FAST-ACTING BISTABLE RELAYS WITH 3-7 CONTACTS

RGBZ10-11 | RMBZ30 SERIES fast-acting

USER SECTORS

- Power generation
- Nuclear
- Power transmission
- Rolling Stock
- Fixed railway installations
- Shipbuilding
- Shipbuilding
- Heavy industry

RGBZ10

RMBZ30

PRODUCT ADVANTAGES

- Fast-acting bistable relay
- Solid and rugged construction for heavy or intensive duty
- Very long electrical life expectancy and exceptional endurance
- Self-cleaning knurled contacts
- Direct current operation
- Retaining clip or fixing screws for secure locking of relay to socket
- Transparent cover, pull-out handle or fixing/pulling screws
- Label holder in cover for customer's use
- Positive mechanical keying for relay and socket

DESCRIPTION

Fast-acting bistable relays are available in 3 models with **3, 4 and 7 change-over contacts**. This family of relays is able to guarantee high speed switching of contacts. Sharing the same basic electromechanical design as relays of the G series, they offer the same specifications and benefits. These relays can be operated off a d.c. power supply.

In an instantaneous bistable relay, the closure of an NO contact takes normally between 30 and 60 ms, depending on the particular product specifications. In contrast, a fast-acting relay is able to close the contact in a time of **between 10 and 20 ms.**

The operating time is measured from the moment when the coil is energized until completion of the change in status and stabilization of the contact, including bounces. A 'bounce' is an intermediate position assumed by the contact during the course of stabilization in its final position. It is advisable to discuss this aspect thoroughly with the manufacturer, when selecting the component. The contacts used are of a type designed to give good levels of performance both with **high and strongly inductive d.c. loads**, and with **particularly low loads** such as interface signals; inclusion of the magnetic arc blow-out function (optional) helps to achieve a considerable increase in breaking capacity.

Knurled contacts ensure not only have better **self-cleaning** characteristics, but also lower ohmic resistance thanks to multiple points of electrical connection, thereby extending the electrical life expectancy of the component.

Typical sectors of use are among the most demanding, such as, for example, electricity generating stations, electrical transformer stations, fixed equipment for railways, or industries using continuous production processes (chemical and petrochemical, rolling mills, cement factories, etc.). The performance and reliability of the product have secured its approval with ENEL and other multi-utilities.

Fast-acting relays are often incorporated into circuits of key importance, such as those providing protection and breaker functions on a power line in the event of faults occurring. With this in mind, operating speed is an essential parameter for electrical system designers. The contacts are connected to multifunction digital protection devices or recording instruments (disturbance recorders).

Like all our relays, the models in the fast-acting bistable series are assembled as part of a controlled manufacturing process in which every step of production is verified by the next step in succession. In effect, each relay is calibrated and tested individually, by hand, in such a way as to guarantee top reliability.

Models	Type	Number of contacts	Nominal current	Operating time (1)	
				Pick-up	Drop-out
RGBZ10	Bistable	3	12 A	≤ 8 + 4 ms	≤ 9 + 25 ms
RGBZ11	Bistable	4	12 A	≤ 8 + 7 ms	≤ 9 + 25 ms
RMBZ30	Bistable	7	10 A	≤ 10 + 8 ms	≤ 10 + 35 ms

(1) Operating times are expressed as time of first contact + bounce times.

FOR CONFIGURATION OF PRODUCT CODE, SEE "ORDERING SCHEME" TABLE

Coil specifications	RGBZ10	RGBZ11	RMBZ30
Nominal voltages Un	DC: 24-48-110-125-220 (1)		
Consumption at Un (DC/AC)	18 W (2)		36 W (2)
Operating range	DC: 80…120% Un		
Type of duty	Continuous		

Minimum control pulse 50ms.
(1) Other values on request.
(2) During latch and unlatch. Power consumption is zero on completion of the operating cycle, as the coil de-energizes automatically.

Contact specifications		RGBZ10	RGBZ11	RMBZ30
Number and type		3 CO, form C	4 CO, form C	7 CO, form C
Current	Nominal (1)	12 A		10 A
	Maximum peak (2)	20A for 1min - 40A for 1s		
	Maximum pulse (2)	150A for 10ms		
Example of electrical life expectancy (3)		0.5A - 110 Vdc - L/R 40ms - 10^5 operations - 1,800 operations/hour		
Minimum load		200 mW (10 V, 10 mA)		
Maximum breaking voltage		350 VDC / 440 VAC		
Contact material		AgCdO		
Operating time at Un (ms) (4)		RGBZ10	RGBZ11	RMBZ30
Pick-up (NO contact closing)		≤ 8 + 4	≤ 8 + 7	≤ 10 + 8
Drop-out (NC contact closing)		≤ 9 + 25	≤ 9 + 25	≤ 10 + 35

(1) On all contacts simultaneously, reduction of 30%.
(2) Maximum peak and pulse currents are those currents that can be handled, for a specified time, by the contact. They do not refer to steady or interrupted currents.
(3) For other examples, see electrical life expectancy curves.
(4) Operating times are expressed as time of first contact + bounce times.

