Input contacts can be used in any explosive gas and Zone 0/Class I Div. 1 areas.

Relay Barrier: [Exia] II C Explosion Switch (EB9Z-A): Exia II CT6 protection Switch (EB9Z-A1): Exia II BT6

- IEC60079 compliant.
- Wide variety of models ranging from 1-circuit to 16 circuit
- 8- and 16-channel are available in common wiring, ideal for connection to PLCs. 16-circuit also available with a connec-
- No grounding required.
- IDEC's original spring-up terminal minimizes wiring time.
- 35-mm-wide DIN rail mounting or direct screw mounting.

• Global usage

IECEx

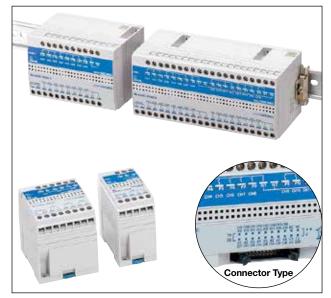
FM, UL Europe: CE marking, ATEX USA:

China: CQST Korea: KCS

Taiwan TS

Japan: TIIS

• Ship class: NK (Japan), KR (Korea)

















Power Voltage	Connection to Non-intrinsically Safe Circuit	Input Wiring Method	Ou	tput	Number of Channels	Part No.	Weight (g)
					1	EB3C-R01AN	150
					2	EB3C-R02AN	180
					3	EB3C-R03AN	190
		Separate/Common Wiring Compatible		alau.	5	EB3C-R05AN	260
		Willing Compatible	l ne	elay	6	EB3C-R06AN	270
					8	EB3C-R08AN	300
					10	EB3C-R10AN	380
		Common Wiring Only			8	EB3C-R08CAN	280
					1	EB3C-T01AN	140
100 to 240V AC					2	EB3C-T02AN	170
		0 1 10			3	EB3C-T03AN	180
		Separate/Common Wiring Compatible	Transistor (Sink/Source)	5	EB3C-T05AN	250
		Wiring Compatible			6	EB3C-T06AN	260
					8	EB3C-T08AN	320
					10	EB3C-T10AN	340
		Common Wiring Only	Transistor (Sink)		8	EB3C-T08CKAN	260
					16	EB3C-T16CKAN	260
			Transistor (Source)		8	EB3C-T08CSAN	260
			Iransisto	r (Source)	16	EB3C-T16CSAN	260
	Screw Terminal	Separate/Common Wiring Compatible	Relay		1	EB3C-R01DN	130
					2	EB3C-R02DN	170
					3	EB3C-R03DN	180
					5	EB3C-R05DN	250
					6	EB3C-R06DN	260
					8	EB3C-R08DN	260
					10	EB3C-R10DN	360
					8	EB3C-R08CDN	270
		Common Wiring Only			16	EB3C-R16CDN	390
					1	EB3C-T01DN	120
0.01.50					2	EB3C-T02DN	160
24V DC					3	EB3C-T03DN	170
		Separate/Common	Transistor (Sink/Source)	5	EB3C-T05DN	240
		Wiring Compatible		,	6	EB3C-T06DN	250
					8	EB3C-T08DN	250
					10	EB3C-T10DN	320
					8	EB3C-T08CKDN	250
				Sink	16	EB3C-T16CKDN	350
				_	8	EB3C-T08CSDN	250
		Common Wiring Only	Transistor	Source	16	EB3C-T16CSDN	350
		-		Sink		EB3C-T16CKD-CN	330
	Connector			Source	16	EB3C-T16CSD-CN	330

Accessories

Name	Part No.	Ordering No.	Package Quantity	Description
DIN Rail	BAA1000	BAA1000PN10	10	Aluminum (1m long)
DIN Raii	BAP1000	BAP1000PN10	10	Steel (1m long)
End Clip	BNL6	BNL6PN10	10	For fastening EB3C units on the DIN rail.
Static Electricity Caution Plate	EB9Z-N1	EB9Z-N1PN10	10	Polyester 20 (W) x 6 (H) mm

