



RELAYS

FAST-ACTING MONOSTABLE RELAYS WITH 2-4-8 CONTACTS

RGR | RGMV | RMMZ | RMMV SERIES fast-acting

USER SECTORS



Power generation



Nuclear



Power transmission



Rolling stock



Fixed railway installations



Shipbuilding



Shipbuilding



Heavy industry



RGMV13



RMMV12

PRODUCT ADVANTAGES

- Fast-acting monostable 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 **monostable relays** are available in 6 models with different types and numbers of contacts. This family of relays is able to guarantee high speed switching of contacts during pick-up or during drop-out, depending on the model. All models are based on the electromechanical design of the G series, except for the RGRE, which utilizes reed contact technology. These relays can be operated off a d.c. power supply.

In an instantaneous monostable relay, the closure of an NO contact takes normally between 15 and 40 ms, depending on the particular product specifications. By contrast, a fast-acting relay is able to close the contact in a **time of between 2.5 and 10 ms**.

The operating time is measured from the moment when the coil is energized/de-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. Unless specified otherwise, the operating times indicated for our relays include the duration of the bounce. It is advisable to discuss this aspect thoroughly, with the manufacturer, when selecting the component. Knurled contacts ensure not only 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 special importance, such as those providing protection and breaker functions on a power line in the event of faults occurring. With this in mind, the 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 monostable 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
RGRE12	Monostable	2 CO (reed)	2 A	≤ 2,5 ms	≤ 3 ms
RGMV12	Monostable	4 CO	10 A	≤ 8 ms	≤ 45 ms
RGMV13	Monostable	4 NC	10 A	-	≤ 8 ms
RMMV12	Monostable	8 NO	10 A	≤ 6 ms	-
RMMV13	Monostable	4 NO + 4 NC	10 A	≤ 6 ms (NO)	≤ 6 ms (NC)
RMMZ11	Monostable	8 CO	10 A	≤ 8 + 5 ms	≤ 50 ms

(1) Unless specified otherwise, the operating time signifies until stabilization of the contact (including bounces).



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



Coil specifications	RGRE12	RGMV12	RGMV13	RMMV12	RMMV13	RMMZ11
Nominal voltages Un	DC: 24-48-110-125-220 ⁽¹⁾					
Consumption at Un	1 W	4 W		7 W		
Operating range	DC: 80...120% Un	DC: 80...110% Un				
Type of duty	Continuous					
Drop-out voltage ⁽²⁾	DC: > 5% Un					

(1) Other values on request.

(2) Limit value for supply voltage, expressed as % of the nominal value, beneath which the relay is certain to be de-energized.



Contact specifications	RGRE12	RGMV12	RGMV13	RMMV12	RMMV13	RMMZ11
Number and type	2 CO, form C REED	4 CO, form C	4 CO, form C	8 NO	4 NO + 4 NC	8 CO, form C
Current						
Nominal ⁽¹⁾	2A	10A				
Maximum peak ⁽²⁾	-	20A for 1min - 40A for 1s				
Maximum pulse ⁽²⁾	-	150A for 10ms				
Example of electrical life expectancy ⁽³⁾	0.1A - 110Vdc - L/R=40ms - 10 ⁵ operations 1,800 operations/hour	0.3 A - 110 Vdc - L/R = 40 ms - 10 ⁵ operations – 1,800 operations/hour				
Minimum load	200 mW (10 V, 10 mA)	200 mW (10 V, 10 mA)				
Maximum breaking voltage	300 V	350 VDC / 440 VAC				
Contact material	Rh	AgCdO				
Operating time at Un (ms) ⁽⁴⁾	RGRE12	RGMV12	RGMV13	RMMV12	RMMV13	RMMZ11
Pick-up (NO contact closing)	≤ 2.5	≤ 8	-	≤ 6	≤ 6	≤ 8 + 5 ⁽⁵⁾
Drop-out (NC contact closing)	≤ 3	≤ 45	≤ 8	-	≤ 6	≤ 50

(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) Unless specified otherwise, operating times are understood as comprising stabilization of the contact (inclusive of bounces).

(5) Bounces = 5 ms.



