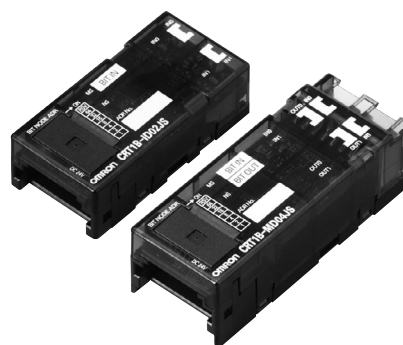


Bit Slave Units with Compact Connectors

# CRT1B-□D02JS(-1)/□D04JS(-1)

## Bit slave of smallest class in industry Innovation in wiring for any type of machinery

- Available in 2 types: 2-point Bit Slave Unit and 4-point Bit Slave Unit.
- Compact size for installation in limited space. Save space and wiring since bit slave can be installed near I/O devices.
- Industry first bit slave connectable with round cables which can be easily purchased at a lower price. Connectable with flat cables, too for easy wiring. Cables are selectable depending on applications.



### Ordering Information

| Name               | Specifications   |                    |     | Model          |            |
|--------------------|------------------|--------------------|-----|----------------|------------|
| Compact Connectors | Inputs           | 2 inputs           | NPN | CRT1B-ID02JS   |            |
|                    |                  | 2 outputs          | PNP | CRT1B-ID02JS-1 |            |
|                    | Outputs          | 2 inputs           | NPN | CRT1B-OD02JS   |            |
|                    |                  | 2 outputs          | PNP | CRT1B-OD02JS-1 |            |
|                    | Inputs/Outputs   | 1 input/1 output   | NPN | CRT1B-MD02JS   |            |
|                    |                  | 1 input/1 output   | PNP | CRT1B-MD02JS-1 |            |
|                    | Inputs           | 4 inputs           | NPN | CRT1B-ID04JS   |            |
|                    |                  | 4 outputs          | PNP | CRT1B-ID04JS-1 |            |
|                    | Outputs          | 4 inputs           | NPN | CRT1B-OD04JS   |            |
|                    |                  | 4 outputs          | PNP | CRT1B-OD04JS-1 |            |
|                    | Inputs/Outputs   | 2 inputs/2 outputs | NPN | CRT1B-MD04JS   |            |
|                    |                  | 2 inputs/2 outputs | PNP | CRT1B-MD04JS-1 |            |
|                    | Mounting Bracket |                    |     |                | CRT1-ATT03 |

#### ● Peripheral Devices

##### For Round Cable I

| Name  | Model           |
|---|-----------------|
| Open Type Connector (for Unit connection)<br>(Honda Tsushin Kogyo Co.,Ltd.) | HCN-TB4LMZG+ *1 |
| Terminating Resistor  | DRS1-T          |

##### For Round Cable II

| Name  | Model           |
|---|-----------------|
| Open Type Connector (for Unit connection)<br>(Honda Tsushin Kogyo Co.,Ltd.) | HCN-TB4LMZG+ *1 |
| Terminating Resistor  | DCN4-TM4 *2     |
| Flat Connector Socket   | DCN4-TR4 *2     |

Note: The DCN4-MD4 Multidrop Connector cannot be used with Bit Slaves with Compact Connectors. Use Open Type Connector from Honda Tsushin Kogyo Co., Ltd.

##### For Flat Cable I

| Name                          | Model       |
|-------------------------------|-------------|
| Flat Connector Socket         | DCN4-TR4 *2 |
| Flat Connector Plug           | DCN4-BR4 *2 |
| Flat Multidrop Connector Plug | DCN4-MR4 *2 |
| Terminating Resistor          | DCN4-TM4 *2 |
| Special Tools                 | DWT-A01     |

Note: The DCN4-MD4 Multidrop Connector cannot be used with Bit Slaves with Compact Connectors.

