



BZ953T

Two independent safety relays with fixed turn-off delay in one housing



* For reference only. Mating connector not included in scope of delivery.

Application / Function	2
Device Variants	2
Technical Data	3
Standards and Norms	4
Mechanical Data	5
Block Schematic	6
Measures / Mounting Diagram	6
Changes to this document	7

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page: 1/7

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Application / Function

Two completely independent relay modules K1 and K2, each with a forcefully guided type A safety relay after EN 61810-3: 2015 with protective measures and turn-off delay, in a single enclosure. Each module has its own timer and is equipped with one normally open and one normally closed contact. The turn-off delay with a fixed delay time is set up without programmable components and starts automatically when the supply voltage is removed. Two LEDs on the front of the enclosure show the current status of each relay.

Device Variants

The device is available for DC supply voltages from 24 V to 110 V as defined in EN 50155: 2017 section 5.1 and with turn-off delays of max. 2 s. The device designation corresponds to the nominal operating voltage and the duration of the delay. Article numbers only exist for versions that have already been produced. If you wish to order a device with a different delay or operating voltage, the new version will be assigned a new article number. Please contact us directly in this case.

Device designation: BZ953T-XXXV-Y.Ys

XXX = nominal supply voltage in volts

Y.Y = turn-off delay in seconds

Example: The article with the designation BZ953T-36V-2.0s (article number 216) describes a device in which the two relay modules are identical. Each module is nominally set to a turn-off delay of 2.0 seconds and is designed for a supply voltage of 36 V DC.

Tolerance: For all device variants with nominal delays in the range of up to 2 seconds, the tolerance lies within $\pm 10\%$ or ± 100 ms (the greater of the two values applies) over the entire voltage and temperature range.

Different modules: Devices in which the two modules K1 and K2 are designed differently can be ordered. This is possible for both supply voltage and delay. The device designation then contains two voltages and / or two delays.

Example: The order number BZ953T-24V-2.0s-36V-1.5s describes a device in which the first relay module K1 is designed for a supply voltage of 24 V and in which the turn-off delay lasts 2.0 s. The second relay module K2 is designed for a supply voltage of 36 V and the turn-off delay lasts 1.5 s.

Turn-off delay / s	Supply voltage / V	Holding current per module / mA	Device designation	Art. No.
2.0	36	≤ 35	BZ953T-36V-2.0s	216
2.0	110	≤ 15	BZ953T-110V-2.0s	325
1.9	110	≤ 15	BZ953T-110V-1.9s	302

Table 1: Existing order options for BZ953T with nominal supply voltage, turn-off delay and article number.



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Created: 18.11.2021
Changed: 11.09.2023

page: 2/7

BZ953T

Two independent safety relays with fixed turn-off
delay in one housing

Technical Data

Environment

General

Height above sea level	AX (max. 2000m)	(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	(see device variant table)	(EN 50155:2017)
Permissible permanent deviation	-30% bis +25%	
Permissible short-term deviation (< 1s)	-40% bis +40%	
Interruption class	S3 (20 ms)	
Electromagnetic compatibility	EN 50121-3-2:2016	

Turn-on Behavior and Minimum Turn-on Duration

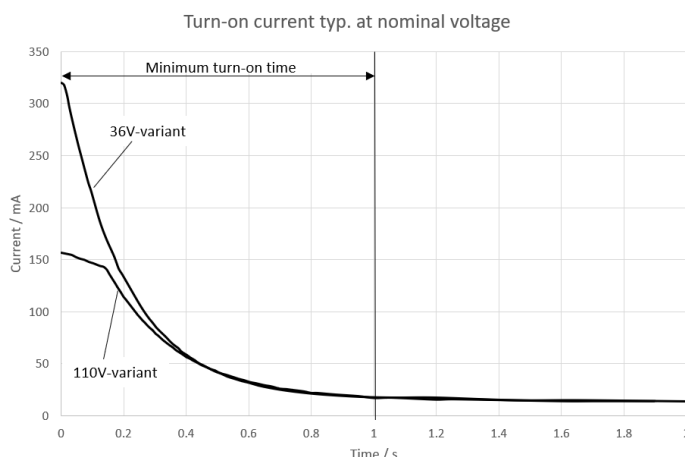


Figure 1: Typical inrush current at nominal voltage

Without previous operation, the inrush current of a module is max. 500 mA for a duration of max. 500 ms, depending on the device variant (see Figure 1). The full holding power is reached after 1 second irrespective of the variant. Falling below the minimum turn-on time of 1 second can lead to a reduction in the turn-off delay and must therefore be prevented. The response time of the relay contacts after connecting the supply voltage is typically 10 ms.

Fault Diagnosis

When used in circuits with safety requirements, the turn-off behavior of the device should be checked regularly (e.g. as part of the normal turn-off process of the vehicle). If the turn-off time significantly exceeds or falls below the specified tolerance of $\pm 10\%$ or ± 100 ms (the greater of the two values applies), the device should be replaced.