Explosion-Protection and Electrical Specifications

_		icatio										
_		Protection		Intrinsic safety type								
Degre	e of I	Protection		IP20 (IEC60529)								
Instal	lation	Location	Relay Barrier	Safe indoor place (safe area: non-hazardous area)								
			Switch	For zone 0, 1, 2 ha	azardous areas							
	Non-intrinsically Safe Circuit Maximum Voltage (Um)		250V AC									
	Wirin	Wiring Method		1-channel Separate Wiring	16-channel Common Wiring							
	Rate	d Operating	Voltage	12V DC ±10%								
		d Operating		10 mA DC ±20%								
lits			Voltage (Uo)	13.2V DC								
<u>i</u>		mum Output		14.2 mA	227.2 mA							
e.	-	mum Output		46.9 mW	750 mW							
Intrinsically Safe Circuits	Capa	mum Extern acitance (Co)	(Note 1)	470 nF (470 nF)	490 nF (365 nF)							
insica	Maxi	mum Extern	al Inductance (Lo) (Note 2)	87.5 mH (87.5 mH)	0.6 mH (0.425 mH)							
Intr	Allow	Allowable Wiring Resistance (Rw)		300Ω	$600/(N+1)\Omega$ (N = number of common channels)							
	Maximum Channels per Common Line		_	16								
		Contact Co	nfiguration	1NO								
		Rated Insulation Voltage (Ui)		250V AC, 125V D	2							
		Thermal Current (Ith)		3A (common term	inal: 8A)							
		Contact	Resistive Load	AC: 750 VA, DC: 72W								
		Allowable Power	Inductive Load	AC: 750 VA (cos ø DC: 48W (L/R = 7								
	rtbut	Relay Output							Rated	Resistive Load	250V AC 3A, 24V	DC 3A
			Load	Inductive Load	250V AC 3A (cos of 24V DC 2A (L/R =							
	Q	Minimum A	pplicable Load	0.1V DC, 0.1 mA (reference value)							
uits	ela	Contact Re	sistance	50 mΩ maximum (initial value)								
is	==	Turn ON Tir	me	12 ms maximum (rated voltage)								
lfe (Turn OFF T	ime	10 ms maximum (rated voltage)								
Non-intrinsically Safe Circuits		Mechanical	Life	20,000,000 operation (at 18,000 operation load)								
intrins		Electrical Li	ife	100,000 operation (at 1,800 operation	ns minimum ns/hour, rated load)							
- Lo		Short-circu	it Protection	None								
Z		Rated Volta	ige	24V DC								
		Maximum \	/oltage	30V DC								
	Ħ	Maximum (Current	100 mA (connecto	or type: 15 mA)							
	dt	Leakage Cu	urrent	0.1 mA maximum								
	5	Voltage Dro	р	1.5 V maximum								
	Fransistor Output	Clamping V		33V (1W)								
	ans	Inrush Curr	ent	0.5A maximum (1	sec)							
	F	Turn ON Tir		0.1 ms maximum	(resistive load)							
		Turn OFF T	ime	0.4 ms (typical) (re	esistive load)							
		Short-circu	it Protection	None								

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

Certification No.

Certification Organization	Explosion Protection	Certification No.	
FM	Class I, II, III Div. 1 Group A, B, C, D, E, F, G	3047250	
	Class I, Zone 0 AEx [ia] II C		
UL	Class I, II, III, Div. 1 Group A, B, C, D, E, F, G	E234997	
	Class I, Zone 0 AEx [ia] II C		
PTB (ATEX)	[Exia] II C: Gas, Vapour [Exia] III C: Dust	PTB09 ATEX2046	
PTB (IECEx)	[Exia] II C: Gas, Vapour [Exia] III C: Dust	IECEx PTB10.0015	
CQST	[Exia Ga] II C	CNEx14.0047	
KCS	[Exia] II C	14-AV4B0-0373	
	Relay barrier: [Exia] II C	TC20539	
TIIS	Switch (EB9Z-A): Exia II CT6	TC15758	
	Switch (EB9Z-A1): Exia II BT6	TC15961	
NK	[Exia] II C	Type Test No. 13T606	
KR	[Exia] II C	TYK17821-EL003	

Note: For details about switches, see "Switch Explosion-Protection Specifications" on page **T-6** and "3. Switches in the Hazardous Area" on page **T-10**.

