

Water-resistive Transmission Unit

- Compact and satisfies the requirements of IP67.
- Incorporating an FA connector for limit switches, proximity sensors, and photoelectric sensors.
- Transmits 10 input signals.
- Incorporating easy-to-see indicators for I/O signal monitoring.



Ordering Information

■ Model Number Legend

B7AC - T 10 A 1 - A
 1 2 3 4 5 6

1. Classification

C: FA connector model

2. Input/Output Classification

T: Input

3. Number of I/O

10: 10 points

4. FA Connector/Contact Arrangement

A: M12/type A (Refer to page 79 for details.)

5. I/O Delay Time (Typical)

1: 19.2 ms

6. I/O Delay Selection (19.2 ms/3 ms)/Input Configuration

None: Without selection function/NPN

A: With selection function/NPN

B: With selection function/PNP

■ Product List

Refer to page 114 for details.

■ I/O Combinations

Refer to pages 1 to 5 for details.

■ Accessories (Attachment)

Name	Model	Material	Suitable connector	
			Model	Mounting part
Waterproof Cover	XS2Z-11	Aluminum/white	XS2G/XS2H/XS2M/XS2R	M12 male screw
	XS2Z-12		XS2C/XS2R/XS2F/XS2P	M12 female screw (with mounting bracket)
Dust Cover	XS2Z-13	Polyvinyl chloride/transparent	XS2G/XS2H/XS2M/XS2R	M12 male screw
	XS2Z-14	Polyvinyl chloride/red	XS2C/XS2R/XS2F/XS2P	M12 female screw (with mounting bracket)
	XS2Z-15			Contact block (female contact)

■ Suitable Connectors

Be sure to put the XS2Z-12 Waterproof Cover or XS2Z-15 Dust Cover on any unused connector.

For Input (Connector No. 0 to 9)

XS2G-D4□□	Assembling connector (crimp-style/solder-type/screw-type) plug
XS2H-D421-□□□	Cable with a connector (plug) at one end
XS2W-D42□-□□□	Cable with connectors at both ends (socket and plug)

For Transmission Path and Power Supply Line (Connector No. P)

XS2C-D4□□	Assembling connector (crimp-style/solder-type/screw-type) socket
XS2F-D42□-□80	Cable with a connector at one end (socket)

Specifications

■ Characteristics

General

Communications method	Unidirectional, time-division multiplex
Transmission distance	100 m max.
I/O delay time	Typical: 19.2 ms; 31 ms max.
Minimum input time (see note)	16 ms
Operating voltage range	24 VDC (21.6 to 26.4 VDC)
Insulation resistance	100 M Ω 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	Noise level: 1.5 kV; pulse width: 100 ns to 1 μ s (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) Storage: -25 to 65°C (with no icing)
Ambient humidity	Operating: 35% to 85% (with no condensation)
Enclosure rating	IEC IP67
Weight	Approx. 420 g

Note: The minimum input time is required for the B7AC to read an input signal.

Enclosure Rating

- Do not continuously impose external force on the joint of the contact block and cover, otherwise IP67 may not be maintained.
- IP67 does not ensure that the B7AC is perfectly watertight. Do not use the B7AC underwater.
- The case of the B7AC is made of plastic resin. Do not put heavy objects on it.

B7AC-T10A1/B7AC-T10A1-A Input

Compatible inputs	Switches, two-wire sensors, three-wire NPN sensors
Input logic	Active low
Current consumption (see note)	120 mA max. with all input terminals ON
Input voltage range	0 VDC to supply voltage
Input current range	-5.3 to -3.6 mA/point
ON/OFF threshold	No-contact input: ON voltage: 5.5 V max. OFF voltage: 7.5 V min. Contact input: ON discrimination resistance: 1 k Ω max. OFF discrimination resistance: 2.1 k Ω min.

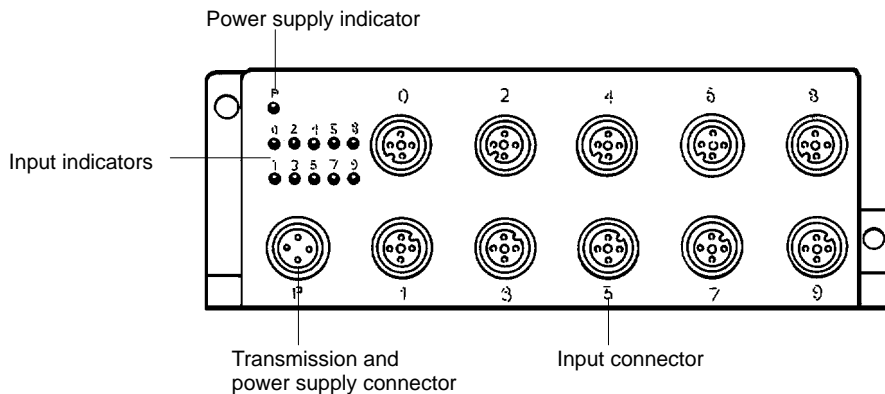
Note: Consumption when all 10 points are ON. Excludes external sensor current for Input Terminals.