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Created: 18.11.2021
Changed: 11.09.2023

page: 3/7

BZ953T

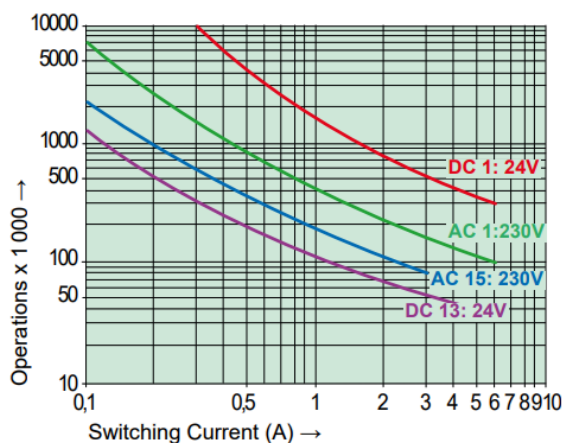
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Relay Contacts

Contact material	AgCuNi+0,2-0,4 µm Au
Contact type	Single contact with serrated crown
Rated switching capacity	320 VA 160 VAC 2 A AC1
Max. switch-on current	10 A for 20 ms
Switching voltage range	5 to 160 V DC/AC
Typical switching current range	3 mA to 6 mA
Max. permanent contact load	2 A
Contact resistance (unused)	< 100 mΩ
Mechanical service life	> 10 x 10 ⁶ switching cycles
Normally open contact bouncing period	typically 2 ms
Normally closed contact bouncing period	typically 15 ms
Shock resistance 16 ms	NO contact 17 g NC contact 7 g
Vibration resistance 10-200 Hz	NO contact 7 g NC contact 2 g

Insulation between any two contacts as well as between any contact and any coil is designed according to the requirements of reinforced insulation as defined by EN 50124-1:2017 for nominal voltages of up to 110VDC.

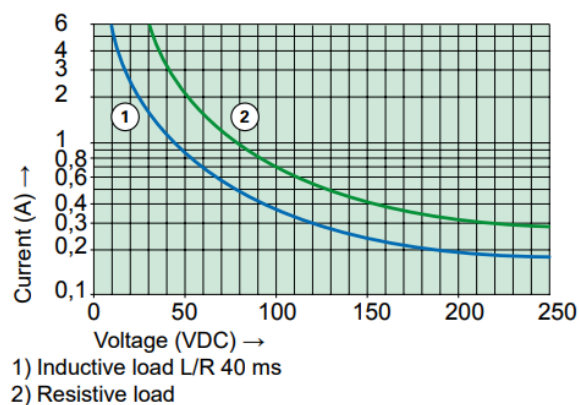
Contact Lifetime for NO Contacts



Maximal switching characteristics (EN60947-5-1)

AC 1: 250 V / 6 A
AC 15: 230 V / 3 A
DC 1: 24 V / 6 A
DC 13: 24 V / 5 A / 0,1 Hz
UL 508: B300 / R300

Load Limit Curve with Direct Current



Standards and Norms

The device is manufactured according to the following standards:

ISO 9001:2015

Electronic equipment used on rolling stock: EN 50155:2017

Fire protection: EN 45545-2:2020

The standards applicable to this product are dependent on the version available at the time of development.



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Created: 18.11.2021
Changed: 11.09.2023

page: 4/7

BZ953T

Two independent safety relays with fixed turn-off
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Mechanical Data

Dimensions

Size over all: 95x23x87 mm (L x W x H)
Weight: ca. 95 g (without mating connector)

Materials

Enclosure: Glass-fibre reinforced plastic
Cover: Plastic
PCB: FR-4

Mounting

Arbitrary orientation
Mounting: on standard 35 mm T-rails, EN-50022-35

Front edge connector

12-pin plug connector: WAGO

Mating connector (optional)

12-pin female connector: WAGO 734-112/037-047/034-000
Female connector with strain relief



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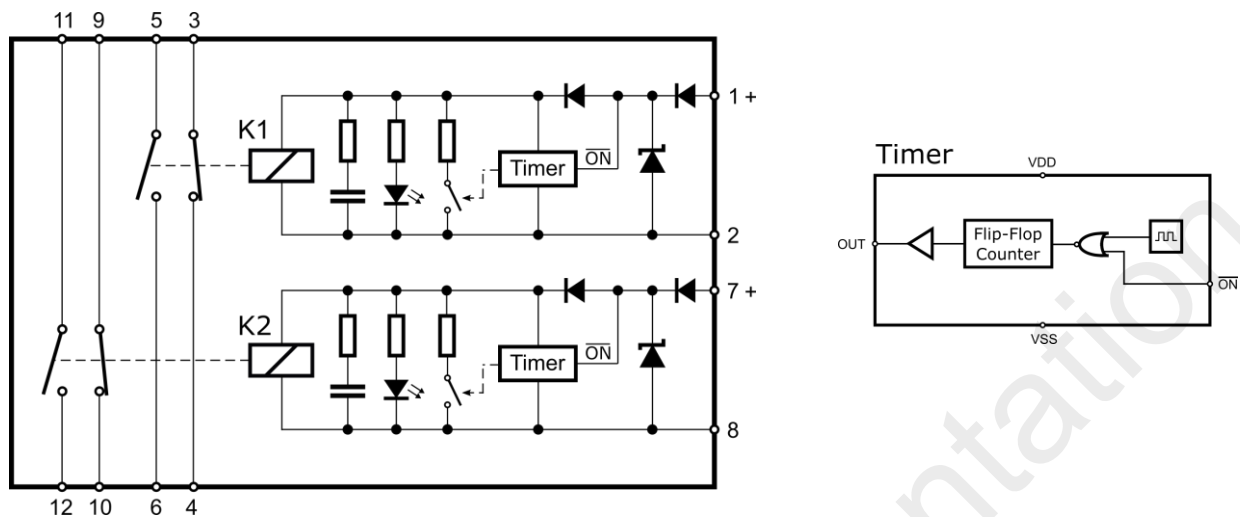
Created: 18.11.2021
Changed: 11.09.2023

