

Digital Signal Converter (Terminal Module) Inputs

FA1-TH16X24RA1L20S1E,FA1-TH16X24RA1H20S1E,
FA1-TH8X24RA1L20S1E,FA1-TH8X24RA1H20S1E,
FA1-TH4X24RA1L20S1E,FA1-TH4X24RA1H20S1E,
FA-TH16XRA20S,FA-TH16X100A31,FA-TH16X200A31,
FA-TH16X24D31,FA-TH16X100A31L,FA-TH16X200A31L,
FA-TH16X24D31L,FA-TH16X48D31L,FA-TH16X100D31L

User's Manual

Thank you for purchasing the products.

Before using the products, please read this manual and the relevant manuals carefully to handle the products correctly.

MITSUBISHI ELECTRIC ENGINEERING COMPANY LIMITED

SAFETY PRECAUTIONS

(Read these precautions before using the products.)

Before using the products, please read this manual and the relevant manuals carefully, and pay full attention to safety to handle the products correctly.

The precautions given in this manual are concerned with time and wire saving devices only.

For the safety precautions of the programmable controller system, refer to the user's manual for the programmable controller used.

In this manual, the safety precautions are classified into two levels: "⚠WARNING" and "⚠CAUTION".



WARNING

Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



CAUTION

Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under "⚠CAUTION" may lead to serious consequences.

Observe the precautions of both levels because they are important for personal and system safety.

[Design Precautions]



WARNING

- Configure safety circuits externally to ensure that the entire system operates safely even when a fault occurs in the external power supply, the programmable controller, or the products. Failure to do so may result in an accident due to an incorrect output or malfunction.
 - (1) Emergency stop circuits, protection circuits, and protective interlock circuits for conflicting operations (such as forward/reverse rotations or upper/lower limit positioning) must be configured externally.
 - (2) Outputs may remain on or off due to a failure of a component such as a relay, transistor, and triac used for digital signal converter outputs. Configure an external circuit for monitoring output signals that could cause a serious accident.
- In an output circuit for digital signal converter outputs, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- Configure a circuit so that the programmable controller is turned on first and then the external power supply. If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.

[Design Precautions]



CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm (3.94 inches) or more between them. Failure to do so may result in malfunction or failure due to noise.
- When using a terminal block conversion module for a high-speed counter module, do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 150mm (5.91 inches) or more between them. Failure to do so may result in malfunction or failure due to noise.
- Keep a distance of 100mm (3.94 inches) or more between a thermocouple or RTD (Resistance Temperature Detector) and the main circuit line or AC control lines. Also, keep the thermocouple or RTD away from a circuit that includes harmonics, such as a high-voltage circuit and a load circuit of an inverter. If not, the thermocouple or RTD is more likely to be affected by noise, surges, and induction.
- At power-on or power-off, a voltage may occur or a current may flow between output terminals for a moment. To use an analog signal converter or analog terminal block conversion module, start the control after analog outputs become stable.
- Do not place an analog signal converter or analog terminal block conversion module near a device that generates magnetic noise.
- When a device such as a lamp, heater, or solenoid valve is controlled using a module for digital signal converter outputs, a large current (approximately 10 times greater than normal) may flow when the output is turned from off to on. Therefore, select a module for digital signal converter outputs that has a sufficient current rating.

[Installation Precautions]



WARNING

- Shut off the external power supply (all phases) used in the system before installation. Failure to do so may result in electric shock or damage to the products.

[Installation Precautions]



CAUTION

- Use products in an environment that meets the general specifications in this manual. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the products.
- Securely fix the products with a DIN rail or screws. Incorrect installation may cause malfunction, failure, or drop of the module. When using the products in an environment of frequent vibrations, fix the products with screws.
- Tighten the screws within the specified torque range. Undertightening can cause drop of the screw, short circuit, or malfunction. Overtightening can damage the screw and/or products, resulting in drop, short circuit, or malfunction.
- Attach DIN rail stoppers on the right and left sides of the spring clamp conversion module (FA1-TESV**) to fix the module securely.
- Shut off the external power supply (all phases) used in the system before mounting or removing the products. Failure to do so may result in damage to, malfunction of, or failure of the products.
- Do not directly touch any conductive parts and electronic components of the products. Failure to do so may cause malfunction or failure of the products.
- Install the products in the correct orientation if it is specified. Failure to do so may result in damage to or deterioration of the products.
- When drilling screw holes, be careful not to drop chips into the inside of the products or conductive parts. Such foreign matter can cause a fire, failure, or malfunction.
- When using modules for replacing digital signal converters or signal conversion modules, use them in the correct combination. Incorrect combination may cause failure.
- Shut off the power supply before installing/removing a module for replacing digital signal converters. Failure to do so may cause failure or malfunction.
- Securely mount a module for replacing digital signal converters and signal conversion module on a digital signal converter and installation base. Failure to do so may cause damage to or drop of the products, or malfunction due to poor contact. Follow the correct procedure to install/remove them. Failure to do so may cause damage to or drop of the products, or malfunction due to poor contact.
- When a module for digital signal converters or signal conversion module is mounted on a digital signal converter or installation base, hold the digital signal converter or installation base to transport them or install them to a panel. Holding the module for digital signal converters or signal conversion module may cause drop or failure of the digital signal converter or installation base.

[Wiring Precautions]



WARNING

- Shut off the external power supply (all phases) used in the system before wiring. Failure to do so may result in electric shock or damage to the products.
- After wiring, attach the included terminal cover to the products before turning them on for operation. Failure to do so may result in electric shock.

[Wiring Precautions]



CAUTION

- Use applicable solderless terminals and tighten them within the specified torque range. Failure to do so may cause failure, damage, or malfunction.
- Check the rated voltage and terminal layout before wiring to the products, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- When using a terminal block conversion module for a high-speed counter module, do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 150mm (5.91 inches) or more between them. Failure to do so may result in malfunction or failure due to noise.
- Keep a distance of 100mm (3.94 inches) or more between a thermocouple or RTD (Resistance Temperature Detector) and the main circuit line or AC control lines. Also, keep the thermocouple or RTD away from a circuit that includes harmonics, such as a high-voltage circuit and a load circuit of an inverter. If not, the thermocouple or RTD is more likely to be affected by noise, surges, and induction.
- Do not place an analog signal converter or analog terminal block conversion module near a device that generates magnetic noise.
- Place the cables in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the products or cables or malfunction due to poor contact.
- Tighten the terminal screws within the specified torque range. Undertightening can cause short circuit, fire, or malfunction. Overtightening can damage the screw and/or products, resulting in drop, short circuit, or malfunction.
- Tighten the connector screws within the specified torque range. Undertightening can cause short circuit, fire, or malfunction. Overtightening can damage the screw and/or products, resulting in drop, short circuit, fire, or malfunction.
- Securely connect connectors to the products. Failure to do so may cause malfunction.
- When disconnecting a cable from the products, do not pull the cable by the cable part. For the cable with connector, hold the connector part of the cable. For the cable connected to the terminal block, loosen the terminal screw. Pulling the cable connected to the products may result in malfunction or damage to the products or cable.
- Check the interface type and correctly connect the cable. Incorrect wiring (connecting the cable to an incorrect interface) may cause failure of the products and external device.
- Prevent foreign matter such as dust or wire chips from entering the products. Such foreign matter can cause a fire, failure, or malfunction.
- The products must be installed in control panels. Connect the main power supply to the products in the control panel through a relay terminal block. Wiring and replacement of the products must be performed by qualified maintenance personnel with knowledge of protection against electric shock.
- When connecting the products with a programmable controller, check that the product configuration is correct. An incorrect configuration may cause failure or malfunction.
- Use the products with no force applied to their connectors. Applied force may cause failure or disconnection.
- Attach protective covers or signal conversion modules to unused connectors or empty slots of the products. Failure to do so may cause a fire, failure, or malfunction due to foreign matter.
- When using modules for replacing digital signal converters or signal conversion modules, use them in the correct combination. Incorrect combination may cause failure of a programmable controller, digital signal converter, installation base, or external device.
- Individually ground the FG terminal of the products with a ground resistance of 100 ohms or less. Failure to do so may result in electric shock or malfunction.

[Startup and Maintenance Precautions]



WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Shut off the external power supply (all phases) used in the system before cleaning the products or retightening the terminal screws, connector screws, or products fixing screws. Failure to do so may result in electric shock or cause failure or malfunction of the products. Undertightening can cause drop of the screw, short circuit, or malfunction. Overtightening can damage the screw and/or products, resulting in drop, short circuit, or malfunction.

[Startup and Maintenance Precautions]



CAUTION

- Do not disassemble or modify the products. Doing so may cause failure, malfunction, injury, or a fire.
- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm away in all directions from the programmable controller and products. Failure to do so may cause malfunction.
- Shut off the external power supply (all phases) used in the system before mounting or removing the products. Failure to do so may cause failure or malfunction of or damage to the products.
- After the first use of the products, do not connect/remove the products and cables more than 50 times. Exceeding the limit may cause malfunction.
- Startup and maintenance of a control panel must be performed by qualified maintenance personnel with knowledge of protection against electric shock. Lock the control panel so that only qualified maintenance personnel can operate it.
- Before handling the products, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause failure or malfunction of the products.

[Disposal Precautions]



CAUTION

- When disposing of the products, treat them as industrial waste.

[Transportation Precautions]



CAUTION

- Do not apply shock that exceeds the shock resistance described in the general specifications during transportation since the products are precision devices. Doing so may cause failure of the module.
- The halogens (such as fluorine, chlorine, bromine, and iodine), which are contained in a fumigant used for disinfection and pest control of wood packaging materials, may cause failure of the products. Prevent the entry of fumigant residues into the product or consider other methods (such as heat treatment) instead of fumigation. The disinfection and pest control measures must be applied to unprocessed raw wood.

EMC and Low Voltage Directives

Compliance with the EMC Directive, which is one of the EU directives, has been mandatory for products sold within EU member states since 1996 as well as compliance with the Low Voltage Directive since 1997.

For products compliant to the EMC and Low Voltage Directives, their manufacturers are required to declare compliance and affix the CE marking.

In some other countries and regions, manufacturers are required to make their products compliant with applicable laws or regulations and attach a certification mark on the products as well (such as UK Conformity Assessed (UKCA) marking in the UK, and Korea Certification (KC) marking in South Korea).

(1) Sales representative in EU member states

The sales representative in EU member states is:

Company: MITSUBISHI ELECTRIC EUROPE B.V.

Address: Mitsubishi-Electric-Platz 1, 40882 Ratingen, Germany

(2) Method of ensuring compliance

To ensure that products maintain EMC and Low Voltage Directives when incorporated into other machinery or equipment, certain measures may be necessary. Please refer to "EMC and Low Voltage Directives Compliant Manual" (50D-FA9010-108).

REVISIONS

*The manual number is given on the bottom left of the last page.

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1. INTRODUCTION

This manual describes the specifications and handling of digital signal converters used in combination with Mitsubishi Electric Corporation programmable controller DC input modules.

2. GENERAL SPECIFICATIONS

| Item | | | Specifications |
|---------------------------------------|------------------------------|--------------|---|
| Operating surrounding air temperature | | | -20 to 55°C ^{*4} |
| Storage ambient temperature | | | -25 to 75°C |
| Operating ambient humidity | | | 5 to 95% RH, no condensation |
| Storage ambient humidity | | | 5 to 95% RH, no condensation |
| Vibration resistance | Compliance with standards | | JIS B 3502, IEC61131-2 |
| | Under intermittent vibration | 5 to 8.4Hz | Amplitude: 3.5mm |
| | | 8.4 to 150Hz | Acceleration: 9.8m/s ² (1G) |
| | | Sweep count | 10 times each in X, Y, and Z directions |
| | Under continuous vibration | 5 to 8.4Hz | Amplitude: 1.75mm |
| | | 8.4 to 150Hz | Acceleration: 4.9m/s ² (0.5G) |
| | | Sweep count | — |
| Shock resistance | | | Compliance with JIS B 3502 and IEC61131-2 (147m/s ² (15G), 3 times each in X, Y, and Z directions) |
| Operating atmosphere | | | No corrosive gas |
| Operating altitude ^{*1} | | | 2,000m or lower |
| Installation location | | | Inside the control panel ^{*5} (Indoor use) |
| Overvoltage category ^{*2} | | | II or lower |
| Pollution level ^{*3} | | | 2 or lower |

*1: Do not use or store the products under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause malfunction.

*2: This category indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.

*3: This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.

*4: Use the digital signal converter within the specifications of the programmable controller being used.

*5: The enclosure is suitably designed for those specific environmental conditions, as applicable, and enclosure rate meets IP20 and minimum type 1 of UL 50.

3. PERFORMANCE SPECIFICATIONS

3-1. FA1-TH16X24RA1L20S1E, FA1-TH16X24RA1H20S1E

| Item | | | Model | FA1-TH16X24RA1L20S1E | FA1-TH16X24RA1H20S1E |
|--|--------------------|---|-------|---|--|
| Connected programmable controller | | | | DC input module (Positive common type) | |
| Number of points, input device numbers | | | | 16 points, X0 to XF | |
| Insulation method | | | | Relay | |
| Rated input voltage/current | | | | Voltage: 24 VDC (SELV and LIM or Class 2), Current: Approx. 10mA (24 VDC) | |
| Used voltage range | | | | 21.6 to 26.4 VDC (24 VDC±10% (ripple factor within 5%), SELV and LIM or Class 2) | |
| Maximum number of points simultaneously ON | | | | 100%(5-directional attachment) | |
| ON voltage/ON current | | | | 19.2 VDC or higher / 8.1mA or higher | |
| OFF voltage/OFF current | | | | 2.4 VDC or lower / 1.0mA or lower | |
| Input impedance | | | | Approx. 2.2kΩ | |
| Response time | OFF→ON | | | 10ms or less (excluding programmable controller response time) | |
| | ON→OFF | | | 12ms or less (excluding programmable controller response time) | |
| Minimum switching load | | | | 24 VDC 1mA or higher | |
| Maximum switching frequency | | | | 1800 times/hr (ON for 1 second or longer, OFF for 1 second or longer) | |
| Mechanical life | | | | 20000000 times or more | |
| Electrical life *1 | | | | 100,000 times or more (at contact side) at 24 VDC, 100mA | |
| Wiring method for common | | | | All points independent Positive common type | All points independent Negative common type |
| External power supply | | | | 24VDC±10% (ripple ratio: within 5%, SELV and LIM or Class 2) | |
| Current consumption | | | | Approx. 10mA when 24 VDC (not including current consumption of programmable controller) | |
| Withstand voltage, insulation resistance | | | | 510Vrms AC / 1min (altitude: 0 to 2000m), 10MΩ or higher | |
| Noise immunity | | | | Simulator noise 500Vp-p, noise width 1μs (based on noise simulator with noise frequency of 25 to 60Hz) | |
| Operation indication | | | | LED on with power supply ON and input ON | |
| Socket | | | | Yes (relay module replaceable) | |
| Module replacement count | | | | 50 times | |
| Module mixing | | | | Device mixing possible | |
| Built-in module | | | | FA-NYP24WK4 | |
| Terminal block (spring clamp type) | Number of points | | | 52 points (power supply 4 points, input 48 points) | |
| | Applicable wire *2 | When a ferrule is not used (stranded wire or solid wire) | | 0.2 to 1.5mm ² (AWG24-16) Copper wire with a temperature rating of 75°C or more | |
| | | When a ferrule is used (stranded wire) | | 0.08 to 0.75mm ² (AWG28-18) Copper wire with a temperature rating of 75°C or more | |
| | Wire strip length | | | 8mm | |
| Installation method *3 | Screw | | | M4 × 0.7mm × 22mm or more | |
| | | | | Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10lbf·in) | |
| | DIN rail | | | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) | |
| Weight | | | | Approx. 220 g | |

*1: Evaluation for UL certification is conducted 6000 times.

*2: For UL certification, suitable for field wiring when a ferrule is not used.

*3: Evaluation for UL certification is conducted a DIN rail installation.

3-2. FA1-TH8X24RA1L20S1E, FA1-TH8X24RA1H20S1E

| Model | | | FA1-TH8X24RA1L20S1E | FA1-TH8X24RA1H20S1E |
|--|--------------------|---|---|--|
| Item | | | | |
| Connected programmable controller | | | 24VDC input module (Positive common type) | |
| Number of points, input device numbers | | | 8 points, X0 to X7, X8 to XF | |
| Insulation method | | | Relay | |
| Rated input voltage/current | | | Voltage: 24 VDC (SELV and LIM or Class 2) *5, Current: Approx. 10mA (24 VDC) | |
| Used voltage range | | | 21.6 to 26.4 VDC (24 VDC±10% (ripple factor within 5%), SELV and LIM or Class 2) *5 | |
| Maximum number of points simultaneously ON | | | 100%(5-directional attachment) | |
| ON voltage/ON current | | | 19.2 VDC or higher / 8.1mA or higher | |
| OFF voltage/OFF current | | | 2.4 VDC or lower / 1.0mA or lower | |
| Input impedance | | | Approx. 2.2kΩ | |
| Response time | OFF→ON | | 10ms or less (excluding programmable controller response time) | |
| | ON→OFF | | 12ms or less (excluding programmable controller response time) | |
| Minimum switching load | | | 24 VDC 1mA or higher | |
| Maximum switching frequency | | | 1800 times/hr (ON for 1 second or longer, OFF for 1 second or longer) | |
| Mechanical life | | | 20000000 times or more | |
| Electrical life *1 | | | 100,000 times or more (at contact side) at 24 VDC, 100mA | |
| Wiring method for common | | | All points independent Positive common type | All points independent Negative common type |
| External power supply | | | 24VDC±10% (ripple ratio: within 5%, SELV and LIM or Class 2) *5 | |
| Current consumption | | | Approx. 5mA when 24 VDC (not including current consumption of programmable controller) | |
| Withstand voltage, insulation resistance | | | 510Vrms AC / 1min (altitude: 0 to 2000m), 10MΩ or higher | |
| Noise immunity | | | Simulator noise 500Vp-p, noise width 1μs (based on noise simulator with noise frequency of 25 to 60Hz) | |
| Operation indication | | | LED on with power supply ON and input ON*4 | |
| Socket | | | Yes (relay module replaceable) | |
| Module replacement count | | | 50 times | |
| Module mixing | | | Device mixing possible | |
| Built-in module | | | FA-NYP24WK2, FA-NYP24WK4 | |
| Terminal block (spring clamp type) | Number of points | | 28 points (power supply 4 points, input 24 points) | |
| | Applicable wire *2 | When a ferrule is not used (stranded wire or solid wire) | 0.2 to 1.5mm ² (AWG24-16) Copper wire with a temperature rating of 75°C or more | |
| | | When a ferrule is used (stranded wire) | 0.08 to 0.75mm ² (AWG28-18) Copper wire with a temperature rating of 75°C or more | |
| | Wire strip length | | 8mm | |
| Installation method *3 | Screw | | M4 × 0.7mm × 22mm or more Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10lbf·in) | |
| | DIN rail | | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) | |
| Weight | | | Approx. 145 g | |

*1: Evaluation for UL certification is conducted 6000 times.

*2: For UL certification, suitable for field wiring when a ferrule is not used.

*3: Evaluation for UL certification is conducted a DIN rail installation.

*4: When the power is off, the "PW" LED may light up for a while.

*5: External connection to 24VDC power supply circuit of Digital Signal Converter must be powered from source compliant with SELV (Safety Extra-Low Voltage) and LIM (Limited energy circuit) according to UL 61010-2-201 or Class2 power supply.

3-3. FA1-TH4X24RA1L20S1E, FA1-TH4X24RA1H20S1E

| Model | | | FA1-TH4X24RA1L20S1E | FA1-TH4X24RA1H20S1E |
|--|--------------------|--|---|--|
| Item | | | | |
| Connected programmable controller | | | 24VDC input module (Positive common type) | |
| Number of points, input device numbers | | | 4 points, X0 to X3, X4 to X7, X8 to XB, XC to XF | |
| Insulation method | | | Relay | |
| Rated input voltage/current | | | Voltage: 24 VDC (SELV and LIM or Class 2) ^{*5} , Current: Approx. 10mA (24 VDC) | |
| Used voltage range | | | 21.6 to 26.4 VDC (24 VDC±10% (ripple factor within 5%), SELV and LIM or Class 2) ^{*5} | |
| Maximum number of points simultaneously ON | | | 100%(5-directional attachment) | |
| ON voltage/ON current | | | 19.2 VDC or higher / 8.1mA or higher | |
| OFF voltage/OFF current | | | 2.4 VDC or lower / 1.0mA or lower | |
| Input impedance | | | Approx. 2.2kΩ | |
| Response time | OFF→ON | | 10ms or less (excluding programmable controller response time) | |
| | ON→OFF | | 12ms or less (excluding programmable controller response time) | |
| Minimum switching load | | | 24 VDC 1mA or higher | |
| Maximum switching frequency | | | 1800 times/hr (ON for 1 second or longer, OFF for 1 second or longer) | |
| Mechanical life | | | 20000000 times or more | |
| Electrical life *1 | | | 100,000 times or more (at contact side) at 24 VDC, 100mA | |
| Wiring method for common | | | All points independent Positive common type | All points independent Negative common type |
| External power supply | | | 24VDC±10% (ripple ratio: within 5%, SELV and LIM or Class 2) ^{*5} | |
| Current consumption | | | Approx. 3mA when 24 VDC (not including current consumption of programmable controller) | |
| Withstand voltage, insulation resistance | | | 510Vrms AC / 1min (altitude: 0 to 2000m), 10MΩ or higher | |
| Noise immunity | | | Simulator noise 500Vp-p, noise width 1μs (based on noise simulator with noise frequency of 25 to 60Hz) | |
| Operation indication | | | LED on with power supply ON and input ON ^{*4} | |
| Socket | | | Yes (relay module replaceable) | |
| Module replacement count | | | 50 times | |
| Module mixing | | | Device mixing possible | |
| Built-in module | | | FA-NYP24WK2, FA-NYP24WK4 | |
| Terminal block (spring clamp type) | Number of points | | 16 points (power supply 4 points, input 12 points) | |
| | Applicable wire *2 | When a ferrule is not used (stranded wire or solid wire) | 0.2 to 1.5mm ² (AWG24-16) Copper wire with a temperature rating of 75°C or more | |
| | | When a ferrule is used (stranded wire) | 0.08 to 0.75mm ² (AWG28-18) Copper wire with a temperature rating of 75°C or more | |
| | Wire strip length | | 8mm | |
| Installation method *3 | Screw | | M4 × 0.7mm × 22mm or more | |
| | | | Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10lbf·in) | |
| | DIN rail | | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) | |
| Weight | | | Approx. 105 g | |

*1: Evaluation for UL certification is conducted 6000 times.

*2: For UL certification, suitable for field wiring when a ferrule is not used.

*3: Evaluation for UL certification is conducted a DIN rail installation.

*4: When the power is off, the "PW" LED may light up for a while.

*5: External connection to 24VDC power supply circuit of Digital Signal Converter must be powered from source compliant with SELV (Safety Extra-Low Voltage) and LIM (Limited energy circuit) according to UL 61010-2-201 or Class2 power supply.

3-4. FA-TH16XRA20S

| Item | | Model | FA-TH16XRA20S |
|--|----------------------|-------|---|
| Connected programmable controller | | | DC input module (Positive common type) |
| Number of I/O points, Input device numbers | | | 16 points, X0 to XF |
| Insulation method | | | Relay |
| Rated input voltage/current | | | Voltage: 24VDC (CLASS 2), Current: Approx. 10mA (24VDC) |
| Operating voltage range | | | 21.6 to 26.4VDC (24VDC \pm 10% (ripple ratio: within 5%), CLASS 2) |
| Maximum number of contacts simultaneously ON | | | 100% (3-directional attachment) |
| ON voltage/ON current | | | 19.2VDC or higher / 8.1mA or higher |
| OFF voltage/OFF current | | | 24VDC or lower / 1.0mA or lower |
| Input impedance | | | Approx. 2.2k Ω |
| Response time | OFF \rightarrow ON | | 10ms or less (excluding programmable controller response time) |
| | ON \rightarrow OFF | | 12ms or less (excluding programmable controller response time) |
| Minimum switching load | | | 24VDC 1mA or higher |
| Maximum switching frequency | | | 1800 times/hr (ON 1 second or longer, OFF 1 second or longer) |
| Mechanical life | | | 20000000 times or more |
| Electrical life | | | 100000 times or more (at contact side) at 24VDC, 100mA |
| Wiring method for common | | | All points independent |
| External power supply | | | 24VDC \pm 10% (ripple ratio: within 5%, CLASS 2) |
| Current consumption | | | Approx. 10mA when 24VDC (not including current consumption of programmable controller) |
| Withstand voltage, insulation resistance | | | Between each input, between external power supply and inputs: 2500 VAC 1 minute, 10M Ω or higher |
| Noise immunity | | | Simulator noise 500Vp-p, noise width 1 μ s (based on noise simulator with noise frequency of 25 to 60Hz) |
| Operation indication | | | LED on with power supply ON and input ON |
| Socket | | | Yes (relay module replaceable) |
| Module replacement count | | | 50 times |
| Module mixing | | | Device mixing possible |
| Built-in module | | | FA-NYP24WK4 |
| Terminal block | Terminal block screw | | M3 screw, Number of terminals: 34P, 7.62mm pitch, Spring-up screw with finger protection cover Tightening torque range: 58.8 to 88.2N \cdot cm (6 to 9kgf \cdot cm, 5.22 to 7.5lbf \cdot in), UL standard conformity tightening torque: 59N \cdot cm, 5.22 lbf \cdot in |
| | Applicable wire | | 22 to 14 AWG: 0.3 to 2.0mm ² (when solderless terminals are used) |
| Installation method | Screw | | M4 \times 0.7mm \times 22mm or more Tightening torque range: 78 to 118N \cdot cm (8 to 12kgf \cdot cm, 7 to 10lbf \cdot in) |
| | DIN rail | | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) |
| Weight | | | Approx. 300g |

3-5. FA-TH16X100A31

| Model | | FA-TH16X100A31 |
|--|----------------------|--|
| Item | | |
| Connected programmable controller | | DC input module (Positive common type) |
| Number of I/O points, Input device numbers | | 16 points, X0 to XF |
| Insulation method | | Photocoupler |
| Rated input voltage/current *1 | | Voltage: 100 to 110VAC (50/60 Hz), Current: Approx. 8mA (100VAC 60Hz), Approx. 7mA (100VAC 50Hz) |
| Operating voltage range | | 85 to 132VAC (50/60Hz \pm 3Hz (distortion factor within 5%)) |
| Maximum number of contacts simultaneously ON | | 100% (5-directional attachment) |
| ON voltage/ON current | | 80VAC or higher / 5mA or higher (50Hz, 60Hz) |
| OFF voltage/OFF current | | 30VAC or lower / 1.7mA or lower (50Hz, 60Hz) |
| Inrush current | | Within max. 200mA 1ms (132VAC) |
| Input impedance | | Approx. 12k Ω (60Hz), Approx. 15k Ω (50Hz) |
| Response time | OFF→ON | 15ms or less (excluding programmable controller response time) |
| | ON→OFF | 35ms or less (excluding programmable controller response time) |
| Wiring method for common | | 16 points/common (2-wire type, WET method) |
| External power supply | | 24VDC \pm 10% (ripple ratio: within 5%, CLASS 2) |
| Current consumption | | Approx. 25mA when 24VDC (not including current consumption of programmable controller) |
| Withstand voltage, insulation resistance | | 1780Vrms AC / 3 cycles (altitude: 2000m), 10M Ω or higher |
| Noise immunity | | Simulator noise 1500Vp-p, noise width 1 μ s (based on noise simulator with noise frequency of 25 to 60Hz) |
| Operation indication | | LED on with power supply ON and input ON |
| Terminal block | Terminal block screw | M3 screw, Number of terminals:36P, 7.62mm pitch, Spring-up screw with finger protection cover Tightening torque range: 58.8 to 88.2N·cm (6 to 9kgf·cm, 5.22 to 7.5lbf·in), UL standard conformity tightening torque: 59N·cm, 5.22 lbf·in |
| | Applicable wire | 22 to 14 AWG: 0.3 to 2.0mm ² (when solderless terminals are used) |
| Installation method | Screw | M4 \times 35mm or more Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10lbf·in) |
| | DIN rail | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) |
| Weight | | Approx. 310g |

*1: Use a power supply which can be supplied from the secondary side which is isolated by a transformer or converter, etc.

