BZ957 Series

Two-Channel Safety Relay with Turn-On / Turn-Off Delay and Redundant Timer

** Device appearance may change based on the specific variant ordered. Mating connector not included in scope of delivery.*

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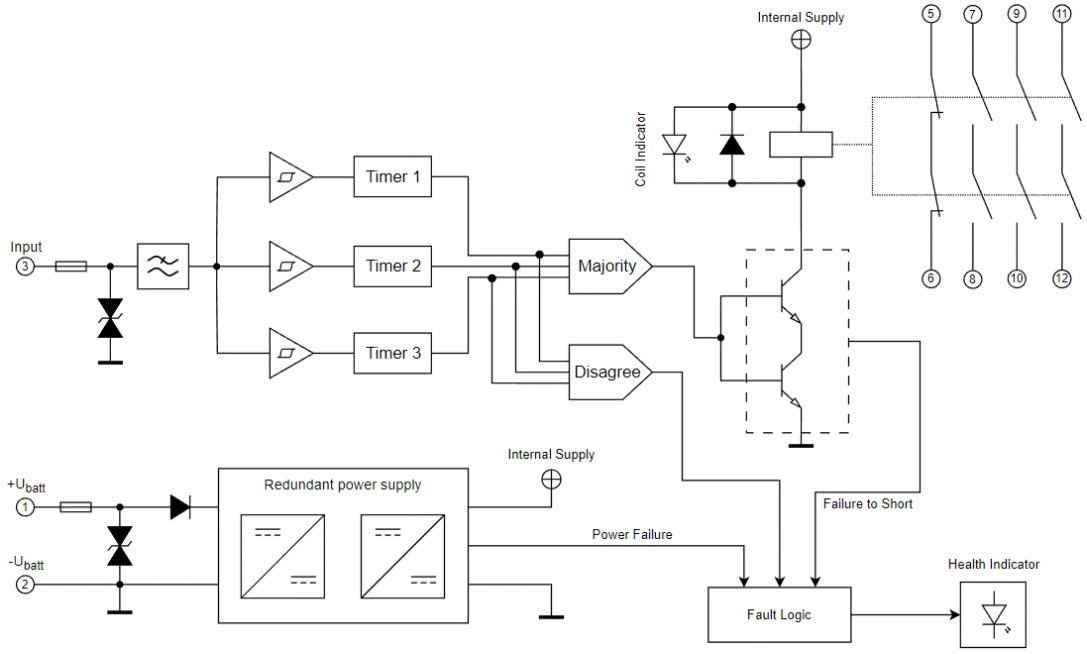
Functionality and Features



Double channel safety relay

Safety relay with forcibly guided contacts according to IEC 61810-3 type A featuring a mechanical design that allows one coil to actuate two sets of contacts. Both sets can move independently, thus matching the safety benefits usually achieved by placing the contacts of two separate relays in series.

Robust timing

Devices implementing either no timing, a fixed turn-on delay or a fixed turn-off delay are available. Timing is achieved using three independent timers. Each timer is based on a different timing method, reducing the risk of common causes of failure. None of the timers is implemented using programmable logic. Only if two of the three modules agree will the driving transistors be activated or released. Two transistors placed in a serial configuration are used to drive the relay. This design allows the relay to be switched off even in the event of one of the transistors failing to short.

Redundant power supply

Two independent power converters ensure a reliable internal power supply. In case one supply path fails, the other will take over seamlessly, thus preventing the relay from prematurely switching off.

Fault detection

Failure of the primary power supply, a prolonged disagreement between the timers or a short circuit in one of the driving transistors will lead to the fault logic permanently and irreversibly changing the state of the fault indicator LED, thus allowing a degraded device state to be detected by maintenance staff.

Device Variants

BZ957 - 36V - 10s - OFF - O

Supply Voltage	Time Delay	Type of Delay	Opto-Isolation
24V **28V** **36V** **48V** **72V** **110V**	Any duration between 200ms and 5 minutes	**OFF** = Relay immediately turns on, delay applies when turning off. **ON** = Relay turns on with specified delay. Turning off is immediate.	**O** = Input is optically isolated Remove postfix for normal input

Environment

Stresses exceeding these limits may lead to device malfunction or damage.