B7AC-T10A1-B Input

Compatible inputs	Switches, two-wire sensors, three-wire PNP sensors
Input logic	Active high
Current consumption (see note)	120 mA max. with all input terminals ON
Input voltage range	0 VDC to supply voltage
Input current range	3.6 to 5.3 mA/point
ON/OFF threshold	No-contact input: ON voltage: Power supply voltage –5.5 V min. OFF voltage: Power supply voltage –7.5 V max. Contact input: ON discrimination resistance: 1 kΩ max. OFF discrimination resistance: 2.1 kΩ min.

Note: Consumption when all 10 points are ON. Excludes external sensor current for Input Terminals.

Nomenclature



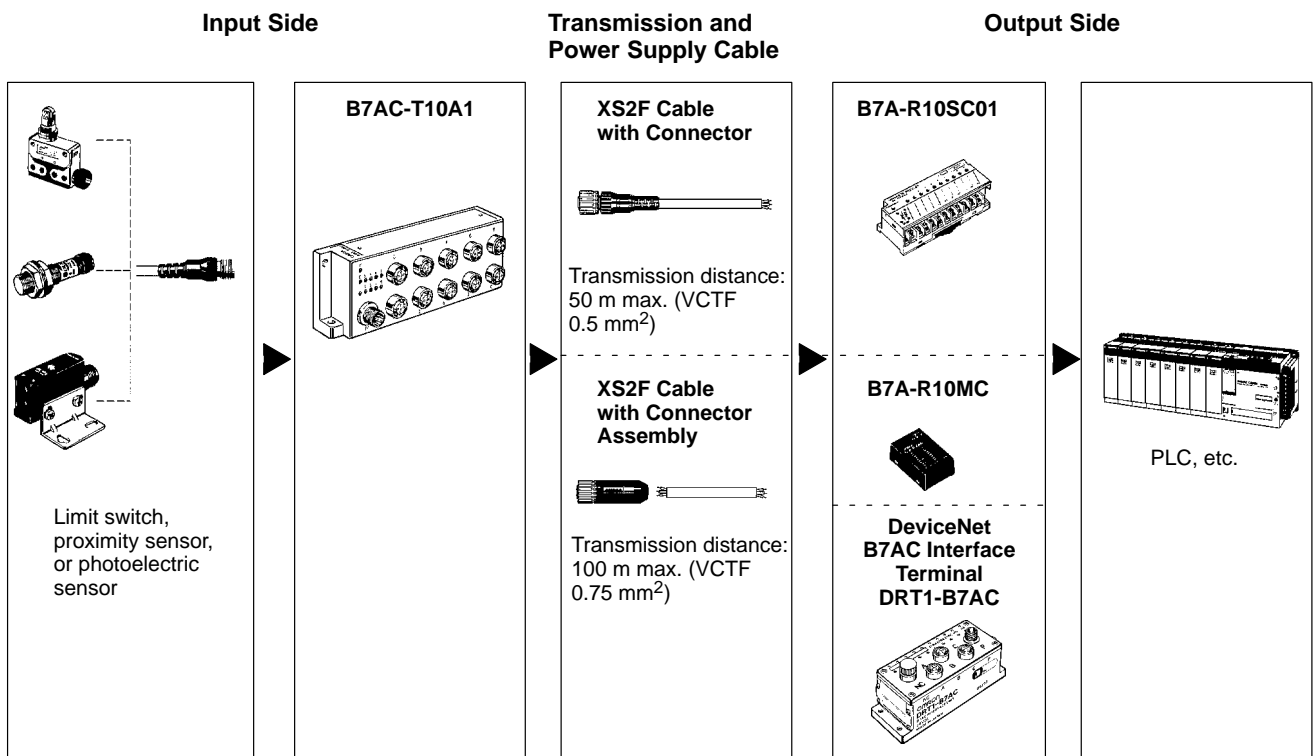
Indicator Operation

Indicator	Function
POWER	G Lit when power is supplied and the Terminal is operating.
	N Not lit when power is not supplied.
Input	O Lit when the input signals are ON.
	N Not lit when the signals are OFF.