3-6. FA-TH16X200A31

| Model | | FA-TH16X200A31 |
|--|----------------------|--|
| Item | | |
| Connected programmable controller | | DC input module (Positive common type) |
| Number of I/O points, Input device numbers | | 16 points, X0 to XF |
| Insulation method | | Photocoupler |
| Rated input voltage/current *1 | | Voltage: 200 to 220VAC (50/60 Hz), Current: Approx. 7.5mA (200VAC 60Hz), Approx. 6mA (200VAC 50Hz) |
| Operating voltage range | | 170 to 264VAC (50/60Hz \pm 3Hz (distortion factor within 5%)) |
| Maximum number of contacts simultaneously ON | | 100% (5-directional attachment) |
| ON voltage/ON current | | 160VAC or higher / 4.8mA or higher (50Hz, 60Hz) |
| OFF voltage/OFF current | | 60VAC or lower / 2.3mA or lower (50Hz, 60Hz) |
| Inrush current | | Within max. 500mA 1ms (264VAC) |
| Input impedance | | Approx. 27k Ω (60Hz), Approx. 32k Ω (50Hz) |
| Response time | OFF→ON | 15ms or less (200VAC 60Hz) (excluding programmable controller response time) |
| | ON→OFF | 35ms or less (200VAC 50Hz) (excluding programmable controller response time) |
| Wiring method for common | | 16 points/common (2-wire type, WET method) |
| External power supply | | 24VDC \pm 10% (ripple ratio: within 5%, CLASS 2) |
| Current consumption | | Approx. 25mA when 24VDC (not including current consumption of programmable controller) |
| Withstand voltage, insulation resistance | | 2830Vrms AC / 3 cycles (altitude: 2000m), 10M Ω or higher |
| Noise immunity | | Simulator noise 1500Vp-p, noise width 1 μ s (based on noise simulator with noise frequency of 25 to 60Hz) |
| Operation indication | | LED on with power supply ON and input ON |
| Terminal block | Terminal block screw | M3 screw, Number of terminals:36P, 7.62mm pitch, Spring-up screw with finger protection cover Tightening torque range: 58.8 to 88.2N·cm (6 to 9kgf·cm, 5.22 to 7.5lbf·in), UL standard conformity tightening torque: 59N·cm, 5.22 lbf·in |
| | Applicable wire | 22 to 14 AWG: 0.3 to 2.0mm ² (when solderless terminals are used) |
| Installation method | Screw | M4 \times 35mm or more Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10lbf·in) |
| | DIN rail | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) |
| Weight | | Approx. 320g |

*1: Use a power supply which can be supplied from the secondary side which is isolated by a transformer or converter, etc.

3-7. FA-TH16X24D31

| Model | | FA-TH16X24D31 |
|--|----------------------|--|
| Item | | |
| Connected programmable controller | | DC input module (Positive common type) |
| Number of I/O points, Input device numbers | | 16 points, X0 to XF |
| Insulation method | | Photocoupler |
| Rated input voltage/current | | Voltage: 24VDC (CLASS 2), Current: Approx. 10mA (24VDC) |
| Operating voltage range | | 21.6 to 26.4VDC (24VDC $\pm 10\%$ (ripple ratio: within 5%, CLASS 2)) |
| Maximum number of contacts simultaneously ON | | 100% (5-directional attachment) |
| ON voltage/ON current | | 19VDC or higher / 7.9mA or higher |
| OFF voltage/OFF current | | 8VDC or lower / 3.3mA or lower |
| Input impedance | | Approx. 2.2k Ω |
| Response time | OFF→ON | 10ms or less (excluding programmable controller response time) |
| | ON→OFF | 10ms or less (excluding programmable controller response time) |
| Wiring method for common | | 16 points/common (2-wire type, WET method) |
| External power supply | | 24VDC $\pm 10\%$ (ripple ratio: within 5%, CLASS 2) |
| Current consumption | | Approx. 27mA when 24VDC (not including current consumption of programmable controller) |
| Withstand voltage, insulation resistance | | 560Vrms AC / 3 cycles (altitude: 2000m), 10M Ω or higher |
| Noise immunity | | Simulator noise 500Vp-p, noise width 1 μ s (based on noise simulator with noise frequency of 25 to 60Hz) |
| Operation indication | | LED on with power supply ON and input ON |
| Terminal block | Terminal block screw | M3 screw, Number of terminals:36P, 7.62mm pitch, Spring-up screw with finger protection cover Tightening torque range: 58.8 to 88.2N·cm (6 to 9kgf·cm, 5.22 to 7.5lbf·in), UL standard conformity tightening torque: 59N·cm, 5.22 lbf·in |
| | Applicable wire | 22 to 14 AWG: 0.3 to 2.0mm ² (when solderless terminals are used) |
| Installation method | Screw | M4 \times 35mm or more Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10lbf·in) |
| | DIN rail | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) |
| Weight | | Approx. 310g |

3-8. FA-TH16X100A31L

| Model | | FA-TH16X100A31L |
|--|----------------------|--|
| Item | | |
| Connected programmable controller | | DC input module (Positive common type) |
| Number of I/O points, Input device numbers | | 16 points, X0 to XF |
| Insulation method | | Photocoupler |
| Rated input voltage/current *1 | | Voltage: 100 to 110VAC (50/60Hz), Current: Approx. 8mA (100VAC 60Hz), Approx. 7mA (100VAC 50Hz) |
| Operating voltage range | | 85 to 132 VAC (50/60Hz ± 3 Hz (distortion factor within 5%)) |
| Maximum number of contacts simultaneously ON | | 100% (5-directional attachment) |
| ON voltage/ON current | | 80VAC or higher / 5mA or higher (50Hz, 60Hz) |
| OFF voltage/OFF current | | 30VAC or lower / 1.7mA or lower (50Hz, 60Hz) |
| Inrush current | | Max. 200mA within 1ms (132VAC) |
| Input impedance | | Approx. 12k Ω (60Hz), Approx. 15k Ω (50Hz) |
| Response time | OFF→ON | 15ms or less(100VAC 60Hz) (excluding programmable controller response time) |
| | ON→OFF | 35ms or less(100VAC 60Hz) (excluding programmable controller response time) |
| Wiring method for common | | 16 points/common (2-wire type, WET method) |
| External power supply | | 24VDC $\pm 10\%$ (ripple ratio: within 5%, CLASS 2) |
| Current consumption | | Approx. 25mA when 24VDC (not including current consumption of programmable controller) |
| Withstand voltage, insulation resistance | | 1780Vrms AC / 3 cycles (altitude: 2000m), 10M Ω or higher |
| Noise immunity | | Simulator noise 1500Vp-p, noise width 1 μ s (based on noise simulator with noise frequency of 25 to 60Hz) |
| Operation indication | | LED on with power supply ON and input ON |
| Terminal block | Terminal block screw | M3.5 screw, Number of terminals:36P, 8mm pitch Tightening torque range: 68 to 92N·cm(7 to 9kgf·cm, 6.1 to 8lbf·in), UL standard conformity tightening torque : 80N·cm, 7.08 lbf·in |
| | Applicable wire | 20 to 14 AWG: 0.5 to 2.0mm ² |
| Installation method | Screw | M4 \times 35mm or more Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10lbf·in) |
| | DIN rail | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) |
| Weight | | Approx. 320g |

*1: Use a power supply which can be supplied from the secondary side which is isolated by a transformer or converter, etc.

3-9. FA-TH16X200A31L

| Model | | FA-TH16X200A31L |
|--|----------------------|--|
| Item | | |
| Connected programmable controller | | DC input module (Positive common type) |
| Number of I/O points, Input device numbers | | 16 points, X0 to XF |
| Insulation method | | Photocoupler |
| Rated input voltage/current *1 | | Voltage: 200 to 220 VAC (50/60Hz), Current: Approx. 7.5mA (200VAC 60Hz), Approx. 6mA (200VAC 50Hz) |
| Operating voltage range | | 170 to 264VAC (50/60Hz \pm 3Hz (distortion factor within 5%)) |
| Maximum number of contacts simultaneously ON | | 100% (5-directional attachment) |
| ON voltage/ON current | | 160VAC or higher / 4.8mA or higher (50Hz, 60Hz) |
| OFF voltage/OFF current | | 60VAC or lower / 2.3mA or lower (50Hz, 60Hz) |
| Inrush current | | Max. 500mA within 1ms (264VAC) |
| Input impedance | | Approx. 27k Ω (60Hz), Approx. 32k Ω (50Hz) |
| Response time | OFF→ON | 15ms or less(100VAC 60Hz) (excluding programmable controller response time) |
| | ON→OFF | 35ms or less(100VAC 60Hz) (excluding programmable controller response time) |
| Wiring method for common | | 16 points/common (2-wire type, WET method) |
| External power supply | | 24VDC \pm 10% (ripple ratio: within 5%, CLASS 2) |
| Current consumption | | Approx. 25mA when 24VDC (not including current consumption of programmable controller) |
| Withstand voltage, insulation resistance | | 2830 Vrms AC / 3 cycles (altitude: 2000m), 10M Ω or higher |
| Noise immunity | | Simulator noise 1500Vp-p, noise width 1 μ s (based on noise simulator with noise frequency of 25 to 60Hz) |
| Operation indication | | LED on with power supply ON and input ON |
| Terminal block | Terminal block screw | M3.5 screw, Number of terminals:36P, 8mm pitch Tightening torque range: 68 to 92N·cm(7 to 9kgf·cm, 6.1 to 8lbf·in), UL standard conformity tightening torque : 80N·cm, 7.08 lbf·in |
| | Applicable wire | 20 to 14 AWG: 0.5 to 2.0mm ² |
| Installation method | Screw | M4 \times 35mm or more Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10lbf·in) |
| | DIN rail | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) |
| Weight | | Approx. 330g |

*1: Use a power supply which can be supplied from the secondary side which is isolated by a transformer or converter, etc.

3-10. FA-TH16X24D31L

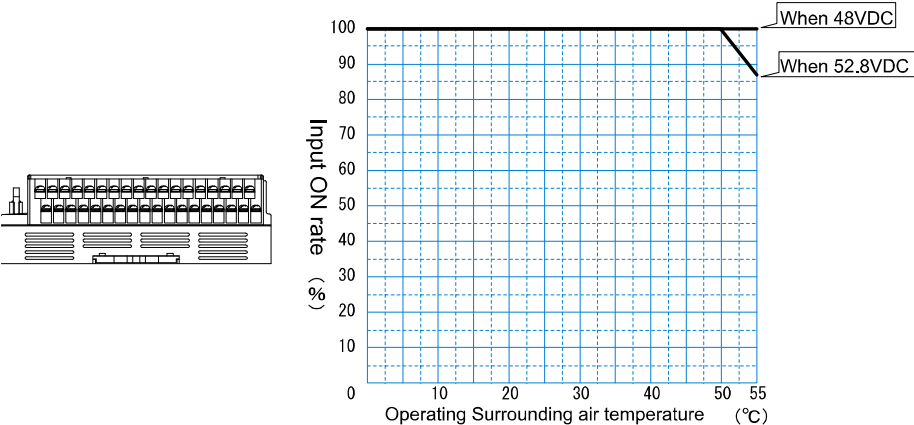
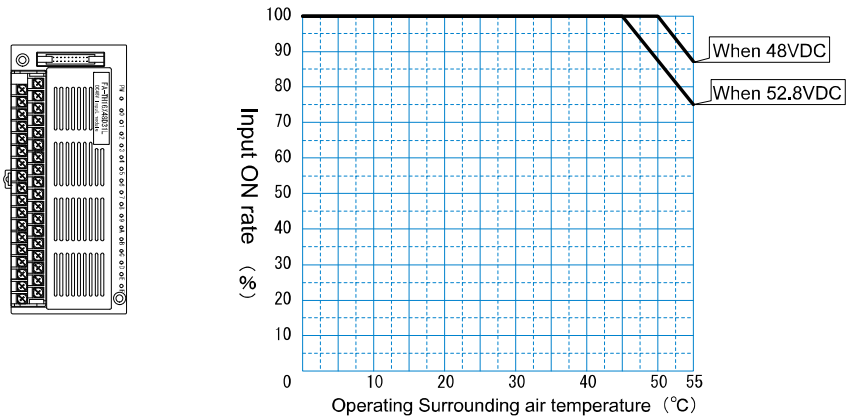
| Model | | FA-TH16X24D31L |
|--|----------------------|--|
| Item | | |
| Connected programmable controller | | DC input module (Positive common type) |
| Number of I/O points, Input device numbers | | 16 points, X0 to XF |
| Insulation method | | Photocoupler |
| Rated input voltage/current | | Voltage: 24VDC (CLASS 2), Current: Approx. 10mA (24VDC) |
| Operating voltage range | | 21.6 to 26.4VDC (24VDC \pm 10% (ripple ratio: within 5%, CLASS 2)) |
| Maximum number of contacts simultaneously ON | | 100% (5-directional attachment) |
| ON voltage/ON current | | 19VDC or higher / 7.9mA or higher |
| OFF voltage/OFF current | | 8VDC or lower / 3.3mA or lower |
| Input impedance | | Approx. 2.2k Ω |
| Response time | OFF→ON | 10ms or less (excluding programmable controller response time) |
| | ON→OFF | 10ms or less (excluding programmable controller response time) |
| Wiring method for common | | 16 points/common (2-wire type, WET method) |
| External power supply | | 24VDC \pm 10% (ripple ratio: within 5%, CLASS 2) |
| Current consumption | | Approx. 27mA when 24VDC (not including current consumption of programmable controller) |
| Withstand voltage, insulation resistance | | 560Vrms AC / 3 cycles (altitude: 2000m), 10M Ω or higher |
| Noise immunity | | Simulator noise 500Vp-p, noise width 1 μ s (based on noise simulator with noise frequency of 25 to 60Hz) |
| Operation indication | | LED on with power supply ON and input ON |
| Terminal block | Terminal block screw | M3.5 screw, Number of terminals:36P, 8mm pitch Tightening torque range: 68 to 92N·cm(7 to 9kgf·cm, 6.1 to 8lbf·in), UL standard conformity tightening torque : 80N·cm, 7.08 lbf·in |
| | Applicable wire | 20 to 14 AWG: 0.5 to 2.0mm ² |
| Installation method | Screw | M4 \times 35mm or more Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10lbf·in) |
| | DIN rail | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) |
| Weight | | Approx. 310g |

3-11. FA-TH16X48D31L

| Model | | FA-TH16X48D31L |
|--|----------------------|--|
| Connected programmable controller | | DC input module (Positive common type) |
| Number of I/O points, Input device numbers | | 16 points, X0 to XF |
| Insulation method | | Photocoupler |
| Rated input voltage/current | | Voltage: 48VDC, Current: Approx. 5mA (48VDC) |
| Operating voltage range | | 43.2 to 52.8VDC (48VDC \pm 10% (ripple ratio: within 5%)) |
| Maximum number of contacts simultaneously ON | | Depends on the Derating chart |
| ON voltage/ON current | | 34 VDC or higher / 4.0mA or higher |
| OFF voltage/OFF current | | 10 VDC or lower / 1.0mA or lower |
| Input impedance | | Approx. 8.5k Ω |
| Response time | OFF→ON | 10 ms or less (excluding programmable controller response time) |
| | ON→OFF | 10 ms or less (excluding programmable controller response time) |
| Wiring method for common | | 16 points/common (2-wire type, WET method) |
| External power supply | | 24VDC \pm 10% (ripple ratio: within 5%, CLASS 2) |
| Current consumption | | Approx. 27mA when 24VDC (not including current consumption of programmable controller) |
| Withstand voltage, insulation resistance | | 560 Vrms AC / 3 cycles (altitude: 2000m), 10M Ω or higher |
| Noise immunity | | Simulator noise 500Vp-p, noise width 1 μ s (based on noise simulator with noise frequency of 25 to 60Hz) |
| Operation indication | | LED on with power supply ON and input ON |
| Terminal block | Terminal block screw | M3.5 screw, Number of terminals:36P, 8mm pitch Tightening torque range: 68 to 92N·cm(7 to 9kgf·cm, 6.1 to 8lbf·in), UL standard conformity tightening torque : 80N·cm, 7.08 lbf·in |
| | Applicable wire | 20 to 14 AWG: 0.5 to 2.0mm ² |
| Installation method | Screw | M4 \times 35mm or more Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10lbf·in) |
| | DIN rail | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) |
| Weight | | Approx. 310g |

Derating chart

■In the following directions of the installation, the restriction is generated in a simultaneous ON number.



■In directions of the installation, other than the above-mentioned, the derating is not generated.

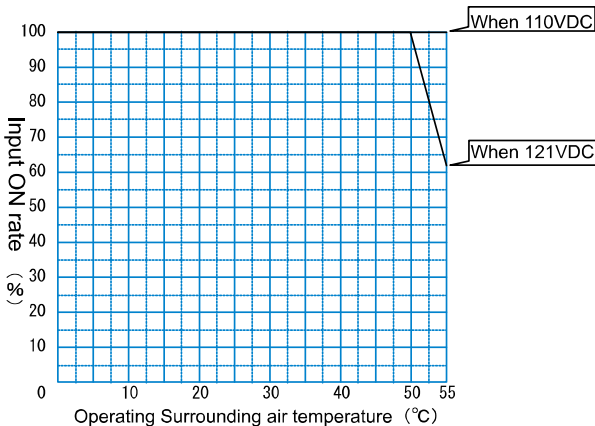
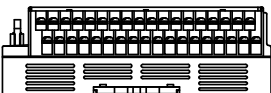
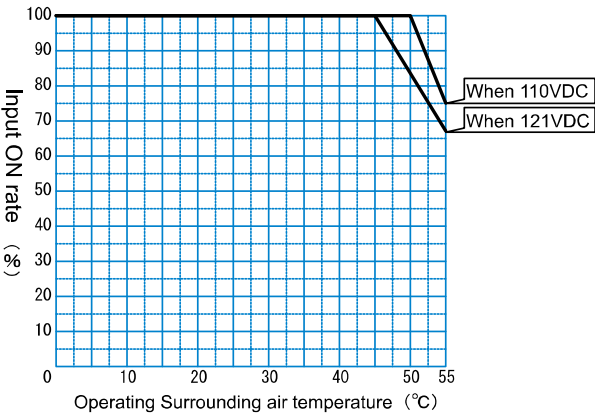
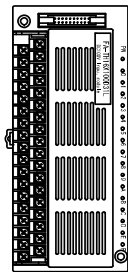
3-12. FA-TH16X100D31L

| Item | | Model | FA-TH16X100D31L |
|--|----------------------|-------|--|
| Connected programmable controller | | | DC input module (Positive common type) |
| Number of I/O points, Input device numbers | | | 16 points, X0 to XF |
| Insulation method | | | Photocoupler |
| Rated input voltage/current *1 | | | Voltage: 100/110VDC, Current: Approx. 2.5mA (100VDC) |
| Operating voltage range | | | 90 to 121VDC (100/110VDC ±10% (ripple ratio: within 5%)) |
| Maximum number of contacts simultaneously ON | | | Depends on the Derating chart |
| ON voltage/ON current | | | 80VDC or higher / 2.2mA or higher |
| OFF voltage/OFF current | | | 20VDC or lower / 0.5mA or lower |
| Input impedance | | | Approx. 37kΩ |
| Response time | OFF→ON | | 10ms or less (excluding programmable controller response time) |
| | ON→OFF | | 10ms or less (excluding programmable controller response time) |
| Wiring method for common | | | 16 points/common (2-wire type, WET method) |
| External power supply | | | 24VDC ±10% (ripple ratio: within 5%, CLASS 2) |
| Current consumption | | | Approx. 27mA when 24VDC (not including current consumption of programmable controller) |
| Withstand voltage, insulation resistance | | | 1780Vrms AC / 3 cycles (altitude: 2000m), 10MΩ or higher |
| Noise immunity | | | Simulator noise 500Vp-p, noise width 1μs (based on noise simulator with noise frequency of 25 to 60Hz) |
| Operation indication | | | LED on with power supply ON and input ON |
| Terminal block | Terminal block screw | | M3.5 screw, Number of terminals:36P, 8mm pitch Tightening torque range: 68 to 92N·cm(7 to 9kgf·cm, 6.1 to 8lbf·in), UL standard conformity tightening torque : 80N·cm, 7.08 lbf·in |
| | Applicable wire | | 20 to 14 AWG: 0.5 to 2.0mm ² |
| Installation method | Screw | | M4 × 35mm or more Tightening torque range: 78 to 118N·cm (8 to 12kgf·cm, 7 to 10 lbf·in) |
| | DIN rail | | Applicable DIN rail: TH35-7.5Fe, TH35-7.5Al (compliant with IEC 60715) |
| Weight | | | Approx. 320g |

*1: Use a power supply which can be supplied from the secondary side which is isolated by a transformer or converter, etc.

Derating chart

■ In the following directions of the installation, the restriction is generated in a simultaneous ON number.



■ In directions of the installation, other than the above-mentioned, the derating is not generated.

