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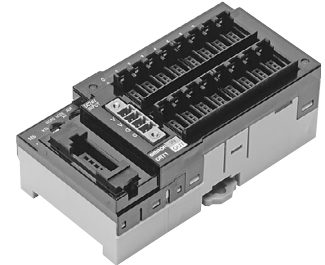
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Digital I/O Slave Units with e-CON Connectors

# CRT1-□D16S(-1)/□D32S(-1)/□D16SH(-1)/□D32SH(-1)

## Industry-standard Sensor Connectors for Easy Connection to Pre-wired Sensors without Special Tools.

- A digital I/O terminal with industry-standard e-CON connectors.
- Easy to install without the use of special tools. Reduces wiring work.
- Equipped with load short-circuit detection.



### Ordering Information

| Name               | Specifications            |                           |               | Model   |               |
|--------------------|---------------------------|---------------------------|---------------|---|---------------|
| e-CON Connectors   | Inputs                    | 16 inputs                 | NPN           | Without Short-circuit and Disconnected Line Detection | CRT1-ID16S    |
|                    |                           |                           | PNP           |   | CRT1-ID16S-1  |
|                    | Outputs                   | 16 outputs                | NPN           |   | CRT1-OD16S    |
|                    |                           |                           | PNP           |   | CRT1-OD16S-1  |
|                    | Inputs/<br>Outputs        | 8 inputs /<br>8 outputs   | NPN           |   | CRT1-MD16S    |
|                    |                           |                           | PNP           |   | CRT1-MD16S-1  |
|                    | Inputs                    | 32 inputs                 | NPN           |   | CRT1-ID32S    |
|                    |                           |                           | PNP           |   | CRT1-ID32S-1  |
|                    | Outputs                   | 32 outputs                | NPN           |   | CRT1-OD32S    |
|                    |                           |                           | PNP           |   | CRT1-OD32S-1  |
|                    | Inputs/<br>Outputs        | 16 inputs /<br>16 outputs | NPN           | CRT1-MD32S  |               |
|                    |                           |                           | PNP           | CRT1-MD32S-1  |               |
|                    | Inputs                    | 16 inputs                 | NPN           | With Short-circuit and Disconnected Line Detection    | CRT1-ID16SH   |
|                    |                           |                           | PNP           |   | CRT1-ID16SH-1 |
|                    | Outputs                   | 16 outputs                | NPN           |   | CRT1-OD16SH   |
|                    |                           |                           | PNP           |   | CRT1-OD16SH-1 |
|                    | Inputs/<br>Outputs        | 8 inputs /<br>8 outputs   | NPN           |   | CRT1-MD16SH   |
|                    |                           |                           | PNP           |   | CRT1-MD16SH-1 |
|                    | Inputs                    | 32 inputs                 | NPN           |   | CRT1-ID32SH   |
|                    |                           |                           | PNP           |   | CRT1-ID32SH-1 |
| Outputs            | 32 outputs                | NPN                       | CRT1-OD32SH   |   |               |
|                    |                           | PNP                       | CRT1-OD32SH-1 |   |               |
| Inputs/<br>Outputs | 16 inputs /<br>16 outputs | NPN                       | CRT1-MD32SH   |   |               |
|                    |                           | PNP                       | CRT1-MD32SH-1 |   |               |

**Note.** Output power supply connectors (Phoenix Contact K.K.) are provided with Output Units and I/O Units.

Slave External I/O Connections in the appendix for applicable connectors.

### Performance Specifications

For Basic Performance Specifications of Slave Units, refer to page 32.

