# Specifications

## ■ Characteristics

### General

| | Normal speed | High speed |
|---|---|---|
| **Communications method** | Unidirectional, time-division multiplex | |
| **Transmission distance (see note 1)** | 500 m max. | 100 m max. (see note 2) |
| **I/O delay time** | Typical: 19.2 ms; 31 ms max. | Typical: 3 ms; 5 ms max. |
| **Minimum input time (see note 3)** | 16 ms | 2.4 ms |
| **Operating voltage range** | 12 to 24 VDC (10.8 to 26.4 VDC) (see note 1) | |
| **Insulation resistance** | 100 MΩ min. (500 V) between each terminal and external parts | |
| **Dielectric strength** | 1,000 VAC, 50/60 Hz for 1 min between each terminal and external parts | |
| **Noise immunity (see note 4)** | Noise level: 1.5 kV; pulse width: 100 ns to 1 μs (on transmission line due to coupling) | |
| **Vibration resistance** | 10 to 55 Hz, 1.5-mm double amplitude | |
| **Shock resistance** | 300 $m/s^2$ | |
| **Ambient temperature** | Operating: –10 to 55°C (with no icing)<br>Storage: –25 to 65°C (with no icing) | |
| **Ambient humidity** | Operating: 35% to 85% (with no condensation) | |

**Note:** 1. The transmission distance values stated in this table are possible if the Input or Output Link Terminal is connected to an independent power supply. If a single power supply is connected to the Input or Output Link Terminal, the supply voltage must be 24 VDC ±10%, in which case the transmission distance of a normal-speed model is 100 m maximum and that of a high-speed model is 50 m maximum. Refer to *Power Supply* on page 21 for details.

2. A shielded transmission cable or a VCTF cable with a thickness of 0.75 $mm^2$ minimum must be used for signal transmission. If the VCTF cable is used, however, the transmission distance will be 10 m maximum regardless of whether or not independent power supplies for the Input and the Output Link Terminals are used.