Note: G: Green indicator lit; O: Orange indicator lit; N: Not lit

Operation

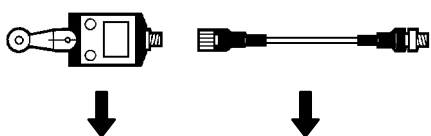
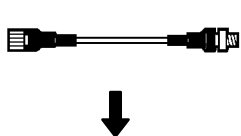
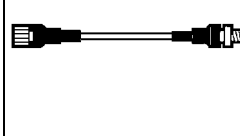
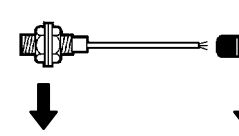
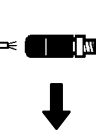
■ System Configuration



Note: Refer to the FA Connector Catalog for details on connectors.

↓
24 VDC power supply

■ Connecting Input Devices

Input Devices		Direct connection		Joint connection	Pre-wired	Pre-wired
						
B7AC-T10A1, B7AC-T10A1-A	Limit switch	WL□-□K13 D4E-□□10N (see note)	XS2W-D42□-□81-A	WL□-□DK1EJ□ D4C-□0□□-DK1EJ□ (see note)	Refer to the following conditions required for connectable input devices.	XS2G
	Proximity sensor	E2E-X2E1-P1 E2E-X5ME1-P1 E2E-X5E1-P1 E2E-X10ME1-P1 E2E-X10E1-P1 E2E-X18ME1-P1		E2E-X3D1-M1J-T E2E-X7D1-M1J-T E2E-X10D1-M1J-T		
	Photoelectric sensor	E3S-AT16 E3S-AT66 E3S-AD16 E3S-AD17 E3S-AD66 E3S-AD67 E3S-AR16 E3S-AR66		E3S-AT11-M1J E3S-AT61-M1J		
B7AC-T10A1-B	Limit switch	D4CC		WL□-□M1GJ D4C-□0□□-M1GJ		
	Proximity sensor	E2E-X2E1-M1 E2E-X5ME1-M1 E2E-X5E1-M1 E2E-X10ME1-M1 E2E-X10E1-M1 E2E-X18ME1-M1		E2E-X3D1-M1GJ-T E2E-X7D1-M1GJ-T E2E-X10D1-M1GJ-T		
	Photoelectric sensor	E3S-AT36 E3S-AT86 E3S-AD36 E3S-AD37 E3S-AD86 E3S-AD87 E3S-AR36 E3S-AR86		E3S-AT31-M1GJ E3S-AT81-M1GJ		

Note: Normally open connection is possible with the limit switches listed in the above table.

Input Device Connection Conditions

Two-wire DC Sensor

Residual voltage: 5 V max.
Leakage current: 1.5 mA max.
Lower limit of control output: 3 mA max.

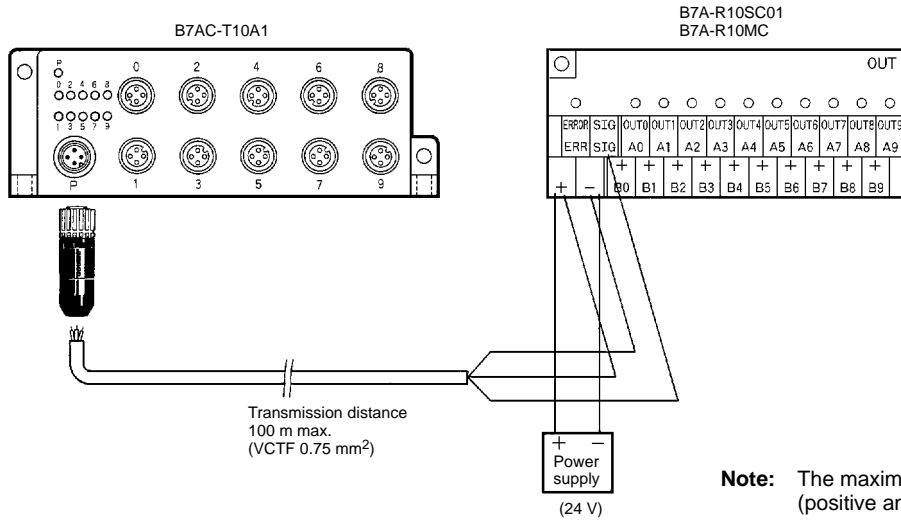
Three-wire NPN Sensor

Residual voltage: 5 V max.