## Input Section Specifications

### ● Sixteen-point Input Units

| Item  | Specification  |  |  |  |
|---|--|--|--|--|
| Model   | CRT1-ID16S   | CRT1-ID16S-1   | CRT1-ID16SH  | CRT1-ID16SH-1  |
| I/O capacity                                    | 16 inputs  |  |  |  |
| Internal I/O common                             | NPN  | PNP  | NPN  | PNP  |
| ON voltage                                      | 10.5 VDC min. (between each input terminal and the V terminal)                             | 10.5 VDC min. (between each input terminal and the G terminal) | 10.5 VDC min. (between each input terminal and the V terminal)                             | 10.5 VDC min. (between each input terminal and the G terminal) |
| OFF current                                     | 1 mA max.  |  |  |  |
| Input current                                   | At 24 VDC: 6.0 mA max./input<br>At 11 VDC: 3.0 mA min./input                               |  |  |  |
| ON delay  | 1.5 ms max.  |  |  |  |
| OFF delay                                       | 1.5 ms max.  |  |  |  |
| Power supply short-circuit detection            | ---  |  | Operates at 50 mA/point min.   |  |
| Disconnection detection                         | ---  |  | Operates at 0.3 mA/point max.  |  |
| Number of circuits per common                   | 16 inputs/common   |  |  |  |
| Isolation method                                | Photocoupler   |  |  |  |
| Input indicator                                 | LED (yellow)   |  |  |  |
| Installation                                    | DIN Track  |  |  |  |
| Power supply type                               | Network power supply   |  |  |  |
| Power short-circuit protection                  | Operates at 50 mA/point min.   |  |  |  |
| Current supplied to input devices               | 50 mA/input  |  |  |  |
| Communications power supply current consumption | 110 mA max. for 24-VDC power supply voltage<br>125 mA max. for 14-VDC power supply voltage |  | 125 mA max. for 24-VDC power supply voltage<br>145 mA max. for 14-VDC power supply voltage |  |
| Weight  | 110 g max.   |  |  |  |

### ● Thirty-two-point Input Units

| Item  | Specification  |  |  |  |
|---|--|--|--|--|
| Model   | CRT1-ID32S   | CRT1-ID32S-1   | CRT1-ID32SH  | CRT1-ID32SH-1  |
| I/O capacity                                    | 32 inputs  |  |  |  |
| Internal I/O common                             | NPN  | PNP  | NPN  | PNP  |
| ON voltage                                      | 10.5 VDC min. (between each input terminal and the V terminal)                             | 10.5 VDC min. (between each input terminal and the G terminal) | 10.5 VDC min. (between each input terminal and the V terminal)                             | 10.5 VDC min. (between each input terminal and the G terminal) |
| OFF current                                     | 1.0 mA max.  |  |  |  |
| Input current                                   | At 24 VDC: 6.0 mA max./input<br>At 11 VDC: 3.0 mA min./input                               |  |  |  |
| ON delay  | 1.5 ms max.  |  |  |  |
| OFF delay                                       | 1.5 ms max.  |  |  |  |
| Power supply short-circuit detection            | ---  |  | Operates at 50 mA/point min.   |  |
| Disconnection detection                         | ---  |  | Operates at 0.3 mA/point max.  |  |
| Number of circuits per common                   | 32 inputs/common   |  |  |  |
| Isolation method                                | Photocoupler   |  |  |  |
| Input indicator                                 | LED (yellow)   |  |  |  |
| Installation                                    | DIN Track  |  |  |  |
| Power short-circuit protection                  | Operates at 50 mA/point min.   |  |  |  |
| Power supply type                               | Network power supply   |  |  |  |
| Current supplied to input devices               | 50 mA/input  |  |  |  |
| Communications power supply current consumption | 195 mA max. for 24-VDC power supply voltage<br>200 mA max. for 14-VDC power supply voltage |  | 210 mA max. for 24-VDC power supply voltage<br>235 mA max. for 14-VDC power supply voltage |  |
| Weight  | 180 g max.   |  |  |  |