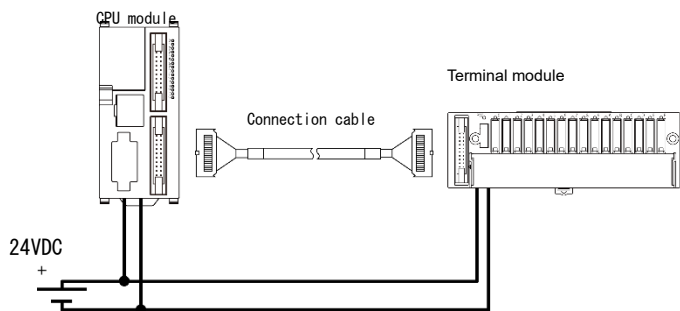
4. TARGET PLC MODULES AND CONNECTION CABLES

4-1. Programmable controllers

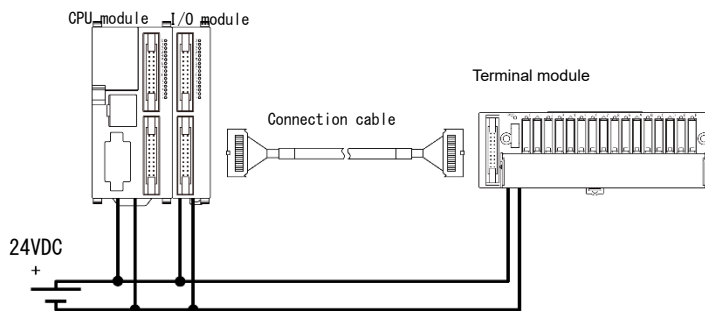
| Module model for a programmable controller *1 | | | | Cable model | Module model |
|---|---|--|----------------------------|---|---|
| MELSEC iQ-R series | Input module Positive/negative common shared type Connector type | RX41C4 RX42C4 RX41C6HS | Positive common | FA-CBL**FM2V* ² FA-CBL**FM2LV* ² FA-CBL**MMH20* ² (For distribution) | FA-TH16XRA20S FA-TH16X100A31 FA-TH16X100A31L FA-TH16X200A31 FA-TH16X200A31L FA-TH16X24D31 FA-TH16X24D31L FA-TH16X48D31L FA-TH16X100D31L FA1-TH16X24RA1L20S1E FA1-TH16X24RA1H20S1E FA1-TH8X24RA1L20S1E* ⁷ FA1-TH8X24RA1H20S1E* ⁷ FA1-TH4X24RA1L20S1E* ⁷ FA1-TH4X24RA1H20S1E* ⁷ |
| | I/O combined module Input: Positive/negative common shared type Connector type | RH42C4NT2P | Input side positive common | FA-CBL**FM2V* ² FA-CBL**FM2LV* ² FA-CBL**MMH20* ² (For distribution) | |
| | Input module Positive/negative common shared type Screw type terminal block | RX40C7 | Positive common | FA-CBL**M20 FA-CBL**YM20 FA-CBL**TMV20 FA-CBL**MMH20* ² (For distribution) | |
| | Input module Positive/negative common shared type Spring clamp type terminal block | RX40C7-TS | Positive common | FA1-CB1L**EM1F18* ² FA-CBL**MMH20* ² (For distribution) | |
| | Input module Positive/negative common shared type Spring clamp type terminal block | RX41C4-TS | Positive common | FA1-CB1L**EM2F34* ² FA-CBL**MMH20* ² (For distribution) | |
| MELSEC iQ-F series | Input module Sink Connector type | FX5-C16EX/D FX5-C32EX/D | Input side | FA-FXCBL**MMH20* ³ FA2-CB1LT**MM1H20* ³ * ⁴ * ⁶ FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Sink Connector type | FX5-C32ET/D FX5UC-32MT/D FX5UC-64MT/D FX5UC-96MT/D | | | |
| | Input module Sink/source shared type Connector type | FX5-C16EX/DS FX5-C32EX/DS | Sink input | FA2-CB1L**MM1H20E* ³ FA2-CB1LT**MM1H20E* ³ * ⁵ * ⁶ FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Sink/source shared type Connector type | FX5-C32ET/DSS FX5UC-32MT/DSS FX5UC-64MT/DSS FX5UC-96MT/DSS | Input side sink | | |
| | Input module Sink/source shared type Spring clamp type terminal block | FX5-C32EX/DS-TS | Sink input | FA2-CB1L**EM1F18E* ² * ³ FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Sink/source shared type Spring clamp type terminal block | FX5-C32ET/DS-TS FX5-C32ET/DSS-TS FX5UC-32MT/DS-TS FX5UC-32MT/DSS-TS | Input side sink | FA2-CB1L**EM1F18E* ² * ³ FA-CBL**MMH20* ² (For distribution) | |
| MELSEC-Q series | Input module Positive common Connector type | QX41 QX41-S1 QX41-S2 QX42 QX42-S1 | Input side | FA-CBL**FM2V* ² FA-CBL**FM2LV* ² FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Positive common Connector type | QH42P QX41Y41P | | FA-CBL**FM2V* ² FA-CBL**FM2LV* ² FA-CBL**MMH20* ² (For distribution) | |
| | Input module Positive common Screw type terminal block | QX40 QX40-S1 | | FA-CBL**M20 FA-CBL**YM20 FA-CBL**TMV20 FA-CBL**MMH20* ² (For distribution) | |
| MELSEC-L series | Input module Positive/negative common shared type Connector type | LX41C4 LX42C4 | Positive common | FA-CBL**FM2V* ² FA-CBL**FM2LV* ² FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Positive/negative common shared type Connector type | LH42C4NT1P LH42C4PT1P | Input side positive common | FA-CBL**FM2V* ² FA-CBL**FM2LV* ² FA-CBL**MMH20* ² (For distribution) | |
| | Input module Positive/negative common shared type Screw type terminal block | LX40C6 | Positive common | FA-CBL**M20 FA-CBL**YM20 FA-CBL**MMH20* ² (For distribution) | |
| MELSEC-F series | Input module Sink Connector type | FX2NC-16EX FX2NC-32EX | Input side | FA-FXCBL**MMH20* ³ FA2-CB1LT**MM1H20* ³ * ⁴ * ⁶ FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Sink Connector type | FX3GC-32MT/D FX3UC-16MT/D FX3UC-32MT/D FX3UC-32MT-LT FX3UC-32MT-LT-2 FX3UC-64MT/D FX3UC-96MT/D | | | |
| | Input module Sink/source shared type Connector type | FX2NC-16EX-DS FX2NC-32EX-DS | Sink input | FA2-CB1L**MM1H20E* ³ FA2-CB1LT**MM1H20E* ³ * ⁵ * ⁶ FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Sink/source shared type Connector type | FX3GC-32MT/DSS FX3UC-16MT/DSS FX3UC-32MT/DSS FX3UC-64MT/DSS FX3UC-96MT/DSS | Input side sink | | |

- *1 : For use with 24 V DC only.
- *2 : Use the same power supply for the modules to be connected.
- *3 : Use the same 24VDC external power supply for the MELSEC iQ-F or MELSEC-F series module and the digital signal converter.
- *4 : When the operating ambient temperature is -20 to 55°C, use the FA2-CB1LT**MM1H20.
- *5 : When the operating ambient temperature is -20 to 55°C, use the FA2-CB1LT**MM1H20E.
- *6 : For use below 0°C, check the Operating ambient temperature of programmable controller.
- *7 : A distributed cable is required for distributed connection.

• Connection example: CPU module



• Connection example: I/O module



| Module model for a programmable controller *1 | | | | Cable model | Module model |
|---|---|---|--------------------|---|---|
| CC-Link IE TSN series | Input module Positive/negative common shared type Connector type | NZ2GNCF1-32D | Positive common | FA-CBL**FM2H* ² FA-CBL**FM2LH* ² FA-CBL**MMH20* ² (For distribution) | FA-TH16XRA20S FA-TH16X100A31 FA-TH16X100A31L FA-TH16X200A31 FA-TH16X200A31L FA-TH16X24D31 FA-TH16X24D31L FA-TH16X48D31L FA-TH16X100D31L FA1-TH16X24RA1L20S1E FA1-TH16X24RA1H20S1E FA1-TH8X24RA1L20S1E* ⁴ FA1-TH8X24RA1H20S1E* ⁴ FA1-TH4X24RA1L20S1E* ⁴ FA1-TH4X24RA1H20S1E* ⁴ |
| | Input module Positive/negative common shared type Screw type terminal block *3 | NZ2GN2B1-32D | Positive common | FA-CBL**M20 FA-CBL**YM20 FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Positive common Screw type terminal block *3 | NZ2GN2B1-32DT | Input side | | |
| | Input module Positive/negative common shared type Spring clamp type terminal block | NZ2GN2S1-16D | Positive common | FA3-CB1L**EM1F18X* ² FA-CBL**MMH20* ² (For distribution) | |
| | Input module Positive/negative common shared type Spring clamp type terminal block | NZ2GN2S1-32D | Positive common | FA3-CB1L**EM2F34X* ² FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Positive common Spring clamp type terminal block | NZ2GN2S1-32DT | Input side | FA3-CB1L**EM2F34Y* ² FA-CBL**MMH20* ² (For distribution) | |
| CC-Link IE Field Basic series | Input module Positive/negative common shared type Screw type terminal block *3 | NZ2MFB1-32D | Positive common | FA-CBL**M20 FA-CBL**YM20 FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Positive common Screw type terminal block *3 | NZ2MFB1-32DT | Input side | | |
| | Input module Positive/negative common shared type Spring clamp type terminal block | NZ2MF2S1-32D | Positive common | FA3-CB1L**EM2F34X* ² FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Positive common Spring clamp type terminal block | NZ2MF2S1-32DT | Input side | FA3-CB1L**EM2F34Y* ² FA-CBL**MMH20* ² (For distribution) | |
| CC-Link IE Field series | Input module Positive/negative common shared type Connector type | NZ2GFCF1-32D | Positive common | FA-CBL**FM2H* ² FA-CBL**FM2LH* ² FA-CBL**MMH20* ² (For distribution) | |
| | Input module Positive/negative common shared type Screw type terminal block *3 | NZ2GF2B1N1-16D NZ2GF2B1-32D | Positive common | FA-CBL**M20 FA-CBL**YM20 FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Positive common Screw type terminal block *3 | NZ2GF2B1-32DT | Input side | | |
| CC-Link series | Input module Positive/negative common shared type Connector type | AJ65SBTCF1-32D | Positive common | FA-CBL**FM2H* ² FA-CBL**FM2LH* ² FA-CBL**MMH20* ² (For distribution) | |
| | Input module Positive/negative common shared type Screw type terminal block *3 | AJ65SBTB1-16D AJ65SBTB1-16D1 AJ65SBTB3-16D AJ65SBTB3-16KD AJ65SBTB1-32D AJ65SBTB1-32D1 AJ65SBTB1-32KD | Positive common | FA-CBL**M20 FA-CBL**YM20 FA-CBL**MMH20* ² (For distribution) | |
| | I/O combined module Input: Positive common Screw type terminal block *3 | AJ65SBTB1-32DT | Input side | | |
| | Input module Positive/negative common shared type Spring clamp type terminal block *3 | AJ65VBTS3-16D | Positive common | FA-CBL**M20 FA-CBL**MMH20* ² (For distribution) | |

*1 : For use with 24 V DC only.

*2 : Use the same power supply for the modules to be connected.

*3 : Can be connected by connecting the FA-CBL**M20 (connection cable (discrete cable)) or FA-CBL**YM20(connection cable with Y-shaped solderless terminal) to a digital signal converter.

*4 : A distributed cable is required for distributed connection.

4-2. CC-Link interface module for digital signal converter

| Model | | Interface module cable | | Unit model |
|---|------------------|---|---|--|
| CC-Link IE TSN/Ethernet interface module for digital signal converter | FA3-TH1T16XC-01C | FA3-TH1T16XC Dedicated cable (Included with the CC-Link IE TSN/Ethernet interface module) | — | FA-TH16XRA20S |
| | | Signal converter connection extension cable | FA3-CB2L**MM1H20 FA-CBL**MMH20* ² (For distribution) | FA-TH16X100A31 FA-TH16X100A31L FA-TH16X200A31 FA-TH16X200A31L |
| | FA3-TH1T16XC | Signal converter connection extension cable | FA3-CB2L**MM1H20 FA-CBL**MMH20* ² (For distribution) | FA-TH16X24D31 FA-TH16X24D31L FA-TH16X48D31L |
| CC-Link interface module for digital signal converter | FA3-TH1C16XC-01C | FA3-TH1C16XC Dedicated cable (Included with the CC-Link interface module) | — | FA-TH16X100D31L FA1-TH16X24RA1L20S1E |
| | | Signal converter connection extension cable | FA3-CB2L**MM1H20 FA-CBL**MMH20* ² (For distribution) | FA1-TH16X24RA1H20S1E FA1-TH8X24RA1L20S1E* ¹ FA1-TH8X24RA1H20S1E* ¹ FA1-TH4X24RA1L20S1E* ¹ FA1-TH4X24RA1H20S1E* ¹ |
| | FA3-TH1C16XC | Signal converter connection extension cable | FA3-CB2L**MM1H20 FA-CBL**MMH20* ² (For distribution) | |

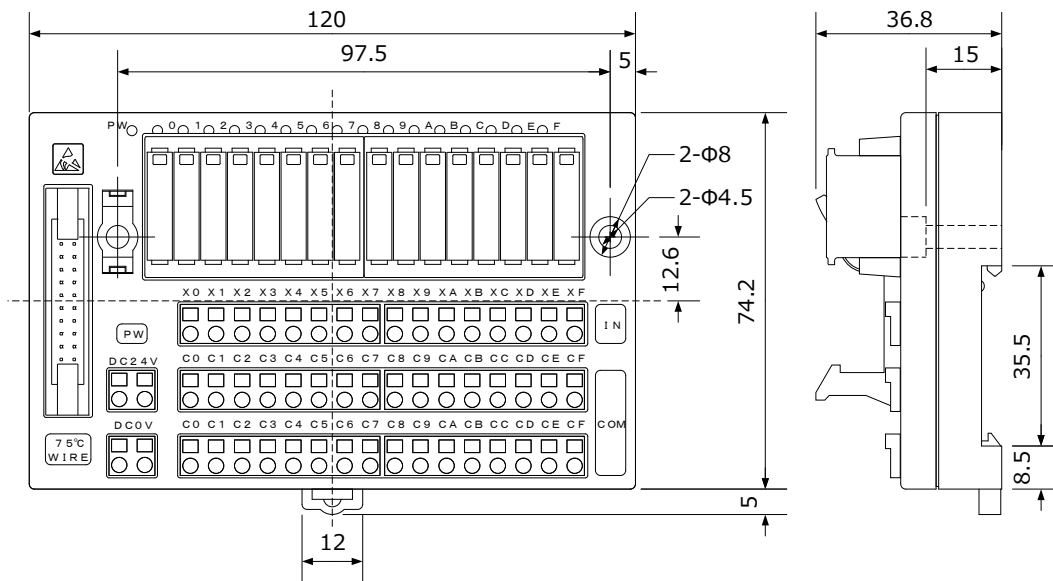
*1 : A distributed cable is required for distributed connection.

*2 : Use the same power supply for the modules to be connected.

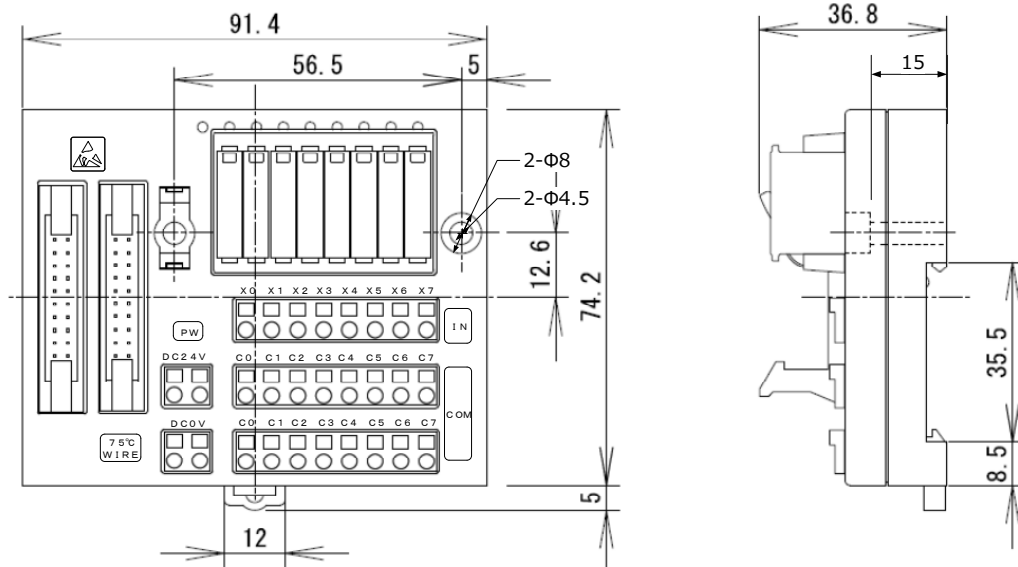
5. EXTERNAL DIMENSIONS

5-1. FA1-TH16X24RA1L20S1E, FA1-TH16X24RA1H20S1E

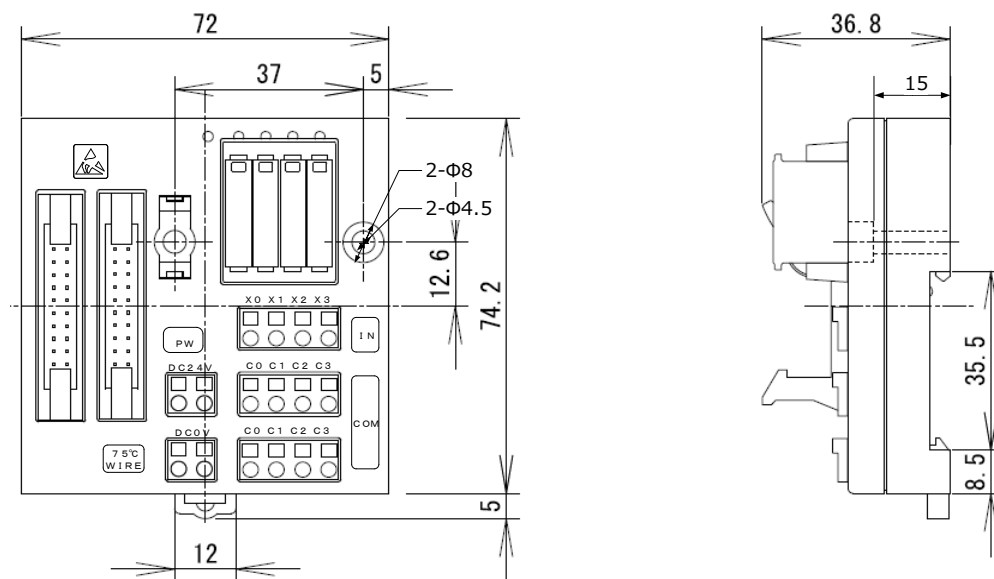
[Unit : mm]

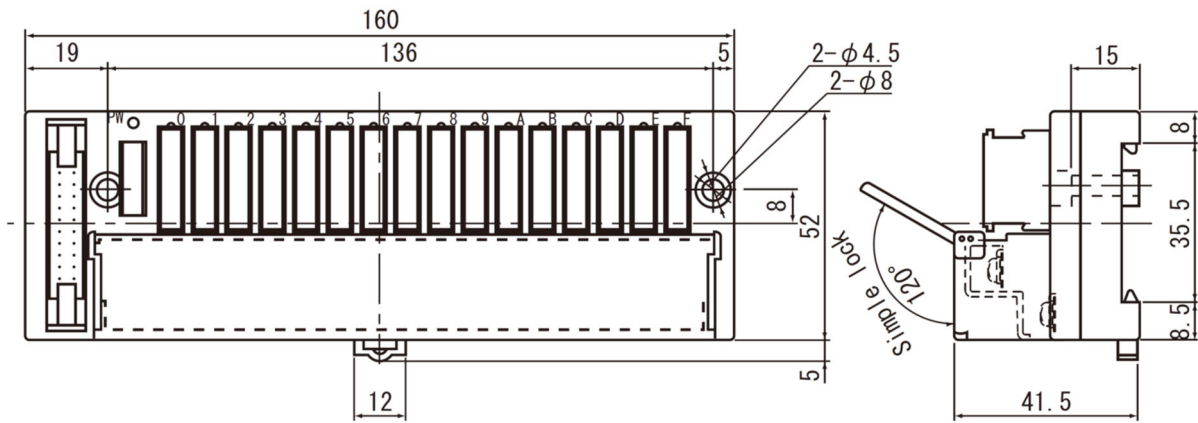


[Unit : mm]



[Unit : mm]





*1: A terminal block symbol sheet for the MELSEC iQ-R and MELSEC-Q series modules is attached to the module.
When connecting to the MELSEC iQ-F or MELSEC-F series module, obtain a terminal block symbol sheet for the MELSEC iQ-F or MELSEC-F series module from our MEEFAN website and replace the sheet as needed.
URL: https://www.mee.co.jp/sales/fa/meefan/product_information/product_information.html

<Terminal block symbol paper>

MELSEC iQ-R
and MELSEC-Q
series
(Hexadecimal)
*2

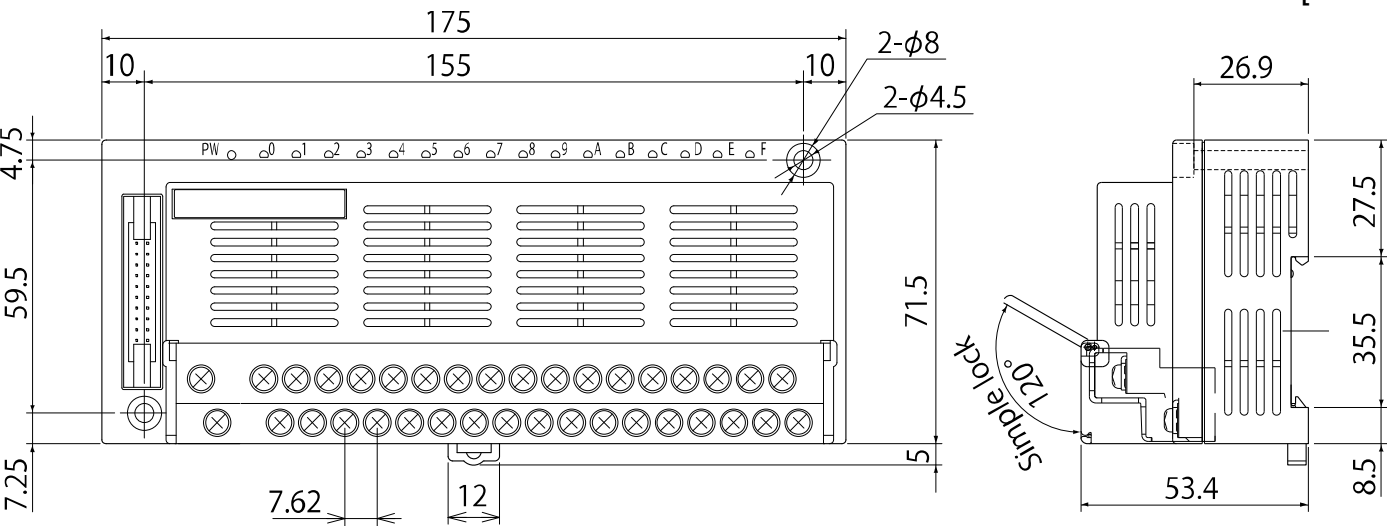
Front

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|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| DC 24V | X0 (-) | X1 (-) | X2 (-) | X3 (-) | X4 (-) | X5 (-) | X6 (-) | X7 (-) | X8 (-) | X9 (-) | XA (-) | XB (-) | XC (-) | XD (-) | XE (-) | XF (-) |
| FA-T1618A105 | | | | | | | | | | | | | | | | |
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*2: This sheet is attached to the module.
*3: When using the MELSEC iQ-F or MELSEC-F series module, regard the LED indication numbers 8 to F as higher numbers 0 to 7.

5-5. FA-TH16X100A31

[Unit:mm]



*1: A terminal block symbol sheet for the MELSEC iQ-R and MELSEC-Q series modules is attached to the module.
When connecting to the MELSEC iQ-F or MELSEC-F series module, obtain a terminal block symbol sheet for the MELSEC iQ-F or MELSEC-F series module from our MEEFAN website and replace the sheet as needed.
URL: https://www.mee.co.jp/sales/fa/meefan/product_information/product_information.html

<Terminal block symbol paper>

MELSEC iQ-R
and MELSEC-Q
series(Hexadeci
mal)
*2

Front

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| FA-TH16X10A31 | DC 24V | DC 0V | | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 2 | COM 1 | COM 2 |
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|-----------|----------|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| DC 24V | | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | MELSEC-Q1 |
| | DC 0V | | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

MELSEC iQ-F
and MELSEC-F
series
(Octal)
[Downloadable
from our
website]

Front

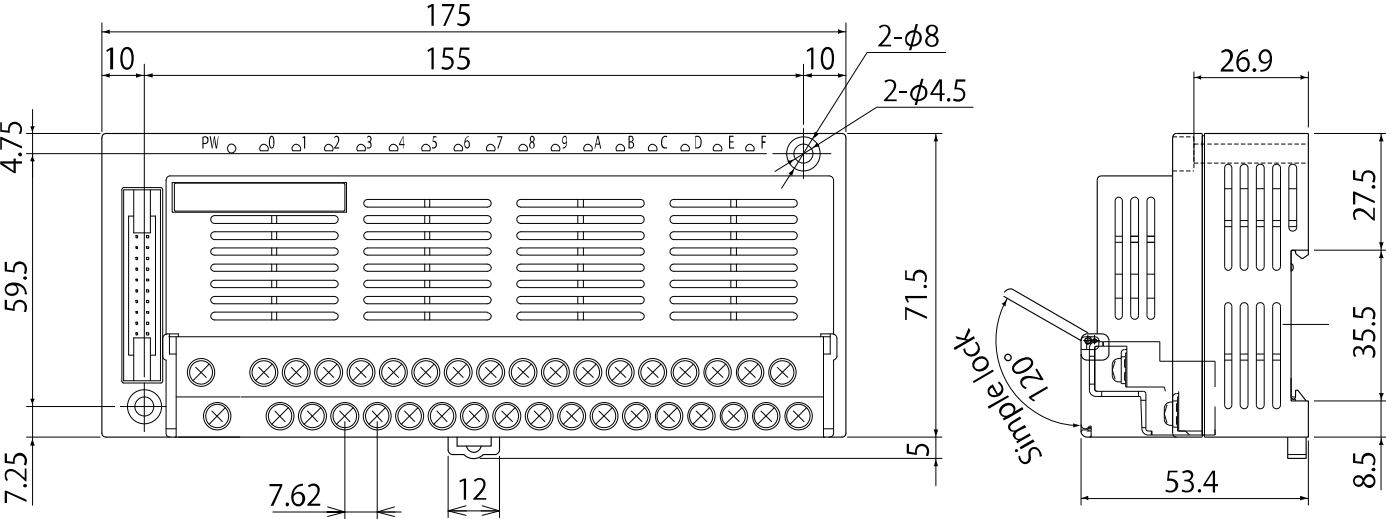
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---------------|-----------|----------|--|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----------|----------|
| FA-TH16X10A31 | DC 24V | DC 0V | | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | COM 1 | COM 2 |
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Back

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|-----------|----------|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| DC 24V | | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | COM 1 | MELSEC-F1 |
| | DC 0V | | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

*2: This sheet is attached to the module.
*3: When using the MELSEC iQ-F or MELSEC-F series module, regard the LED indication numbers 8 to F as higher numbers 0 to 7.

[Unit:mm]



*1: A terminal block symbol sheet for the MELSEC iQ-R and MELSEC-Q series modules is attached to the module.
When connecting to the MELSEC iQ-F or MELSEC-F series module, obtain a terminal block symbol sheet for the MELSEC iQ-F or MELSEC-F series module from our MEEFAN website and replace the sheet as needed.
URL: https://www.mee.co.jp/sales/fa/meefan/product_information/product_information.html

<Terminal block symbol paper>

MELSEC iQ-R
and MELSEC-Q
series(Hexadeci
mal)
*2

Front

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|---------------|-----------|----------|--|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----------|----------|
| FA-TH16X20A31 | DC 24V | DC 0V | | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 2 | COM 1 | COM 2 |
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Back

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|-----------|----------|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------------|
| DC 24V | | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | RESISTANCE GND |
| | DC 0V | | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

MELSEC iQ-F
and MELSEC-F
series
(Octal)
[Downloadable
from our
website]

Front

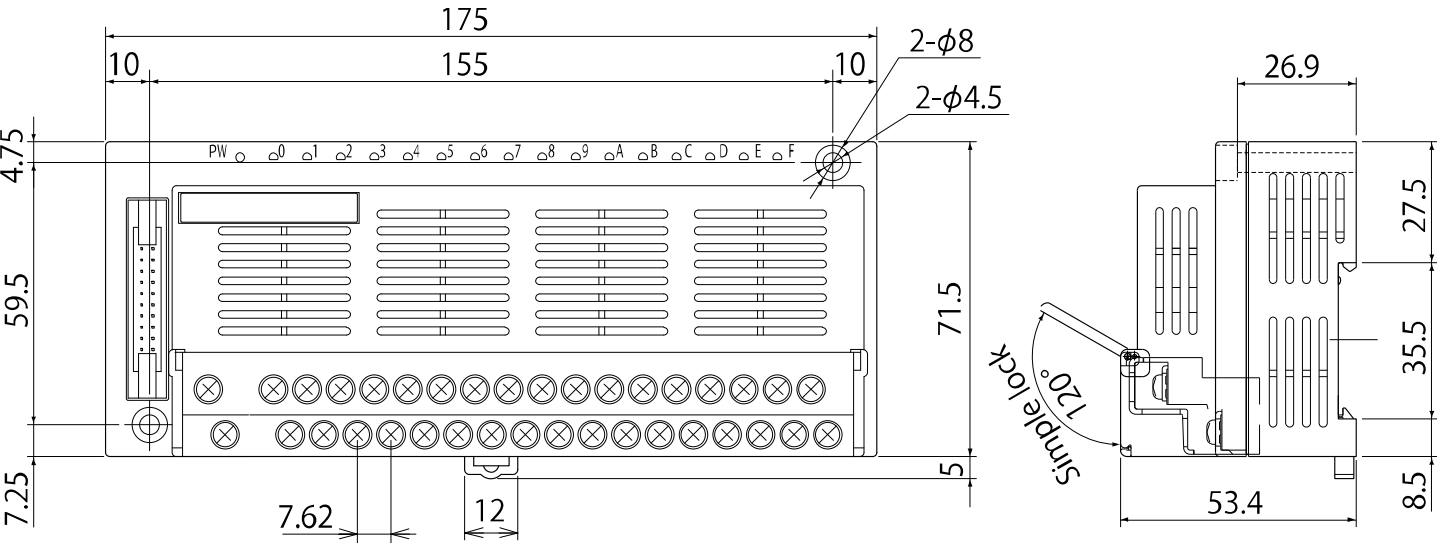
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|---------------|-----------|----------|--|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----|----------|----------|----------|
| FA-TH16X20A31 | DC 24V | DC 0V | | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | COM 1 | COM 2 |
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Back

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|-----------|----------|----|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|-------------------|
| DC 24V | | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | COM 1 | RESISTANCE GND |
| | DC 0V | | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

*2: This sheet is attached to the module.
*3: When using the MELSEC iQ-F or MELSEC-F series module, regard the LED indication numbers 8 to F as higher numbers 0 to 7.