Contact Switch

Leakage current: 1.5 mA max.

■ Power Supply

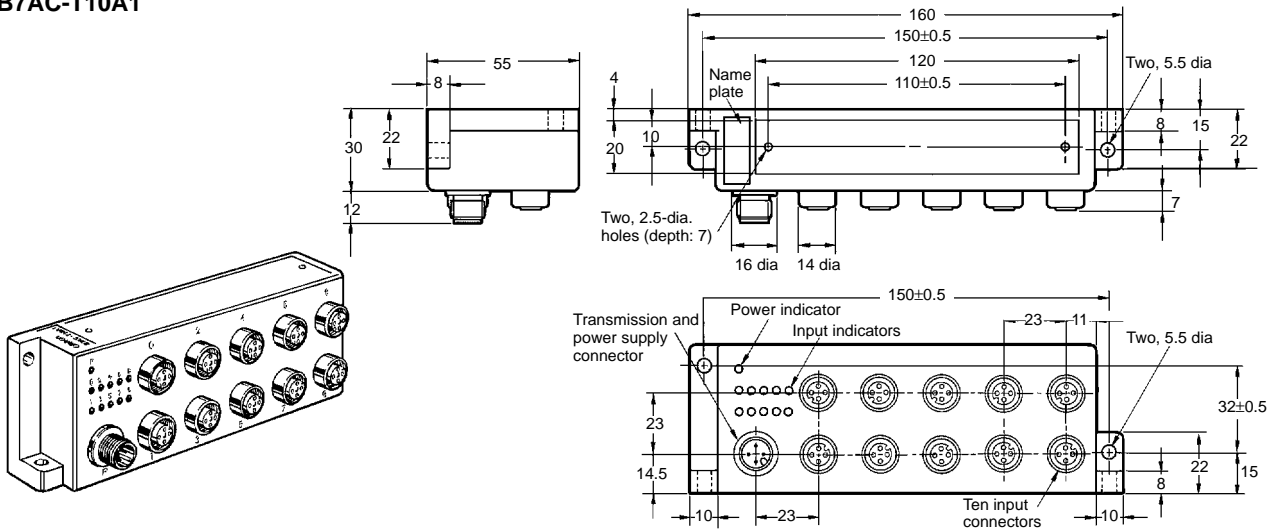


Note: The maximum current flow of the power lines (positive and negative lines) is 1.2 A max.

Dimensions

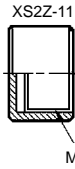
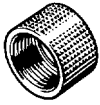
Note: All units are in millimeters unless otherwise indicated.

B7AC-T10A1



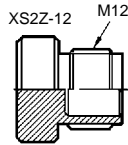
Waterproof Cover

XS2Z-11



⇒ Transmission and power supply connector

XS2Z-12

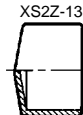


⇒ Input connector

Note: The B7AC maintains IP67 with the XS2Z-11 and XS2Z-12 Waterproof Covers. Be sure to connect the XS2Z-11 and XS2Z-12 Waterproof Covers to the connectors by hand and tighten the Waterproof Covers securely with a force of 4 to 5 kgf • cm (0.39 to 0.49 N • m).

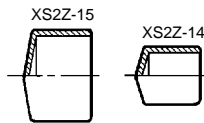
Dust Cover

XS2Z-13



⇒ Transmission and power supply connector

XS2Z-14/XS2Z-15



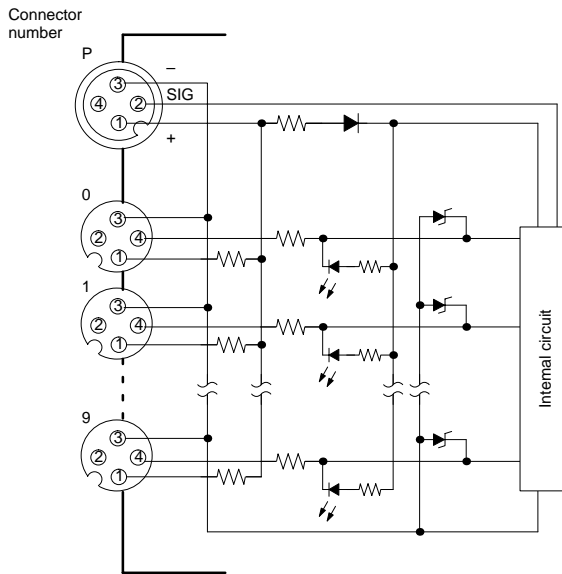
⇒ Input connector

Note: The XS2Z-13, XS2Z-14, and XS2Z-15 Dust Covers are used for dust prevention. The B7AC cannot maintain IP67 with them. Press them securely to the connector joints.

