

# Intrinsically Safe Explosion Proof Barriers

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Overview

X Series E-Stops

Door Interlock Switches

Enabling Switches

Barriers

As-Interface Safety at Work

**Intrinsically Safe Explosion-Proof: EB3C Relay Barriers**

**EB3C Key features include:**

**Explosion Protection**

Relay Barrier: [Exia] II C

- IEC60079 compliant
- Dry-contact switches with 0.5Ω maximum contact resistance can be connected to the EB3C.
- 8- and 16-circuit types are available in common wiring types, ideal for connection to PLCs.
- Universal AC power voltage (100 to 240V AC)
- No grounding required.
- IDEC's original spring-up terminals minimizes wiring time.
- Installation: 35-mm-wide DIN rail mounting or direct panel mounting
- Global usage  
USA: FM  
Canada: CSA  
Europe: CE marking, ATEX



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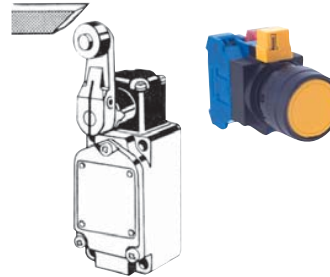
**Illuminated Pushbutton/Selector Switches**

Illuminated pushbutton/selector switches can be used with the combination of EB3C.



**Dry Contact Switches**

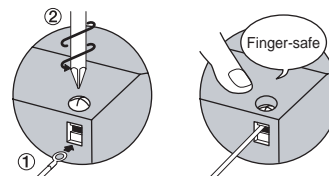
Dry-contact switches with 0.5Ω maximum contact resistance can be connected to the EB3C.



**Common Wiring for PLC Inputs**

8- and 16-circuit types are available in common wiring types, ideal for connection to PLCs.

**Spring-up Fingersafe Terminals Reduce Wiring Time**



Specifications

Explosion-Protection and Electrical Specifications

<b>Explosion Protection</b>		Intrinsic safety type (IEC compliant) [Exia] II C		
<b>Degree of Protection</b>		IP20 (IEC60529)		
<b>Installation Location</b>	Relay Barrier	Safe indoor place (non-hazardous area)		
	Switch	For zone 0, 1, 2 hazardous areas		
<b>Non-intrinsically Safe Circuit Maximum Voltage (Um)</b>		250V AC 50/60Hz, 250V DC		
<b>Intrinsically Safe Circuits</b>	Wiring Method	1-channel Separate Wiring	16-channel Common Wiring	
	Rated Operating Voltage	12V DC ±10%		
	Rated Operating Current	10 mA DC ±20%		
	Maximum Output Voltage (Uo)	13.2V DC		
	Maximum Output Current (Io)	14.2 mA	227.2 mA	
	Maximum Output Power (Po)	46.9 mW	750 mW	
	Maximum External Inductance (Lo)*	175 (125) mH	0.68 (0.68) mH	
	Maximum External Capacitance (Co)*	900 (740) nF		
	Allowable Wiring Resistance (Rw)	300Ω	600/(n+1)Ω (n = number of common channels)	
	Maximum Channels per Common Line	—	16	
<b>Non-intrinsically Safe Circuits</b>	<b>Relay Output</b>	Contact Configuration	1NO	
		Rated Insulation Voltage (Ui)	250V AC, 125V DC	
		Thermal Current (Ith)	3A (common terminal: 8A)	
		Contact Allowable Power	Resistive Load	AC: 750 VA, DC: 72W
			Inductive Load	AC: 750 VA (cos φ = 0.3 to 0.4) DC: 48W (L/R = 7 ms)
		Rated Load	Resistive Load	250V AC 3A, 24V DC 3A
			Inductive Load	250V AC 3A (cos φ = 0.3 to 0.4) 24V DC 2A (L/R = 7 ms)
		Minimum Applicable Load	0.1V DC, 0.1 mA (reference value)	
		Contact Resistance	50 mΩ	
	ON Time	12 ms maximum (rated voltage)		
	OFF Time	10 ms maximum (rated voltage)		
	Mechanical Life	20,000,000 operations minimum (at 18,000 operations/hour, without load)		
	Electrical Life	100,000 operations minimum (at 1,800 operations/hour, rated load)		
	Short-circuit Protection	None		
	<b>Transistor Output</b>	Rated Voltage	24V DC	
		Maximum Voltage	30V DC	
		Maximum Current	100 mA (connector type: 15 mA)	
		Leakage Current	0.1 mA maximum	
Voltage Drop		1V maximum		
Clamping Voltage		33V (1W)		
Inrush Current		0.5A maximum (1 sec)		
ON Time		0.1 ms maximum (resistive load)		
OFF Time		0.4 ms (typical) (resistive load)		
Short-circuit Protection	None			