General Specifications

acriciai ope		50.5			
Power Voltage	AC Power	DC Power			
Rated Power Voltage	100 to 240V AC	24V DC			
Allowable Voltage Range	-15 to +10%	±10%			
Rated Frequency	50/60 Hz (allowable range: 47 to 63 Hz)	_			
Inrush Current	10A (100V AC) 20A (200V AC)	10A			
Pinton in Olymputh	Between intrinsically safe cisafe circuit: 1526.4V AC	rcuit and non-intrinsically			
Dielectric Strength (1 minute, 1 mA)	Between AC power and out	put terminal: 1500V AC			
(Tillillate, TillA)	Between DC power and transistor output terminal: 1000V AC (screw terminal type only)				
Operating Temperature	-20 to +60°C (no freezing)				
Storage Temperature	-20 to +60°C (no freezing)				
Operating Humidity	45 to 85% RH (no condensa	ation)			
Atmosphere	800 to 1100 hPa				
Pollution Degree	2 (IEC60664)				
Insulation Resistance	10 MΩ minimum (500V DC r poles as the dielectric streng				
Vibration Resistance	Panel mounting: 10 to 55 Hz, amplitude 0.75 mm				
(damage limits)	DIN rail mounting: 10 to 55 Hz, amplitude 0.35 mm				
Shock Resistance	Panel mounting: 500 m/s² (3 times each on X, Y, Z)				
(damage limits)	DIN rail mounting: 300 m/s² (3 times each on X, Y, Z)				
Terminal Style	M3 screw terminal				
Mounting	35-mm-wide DIN rail or panel mounting (M4 screw)				
Power Consumption (approx.)	9.6 VA (EB3C-R10AN at 200V AC) 4.8W (EB3C-R16CDN at 24V DC)				

Switches & Pilot Lights

Flush Silhouette Switches

Emergency Stop Switches

Control Stations Display Lights

Operator Interfaces

PLCs

Softwares

Relays

Sockets

Timers

Terminal Blocks

Protectors

Power
Supplies

Sensors

Ex-proof Control Boxes

Barriers

LEDs

Safety Products

Switch Explosion-Protection Specifications (Japan only)

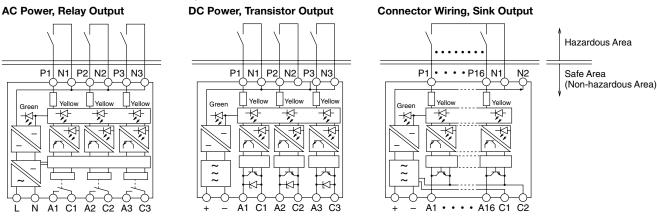
Simple apparatuses in accordance with relevant standards of each country can be installed in the hazardous area and connected to the EB3C located in the safe area. In Japan, any switches, though regarded as simple apparatuses, must be certified for explosion-proof devices. EB9Z-A and EB9Z-A1 are IDEC's generic Part No. of any single apparatuses certified by TIIS for use with the EB3C, therefore simple apparatuses with specifications shown below can be used as those approved by the Japanese explosion-proof certification.

Switch Part No.	EB9Z-A	EB9Z-A1
Explosion Proof (Note 1)	Exia II CT6	Exia II BT6
Operating Temperature	-20 to +60°C (no freezing)	
Operating Humidity	45 to 85% RH (no condensation)	
Degree of Protection	IP20	
Dielectric Strength	500V AC, 1 mA	
Intrinsic Safety Ratings and Parameters	1-channel Separate Wiring Maximum input voltage (Ui): 13.2V Maximum input current (Ii): 14.2 mA Maximum input power (Pi): 46.9 mW Internal capacitance (Ci): ≤ 2 nF Internal inductance (Li): ≤ 5 μH	16-channel Common Wiring Maximum input voltage (Ui): 13.2V Maximum input current (Ii): 227.2 mA Maximum input power (Pi): 750 mW Internal capacitance (Ci): ≤ 32 nF Internal inductance (Li): ≤ 80 μH
Enclosure Material	Metallic: Magnesium content must be 7.5% or less (standard programment) Plastic: Switch operator exposed area lIC: 20 cm² maximum lIB: 100 cm² maximum When the switch has a wider exposed area, attach a caution label as shown at right.	teel and aluminum are acceptable) Caution To prevent electrostatic charges, do not rub the switch surface during operation. Use a soft cloth dipped with water for cleaning. Caution Label Example
Switch Ratings (Note 2)	Contact rating: Ui, li minimum Contact resistance: 0.5Ω maximum Cross sectional area of wire: 0.000962 mm² minimum Printed circuit board: Thickness 0.5 mm minim Copper foil width 0.15 m Thickness 18 μm minimu A resistor to prevent contact welding and an LED can Consult IDEC for details.	num nm minimum ım one/both side(s)

Note 1: See "Precautions for Operation" on page **T-10**.