Insulation	
Insulation resistance (at 500Vdc)	
between electrically independent circuits and between these circuits and ground	> 10,000 MΩ
between open contact parts	> 10,000 MΩ
Withstand voltage at industrial frequency	
between electrically independent circuits and between these circuits and ground	2 kV (1 min) - 2.2 kV (1 s)
between open contact parts	2 kV (1 min) - 2.2 kV (1 s)
between adjacent contacts	2 kV (1 min) - 2.2 kV (1 s)
Impulse withstand voltage (1.2/50µs - 0.5J)	
between electrically independent circuits and between these circuits and ground	5 kV
between open contact parts	4 kV

Mechanical specifications		RGBZ10	RGBZ11	RMBZ30
Mechanical life expectancy		20x10^6 operations		
Maximum switching rate	Mechanical	900 operations/hour		
Degree of protection		IP40		
Dimensions (mm)		45x50x86 (1)	45x50x112 (1)	132x58x86 (1)
Weight (g)		280	370	450

(1) Excluding output terminals

Environmental specifications

Operating temperature	-25 to 55°C
Storage and shipping temperature	-25 to 70°C
Relative humidity	Standard: 75% RH - Tropicalized: 95% RH
Fire behavior	V0

Standards and reference values

EN 61810-1, EN 61810-2, EN 61810-7	Electromechanical elementary relays
EN 60695-2-10	Fire behavior
EN 50082-2	Electromagnetic compatibility
EN 60529	Degree of protection provided by enclosures

Unless otherwise specified, products are designed and manufactured according to the requirements of the European and International standards indicated above.
In accordance with EN 61810-1, all items of technical data are referred to ambient temperature 23 °C, atmospheric pressure 96kPa and 50% humidity.
Tolerance for coil resistance, nominal electrical input and nominal power is ±7%.

Configurations - Options

TROPICALIZATION	Surface treatment of the coil with protective coating for use with RH 95%.
LEVER FOR MANUAL OPERATION	Allows manual operation of the relay, with the cover closed, using a screwdriver (except RGBZ11).

Ordering scheme

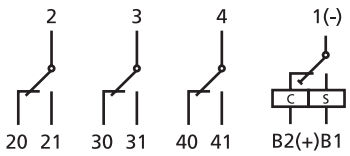
Product code	Configuration	Label	Type of power supply	Nominal voltage (V) (1)	Finish (2)	Keying position code (3)
RGBZ	10: 3 CO contacts 11: 4 CO contacts	F	C: Vdc	024 - 048 - 110 125 - 132 - 144 220	T: Tropicalized coil M: Manual operation (4)	xxx
RMBZ	30: 7 CO contacts					

Example

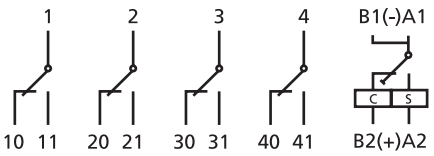
RGBZ	**10**	**F**	**C**	**110**		
RGBZ10F-C110 = Fast-acting bistable relay with 3 change-over contacts and 110Vdc coil.						
RMBZ	**30**	**F**	**C**	**048**	**T**	
RMBZ30F-C048/T = Fast-acting bistable relay with 7 change-over contacts and 48Vdc tropicalized coil.						

(1) Other values on request.
(2) Optional value. Multiple selection possible (e.g. TM).
(3) Optional value. Positive mechanical keying is defined according to the manufacturer's model .
(4) RMBZ30 only.

