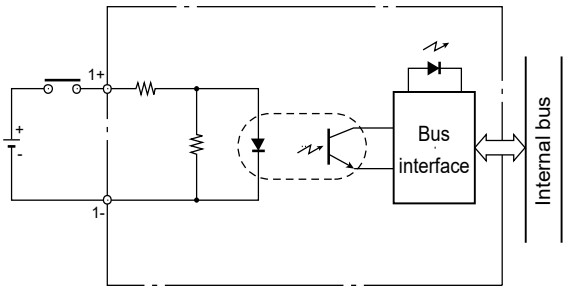



**Input LEDs :**
Indicates the on/off status of inputs.

**Terminal block :**
10-point detachable terminal block. The terminal screws are M3.5 screws with square captive washers.

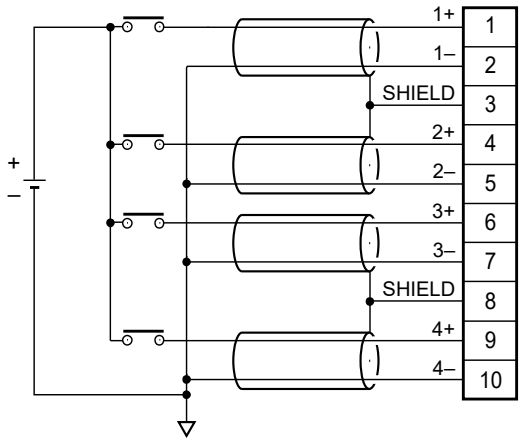
## Internal Circuit Diagram

F3XH04-3N (High-speed input module)



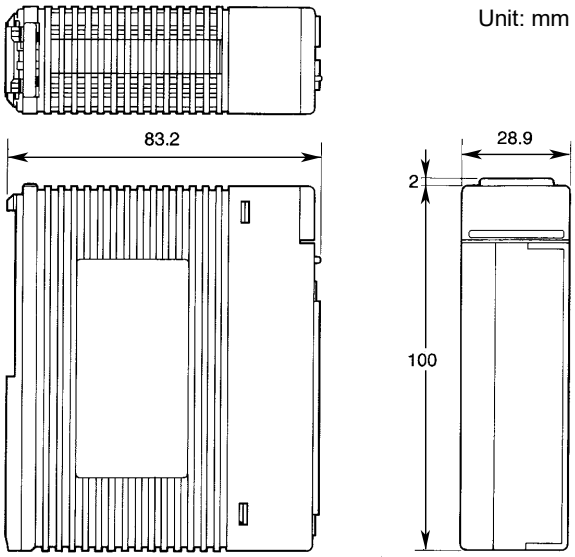

## External Connection Diagram

F3XH04-3N (High-speed input module)




## External Dimensions

Unit: mm




## ■ External Connection Method

| | | Terminal Block Type |
|---|---|---|
| Applicable conductor size | | 0.33-0.82 mm$^2$ |
| Wire connection method | | Solderless |
| Solderless terminal | Solderless terminal | For 3.5 mm terminals |
| | Crimping torque | 0.8 N·m (8 kgf·cm, 6.9lbf·in) |
| | Applicable solderless terminal | Example:<br>Japan Solderless Terminal Mfg. Co., Ltd.:V1.25-M3<br>Nippon Tanshi Co., Ltd.:<br>RAV1.25-3.5 |

## Operating Environment

There is no restriction on the type of CPU modules that can be used with this module.

## Model and Suffix Codes

| Model | Suffix Code | Style Code | Option Code | Description |
|---|---|---|---|---|
| F3XH04 | -3N | ..... | ..... | High-speed inputs with pulse-capture feature, 24 V DC, 4 points |

# General Specifications

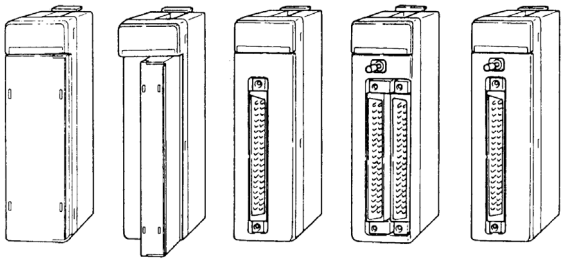
F3XA08, F3XA16, F3XC08, F3XD08, F3XD16, F3XD32 and F3XD64 Input Modules

FA-M3

## General

*The input modules for the FA-M3 are listed below. Select the most appropriate modules according to your applications.*

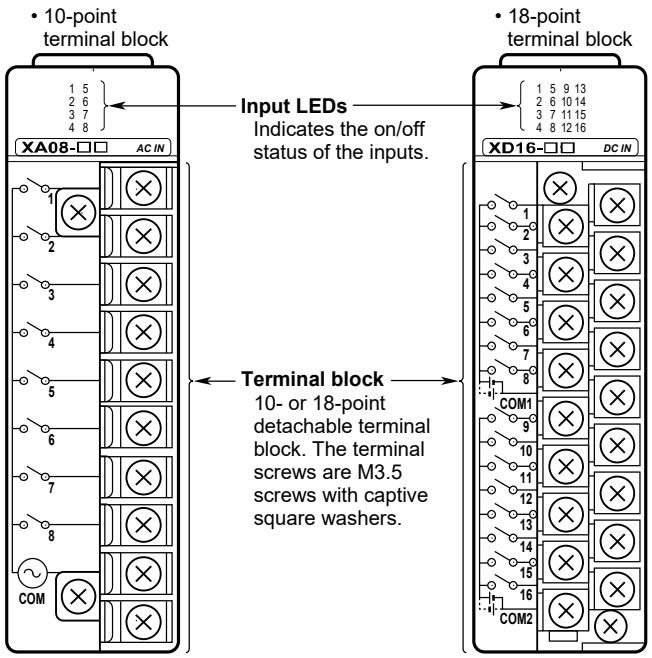
F3XA08-1N AC input module
F3XA08-2N AC input module
F3XA16-1N AC input module
F3XC08-0C No voltage contact input module
F3XC08-0N No voltage contact input module
F3XD08-6F DC input module
F3XD16-3F DC input module
F3XD16-4F DC input module
F3XD32-3F DC input module
F3XD32-4F DC input module
F3XD32-5F DC input module
F3XD64-3F DC input module
F3XD64-4F DC input module
F3XD64-6M DC input module
F3XD16-3H DC input module



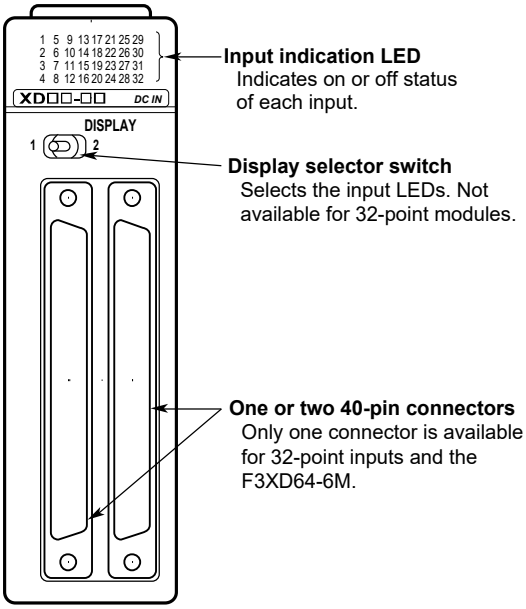
## Components and Functions

The input modules are divided into terminal block and connector types as shown below.

● **Terminal Blocks**




● **Connector type**




| Display selector switch position | LED Indication |
|---|---|
| 1 | Indicates the on/off status of inputs 1 to 32. |
| 2 | Indicates the on/off status of inputs 33 to 64. |

## Specifications

| Model | Input Type | Number of Inputs | Isolation Method | Rated Input Voltage | Rated Input Current | Operating Voltage Range | Operating Voltage/Current ON | Operating Voltage/Current OFF | Maximum ratio of inputs turned on simultaneously | Input response OFF→ON | Input response ON→OFF | External Connection | Points/ Common | Interrupt *2 | Current Consumption | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **F3XA08-1N** | AC voltage | 8 | Photocoupler isolation | 100–120 V AC 50/60 Hz | 5.4 - 6.5 mA/point 100-120V AC,60Hz | 85-132 V AC 50/60Hz | 80 V AC min. 5 mA min. | 40 V AC max. 1 mA max. | 100% | Selectable from 15 ms max. or 30 ms | Selectable from 25 ms max. or 40 ms | 10-point terminal block M3.5 screw | 8 points/ common | Can be specified for each input point. | 40mA (5V DC) | 130g |
| **F3XA08-2N** | | | | 200–240 V AC 50/60 Hz | 5.1 - 6.1 mA/point 200-240 V AC,60Hz | 170-264 V AC 50/60Hz | 160 V AC min. 4 mA min. | 70 V AC max. 1 mA max. 40 V AC | | | | | | | | |
| **F3XA16-1N** | | 16 | | 100–120 V AC 50/60 Hz | 5.4 - 6.5 mA/point 100-120 V AC,60Hz | 85-132 V AC 50/60Hz | 80 V AC min. 5 mA min. | 40 V AC max. 1 mA max. | | | | 18-point terminal block M3.5 screw | | | 65mA (5VDC) | 180g |
| **F3XD08-6F** | DC voltage (sink/ source) | 8 | | 12 – 24 V DC | 4.1 mA/point (12V DC) 8.5 mA/point (24V DC) | 10.2-26.4 V DC | 8.0 V DC min. 2.6 mA min. | 3.4 V DC max. 1.0 mA max. | | Input sampling time can be specified for 5 steps: Always (0µs), 62.5µs, 250µs, 1ms, and 16ms. *1*2 | Input sampling time can be specified for 5 steps: Always (0µs), 62.5µs, 250µs, 1ms, and 16ms. *1*2 | 10-point terminal block M3.5 screw | | | 40mA (5V DC) | 130g |
| **F3XD16-3F** | | 16 | | 24 V DC | 4.1 mA/point 24 V DC | 20.4 - 26.4 V DC | 16.0 V DC min. 3.2 mA min. | 5.8 V DC max. 0.9 mA max. | | | | 18-point terminal block M3.5 scr | | | 65mA (5V DC) | 160g |
| **F3XD16-4F** | | | | 12V DC | 4.1 mA/point} 12 V DC | 10.2 - 13.2 V DC | 8.0 V DC min. 2.6 mA min. | 3.4 V DC max. 1.0 mA max. | | | | | | | | |
| **F3XD16-3H** | DC voltage (plus common) | | | 24 V DC | 4. 7 mA/point 24 V DC | 20.4 - 26.4 V DC | 16 V DC min. 3.2 mA min. | 5.8 V DC max. 0.9 mA max. | | | | | | | | |
| **F3XD32-3F** | DC voltage (sink/ source) | 32 | | 24 V DC | 4.1 mA/point 24 V DC | 20.4 - 26.4 V DC | 16.0 V DC min. 3.2 mA min. | 5.8 V DC max. 0.9 mA max. | | | | One 40-pin connector | | | 75mA (5V DC) | 120g |
| **F3XD32-4F** | | | | 12V DC | 4.1 mA/point 12 V DC | 10.2 - 13.2 V DC | 8.0 V DC min. 2.6 mA min. | 3.4 V DC max. 1.0 mA max. | | | | | | | | |
| **F3XD32-5F** | | | | 5V DC | 4.0 mA/point 5 V DC | 4.5 - 5.5 V DC | 3.5 V DC min. 2.0 mA min. | 1.0 V DC max. 0.2 mA max. | | | | | | | | |
| **F3XD64-3F** | | 64 | | 24V DC | 4.1 mA/point 24 V DC | 20.4 - 26.4 V DC | 16.0 V DC min. 3.2 mA min. | 5.8 V DC max. 0.9 mA max. | 60% | Input sampling time can be specified for 4 steps : Always (0µs),62.5µs, 250µs and 1ms. *1*2 | Input sampling time can be specified for 4 steps : Always (0µs),62.5µs, 250µs and 1ms. *1*2 | Two 40-pin connectors | | None | 100mA (5V DC) | 160g |
| **F3XD64-4F** | | | | 12 V DC | 4.1 mA/point 12 V DC | 10.2 - 13.2 V DC | 8.0 V DC min. 2.6 mA min. | 3.4 V DC max. 1.0 mA max. | | | | | | | | |
| **F3XD64-6M** | Matrix scan | | | 12 – 24 V DC | 3.9 mA (12 V DC) 8.2 mA (24 V DC) | 10.2 - 26.4 V DC | 8.0 V DC min. 2.6 mA min. | 3.4 V DC max. 1.0 mA max | - | 16 ms max. | 16 ms max. | One 40-pin connector | 8 x 8 matrix | | 110mA (5V DC) | 130g |

Note: See external dimensions for dimensions of the modules.

*1: When F3SP28, F3SP38, F3SP5x, F3SP6x or F3SP7x is used. For other CPU modules, the specification is the same as the F3XDxx-xN. The actual response time can be obtained by adding the following values:

For F3XDxx - xF: 100 µs (OFF → ON)
300 µs (ON →OFF)

For F3XD16-3H: 10 µs

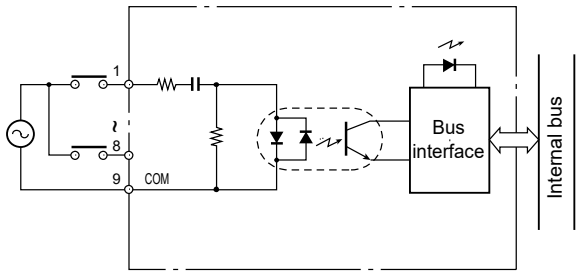
*2: If the input interrupt is to be used with the F3XDxx - xF, set the input sampling period to at least 62.5 µs.

| Model | Input Type | Number of Inputs | Isolation Method | Contact Ratings | ON Resistance | OFF Resistance | Maximum ratio of inputs turned on simultaneously | Input response | | External Connection | Points/ Common | Interrupt *2 | Current Consumption | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | OFF→ON | ON→OFF | | | | | |
| **F3XC08-0C** | No-voltage contact | 8 | Transformer isolation | 5 V DC min. 20 mA max. | 200 Ω max. | 100 kΩ min. | 100% | Input sampling time can be specified for 5 steps: Always (0μs), 62.5μs, 250μs, 1ms, and 16ms *2 (Response time is sampling period + 1 ms max.) | Input sampling time can be specified for 5 steps: Always (0μs), 62.5μs, 250μs, 1ms, and 16ms *2 (Response time is sampling period + 1 ms max.) | 18-point terminal block M3.5 screw | Separate commons | Can be specified for Each input point. | 75mA | 170g |
| **F3XC08-0N** | | | | | | | | Selectable from 2.0 ms max. or 17 ms | Selectable from 2.0 ms max. or 17 ms | 10-point terminal block M3.5 screw | 8 points/ common | | | 140g |

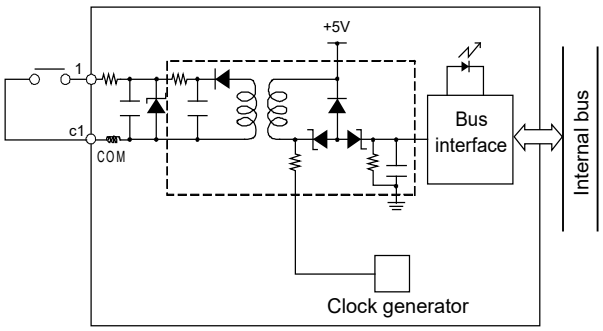
Note: See external dimensions for dimensions of the modules.
*2: If the input interrupt is to be used, set the input sampling period to at least 62.5 μs.