[Unit:mm]



*1: A terminal block symbol sheet for the MELSEC iQ-R and MELSEC-Q series modules is attached to the module.
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URL: https://www.mee.co.jp/sales/fa/meefan/product_information/product_information.html

<Terminal block symbol paper>

MELSEC iQ-R
and MELSEC-Q
series(Hexadeci
mal)
*2

Front

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|---------------|--------|-------|--|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|
| FA-TH16X24D3T | DC 24V | DC 0V | | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 2 | COM 1 | COM 2 |
|---------------|--------|-------|--|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|

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|--------|-------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|
| DC 24V | | | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | MELSEC-Q01 |
| | DC 0V | | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 |

MELSEC iQ-F
and MELSEC-F
series
(Octal)
[Downloadable
from our
website]

Front

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|---------------|--------|-------|--|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|
| FA-TH16X24D3T | DC 24V | DC 0V | | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | COM 1 | COM 2 |
|---------------|--------|-------|--|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|

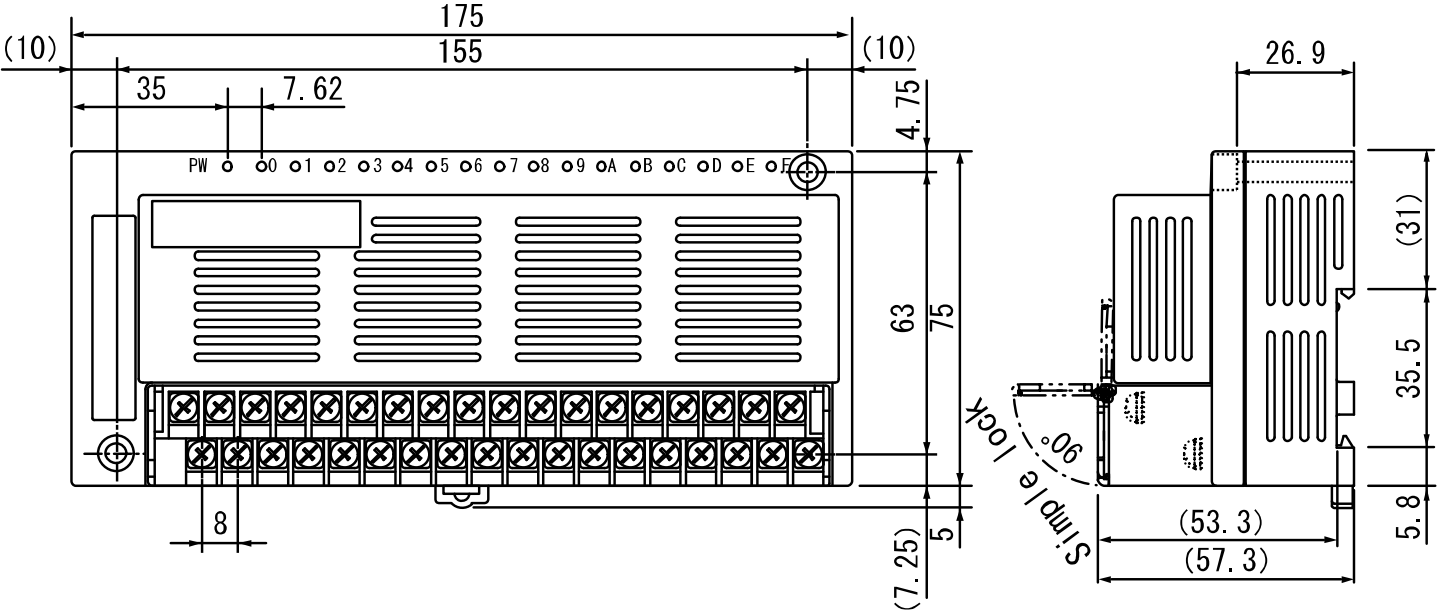
Back

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|--------|-------|--|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------|
| DC 24V | | | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | COM 1 | MELSEC-F01 |
| | DC 0V | | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 |

*2: This sheet is attached to the module.
*3: When using the MELSEC iQ-F or MELSEC-F series module, regard the LED indication numbers 8 to F as higher numbers 0 to 7.

5-8. FA-TH16X100A31L

[Unit:mm]



*1: A terminal block symbol sheet for the MELSEC iQ-R and MELSEC-Q series modules is attached to the module.

When connecting to the MELSEC iQ-F or MELSEC-F series module, obtain a terminal block symbol sheet for the MELSEC iQ-F or MELSEC-F series module from our MEEFAN website and replace the sheet as needed.

URL: https://www.mee.co.jp/sales/fa/meefan/product_information/product_information.html

<Terminal block symbol paper>

MELSEC iQ-R
and MELSEC-Q
series(Hexadecimal)
*2

Front

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|-----------------|--------|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|
| FA-TH16X100A31L | DC 24V | DC 0V | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 2 | COM 1 | COM 2 |
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|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|
| DC 24V | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | FA-TH16X100A31L |
| DC 0V | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

MELSEC iQ-F
and MELSEC-F
series
(Octal)
[Downloadable
from our
website]

Front

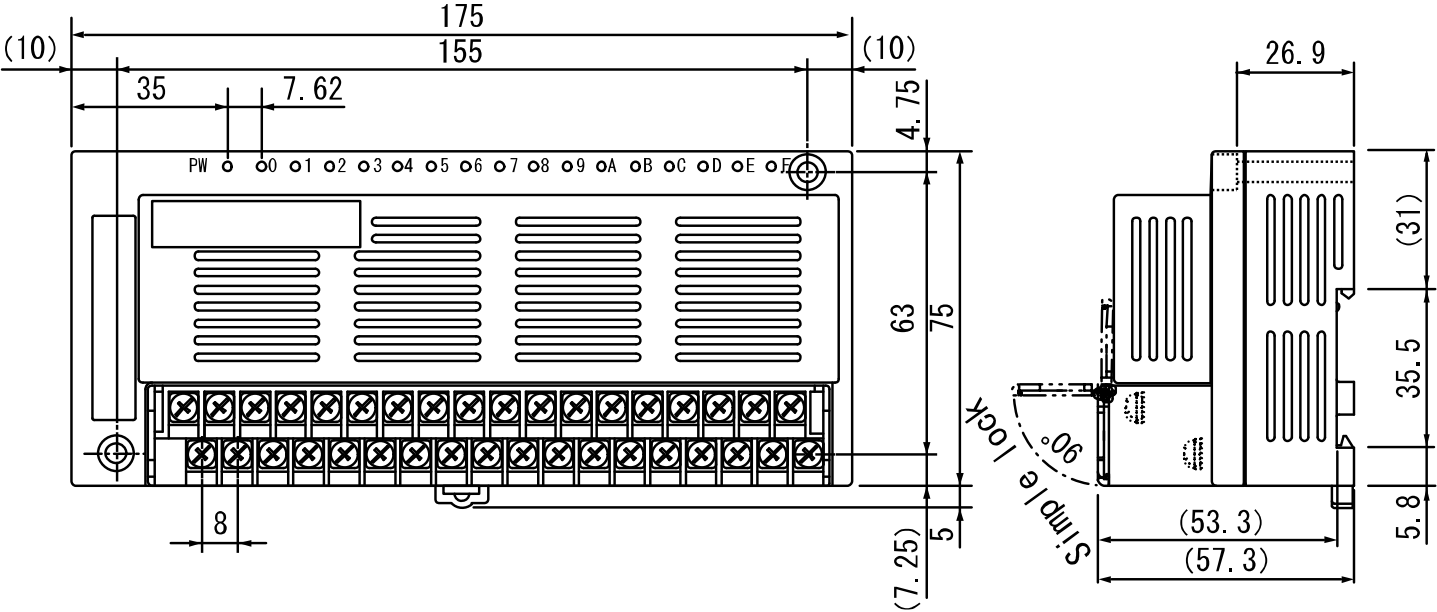
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| FA-TH16X100A31L | DC 24V | DC 0V | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | X6 | COM 2 | X7 | COM 2 | COM 1 | COM 2 |
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Back

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|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|
| DC 24V | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | COM 1 | FA-TH16X100A31L |
| DC 0V | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

*2: This sheet is attached to the module.
*3: When using the MELSEC iQ-F or MELSEC-F series module, regard the LED indication numbers 8 to F as higher numbers 0 to 7.

[Unit:mm]



*1: A terminal block symbol sheet for the MELSEC iQ-R and MELSEC-Q series modules is attached to the module.

When connecting to the MELSEC iQ-F or MELSEC-F series module, obtain a terminal block symbol sheet for the MELSEC iQ-F or MELSEC-F series module from our MEEFAN website and replace the sheet as needed.

URL: https://www.mee.co.jp/sales/fa/meefan/product_information/product_information.html

<Terminal block symbol paper>

MELSEC iQ-R
and MELSEC-Q
series(Hexadecimal)
*2

Front

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|-----------------|--------|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|
| FA-TH16X200A31L | DC 24V | DC 0V | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 2 | COM 1 | COM 2 |
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|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|
| DC 24V | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | FA-TH16X200A31L |
| DC 0V | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

MELSEC iQ-F
and MELSEC-F
series
(Octal)
[Downloadable
from our
website]

Front

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|-----------------|--------|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|
| FA-TH16X200A31L | DC 24V | DC 0V | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 2 | COM 1 | COM 2 |
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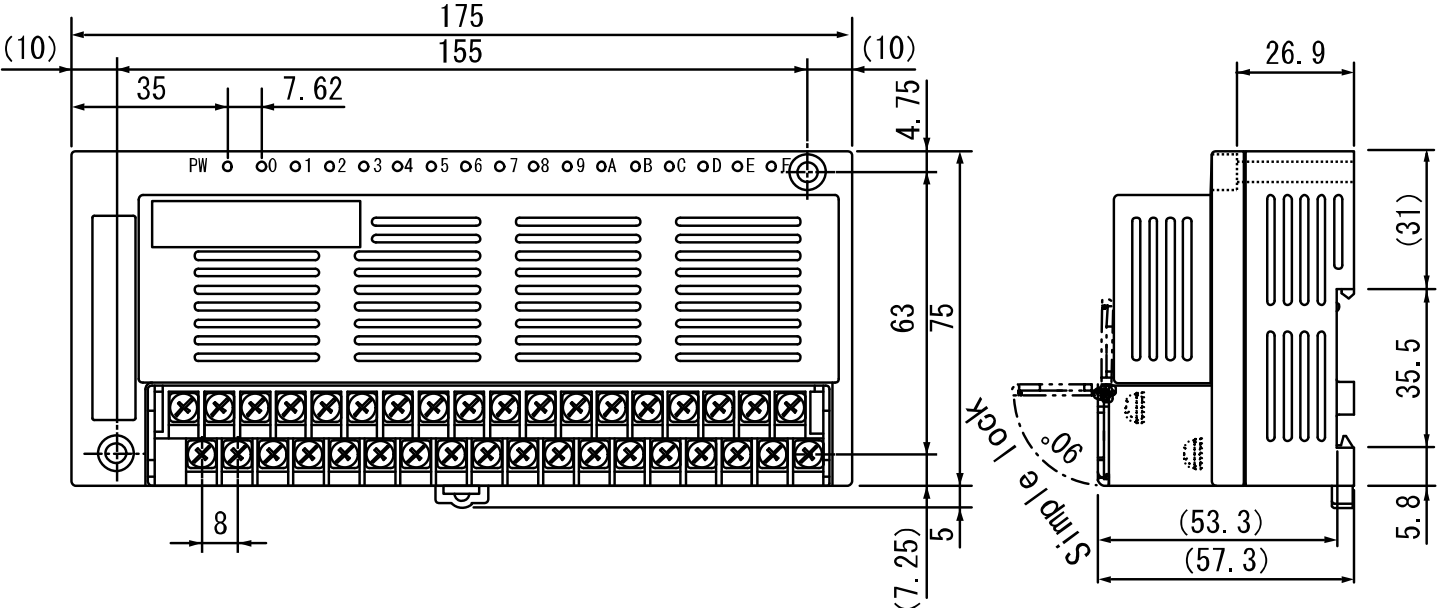
Back

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|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|
| DC 24V | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | FA-TH16X200A31L |
| DC 0V | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

*2: This sheet is attached to the module.
*3: When using the MELSEC iQ-F or MELSEC-F series module, regard the LED indication numbers 8 to F as higher numbers 0 to 7.

5-10. FA-TH16X24D31L

[Unit:mm]



*1: A terminal block symbol sheet for the MELSEC iQ-R and MELSEC-Q series modules is attached to the module.

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URL: https://www.mee.co.jp/sales/fa/meefan/product_information/product_information.html

<Terminal block symbol paper>

MELSEC iQ-R
and MELSEC-Q
series(Hexadecimal)
*2

Front

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|----------------|--------|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|
| COM 1 | DC 24V | DC 0V | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 2 | COM 1 | COM 2 |
| FA-TH16XZ4D31L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| DC 24V | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | COM 2 |
| DC 0V | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 |

MELSEC iQ-F
and MELSEC-F
series
(Octal)
[Downloadable
from our
website]

Front

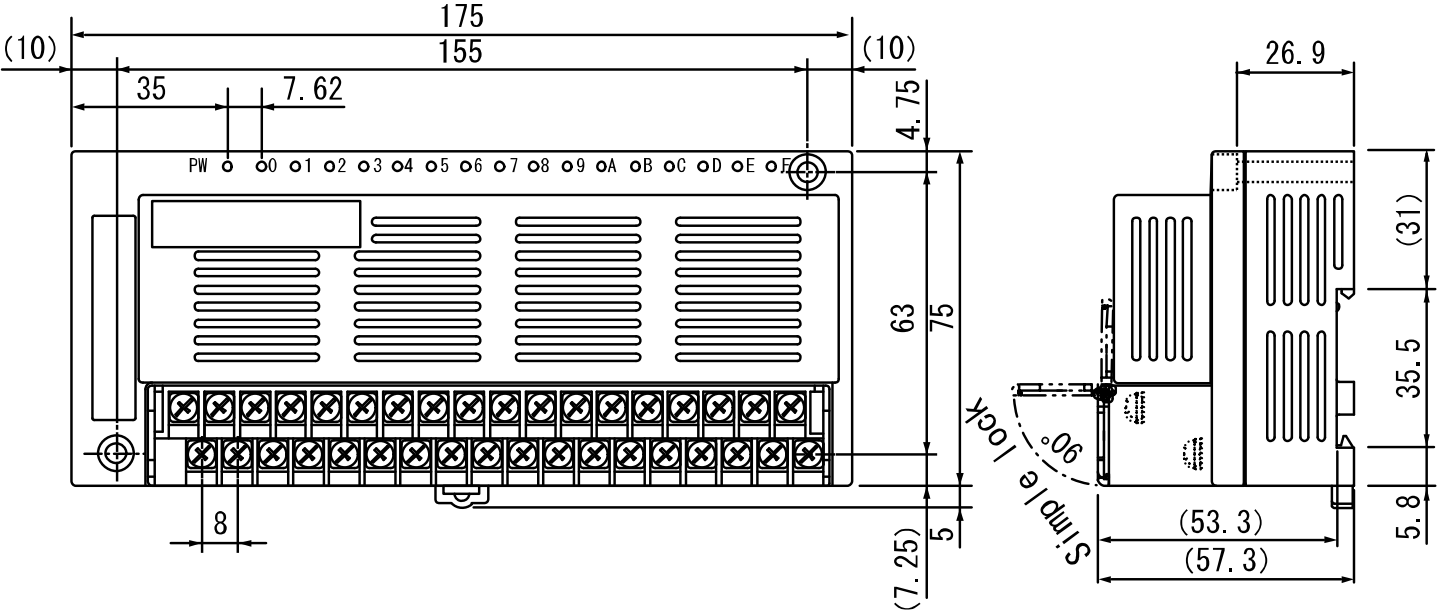
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|----------------|--------|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|
| COM 1 | DC 24V | DC 0V | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 2 | COM 1 | COM 2 |
| FA-TH16XZ4D31L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| DC 24V | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | COM 2 |
| DC 0V | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 |

*2: This sheet is attached to the module.
*3: When using the MELSEC iQ-F or MELSEC-F series module, regard the LED indication numbers 8 to F as higher numbers 0 to 7.

[Unit:mm]



*1: A terminal block symbol sheet for the MELSEC iQ-R and MELSEC-Q series modules is attached to the module.

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URL: https://www.mee.co.jp/sales/fa/meefan/product_information/product_information.html

<Terminal block symbol paper>

MELSEC iQ-R
and MELSEC-Q
series(Hexadeci
mal)
*2

Front

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|----------------|--------|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|
| FA-TH16X4BD31L | DC 24V | DC 0V | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 1 | COM 2 |
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|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| DC 24V | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | MELSEC-Q |
| DC 0V | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

MELSEC iQ-F
and MELSEC-F
series
(Octal)
[Downloadable
from our
website]

Front

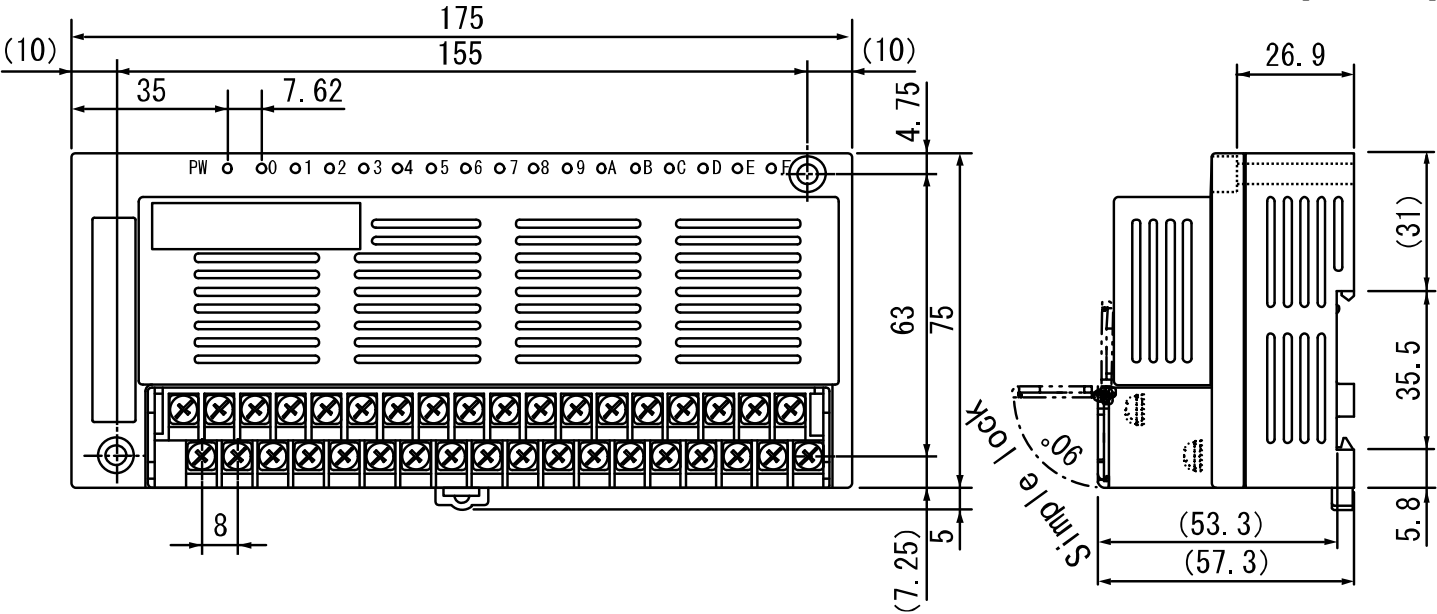
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|----------------|--------|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|
| FA-TH16X4BD31L | DC 24V | DC 0V | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 1 | COM 2 |
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|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|
| DC 24V | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | COM 1 | MELSEC-Q |
| DC 0V | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

*2: This sheet is attached to the module.
*3: When using the MELSEC iQ-F or MELSEC-F series module, regard the LED indication numbers 8 to F as higher numbers 0 to 7.

[Unit:mm]



*1: A terminal block symbol sheet for the MELSEC iQ-R and MELSEC-Q series modules is attached to the module.

When connecting to the MELSEC iQ-F or MELSEC-F series module, obtain a terminal block symbol sheet for the MELSEC iQ-F or MELSEC-F series module from our MEEFAN website and replace the sheet as needed.

URL: https://www.mee.co.jp/sales/fa/meefan/product_information/product_information.html

<Terminal block symbol paper>

MELSEC iQ-R
and MELSEC-Q
series(Hexadecimal)
*2

Front

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|--------|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|
| FA-TH16X100D31L | DC 24V | DC 0V | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 2 | COM 1 | COM 2 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Back

| | | | | | | | | | | | | | | | | | | |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|
| DC 24V | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | FA-TH16X100D31L |
| DC 0V | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

MELSEC iQ-F
and MELSEC-F
series
(Octal)
[Downloadable
from our
website]

Front

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------|--------|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|----|-------|-------|-------|
| FA-TH16X100D31L | DC 24V | DC 0V | X0 | COM 2 | X1 | COM 2 | X2 | COM 2 | X3 | COM 2 | X4 | COM 2 | X5 | COM 2 | X6 | COM 2 | X7 | COM 2 | X8 | COM 2 | X9 | COM 2 | XA | COM 2 | XB | COM 2 | XC | COM 2 | XD | COM 2 | XE | COM 2 | XF | COM 2 | COM 1 | COM 2 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Back

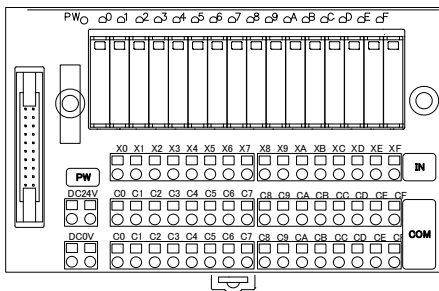
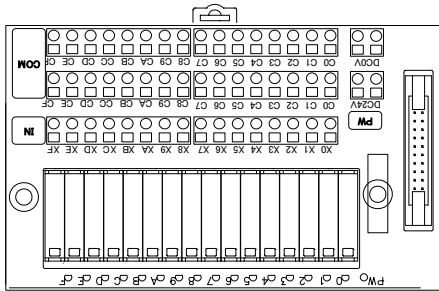
| | | | | | | | | | | | | | | | | | | |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----------------|
| DC 24V | X0 | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | XA | XB | XC | XD | XE | XF | COM 1 | FA-TH16X100D31L |
| DC 0V | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | COM 2 | |

*2: This sheet is attached to the module.
*3: When using the MELSEC iQ-F or MELSEC-F series module, regard the LED indication numbers 8 to F as higher numbers 0 to 7.

6. INSTALLATION ORIENTATION

6-1. FA1-TH16X24RA1L20S1E/H20S1E, FA1-TH8X24RA1L20S1E/H20S1E, FA1-TH4X24RA1L20S1E/H20S1E

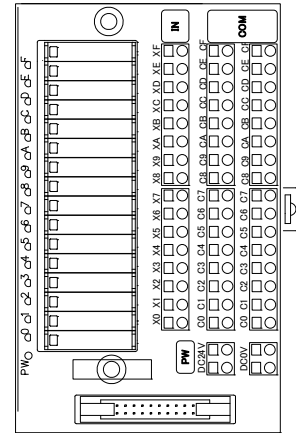
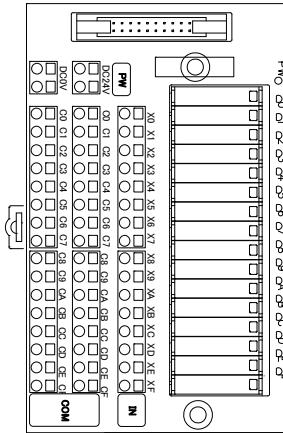
Horizontal installation



Upward installation



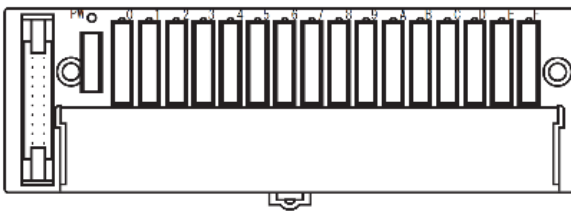
Vertical installation



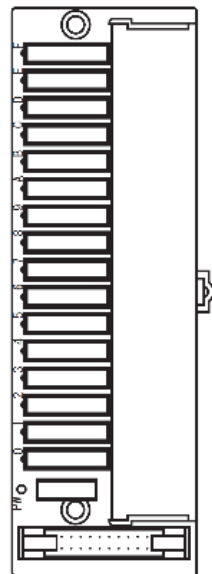
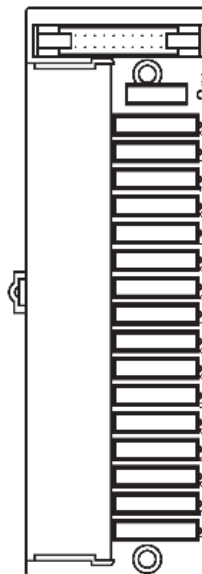
*1: Do not install the module in any direction other than the above.

