Fuji Integrated Controllers MICREX-SX Series

Programmable Controller SPF

Achieving Cost Efficiency and High Performance Processing
Achieves high cost performance
Flexibly supports machinery and systems

- High processing performance corresponding to high-speed, high functioning
- Variety of extension units flexibly adapting to applications
- Realizing servo system with 4 axes of 200 kHz pulse output
High-speed processing
The unit has impressive sequence processing performance for machine control operations, as well as enhanced data processing capabilities. Instruction execution time is as fast as 0.3 μs for basic instructions and 0.87 μs for data instructions, enabling the unit to achieve the highest performance of its class. This contributes to improving production capacity.

Positioning function
This function is compatible with a 200 kHz, 4-axis pulse output. It can be utilized for increasingly sophisticated and high-accuracy positioning.

Two types of basic units for varying applications
SPF has two types of basic units: the high-functionality type basic unit (Type: NA0PA), which is suitable for positioning control while connected to a servo system; and the standard type basic unit (Type: NA0PB), which is suitable for the control of general equipment not supported by a servo system. It’s possible to select a basic unit depending on applications.

Rich communication functions
RS-232C, RS-485 and Ethernet communication can be established by simply mounting a small board to the basic unit. Communication functions can also be achieved through use of an extension unit on the left aids.

Operability Oriented Support Tool
SX-Programmer standard is a support tool, which is based on ladder programming basis. Function blocks (FB) can also be used corresponding to the control applications.

Internal large-capacity memory
With enhancements to the functional system and increased data processing, the unit comes with a large-capacity program and data memory.

<table>
<thead>
<tr>
<th>Model</th>
<th>Memory capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Program</td>
</tr>
<tr>
<td>14 points</td>
<td>8 k steps</td>
</tr>
<tr>
<td>24 points</td>
<td>16 k steps</td>
</tr>
<tr>
<td>32 points</td>
<td>24 k steps</td>
</tr>
<tr>
<td>40 points</td>
<td>32 k steps</td>
</tr>
<tr>
<td>60 points</td>
<td>48 k steps</td>
</tr>
</tbody>
</table>

MONITOUCH connection function
SPF can be connected to the MONITOUCH via the loader port. It does not require any special communication equipment.

Load cell unit
We offer a unique lineup of modules compatible with load cells used for metering and weighing systems, tank scales, etc. They can be applied to wide range of applications such as cement plants.

Standard calendar function
A calendar function comes standard as an essential function for monitoring machinery and systems.
Flexible system construction by using extension units

Constructing optimal systems using Fuji components
MODEL LINEUP

Basic unit (CPU unit)

14 points
Basic unit
- **NA0PA-14T-34C**
  - Power supply voltage: 24 V DC
  - DI/O: input 8 points, output 6 points
  - Output type: Tri sink output
  - Detachable terminal block

14 points
Basic unit
- **NA0PB-14R-34C**
  - Power supply voltage: 24 V DC
  - DI/O: input 8 points, output 6 points
  - Output type: Ry output

24 points
Basic unit
- **NA0PA-24T-34C**
  - Power supply voltage: 100 to 240 V AC or 24 V DC
  - DI/O: input 14 points, output 10 points
  - Output type: Tri sink output
  - Detachable terminal block

24 points
Basic unit
- **NA0PB-24R-34C**
  - Power supply voltage: 24 V DC
  - DI/O: input 14 points, output 10 points
  - Output type: Ry output

32 points
Basic unit
- **NA0PA-32T-34C**
  - Power supply voltage: 100 to 240 V AC or 24 V DC
  - DI/O: input 20 points, output 12 points
  - Output type: Tri sink output
  - Detachable terminal block

32 points
Basic unit
- **NA0PB-32R-34C**
  - Power supply voltage: 24 V DC
  - DI/O: input 20 points, output 12 points
  - Output type: Ry output

40 points
Basic unit
- **NA0PA-40T-34C**
  - Power supply voltage: 100 to 240 V AC or 24 V DC
  - DI/O: input 24 points, output 16 points
  - Output type: Tri sink output
  - Detachable terminal block

40 points
Basic unit
- **NA0PB-40R-34C**
  - Power supply voltage: 24 V DC
  - DI/O: input 24 points, output 16 points
  - Output type: Ry output