## Output Section Specifications

### ● Sixteen-point Output Unit

| Item  | Specification  |  |  |  |
|---|--|--|--|--|
| Model   | CRT1-OD16S   | CRT1-OD16S-1   | CRT1-OD16SH  | CRT1-OD16SH-1  |
| I/O capacity                                    | 16 outputs   |  |  |  |
| Internal I/O common                             | NPN  | PNP  | NPN  | PNP  |
| Rated output current                            | 0.5 A/output, 4 A/common   |  |  |  |
| Residual voltage                                | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal)                   | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal)                   | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) |
| Leakage current                                 | 0.1 mA max.  |  |  |  |
| ON delay  | 0.5 ms max.  |  |  |  |
| OFF delay                                       | 1.5 ms max.  |  |  |  |
| Load short-circuit detection                    | ---  |  | Supported.   |  |
| Disconnection detection                         | ---  |  | Operates at 3 mA/point max. (Does not operate at over 3 mA.)                             |  |
| Number of circuits per common                   | 16 outputs/common  |  |  |  |
| Isolation method                                | Photocoupler   |  |  |  |
| Output indicators                               | LED (yellow)   |  |  |  |
| Installation                                    | DIN Track  |  |  |  |
| Power supply type                               | Multi-power supply   |  |  |  |
| Current supplied to output devices              | 100 mA/output  |  |  |  |
| Communications power supply current consumption | 40 mA max. for 24-VDC power supply voltage<br>60 mA max. for 14-VDC power supply voltage |  | 40 mA max. for 24-VDC power supply voltage<br>65 mA max. for 14-VDC power supply voltage |  |
| I/O power supply current consumption            | 20 mA max. for 24-VDC power supply voltage   |  | 15 mA max. for 24-VDC power supply voltage   | 60 mA max. for 24-VDC power supply voltage                             |
| Output handling for communications errors       | Select either hold or clear from CX-Integrator.  |  |  |  |
| Weight  | 110 g max.   |  |  |  |

### ● Thirty-two-point Output Unit

| Item  | Specification  |  |  |  |
|---|--|--|--|--|
| Model   | CRT1-OD32S   | CRT1-OD32S-1   | CRT1-OD32SH  | CRT1-OD32SH-1  |
| I/O capacity                                    | 32 outputs   |  |  |  |
| Internal I/O common                             | NPN  | PNP  | NPN  | PNP  |
| Rated output current                            | 0.5 A/output, 4 A/common   |  |  |  |
| Residual voltage                                | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal)                   | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal)                   | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) |
| Leakage current                                 | 0.1 mA max.  |  |  |  |
| ON delay  | 0.5 ms max.  |  |  |  |
| OFF delay                                       | 1.5 ms max.  |  |  |  |
| Load short-circuit detection                    | ---  |  | Supported.   |  |
| Disconnection detection                         | ---  |  | Operates at 3 mA/point max. (Does not operate at over 3 mA.)                             |  |
| Number of circuits per common                   | 16 outputs/common  |  |  |  |
| Isolation method                                | Photocoupler   |  |  |  |
| Output indicators                               | LED (yellow)   |  |  |  |
| Installation                                    | DIN Track  |  |  |  |
| Power supply type                               | Multi-power supply   |  |  |  |
| Current supplied to output devices              | 100 mA/output  |  |  |  |
| Communications power supply current consumption | 50 mA max. for 24-VDC power supply voltage<br>80 mA max. for 14-VDC power supply voltage |  | 50 mA max. for 24-VDC power supply voltage<br>90 mA max. for 14-VDC power supply voltage |  |
| I/O power supply current consumption            | 15 mA max. for 24-VDC power supply voltage   |  | 60 mA max. for 24-VDC power supply voltage   |  |
| Output handling for communications errors       | Select either hold or clear from CX-Integrator.  |  |  |  |
| Weight  | 170 g max.   |  |  |  |

## Input and Output Section Specifications

### ● 8-point Input and 8-point Output Units

#### Common Specifications

| Item  | Specification  |              |   |               |
|---|--|--------------|---|---------------|
| Model   | CRT1-MD16S   | CRT1-MD16S-1 | CRT1-MD16SH   | CRT1-MD16SH-1 |
| Installation                                    | DIN Track  |              |   |               |
| Communications power supply current consumption | 75 mA max. for 24-VDC power supply voltage<br>95 mA max. for 14-VDC power supply voltage |              | 95 mA max. for 24-VDC power supply voltage<br>115 mA max. for 14-VDC power supply voltage |               |
| Weight  | 120 g max.   |              |   |               |