\*1 For information of HCN-TB4LMZG+, contact to Honda Tsushin Kogyo Co.,Ltd. Tel:+81-52-242-2111

\*2 The minimum quantity packaged is 10 Connectors.Oder the Connectors in multiples of 10.

## ● Compact Connectors

The compact connectors use XA-series Connectors from JST Mfg. Co., Ltd. Special cable connectors must be attached for cables connecting to external devices if a Slave Unit with Compact Connectors is used.

| Name     |                | Applicable cable range |          |                               | Model         | Crimping Tool |
|----------|----------------|------------------------|----------|-------------------------------|---------------|---------------|
|          |                | mm <sup>2</sup>        | AWG#     | Wire sheath external diameter |               |               |
| Contacts | Loose terminal | 0.08 to 0.33           | 28 to 22 | 1.2 to 1.9                    | BXA-001T-P0.6 | YC-692R       |
|          | Chain terminal |                        |          |                               | SXA-001T-P0.6 | YRS-692       |
|          | Loose terminal | 0.22 to 0.5            | 24 to 20 | 1.5 to 1.9                    | BXA-01T-P0.6  | YC-701R       |
|          | Chain terminal |                        |          |                               | SXA-01T-P0.6  | YRS-701       |
| Housing  | ---            | ---                    | ---      | ---                           | XAP-03V-1     | ---           |

Note 1. Automated Crimp Tools are also available. For details, contact the manufacturer.

2. For information on the processing procedure, refer to the instruction manual included with the tool or contact the manufacturer (JST Mfg. Co., Ltd.).

## Performance Specifications

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

## Input Section Specifications

| Item   | Specification   |  |   |  |
|--|---|--|---|--|
|  | CRT1B-ID02JS  | CRT1B-ID02JS-1   | CRT1B-ID04JS  | CRT1B-ID04JS-1   |
| <b>Model</b>   | CRT1B-ID02JS  | CRT1B-ID02JS-1   | CRT1B-ID04JS  | CRT1B-ID04JS-1   |
| <b>I/O capacity</b>                                      | 2 inputs  |  | 4 inputs  |  |
| <b>Internal I/O common</b>                               | NPN   | PNP  | NPN   | PNP  |
| <b>ON voltage</b>  | 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) |
| <b>OFF voltage</b>                                       | ---   | ---  | ---   | ---  |
| <b>OFF current</b>                                       | 1.0 mA max.   |  | 1.0 mA max.   |  |
| <b>Input current</b>                                     | 3.0 mA min./input (at 10.5 VDC)   |  | 3.0 mA min./input (at 10.5 VDC)   |  |
| <b>Sensor power supply voltage</b>                       | Communications power supply voltage 0 V (max.)<br>Communications power supply voltage -1 V (min.) |  | Communications power supply voltage 0 V (max.)<br>Communications power supply voltage -1 V (min.) |  |
| <b>ON delay</b>  | 1.5 ms max.   |  | 1.5 ms max.   |  |
| <b>OFF delay</b>   | 1.5 ms max.   |  | 1.5 ms max.   |  |
| <b>Number of circuits per common</b>                     | 2 inputs/common   |  | 4 inputs/common   |  |
| <b>Power short-circuit detection</b>                     | Not supported.  |  | Not supported.  |  |
| <b>Isolation method</b>                                  | No isolation  |  | No isolation  |  |
| <b>Input indicators</b>                                  | LEDs (yellow)   |  | LEDs (yellow)   |  |
| <b>Degree of protection</b>                              | IEC standard IP20   |  | IEC standard IP20   |  |
| <b>Installation</b>                                      | M4 screw mounting using CRT1B-ATT03 Mounting Bracket  |  | M4 screw mounting using CRT1B-ATT03 Mounting Bracket  |  |
| <b>Power supply type</b>                                 | Network power supply  |  | Network power supply  |  |
| <b>Communications power supply current consumption *</b> | 25 mA max. for 24-VDC power supply voltage<br>30 mA max. for 14-VDC power supply voltage          |  | 35 mA max. for 24-VDC power supply voltage<br>40 mA max. for 14-VDC power supply voltage          |  |
| <b>Input device supply current</b>                       | 50 mA/point (G terminal)  | 50 mA/point (V terminal)                                       | 50 mA/point (G terminal)  | 50 mA/point (V terminal)                                       |
| <b>Weight</b>  | 16 g max.   |  | 21 g max.   |  |