60 points
Basic unit
- **NA0PA-60T-34C**
  - Power supply voltage: 100 to 240 V AC or 24 V DC
  - DI/O: input 36 points, output 24 points
  - Output type: Tri sink output
  - Detachable terminal block

60 points
Basic unit
- **NA0PB-60R-34C**
  - Power supply voltage: 24 V DC
  - DI/O: input 36 points, output 24 points
  - Output type: Ry output
Improves Programming Development Efficiency

Programming Support Tools: SX-Programmer Standard

Operability Oriented Support Tools

Features

Multi-language support
- The SPF supports not only ladder diagrams but also ST and FBD. It allows the programmer to select the proper programming language for the control target.

Intuitive screen operation
- Through guidance display and a command word candidate narrowing-down function based on a keyword search, you can input data without referring to the manual.
- You can select the proper input mode according to the situation from functions such as mouse wheel + click input, keyword search input, and Intellisense function input.

Simulation function
- Provided with built-in Standard, the SPF is capable of testing the operation of programs without using an actual system.

Resume function
- When the SPF starts to run, it automatically displays the position last edited or monitored.
- In online mode, the SPF displays the position last monitored and starts monitoring.
- In offline mode, the SPF displays the position last monitored and enters Edit mode.

Device editor and collation function
- Device information is displayed on a single screen, for example, in the form of a list of the operating states of devices, enabling you to save time in memory management.
- You can display details of different points on programs and edit by referring to collation results.

Usage

Ladder operation for on-site maintenance personnel
- Supports the full keyboard operations useful for on-site maintenance personnel. Editing and download can be performed immediately after activation.

Utilization of programming resources
- Program and comment resources of the models of MICREX series and FLEX-PC series of Fuji Electric can be reused. Screens, operability, and programming can be handled as if you were using a personal computer loader with which you are already familiar.
Screen Sample

Entering instruction

Collation function

Operating environment

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>IBM-PC/AT compatible</td>
</tr>
<tr>
<td>CPU</td>
<td>Intel Pentium 233 MHz or higher (800 MHz or higher recommended)</td>
</tr>
<tr>
<td>Hard disk</td>
<td>Free space of 200 Mbytes or more</td>
</tr>
<tr>
<td>CD-ROM unit</td>
<td>1 unit (x 4 speed or faster), media: ISO 9660 format</td>
</tr>
<tr>
<td>Memory capacity</td>
<td>64 Mbytes or more (128 Mbytes or more recommended)</td>
</tr>
<tr>
<td>Keyboard</td>
<td>101 English keyboard</td>
</tr>
<tr>
<td>Mouse</td>
<td>USB mouse, bus mouse, or PS2 mouse</td>
</tr>
<tr>
<td>Communication</td>
<td>Ethernet</td>
</tr>
<tr>
<td>Interface</td>
<td>USB</td>
</tr>
<tr>
<td>OS</td>
<td>Windows XP, Vista, 7 &amp; 10</td>
</tr>
<tr>
<td>Environmental</td>
<td>Depends on environmental conditions of commercial personal computer</td>
</tr>
</tbody>
</table>

System configuration

Personal computer

USB

NADH-CIV

SPF

NADL-AET1

NADL-AET1

Standard

Ethernet

+ Or
APPLICATION EXAMPLES

Flexibly supports machinery and systems

- Take-out robot
- Molding machine
- Spinning machine
- Pressing machine
- Packing machine

Monitors plastic bottle shot number, total shot number, error rate

Connects the start timing of film feeding based on the speed of the plastic bottle