#### Input Section Specifications

| Item                                 | Specification  |  |  |  |
|--------------------------------------|--|--|--|--|
| Model                                | CRT1-MD16S   | CRT1-MD16S-1   | CRT1-MD16SH  | CRT1-MD16SH-1  |
| I/O capacity                         | 8 inputs   |  |  |  |
| Internal I/O common                  | NPN  | PNP  | NPN  | PNP  |
| ON voltage                           | 10.5 VDC min. (between each input terminal and the V terminal) | 10.5 VDC min. (between each input terminal and the G terminal) | 10.5 VDC min. (between each input terminal and the V terminal) | 10.5 VDC min. (between each input terminal and the G terminal) |
| OFF current                          | 1.0 mA max.  |  |  |  |
| Input current                        | At 24 VDC: 6.0 mA max./input<br>At 11 VDC: 3.0 mA min./input   |  |  |  |
| ON delay                             | 1.5 ms max.  |  |  |  |
| OFF delay                            | 1.5 ms max.  |  |  |  |
| Power supply short-circuit detection | ---  |  | Operates at 50 mA/point min.                                   |  |
| Disconnection detection              | ---  |  | Operates at 0.3 mA/point max.                                  |  |
| Number of circuits per common        | 8 inputs/common  |  |  |  |
| Isolation method                     | Photocoupler   |  |  |  |
| Input indicator                      | LED (yellow)   |  |  |  |
| Power supply type                    | Network power supply   |  |  |  |
| Power short-circuit protection       | Operates at 50 mA/point min.                                   |  |  |  |
| Current supplied to input devices    | 50 mA/input  |  |  |  |

#### Output Section Specifications

| Item                                      | Specification  |  |  |  |
|---|--|--|--|--|
| Model                                     | CRT1-MD16S   | CRT1-MD16S-1   | CRT1-MD16SH  | CRT1-MD16SH-1  |
| I/O capacity                              | 8 outputs  |  |  |  |
| Internal I/O common                       | NPN  | PNP  | NPN  | PNP  |
| Rated output current                      | 0.5 A/output, 2 A/common   |  |  |  |
| Residual voltage                          | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) |
| Leakage current                           | 0.1 mA max.  |  |  |  |
| ON delay                                  | 0.5 ms max.  |  |  |  |
| OFF delay                                 | 1.5 ms max.  |  |  |  |
| Load short-circuit detection              | ---  |  | Supported.   |  |
| Disconnection detection                   | ---  |  | Operates at 3 mA/point max.<br>(Does not operate at over 3 mA.)        |  |
| Number of circuits per common             | 8 outputs/common   |  |  |  |
| Isolation method                          | Photocoupler   |  |  |  |
| Output indicators                         | LED (yellow)   |  |  |  |
| Power supply type                         | Multi-power supply   |  |  |  |
| Current supplied to output devices        | 100 mA/output  |  |  |  |
| I/O power supply current consumption      | 15 mA max. for 24-VDC power supply voltage                             |  |  | 35 mA max. for 24-VDC power supply voltage                             |
| Output handling for communications errors | Select either hold or clear from CX-Integrator.                        |  |  |  |

● 16-point Input and 16-point Output Units

Common Specifications

| Item  | Specification  |              |  |               |
|---|--|--------------|--|---------------|
| Model   | CRT1-MD32S   | CRT1-MD32S-1 | CRT1-MD32SH  | CRT1-MD32SH-1 |
| Installation                                    | DIN Track  |              |  |               |
| Communications power supply current consumption | 120 mA max. for 24-VDC power supply voltage<br>140 mA max. for 14-VDC power supply voltage |              | 135 mA max. for 24-VDC power supply voltage<br>155 mA max. for 14-VDC power supply voltage |               |
| Weight  | 180 g max.   |              |  |               |

Input Section Specifications

| Item                                 | Specification  |  |  |  |
|--------------------------------------|--|--|--|--|
| Model                                | CRT1-MD32S   | CRT1-MD32S-1   | CRT1-MD32SH  | CRT1-MD32SH-1  |
| I/O capacity                         | 16 inputs  |  |  |  |
| Internal I/O common                  | NPN  | PNP  | NPN  | PNP  |
| ON voltage                           | 10.5 VDC min. (between each input terminal and the V terminal) | 10.5 VDC min. (between each input terminal and the G terminal) | 10.5 VDC min. (between each input terminal and the V terminal) | 10.5 VDC min. (between each input terminal and the G terminal) |
| OFF current                          | 1.0 mA max.  |  |  |  |
| Input current                        | At 24 VDC: 6.0 mA max./input<br>At 11 VDC: 3.0 mA min./input   |  |  |  |
| ON delay                             | 1.5 ms max.  |  |  |  |
| OFF delay                            | 1.5 ms max.  |  |  |  |
| Power supply short-circuit detection | ---  |  | Operates at 50 mA/point min.                                   |  |
| Disconnection detection              | ---  |  | Operates at 0.3 mA/point max.                                  |  |
| Number of circuits per common        | 16 inputs/common   |  |  |  |
| Isolation method                     | Photocoupler   |  |  |  |
| Input indicator                      | LED (yellow)   |  |  |  |
| Power supply type                    | Network power supply   |  |  |  |
| Power short-circuit protection       | Operates at 50 mA/point min.                                   |  |  |  |
| Current supplied to input devices    | 50 mA/input  |  |  |  |

