# Installation Manual

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## Type EB3C-N Relay Barrier
## For Intrinsically Safe System [Ex ia Ga]IIC, [Ex ia Da]IIIC

Certificate No. IECEx DEK 21.0070

When installing an IDEC Type EB3C-N Relay Barrier (thereafter, called Barrier), make sure it conforms to the following drawings and descriptions as well as all applicable requirements.

IEC Standard IEC 60079-0:2017(Ed.7), IEC 60079-11:2011(Ed.6), IEC 60079-25:2010(Ed.2), IEC 60079-14:2013(Ed.5)

All intrinsically safe systems must have "EB3C-N" in the part number. Barrier must be located in a safe area (non-hazardous area). The intrinsically safe apparatus, such as the Contact certificated, approved or considered to be a "simple apparatus" such as the Switch specified by standard, may be located in the hazardous area.

- **Servicing – Replacement and Repairs:** Inspection and replacement of Barrier shall not be made until power is disconnected and shall not be connected again until all replacement Barrier are properly re-assembled. All electrical components, including the interconnecting wiring, shall be kept in safe condition. Defective Barrier should be returned to the factory for repair.

*Warning ! Substitution of components or unauthorized repair may impair intrinsic safety of apparatus.*
*To maintain intrinsic safety, the Signal input terminal (Pn-Nn) may only be connected to intrinsically safe circuits where both the wiring and the connected equipment maintain 500 V isolation to the hazardous area earthing/bonding connections.*

- **Mounting** : All bolts, nuts, screws, and other means of fastening, including the unused wiring screws, shall be fastened in place, properly tightened and secured. Mount Barrier on a 35mm track or directly mount on a panel surface using screws.
- **Certified Barrier**: Type EB3C-abcdeN "EB3C-…N"= Series type

a = Output **R**: Relay, **T**: Transistor
b = channels **01, 02, 03, 05, 06, 08, 08C, 10, 16C**(**C**: common wiring only)
c = Signal type **K**: Sink, **S**: Source (for **08C, 16C**)
d = Power supply **A**: 100~240Vac, **D**: 24Vdc
e = connection Blank: Terminal, **-C**: Connector

- **Rating and Parameters of I.S**.

Ta= 60°C, Um= 250V, Uo=13.2V, Io= 14.2mA, Po= 46.9mW at each channel Pn-Nn
Io=227.2mA, Po= 750mW at max 16 channels Pn-Nn

| Io(mA) | 14.2 | 28.4 | 42.6 | 56.8 | 71.0 | 85.2 | 99.4 | 113.6 | 127.8 | 142.0 | 156.2 | 170.4 | 184.6 | 198.8 | 213.0 | 227.2 | Combined Lo(mH) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Po(mW) | 46.9 | 93.8 | 140.6 | 187.5 | 234.3 | 281.2 | 328.1 | 374.9 | 421.8 | 468.6 | 515.5 | 562.4 | 609.2 | 656.1 | 702.9 | 750 | |
| Co(μF) | 0.67 | 0.65 | 0.63 | 0.61 | 0.59 | 0.57 | 0.55 | 0.53 | 0.51 | 0.49 | 0.47 | 0.44 | 0.42 | 0.39 | - | - | 1.0 |
| | 0.79 | 0.77 | 0.76 | 0.75 | 0.73 | 0.72 | 0.70 | 0.69 | 0.67 | 0.66 | 0.64 | 0.62 | 0.61 | 0.59 | 0.57 | 0.55 | 0.5 |
| | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.93 | 0.92 | 0.91 | 0.90 | 0.88 | 0.87 | 0.86 | 0.85 | 0.84 | 0.2 |
| | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.94 | 0.1 |

Note 1 Added to above table, the next values combined Lo and Co are allowable;

| Io(mA) | 14.2 | | | | | | | 28.4 | | | | | | | 227.2 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lo(mH) | 176* | 88.0 | 2.50 | 1.60 | 0.84 | 0.48 | 0.25 | 44.0* | 22.0 | 3.50 | 1.40 | 0.76 | 0.45 | 0.25 | 0.68* | 0.68 | 0.60 | 0.42 | 0.30 | 0.22 | 0.15 |
| Co(μF) | 0.94* | 0.47 | 0.55 | 0.60 | 0.70 | 0.80 | 0.94 | 0.94* | 0.47 | 0.48 | 0.60 | 0.70 | 0.80 | 0.93 | 0.94* | 0.45 | 0.49 | 0.60 | 0.70 | 0.80 | 0.94 |

*: Therefore, the values are allowable only at Li<1%Lo or Ci<1%Co of the intrinsic safe apparatus.