Values in ( ) are those approved by TIIS (Technology Institution of Industrial Safety, Japan).

General Specifications

	AC	DC
Rated Voltage	100 to 240V AC	24V DC
Allowable Voltage Range	85 to 264V AC	21.6 to 26.4V DC
Rated Frequency	50/60 Hz (allowable range: 47 to 63 Hz)	—
Inrush Current	10A (100V AC) 20A (200V AC)	10A
Dielectric Strength (1 minute, 1 mA)	Between intrinsically safe circuit and non-intrinsically safe circuit: 1500V AC Between AC power and output terminal: 1500V AC Between DC power and transistor output terminal: 1000V AC	
Operating Temperature	-20 to +60°C (no freezing)	
Storage Temperature	-20 to +60°C (no freezing)	
Operating Humidity	45 to 85% RH (no condensation)	
Atmosphere	800 to 1100 hPa	
Pollution Degree	2 (IEC60664)	
Insulation Resistance	10 MΩ minimum (500V DC megger, between the same poles as the dielectric strength)	
Vibration Resistance	Damage Limits	Panel mounting: 10 to 55 Hz, amplitude 0.75 mm DIN rail mounting: 10 to 55 Hz, amplitude 0.35 mm
	Operation Extremes (relay output only)	Panel mounting: 10 to 55 Hz, amplitude 0.5 mm DIN rail mounting: 10 to 55 Hz, amplitude 0.35 mm
Shock Resistance	Damage Limits	Panel mounting: 500 m/s <sup>2</sup> (3 times each on X, Y, Z) DIN rail mounting: 300 m/s <sup>2</sup> (3 times each on X, Y, Z)
		Terminal Style
Mounting	35-mm-wide DIN rail or panel mounting (M4 screw)	
Power Consumption (approx.)	9.6 VA (EB3C-R10A at 200V AC) 4.8 W (EB3C-R16CD at 24V DC)	
Weight (approx.)	0.39 kg (EB3C-R16CD)	

Certification Number

Certification Organization	Explosion Protection	Certification Number
FM	Class I, II, III Div. 1 Group A, B, C, D, E, F, G	3015417 (terminal type)
	Class I, Zone 0 AEx [ia] IIC	
CSA	Class I Div. 1 Group A, B, C, D	166730
NEMKO	[Exia] II C	Nemko 02ATEX279
TIIS Japan	Relay barrier: [Exia] II C	C15753
Class NK	Exia II C	02T606



Class NK is Korean Shipping agency approval.