\* The current consumption is for Bit Slave Unit communications current when all inputs are OFF, i.e., it does not include input device current consumption. The communications power supply is also used for the I/O power supply for sensors. Be sure to consider the sensor current consumption and the number of sensors connected in addition to the communications power.

The power supply current consumption is expressed by the following formula.

Communications power supply current consumption = Bit Slave Unit communications current consumption + (Bit Slave Unit input current × number of inputs used) + (sensor current consumption × number of sensors used)

## Output Section Specifications

| Item  | Specification   |  |   |  |
|---|---|--|---|--|
| Model   | CRT1B-OD02JS  | CRT1B-OD02JS-1   | CRT1B-OD04JS  | CRT1B-OD04JS-1   |
| I/O capacity                                      | 2 outputs   |  | 4 outputs   |  |
| Internal I/O common                               | NPN   | PNP  | NPN   | PNP  |
| ON voltage  | 0.1 A/output  |  | 0.1 A/output  |  |
| OFF voltage                                       | Communications power supply voltage 0 V (max.)<br>Communications power supply voltage -1.2 V (min.) |  | Communications power supply voltage 0 V (max.)<br>Communications power supply voltage -1.2 V (min.) |  |
| OFF current                                       | 1.2 V max. (0.1 A DC,<br>between each output terminal<br>and G terminal)                            | 1.2 V max. (0.1 A DC,<br>between each output terminal<br>and V terminal) | 1.2 V max. (0.1 A DC,<br>between each output terminal<br>and G terminal)                            | 1.2 V max. (0.1 A DC,<br>between each output terminal<br>and V terminal) |
| Input current                                     | 0.1 mA max.   |  | 0.1 mA max.   |  |
| Sensor power supply voltage                       | 0.5 ms max.   |  | 0.5 ms max.   |  |
| ON delay  | 1.5 ms max.   |  | 1.5 ms max.   |  |
| OFF delay   | 2 outputs/common  |  | 4 outputs/common  |  |
| Number of circuits per common                     | Not supported.  |  | Not supported.  |  |
| Power short-circuit detection                     | No isolation  |  | No isolation  |  |
| Isolation method                                  | LEDs (yellow)   |  | LEDs (yellow)   |  |
| Input indicators                                  | IEC standard IP20   |  | IEC standard IP20   |  |
| Degree of protection                              | M4 screw mounting using CRT1B-ATT03 Mounting Bracket  |  | M4 screw mounting using CRT1B-ATT03 Mounting Bracket  |  |
| Installation                                      | Network power supply  |  | Network power supply  |  |
| Power supply type                                 | 25 mA max. for 24-VDC power supply voltage<br>30 mA max. for 14-VDC power supply voltage            |  | 30 mA max. for 24-VDC power supply voltage<br>35 mA max. for 14-VDC power supply voltage            |  |
| Communications power supply current consumption * | 30 mA/point (G terminal)  | 30 mA/point (V terminal)   | 30 mA/point (G terminal)  | 30 mA/point (V terminal)   |
| Input device supply current                       | 16 g max.   |  | 21 g max.   |  |
| Weight  | Specification   |  | CRT1B-OD04JS  | CRT1B-OD04JS-1   |

\* The current consumption is for Bit Slave Unit communications current when all outputs are OFF, i.e., it does not include the output device load current consumption. The communications power supply is also used for the I/O power supply for actuators. Be sure to consider the actuator load current consumption and the number of sensors connected in addition to the communications power. The power supply current consumption is expressed by the following formula.