Visualizes production information using data from SPF

APPLICATION EXAMPLES
### SPECIFICATIONS

#### General specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating ambient temperature</td>
<td>-40 to +85˚C</td>
</tr>
<tr>
<td>Storage (temperature) temperature</td>
<td>(5 to 95% RH, No condensation)</td>
</tr>
<tr>
<td>Relative humidity</td>
<td>No condensation</td>
</tr>
<tr>
<td>Pollution degree</td>
<td>Pollution degree 2 Note 1)</td>
</tr>
<tr>
<td>Corrosion resistance</td>
<td>No corrosion</td>
</tr>
<tr>
<td>Usage altitude</td>
<td>Pollution degree 2 Note 1)</td>
</tr>
<tr>
<td>Vibration resistance</td>
<td>One-way amplitude: 0.15 mm, constant acceleration: 19.6 m/s²</td>
</tr>
<tr>
<td>Shock resistance</td>
<td>Peak constant: 48 m/s², 49 m/s² (in each direction)</td>
</tr>
<tr>
<td>Electrostatic discharge</td>
<td>±4 kV: Contact discharge method</td>
</tr>
<tr>
<td>墨西哥电磁场干扰</td>
<td>±8 kV: Aerial discharge method</td>
</tr>
<tr>
<td>Radiated radio frequency electromagnetic field</td>
<td>80 to 1000 MHz, 10 V/m</td>
</tr>
<tr>
<td>Radiated radio frequency electromagnetic field</td>
<td>1.4 to 2.0 GHz, 3 V/m (in each direction)</td>
</tr>
<tr>
<td>Power frequency magnetic field</td>
<td>±2 kV: Communication line, I/O signal line (AC non-shielded line)</td>
</tr>
<tr>
<td>Power frequency magnetic field</td>
<td>±1 kV: Communication line, I/O signal line (excluding AC non-shielded line)</td>
</tr>
<tr>
<td>Power frequency magnetic field</td>
<td>±2 kV: AC power supply, ±1 kV: DC power supply</td>
</tr>
<tr>
<td>Power frequency magnetic field</td>
<td>±2 kV: AC power supply, ±1 kV: DC power supply</td>
</tr>
<tr>
<td>Power frequency magnetic field</td>
<td>±2 kV: AC power supply, ±1 kV: DC power supply</td>
</tr>
<tr>
<td>Square wave impulse noise</td>
<td>±150 kV/µs, rise time: 1 µs, pulse width: 3 µs, ±1 kV</td>
</tr>
<tr>
<td>Structure</td>
<td>Open type equipment (panel built-in type)</td>
</tr>
<tr>
<td>Cooling systems</td>
<td>Natural air cooling</td>
</tr>
</tbody>
</table>

Note 1) Pollution degree 2: Normally, this is the state in which conduction is not expected to occur. However, there are circumstances in which condensation may occur due to a change in temperature or humidity.

Note 2) This is a mounted state in which the unit is fixed to the control panel with fixing screws. Make sure there is no vibration or shock during DIN rail mounting.

Note 3) Make sure to implement vibration countermeasures for environments in which there is repeated or continuous vibration.

#### Power supply specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>NMB-24P (AC)</th>
<th>NMB-24P (DC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>100 to 240 V AC</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>0.50 to 0.60 V DC</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Rated frequency</td>
<td>50/60 Hz</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Frequency tolerance</td>
<td>50/60 Hz</td>
<td>24 V DC</td>
</tr>
<tr>
<td>Time interval for intransient power failure</td>
<td>0.5 to 30 ms</td>
<td>0.5 to 30 ms</td>
</tr>
<tr>
<td>Waveform distortion rate</td>
<td>5% or less</td>
<td>5% or less</td>
</tr>
<tr>
<td>Rated output voltage 1 (internal 24 V)</td>
<td>5 V DC ±6%</td>
<td></td>
</tr>
<tr>
<td>Rated output voltage 2 (external 24 V)</td>
<td>24 V DC ±10%</td>
<td></td>
</tr>
<tr>
<td>Rated output voltage 3 (external 24 V)</td>
<td>24 V DC ±10%</td>
<td></td>
</tr>
<tr>
<td>Rated output voltage 3 (external 24 V)</td>
<td>24 V DC ±10%</td>
<td></td>
</tr>
<tr>
<td>RMS current</td>
<td>0.06 A or less</td>
<td>0.06 A or less</td>
</tr>
<tr>
<td>Short current</td>
<td>0.12 A or less</td>
<td>0.12 A or less</td>
</tr>
<tr>
<td>Electrical strength</td>
<td>2000 Vrms AC/1000 Vrms AC</td>
<td>1000 Vrms AC/1000 Vrms AC</td>
</tr>
<tr>
<td>Insulation type</td>
<td>Flame-retardant insulation</td>
<td></td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>0.05 mm thick copper with 0.05 mm copper</td>
<td></td>
</tr>
</tbody>
</table>
### Performance Specifications