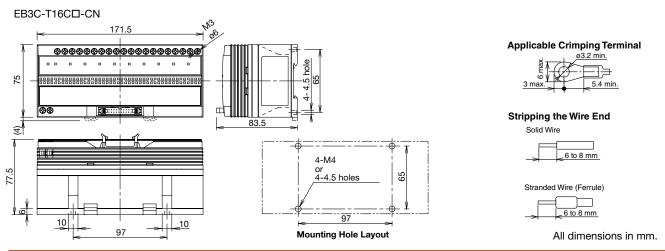
Note 2: For details, see "3. Switches in the Hazardous Area" on page **T-10**.

Internal Circuit Block Diagram



Dimensions

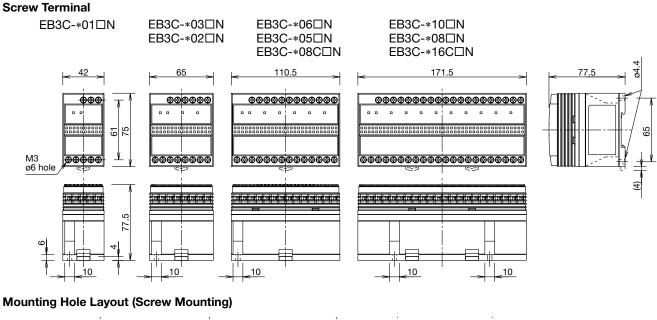
Connector Type

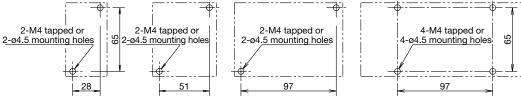


Transistor Source Output

(Ex.: EB3C-T08CSDN)

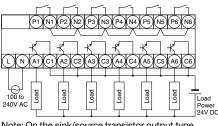
24V DC





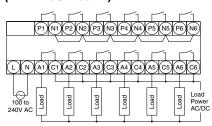
External Wiring Examples

Transistor Output (Ex.: EB3C-T06AN)

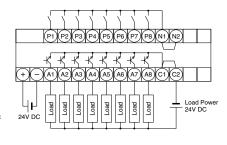


Note: On the sink/source transistor output type, terminals A can be used as a positive common line.

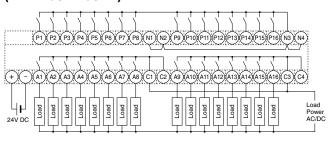
Relay Output (Ex.: EB3C-R06AN)



Transistor Sink Output (Ex.: EB3C-T08CKDN)



Relay Output Common Wiring (Ex.: EB3C-R16CDN)



Switches & Pilot Lights

Flush Silhouette Switches

Emergency Stop Switches

Control Stations

Display Lights

Operator Interfaces

PLCs

Softwares

Relays

Sockets

Timers

Terminal

Circuit Protectors

Power Supplies

Sensors

Ex-proof Control Boxes

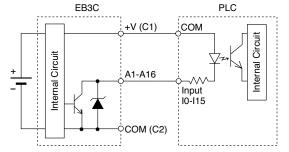
LEDs

Safety **Products**

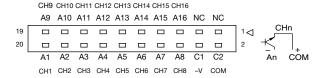
Connector Type Output Wiring Diagram

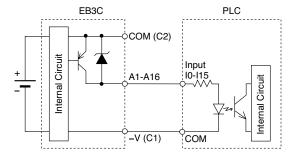
EB3C-T16CKD-CN (Sink)





EB3C-T16CSD-CN (Source)