## Internal Circuit Diagram

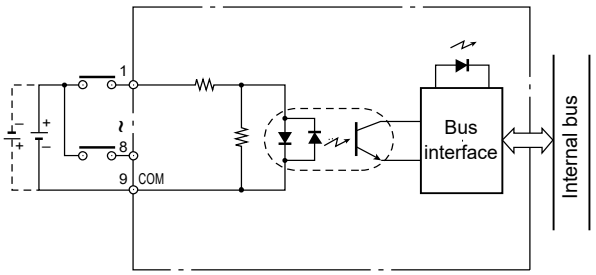
F3XA08-1N
F3XA08-2N
F3XA16-1N



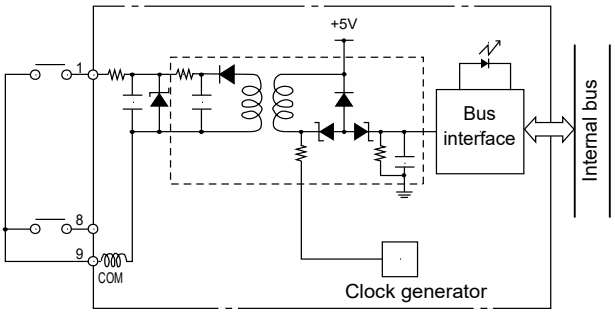

F3XC08-0C



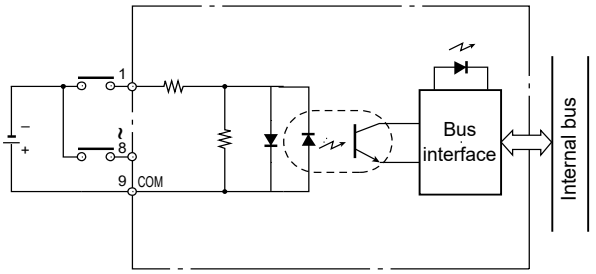

F3XD08-6F
F3XD16-3F
F3XD16-4F



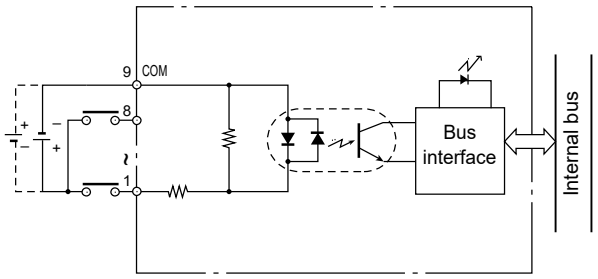

F3XC08-0N



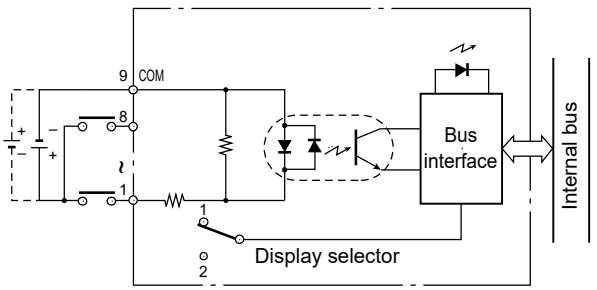

F3XD16-3H



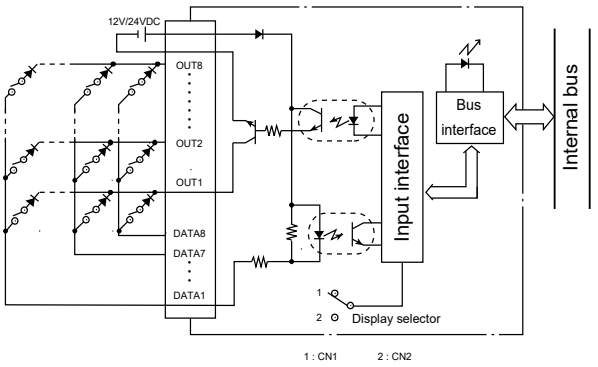

F3XD32-3F
F3XD32-4F
F3XD32-5F




F3XD64-3F
F3XD64-4F

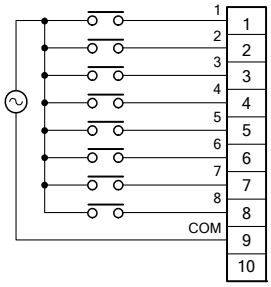



F3XD64-6M



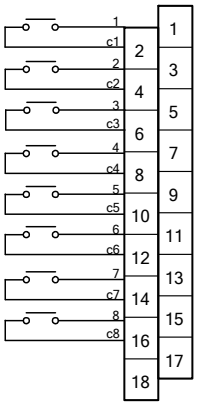
## External Connection Diagram

F3XA08-1N
F3XA08-2N



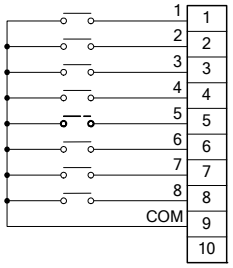

Note: Viewed from the front of the module.

F3XC08-0C



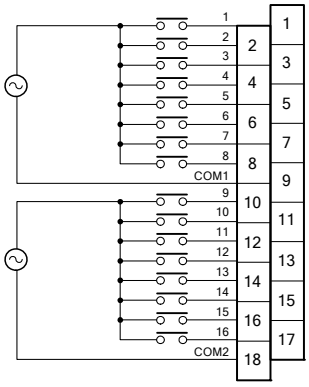

Note: Viewed from the front of the module.

F3XC08-0N



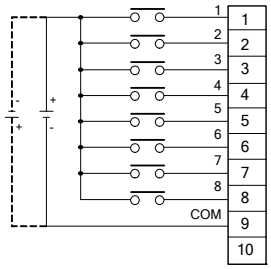

Note: Viewed from the front of the module.

F3XA16-1N



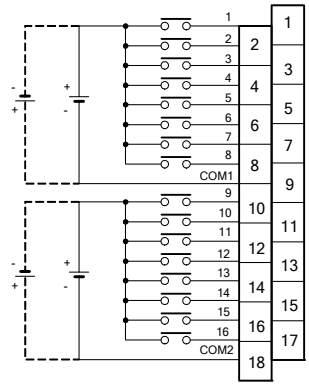

Note: Viewed from the front of the module.

F3XD08-6F



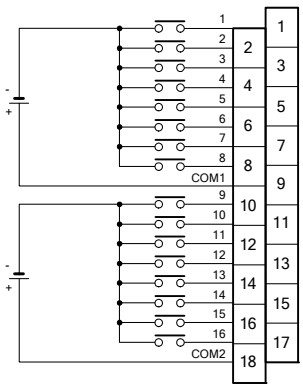

Note: Viewed from the front of the module.

F3XD16-3F
F3XD16-4F



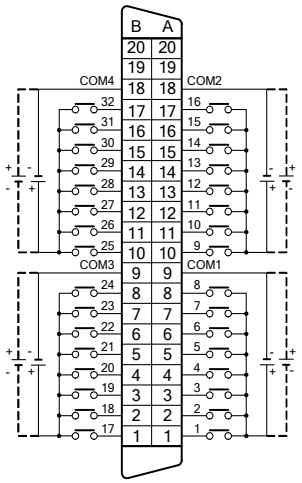

Note: Viewed from the front of the module.

F3XD16-3H



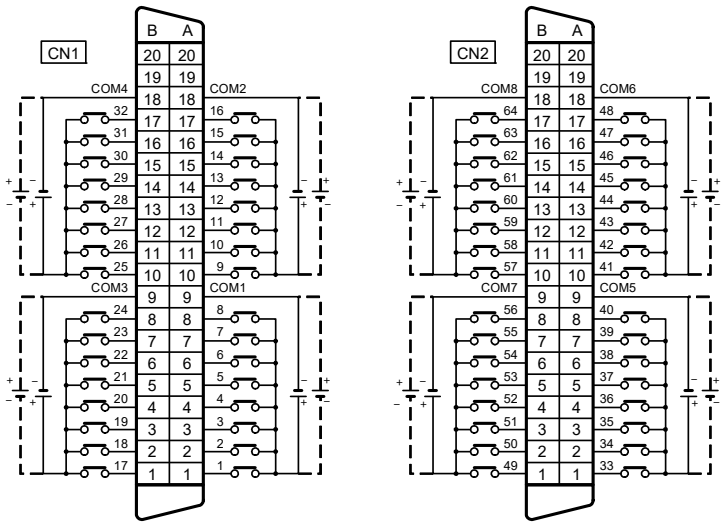

Note: Viewed from the front of the module.

F3XD32-3F
F3XD32-4F
F3XD32-5F



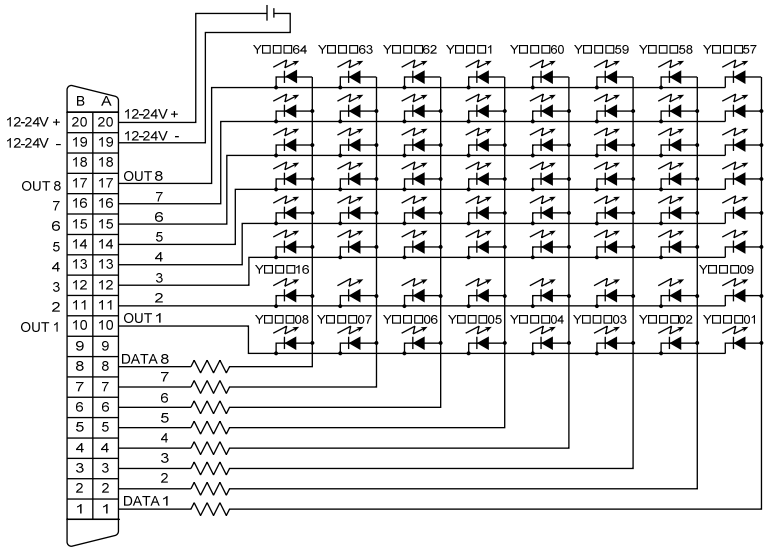

Note: Viewed from the front of the module.

F3XD64-3F
F3XD64-4F



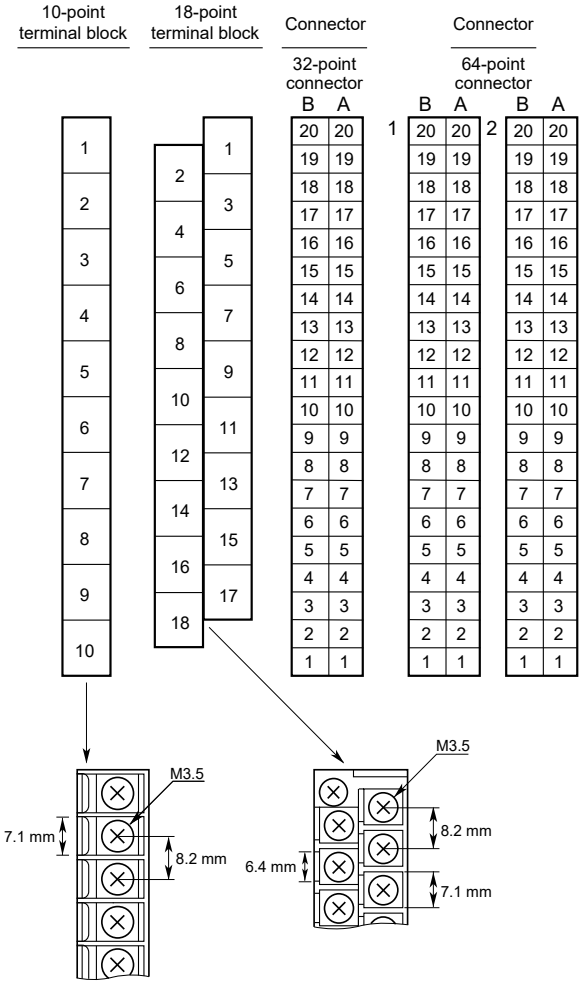

Note: Viewed from the front of the module.

F3XD64-6M




Note: Viewed from the front side of the module.

## ■ Terminal Arrangement




## External Connection Method

| | | Terminal Block Type | Connector Type | | |
|---|---|---|---|---|---|
| Applicable conductor size | | 0.33 - 0.82 mm² | 0.26 mm² max. | 0.08 - 0.20 mm² | Flat cable, 1.27 mm pitch, 0.08 mm² |
| Wire connection method | | Solderless | Soldered | Solderless | Solderless |
| Rated wire temperature | | 75°C min. | | | |
| Wire Material | | Copper | | | |
| Solderless terminal | Solderless terminal | For 3.5 mm terminals | — | | |
| | Crimping torque | 0.8 N·m {8 kgf·cm, 6.9 lbf·in} | — | | |
| | Applicable solderless terminal | Example: Japan Solderless Terminal Mfg Co., Ltd.: V1.25-M3 Nippon Tanshi Co., Ltd.: RAV1.25-3.5 | — | | |

## Applicable External Connectors

- OTAX Corporation

| Connection method | | Compatible connector | Remarks |
|---|---|---|---|
| Soldered type | Connector | N361J040AU | Purchase the desired connector kit separately. |
| | Connector cover | N360C040B | |
| Crimp-on type | Housing | N363J040 | |
| | Contact | N363JAU | |
| | Connector cover | N360C040B | |
| Pressure-welded type | | N367J040AUFW | |

## Operating Environment

There is no restriction on the type of CPU modules that can be used with this module.

## Environment Specifications

| Item | Specifications |
|---|---|
| Surrounding air temperature range | Operating : 0 to 55°C |
| | Storage : -20°C to 75°C |
| Surrounding humidity range | Operating : 10 to 90% RH (non-condensing) |
| | Storage : 10 to 90% RH (non-condensing) |
| Surrounding atmosphere | Must be free of corrosive gases, flammable gases or heavy dust. |

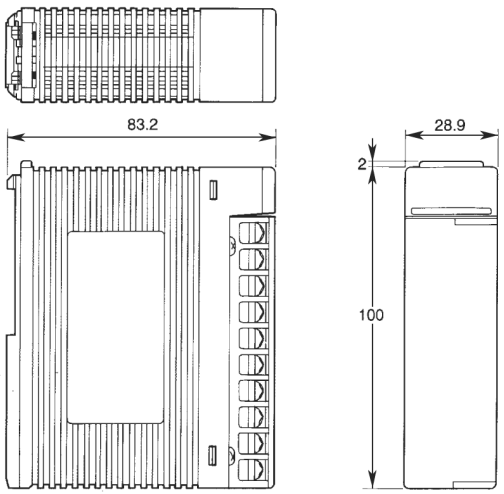
## Model and Suffix Codes

| Model | Suffix code | Style code | Option code | Description |
|---|---|---|---|---|
| F3XA08 | -1N | ..... | ..... | 100-120 V AC input, 8 points |
| F3XA08 | -2N | ..... | ..... | 200-240 V AC input, 8 points |
| F3XA16 | -1N | ..... | ..... | 100-120 V AC input, 16 points |
| F3XC08 | -0C | ..... | ..... | No-voltage contact, 8 points (with separate commons) |
| F3XC08 | -0N | ..... | ..... | No-voltage contact, 8 points |
| F3XD08 | -6F | ..... | ..... | DC input sink/source, 12-24 V DC, 8 points |
| F3XD16 | -3F | ..... | ..... | DC input sink/source, 24 V DC, 16 points |
| F3XD16 | -4F | ..... | ..... | DC input sink/source, 12 V DC, 16 points |
| F3XD32 | -3F | ..... | ..... | DC input sink/source, 24 V DC, 32 points* |
| F3XD32 | -4F | ..... | ..... | DC input sink/source, 12 V DC, 32 points* |
| F3XD32 | -5F | ..... | ..... | DC input sink/source, 5 V DC, 32 points* |
| F3XD64 | -3F | ..... | ..... | DC input sink/source, 24 V DC, 64 points* |
| F3XD64 | -4F | ..... | ..... | DC input sink/source, 12 V DC, 64 points* |
| F3XD64 | -6M | ..... | ..... | DC input matrix scan 12-24 V DC, 64 points* |
| F3XD16 | -3H | ..... | ..... | DC input (sink, +common), 24 V DC, 16 points (Quick response type) |

*: See the section on spare parts in FA-M3 Range-free Multi-controller (GS 34M06A01-01E) for information on connectors.