**Control system**
- Stored program and cyclic scanning system
- Detachable, parallel task, event task

**Direct I/O connection method**
- Local bus

**Direct I/O control method**
- Special

**Innovative function**
- Instruction word length
- Instruction execution time

**High-speed standard memory (M)**
- Standard memory (M)
- Retained memory (RM)

**UserFB instance memory initial value setting area**
- UserFB instance memory (FM)

**UserFB instance memory initial value setting area**
- UserFB instance memory (FM)

**Timer**
- Integrating timer
- Counter
- Edge detection

**POU**
- UserPG
- UserFB
- UserFCT

**Diagnostic functions**
- Program status: Monitoring, testing, etc.

**Memory pack**
- External: Detachable
- Storage: CompactFlash
- System definition: System definition
- 2MB flash memory

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<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications: Basic unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Item</td>
<td>Total points</td>
</tr>
<tr>
<td>Control system</td>
<td>Stored program and cyclic scanning system</td>
</tr>
<tr>
<td>Direct I/O connection method</td>
<td>Local bus</td>
</tr>
<tr>
<td>Direct I/O control method</td>
<td>Special</td>
</tr>
<tr>
<td>Instruction word length</td>
<td>Instruction execution time</td>
</tr>
<tr>
<td>High-speed standard memory (M)</td>
<td>Standard memory (M)</td>
</tr>
<tr>
<td>UserFB instance memory initial value setting area</td>
<td>UserFB instance memory (FM)</td>
</tr>
<tr>
<td>Timer</td>
<td>Integrating timer</td>
</tr>
<tr>
<td>POU</td>
<td>UserPG</td>
</tr>
<tr>
<td>Diagnostic functions</td>
<td>Program status: Monitoring, testing, etc.</td>
</tr>
<tr>
<td>Memory pack</td>
<td>External: Detachable</td>
</tr>
</tbody>
</table>
## Product name | Model | Specifications
--- | --- | ---
**Basic unit**<br>High-functionality type: Basic unit <NA0PA><br>Standard type: Basic unit <NA0PB><br>Extension unit<br>Power supply unit<br>DIO unit<br>AIO unit<br>AIO board<br>Temperature measuring unit<br>AI + temperature measuring combo unit<br>Load cell unit<br>High-precision load cell unit<br>Communication unit<br>Related equipment<br>PC loader<br>Loader connection cable<br>Memory pack<br>Terminal connector | **Model**<br>NA0PA14T-34C<br>NA0PA24T-34C<br>NA0PA32T-34C<br>NA0PA40T-34C<br>NA0PA60T-34C<br>NA0PA24T-31C<br>NA0PA32T-31C<br>NA0PA40T-31C<br>NA0PA60T-31C<br>NA0PB14R-34C<br>NA0PB24R-34C<br>NA0PB32R-34C<br>NA0PB60R-34C<br>NA0S-2<br>NA0E24R-34<br>NA0E24T-31<br>NA0E08R-3<br>NA0E08T-3<br>NA0E08T-0<br>NA0E08X-3<br>NA0E16R-0<br>NA0E16T-0<br>NA0AY02-MR<br>NA0AW06-MR<br>NA0AX06-MR<br>NA3AY02-MR<br>NA3AW03-MR<br>NA0AX02-TC<br>NA0AX06-TC<br>NA0AX16-TC<br>NA0AX06-PT<br>NA0AX06-MRTC<br>NA0F-LC1<br>NA0FA-LC1<br>NA0LA-RS3<br>NA0LA-RS5<br>NA0LA-ETI<br>NA3LA-RS1<br>NA3LA-ET1<br>NA3LA-CA1<br>NPH-20NH<br>NPH-20JC<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC<br>NPH-20NH<br>NPH-20JC
--- | **Specifications**<br>24 V DC DI 8 points; Tr DO 6 points, RS-232C port, 24 V DC power supply<br>24 V DC DI 14 points; Tr DO 10 points, RS-232C port, 24 V DC power supply<br>24 V DC DI 20 points; Tr DO 12 points, RS-232C port, 24 V DC power supply<br>24 V DC DI 24 points; Tr DO 16 points, RS-232C port, 24 V DC power supply<br>24 V DC DI 36 points; Tr DO 24 points, RS-232C port, 24 V DC power supply<br>24 V DC DI 