General

Height above sea level	**AX (max. 2500m)**	(EN 50125-1:2014 Tab. 1)
Operational temperature	**OT3 (-25°C to +70°C)**	(EN 50155:2017 Tab. 1)
Temperature rise on power on	**ST1**	(EN 50155:2017 Tab. 2)
Fast temperature changes	**H1**	(EN 50155:2017 Tab. 3)
Vibration and shock	**Kat. 1, Class B**	(EN 61373:2010)
Dirt and condensation	**PD2 (light / non-conducting)**	(EN 50124-1:2017 Tab. A.4)

Electrical

Nominal supply voltage(s) / V	**24, 28, 36, 48, 72, 110**	(EN 50155:2017)
Permissible long-term deviation	**-30% bis +25%**	
Permissible short-term deviation (< 1s)	**-40% bis +40%**	
Interruption class	**S3 (20 ms)**	
Electromagnetic compatibility	**EN 50121-3-2:2016**	

Fire Protection

(Evaluated as grouped components according to EN 45545-2:2020)

	mounted inside of vehicle			**mounted outside of vehicle**		
	HL1	**HL2**	**HL3**	**HL1**	**HL2**	**HL3**
Combustible mass	0 g	0 g	0 g	0 g	0 g	0 g

A detailed report as well as test certificates are available upon request.

Technical Data

Power Supply

Power consumption	1 W typ.
Inrush current	<= 200 mA
Transient protection	EN 50121-3-2:2016

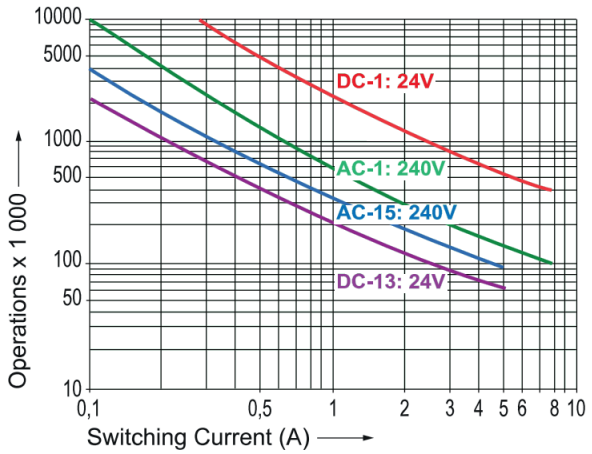
Signal Input

Input current at nominal voltage	10 mA typ.
Positive switching threshold	> 50% of nominal supply voltage typ.
Negative switching threshold	< 20% of nominal supply voltage typ.
Permissible overvoltage	+40 % of nom. voltage
Transient protection	EN 50121-3-2:2016

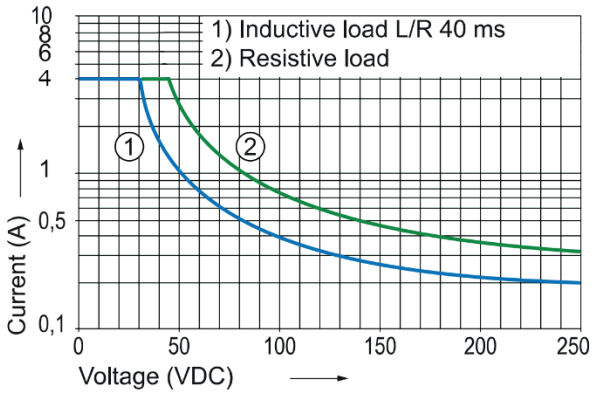
Contact Data

Contact material	AgCuNi + 0.2 … 0.4 µm Au
Type of contact	Single contact with notched crown
Switching current range	3 mA … 8 A typ.
Load inrush current	max. 30 A for 20 ms
Contact resistance when new	≤ 100 mΩ
Electr. life (0.1 Hz, 10% DC)	100'000
Mechanical life	10 x 10^6 operations
Response time NO closed (w/o timer)	≤ 40 ms typ.
Response time NC closed (w/o timer)	≤ 25 ms typ.
Switching capacity (IEC 61810-1)	
AC-1:	240V / 8A max.
AC-15:	240V / 5A max.
DC-1:	24V / 8A max.
DC-13:	24V / 5A / 0.1 Hz max. L/R = 40ms
Continuous current per contact	4 A max.