Wiring Example with IDEC's MicroSmart PLC Input Modules

EB3C-T1	6CKD-CI	V	FC4A-N16B3		
Terminal	Output		Input	Terminal	
20	A1		10	20	
19	A9	_	110	19	
18	A2		l1	18	
17	A10		l11	17	
16	A3		12	16	
15	A11		l12	15	
14	A4		13	14	
13	A12		l13	13	
12	A5		14	12	
11	A13		114	11	
10	A6		15	10	
9	A14	_	l15	9	
8	A7	_	16	8	
7	A15	_	l16	7	
6	A8	_	17	6	
5	A16		117	5	
4	+V		СОМ	4	
3	NC		СОМ	3	
2	СОМ		NC	2	
1	NC	}	NC	1	

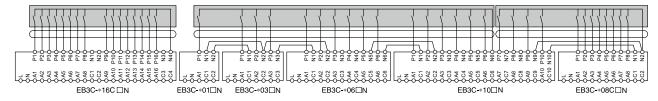
EB3C-T1	6CSD-CI	٧	FC4A-	N16B3
Terminal	Output		Input	Terminal
20	A1		10	20
19	A9		l10	19
18	A2		l1	18
17	A10		l11	17
16	A3		12	16
15	A11		l12	15
14	A4		13	14
13	A12		l13	13
12	A5		14	12
11	A13		l14	11
10	A6		15	10
9	A14		l15	9
8	A7		16	8
7	A15		l16	7
6	A8		17	6
5	A16		117	5
4	-V		СОМ	4
3	NC		СОМ	3
2	СОМ		NC	2
1	NC	}	NC	1

Note: The wiring in dashed line does not affect the operation of the EB3C. Applicable connector is IDEC's JE1S-201. Input power for PLC inputs is supplied by the EB3C, therefore the PLC input does not need an external power supply.

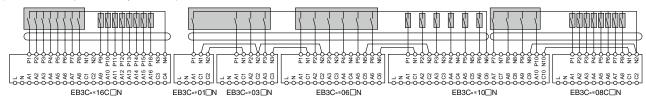
Wiring Example of Intrinsically Safe External Inputs

Common Wiring (Maximum 16 circuits)

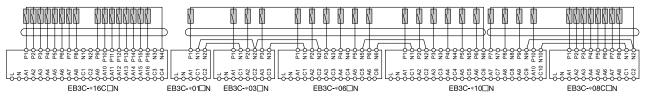
All input lines are wired to a common line inside the intrinsically safe switch (one common line per intrinsically safe circuit).



Some input lines are wired to a common line inside the intrinsically safe switches, while others are outside switches (one common line per intrinsically safe circuit).



All input lines are wired to a common line outside the intrinsically safe switch (one common line per intrinsically safe circuit).



2. Separate Wiring

Each input line of the EB3C makes up one independent intrinsically safe circuit.

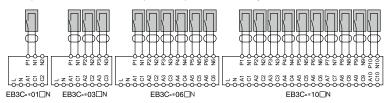
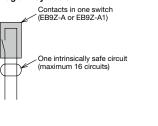
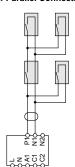


Diagram Symbols



Serial-Parallel Connection of Switches

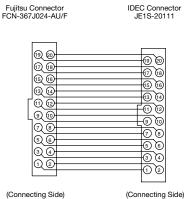


- As shown in the diagram on the left, a required number of "contacts in one switch" (3 contacts in the example at left) can be added to the "contacts in one switch" connected to one input channel.
- Similarly, a required number of "contacts in one switch" can be added to a common line connected to multiple input channels.
- The capacitance and inductance of the added "contacts in one switch* must be included in the calculation of the wiring capacitance and inductance in "Precautions for Operation, 5. Wiring for Intrinsic Safety, (7)" on page **T-11**.
- In addition, a required number of contacts can be added in the enclosure of "contacts in one switch." In this case, however, do not include the capacitance and inductance in the calculation of the wiring capacitance and inductance on page T-11. Instead, make sure that the internal capacitance (Ci) and internal inductance (Li) are within the values shown in the table "Switch Explosion-Protection" Specifications (Japan only)" on page T-6.