6-2. FA-TH16XRA20S

Horizontal installation



Vertical installation

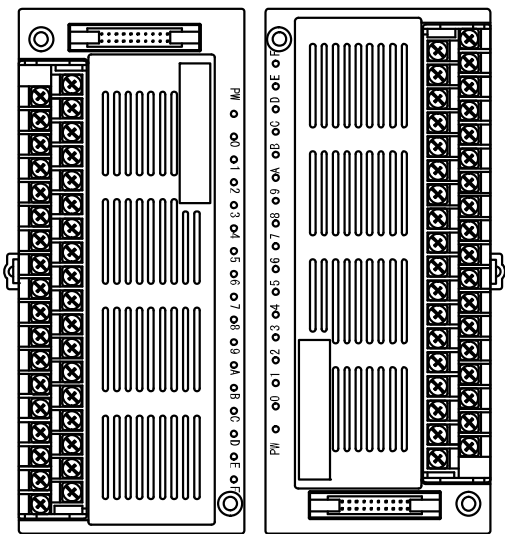
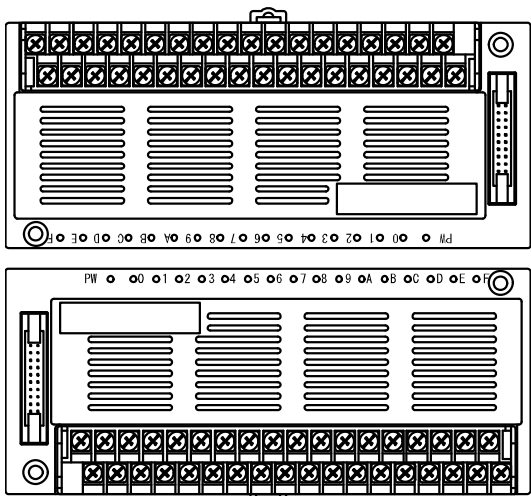


*1: Do not install the module in any direction other than the above.

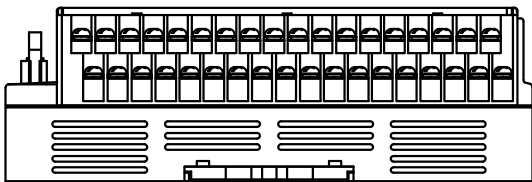
6-2. FA-TH16X100A31/200A31/24D31/100A31L/200A31L/24D31L/48D31L/100D31L

Horizontal installation

Vertical installation



Upward installation

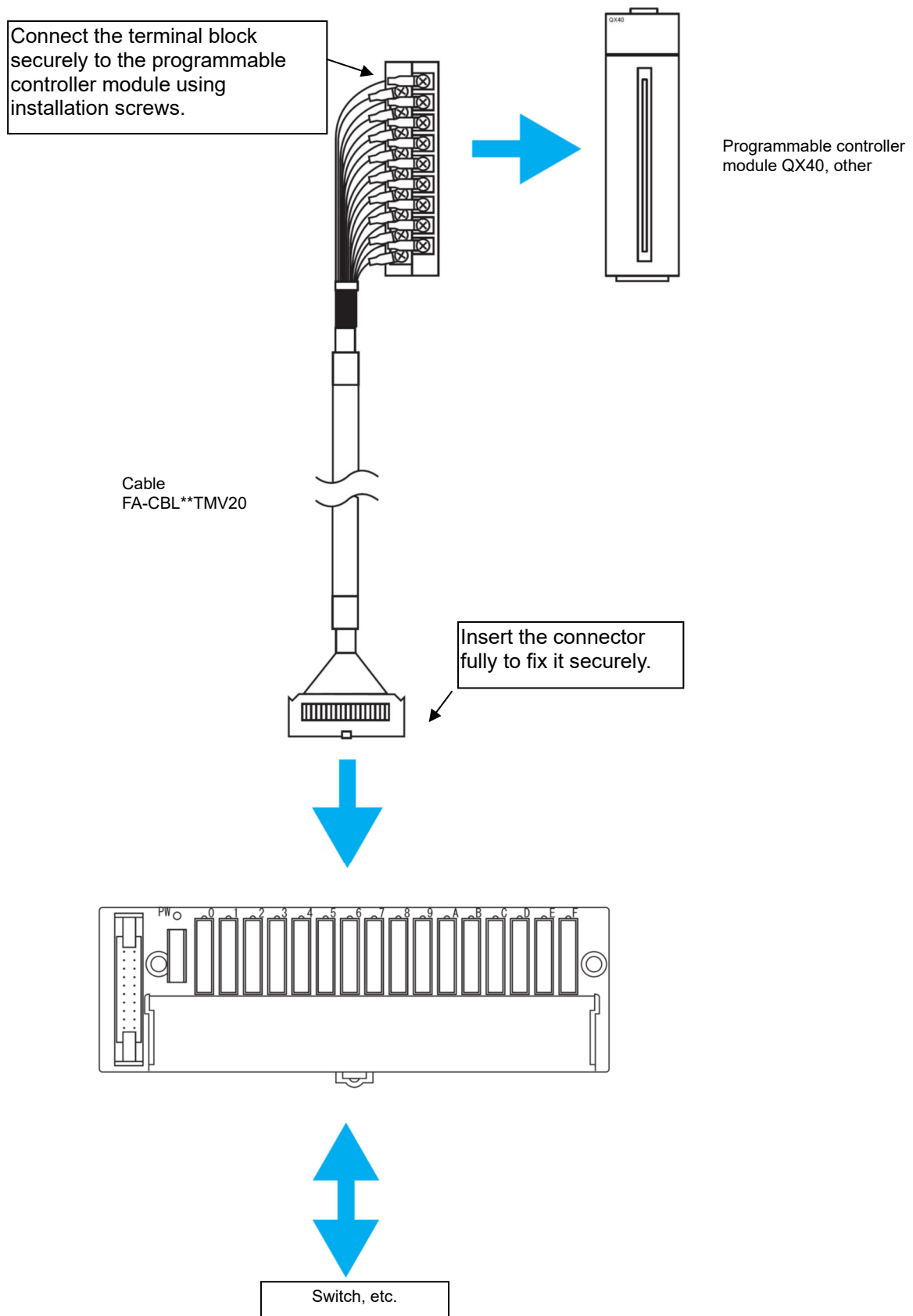


*1: Do not install the module in any direction other than the above.

7. CONNECTING METHOD

7-1. Connection example with a terminal block module of a programmable controller

7-1-1. When a cable with a terminal block is used



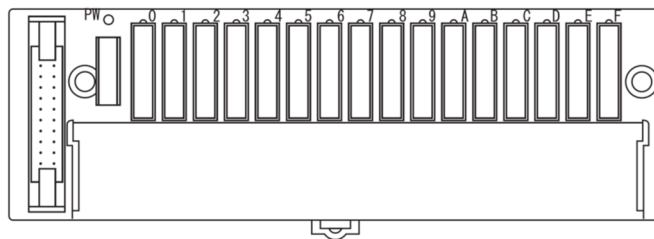
7-1-2. When a discrete cable is used

Wire the cable securely to the terminal block of the programmable controller module.

Cable
FA-CBL**M20
FA-CBL**YM20

Insert the connector
fully to fix it securely.

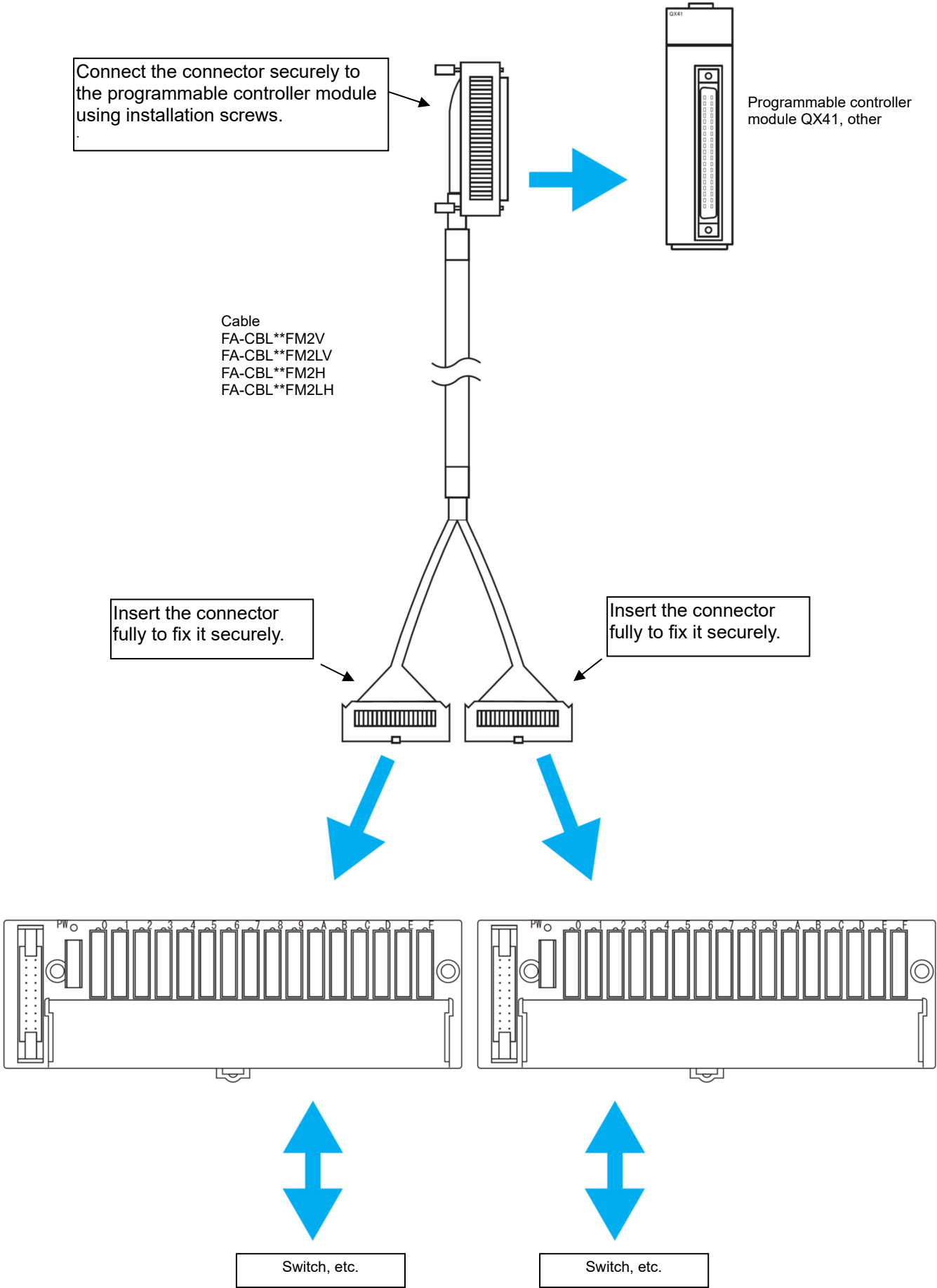
Programmable controller
module QX40, other



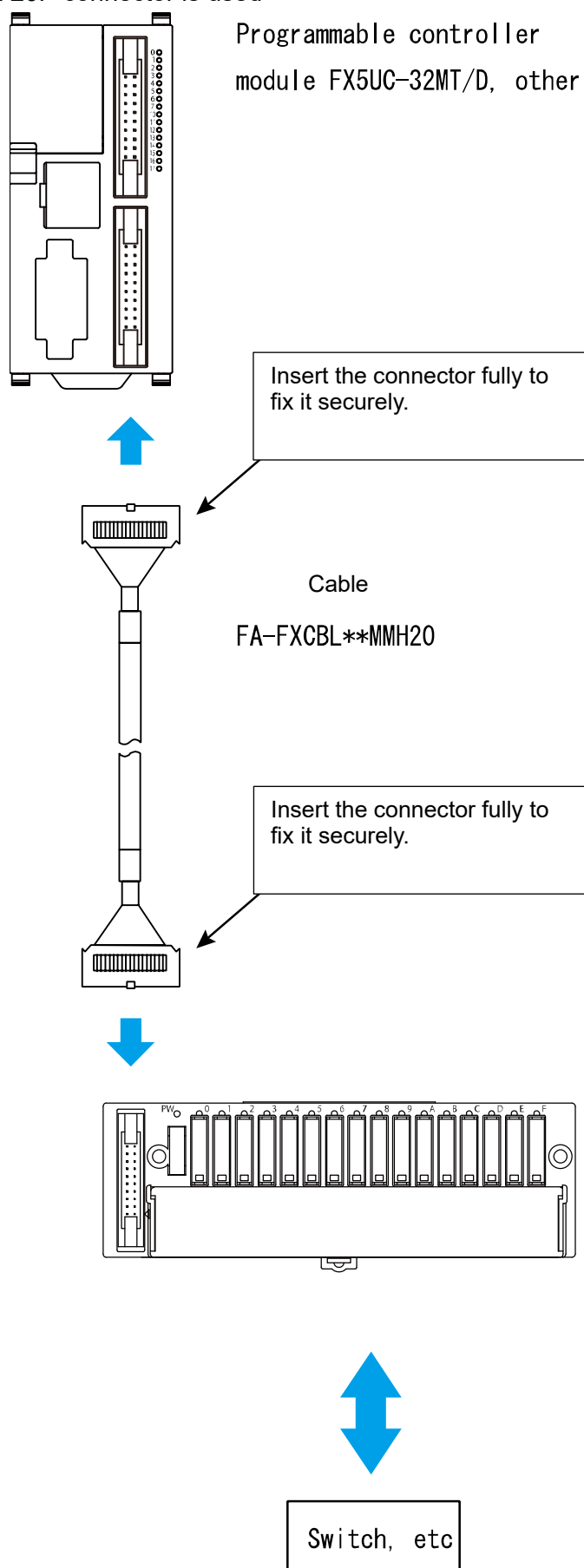
Switch, etc.

7-2. Connection example with a connector module of a programmable controller

7-2-1. When a cable with a 40P connector is used



7-2-2. When a cable with a 20P connector is used



7-3. Using a dedicated interface module cable

Refer to the User's Manual of the CC-Link interface module for the digital signal converter.

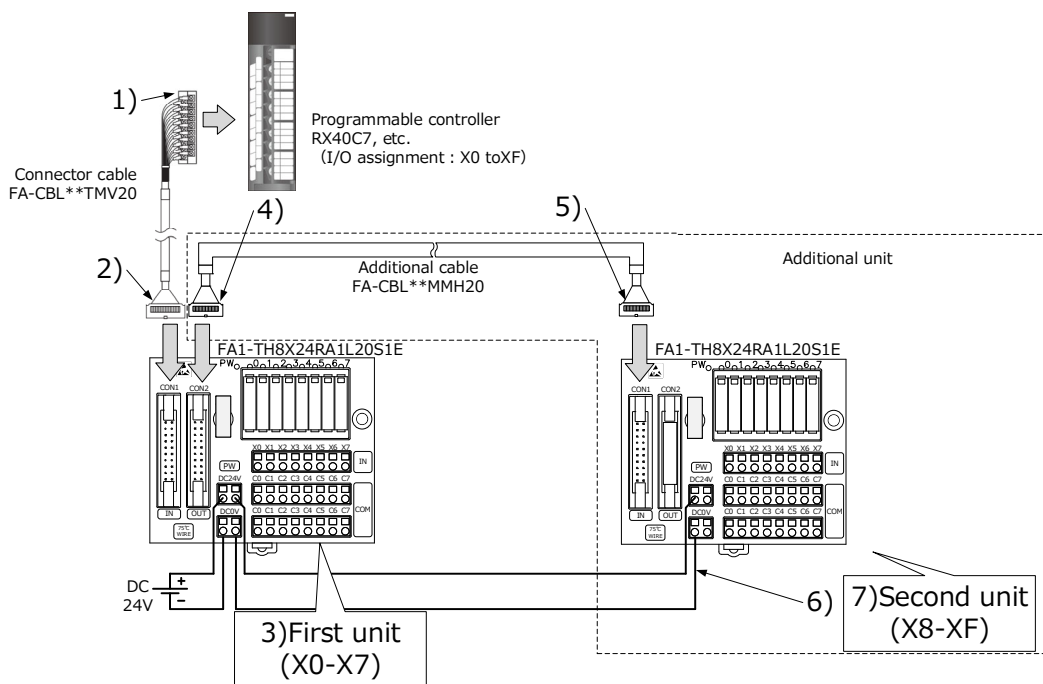
7-4. Distributed arrangement connection example

Wire the programmable controller and digital signal converter as shown below.

7-4-1. Using cables that have terminal blocks

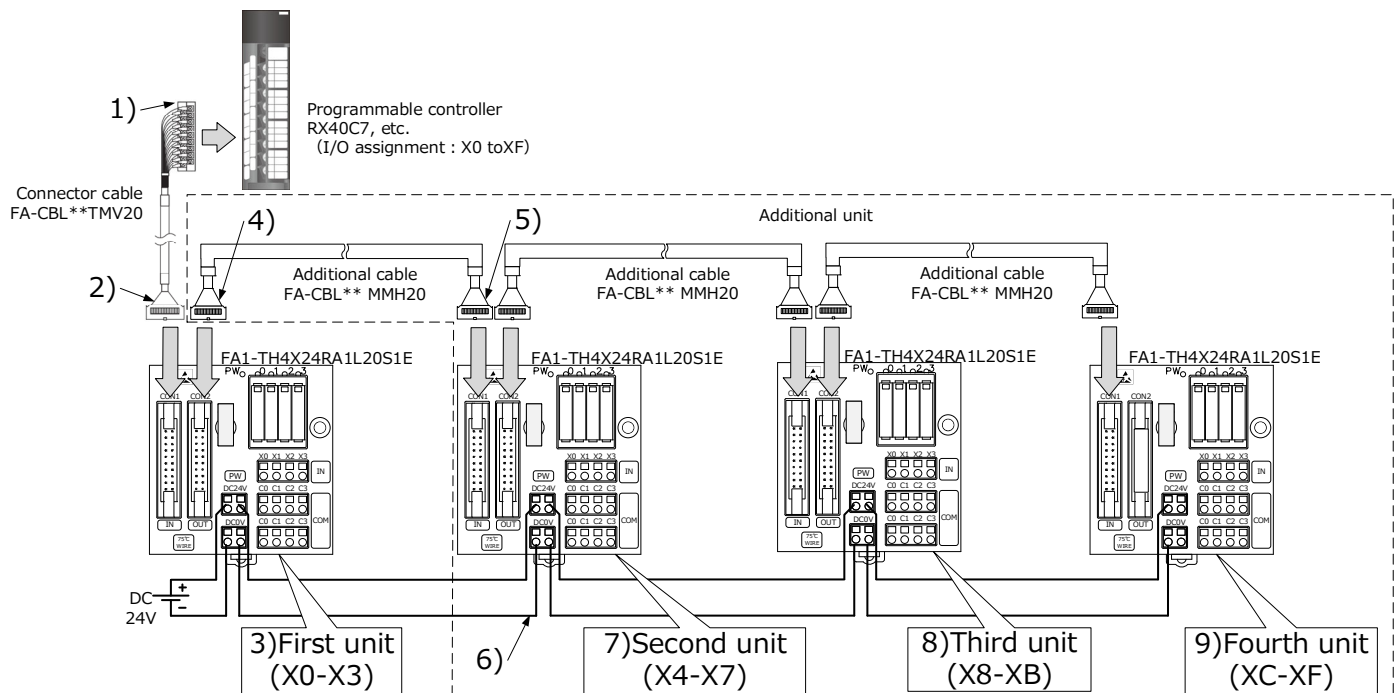
(Example 1) Connecting two FA1-TH8X24RA1L20S1E units

- 1) Insert the terminal block firmly into the port on the programmable controller and tighten the screws.
- 2) Insert the connector firmly into the IN cable port as far as it will go.
- 3) The first FA1-TH8X24RA1L20S1E will be assigned to X0 to X7.
- 4) Insert the connector firmly into the OUT cable port on the first unit as far as it will go.
- 5) Insert the connector firmly into the IN cable port on the second unit as far as it will go.
- 6) Supply power to the second unit from the first unit by wiring them in series to an external power supply.
- 7) The second FA1-TH8X24RA1L20S1E will be assigned to X8 to XF.



(Example 2) Connecting four FA1-TH4X24RA1L20S1E units

- 1) Insert the terminal block firmly into the port on the programmable controller and tighten the screws.
- 2) Insert the connector firmly into the IN cable port as far as it will go.
- 3) The first FA1-TH4X24RA1L20S1E will be assigned to X0 to X3.
- 4) Insert each connector firmly into the OUT cable port on all of the relevant units as far as it will go.
- 5) From the second unit onward, insert each connector firmly into the IN cable port on all the units as far as it will go.
- 6) Supply power to the second unit onward from the first unit by wiring them in series to an external power supply.
- 7) The second FA1-TH4X24RA1L20S1E will be assigned to X4 to X7.
- 8) The third FA1-TH4X24RA1L20S1E will be assigned to X8 to XB.
- 9) The fourth FA1-TH4X24RA1L20S1E will be assigned to XC to XF.



7-4-2. Using a 40P connector cable

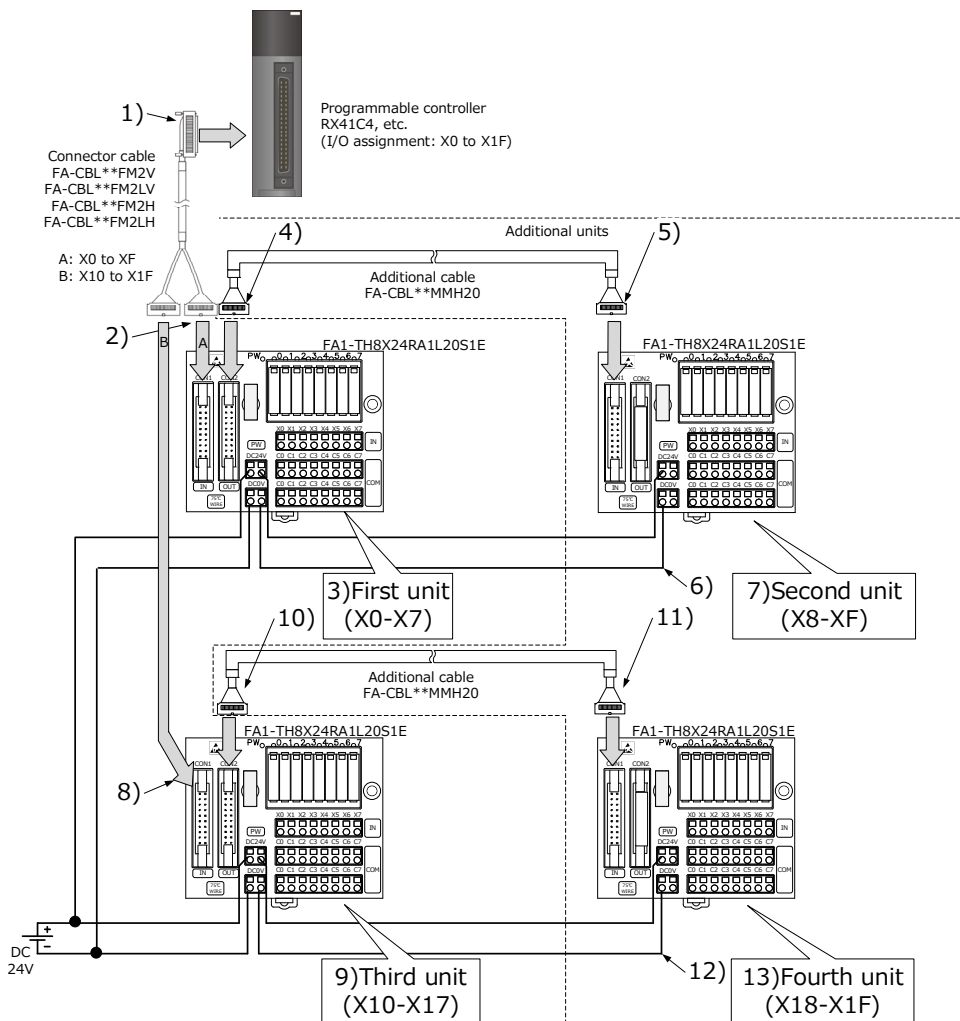
(Example 3) Connecting four FA1-TH8X24RA1L20S1E units

Assigning X0 to XF

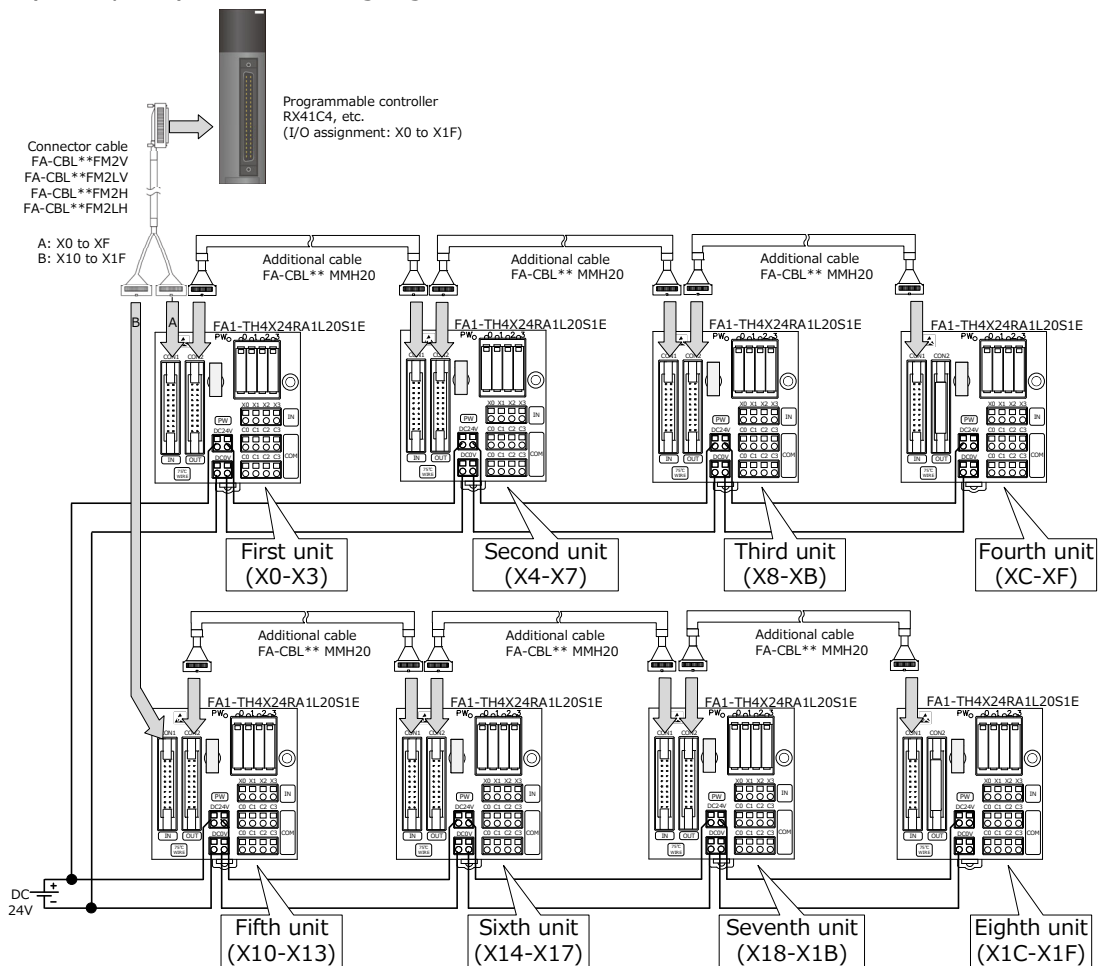
- 1) Insert the terminal block firmly into the port on the programmable controller and tighten the screws.
- 2) Insert the A-side connector firmly into the IN cable port on the first unit as far as it will go.
- 3) The first FA1-TH8X24RA1L20S1E will be assigned to X0 to X7.
- 4) Insert the connector firmly into the OUT cable port on the first unit as far as it will go.
- 5) Insert the connector firmly into the IN cable port on the second unit as far as it will go.
- 6) Supply power to the second unit from the first unit by wiring them in series to an external power supply.
- 7) The second FA1-TH8X24RA1L20S1E will be assigned to X8 to XF.