Note 2 The intrinsic safe apparatus and wirings shall be accordance to following formulas; for examples,
Ui ≥ Uo
Ii ≥ Io
Pi ≥ Po
Ci+Cc ≤ Co
Li+Lc ≤ Lo

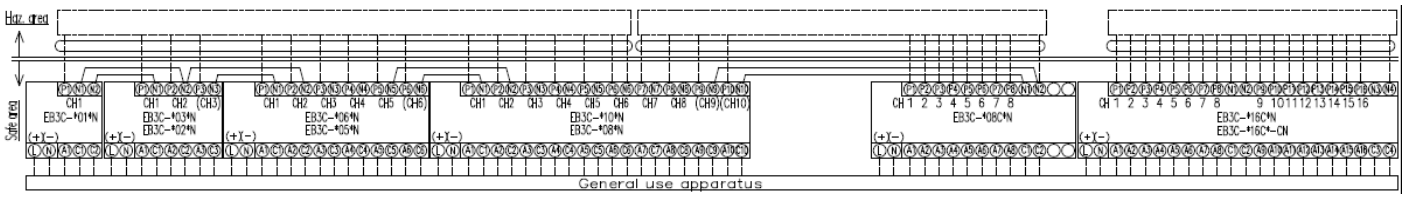
- **Typical Installation**: Install Barrier must be according to the above Ratings and Parameters of I.S. and descriptions.

To avoid electrical shock, install Barrier in a tool-accessible enclosure. Layout and wiring must be done to prevent the inductive or capacitive induction to the intrinsically safe circuit. For example, separate intrinsically safe circuits from non-intrinsically safe circuits, by a minimum space of 50mm or using a full height metal separator. If color-coding is required use for the intrinsic safe components and terminals, use only cables and terminals with light blue markings. Interconnection between the Barriers to setting Common Wiring: connect two independent wires in parallel at each two " N " terminals between adjacent the Barrier inside the panel. Maintain at least 3 mm clearance between the external connection terminals and the grounded metal part.

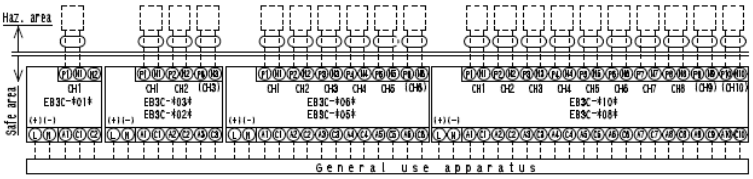
- **Dielectric Strength**: Between intrinsically safe circuit and non-intrinsically safe circuit 1526.4V AC.

**Example of connections:** The ⬭ marks indicate the samples of single intrinsic safe circuits, and ⬚ marks indicate IS apparatus.

**Common Wiring** (e.g. Io=227.2mA with 16 channels)




**Separate Wiring** (e.g. Io=14.2mA with 1 channel)




- **Operating rating**

| | | | | |
|---|---|---|---|---|
| Power input | | **EB3C-...A.** | Terminal **L - N** | 100 ~ 240V AC |
| | | **EB3C-...D.** | Terminal **+ - -** | 24V DC |
| Signal | input | **EB3C-...** | Terminal **Pn - Nn** | 12V DC, 10mA (source) |
| | output | **EB3C-R...** | Terminal / Connector **An,- Cn** | 250V, 3A (but Connector 30V, 1A) |
| | | **EB3C-T…** | | 24V DC, 100mA |

Note common terminal / connector pin: 8A / 1A