$$\text{Communications power supply current consumption} = \text{Bit Slave Unit communications current consumption} + (\text{actual load current} \times \text{number of actuators used})$$

## Input and Output Section Specifications

### ● 1-point Input and 1-point Output units

#### Input Section Specification

| Item  | Specification   |   |
|---|---|---|
|   | CRT1B-MD02JS  | CRT1B-MD02JS-1  |
| Model   | CRT1B-MD02JS  | CRT1B-MD02JS-1  |
| I/O capacity                                      | 1 input   |   |
| Internal I/O common                               | NPN   | PNP   |
| ON voltage  | 10.5 VDC min.<br>(between each input terminal and the V terminal)                                       | 10.5 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                                       | ---   | ---   |
| OFF current                                       | 1.0 mA max.   |   |
| Input current                                     | 3.0 mA min./input (at 10.5 VDC)   |   |
| Sensor power supply voltage                       | Communications power supply voltage<br>0 V (max.)<br>Communications power supply voltage<br>-1 V (min.) |   |
| ON delay  | 1.5 ms max.   |   |
| OFF delay   | 1.5 ms max.   |   |
| Number of circuits per common                     | 1 input/common  |   |
| Power short-circuit detection                     | Not supported.  |   |
| Isolation method                                  | No isolation  |   |
| Input indicators                                  | LEDs (yellow)   |   |
| Degree of protection                              | IEC standard IP20   |   |
| Installation                                      | M4 screw mounting using CRT1B-ATT03 Mounting Bracket  |   |
| Power supply type                                 | Network power supply  |   |
| Communications power supply current consumption * | 25 mA max. for 24-VDC power supply voltage<br>30 mA max. for 14-VDC power supply voltage                |   |
| Input device supply current                       | 50 mA/point<br>(G terminal)   | 50 mA/point<br>(V terminal)                                       |
| Weight  | 16 g max.   |   |

#### Output Section Specification

| Item                          | Specification   |   |
|-------------------------------|---|---|
|                               | CRT1B-MD02JS  | CRT1B-MD02JS-1  |
| Model                         | CRT1B-MD02JS  | CRT1B-MD02JS-1  |
| I/O capacity                  | 1 output  |   |
| Internal I/O common           | NPN   | PNP   |
| Rated output current          | 0.1 A/output  |   |
| Load power supply voltage     | Communications power supply voltage<br>0 V (max.)<br>Communications power supply voltage<br>-1.2 V (min.) |   |
| Residual voltage              | 1.2 V max. (DC, 0.1 A, between each output terminal and G terminal)                                       | 1.2 V max. (DC, 0.1 A, between each output terminal and V terminal) |
| Leakage current               | 0.1 mA max.   |   |
| ON delay                      | 0.5 ms max.   |   |
| OFF delay                     | 1.5 ms max.   |   |
| Number of circuits per common | 1 output/common   |   |
| Load short-circuit detection  | Not supported.  |   |
| Isolation method              | No isolation  |   |
| Output indicators             | LEDs (yellow)   |   |
| Degree of protection          | IEC standard IP20   |   |
| Installation                  | M4 screw mounting using CRT1B-ATT03 Mounting Bracket  |   |
| Power supply type             | Network power supply  |   |
| Output device supply current  | 30 mA/point<br>(G terminal)   | 30 mA/point<br>(V terminal)   |

\* The current consumption is for Bit Slave Unit communications current when all inputs are OFF, i.e., it does not include input device current consumption. The communications power supply is also used for the I/O power supply for sensors. Be sure to consider the sensor current consumption and the number of sensors connected in addition to the communications power. The power supply current consumption is expressed by the following formula.

