

## INSTRUCTION SHEET

### Intrinsically Safe EB3S-BN Sensor Barrier

To make sure of correct installation, wiring, operation, maintenance, and inspection of the EB3S-N sensor barrier, read this instruction sheet **B-2274-1 to 8** for intrinsically safe systems.

Make sure that this instruction sheet be kept at the final user of the EB3S-N sensor barrier.

Note: The sensor connected with the EB3S-N sensor barrier must satisfy the "Sensor power voltage" and "Sensor Signal" (chapter 1.2) and "Installations of IDEC intrinsically Safe System". See **B-2274-1 to 8**.

Connectable sensor examples:

- Intrinsically safe explosion-proof photoelectric sensor series
- Made by: TAKENAKA ELECTRONIC INDUSTRIAL CO., LTD.

### Safety Precautions

Use the EB3S-N sensor barrier only for the protection of electrical equipment used in potentially explosive atmospheres. In this instruction sheet, safety precautions are categorized in order of importance to Warning and Caution.

#### Warning

**Improper operation may cause severe personal injury or death**

- Special expertise is required to install, wire, operate, maintain, and inspect the EB3S-N sensor barrier. People without such expertise and knowledge in the installation of electrical equipment used in potentially explosive atmospheres and electric systems, relevant regulations, principle, function, and skill must not use the EB3S-N sensor barrier.

- Install the EB3S-N sensor barrier in non-hazardous areas.
- Make sure that the operating environment satisfies the specifications.

#### Caution

**Inattention might cause personal injury or damage to equipment.**

- Use the EB3S-N sensor barrier within the rated values of the specifications.
- Do not use a damaged EB3S-N sensor barrier, otherwise injury or fire may result.
- When disposing of the EB3S-N sensor barrier, do so as an industrial waste.

### 1 Specifications

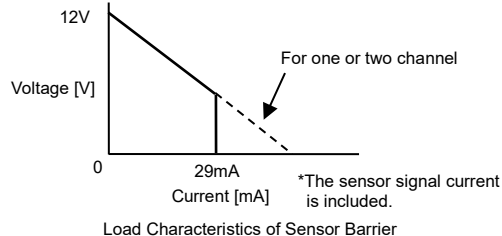
#### 1.1 Certificate

Certification Body	Applicable Standard	Performance for Type of Protection	Manual No.
JAPAN	Recommended Practices for Explosion-Protected Electrical Installations in General Industries	[Ex ia Ga] IIC [Ex ia Da] IIIC*1	B-2274-1
IECEX	IEC 60079-11		B-2274-2
EU/ATEX UK/UKCA	EN 60079-11	II(1)G[Ex ia Ga] IIC II(1)D[Ex ia Da] IIIC*1	B-2274-3
USA/FM	Class 3610 ANSI/UL60079-11	AIS Cl. I,II,III Division 1, Groups A,B,C,D,E,F,G AIS Zone 0,1 [AEx ia Ga] IIC, IIB, IIA*1	B-2274-4
CHINA/Ex-CCC	GB/T3836.4		B-2274-5
KOREA/KCS	IEC 60079-11	[Ex ia Ga] IIC [Ex ia Da] IIIC*1	B-2274-6
TAIWAN/TS	IEC 60079-11		B-2274-8

\*1: Gas class IIC(IIIC) is included in IIB(IIIB). Because explosion-proof rating parameter (Co,Lo) is IIC(IIIC), IIB(IIIB) individual, and values are different, please refer to an instruction manual for the details.

### 1.2 General specifications

Standard for Equipment	IEC60947-5-2
Degree of Protection	IP20
Operating Temperature	-20 to +60°C (no freezing)
Rated Voltage	100 to 240V AC (-15%, +10%) 24V DC (±10%)
Power Consumption	AC: 12.4VA (EB3S-BR06AN) DC: 3.7W (EB3S-BR06DN)
Sensor Power Voltage	Rated voltage: 7V DC 6.4V min. at 14 mA
Sensor Signal	Rated voltage: 7V DC Rated current: 2 mA *Sensor output: NPN open collector
Relay Output Contact Configuration: 1NO	Ui = 250V AC, 125V DC, Ith = 3A Minimum applicable load: 0.1V DC 0.1 mA (reference value)
Transistor Output (sink and source output) (1NO)	24V DC (30V max.) 100 mA Voltage drop: 1.5V max(Ta=25°C).
Inrush Current	AC: 10A (at 100V) 20A (at 200V) DC: 10A (at 24V)
Dielectric Strength	Between intrinsically safe circuit and non-intrinsically safe circuit : 1527V AC Between AC power and output terminal : 1500V AC Between DC power and transistor output terminal : 1000V AC
Terminal Style	M3 screw terminal
Mounting	35mm-wide DIN rail or panel mounting (M4 screw)
Weight (approx.)	357g (EB3S-BR06AN)



### 2 Wiring

The connection example for the two-channel barrier type.