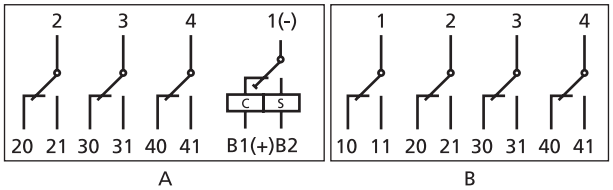
Wiring diagram



RGBZ10

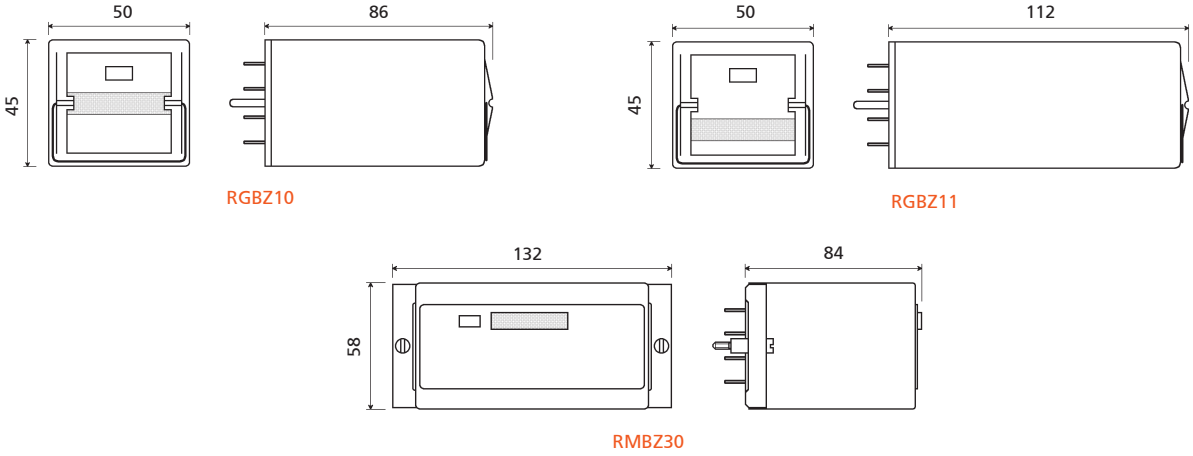


RGBZ11

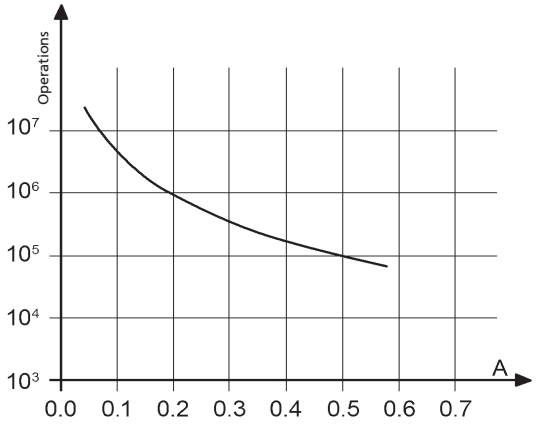


RMBZ30

Dimensions



Electrical life expectancy



Contact loading: 110Vdc, L/R 40 ms

U	I (A)	L/R (ms)	Operations
110 Vdc	0.5	40	100,000
110 Vdc	0.6	10	300,000
120 Vdc	0.7	40	100,000
125 Vdc	1.2	0	1,000,000
220 Vdc	0.1	40	100,000
220 Vdc	0.25	10	100,000
U	I (A)	cosφ	Operations
110 Vac	1	1	2,000,000
110 Vac	1	0.5	1,500,000
110 Vac	5	1	1,000,000
110 Vac	5	0.5	500,000
220 Vac	0.5	1	2,000,000
220 Vac	1	0.5	600,000
220 Vac	5	1	650,000
220 Vac	5	0.5	600,000

Switching frequency: 1,200 operations/hour

Sockets and retaining clips		RGBZ10 - RGBZ11			RMBZ30
Type of installation	Type of outputs	Socket	Clip for RGBZ10	Clip for RGBZ11	Socket
Wall or DIN rail mounting	Screw	PAVG161	VM1222	VM1223	PAVM321
Flush mounting	Double faston (4.8 x 0.8 mm)	PRDG161	VM1222	VM1223	PRDM321
	Screw	PRVG161	VM1222	VM1223	PRVM321

Mounting tips

The preferred mounting position is on the wall, with the relay positioned horizontally in the reading direction on the nameplate.
For safe and secure operation of G series relays, it is advisable to use retaining clips. Retaining clips are not required for M series relays, as a secure connection is guaranteed by the fixing screws. These same screws also serve to facilitate installation and removal of the relay.
To ensure correct use, the screws must be tightened / loosened in alternating sequence, by degrees.
No special maintenance is required.
Condensation can form inside the relay when powered up and the outside ambient temperature is cold; this is quite normal and does not affect the operation of the relay. The plastic materials of the relay do not possess hygroscopic properties.