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**Part Numbers**

**Relay Barriers**

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Door Interlock Switches

Power Voltage	Number of Channels	Connection to Non-intrinsically Safe Circuit	Input Wiring Method	Output	Part Number		
100 to 240V AC	1	Screw Terminal	Separate/Common Wiring Compatible	Relay	EB3C-R01A		
	2				EB3C-R02A		
	3				EB3C-R03A		
	5				EB3C-R05A		
	6				EB3C-R06A		
	8				EB3C-R08A		
	10				EB3C-R10A		
	8				Common Wiring Only	EB3C-R08CA	
	6				EB3C-T06A		
	8				Separate/Common Wiring Compatible	Transistor (Sink/Source)	EB3C-T08A
	10	EB3C-T10A					
	8	Common Wiring Only	Transistor (Sink)	EB3C-T08CKA			
24V DC	8	Screw Terminal	Common Wiring Only	Relay	EB3C-R08CD		
	10		Separate/Common Wiring Compatible		EB3C-R10D		
	16		Common Wiring Only		EB3C-R16CD		
	10		Separate/Common Wiring Compatible		Transistor (Sink/Source)	EB3C-T10D	
	8		Common Wiring Only		Transistor	Sink	EB3C-T08CKD
	16					EB3C-T16CKD	
	8					Source	EB3C-T08CSD
	16					EB3C-T16CSD	

**Accessories**

Enabling Switches

Item	Part Number	Description
DIN Rail	BAA1000	Aluminum (1m long, 7.5mm high)
	BNDN1000	Aluminum (1m long, 10.5mm high)
Mounting Clip	BNL5	

All dimensions in mm.

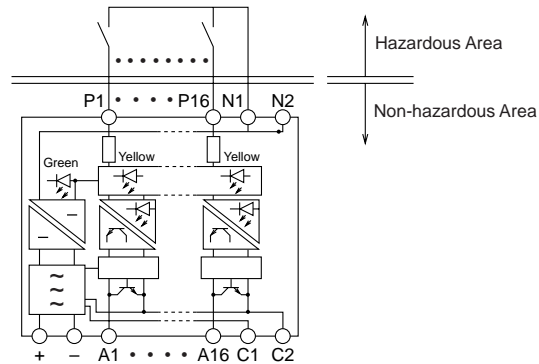
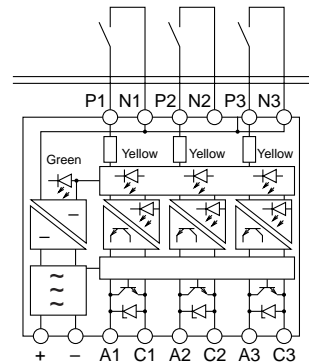
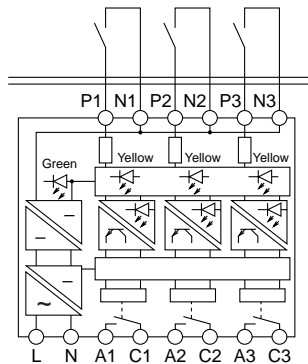
**Circuit Diagrams**

**Internal Circuit Block Diagrams**

**AC Power, Relay Output Type**

**DC Power, Transistor Output Type**

**Connector Wiring, Sink Output Type**



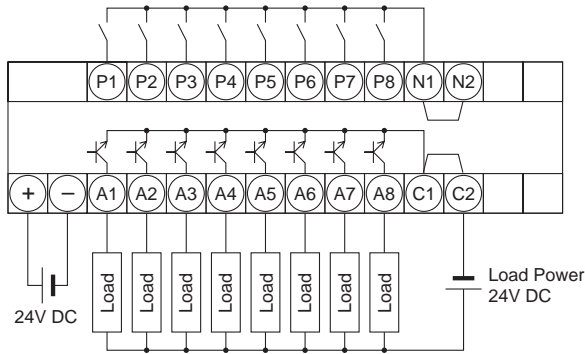
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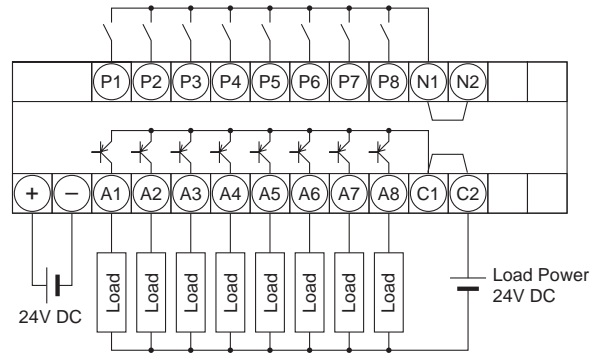
Wiring Examples