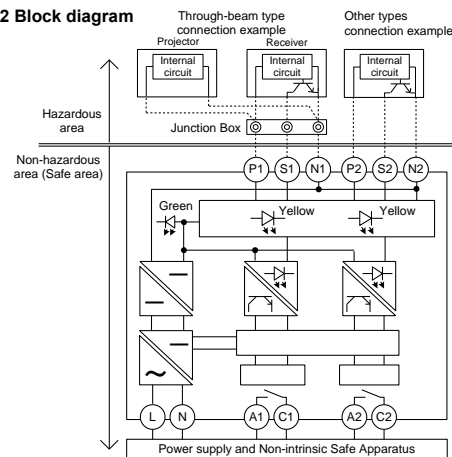
- Connect the one sensor to one channel of the barrier. The junction box is not needed when the projector is connected with the receiver in the non-hazardous area.
- Apply the + voltage to terminal A of the transistor output type. There is possibility of damage when a reverse voltage is applied.
- Turn off the power to the sensor barrier before wiring.
- The transistor output is insulated between the outputs and between the output and the internal circuit. Therefore, the output can be used in both sink and source modes.

#### 2.1 Terminal specifications

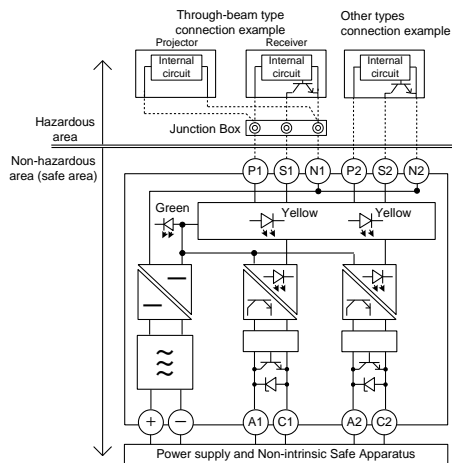
Marking	Signal
L(+)	Sensor barrier power supply
N(-)	
Pn	Sensor (+) power supply
Nn	Sensor (-) power supply
Sn	Sensor signal
An	Sensor barrier outputs
Cn	

n represents channel No.1 to 6.

### 2.2 Block diagram

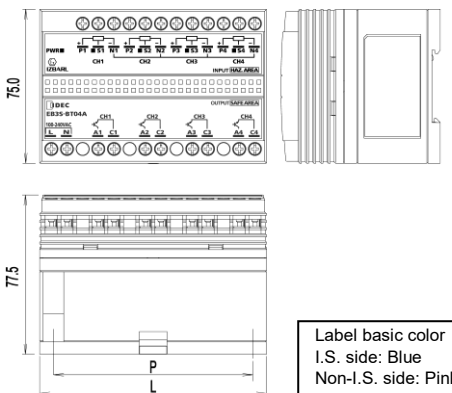


Example: AC power supply and relay output



Example: DC power supply and transistor output

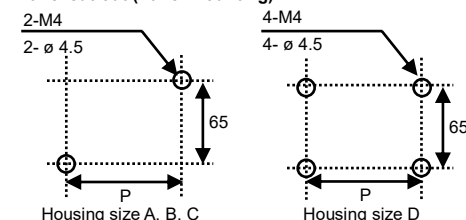
### 3 Dimensions (mm)



Label basic color  
I.S. side: Blue  
Non-I.S. side: Pink

### 4 Installation

#### 4.1 Panel cut-out (Panel mounting)



#### 4.2 Panel cut-out dimensions

Housing Size	Number of Circuits	P (mm)	L (mm)
A	1	28.0	42.0
B	2	51.0	65.0
C	4 (3)	97.0	110.5
D	6 (5)	97.0	171.5

### 5 Instructions

#### 5.1 Mounting

- The EB3S-N sensor barrier can be installed in any direction.
- Install the EB3S-N sensor barrier securely to withstand vibrations.
- When mounting the EB3S-N sensor barrier onto a DIN rail, make sure to press in the clamp completely. Use the BNL6 end clips to prevent the EB3S-N barrier from moving sideways.

#### <Ex. Disposal of Wire end>

Single core  
6 to 8 mm

Stranded wire (ferrule)  
6 to 8 mm

<Clamp Terminal>  
6 max. 6.2 min.

3 max. 5.4 min.

#### 5.2 Terminal Connection

- Provide IP20 for wiring of the EB3S-N sensor barrier. Use shielded wires for bare crimping terminals. (All Dimensions in mm)
- Using a ø6 mm or smaller screw driver, tighten the screw to a torque of 0.6 to 1.0 N-m (recommended).

#### 5.3 Output

- When required, provide a short-circuit protection externally.
- Do not apply an excessively high voltage or reverse voltage, otherwise the transistor output may be damaged.

#### 5.4 Power

- Do not apply an expressive power, otherwise the EB3S-N sensor barrier may be damaged.
- The malfunction prevention circuit operates for 300 ms or less after turning on the power supply.
- Use the EB3S-N sensor barrier 300 ms after turning on the power supply.

#### 5.5 Extraneous Noise (EMC)

- Induction of excessive noise may cause malfunction and damage to the EB3S-N sensor barrier.
- When the protection circuit (thyristor) inside the DC-DC converter operates, remove noise and restart the EB3S-N sensor barrier. Operation may be restarted.

#### 5.6 Power LED

If the POWER LED display changes from Green to Red while the barrier is in operation, it is time to replace the barrier.

Please check the instruction manual including other languages at the following URL : <https://product.idec.com/?product=EB3S-N>

**IDEC CORPORATION**

<http://www.idec.com>

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