14 points; Tr DO 10 points, RS-232C port, 100 to 240 V AC power supply<br>24 V DC DI 20 points; Tr DO 12 points, RS-232C port, 100 to 240 V AC power supply<br>24 V DC DI 24 points; Tr DO 16 points, RS-232C port, 100 to 240 V AC power supply<br>24 V DC DI 36 points; Tr DO 24 points, RS-232C port, 100 to 240 V AC power supply<br>24 V DC DI 8 points; Ry DO 6 points, RS-232C port, 24 V DC power supply<br>24 V DC DI 14 points; Ry DO 10 points, RS-232C port, 24 V DC power supply<br>24 V DC DI 20 points; Ry DO 12 points, RS-232C port, 24 V DC power supply<br>24 V DC DI 36 points; Ry DO 24 points, RS-232C port, 24 V DC power supply<br>5 V DC, 24 V DC output; 100 to 240 V AC input power supply<br>5 V DC, 24 V DC output; 24 V DC input power supply<br>24 V DC DI 14 points; Ry DO 10 points, 24 V DC power supply<br>24 V DC DI 20 points; Ry DO 12 points, 24 V DC power supply<br>24 V DC DI 24 points; Ry DO 16 points, 24 V DC power supply<br>24 V DC DI 36 points; Ry DO 24 points, 24 V DC power supply<br>24 V DC DI 8 points; 24 V DC power supply<br>24 V DC DI 14 points; 24 V DC power supply<br>24 V DC DI 4 points; 24 V DC power supply<br>24 V DC DI 4 points; 24 V DC power supply<br>Tr DO 8 points<br>Ry DO 16 points<br>Analog Output 2ch (-10~10V, 0~10V or -20~20mA, 0~20mA)<br>Analog Input 4ch (-10~10V, 0~10V or -20~20mA, 0~30mA) + Analog Output 2ch (-10~10V, 0~10V or -20~20mA, 0~30mA)<br>Analog Input 2ch (0~10V or 0~20mA) + Analog Output 2ch (-10~10V, 0~10V or 0~20mA)<br>Analog Input 2ch (0~10V or 0~20mA) + Analog Output 1ch (0~10V or 0~20mA)<br>Thermocouple input 2ch, resolution 0.1˚C<br>Thermocouple input 6ch, resolution 0.1˚C<br>Thermocouple input 16ch, resolution 0.1˚C<br>Input 2ch + thermocouple input 4ch, 1ch, resolution 16 bits<br>Input 2ch + thermocouple input 4ch, 1ch, resolution 24 bits<br>Communication Port 1 (RS-232C), Port 2 (RS-485, 10BASE-T/100BASE-TX Ethernet), Port 3 + Port 4 (2 ports RS-485, 10BASE-T/100BASE-TX Ethernet)<br>Communication Port 1 (RS-232C), Port 2 (RS-485, 10BASE-T/100BASE-TX Ethernet)<br>Programming support tool Standard (Japanese/English)<br>USB (AM connector) / RS-232C (MD4M connector), 180 cm<br>Extension unit falling-off detection<br>Check for availability
Safety Considerations

- For safe operation, before using the product, read the instruction manual or user manual that comes with the product carefully or consult the Fuji sales representative from which you purchased the product.
- Products introduced in this catalogue have not been designed or manufactured for such applications in a system or equipment that will affect human bodies or lives.
- Customers, who want to use the products introduced in this catalogue for special systems or devices such as for atomic-energy control, aerospace use, medical use, passenger vehicle, and traffic control, are requested to consult the Fuji sales division.
- Customers are requested to prepare safety measures when they apply the products introduced in this catalogue to such systems or facilities that will affect human lives or cause severe damage to property if the products become faulty.
- For safe operation, wiring should be conducted only by qualified engineers who have sufficient technical knowledge about electrical work or wiring.

Materials covered in this document are subject to revision due to the modification of the product.