External Wiring Examples

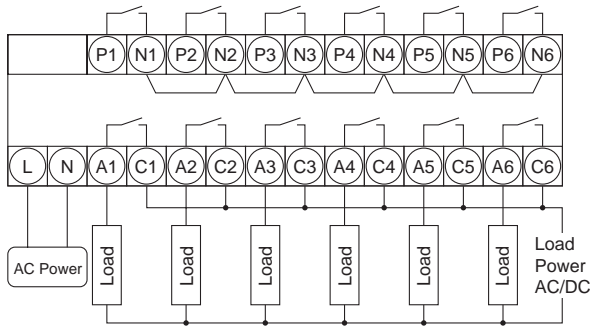
Transistor Sink Output Type (Ex.: EB3C-T08CKD)



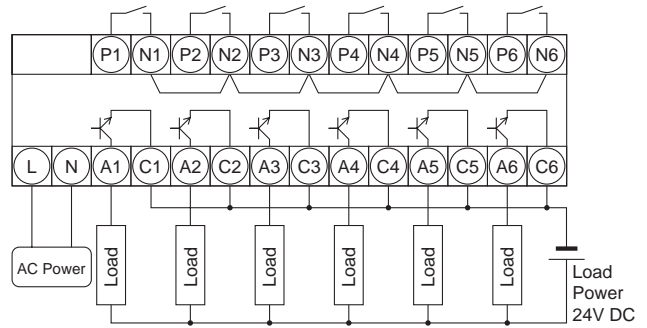
Transistor Source Output Type (Ex.: EB3C-T08CSD)



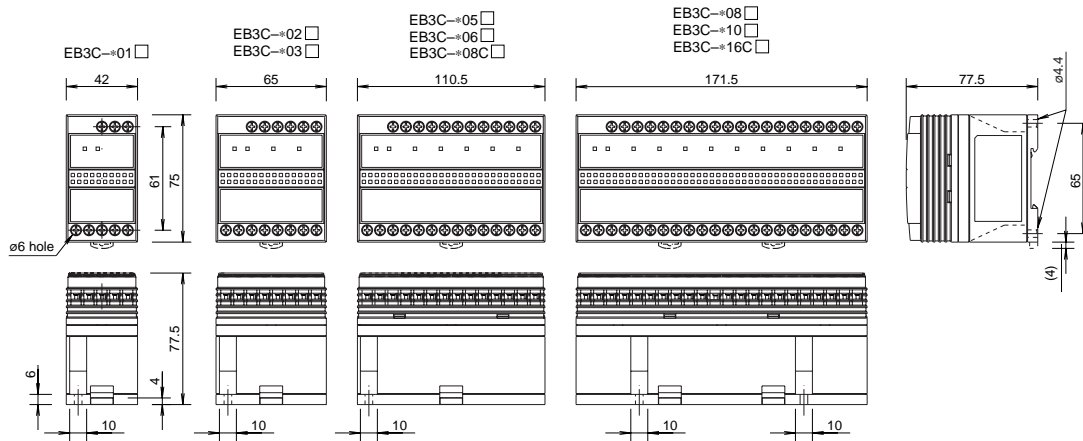
Relay Output Type (Ex.: EB3C-R06A)



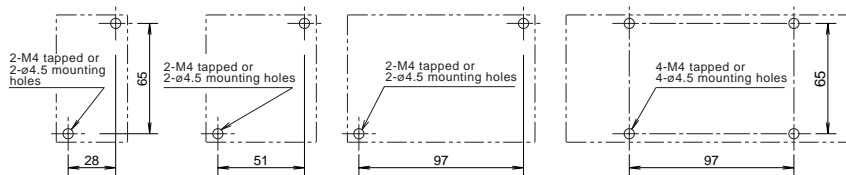
Transistor Output Type (Ex.: EB3C-T06A)



Dimensions (mm)



Mounting Hole Layout (Screw Mounting)



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