Assigning X10 to X1F

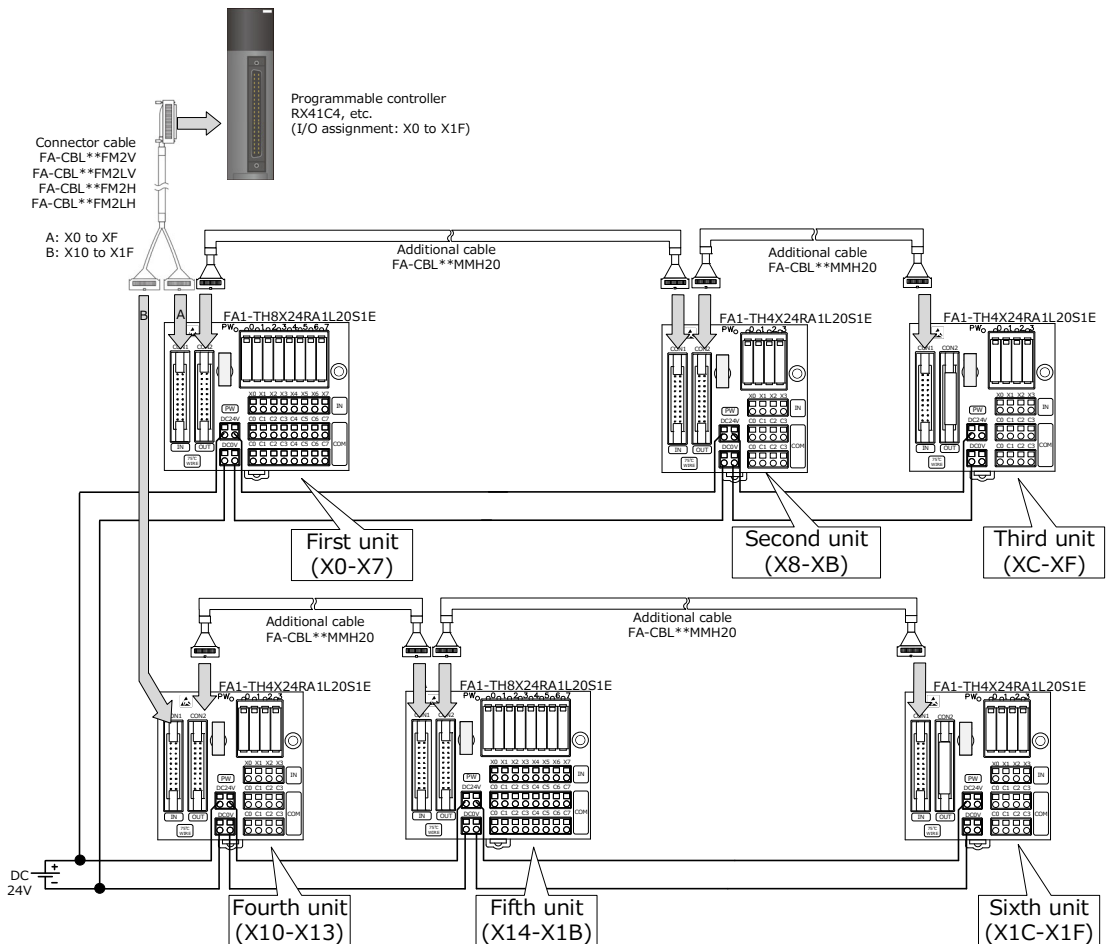
- 8) Insert the B-side connector firmly into the IN cable port on the third unit as far as it will go.
- 9) The third FA1-TH8X24RA1L20S1E will be assigned to X10 to X17.
- 10) Insert the connector firmly into the OUT cable port on the third unit as far as it will go.
- 11) Insert the connector firmly into the IN cable port on the fourth unit as far as it will go.
- 12) Supply power to the fourth unit from the third unit by wiring them in series to an external power supply.
- 13) The fourth FA1-TH8X24RA1L20S1E will be assigned to X18 to X1F.



(Example 4) Connecting eight FA1-TH4X24RA1L20S1E units



(Example 5) Connecting the FA1-TH8X24RA1L20S1E and FA1-TH4X24RA1L20S1E

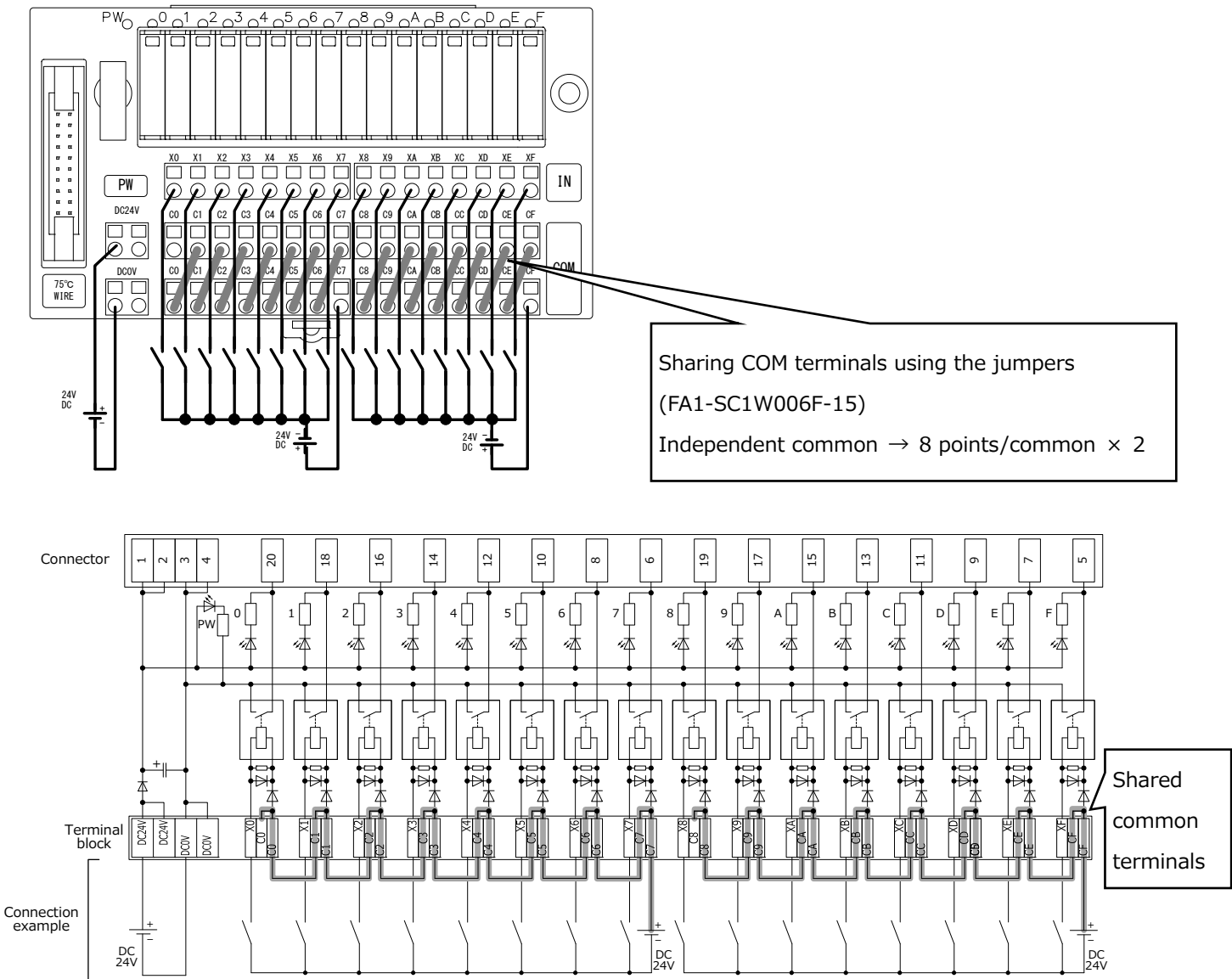


7-5. Sharing common terminals (FA1-TH16/8/4X24RA1L/H20S1E)

The unit has two sets of common terminals.

Shorting common terminals allows for common terminals to be shared.

External connection example (FA1-TH16X24RA1L20S1E): Sharing common terminals with X0-X7 and X8-XF

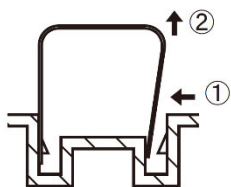


7-6. How to use the extraction tool

(FA-TH16XRA20S, FA1-TH16X24RA1L20S1E/H20S1E, FA1-TH8X24RA1L20S1E/H20S1E, FA1-TH4X24RA1L20S1E/H20S1E)

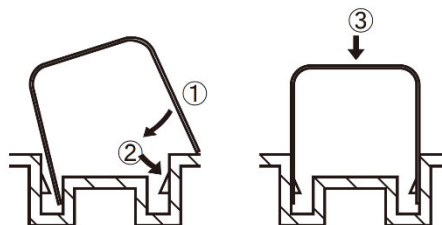
■ How to remove the extraction tool from the case

Remove the tool from the case using your fingers as shown below.



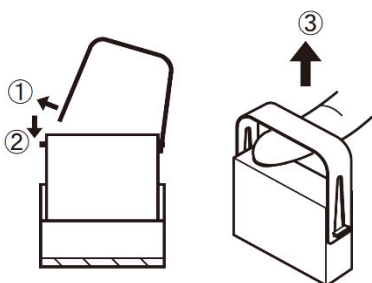
■ How to install the extraction tool to the case

Install the tool to the case using your fingers as shown below.



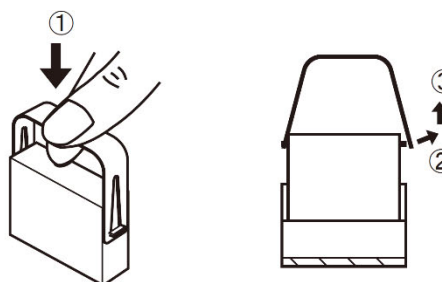
■ How to remove the relay from the socket

Insert the tool into the relay and pull out using your fingers as shown below.



■ How to insert the relay into the socket

Insert the tool into the relay, and then insert the relay into the socket.
After insertion, remove the tool from the relay.



7-7. Wiring

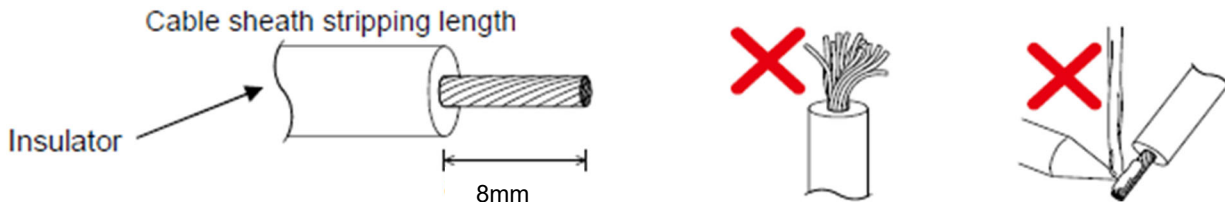
(FA1-TH16X24RA1L20S1E/H20S1E,FA1-TH8X24RA1L20S1E/H20S1E,FA1-TH4X24RA1L20S1E/H20S1E)

Wire the spring clamp terminal block according to the information below.

(1) Wires routing

(a) Fabrication on cable insulator

Strip the wire as follows. If the length of the sheath peeled is too long, a short circuit may occur with neighboring wires. If the length is too short, wires might come off. Wire the stripped cable after twisting it to prevent it from becoming loose. In addition, do not solder it.



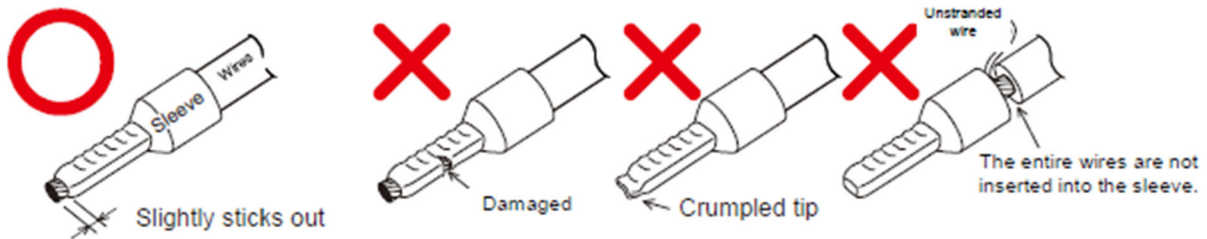
(b) Using a ferrule terminal

Insert wires to a ferrule terminal and crimp it.

Make sure that core wire slightly comes out of the ferrule.

Check the condition of the ferrule terminal after crimping. Do not use a ferrule terminal of which the crimping is inappropriate, or the face is damaged.

* Ferrule terminals crimped onto one wire are applicable to the terminal block of this product.



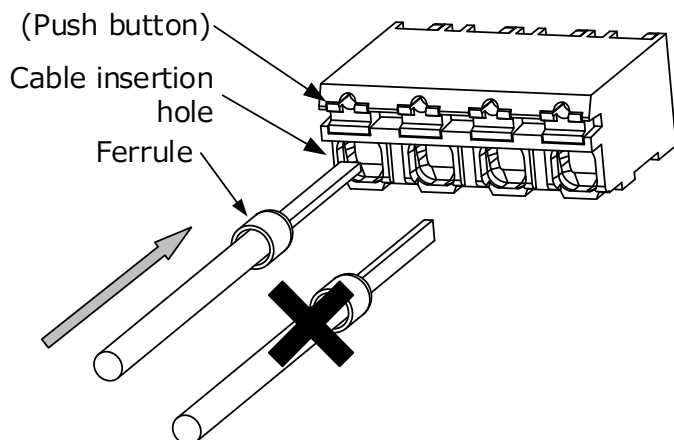
(c) Inserting wires

The wire with ferrule or solid cable can be inserted into the wire insertion hole. After inserting, pull the wire lightly to confirm that the wire is surely connected.

For the correct terminal insertion direction, refer to the figure below.

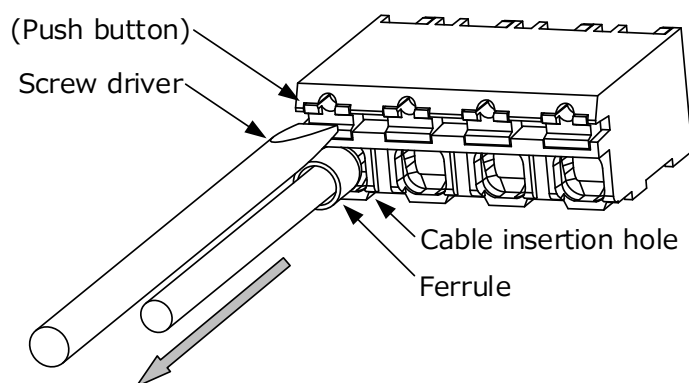
When binding twisted wires, press the push button using the screw driver, then insert the twisted wires into the wire insertion hole.

* Make sure to insert the wire straight as far as it will go.



(2) Wires removal

Press the push button all the way using the screw driver, then pull out the wire.

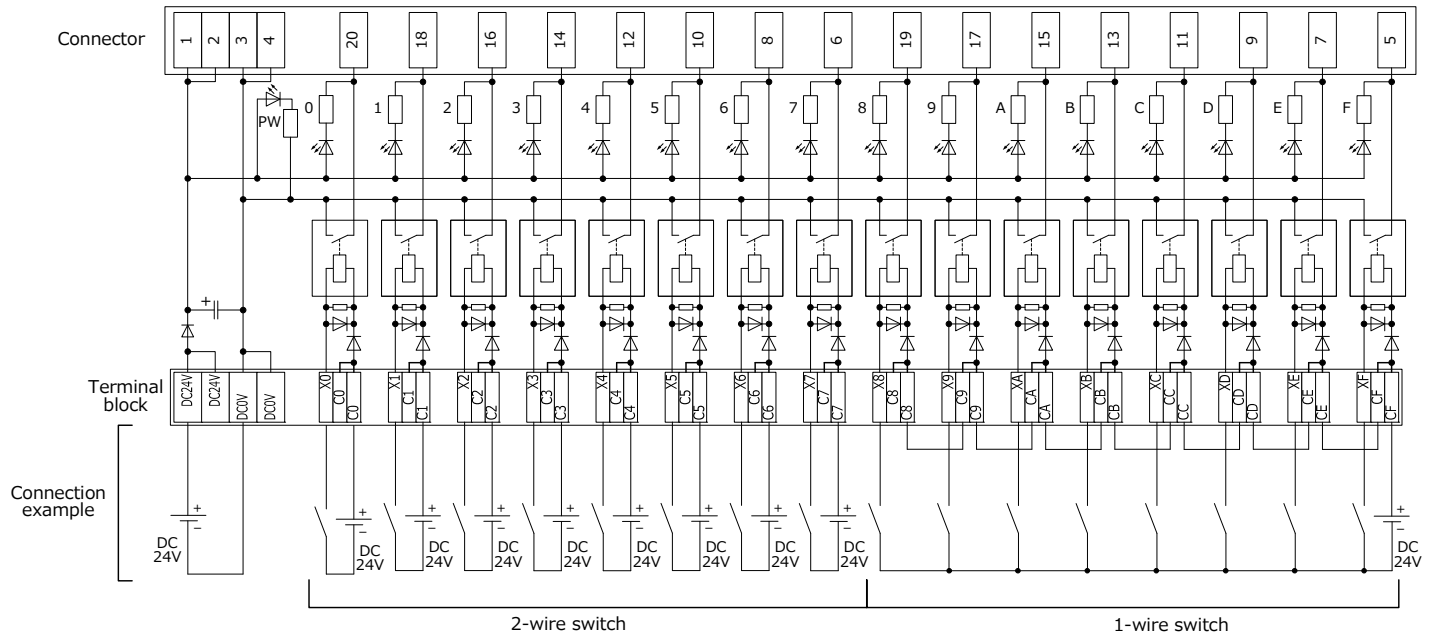


Use the screw driver shown in the table below.

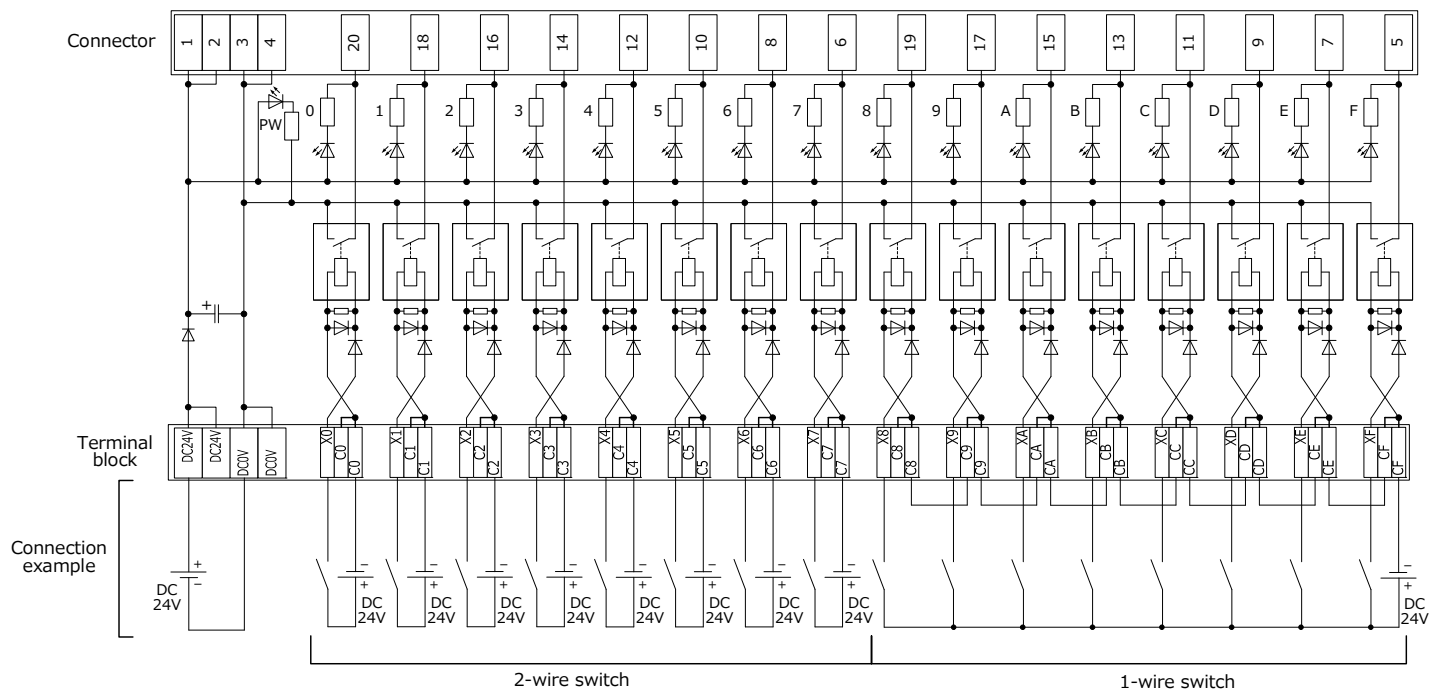
| Recommended tool (screw driver) | | |
|---------------------------------|-----------------|-----------------|
| Manufacturer | Model | Blade edge size |
| PHOENIX CONTACT | SZS 0,4×2,5 VDE | 2.5x0.4mm |