Electrical Life (NO contacts)



Contact Load Limit Curve (DC)



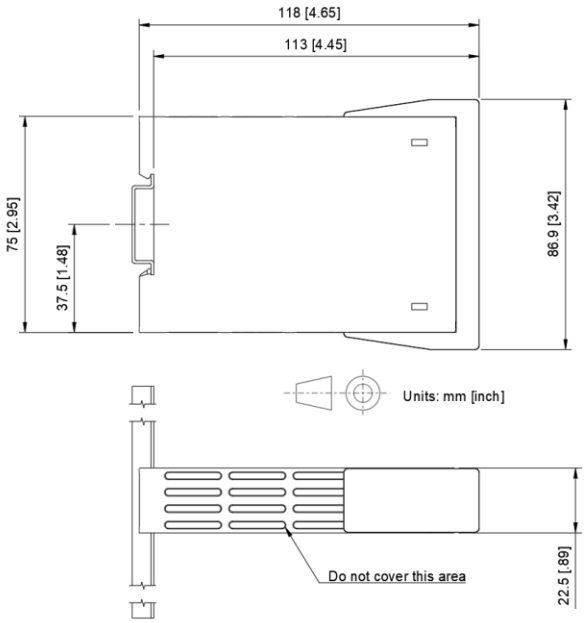
Insulation Data

Circuitry to any contact	1.5 kVDC / 1 min
Between contacts	1.5 kVDC / 1 min
Circuitry or any contact to DIN-rail or neighboring device	1.5 kVDC / 1 min

Mechanical Data

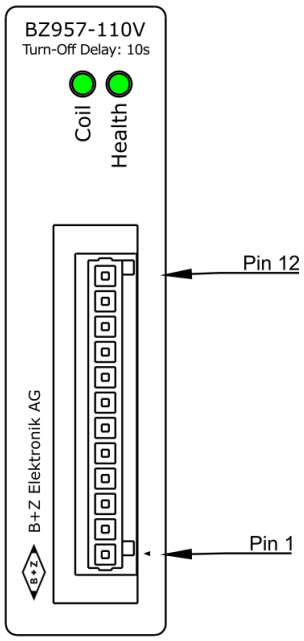
Weight	120 g
Mounting options	35 mm DIN rail
Mounting position	any
Mounting distances:	
sides	none
top / bottom	5 mm
Relay protection class	RT II
Housing material:	
body	PC
cover	PA66

Dimensions



Other Information

Front Panel



Caption:

A shortened version of the full device designation is printed on top of the front panel for easy device identification. The full designation is printed on the side of the device.

Connector:

12 pin 3.5mm pitch female WAGO receptacle of Series 734, compatible with side-locking clips. Pin 1 is indicated with a small triangle.

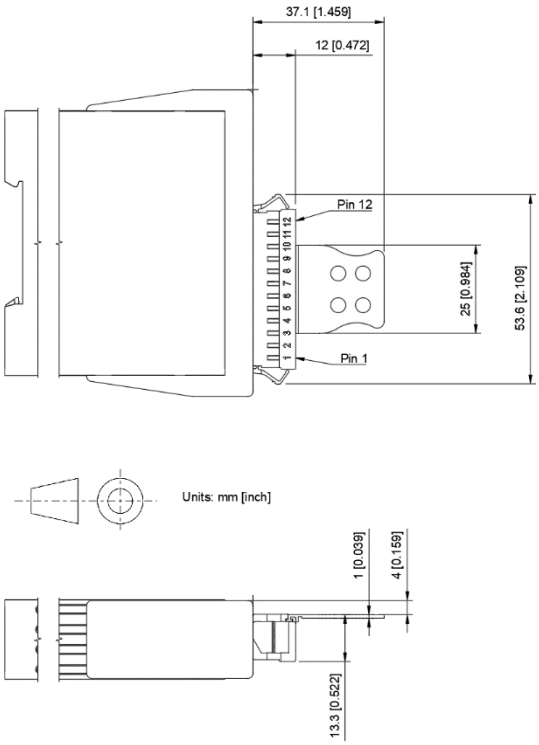
Coil LED:

Indicates current state of the relay coil.

Health-LED:

Indicates state of fault detection circuitry. LED must be on whenever supply voltage is present, otherwise the device's health must be regarded as degraded.

Recommended Mating Connector



For most applications we recommend using a single row connector with side-locking clips and a strain relief plate. For applications with limited space there is a connector without strain relief plate available. Connectors ordered from B+Z are delivered with printed numbers to indicate pins 1 through 12.

With strain relief plate: Art. Nr. 281
Without strain relief plate: Art. Nr. 3145