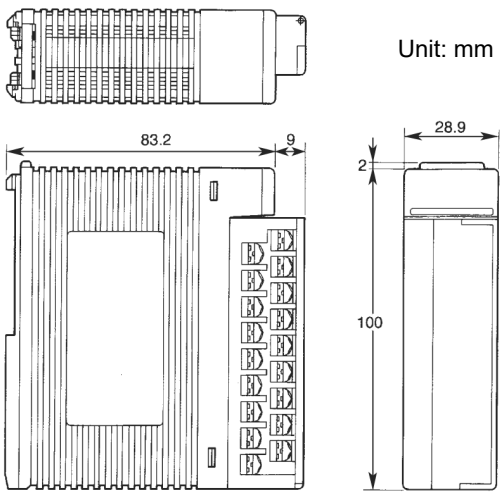
## External Dimensions

**F3XA08, F3XC08-0N, F3XD08**

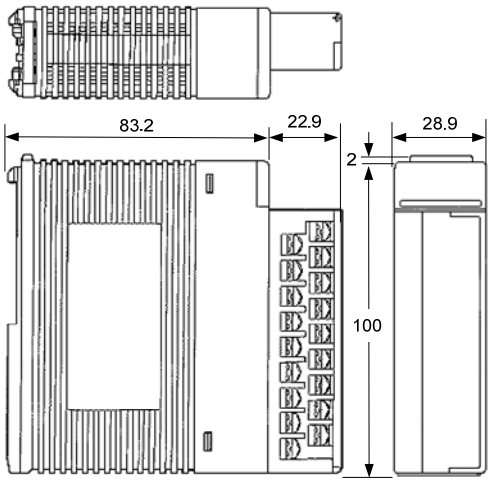



**F3XC08-0C, F3XD16**

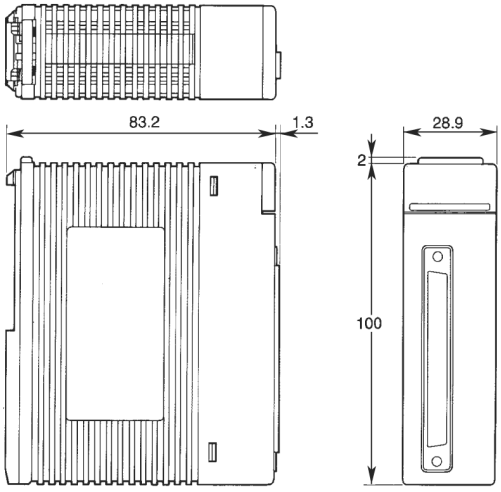
Unit: mm



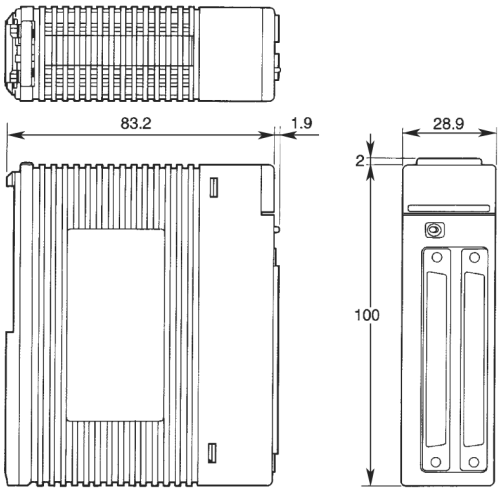

**F3XA16**



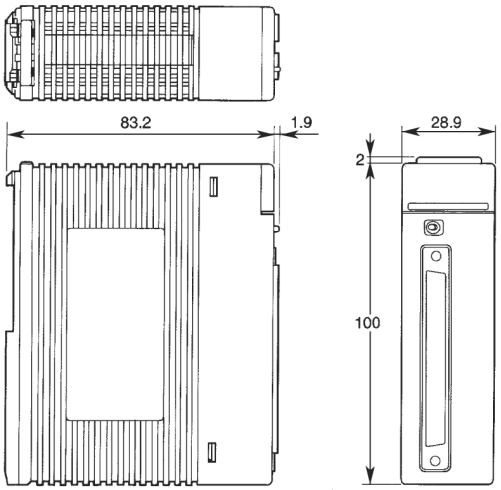

**F3XD32**




**F3XD64-3F, F3XD64-4F**




**F3XD64-6M**



# General Specifications

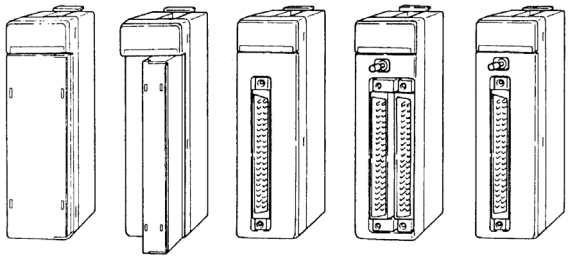
F3YD04, F3YA08, F3YC08, F3YC16, F3YD08, F3YD14, F3YD32 and F3YD64
Output Modules

FA-M3

## General

*The output modules for the FA-M3 are listed below. Select the most appropriate modules according to your applications.*

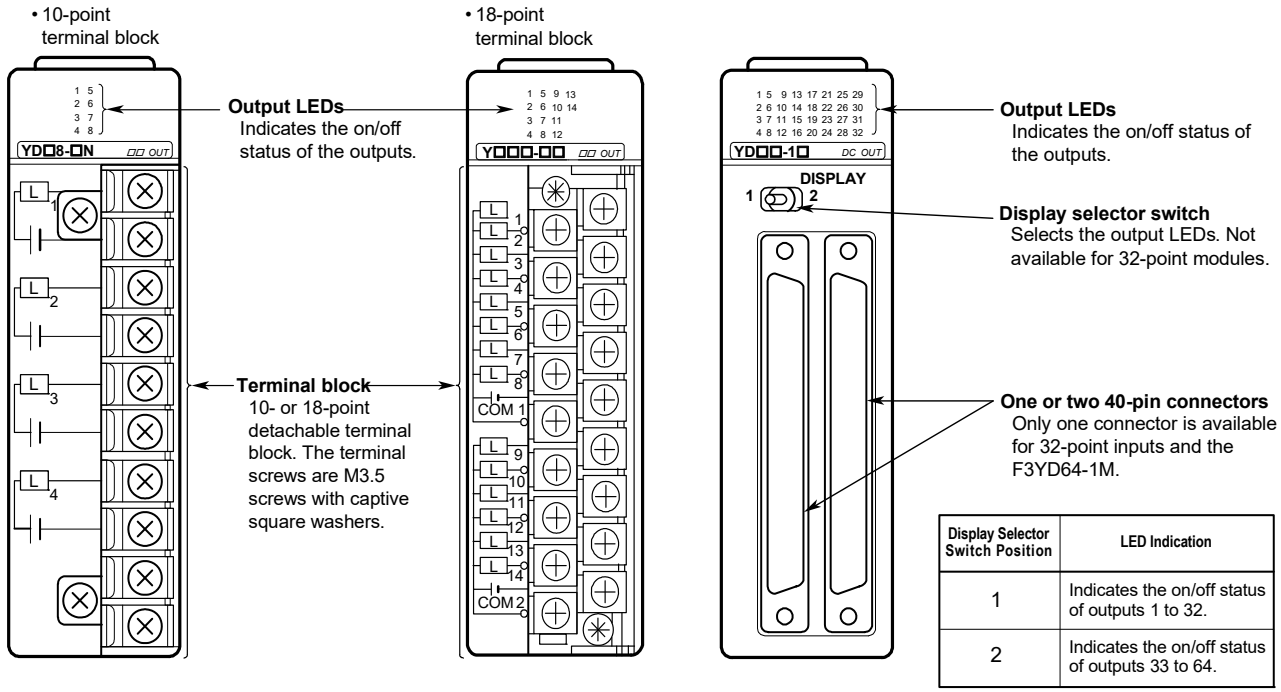
| | |
|---|---|
| F3YD04-7N | Transistor output module |
| F3YA08-2N | TRIAC output module |
| F3YC08-0C | Relay output module |
| F3YC08-0N | Relay output module |
| F3YC16-0N | Relay output module |
| F3YD08-6A | Transistor output module |
| F3YD08-6B | Transistor output module |
| F3YD08-7A | Transistor output module |
| F3YD14-5A | Transistor output module |
| F3YD14-5B | Transistor output module |
| F3YD32-1T | TTL output module |
| F3YD64-1M | Transistor output module |



## Components and Functions

The output modules are divided into terminal block and connector types as given below.

● **Terminal block**




| Display Selector Switch Position | LED Indication |
|---|---|
| 1 | Indicates the on/off status of outputs 1 to 32. |
| 2 | Indicates the on/off status of outputs 33 to 64. |

## Specifications

| Model | Output Type | Number of Outputs | Points/ Common | Isolation Method | Rated Load Voltage | Maximum load current | Response Time | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | OFF→ON | ON→OFF |
| **F3YD04-7N** | Transistor contact | 4 | All points independent | Photocoupler Isolation | 24 V DC | 2 A/point | 5 ms max. | 3 ms max. |
| **F3YA08-2N** | TRIAC contact | 8 | 8 points/ common | Photocoupler Isolation | 100－240 V AC | 1 A/point (0 - 40°C)<br>0.7 A/point (40 - 55°C)<br>3 A/common | 1 ms max. | 1/2 cycle +1 ms max. |
| **F3YC08-0C**[*3] | Relay contact | 8 | All points independent | Mechanical Isolation | DC 5-24 V<br>AC 100-240 V | 2 A/point | 10 ms max. | 10 ms max. |
| **F3YC08-0N**[*3] | Relay contact | 8 | 8 points/ common | Mechanical Isolation | | 2 A/point<br>8 A/common | 10 ms max. | 10 ms max. |
| **F3YD08-6 A** | Transistor contact (sink type) | 8 | 8 points/ common | Photocoupler Isolation | 12－24 V DC | 1 A/point<br>4 A/common | 1 ms max. | 1 ms max. |
| **F3YD08-6B** | Transistor contact (source type) | 8 | 8 points/ common | Photocoupler Isolation | 12－24 V DC | 1 A/point<br>4 A/common | 1 ms max. | 1 ms max. |
| **F3YD08-7A** | Transistor contact (sink type) | 8 | 8 points/ common | Photocoupler Isolation | 12－24 V DC | 2 A/point<br>8 A/common | 1 ms max. | 1 ms max. |
| **F3YD14-5A** | Transistor contact (sink type) | 14 | 8 points/ common<br>6 points/ common | Photocoupler Isolation | 12－24 V DC | 0.5 A/point<br>2 A/common | 1 ms max. | 1 ms max. |
| **F3YD14-5B** | Transistor contact (source type) | 14 | | Photocoupler Isolation | 12－24 V DC | 0.5 A/point<br>2 A/common | 1 ms max. | 1 ms max. |
| **F3YC16-0N**[*3] | Relay contact | 16 | 8 points/ common | Mechanical Isolation | DC 5-24 V<br>AC 100-240 V | 2 A/point<br>8 A/common | 10 ms max. | 10 ms max. |
| **F3YD32-1T** | Transistor contact (TTL output) | 32 | 8 points/ common | Photocoupler Isolation | 5 V DC | 16 mA/point<br>128 mA/common | 1 ms max. | 1 ms max. |
| **F3YD64-1M** | Transistor contact ( matrix scan) | 64 | 8 x 8 matrix | Photocoupler Isolation | 12－24 V DC | 0.1 A | 16 ms max. | 16 ms max. |

| Model | Life | ON voltage | Off-time Leakage Current | Surge Protector | CPU Error Output*2 HOLD/RESET | Current Consumption | External Power Supply | External Connection | Weight |
|---|---|---|---|---|---|---|---|---|---|
| F3YD04-7N | – | 0.5 V DC max. | 0.1 mA max. | Zener diode | When a sequence CPU is used: Initial value: RESET All module outputs can be set collectively *1. When a BASIC CPU is used: No setting function; Always set to HOLD. When an OS-free CPU is used: Initial value: HOLD Can be specified for each set of 8 points. | 85 mA (5 V DC) | Not required | 10 -point terminal block M3.5 screw | 140 g |
| F3Y A08-2N | – | 1.5 V AC max. | 3 mA max. | CR absorber Varistor | | 130 mA (5 V DC) | Not required | | 150 g |
| F3YC08-0C*3 | Mechanical: 20,000,000 operations or more Electrical: 100,000 operations or morel | – | – | None | | 205 mA (5 V DC) | Not required | 18 -point terminal block M3.5 screw | 180 g |
| F3YC08-0N*3 | | – | – | None | | 205 mA (5 V DC) | Not required | 10 -point terminal block M3.5 screw | 160 g |
| F3YD08-6A | – | 0.5 V DC max. | 0.1 mA max. | Active clamp | | 60 mA (5 V DC) | 12－24 V DC 10 mA | 10 -point terminal block M3.5 screw | 130 g |
| F3YD08-6B | – | 0.5 V DC max. | 0.1 mA max. | Active clamp | | 60 mA (5 V DC) | 12－24 V DC 10 mA | 10 -point terminal block M3.5 screw | 130 g |
| F3YD08-7A | – | 0.5 V DC max. | 0.1 mA max. | Active clamp | | 80 mA (5 V DC) | 12－24 V DC 10 mA | 10 -point terminal block M3.5 screw | 130g |
| F3YD14-5A | – | 0.5 V DC max. | 0.1 mA max. | Active clamp | | 120 mA (5 V DC) | 12－24 V DC 20 mA | 18 -point terminal block M3.5 screw | 160 g |
| F3YD14-5B | | 0.5 V DC max. | 0.1 mA max. | Active clamp | | 120 mA (5 V DC) | 12－24 V DC 20 mA | 18 -point terminal block M3.5 screw | 160 g |
| F3YC16-0N*3 | Mechanical: 20,000,000 operations or more Electrical: 100,000 operations or morel | – | – | None | | 380 mA (5 V DC) | Not required | 18 -point terminal block M3.5 screw | 220 g |
| F3YD32-1T | – | – | – | Zener diode | | 210 mA (5 V DC) | 5 V DC 60 mA | One 40-pin connector | 110 g |
| F3YD64-1M | – | 1.5 V DC max. | 0.1 mA max. | Zener diode | | 125 mA (5 V DC) | 12－24 V DC 40 mA | One 40-pin connector | 110 g |

Note: See external dimensions for dimensions of the modules.

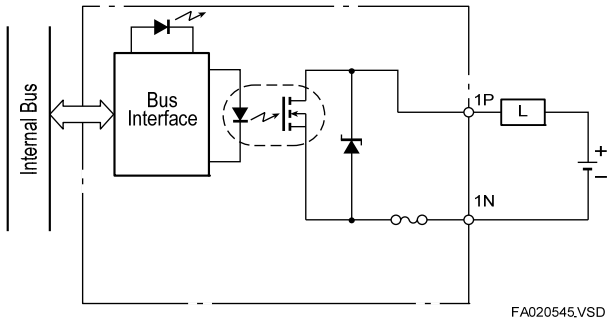
*1 When F3SP28, F3SP38, F3SP5x, F3SP6x or F3SP7x is used, all points can be specified in 16-point units.

*2 For details on the module behavior when the CPU fails, see the Severity of Failures and LED Display" in the FA-M3/e-RT3 Overview (GS 34M06A01-01E).
For detailed operation depending on the status of the OS-free CPU module, see "OS-free CPU module status and output module status" in the FA-M3/e-RT3 Overview (GS 34M06A01-01E).

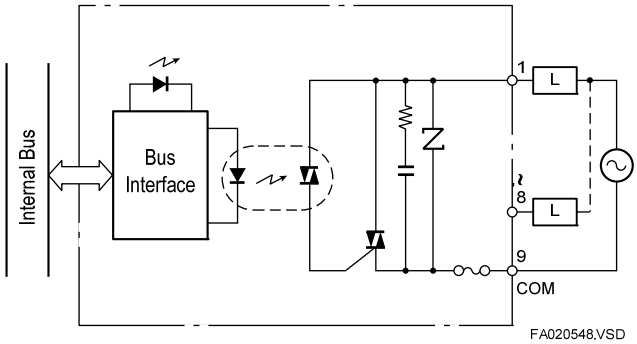
*3 The relays in the relay output modules are not of hermetically sealed type. Dust or corrosive gases in the installation environment will adversely affect the service life of the relays. Relays that are switched on and off in an atmosphere containing silicone gases from silicone-based materials may suffer from poor electrical contact due to $SiO_2$ (silicon dioxide) formed and deposited on the surfaces of their contacts. Risks of bad contact due to silicon gases are especially high under load conditions below 24 VDC and 500 mA. In such environments, we recommend the use of transistor output modules or other modules employing semiconductor elements instead.