8. EXTERNAL CONNECTION EXAMPLE

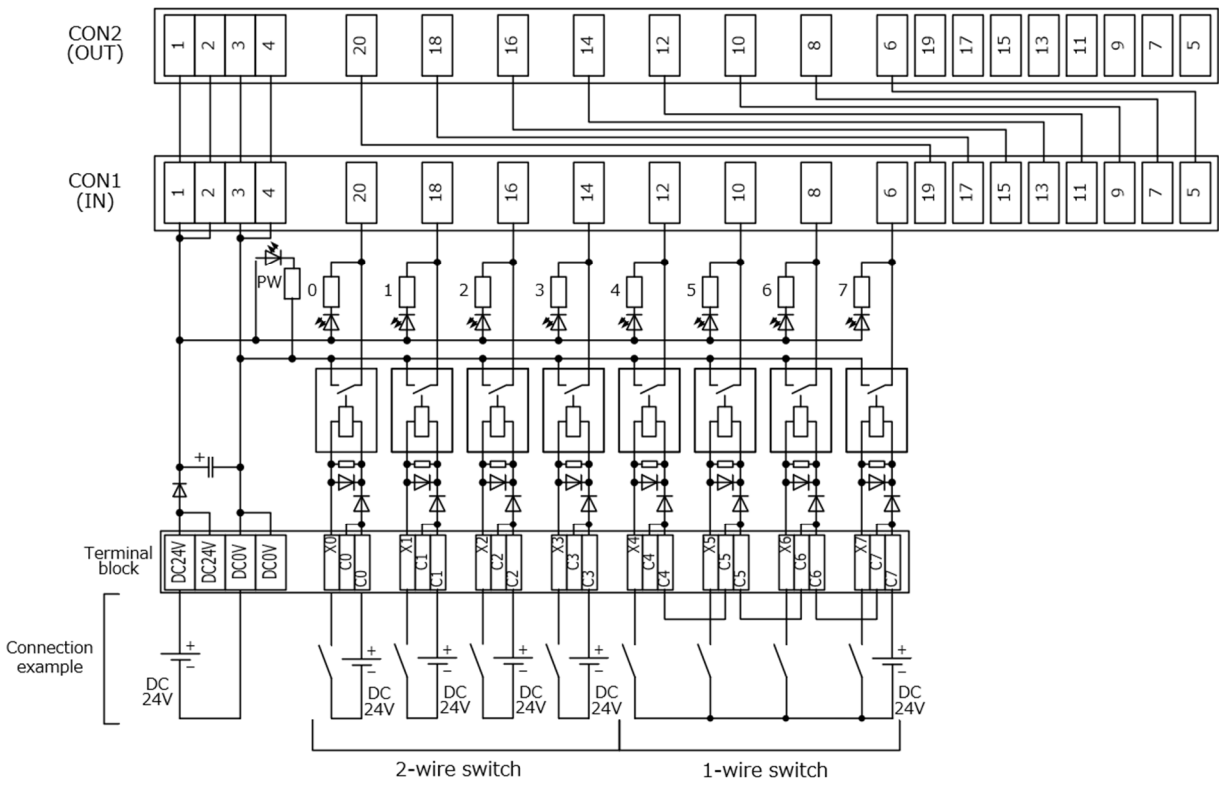
8-1. FA1-TH16X24RA1L20S1E



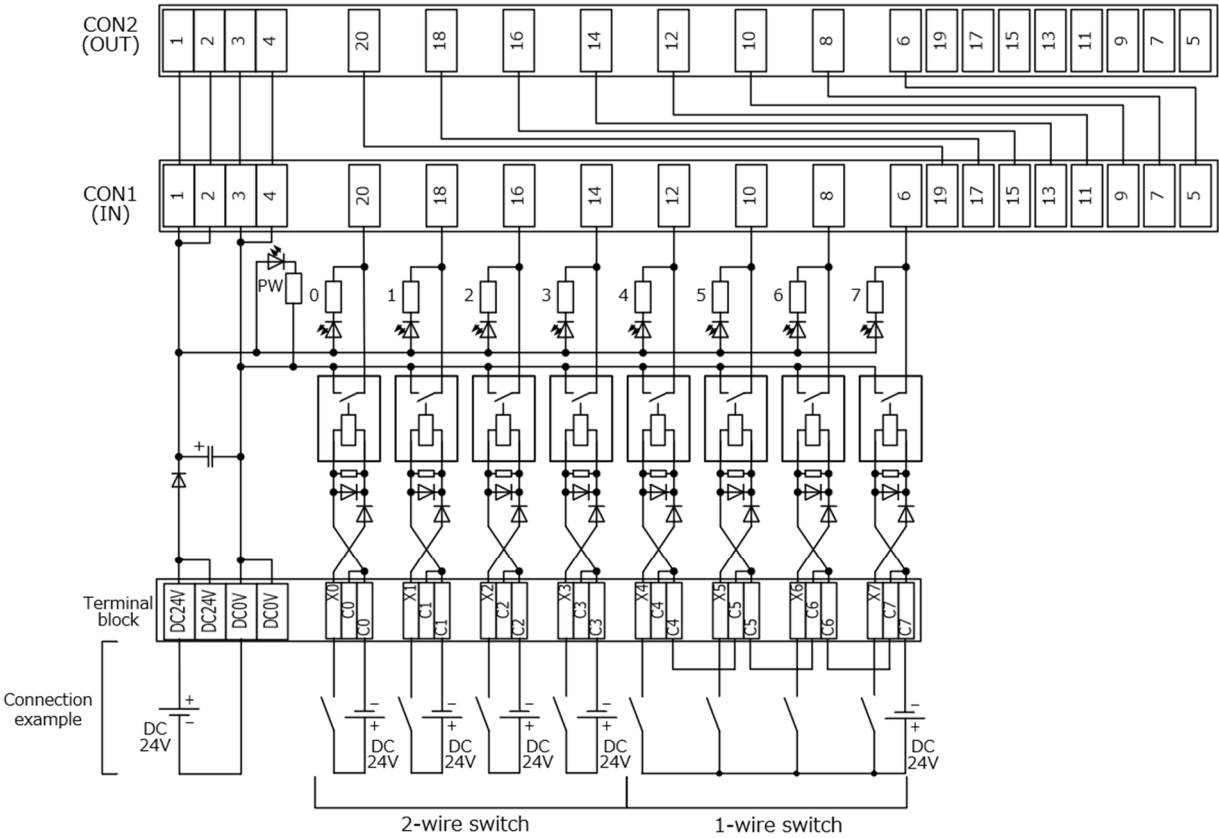
8-2. FA1-TH16X24RA1H20S1E



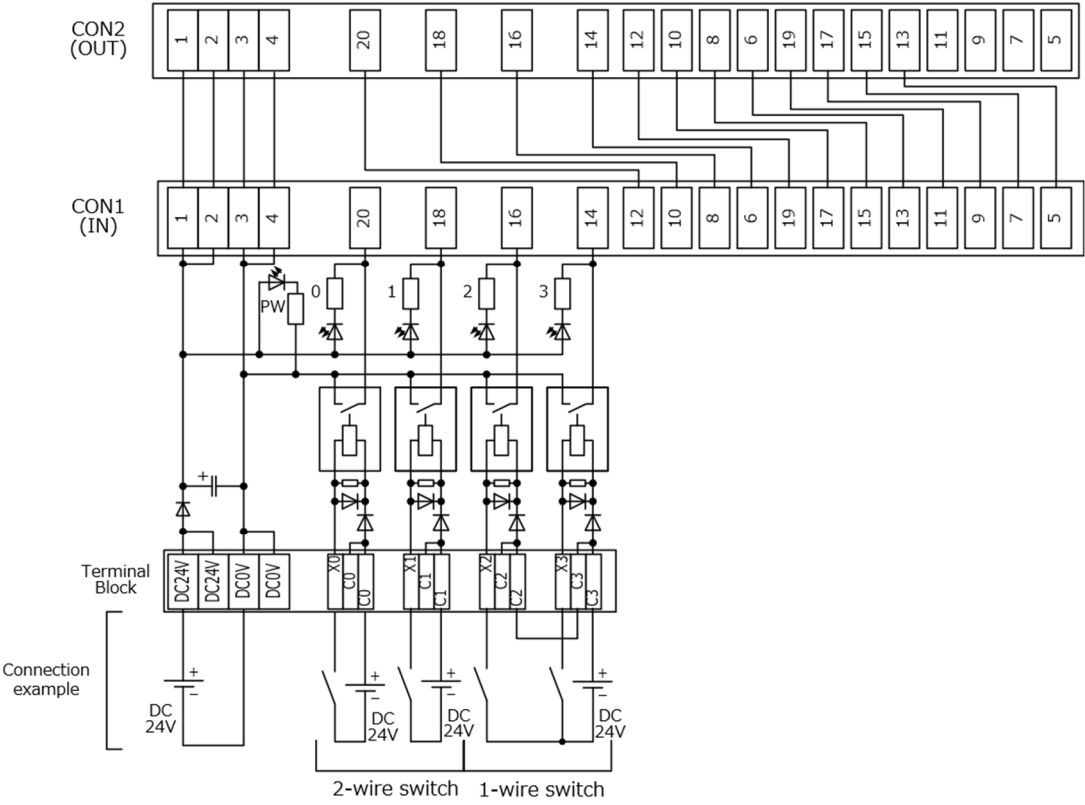
8-3. FA1-TH8X24RA1L20S1E



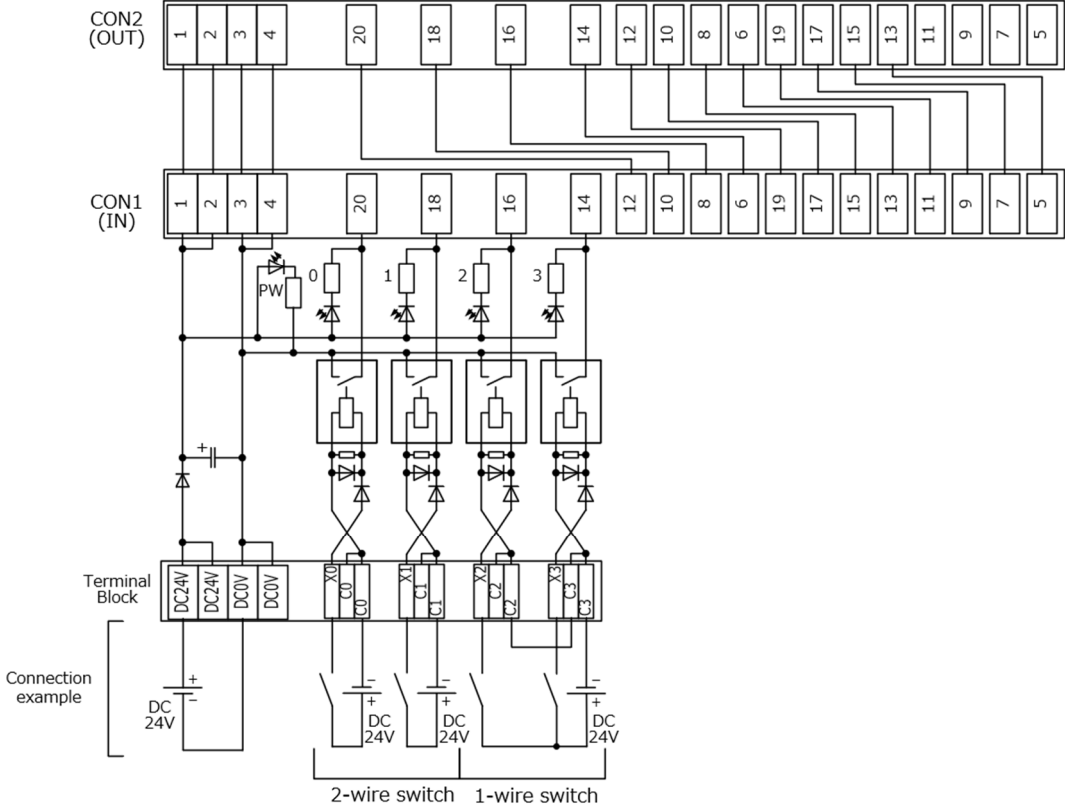
8-4. FA1-TH8X24RA1H20S1E



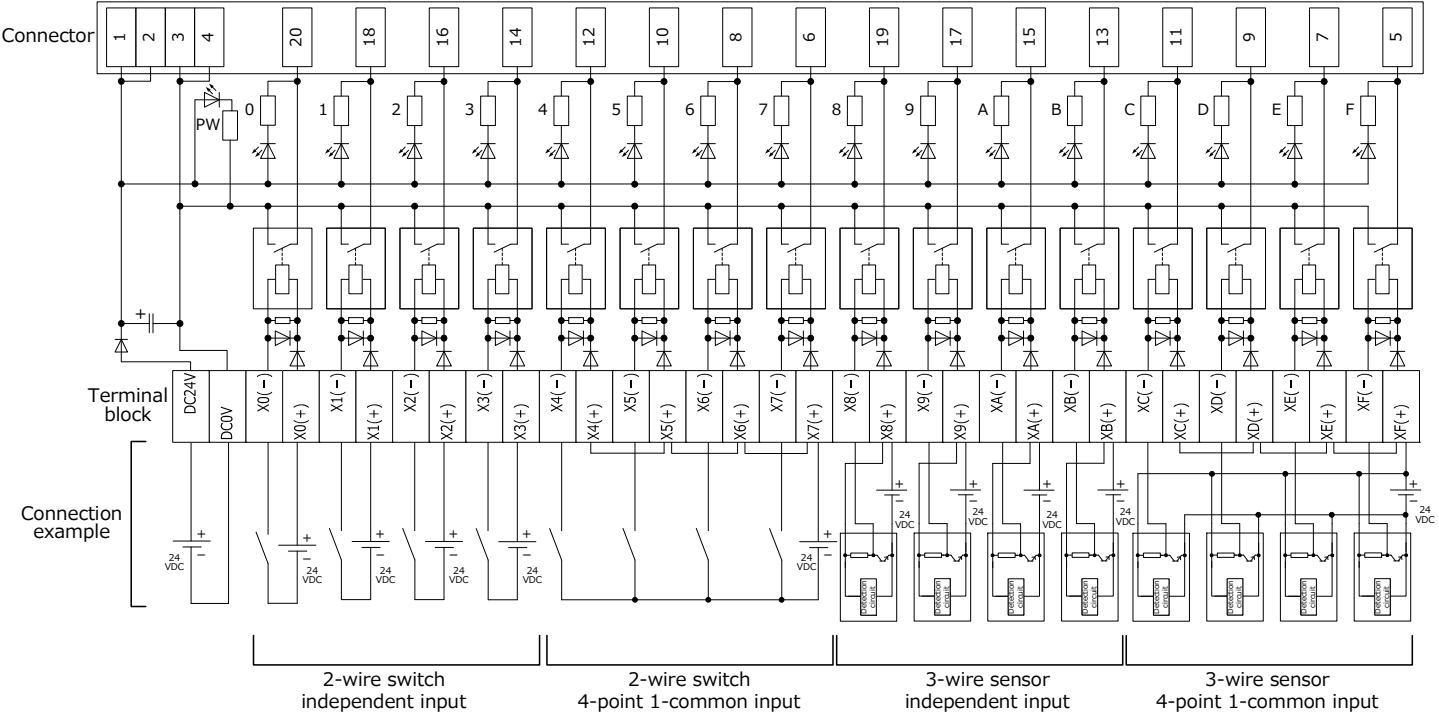
8-5. FA1-TH4X24RA1L20S1E



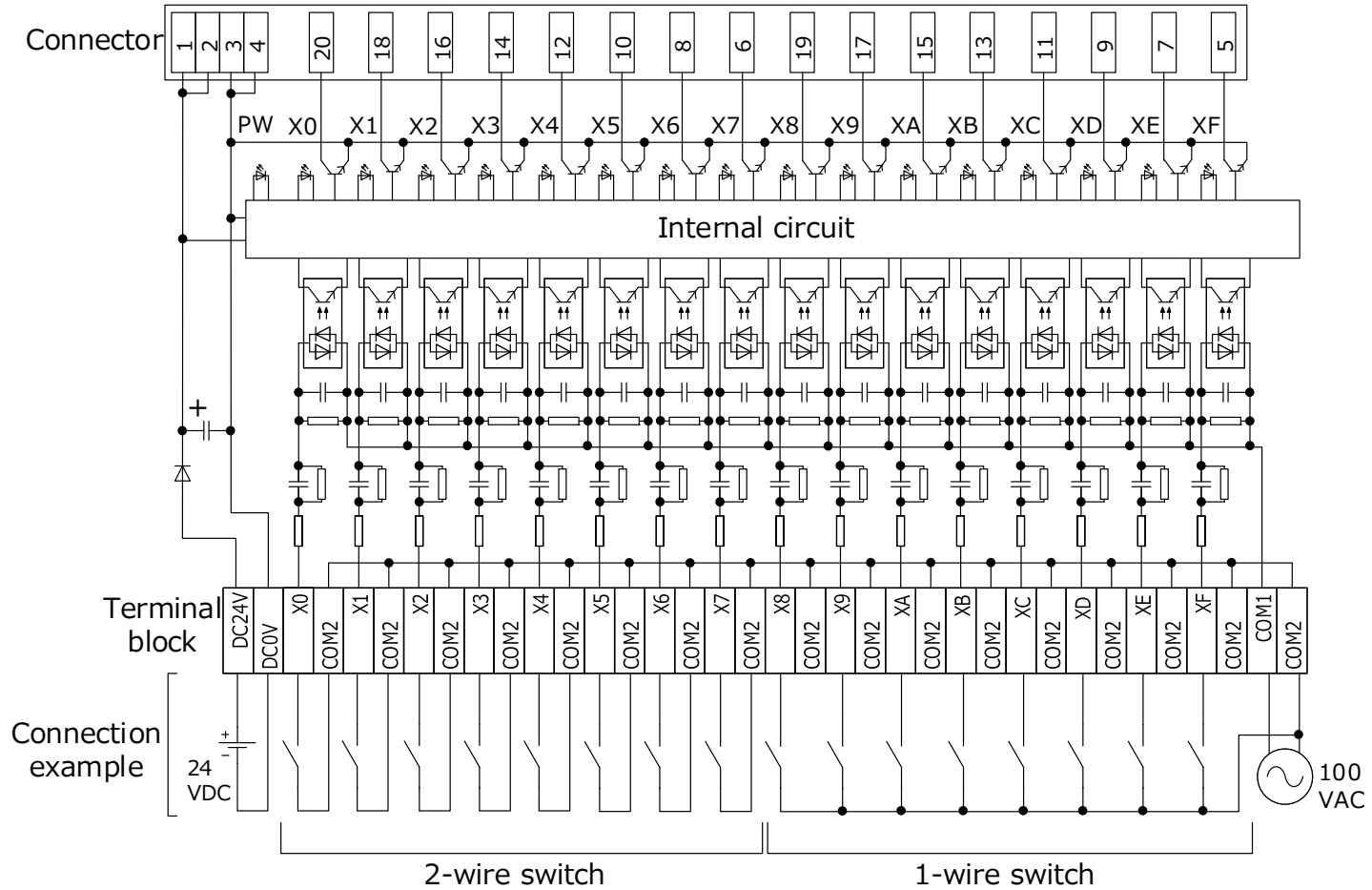
8-6. FA1-TH4X24RA1H20S1E



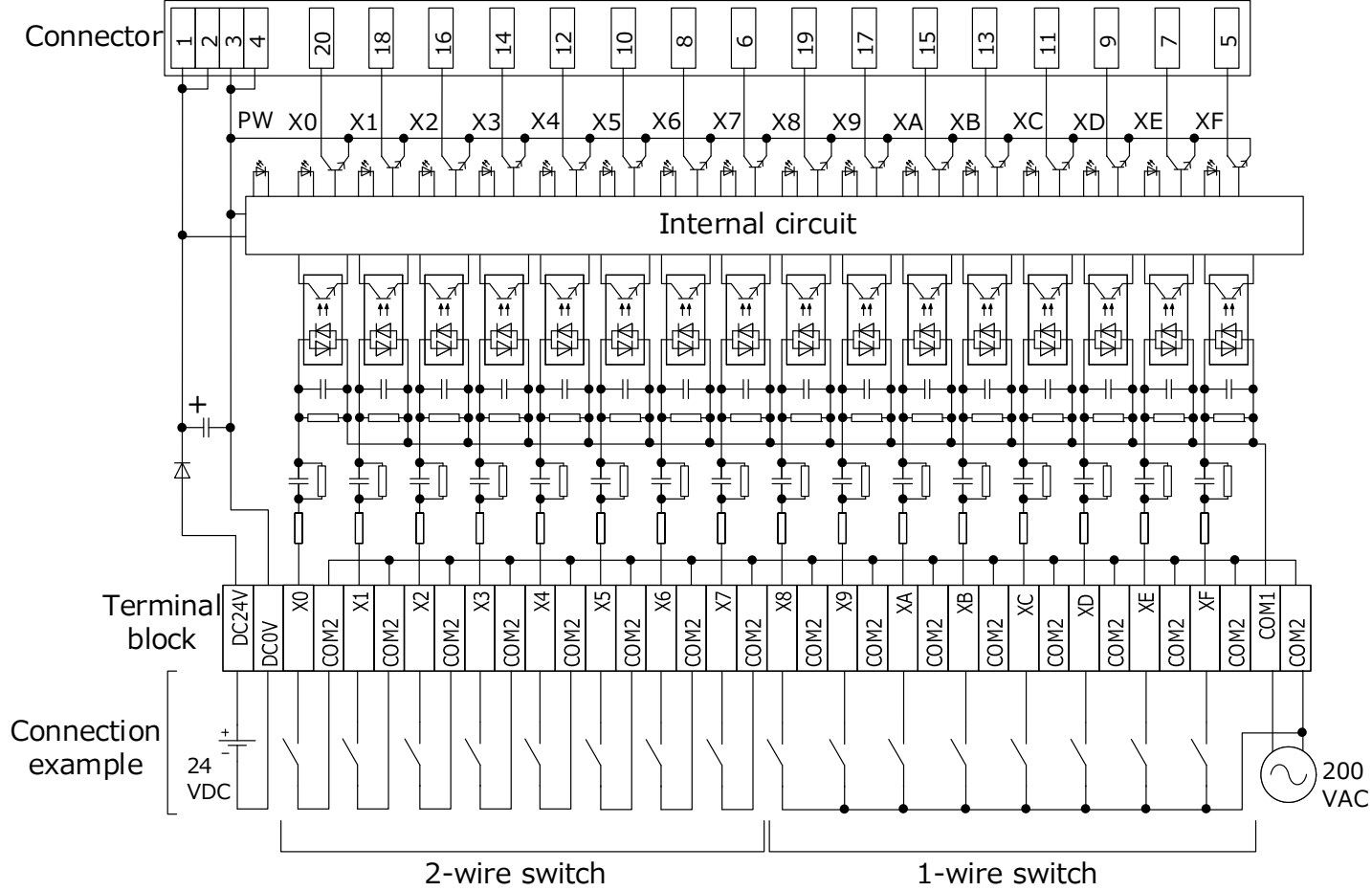
8-7. FA-TH16XRA20S



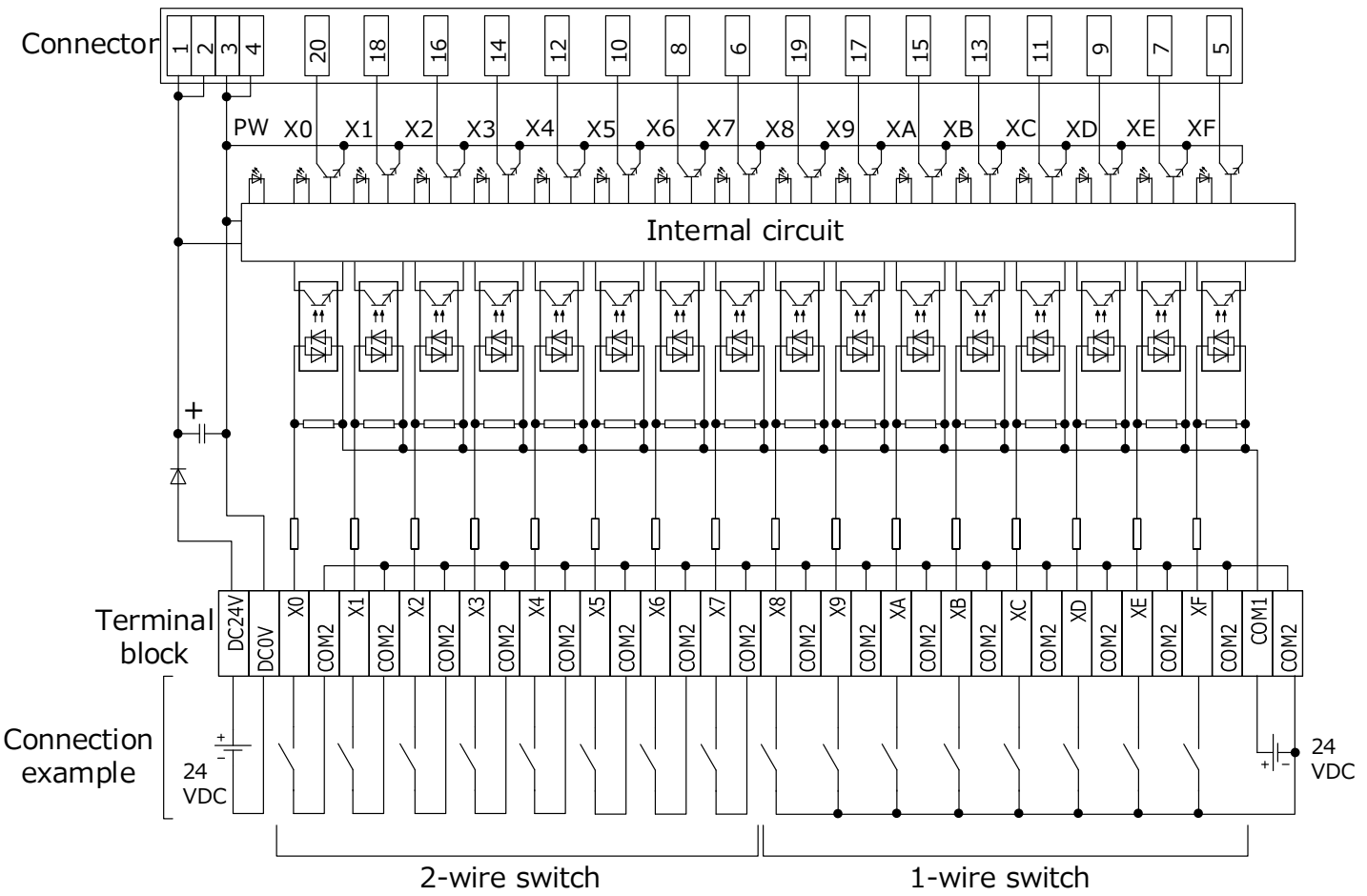
8-8. FA-TH16X100A31, FA-TH16X100A31L



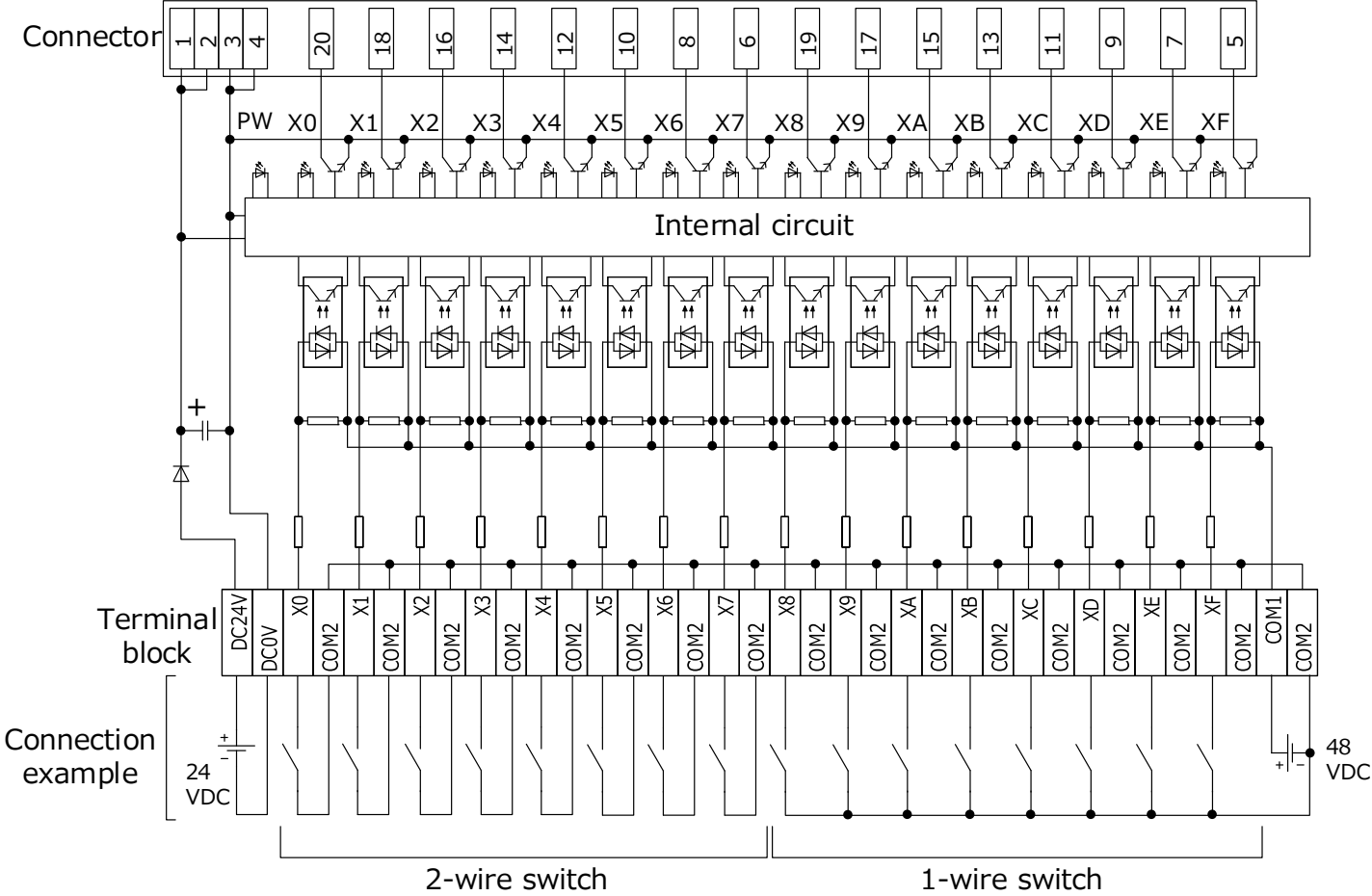
8-9. FA-TH16X200A31, FA-TH16X200A31L



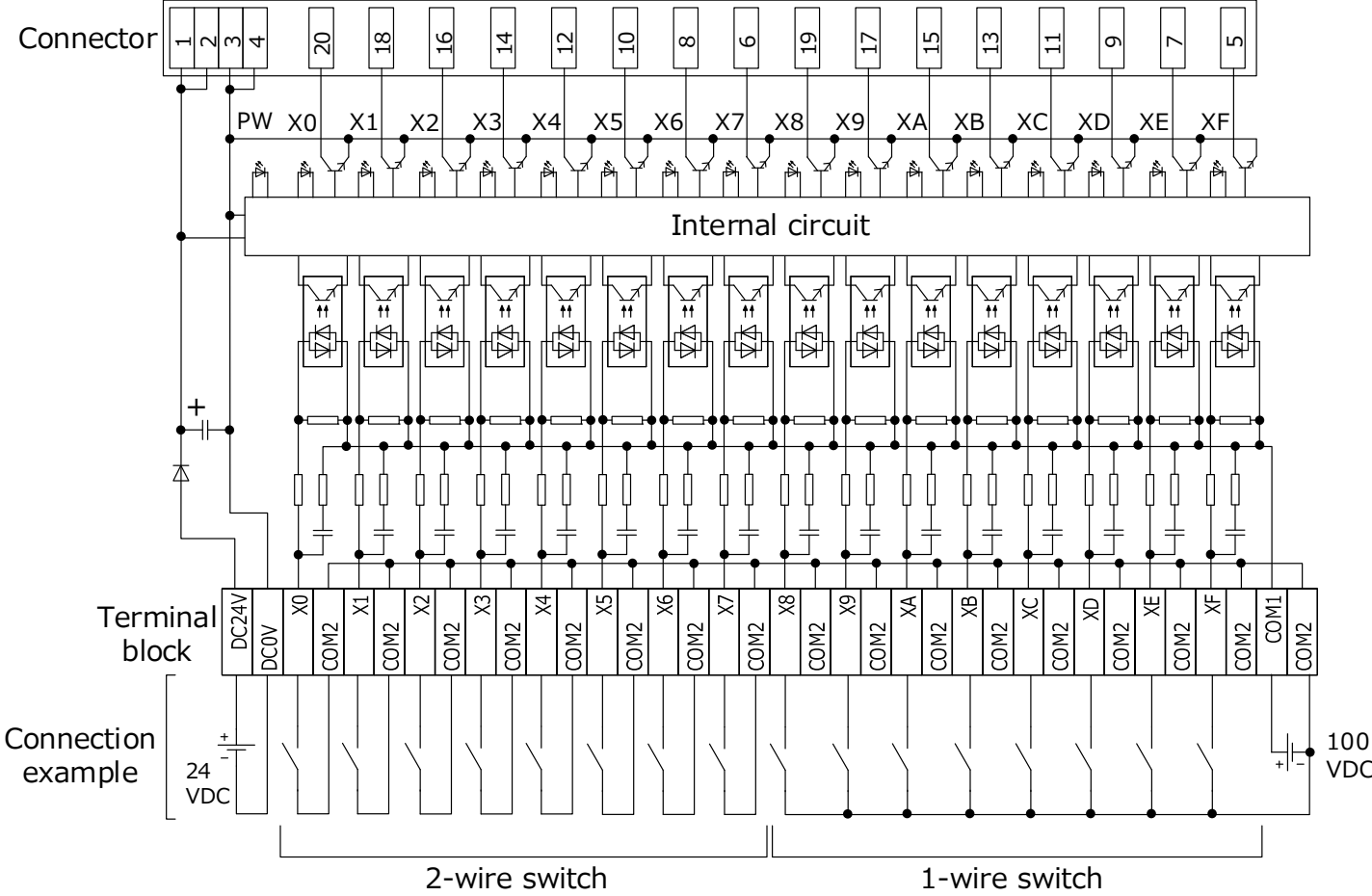
8-10. FA-TH16X24D31, FA-TH16X24D31L



8-11. FA-TH16X48D31L



8-12. FA-TH16X100D31L



9. APPLICABLE SOLDERLESS TERMINALS

9-1. FA1-TH16X24RA1L20S1E/H20S1E, FA1-TH8X24RA1L20S1E/H20S1E, FA1-TH4X24RA1L20S1E/H20S1E

| Type | | Applicable ferrule ^{*1} | Crimp tool |
|-----------------|---|----------------------------------|---------------------|
| Manufacturer | Applicable wire size | | |
| PHOENIX CONTACT | 0.25/24 | AI 0.25-8 YE | CRIMPFOX 6 |
| | 0.3, 0.34/22 | AI 0.34-8 TQ | |
| | 0.5/20 | AI 0.5-8 WH | |
| | 0.75/18 | AI 0.75-8 GY | |
| WAGO | 0.08 to 0.34 mm ² /AWG28 to 22 | 216-302 | 206-220 |
| | 0.34 mm ² /AWG24 and 22 | 216-302 | 206-1204 206-204 |
| | 0.5 mm ² /AWG22 and 20 | 216-201 | |
| | 0.75 mm ² /AWG20 and 18 | 216-202 | |

*1: UL certification is obtained by solid/stranded wires.

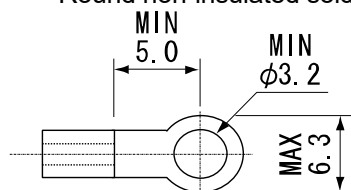
9-2. FA-TH16XRA20S, FA-TH16X100A31, FA-TH16X200A31, FA-TH16X24D31

| Type | | Round | | Y-shaped | |
|---|----------------------------|-----------------------------------|--|--|--|
| Manufacture | Applicable wire size | Non-insulated solderless terminal | Insulated solderless terminal | Non-insulated solderless terminal | Insulated solderless terminal |
| Nichifu Co., Ltd. NTM | 0.3 to 1.25mm ² | R1.25-3N R1.25-3.5N | TG _N ^V 1.25-3N TG _N ^V 1.25-3.5N | 1.25Y-3 1.25Y-3N 1.25Y-3L 1.25Y-3.5 | TG _N ^V 1.25Y-3 TG _N ^V 1.25Y-3N TG _N ^V 1.25Y-3L TG _N ^V 1.25Y-3.5 |
| | 1.25 to 2.0mm ² | R2-3N | TG _N ^V 2-3N | 2Y-3 2Y-3.5S | TG _N ^V 2Y-3 TG _N ^V 2Y-3.5S |
| Japan Solderless Terminal Mfg. Co., Ltd. JST | 0.3 to 1.25mm ² | 1.25-MS3 | V1.25-MS3 | 1.25-B3A 1.25-C3A 1.25-N3A 1.25-C3.5A | V1.25-B3A V1.25-N3A |
| | 1.25 to 2.0mm ² | 2-MS3 | V2-MS3 | 2-N3A 2-M3A | V2-N3A |
| Nippon Tanshi Co., Ltd. NTK | 0.3 to 1.25mm ² | R1.25-3ML R1.25-3.5SL | RAV1.25-3ML RAP1.25-3ML | VD1.25-3L VD1.25-3.5SS VD1.25-3.5S | VDAV1.25-3L VDAV1.25-3.5SS VDAV1.25-3.5S |
| | 1.25 to 2.0mm ² | R2-3SL | RAV2-3SL RAP2-3SL | VD2-3S VD2-3.5SS VD2-3.5S | VDAV2-3.5SS VDAV2-3.5S |

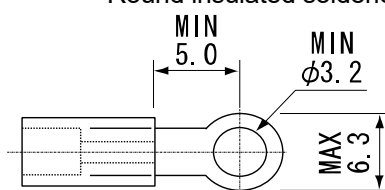
• Solderless terminal dimensions

[Unit:mm]

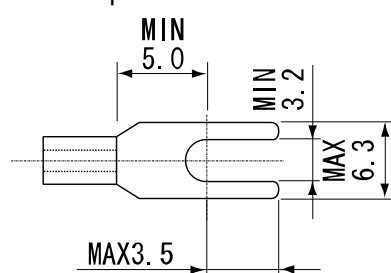
Round non-insulated solderless terminal



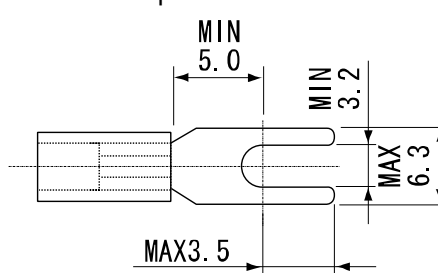
Round insulated solderless terminal



Y-shaped non-insulated solderless terminal

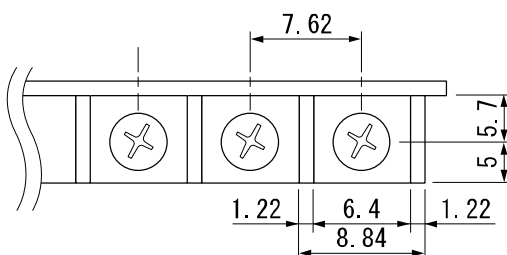


Y-shaped insulated solderless terminal



• Terminal block shape

[Unit:mm]

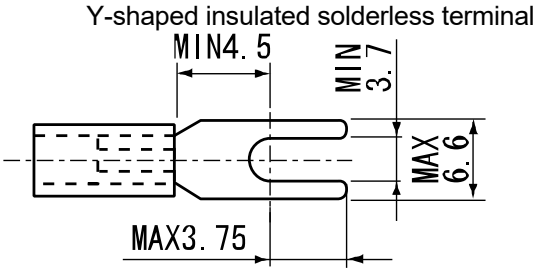
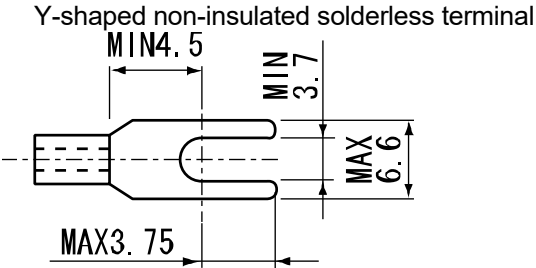
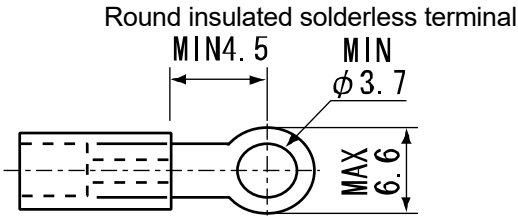
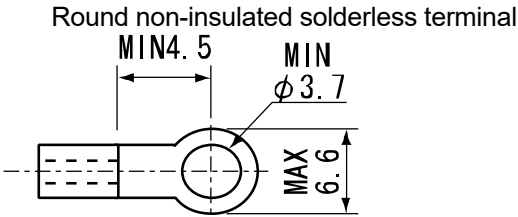


9-3. FA-TH16X100A31L, FA-TH16X200A31L, FA-TH16X24D31L, FA-TH16X48D31L, FA-TH16X100D31L

| Type | | Round | | Y-shaped | |
|---|----------------------------|-----------------------------------|---------------------------------------|-----------------------------------|--|
| Manufacture | Applicable wire size | Non-insulated solderless terminal | Insulated solderless terminal | Non-insulated solderless terminal | Insulated solderless terminal |
| Nichifu Co., Ltd. NTM | 0.3 to 1.25mm ² | R1.25-3.5 | TG _N [√] 1.25-3.5 | 1.25Y-3.5 | TG _N [√] 1.25Y-3.5 |
| | 1.25 to 2.0mm ² | R2-3.5 | TG _N [√] 2-3.5 | 2Y-3.5 | TG _N [√] 2Y-3.5 |
| Japan Solderless Terminal Mfg. Co., Ltd. JST | 0.3 to 1.25mm ² | R1.25-3.5 | V1.25-M3 | 1.25-YS3A | V1.25-YS3A |
| | 1.25 to 2.0mm ² | R2-3.5 | V2-M3 | 2-YS3A | V2-YS3A |
| Nippon Tanshi Co., Ltd. NTK | 0.3 to 1.25mm ² | R1.25-3.5 | RAV1.25-3.5 | VD1.25-3.5S | VDAV1.25-3.5S |
| | 1.25 to 2.0mm ² | R2-3.5 | RAV2-3.5 | VD2-3.5S | VDAV2-3.5S |

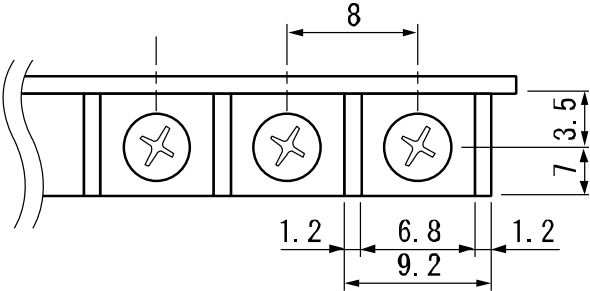
● Solderless terminal dimensions

[Unit:mm]

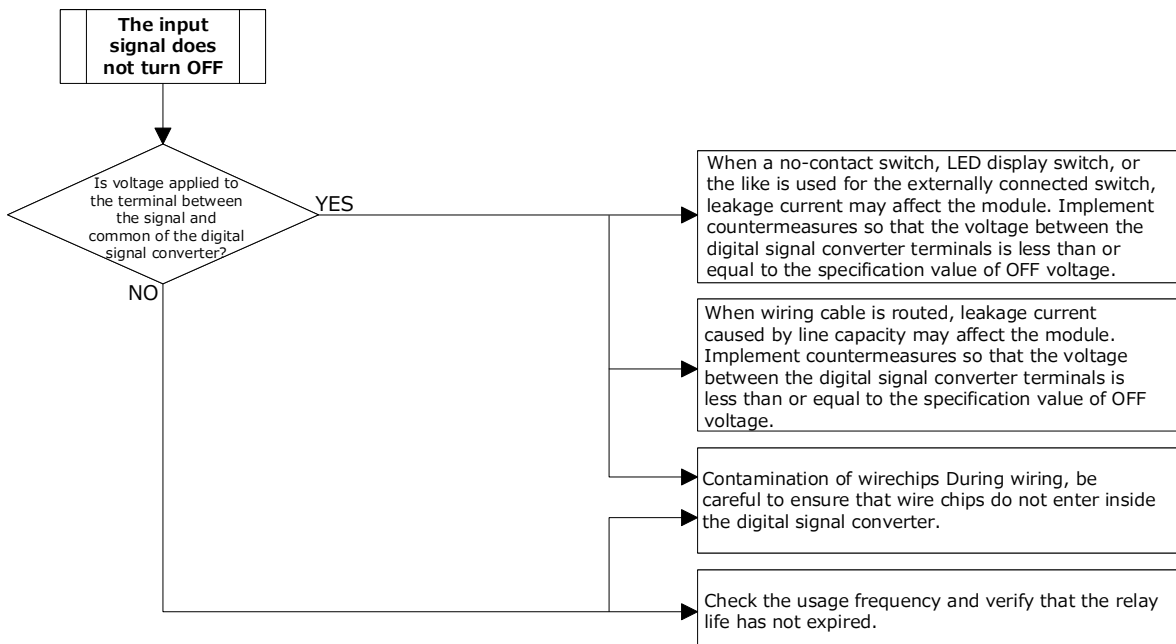
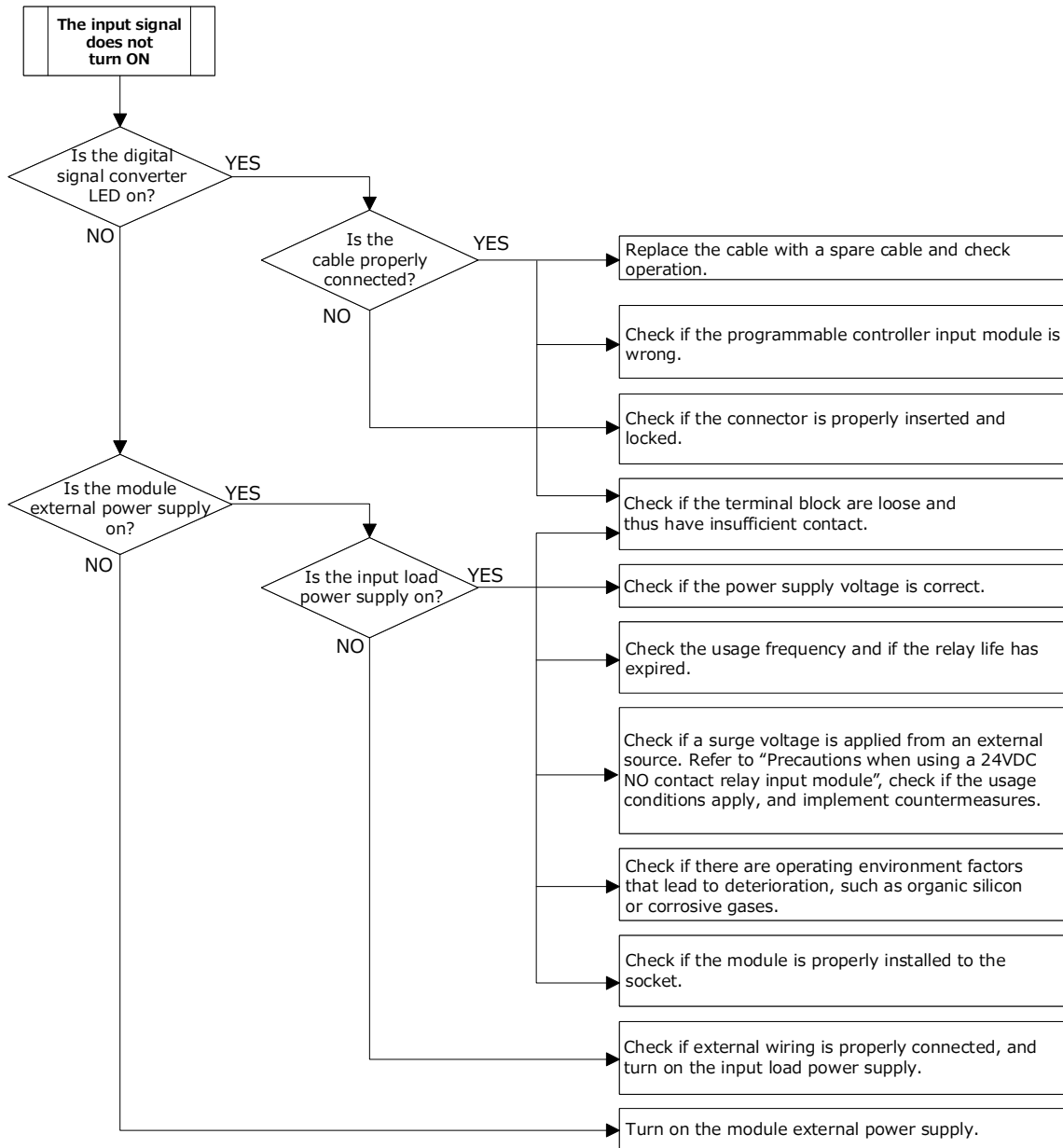


● Terminal block shape

[Unit:mm]



10. TROUBLESHOOTING



[Precautions when using a 24VDC NO contact relay input module]

(1) Relay switching frequency

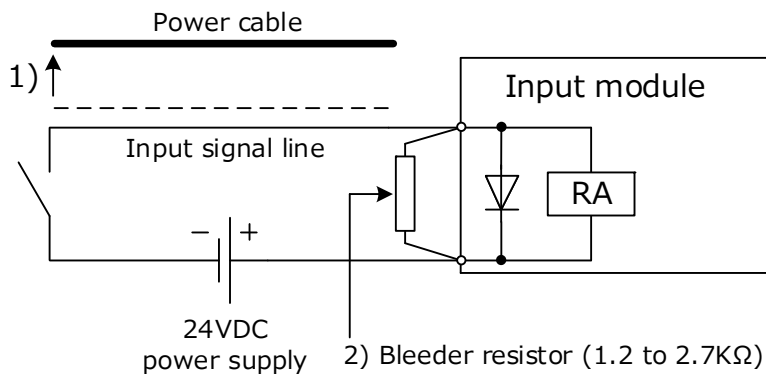
- Use the module with a maximum input signal switching frequency of one-second or longer ON, and one-second or longer OFF.

(2) Input line surge / induced voltage

- Do not install the 24VDC input signal line together with the main circuit lines, power cables, or the like, or wire the 24VDC input signal line close to such wiring.
- As a general rule, keep a distance of 100mm or more between them.