Recommended Connector Cable for Connector Types

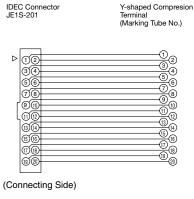
[Description	No. of Poles	Length (m)	Part No.	shape	Applicable Type
			0.5	FC9Z-H050A20		
	With Shield		1	FC9Z-H100A20		IDEC MicroSmart
	With Shield		2	FC9Z-H200A20		I/O Module
I/O Terminal			3	FC9Z-H300A20		
Cable			0.5	FC9Z-H050B20		
	Without Shield		1	FC9Z-H100B20		IDEC MicroSmart
	Without Shleid		2	FC9Z-H200B20		I/O Module
		20	3	FC9Z-H300B20		
		20	1	BX9Z-H100E4	200	
Cable with	Crimping Terminal		2	BX9Z-H200E4		Screw Terminal
			3	BX9Z-H300E4		
40-pin Cable for PLC		Cable for PLC		BX9Z-H100L	350 Connector B	Mitsubishi A Series
				BX9Z-H200L		Input Module (positive common)
			3	BX9Z-H300L	Connector A	EB3C-T16CKD-CN

$FC9Z-H\square\square\square A$, $FC9Z-H\square\square\square B$ **Internal Connection**

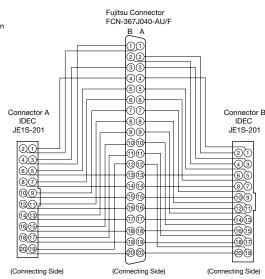


(Connecting Side)

BX9Z□□□ E4 **Internal Connection**



BX9Z-H \square L Internal Connection



Switches & Pilot Lights

Flush Silhouette Switches

Emergency Stop Switches

Control Stations

Display Lights

Operator Interfaces

PLCs

Softwares

Relavs

Sockets

Timers

Terminal

Circuit Protectors

Power Supplies

Sensors

Ex-proof Control Boxes

LEDs

Safety **Products**

Precautions for Operation

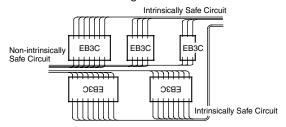
1. Installation of EB3C Relay Barriers

- (1) The EB3C can be installed in any direction.
- (2) Install the EB3C relay barrier in a safe area (non-hazardous area) in accordance with intrinsic safety ratings and parameters. To avoid mechanical shocks, install the EB3C in an enclosure which suppresses shocks.
- (3) When installing or wiring the EB3C, prevent electromagnetic and electrostatic inductions in the intrinsically safe circuit. Also prevent the intrinsically safe circuits from contacting with another intrinsically safe circuit and any other circuits.

Maintain at least 50 mm clearance, or provide a metallic separating board between the intrinsically safe circuit and non-intrinsically safety circuit. When providing a metallic separating board, make sure that the board fits closely to the enclosure (top, bottom, and both sides). Allowable clearance between the enclosure and board is 1.5 mm at the maximum.

The clearance of 50 mm between the intrinsically safe circuit and non-intrinsically safe circuit may not be sufficient when a motor circuit or high-voltage circuit is installed nearby. In this case, provide a wider clearance between the circuits referring to 5 (3) "Minimum Parallel Distance between the Intrinsically Safe Circuit and Other Circuits."

(4) In order to prevent contact between intrinsically safe circuits and non-intrinsically safe circuits, mount EB3C units with terminals arranged in the same direction.



- (5) Maintain at least 6 mm (or 3 mm according to IEC60079-11: 1999) clearance between the terminal of intrinsically safe circuit and the grounded metal part of a metal enclosure, and between the relay terminal block of an intrinsically safe circuit and the grounded metal part of a metal enclosure.
- (6) For installing the EB3C, mount on a 35-mm-wide DIN rail or directly on a panel using screws. Make sure to install securely to withstand vibration. When mounting on a DIN rail, push in the clamp completely. Use the BNL6 end clips on both sides of the EB3C to prevent from moving sideways.
- (7) Excessive extraneous noise may cause malfunction and damage to the EB3C. When extraneous noise activates the voltage limiting circuit (thyristor), remove the noise source and restore the power.