## Internal Circuit Diagram

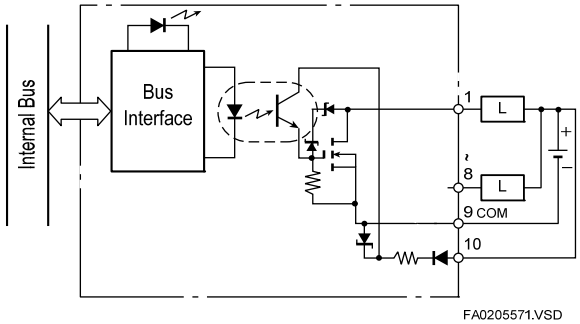
F3YD04-7N Transistor output module



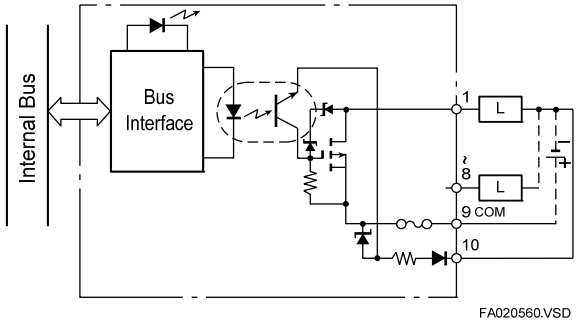

F3YA08-2N TRIAC output module



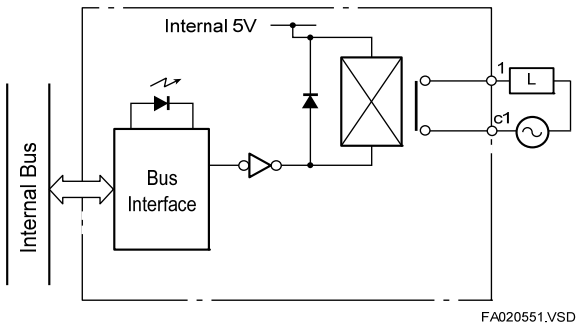

F3YD08-7A Transistor output module
F3YD08-6A Transistor output module
F3YD14-5A Transistor output module



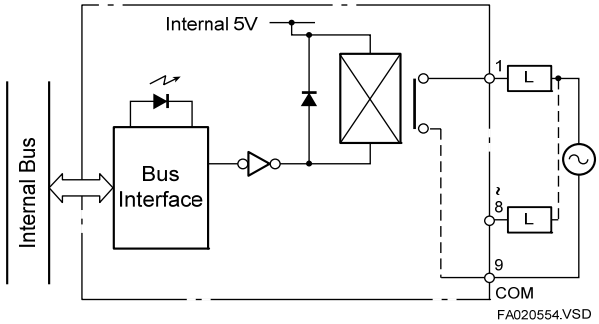

F3YD08-6B Transistor output module
F3YD14-5B Transistor output module



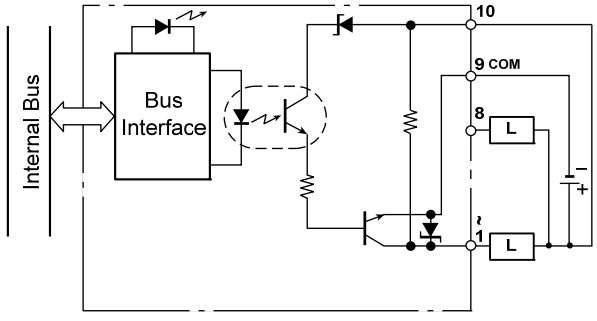

**F3YC08-0C Relay output module**



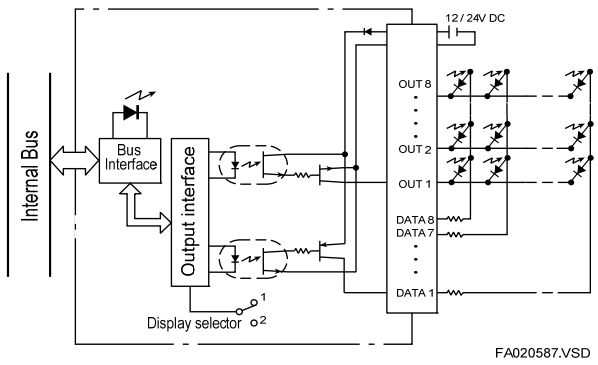

**F3YC08-0N Relay output module**
**F3YC16-0N Relay output module**




**F3YD32-1T TTL output module**

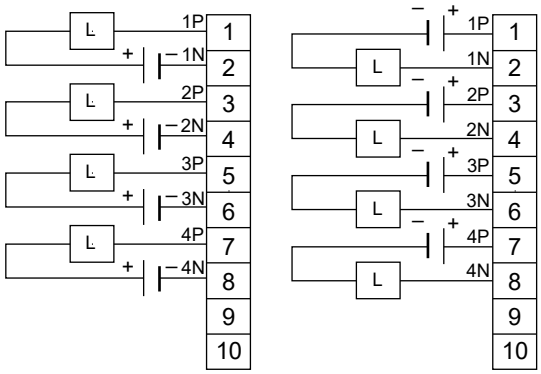



**F3YD64-1M Transistor output module**



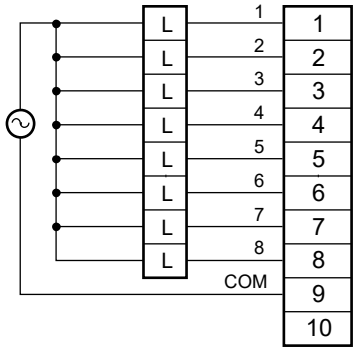

## External Connection Diagram

F3YD04-7N Transistor output module



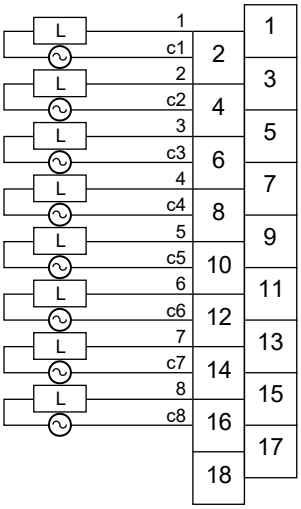

Note: Viewed from the front of the module.

F3YA08-2N TRIAC output module



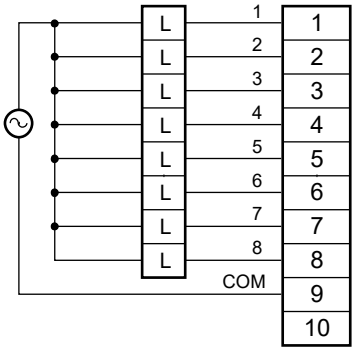

Note: Viewed from the front of the module.

F3YC08-0C Relay output module



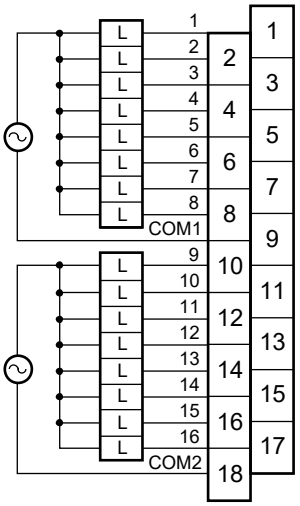

Note: Viewed from the front of the module.

F3YC08-0N Relay output module



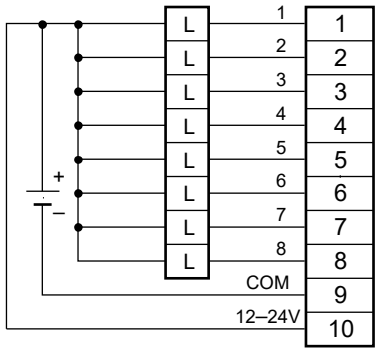

Note: Viewed from the front of the module.

F3YC16-0N Relay output module



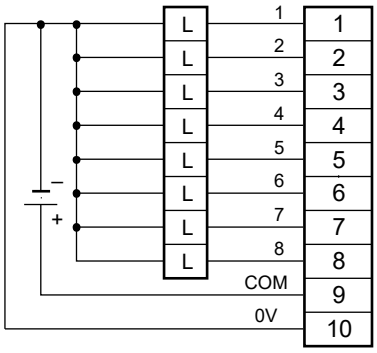

Note: Viewed from the front of the module.

F3YD08-6A Transistor output module
F3YD08-7A Transistor output module



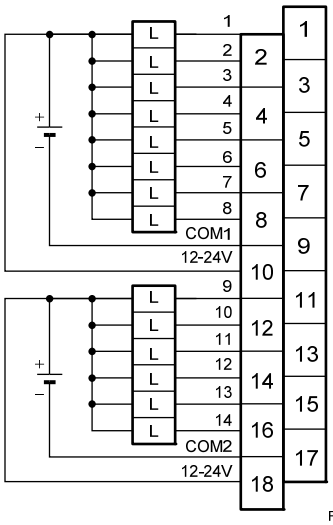

Note: Viewed from the front of the module.

F3YD08-6B Transistor output module



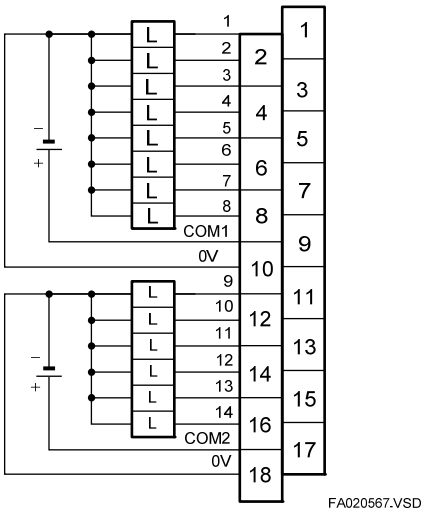

Note: Viewed from the front of the module.

**F3YD14-5A Transistor output module**



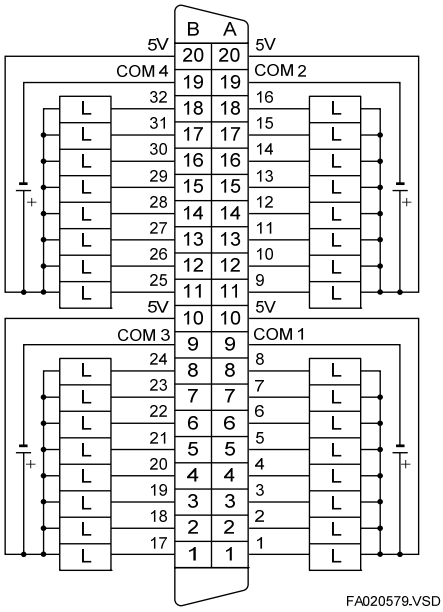

Note: Viewed from the front side of the module.

**F3YD14-5B Transistor output module**



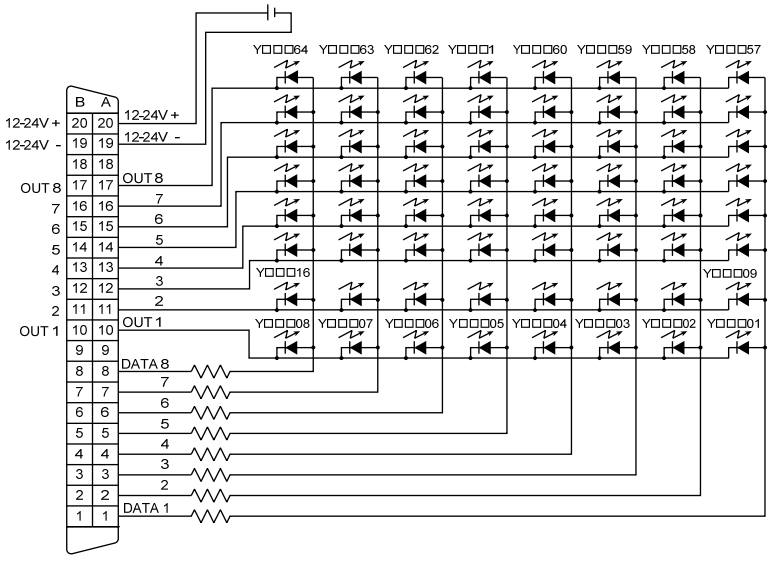

Note: Viewed from the front side of the module.

**F3YD32-1T**
**TTL output module**



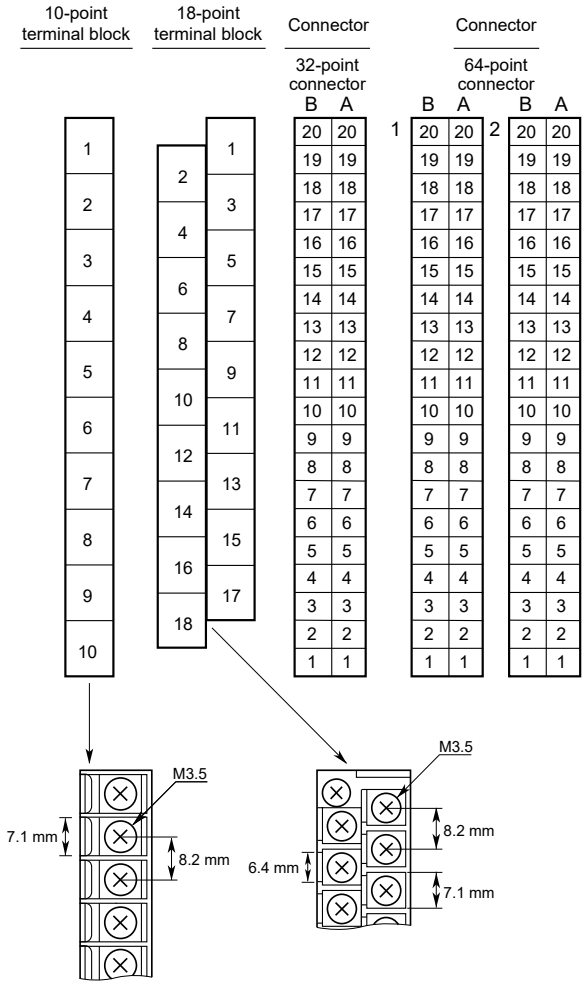

Note: Viewed from the front side of the module.

**F3YD64-1M Transistor output module**




Note: Viewed from the front side of the module.

## ■ Terminal Arrangement




## External Connection Method

| | | Terminal Block Type | Connector Type | | |
|---|---|---|---|---|---|
| Applicable conductor size | | 0.33 - 0.82 $mm^2$ | 0.26 $mm^2$ max. | 0.08 - 0.20 $mm^2$ | Flat cable, 1.27 mm pitch, 0.08 $mm^2$ |
| Wire connection method | | Solderless | Soldered | Solderless | Solderless |
| Rated wire temperature | | 75°C min. | | | |
| Wire Material | | Copper | | | |
| Solderless terminal | Solderless terminal | For 3.5 mm terminals | — | | |
| | Crimping torque | 0.8 N·m {8 kgf·cm, 6.9 lbf·in} | — | | |
| | Applicable solderless terminal | Example: Japan Solderless Terminal Mfg Co., Ltd.: V1.25-M3 Nippon Tanshi Co., Ltd.: RAV1.25-3.5 | — | | |

## Applicable External Connectors

- OTAX Corporation

| Connection method | | Compatible connector | Remarks |
|---|---|---|---|
| Soldered type | Connector | N361J040AU | Purchase the desired connector kit separately. |
| | Connector cover | N360C040B | |
| Crimp-on type | Housing | N363J040 | |
| | Contact | N363JAU | |
| | Connector cover | N360C040B | |
| Pressure-welded type | | N367J040AUFW | |

## Operating Environment

There is no restriction on the type of CPU modules that can be used with this module.

## Environment Specifications

| Item | Specifications |
|---|---|
| Surrounding air temperature range | Operating : 0 to 55°C |
| | Storage : -20°C to 75°C |
| Surrounding humidity range | Operating : 10 to 90% RH (non-condensing) |
| | Storage : 10 to 90% RH (non-condensing) |
| Surrounding atmosphere | Must be free of corrosive gases, flammable gases or heavy dust. |

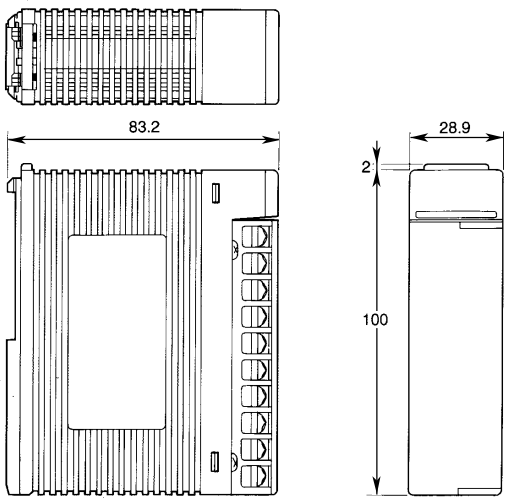
## Model and Suffix Codes

| Model | Suffix code | Style code | Option code | Description |
|---|---|---|---|---|
| F3YD04 | -7N | ..... | ..... | Transistor output, 24 V DC 2 A, 4 points, all points independent |
| F3YA08 | -2N | ..... | ..... | TRIAC output, 100－240 V AC 1 A, 8 points |
| F3YC08 | -0C | ..... | ..... | Relay output, 24 V DC, 100－240 V AC 2 A, 8 points, all points independent |
| F3YC08 | -0N | ..... | ..... | Relay output, 24 V DC, 100－240 V AC 2 A, 8 points |
| F3YC16 | -0N | ..... | ..... | Relay output, 24 V DC, 100－240 V AC 2 A, 16 points |
| F3YD08 | -6 A | ..... | ..... | Transistor output (sink type), 12－24 V DC 1 A, 8 points |
| F3YD08 | -6B | ..... | ..... | Transistor output (source type), 12－24 V DC 1 A, 8 points |
| F3YD08 | -7A | ..... | ..... | Transistor output (sink type), 12－24 V DC 2 A, 8 points |
| F3YD14 | -5 A | ..... | ..... | Transistor output (sink type), 12－24 V DC 0.5 A, 14 points |
| F3YD14 | -5B | ..... | ..... | Transistor output (source type), 12－24 V DC 0.5 A, 14 points |
| F3YD32 | -1T | ..... | ..... | TTL output, 5 V DC, 32 points* |
| F3YD64 | -1M | ..... | ..... | Transistor output (matrix scan), 12－24 V DC 0.1 A, 64 points |

*: See the section on spare parts in the FA-M3 Range-free Multi-controller (GS 34M06A01-01E) for information on connectors.