Communications power supply current consumption = Bit Slave Unit communications current consumption + (Bit Slave Unit input current × number of inputs used) + (sensor current consumption × number of sensors used)

● 2-points Inputs and 2-points Outputs units

Input Section Specification

| Item  | Specification   |   |
|---|---|---|
| Model   | CRT1B-MD04JS  | CRT1B-MD04JS-1  |
| I/O capacity                                      | 2 inputs  |   |
| Internal I/O common                               | NPN   | PNP   |
| ON voltage  | 10.5 VDC min.<br>(between each input terminal and the V terminal)                                       | 10.5 VDC min.<br>(between each input terminal and the G terminal) |
| OFF voltage                                       | ---   | ---   |
| OFF current                                       | 1.0 mA max.   |   |
| Input current                                     | 3.0 mA min./input (at 10.5 VDC)   |   |
| Sensor power supply voltage                       | Communications power supply voltage<br>0 V (max.)<br>Communications power supply voltage<br>-1 V (min.) |   |
| ON delay  | 1.5 ms max.   |   |
| OFF delay   | 1.5 ms max.   |   |
| Number of circuits per common                     | 2 inputs/common   |   |
| Power short-circuit detection                     | Not supported.  |   |
| Isolation method                                  | No isolation  |   |
| Input indicators                                  | LEDs (yellow)   |   |
| Degree of protection                              | IEC standard IP20   |   |
| Installation                                      | M4 screw mounting using CRT1B-ATT03 Mounting Bracket  |   |
| Power supply type                                 | Network power supply  |   |
| Communications power supply current consumption * | 35 mA max. for 24-VDC power supply voltage<br>40 mA max. for 14-VDC power supply voltage                |   |
| Input device supply current                       | 50 mA/point<br>(G terminal)   | 50 mA/point<br>(V terminal)                                       |
| Weight  | 21 g max.   |   |

Output Section Specification

| Item                          | Specification   |   |
|-------------------------------|---|---|
| Model                         | CRT1B-MD04JS  | CRT1B-MD04JS-1  |
| I/O capacity                  | 2 outputs   |   |
| Internal I/O common           | NPN   | PNP   |
| Rated output current          | 0.1 A/output  |   |
| Load power supply voltage     | Communications power supply voltage<br>0 V (max.)<br>Communications power supply voltage<br>-1.2 V (min.) |   |
| Residual voltage              | 1.2 V max. (DC, 0.1 A, between each output terminal and G terminal)                                       | 1.2 V max. (DC, 0.1 A, between each output terminal and V terminal) |
| Leakage current               | 0.1 mA max.   |   |
| ON delay                      | 0.5 ms max.   |   |
| OFF delay                     | 1.5 ms max.   |   |
| Number of circuits per common | 2 outputs/common  |   |
| Load short-circuit detection  | Not supported.  |   |
| Isolation method              | No isolation  |   |
| Output indicators             | LEDs (yellow)   |   |
| Degree of protection          | IEC standard IP20   |   |
| Installation                  | M4 screw mounting using CRT1B-ATT03 Mounting Bracket  |   |
| Power supply type             | Network power supply  |   |
| Output device supply current  | 30 mA/point<br>(G terminal)   | 30 mA/point<br>(V terminal)   |

\* The current consumption is for Bit Slave Unit communications current when all inputs are OFF, i.e., it does not include input device current consumption. The communications power supply is also used for the I/O power supply for sensors. Be sure to consider the sensor current consumption and the number of sensors connected in addition to the communications power. The power supply current consumption is expressed by the following formula.

Communications power supply current consumption = Bit Slave Unit communications current consumption + (Bit Slave Unit input current × number of inputs used) + (sensor current consumption × number of sensors used)

**Wiring**

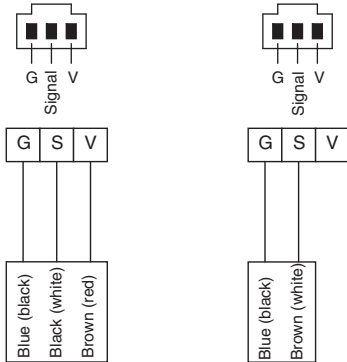
Wire colors have been changed according to revisions in the JIS standards for photoelectric and proximity sensors. The colors in parentheses are the wire colors prior to the revisions.