3. The minimum input time is required for the B7A/B7AS to read an input signal.

4. For high-speed models, these values are possible without grounding the shielded line.

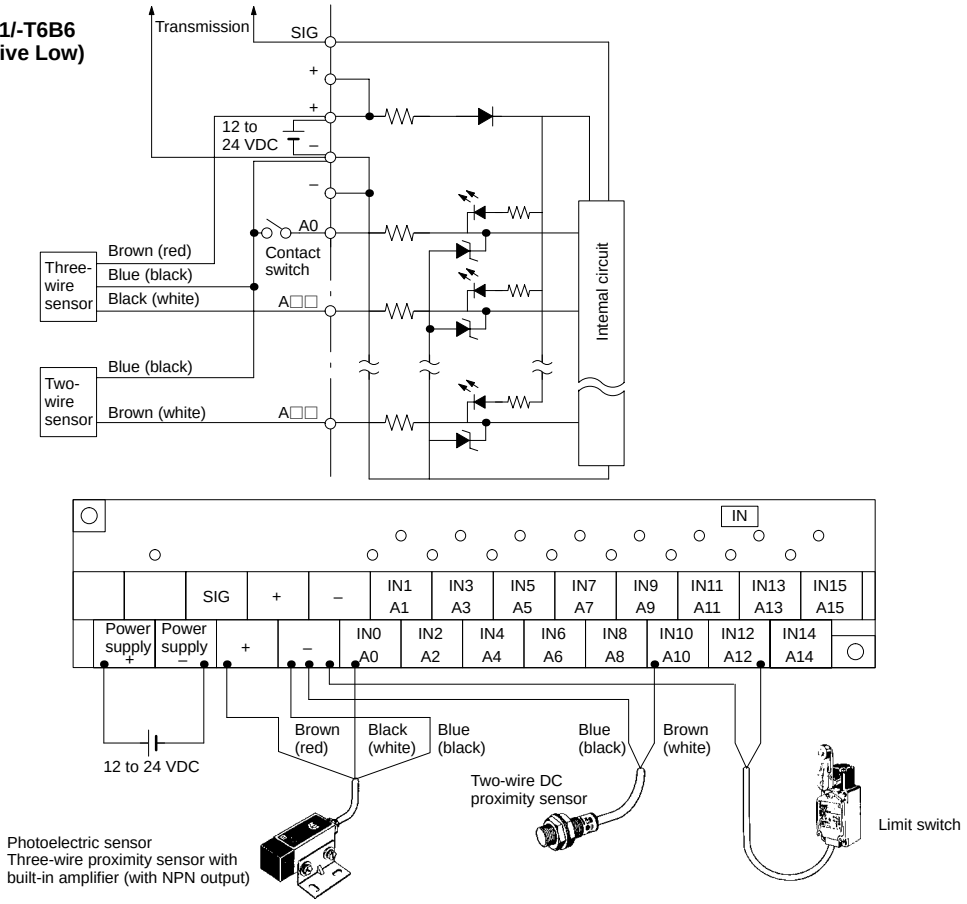
### Input Models

| Item | Screw terminal models | | |
|---|---|---|---|
| | **B7A-T6A1/-T6A6** | **B7A-T6B1/-T6B6** | **B7AS-T6B1/-T6B6** |
| **Compatible inputs (see note 1)** | Switches, two-wire sensors with DC output, three-wire NPN sensors | | |
| **Input logic** | Active low | | |
| **I/O delay time** | B7A□-T6□1: normal speed (typical 19.2 ms); B7A□-T6□6: high speed (typical 3 ms) | | |
| **Current consumption (see note 2)** | 120 mA max. with all input terminals ON | | |
| **Operating voltage range** | 12 to 24 VDC | | |
| **Input voltage range** | 0 VDC to supply voltage | | |
| **Input current range** | –6 to –3 mA/point (current flowing from input terminals) | | |
| **Minimum input time** | B7A□-T6□1: 16 ms; B7A□-T6□6: 2.4 ms | | |
| **ON/OFF threshold** | No-contact input:<br>ON voltage: 4 V max.<br>OFF voltage: 6 V min.<br>Contact input:<br>ON discrimination resistance: 660 Ω max.<br>OFF discrimination resistance: 2 kΩ min. | | |
| **Mounting strength** | No damage when 49-N pull is applied for 1 min each in all directions (except in direction of DIN track) | | |
| **Terminal strength** | No damage when 49-N pull is applied each in all directions | | |
| **Tightening torque** | 0.78 to 1.18 N • m | | |
| **Weight** | Approx. 160 g | | Approx. 130 g |

**Note:** 1. All B terminals of the B7A-T6A□ are negative terminals; power must be supplied to the three-wire sensor via the positive power supply terminal or from an independent power supply.
Two-wire sensors must satisfy the following requirements:
Residual voltage: 4 V max.
Current leakage: 1.5 mA max.
The lower limit of control output: 3 mA (Use a breeder resister to eliminate this restriction.)

2. Consumption when all 16 points are ON. Excludes external sensor current for Input Terminals.

**B7AS-T6B1/-T6B6**
**(Input, Active Low)**



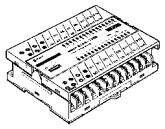

**Note:** 1. The wire colors have been changed in accordance with the revision of the Japanese Industrial Standards for photoelectric sensors and proximity sensors. The colors in parentheses refer to the old colors.

2. Do not short-circuit the SIG terminal with the positive power supply terminal, negative power supply terminal, or a B□□ terminal, otherwise the internal elements of the B7A will be damaged and no transmission will be possible.

## ■ Product List

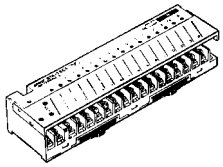
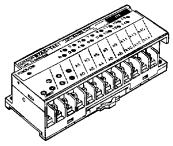
### 32-point Terminals

**Screw Terminal Models**

| Appearance | Model | I/O classification | I/O configuration | I/O delay time (typical) | Internal I/O common | Error processing (see note 1) | Approved standards |
|---|---|---|---|---|---|---|---|
|  | **B7AS-T3BS** | Input | NPN compatible | Normal speed 19.2 ms<br>High speed 3 ms<br>(switch selectable) | +/– common | --- | U, CU, CE |

### 16-point Terminals

**Screw Terminal Models**

| Appearance | Model | I/O classification | I/O configuration | I/O delay time (typical) | Internal I/O common | Error processing (see note 1) | Approved standards |
|---|---|---|---|---|---|---|---|
|  | **B7A-T6A1 (see note 2)** | Input | NPN compatible | Normal speed 19.2 ms | – common | --- | U, C, CE |
| | **B7A-T6B1 (see note 2)** | | | | +/– common | --- | |
| | **B7A-T6C1** | | PNP compatible | | +/– common | --- | |
| | **B7A-T6A6 (see note 2)** | | NPN compatible | High speed 3 ms | – common | --- | |
| | **B7A-T6B6 (see note 2)** | | | | +/– common | --- | |
| | **B7A-T6C6** | | PNP compatible | | +/– common | --- | |
| | **B7A-R6B11** | Output | NPN open collector 100 mA/point | Normal speed 19.2 ms | + common | HOLD | U, C, CE |
| | **B7A-R6B31** | | | | | LOAD OFF | |
| | **B7A-R6C11** | | NPN open collector 500 mA/point (see note 3) | | | HOLD | CE |
| | **B7A-R6C31** | | | | | LOAD OFF | |
| | **B7A-R6F11** | | PNP open collector 100 mA/point | | – common | HOLD | U, C, CE |
| | **B7A-R6F31** | | | | | LOAD OFF | |
| | **B7A-R6G11** | | PNP open collector 500 mA/point (see note 4) | | | HOLD | CE |
| | **B7A-R6G31** | | | | | LOAD OFF | |
| | **B7A-R6B16** | | NPN open collector 100 mA/point | High speed 3 ms | + common | HOLD | U, C, CE |
| | **B7A-R6B36** | | | | | LOAD OFF | |
| | **B7A-R6C16** | | NPN open collector 500 mA/point (see note 3) | | | HOLD | CE |
| | **B7A-R6C36** | | | | | LOAD OFF | |
| | **B7A-R6F16** | | PNP open collector 100 mA/point | | – common | HOLD | U, C, CE |
| | **B7A-R6F36** | | | | | LOAD OFF | |
| | **B7A-R6G16** | | PNP open collector 500 mA/point (see note 4) | | | HOLD | CE |
| | **B7A-R6G36** | | | | | LOAD OFF | |
|  | **B7AS-T6B1** | Input | NPN compatible | Normal speed 19.2 ms | +/– common | --- | U, CU, CE |
| | **B7AS-T6B6** | | | High speed 3 ms | | --- | |
| | **B7AS-R6B11** | Output | NPN open collector 100 mA/point | Normal speed 19.2 ms | | HOLD | U, CU, CE |
| | **B7AS-R6B31** | | | | | LOAD OFF | |
| | **B7AS-R6B16** | | | High speed 3 ms | | HOLD | |
| | **B7AS-R6B36** | | | | | LOAD OFF | |

**Note:** 1. HOLD: The previous output condition will be on hold when an error results.
LOAD OFF: All outputs will be OFF when an error results.