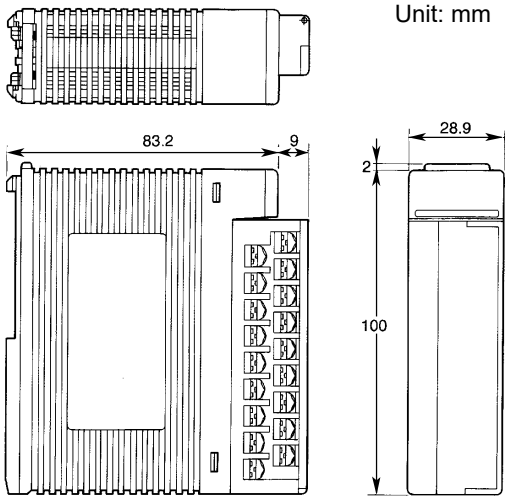
## External Dimensions

**F3YA08, F3YD04, F3YC08-0N, F3YD08**

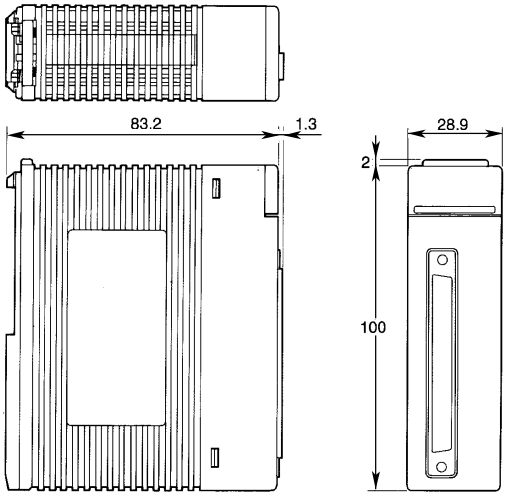



**F3YD14, F3YC08-0C, F3YC16**

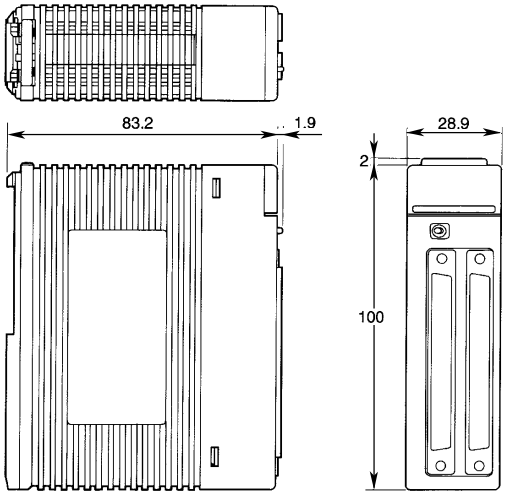
Unit: mm



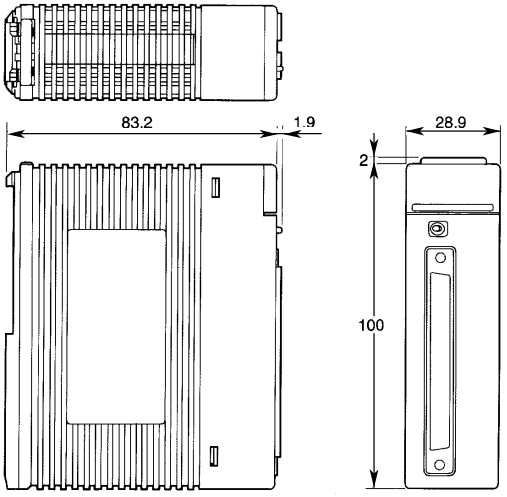

**F3YD32**




**F3YD64-1A, F3YD64-1F**




**F3YD64-1M**



FA-M3

# General Specifications

F3YD32-1H
High-Speed Transistor Output Modules
(sink type with short-circuit protector)

## General

F3YD32-1H is a high-speed transistor output module with 32 outputs.

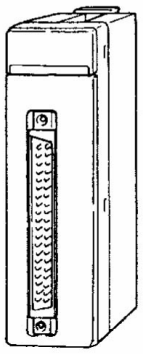
## Features

- Built-in protection against output short-circuit
- High speed response of 0.1 ms max.
- Support for multi-channel pulse output applications

## Specifications

| Item | | F3YD32-1H |
|---|---|---|
| Output type | | Transistor contact (sink type) |
| Number of points | | 32 |
| Common line type | | 8 points/common |
| Isolation method | | Photocoupler isolation |
| Withstanding voltage | | 1500 V AC for one minute between the group of terminals for external connection and the internal circuit |
| Rated load voltage (Operating voltage range) | | 12 to 24 V DC (10.2 to 26.4 V DC) |
| Maximum load current | | 0.1 A/point<br>0.5 A/common |
| Response time | OFF→ON | 0.1 ms max. |
| | ON→OFF | 0.1 ms max. |
| ON voltage | | 0.5 V DC max. |
| Off-time leak current | | 0.1 mA max. |
| Service life | Mechanical | — |
| Protectors *1 | Short -circuit | Limits short-circuit current. |
| | Overheat | Shuts off output when overheat is detected. |
| Surge Protector *2 | | Active clamp |
| Fuse | | None |
| Current consumption | | 165 mA (5 V DC) |
| Output display *3 | | LED (Lit when output is on) |
| Output status when program stops *4 HOLD/RESET | | When a sequence CPU is used:<br>Initial value: RESET<br>All module outputs can be set collectively. *5 |
| | | When a BASIC CPU is used:<br>No setting function;<br>always set to HOLD |
| | | When an OS-free CPU is used:<br>Initial value: HOLD<br>Can be specified for each set of 8 points. |
| External power supply | | 12 to 24 V DC, 30 mA |
| External connection | | One 40-pin connector |
| Weight | | 110 g |

*1: Operation of the protection circuitry:
- If short-circuit occurs, the ON voltage increases and the short-circuit current is limited within the range 1-3 A.
- If the short-circuit condition is removed, normal operation resumes.
- If the short-circuit condition persists, the short-circuit current may cause the temperature of the output element to reach approx. 160°C, triggering the overheat protector to shut down the output.
- If the temperature of the overheated output element then drops by approximately 10°C, normal operation resumes.
- The overheat protector will not be triggered if the module is operated normally within its specifications with no short-circuit condition.
- Both the short-circuit protector and overheat protector are designed to control outputs individually. Under some short-circuit conditions, however, the overheat protector may shut down not only its associated output but also other outputs.
- Short-circuit and overheat protectors are designed to protect the output element against short-term short-circuit. Never leave the module in prolonged short-circuit condition. Otherwise, the module enclosure may deteriorate or the PCB may be discolored.



- Ensure that the polarity of the external power supply is correct. Otherwise, a short-circuit condition may damage an output element and cause smoldering and scattering of chips. Beware that wrongly connecting a connector wired for F3XD32 or F3XD64 to the module may disable the protectors and damage internal elements.

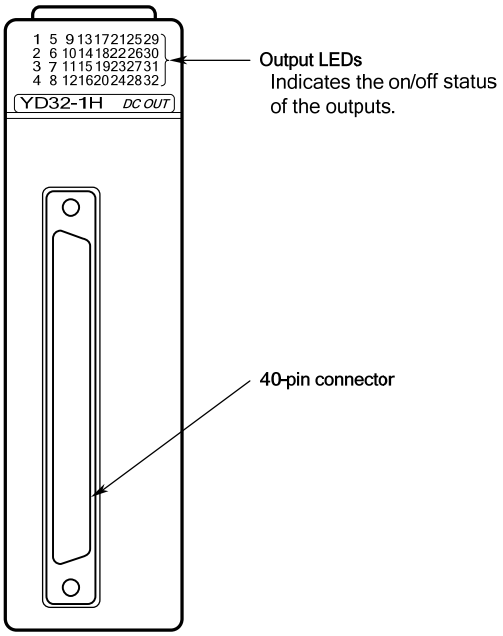
*2: If an inductive load, such as a relay, is to be connected, a surge protector is also required on the load side. Connect a surge protector or a diode across the load nearby so that the module output terminal voltage will not exceed the specified operating load voltage range.

*3: The contact operation of the output block of the circuit and the LED display operate independently and thus may be inconsistent in the event of an error.

*4: For details on the module behavior when the CPU fails, see the Severity of Failures and LED Display" in the FA-M3/e-RT3 Overview (GS 34M06A01-01E).
For detailed operation depending on the status of the OS-free CPU module, see "OS-free CPU module status and output module status" in the FA-M3/e-RT3 Overview (GS 34M06A01-01E).

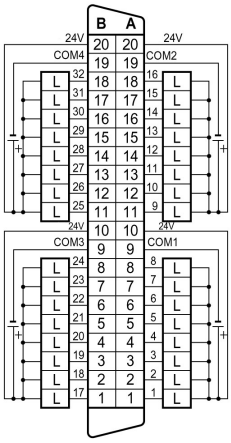
*5: When F3SP28, F3SP38, F3SP5☐, F3SP6☐ or F3SP7☐ is used, all points can be specified in 16-point units.

## Components and Functions



## External Connection Diagram

**F3YD32-1H**

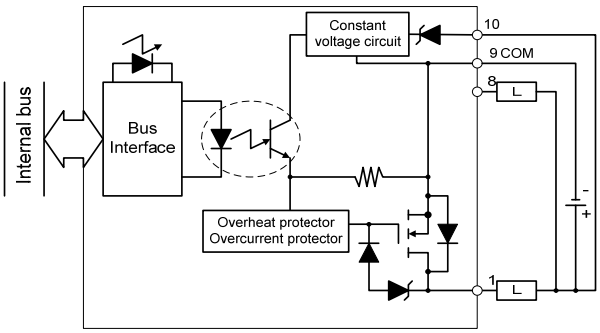



Note: Viewed from the front of the module.

## Terminal Arrangement

| B | A |
|---|---|
| 20 | 20 |
| 19 | 19 |
| 18 | 18 |
| 17 | 17 |
| 16 | 16 |
| 15 | 15 |
| 14 | 14 |
| 13 | 13 |
| 12 | 12 |
| 11 | 11 |
| 10 | 10 |
| 9 | 9 |
| 8 | 8 |
| 7 | 7 |
| 6 | 6 |
| 5 | 5 |
| 4 | 4 |
| 3 | 3 |
| 2 | 2 |
| 1 | 1 |

## Internal Circuit Diagram




## External Connection Method

| | | | |
|---|---|---|---|
| **Applicable conductor size** | 0.26 mm$^2$ max. | 0.08-0.20 mm$^2$ | Flat cable, 1.27 mm pitch, 0.08 mm$^2$ |
| **Wire connection method** | Soldered | Solderless | Solderless |
| **Rated wire temperature** | 75°C min. | | |
| **Wire material** | Copper | | |

## Applicable External Connectors

- OTAX Corporation

| Connection method | | Compatible connector | Remarks |
|---|---|---|---|
| **Soldered type** | **Connector** | N361J040AU | Purchase the desired connector kit separately. |
| | **Connector cover** | N360C040B | |
| **Crimp-on type** | **Housing** | N363J040 | |
| | **Contact** | N363JAU | |
| | **Connector cover** | N360C040B | |
| **Pressure-welded type** | | N367J040AUFW | |

## Operating Environment

This module is compatible with all CPU module types.

## Environment Specifications

| Item | Specifications |
|---|---|
| Surrounding air temperature range | Operating : 0 to 55°C |
| | Storage : -20°C to 75°C |
| Surrounding humidity range | Operating : 10 to 90% RH (non-condensing) |
| | Storage : 10 to 90% RH (non-condensing) |
| Surrounding atmosphere | Must be free of corrosive gases, flammable gases or heavy dust. |

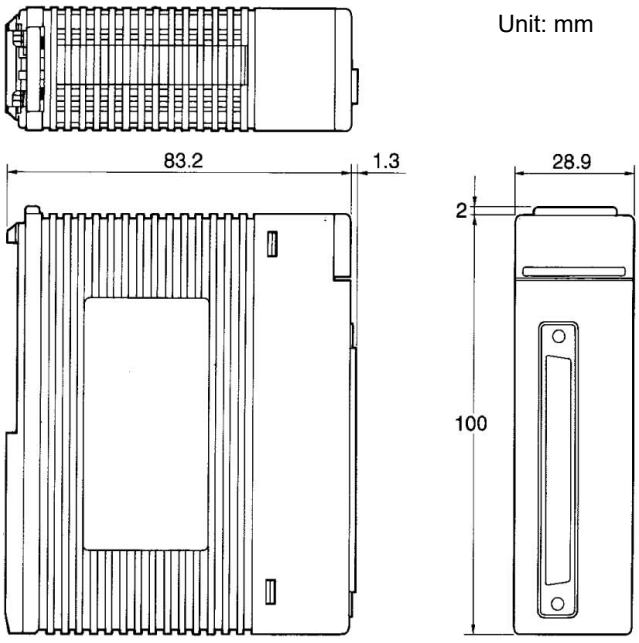
## Model and Suffix Codes

| Model | Suffix Code | Style Code | Option Code | Description |
|---|---|---|---|---|
| **F3YD32** | -1H | . . . . . | . . . . . | Transistor output, 32 points (high-speed output with short-circuit protector) |

## External Dimensions

**F3YD32-1H**

Unit: mm



# General Specifications

F3YD32-1P, F3YD64-1P
Transistor Output Modules
(sink type with short-circuit protector)

FA-M3

## General

F3YD32-1P and F3YD64-1P are 32- and 64-point transistor output modules respectively.

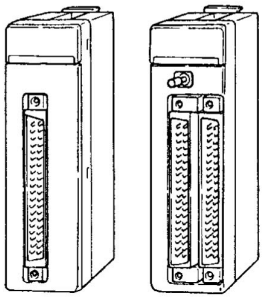
## Features

- The modules have built-in protection against output short-circuit.

## Specifications

| Model | | F3YD32-1P | F3YD64-1P |
|---|---|---|---|
| Output type | | Transistor contact (sink type) | |
| Number of points | | 32 | 64 |
| Common line type | | 8 points/common | |
| Isolation method | | Photocoupler isolation | |
| Withstanding voltage | | 1500 V AC for one minute between the group of terminals for external connection and the internal circuit | |
| Rated load voltage (Operating voltage range) | | 12 to 24 V DC (10.2 to 26.4 V DC) | |
| Maximum load current | | 0.1 A/point 0.5 A/common | 0.1 A/point 0.4 A/common |
| Response time | OFF→ON | 1 ms max. | |
| | ON→OFF | 1 ms max. | |
| ON voltage | | 0.5 V DC max. | |
| Off-time leak current | | 0.1 mA max. | |
| Service life | Mechanical | — | |
| Protectors *1 | Short -circuit | Limit the output current or output shutdown | |
| | Overheat | Output shutdown | |
| Surge Protector *2 | | Active clamp circuit | |
| Fuse | | None | |
| Current consumption | | 160 mA (5 V DC) | 275 mA (5 V DC) |
| Output display *3 | | LED (Lit when output is on) | LED (Lit when outputs are turned on for a switched LED group) |
| Output status when program stops *4 HOLD/RESET | | When a sequence CPU is used: Initial value: RESET Can be set globally on a module-by-module basis *5 | |
| | | When a BASIC CPU is used: No setting function; The status is always HOLD | |
| | | When an OS-free CPU is used: Initial value: HOLD Can be specified for each set of 8 points. | |
| External power supply | | 12 to 24 V DC 55 mA | 12 to 24 V DC 95 mA |
| External connection | | One 40-pin connector | Two 40-pin connectors |
| Weight | | 110 g | 130 g |

*1: Operation of the protection circuitry:
- If short-circuit occurs, the output current is limited or the output is turned off for a certain period of time.
- If the short-circuit condition is removed, normal operation resumes.
- If the short-circuit condition persists, the temperature of the output element will rise. When the internal temperature of the output element exceeds a certain temperature, overheat protection is activated and the output is turned off.
- If the temperature of the overheated output element, then drops, normal operation resumes.
- The overheat protector will not be triggered if the module is operated normally within its specifications with no short-circuit condition.
- The short-circuit protectors are designed to control outputs



individually. On the other hand, Overheat protectors control outputs in 8 units. OUT1-OUT8, OUT9-OUT16, …OUT57-OUT64. Under some short-circuit conditions, however, the overheat protector may shut down not only its associated outputs but also other outputs.

- Short-circuit and overheat protectors are designed to protect the output element against short-term short-circuit. Never leave the module in prolonged short-circuit condition. Otherwise, the module enclosure may deteriorate or the PCB may be discolored.
- Ensure that the polarity of the external power supply is correct. Otherwise, a short-circuit condition may damage an output element and cause smoldering and scattering of chips. Beware that wrongly connecting a connector wired for F3XD32 or F3XD64 to the module may disable the protectors and damage internal elements.

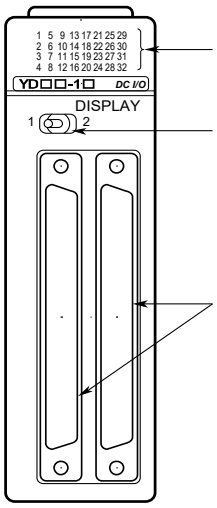
*2: If an inductive load, such as a relay, is to be connected, a surge protector is also required on the load side. Connect a surge protector or a diode across the load nearby so that the module output terminal voltage will not exceed the specified operating load voltage range.