The I/O connector section uses compact connectors. Pin arrangements and signals are shown below. The figure of connector shows the side to insert cables.

● **2-points Inputs/4-points Inputs type**

**CRT1B-ID02JS (NPN)**

**CRT1B-ID04JS (NPN)**

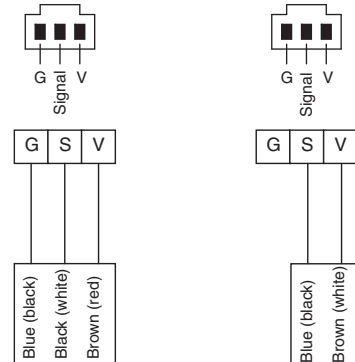


3-wire sensor with NPN output (photoelectric sensor or proximity sensor)

2-wire sensor (e.g., limit switch)

**CRT1B-ID02JS-1 (PNP)**

**CRT1B-ID04JS-1 (PNP)**



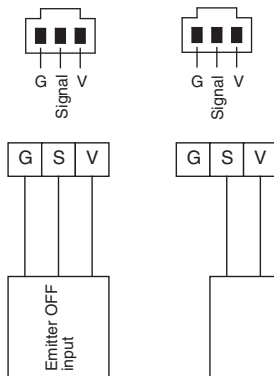
3-wire sensor with PNP output (photoelectric sensor or proximity sensor)

2-wire sensor (e.g., limit switch)

● **2-points Outputs/4-points Outputs type**

**CRT1B-OD02JS (NPN)**

**CRT1B-OD04JS (NPN)**

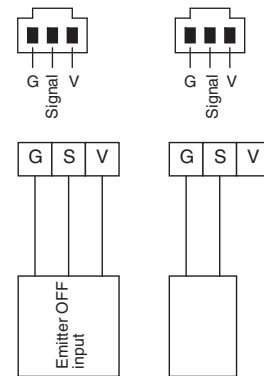


Photoelectric sensor, emitter, etc.

Solenoid, valve, etc.

**CRT1B-OD02JS-1 (PNP)**

**CRT1B-OD04JS-1 (PNP)**



Photoelectric sensor, emitter, etc.

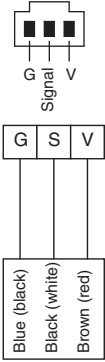
Solenoid, valve, etc.

● 1-point Input/1-point Output type, 2-points Inputs/2-points Outputs type

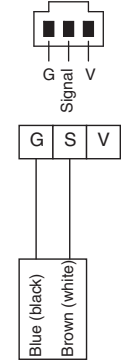
**CRT1B-MD02JS (NPN)**

**CRT1B-MD04JS (NPN)**

Input Connectors

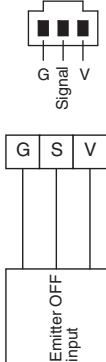


3-wire sensor with NPN output (photoelectric sensor or proximity sensor)

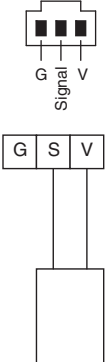


2-wire sensor (e.g., limit switch)

Output Connectors



Photoelectric sensor, emitter, etc.

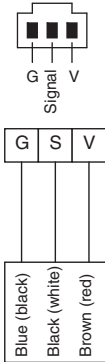


Solenoid, valve, etc.

