

IDEC Installation Manual

Type EB3C-N Relay Barrier

For Intrinsically Safe System II(1)G [Ex ia Ga]IIC, II(1)D [Ex ia Da]IIIC



Draw. No. B-2270-3 (0)
Rev.G

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ATEX Certificate No. DEKRA 21ATEX0103
UKCA Certificate No. CSAE 22UKEX1312

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.

EN IEC 60079-0:2018, EN 60079-11:2012, EN 60079-25:2010, EN 60079-14:2014

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 2 The intrinsic safe apparatus and wirings shall be accordance to following formulas; for examples,
 $U_i > U_o$
 $l_i \geq l_o$
 $P_i \geq P_o$
 $C_i + C_c \leq C_o$
 $L_i + L_c \leq L_o$

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 $L_i \leq 1\%L_o$ or $C_i \leq 1\%C_o$ of the intrinsic safe apparatus.

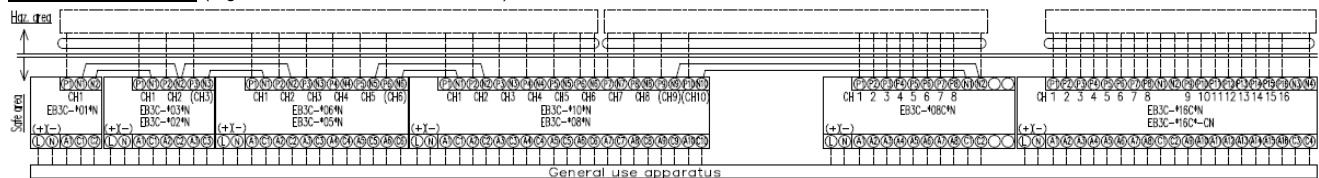
- **Typical Installation:** Install Barrier must be according to the above Ratings and Parameters of I.S. and descriptions.

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.

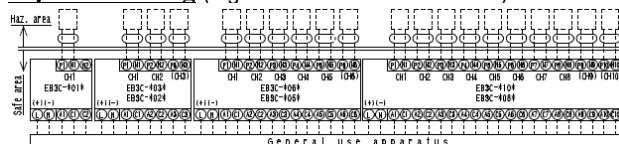
- **Dielectric Strength:** Between intrinsically safe circuit and non-intrinsically safe circuit 1526.4V AC.

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 | Terminal Pn - Nn | 12V DC, 10mA (source) |
| | output | Terminal / Connector | 250V, 3A (but Connector 30V, 1A) |
| | | EB3C-T... | An, Cn |

• Lot No.

a : Production base
b, c : Year (example : 22 → 2022)
d : Month
e, f : Date
g : Number of product

IDEC CORPORATION

Manufacturer: IDEC CORPORATION 2-6-64, Nishimiyahara, Yodogawa-ku, Osaka532-0004, Japan
EU Authorized Representative: APEM SAS
55, Avenue Edouard Herriot BP1, 82303 Causse Cedex, France

EU DECLARATION OF CONFORMITY

We, IDEC CORPORATION 2-6-64, Nishimiyahara, Yodogawa-ku, Osaka532-0004, Japan declare under our sole responsibility that the product/Description : Relay Barrier / Model No : EB3C-N to which this declaration relates is in conformity with the EC Directive on the following standard(s) or other normative document(s). In case of alteration of the product, not agreed upon by us, this declaration will lose its validity.

Applicable EC Directive : ATEX Directive (2014 / 34 / EU) / EMC Directive (2014 / 30 / EU) /RoHS Directive(2011/65/EU and (EU) 2015 / 863)
Applicable Standard(s) : EN60079-0, EN60079-11 (ATEX) / EN60947-5-1 (EMC) /EN IEC 63000(RoHS)

UK Authorized Representative : APEM COMPONENTS LIMITED
Drakes Drive, Long Crendon, Buckinghamshire, HP18 9BA, UK

UKCA DECLARATION OF CONFORMITY

declare under our sole responsibility that the product/Description : Relay Barrier / Model No : EB3C-N to which this declaration relates is in conformity with on the following standard(s) or other normative document(s). In case of alteration of the product, not agreed upon by us, this declaration will lose its validity.

Applicable Standard(s) : EN60079-0, EN60079-11 (S.I. 2016 No.1107) / EN60947-5-1 (S.I. 2016 No. 1091) / EN IEC 63000 (S.I. 2016 No.3303)

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