Output Section Specifications

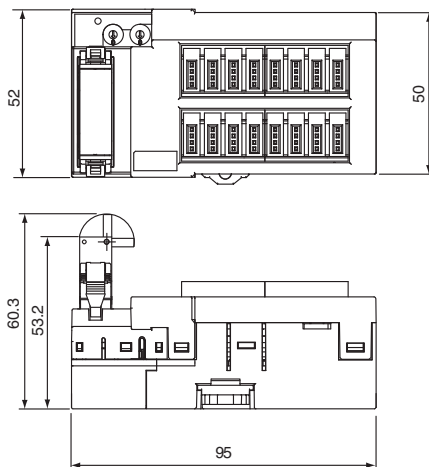
| Item                                      | Specification  |  |  |  |
|---|--|--|--|--|
| Model                                     | CRT1-MD32S   | CRT1-MD32S-1   | CRT1-MD32SH  | CRT1-MD32SH-1  |
| I/O capacity                              | 16 outputs   |  |  |  |
| Internal I/O common                       | NPN  | PNP  | NPN  | PNP  |
| Rated output current                      | 0.5 A/output, 4 A/common   |  |  |  |
| Residual voltage                          | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the G terminal) | 1.2 V max. (0.5 A DC, between each output terminal and the V terminal) |
| Leakage current                           | 0.1 mA max.  |  |  |  |
| ON delay                                  | 0.5 ms max.  |  |  |  |
| OFF delay                                 | 1.5 ms max.  |  |  |  |
| Load short-circuit detection              | ---  |  | Supported.   |  |
| Disconnection detection                   | ---  |  | Operates at 3 mA/point max.<br>(Does not operate at over 3 mA.)        |  |
| Number of circuits per common             | 16 outputs/common  |  |  |  |
| Isolation method                          | Photocoupler   |  |  |  |
| Output indicators                         | LED (yellow)   |  |  |  |
| Power supply type                         | Multi-power supply   |  |  |  |
| Current supplied to output devices        | 100 mA/output  |  |  |  |
| I/O power supply current consumption      | 20 mA max. for 24-VDC power supply voltage                             |  | 15 mA max. for 24-VDC power supply voltage                             | 60 mA max. for 24-VDC power supply voltage                             |
| Output handling for communications errors | Select either hold or clear from CX-Integrator.                        |  |  |  |

Dimensions

(Unit: mm)

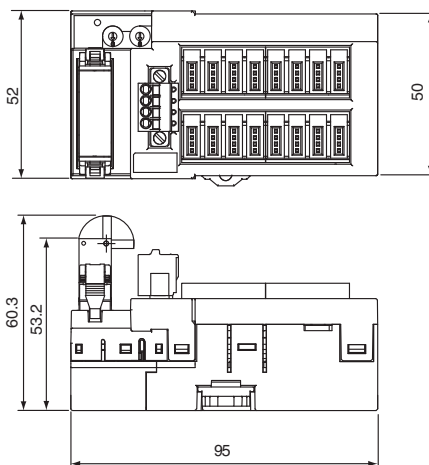
CRT1-ID16S (-1)  
 CRT1-ID16SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



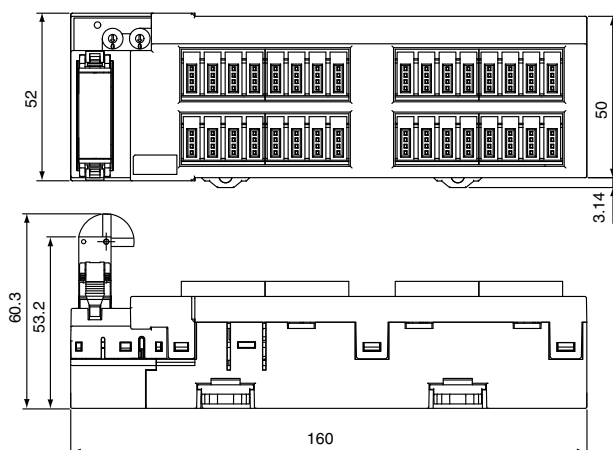
CRT1-MD16S (-1)  
 CRT1-MD16SH (-1)  
 CRT1-OD16S (-1)  
 CRT1-OD16SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