*3: The contact operation of the output block of the circuit and the LED display operate independently and thus may be inconsistent in the event of an error.

*4: For details on the module behavior when the CPU fails, see the Severity of Failures and LED Display" in the FA-M3/e-RT3 Overview (GS 34M06A01-01E).
For detailed operation depending on the status of the OS-free CPU module, see "OS-free CPU module status and output module status" in the FA-M3/e-RT3 Overview (GS 34M06A01-01E).

*5: When F3SP28, F3SP38, F3SP5☐, F3SP6☐ or F3SP7☐ is used, all points can be specified in 16-point units.

## Components and Functions




**Output LEDs**
Indicates the on/off status of the outputs.

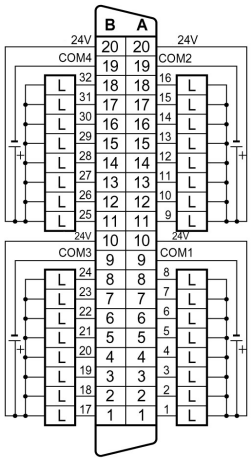
**Display Selector Switch**
Switches display of output LEDs. Not present on 32-point modules.

**One or two 40-pin connectors**
32-point modules have only one connector.

| Display Selector Switch Position | Output LEDs 1-32 |
|---|---|
| 1 | Indicates on/off statuses of outputs 1 to 32. |
| 2 | Indicates on/off statuses of outputs 33 to 64. |

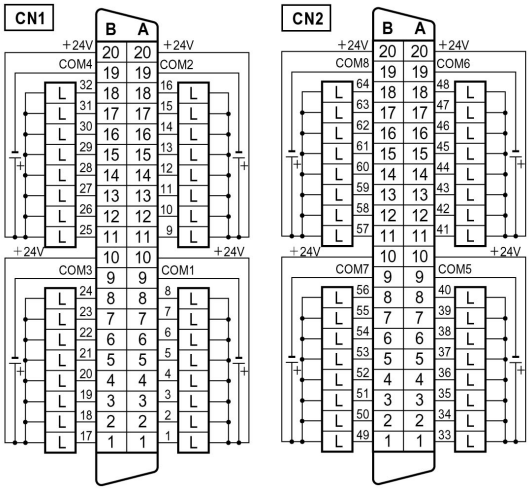
## External Connection Diagram

**F3YD32-1P**




Note: Viewed from the front of the module.

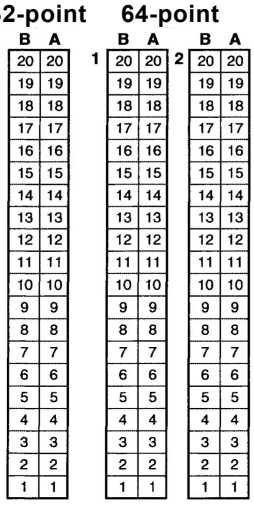
**F3YD64-1P**



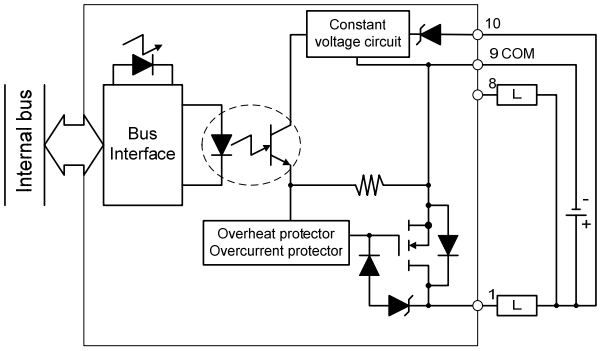

Note: Viewed from the front of the module.

## Terminal Arrangement

**32-point** **64-point**




## Internal Circuit Diagram




## External Connection Method

| | | | |
|---|---|---|---|
| **Applicable conductor size** | 0.26 $mm^2$ max. | 0.08-0.20 $mm^2$ | Flat cable, 1.27 mm pitch, 0.08 $mm^2$ |
| **Wire connection method** | Soldered | Solderless | Solderless |
| **Rated wire temperature** | 75°C min. | | |
| **Wire material** | Copper | | |

## Applicable External Connectors

- OTAX Corporation

| Connection method | | Compatible connector | Remarks |
|---|---|---|---|
| Soldered type | Connector | N361J040AU | Purchase the desired connector kit separately. |
| | Connector cover | N360C040B | |
| Crimp-on type | Housing | N363J040 | |
| | Contact | N363JAU | |
| | Connector cover | N360C040B | |
| Pressure-welded type | | N367J040AUFW | |

## Operating Environment

This module is compatible with all CPU module types.

## Environment Specifications

| Item | Specifications |
|---|---|
| Surrounding air temperature range | Operating : 0 to 55°C |
| | Storage : -20°C to 75°C |
| Surrounding humidity range | Operating : 10 to 90% RH (non-condensing) |
| | Storage : 10 to 90% RH (non-condensing) |
| Surrounding atmosphere | Must be free of corrosive gases, flammable gases or heavy dust. |

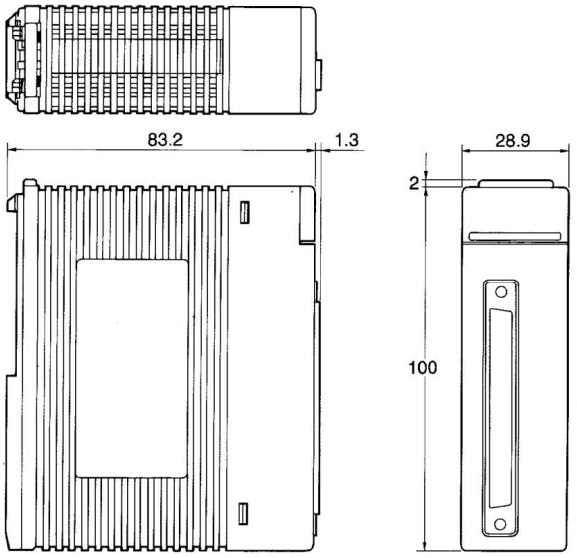
## Model and Suffix Codes

| Model | Suffix Code | Style Code | Option Code | Description |
|---|---|---|---|---|
| F3YD32 | -1P | . . . . . | . . . . . | 32-point transistor output with short-circuit protector |
| F3YD64 | -1P | . . . . . | . . . . . | 64-point transistor output with short-circuit protector |

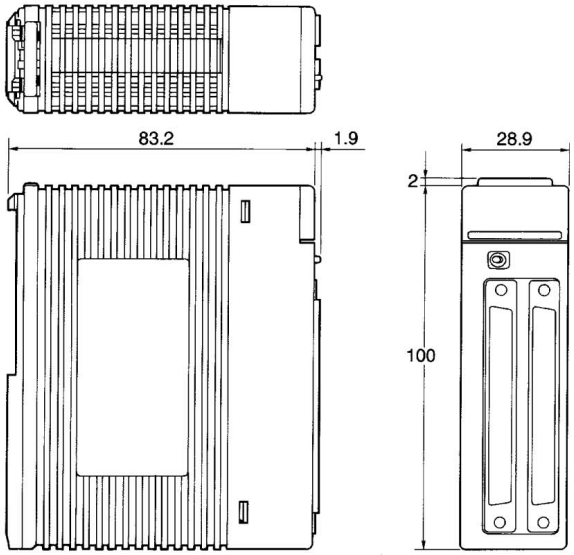
## External Dimensions

Unit: mm

**F3YD32-1P**




**F3YD64-1P**



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# General Specifications

F3YD32-1R, F3YD64-1R
Transistor Output Modules
(source type with short-circuit protector)

FA-M3

## General

F3YD32-1R and F3YD64-1R are 32- and 64-point transistor output modules respectively.

## Features

The modules have built-in protection against output short-circuit.

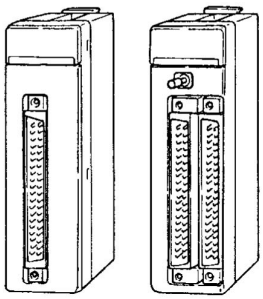
## Specifications

| Model | | F3YD32-1R | F3YD64-1R |
|---|---|---|---|
| Output type | | Transistor contact (source-type) | |
| Number of points | | 32 | 64 |
| Common line type | | 8 points/common | |
| Isolation method | | Photocoupler isolation | |
| Withstanding voltage | | 1500 V AC for one minute between the group of terminals for external connection and the internal circuit | |
| Rated load voltage *1 (Operating voltage range) | | 12 to 24 V DC (10.2 to 26.4 V DC) | |
| Maximum load current | | 0.1 A/point 0.5 A/common | 0.1 A/point 0.4 A/common |
| Response time | OFF→ON | 1 ms max. | |
| | ON→OFF | 1 ms max. | |
| ON voltage | | 0.5 V DC max. | |
| Off-time leak current | | 0.1 mA max. | |
| Service life | Mechanical | — | |
| Protectors *2 | Short -circuit | Limit the output current or output shutdown | |
| | Overheat | Output shutdown | |
| Surge Protector *3 | | None | |
| Fuse | | None | |
| Current consumption | | 170 mA (5 V DC) | 275 mA (5 V DC) |
| Output display *4 | | LED (Lit when output is on) | LED (Lit when outputs are turned on for a switched LED group) |
| Output status when program stops *5 HOLD/RESET | | When a sequence CPU is used: Initial value: RESET All module outputs can be set collectively.*6 | |
| | | When a BASIC CPU is used: No setting function; always set to HOLD | |
| | | When an OS-free CPU is used: Initial value: HOLD Can be specified for each set of 8 points. | |
| External power supply *1 | | 12 to 24 V DC 60 mA | 12 to 24 V DC 110 mA |
| External connection | | One 40-pin connector | Two 40-pin connectors |
| Weight | | 110 g | 130 g |

*1 The external power supply and the load power supply must be identical. Using separate power sources is not allowed even if they have the same voltage.

*2: Operation of the protection circuitry:

- If short-circuit occurs, the output current is limited or the output is turned off for a certain period of time.
- If the short-circuit condition is removed, normal operation resumes.
- If the short-circuit condition persists, the temperature of the output element will rise. When the internal temperature of the output element exceeds a certain temperature, overheat protection is activated and the output is turned off.
- If the temperature of the overheated output element, then drops, normal operation resumes.
- The overheat protector will not be triggered if the module is operated normally within its specifications with no short-circuit condition.
- The short-circuit protectors are designed to control outputs individually. On the other hand, Overheat protectors control outputs in 8 units. OUT1-OUT8, OUT9-OUT16, …OUT57-OUT64. Under some short-circuit conditions, however, the overheat protector may shut down not only its associated outputs but also other outputs.



- Short-circuit and overheat protectors are designed to protect the output element against short-term short-circuit. Never leave the module in prolonged short-circuit condition. Otherwise, the module enclosure may deteriorate or the PCB may be discolored.
- Ensure that the polarity of the external power supply is correct. Otherwise, a short-circuit condition may damage an output element and cause smoldering and scattering of chips.
- Beware that wrongly connecting a connector wired for F3XD32 or F3XD64 to the module may disable the protectors and damage internal elements.

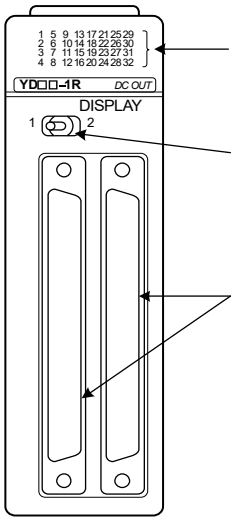
*3: If an inductive load, such as a relay, is to be connected, a surge protector is also required on the load side. Connect a surge protector or a diode across the load nearby so that the module output terminal voltage will not exceed the specified operating load voltage range.

*4: The contact operation of the output block of the circuit and the LED display operate independently and thus may be inconsistent in the event of an error.

*5: For details on the module behavior when the CPU fails, see the Severity of Failures and LED Display" in the FA-M3/e-RT3 Overview (GS 34M06A01-01E).
For detailed operation depending on the status of the OS-free CPU module, see "OS-free CPU module status and output module status" in the FA-M3/e-RT3 Overview (GS 34M06A01-01E).

*6: When F3SP28, F3SP38, F3SP5x, F3SP6x or F3SP7x is used, all points can be specified in 16-point units.

## Components and Functions




**Output LEDs**
Indicates the on/off status of the outputs.

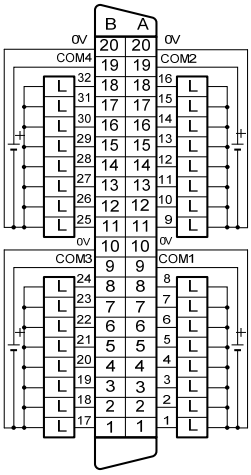
**Display Selector Switch**
Switches display of output LEDs. Not present on 32-point modules.

**One or two 40-pin connectors**
32-point modules have only one connector.

| Display Selector Switch Position | Output LEDs 1-32 |
|---|---|
| 1 | Indicates on/off statuses of outputs 1 to 32. |
| 2 | Indicates on/off statuses of outputs 33 to 64. |

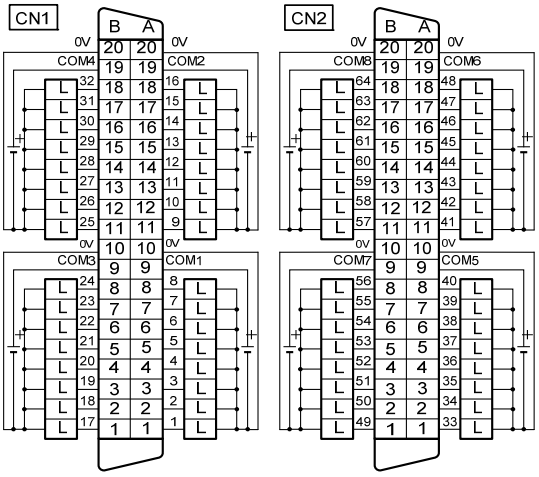
## External Connection Diagram

**F3YD32-1R**




Note: Viewed from the front of the module.

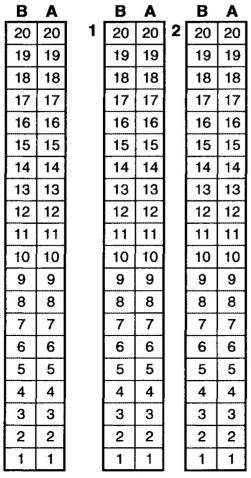
**F3YD64-1R**



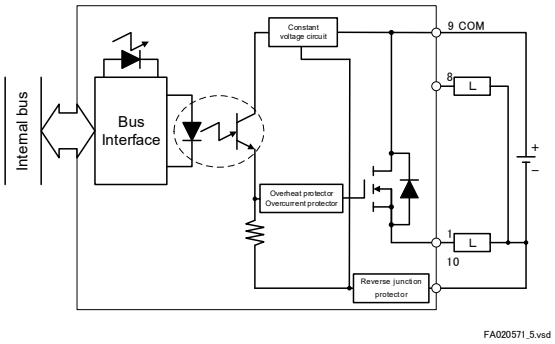

Note: Viewed from the front of the module.

## Terminal Arrangement

**32-point 64-point**




## Internal Circuit Diagram




## External Connection Method

| | | | |
|---|---|---|---|
| **Applicable conductor size** | 0.26 mm² max. | 0.08-0.20 mm² | Flat cable, 1.27 mm pitch, 0.08 mm² |
| **Wire connection method** | Soldered | Solderless | Solderless |
| **Rated wire temperature** | 75°C min. | | |
| **Wire material** | Copper | | |

## Applicable External Connectors

- OTAX Corporation

| Connection method | | Compatible connector | Remarks |
|---|---|---|---|
| **Soldered type** | **Connector** | N361J040AU | Purchase the desired connector kit separately. |
| | **Connector cover** | N360C040B | |
| **Crimp-on type** | **Housing** | N363J040 | |
| | **Contact** | N363JAU | |
| | **Connector cover** | N360C040B | |
| **Pressure-welded type** | | N367J040AUFW | |

## Operating Environment

This module is compatible with all CPU module types.