2. Terminal Wiring

- (1) Using a ø5.5 mm or smaller screw driver, tighten the terminal screws (including unused terminal screws) to a torque of 0.6 to 1.0 N·m (recommended value).
- (2) Make sure that IP20 is achieved when wiring. Use insulation tubes on bare crimping terminals.
- (3) To prevent disengaged wires from contacting with other intrinsically safe circuits, bind together the wires of one intrinsically safe circuit.
- (4) When the adjacent terminal is connected to another intrinsically safe circuit, provide an insulation distance of at least 6 mm.

3. Switches in the Hazardous Area (For Japan application only)

(1) A switch contains the switch contact, enclosure, and internal wiring. A switch contact refers to an ordinary switching device which consists of contacts only, such as a pushbutton switch. See below.

Applicable Switches

	Push-pull Switches	Pushbutton, Foot, Trigger, Rocker, Grip		
Control Switche	Twisting Switches	Rotary, Selector, Cam, Drum, Thumb wheel		
Ownone	Lever and Slide Switches	Toggle, Multidirectional, Wobble stick, Lever, Slide switch		
Sensing	Displacement Switches	Microswitch, Limit, Magnetic proximity, Door, Reed, Mercury		
Switche	s Level Switches	Liquid level		
	Others	Pressure, Temperature		

Note: For installation in hazardous areas and connection to the EB3C, use switches which are certified, approved, or considered to be simple apparatus in relevant standards in each country.

- (2) When the switch has internal wiring or lead wire, make sure that the values of internal inductance (Li) and capacitance (Ci) are within the certified values.
- (3) Enclose the switch contact's bare live part in an enclosure of IP20 or higher protection.
- (4) Depending on the explosion-protection specifications according to TIIS, the exposed area of plastic switch operator is limited as follows:
 - Exia II CT6 (EB9Z-A): 20 cm² maximum
 - Exia II BT6 (EB9Z-A1): 100 cm² maximum
- (5) Attach the certification mark supplied with the EB3C on the EB9Z-A or EB9Z-A1 switch (for Japan application).
- (6) When the switch operator of plastic enclosure has a wider exposed area than the following limits, attach a caution label as shown below.

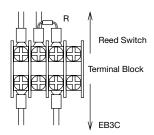
II C: 20 cm² maximum II B: 100 cm² maximum Caution
To prevent electrostatic charges, do not rub the switch surface during operation.
Use a soft cloth dipped with water for cleaning.

Caution Label Example

(7) For the 1-circuit separate wiring, a resistor to prevent reed switch contact welding and an LED miniature pilot lights can be connected in series with the contact. See below. Use the terminal screw of M3 or larger.

Applicable Resistor Ratings

Resistance	100Ω maximum
Rated Wattage	0.5 to 3W
Туре	Metal (oxide) film resistors



Applicable LED

IDEC's IPL1 series LED miniature pilot lights. See pages **T-14** and **T-17**.

Precautions for Operation

4. Output Specifications

- (1) When wiring the output from the EB3C, connect the non-intrinsically safe circuit to terminals A and C. The EB3C output circuit is not equipped with short-circuit protection. If required, provide a protection in the external circuit.
- (2) Relay Output

Some types of loads generate reverse emf (such as solenoids) or cause a large inrush current (incandescent lamps), resulting in a shorter operation life of output relay contacts. The operation life of contacts can be extended by preventing the reverse emf using a diode, RC, or varistor, or by suppressing the inrush current using a resistor or RL.

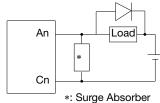
Contacts are made of gold-clad silver. When using at a small current and a low voltage (reference value: 0.1 mA, 0.1V), test the contact on the actual circuit in advance.

(3) Transistor Output

When connecting a small load, the load may not turn off because of a leakage current, even though the transistor output is turned off. If this is the case, connect a resistor in parallel with the load to bypass the leakage current.

When an excessively high voltage (clamps at 33V, 1W) or a reverse voltage is applied to the output terminals, the clamping circuit or output transistor may be damaged.

When driving an inductive load, be sure to connect a diode across the load to absorb reverse emf.



Example of Overvoltage Absorption Circuit

- (4) In the common wiring only types, the output terminals are not isolated from each other.
- (5) When connecting the connector type EB3C's in parallel, use one power supply to power the EB3C's. Do not connect any wiring to the C1 and C2 terminals.