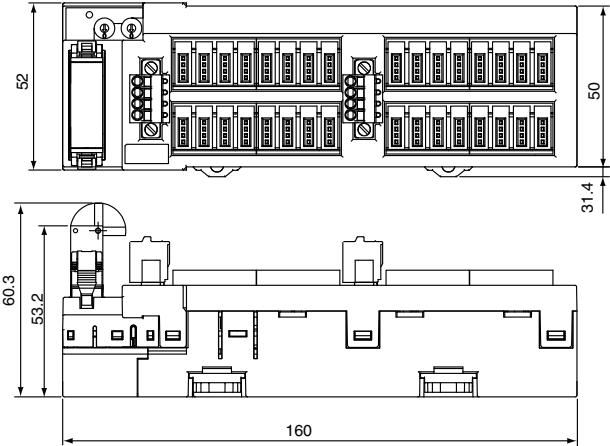
CRT1-ID32S (-1)  
 CRT1-ID32SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



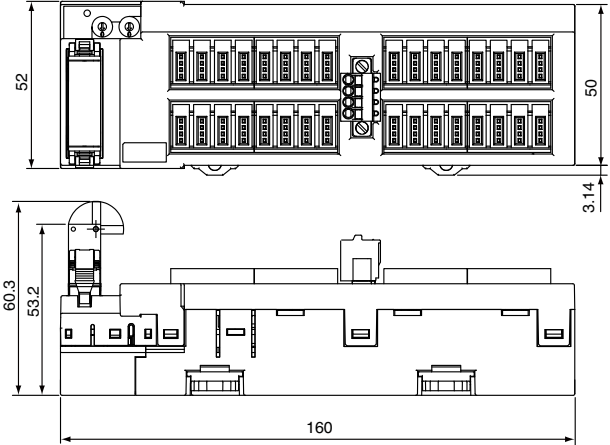
CRT1-OD32S (-1)  
CRT1-OD32SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



CRT1-MD32S (-1)  
CRT1-MD32SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted





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- Systems, machines, and equipment that could present a risk to life or property.

Please know and observe all prohibitions of use applicable to the products.

NEVER USE THE PRODUCTS FOR AN APPLICATION INVOLVING SERIOUS RISK TO LIFE OR PROPERTY WITHOUT ENSURING THAT THE SYSTEM AS A WHOLE HAS BEEN DESIGNED TO ADDRESS THE RISKS, AND THAT THE OMRON PRODUCTS ARE PROPERLY RATED AND INSTALLED FOR THE INTENDED USE WITHIN THE OVERALL EQUIPMENT OR SYSTEM.

### PROGRAMMABLE PRODUCTS

OMRON shall not be responsible for the user's programming of a programmable product, or any consequence thereof.

## Disclaimers

### CHANGE IN SPECIFICATIONS

Product specifications and accessories may be changed at any time based on improvements and other reasons.

It is our practice to change model numbers when published ratings or features are changed, or when significant construction changes are made. However, some specifications of the products may be changed without any notice. When in doubt, special model numbers may be assigned to fix or establish key specifications for your application on your request. Please consult with your OMRON representative at any time to confirm actual specifications of purchased products.

### DIMENSIONS AND WEIGHTS

Dimensions and weights are nominal and are not to be used for manufacturing purposes, even when tolerances are shown.

### PERFORMANCE DATA

Performance data given in this catalog is provided as a guide for the user in determining suitability and does not constitute a warranty. It may represent the result of OMRON's test conditions, and the users must correlate it to actual application requirements. Actual performance is subject to the OMRON Warranty and Limitations of Liability.

### ERRORS AND OMISSIONS

The information in this document has been carefully checked and is believed to be accurate; however, no responsibility is assumed for clerical, typographical, or proofreading errors, or omissions.

2011.12

In the interest of product improvement, specifications are subject to change without notice.

**OMRON Corporation**  
Industrial Automation Company

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