## Environment Specifications

| Item | Specifications |
|---|---|
| Surrounding air temperature range | Operating : 0 to 55°C |
| | Storage : -20°C to 75°C |
| Surrounding humidity range | Operating : 10 to 90% RH (non-condensing) |
| | Storage : 10 to 90% RH (non-condensing) |
| Surrounding atmosphere | Must be free of corrosive gases, flammable gases or heavy dust. |

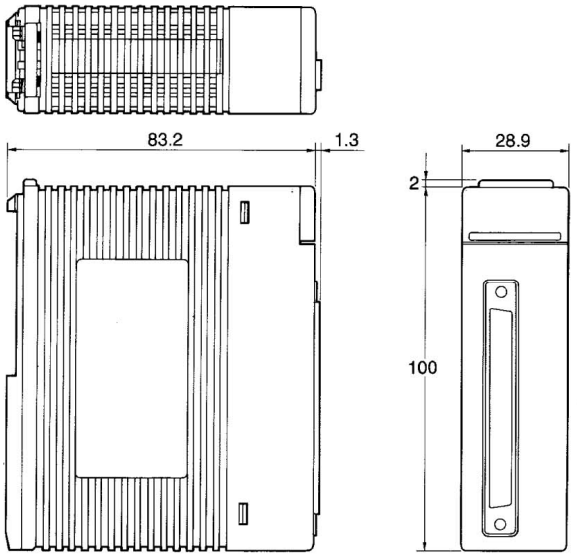
## Model and Suffix Codes

| Model | Suffix Code | Style Code | Option Code | Description |
|---|---|---|---|---|
| **F3YD32** | -1R | . . . . . | . . . . . | 32-point transistor output with short-circuit protector |
| **F3YD64** | -1R | . . . . . | . . . . . | 64-point transistor output with short-circuit protector |

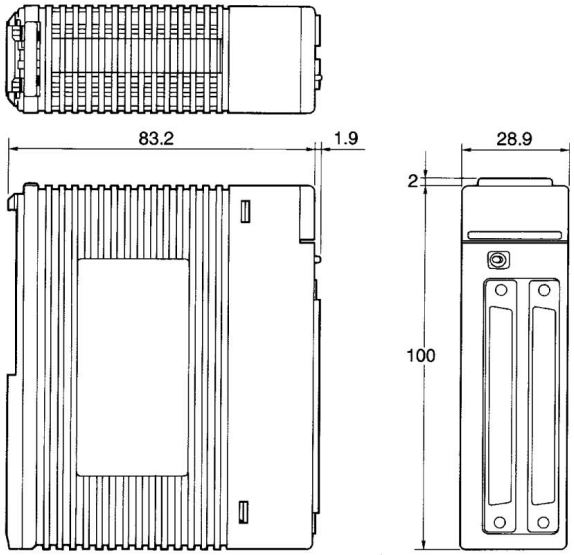
## External Dimensions

Unit: mm

**F3YD32-1R**




**F3YD64-1R**



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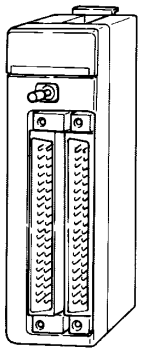
# General Specifications

F3WD64-xP
Input/Output Module
(sink type with short-circuit protector)

FA-M3

## General

The F3WD64 Input/Output Module is intended for use in an input/output slot of the FA-M3. It has 32-point inputs and outputs (sink type) and is provided with two 40-pin connectors. Each input/output point is isolated from the internal circuit by a photocoupler. The F3WD64 input/output module uses an 8-point/common configuration for both input and output.
The operating voltage is either 12 V DC or 24 V DC.



## Features

The modules have built-in protection against output short-circuit.

## Specifications

| | Item | | F3WD64-3P | F3WD64-4P |
|---|---|---|---|---|
| Input Block | Input type | | DC voltage | |
| | Number of inputs | | 32 (Terminal Nos. 01 to 32) | |
| | Common line type | | 8 points/common | |
| | Isolation method | | Photocoupler Isolation | |
| | Withstanding voltage | | 1500 V AC for one minute between the group of terminals for external connection and the internal circuit | |
| | Rated input voltage (Operating voltage range) | | 24V DC (20.4 to 26.4V DC) | 12V DC (10.2 to 13.2V DC) |
| | Rated input current | | 4.1 mA/point (24 V DC) | 4.1 mA/point (12 V DC) |
| | Operating voltage/ current | ON | 16 V DC min. 3.2 mA min. | 8 V DC min. 2.6 mA min. |
| | | OFF | 5.8 V DC max. 0.9 mA max. | 3.4 V DC max. 1.0 mA max. |
| | Response time | OFF→ON | Input sampling time can be specified for 4 steps: Always (0μs),62.5μs, 250μs and 1ms. *1 | |
| | | ON→OFF | Input sampling time can be specified for 4 steps: Always (0μs),62.5μs, 250μs and 1ms. *1 | |
| | Interrupt | | None | |
| | Maximum ratio of inputs turned on simultaneously | | 60% | 100% |
| Output Block | Output type | | Transistor contact (sink type) | |
| | Number of outputs | | 32 (Terminal Nos. 33 to 64) | |
| | Common line type | | 8 points/common | |
| | Isolation method | | Photocoupler isolation | |
| | Rated load voltage (Operating voltage range) | | 24 V DC (20.4 to 26.4 V DC) | 12 V DC (10.2 to 13.2 V DC) |
| | Maximum load current | | 0.1 A/point 0.4 A/common | |
| | Response time | OFF→ON | 1 ms max. | |
| | | ON→OFF | 1 ms max. | |
| | ON voltage | | 0.5 V DC max. | |
| | OFF-time leakage current | | 0.1 mA max. | |
| | Protectors *2 | Short-circuit | Controlled short-circuit current | |
| | | Overheat | Output shutdown | |
| | Surge Protector *3 | | Active clamp circuit | |
| | Fuse | | None | |
| | Output status when program stops *4 HOLD/RESET | | When a sequence CPU is used: Initial value: RESET Can be set globally on a module-by-module basis *5 | |
| | | | When a BASIC CPU is used: No setting function; the status is always HOLD. | |
| | | | When an OS-free CPU is used: Initial value: HOLD Can be specified for each set of 8 points. | |
| | External power supply | | 24 V DC, 55 mA | 12 V DC, 55 mA |
| Common | Withstanding voltage | | 1500 V AC for one minute between the group of terminals for external connection and the internal circuit | |
| | Input/Output status indication *6 | | Lit when status is on (Input or output status indication can be selected using a switch.) | |
| | Current consumption | | 170 mA (5V DC) | |
| | External connection | | Two 40-pin connectors | |
| | Weight | | 120 g | |

*1: When F3SP28, F3SP38, F3SP5x, F3SP6x or F3SP7x is used. For other CPU modules, the OFF → ON response time is 1.0 ms (max.) and the OFF → ON response time is 2.5 ms (max.). The actual response time can be obtained by adding the following values:
- 100 μs (OFF → ON)
- 300 μs (ON → OFF)

If the input interrupt is to be used, set the input sampling period to at least 62.5 μs.

*2: Operation of the protection circuitry:

- If short-circuit occurs, the ON voltage increases and the short-circuit current is limited within the range 1-3 A.
- If the short-circuit condition is removed, normal operation resumes.
- If the short-circuit condition persists, the short-circuit current may cause the temperature of the output element to reach approx. 160°C, triggering the overheat protector to shut down the output.
- If the temperature of the overheated output element then drops by about 10°C, normal operation resumes.
- The overheat protector will not be triggered if the module is operated normally within its specifications with no short-circuit condition.
- Both the short-circuit protector and overheat protector are designed to control outputs individually. Under some short-circuit conditions, however, the overheat protector may shut down not only its associated output but also other outputs.
- Short-circuit and overheat protectors are designed to protect the output element against short-term short-circuit. Never leave the module in prolonged short-circuit condition. Otherwise, the module enclosure may deteriorate or the PCB may be discolored.
- Ensure that the polarity of the external power supply is correct. Otherwise, a short-circuit condition may damage an output element and cause smoldering and scattering of chips. Beware that wrongly connecting a connector wired for F3XD32 or F3XD64 to the module may disable the protectors and damage internal elements.

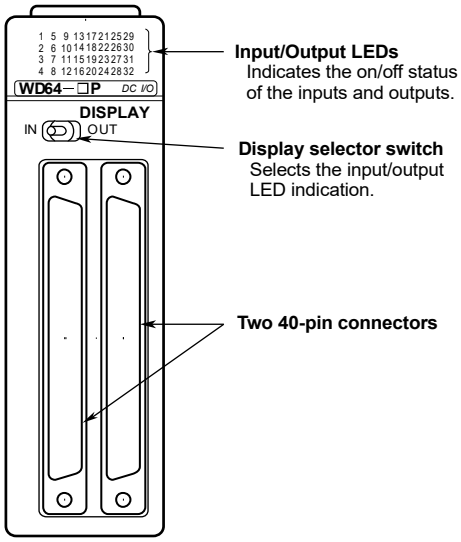
*3: If an inductive load, such as a relay, is to be connected, a surge protector is also required on the load side. Connect a surge protector or a diode across the load nearby so that the module output terminal voltage will not exceed the specified operating load voltage range.

*4: For details on the module behavior when the CPU fails, see the Severity of Failures and LED Display" in the FA-M3/e-RT3 Overview (GS 34M06A01-01E).
For detailed operation depending on the status of the OS-free CPU module, see "OS-free CPU module status and output module status" in the FA-M3/e-RT3 Overview (GS 34M06A01-01E).

*5: When F3SP28, F3SP38, F3SP5x, F3SP6x or F3SP7x is used, all points can be specified in 16-point units.

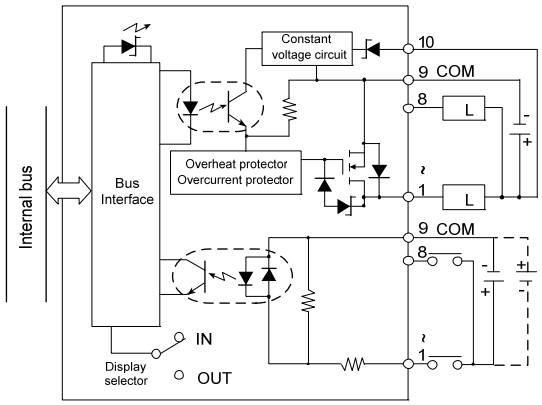
*6: The contact operation of the output block of the circuit and the LED display operate independently and thus may be inconsistent in the event of an error.

## Components and Functions

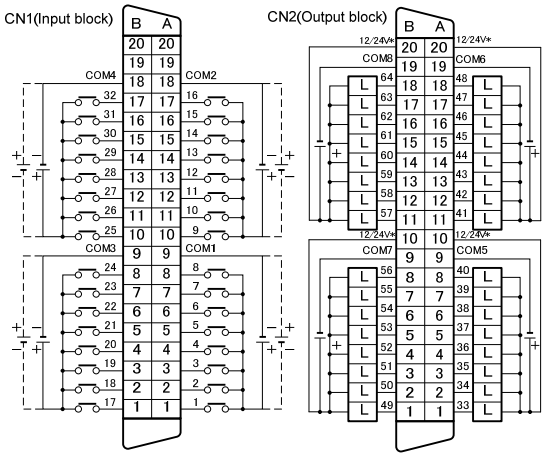



| Display selector switch position | LED Indication |
|---|---|
| IN | Indicates the on/off status of inputs 1 to 32. |
| OUT | Indicates the on/off status of outputs 33 to 64. |

## Internal Circuit Diagram




## External Connection Diagram




Note : Viewed from the front of the module.
* : 24 V for F3WD64-3P and 12 V for F3WD64-4P.

## Terminal Arrangement

| | B | A | | B | A |
|---|---|---|---|---|---|
| 1 | 20 | 20 | 2 | 20 | 20 |
| | 19 | 19 | | 19 | 19 |
| | 18 | 18 | | 18 | 18 |
| | 17 | 17 | | 17 | 17 |
| | 16 | 16 | | 16 | 16 |
| | 15 | 15 | | 15 | 15 |
| | 14 | 14 | | 14 | 14 |
| | 13 | 13 | | 13 | 13 |
| | 12 | 12 | | 12 | 12 |
| | 11 | 11 | | 11 | 11 |
| | 10 | 10 | | 10 | 10 |
| | 9 | 9 | | 9 | 9 |
| | 8 | 8 | | 8 | 8 |
| | 7 | 7 | | 7 | 7 |
| | 6 | 6 | | 6 | 6 |
| | 5 | 5 | | 5 | 5 |
| | 4 | 4 | | 4 | 4 |
| | 3 | 3 | | 3 | 3 |
| | 2 | 2 | | 2 | 2 |
| | 1 | 1 | | 1 | 1 |

## External Connection Method

| | Connector Type | | |
|---|---|---|---|
| Applicable conductor size | 0.26 mm² max. | 0.08 - 0.20 mm² | Flat cable, 1.27 mm pitch, 0.08 mm² |
| Wire connection method | Soldered | Solderless | Solderless |
| Rated wire temperature | 75 °C min. | | |
| Wire Material | Copper | | |

## Applicable External Connectors

- OTAX Corporation

| Connection method | | Compatible connector | Remarks |
|---|---|---|---|
| Soldered type | Connector | N361J040AU | Purchase the desired connector kit separately. |
| | Connector cover | N360C040B | |
| Crimp-on type | Housing | N363J040 | |
| | Contact | N363JAU | |
| | Connector cover | N360C040B | |
| Pressure-welded type | | N367J040AUFW | |

## Operating Environment

There is no restriction on the type of CPU modules that can be used with this module.

## Environment Specifications

| Item | Specifications |
|---|---|
| Surrounding air temperature range | Operating : 0 to 55°C |
| | Storage : -20°C to 75°C |
| Surrounding humidity range | Operating : 10 to 90% RH (non-condensing) |
| | Storage : 10 to 90% RH (non-condensing) |
| Surrounding atmosphere | Must be free of corrosive gases, flammable gases or heavy dust. |

## Model and Suffix Codes

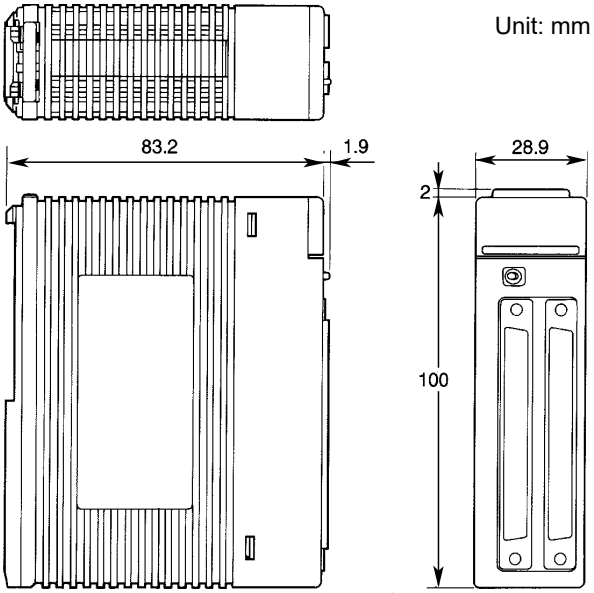
| Model | Suffix code | Style code | Option code | Description |
|---|---|---|---|---|
| F3WD64 | -3P | ..... | ..... | 24 V DC input/output (with short-circuit protector) |
| F3WD64 | -4P | ..... | ..... | 12 V DC input/output (with short-circuit protector) |

*: See the section on spare parts in the FA-M3 Range-free Multi-controller (GS 34M06A01-01E) for information on connectors.

## External Dimensions

**F3WD64-xP**

Unit: mm



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# General Specifications

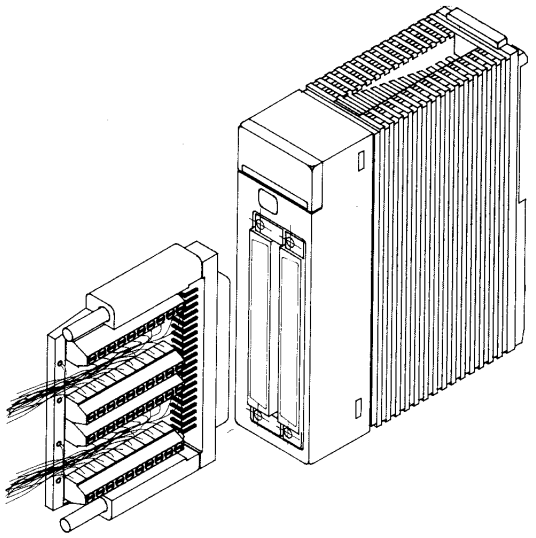
TA40-0N
Terminal Block Unit

FA-M3

## General

*The TA40-0N Terminal Block Unit is intended for use in the input/output modules that conform to the connector specifications of the FA-M3 Range-free Multi-controller It allows direct wiring for its slim connector profile. The TA40-0N can be used effectively not only for permanent connections but also for temporary connections such as during debugging.*

- The ultra-slim connector saves space on the power switch board.
- It permits direct mounting on an input/output module, which leads to cost reduction and dispenses with the need for cables.
- It can be used with all FA-M3 40-pin input/ output connectors.
- Using a European type terminal block relieves the user from the burden of soldering or crimping.
- It can be secured on an input/output module with screws to facilitate stable operation.