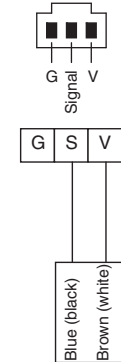
**CRT1B-MD02JS-1 (PNP)**

**CRT1B-MD04JS-1 (PNP)**

Input Connectors

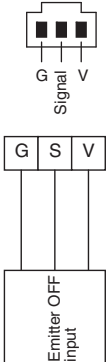


3-wire sensor with PNP output (photoelectric sensor or proximity sensor)

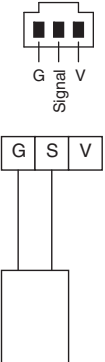


2-wire sensor (e.g., limit switch)

Output Connectors



Photoelectric sensor, emitter, etc.



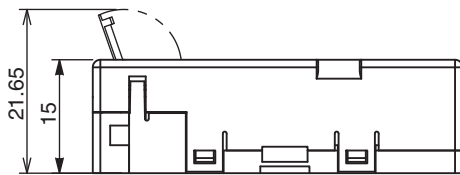
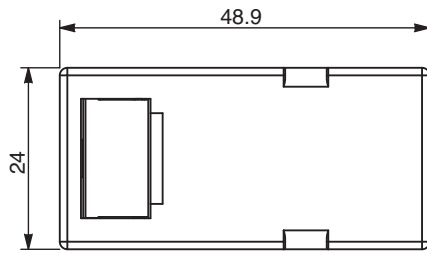
Solenoid, valve, etc.

**Dimensions**

(Unit: mm)

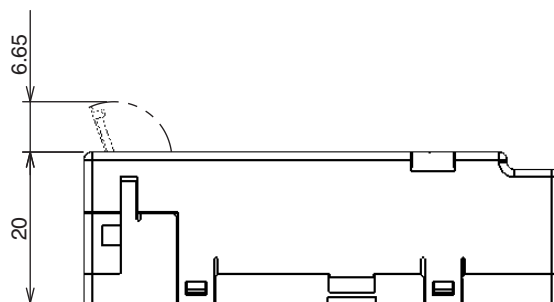
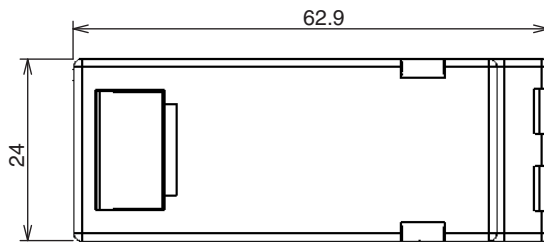
● 2-points Inputs, 2-points Outputs, 1-point Input/1-point Output type

- CRT1B-ID02JS
- CRT1B-ID02JS-1
- CRT1B-OD02JS
- CRT1B-OD02JS-1
- CRT1B-MD02JS
- CRT1B-MD02JS-1



● 4-points Inputs, 4-points Outputs, 2-points Inputs/2-points Outputs type

- CRT1B-ID04JS
- CRT1B-ID04JS-1
- CRT1B-OD04JS
- CRT1B-OD04JS-1
- CRT1B-MD04JS
- CRT1B-MD04JS-1





## Read and Understand This Catalog

Please read and understand this catalog before purchasing the products. Please consult your OMRON representative if you have any questions or comments.

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## Application Considerations

### SUITABILITY FOR USE

OMRON shall not be responsible for conformity with any standards, codes, or regulations that apply to the combination of products in the customer's application or use of the products.

At the customer's request, OMRON will provide applicable third party certification documents identifying ratings and limitations of use that apply to the products. This information by itself is not sufficient for a complete determination of the suitability of the products in combination with the end product, machine, system, or other application or use.

The following are some examples of applications for which particular attention must be given. This is not intended to be an exhaustive list of all possible uses of the products, nor is it intended to imply that the uses listed may be suitable for the products:

- Outdoor use, uses involving potential chemical contamination or electrical interference, or conditions or uses not described in this catalog.
- Nuclear energy control systems, combustion systems, railroad systems, aviation systems, medical equipment, amusement machines, vehicles, safety equipment, and installations subject to separate industry or government regulations.
- 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.

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

**OMRON Corporation**  
Industrial Automation Company

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