- Failure to do so may cause the input signal to turn ON when set to OFF, or not turn OFF when switched from ON to OFF due to the induced voltage from the main circuit or power cables.
- Such wiring may also cause a high surge voltage to occur during ON ↔ OFF of the main circuit, power cables, etc., thereby damaging the diode inserted in parallel with the module relay.

[Countermeasures]

- 1) Arrange the input signal line far away from the main circuit, power cables, etc. (Do not make the input signal lines, main circuit, power cable, etc., the same cable or install the cables together.)
- 2) Insert a bleeder resistor in parallel with the input signal to lower the input impedance of the input signal.



- 2) Bleeder resistor (1.2 to 2.7K Ω)
- For the bleeder resistor, select a resistance value by starting from the large value and gradually decreasing it to find the value at which malfunction does not occur.

11. PRECAUTIONS

- (1) For wiring to the terminal block, refer to the manual of the programmable controller module to be connected, published by Mitsubishi Electric.

12. GRATIS WARRANTY TERMS AND GRATIS WARRANTY RANGE

If any fault or defect (hereinafter referred to as "Failure") attributable to Mitsubishi Electric Engineering should occur within the gratis warranty period, Mitsubishi Electric Engineering shall replace the product free of charge via the distributor from whom you made your purchase.

- Gratis warranty period

The gratis warranty period of this product shall be one (1) year from the date of purchase or delivery to the designated place.

Note that the gratis warranty period shall be limited to 18 months after manufacturing, which includes six months as the distribution period in the market.

In addition, the gratis warranty period of the product after repair is the same as that of the product before repair.

- Gratis warranty range

- (1) The gratis warranty range shall be limited to normal use based on the usage conditions, methods and environment, etc., defined by the terms and precautions, etc., given in the instruction manual, user's manual, and caution labels on the product.
- (2) In the following cases, a repair fee shall be applied even if within the gratis warranty period.
 - 1) Failure resulting from inappropriate storage or handling, carelessness or negligence by the user, or Failure caused by the user's hardware or software design.
 - 2) Failure caused by unapproved modifications, etc., to the product by the user.
 - 3) Failure that could have been avoided if, when the Mitsubishi Electric Engineering product was assembled into the user's device, safeguards defined by legal regulations applicable to the user's device or functions or structures considered standard by the industry had been provided.
 - 4) Failure recognized as preventable if the consumed products specified in instruction manuals, etc., were normally maintained or replaced.
 - 5) Replacement of consumable parts (relays, etc.).
 - 6) Failure caused by external factors beyond anyone's control such as fires or abnormal voltage, and Failure caused by Force Majeure such as earthquakes, lightning, or wind and water damage.
 - 7) Failure caused by reasons unpredictable by scientific technology standards at the time of shipment from Mitsubishi Electric Engineering.
 - 8) Any other failure not attributable to Mitsubishi Electric Engineering or found by the user to not be attributable to Mitsubishi Electric Engineering.

13. EXCLUSION FROM LIABILITY FOR OPPORTUNITY LOSS AND SECONDARY LOSS

Regardless of the gratis warranty period, Mitsubishi Electric Engineering shall not be liable for compensation for damages arising from causes not attributable to Mitsubishi Electric Engineering, opportunity losses or lost profits incurred by the user due to Failures of Mitsubishi Electric Engineering products, damages or secondary damages arising from special circumstances, whether foreseen or unforeseen by Mitsubishi Electric Engineering, compensation for accidents, compensation for damages to products other than Mitsubishi Electric Engineering products, or compensation for replacement work, readjustment of onsite machinery and equipment, startup test runs or other duties carried out by the user.

14. TRADEMARKS

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In some cases, trademark symbols such as '™' or '®' are not specified in this manual.

FOR SAFE OPERATIONS

- This product has been manufactured as a general-purpose part for general industries, and has not been designed or manufactured to be incorporated in a device or system used in purposes related to human life.
- Before using the product for special purposes such as nuclear power, electric power, aerospace, medicine or passenger movement vehicles, consult with Mitsubishi Electric Engineering.
- This product has been manufactured under strict quality control. However, when installing the product where major accidents or losses could occur if the product fails, install appropriate backup or failsafe functions in the system.

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Specifications subject to change without notice.

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