## Specifications

| Item | Specification |
|---|---|
| **Number of points** | 40 |
| **Rated voltage** | 5-24 V DC |
| **Operating voltage range** | 4.5 - 26.4 V DC |
| **Maximum current** | 0.5 A DC / 1 point |
| **Applicable conductor size** | 0.08 - 0.26 $mm^2$ ( AWG23 - 28) |
| **Terminal block screw** | M2 (slotted head screw) |
| **Clamping screw** | M2.6 (cross head screw) |
| **Color** | Black |
| **Weight** | 50 g |

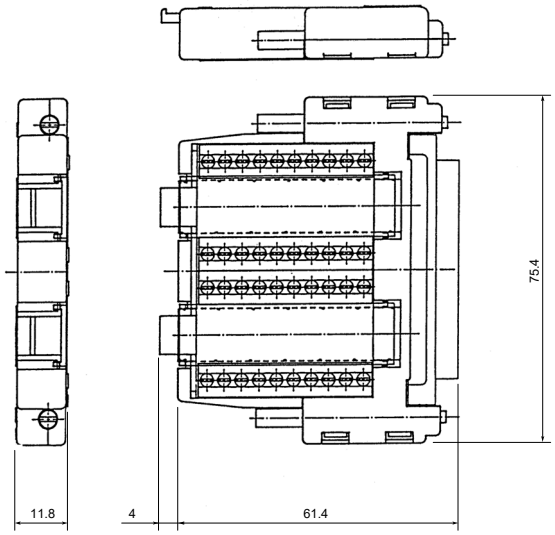
Note: The connector terminal block cannot be used with the F3YP04, F3YP08, F3YP14, F3YP18, F3NC32 and F3NC34 modules.

## Environment Specifications

| Item | Specifications |
|---|---|
| Surrounding air temperature range | Operating : 0 to 55°C |
| | Storage : -20°C to 75°C |
| Surrounding humidity range | Operating : 10 to 90% RH (non-condensing) |
| | Storage : 10 to 90% RH (non-condensing) |
| Surrounding atmosphere | Must be free of corrosive gases, flammable gases or heavy dust. |

## External Dimensions

Unit: mm




## Model and Suffix Codes

| Model | Suffix code | Style code | Option code | Description |
|---|---|---|---|---|
| **TA40** | **-0N** | ..... | ..... | Terminal block unit, 40 points |

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# General Specifications

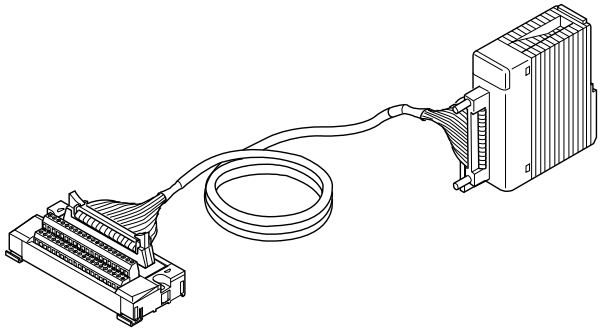
TA50-0N/ TA50-1N/ TA50-2N
Connector Terminal Block Unit
KM55-0xx
Connector Terminal Block Cable

FA-M3

## General

*The TA50-0N , TA50-1N and TA50-2N Connector Terminal Block Units are intended for use in the input/output modules that conform to the connector specifications of the FA-M3 Range-free Multi-controller*

- The TA50-0N and TA50-1N are connected to an input/output unit via the KM55-0xx Connector Terminal Block, which saves space and reduces wiring on the power switch board.
- Use of the connector terminal block unit with the connector terminal block cable eliminates soldering work for wiring.
- The TA50-0N and TA50-1N can be secured with mounting screws or DIN rails.



## Specifications (TA50-xN)

| Item | Specification | | |
|---|---|---|---|
| | TA50-0N | TA50-1N | TA50-2N |
| Number of points | 40 | | |
| Rated voltage | 5-24 V DC | | |
| Operating voltage range | 4.5 - 26.4 V DC | | |
| Maximum current | 0.5 A DC / 1 point | | |
| Applicable conductor size | 2 $mm^2$ max. | 1.25 $mm^2$ max. | |
| Terminal block screw | M3.5 | M3 | |
| Applicable terminal | Solderless ø8 mm max. | Solderless ø5.8 mm max. | |
| Connector | HIF3BA-40PA-2.54DSA (71) (MIL standard compliant) | | |
| Mounting method | 35-mm wide DIN rail or screw mounting | | |
| Clamping screw | M4 (2 points) | | |
| Color | Black | Gray | |
| Weight | 300 g | 175 g | 162g |

Note: The connector terminal blocks cannot be used with the F3YP04, F3YP08, F3YP14, F3YP18, F3YP22, F3YP24, F3YP28, F3NC32 and F3NC34 modules.

## Environment Specifications (TA50-xN)

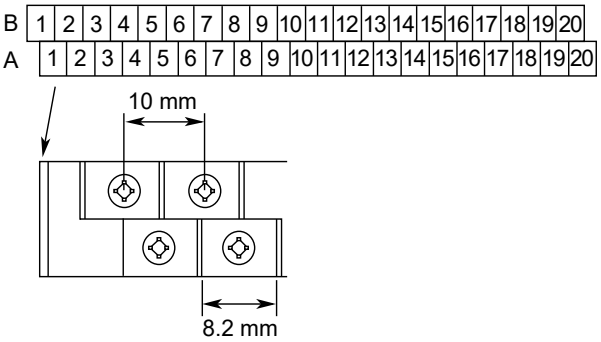
| Item | Specifications |
|---|---|
| Surrounding air temperature range | Operating : 0 to 55°C |
| | Storage : -20°C to 75°C |
| Surrounding humidity range | Operating : 10 to 90% RH (non-condensing) |
| | Storage : 10 to 90% RH (non-condensing) |
| Surrounding atmosphere | Must be free of corrosive gases, flammable gases or heavy dust. |

## Specifications (KM55-0xx)

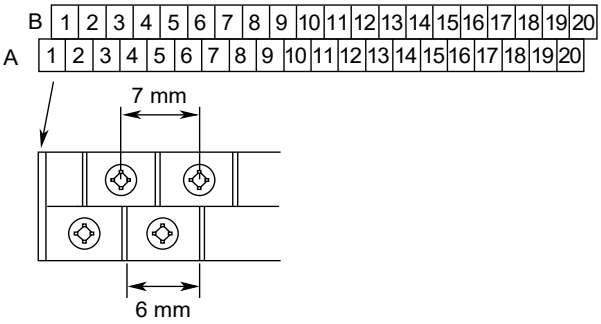
| Item | Specification |
|---|---|
| KM55-005 | 0.5 m |
| KM55-010 | 1.0 m |
| KM55-015 | 1.5 m |
| KM55-020 | 2.0 m |
| KM55-025 | 2.5 m |
| KM55-030 | 3.0 m |

Note: As the connector terminal block does not come with a cable for connecting a module and a connector terminal block, select a suitable cable from the list above.

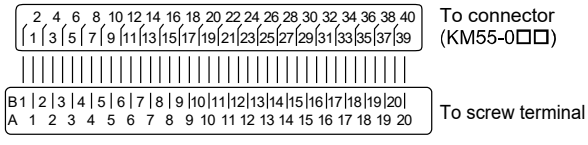
## Terminal Arrangement (TA50-0N)




## Terminal Arrangement (TA50-1N/TA50-2N)



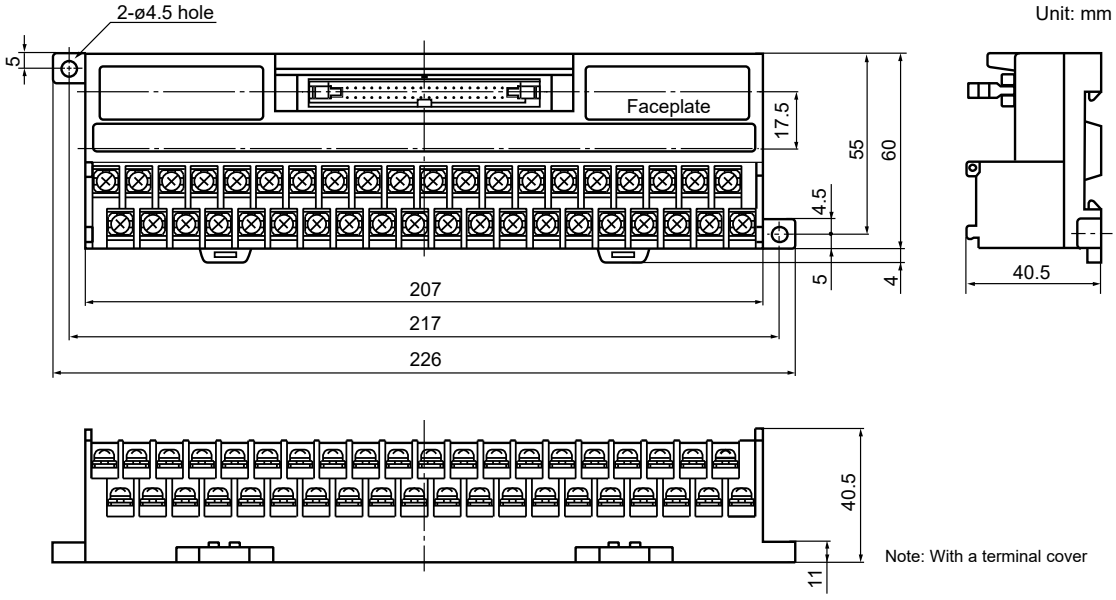

## Internal Connection Diagram




Note: The pin assignment of the screw terminal matches that of the module connectors.

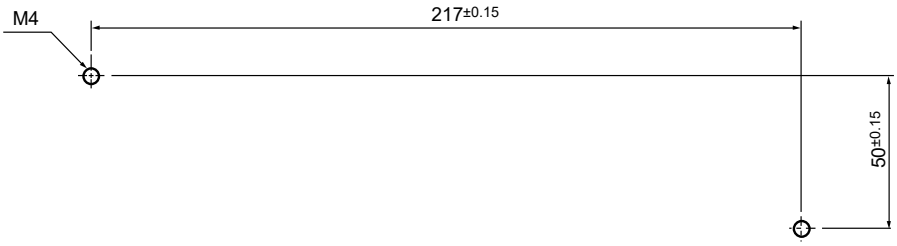
## External Dimensions

● **TA50-0N**

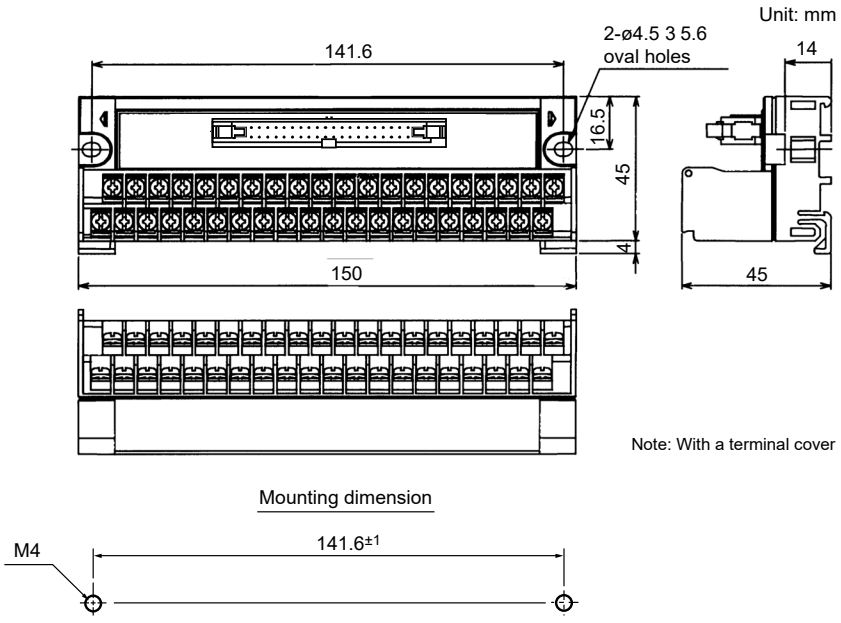



Note: With a terminal cover

Mounting dimension




● **TA50-1N**

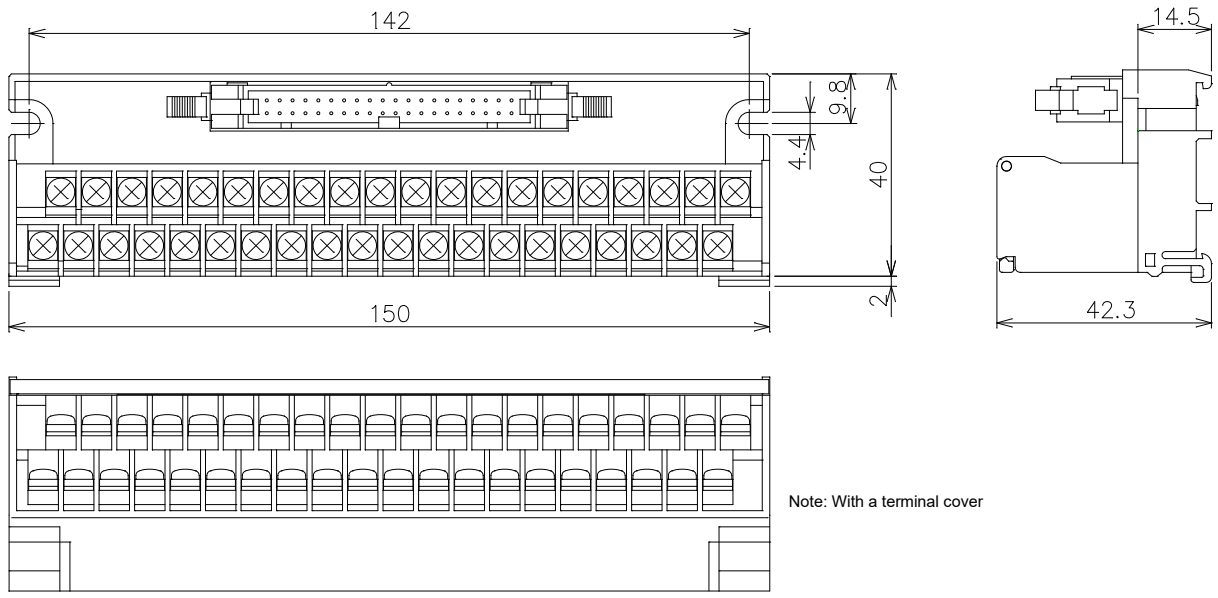



Note: With a terminal cover

Mounting dimension

● **TA50-2N**

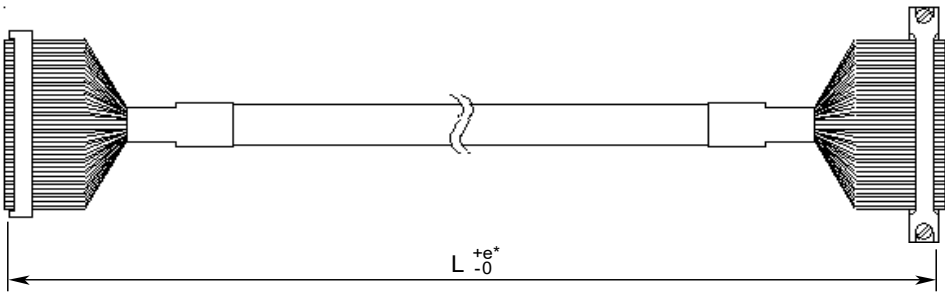
UNIt:mm




Note: With a terminal cover

Mounting dimension


● **KM55-0xx**




| Model | L | +e |
|---|---|---|
| KM55-005 | 0.5 m | 5 cm |
| KM55-010 | 1.0 m | |
| KM55-015 | 1.5 m | 10 cm |
| KM55-020 | 2.0 m | |
| KM55-025 | 2.5 m | |
| KM55-030 | 3.0 m | |

## Model and Suffix Codes

| Model | Suffix code | Style code | Option code | Description |
|---|---|---|---|---|
| TA50 | -0N | ..... | ..... | Connector terminal block unit, 40 points（M3.5 screw） |
| | -1N | ..... | ..... | Connector terminal block unit, 40 points（M3 screw） |
| | -2N | ..... | ..... | Connector terminal block unit, 40 points（M3 screw） |
| KM55 | -005 | ..... | ..... | Connector terminal block cable, 0.5 m |
| | -010 | ..... | ..... | Connector terminal block cable, 1.0 m |
| | -015 | ..... | ..... | Connector terminal block cable, 1.5 m |
| | -020 | ..... | ..... | Connector terminal block cable, 2.0 m |
| | -025 | ..... | ..... | Connector terminal block cable, 2.5 m |
| | -030 | ..... | ..... | Connector terminal block cable, 3.0 m |

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