5. Wiring for Intrinsic Safety

- (1) The voltage applied on the general circuit connected to the non-intrinsically safe circuit terminals of the EB3C relay barrier must be 250V AC, 50/60Hz, or 250V DC at the maximum under any conditions, including the voltage of the input power and the internal circuit.
- (2) When wiring, take into consideration the prevention of electromagnetic and electrostatic charges on intrinsically safe circuits. Also, prevent intrinsically safe circuits from contacting with other circuits.
- (3) The intrinsically safe circuits must be separated from nonintrinsically safe circuits. Contain intrinsically safe circuits in a metallic tube or duct, or separate the intrinsically safe circuits referring to the table below.

Note: Cables with a magnetic shield, such as a metallic sheath, prevent electromagnetic induction and electrostatic induction, however, a non-magnetic shield prevents electrostatic induction only. For non-magnetic shields, take a preventive measure against electromagnetic induction.

Finely twisted pair cables prevent electromagnetic induction. Adding shields to the twisted pair cables provides protection against electrostatic induction.

Minimum Parallel Distance between the Intrinsically Safe Circuit and Other Circuits (mm)

		,		
Voltage and Current of Other Circuits	Over 100A	100A or less	50A or less	10A or less
Over 440V	2000	2000	2000	2000
440V or less	2000	600	600	600
220V or less	2000	600	600	500
110V or less	2000	600	500	300
60V or less	2000	500	300	150

- (4) When identifying intrinsically safe circuits by color, use light blue terminal blocks and cables.
- (5) When using two or more EB3C's to set up one intrinsically safe circuit in the common wiring configuration, interconnect two neutral terminals (N1 through N10) on each EB3C between adjacent EB3C's in parallel.
- (6) Make sure that the power of the EB3C and contact are turned off before starting inspection or replacement.
- (7) When wiring the intrinsically safe circuit, determine the distance to satisfy the wiring parameters shown below. Note that parameters are different between separate wiring and common wiring.
 - Wiring capacitance Cw ≤ Co (Ci + N × 2 nF)
 Co: Maximum external capacitance of the EB3C
 - Ci: Internal capacitance of the switch
 - N: The number of switches connected in series or parallel (the number is infinite)
 - b) Wiring inductance Lw \leq Lo (Li + N \times 5 μ H)
 - Lo: Maximum external inductance of the EB3C
 - Li: Internal inductance of the switch
 - N: The number of switches connected in series or parallel (the number is infinite)
 - c) Wiring resistance ≤ Rw

Rw: Allowable wiring resistance

d) Allowable wiring distance D (km) is the smallest value of those calculated from the capacitance, inductance, and resistance.

 $D \le Cw/C$ C (nF/km): Capacitance of cable per km

 $D \le Lw/L$ L (mH/km): Inductance of cable per km $D \le Rw/2R$ R (Ω/km): Resistance of cable per km

Note: For the details of wiring the intrinsically safe circuits, refer to a relevant test guideline for explosion-proof electric equipment in each country.

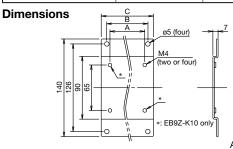
(8) Applicable Wire Size

0.5 to 2.0 mm² (AWG20 to AWG14): two wires However, one wire for 2.0 mm² (AWG14)

Mounting Bracket

The following mounting brackets can be used to install the EB3C relay barriers and EB3L lamp barriers on the mounting holes of IBRC contact signal transducer, IBPL pilot relay barrier, and IBZ buzzer.

No. of Channels	Part No.	Dimension (mm)		
		Α	В	O
1	EB9Z-K01	28.0	44.0	61.0
2	EB9Z-K02	51.0	59.5	76.0
3	EB9Z-K03	51.0	75.0	91.5
5	EB9Z-K05	97.0	105.0	122.0
6	EB9Z-K06	97.0	120.0	137.0
10	EB9Z-K10	97.0	181.0	198.0



All dimensions in mm.

Switches & Pilot Lights

Flush Silhouette Switches

Emergency Stop Switches

Control Stations

Display Lights

Operator Interfaces

PLCs

Softwares

Relays

Sockets

Timers

Terminal Blocks

Circuit Protectors

Power Supplies

Sensors

Ex-proof Control Boxes

Barriers

LEDs

Safety Products