Installation

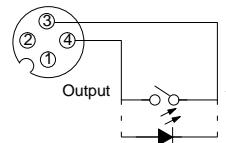
Internal Circuit

B7AC-T10A1/B7AC-T10A1-A



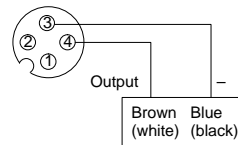
Connector No. 0 to 9 (Input)

With Contact Switch



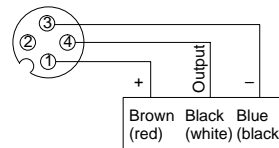
Note: The permissible current leakage is 1.5 mA max.

With Two-wire DC Sensor



Note: The contact arrangement of the two-wire DC sensor does not conform to NECA 4202.

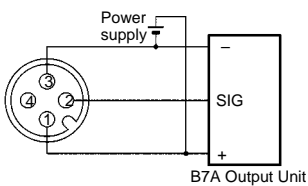
With Three-wire NPN Sensor



Note: The contact arrangement of the three-wire NPN sensor corresponds to the normally open output contact of the three-wire DC sensor of NECA 4202.

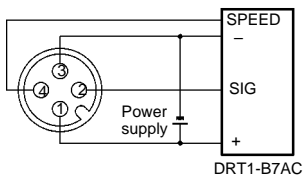
Connector No. P (Transmission)

Connection to B7A Output Unit



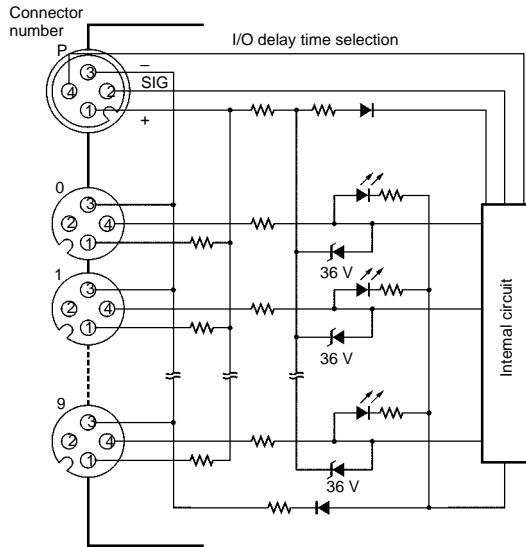
Note: No connection is required to the I/O delay selection terminal (terminal 4).

Connection to DRT1-B7AC



Note: The I/O delay time can be selected by connecting to the I/O delay selection terminal (terminal 4). Selection is made using the DRT1-B7AC's selection switch.

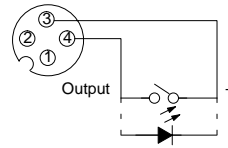
B7AC-T10A1-B



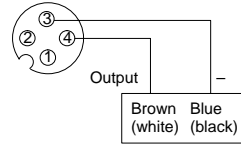
Note: Terminal 2 of connector numbers 0 to 9 is not used.

Connector No. 0 to 9 (Input)

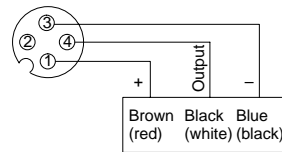
With Contact Switch



With Two-wire DC Sensor

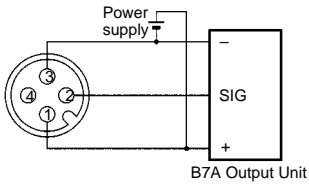


With Three-wire PNP Sensor



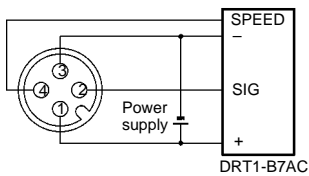
Connector No. P (Transmission)

Connection to B7A Output Unit



Note: No connection is required to the I/O delay selection terminal (terminal 4).

Connection to DRT1-B7AC



Note: The I/O delay time can be selected by connecting to the I/O delay selection terminal (terminal 4). Selection is made using the DRT1-B7AC's selection switch.