page: 5/7

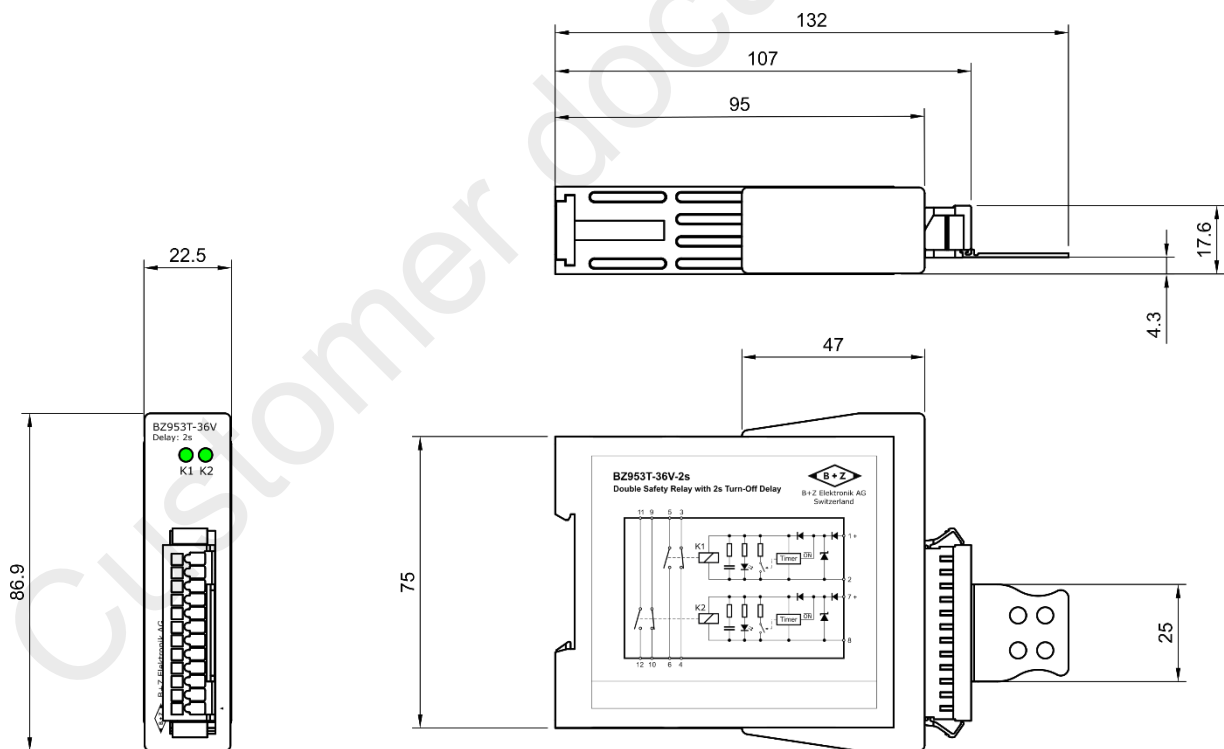
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Two independent safety relays with fixed turn-off
delay in one housing

Block Schematic



Measures / Mounting Diagram



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Created: 18.11.2021
Changed: 11.09.2023

page: 6/7

BZ953T

Two independent safety relays with fixed turn-off delay in one housing

Changes to this document

Date	Paragraph	Change
20.01.2022	Device Variants	Range of available device variants extended to include all voltages between 24V bis 110V. Voltage designator in device designation extended to three characters.
27.06.2022	Technical Data	Fixed spelling of 'non-condensing'.
27.06.2022	Device Variants	Added BZ953T-110V-2.0s to variant list. Max. holding current per module added to variant list.
28.06.2022	Changes to this document	Changed language of column headings to English.
21.03.2023	Device Variants	Added BZ953T-110V-1.9s to variant list. Added decimal digit to turn-off delay column for all variants.
21.03.2023	Title page	Updated ISO9001 seal
11.09.2023	Technical Data	Added figure 1 and more specific information on rush-in current. Refined general and electrical environment information. Added details on insulation.
	Title page	Replaced german image description.



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Created: 18.11.2021
Changed: 11.09.2023

page: 7/7

BZ953T

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