

## Type EB3N Relay Barrier (Safety Relay Barrier) Intrinsically Safe System [Ex ia Ga]IIC [Ex ia Da]IIIC

Draw. No. B-2284-2(0)

Rev.E

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Certificate No. IECEx DEK 21.0070

When installing an IDEC Type EB3N Safety Relay 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 60079-25:2020(Ed.3), IEC 60079-14:2013(Ed.5)  
All intrinsically safe systems must have “EB3N” in the part number. The Safety Relay 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 the Safety Relay Barriers shall not be made until power is disconnected and shall not be connected again until all replacement Safety Relay Barriers are properly re-assembled. All electrical components, including the interconnecting wiring, shall be kept in safe condition. Defective Safety Relay Barriers 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 (n1-n2, Pn-N3) 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 the Safety Relay Barrier on a 35mm track or directly mount on a panel surface using screws.

- **Certified Safety Relay Barrier:** Type EB3N-abc “EB3N”= Series type  
a = Safety circuit    **A2** : for auto start, 2 I/O    **M2** : for manual start, 2 I/O  
b = Auxiliary circuit    **N** : without auxiliary circuit,    **R5** : relay output, 5 I/O  
c = Power supply    **D** : 24V DC

### •Operations

	Terminals	Ratings
Power Supply	Input +,-	24V DC (-15%,+10%)
	Input 11-12, 21-22	12V DC, 10 mA (source)
Safety Circuit	Output 13-14, 23-24	2NO: DC-13 24V, 1A(Ind.) 30V DC, 1A(Res.)
	Input P-N	12V DC, 10mA (source)
Auxiliary Circuit	Output: A-C	5NO/common: 24V DC, 3A(Res.)
Reset Circuit	Input: Y1-Y2	24V DC, 5 mA

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

Ta= 60°C, Um= 250V, Uo=13.2V, Io= 14.2mA, Po= 46.9mW at each terminals (channels) 11-12, 21-22, 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	1.0
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	-	-	0.5
	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,  
 $U_i > U_o$   
 $I_i \geq I_o$   
 $P_i \geq P_o$   
 $C_i + C_c \leq C_o$   
 $L_i + L_c \leq L_o$

- **Typical Installation:** Install the Safety Relay Barrier must be according to the following Ratings and Parameters of I.S. and descriptions. To avoid electrical shock, install the Safety Relay Barrier in a tool-accessible enclosure.

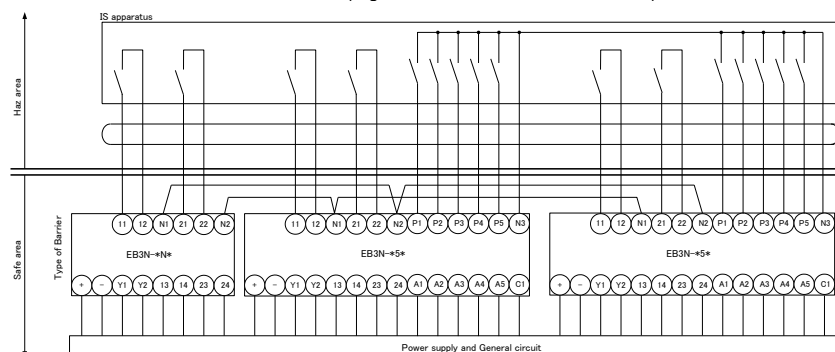
Layout and wiring must be done to prevent the inductive or capacitive induction to the intrinsically safe circuit.

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. Common wiring (max 16 channels): To set up common wiring, connect two “N” terminals between adjacent the Safety Relay Barrier in parallel. 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

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



(e.g. Io=28.4mA with 2 channels)

(e.g. Io=99.4mA with 2 channels and 5channels)