Insulation

Insulation resistance (at 500Vdc) between electrically independent circuits and between these circuits and ground	> 10,000 MΩ
Withstand voltage at industrial frequency between electrically independent circuits and between these circuits and ground between adjacent contacts	2 kV (1 min) - 2.2 kV (1 s) 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



Mechanical specifications	RGRE12	RGMV12	RGMV13	RMMV12	RMMV13	RMMZ11
Mechanical life expectancy	20x10 ⁶ operations	20x10 ⁶ operations		10x10 ⁶ operations		
Maximum switching rate	Mechanical	3,600 ops. / h	1,800 operations / hour			
Degree of protection	IP40					
Dimensions (mm)	45x50x112 ⁽¹⁾	45x50x112 ⁽¹⁾	45x50x86 ⁽¹⁾	132x58x84 ⁽¹⁾		
Weight (g)	190	320	270	530		

(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 behaviour	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 $\pm 7\%$.



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 (RMMZ11 only)



Ordering scheme

Product code	Configuration	Label	Type of power supply	Nominal voltage (V) ⁽¹⁾	Finish ⁽²⁾	Keying position code ⁽³⁾
RGRE	12 : 2 CO reed contacts	F	C : Vdc	024 - 048 - 110 125 - 220	T: Tropicalized coil M: Manual operation ⁽⁴⁾	xxx
RGMV	12 : 4 CO contacts 13 : 4 NC contacts					
RMMV	12 : 8 NO contacts 13 : 4 NO contacts + 4 NC contacts					
RMMZ	11 : 8 CO contacts					

Example

RGMV	12	F	C	110		
RGMV12F-C110 = Fast-acting monostable relay with 4 change-over contacts and 110Vdc coil.						
RMMZ	11	F	C	048	T	
RMMZ11F-C048 = Fast-acting monostable relay with 8 change-over contacts and 48Vdc tropicalized coil.						

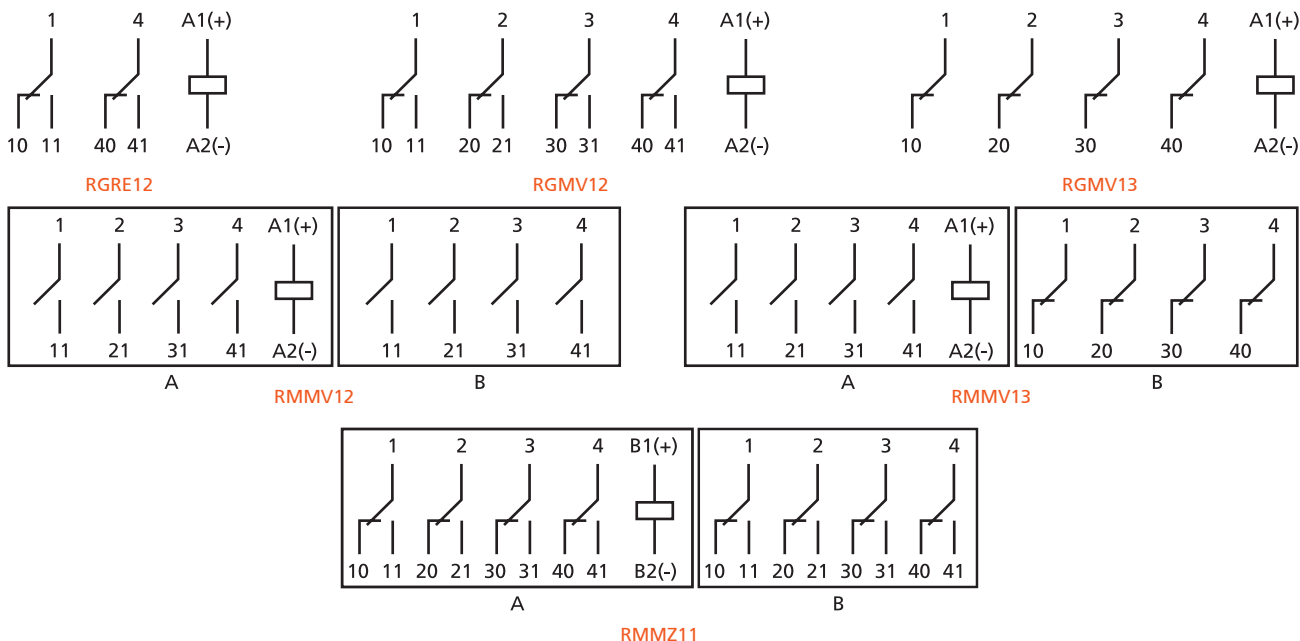
(1) Other values on request.

(2) Optional value. Multiple selection possible (e.g. TM).

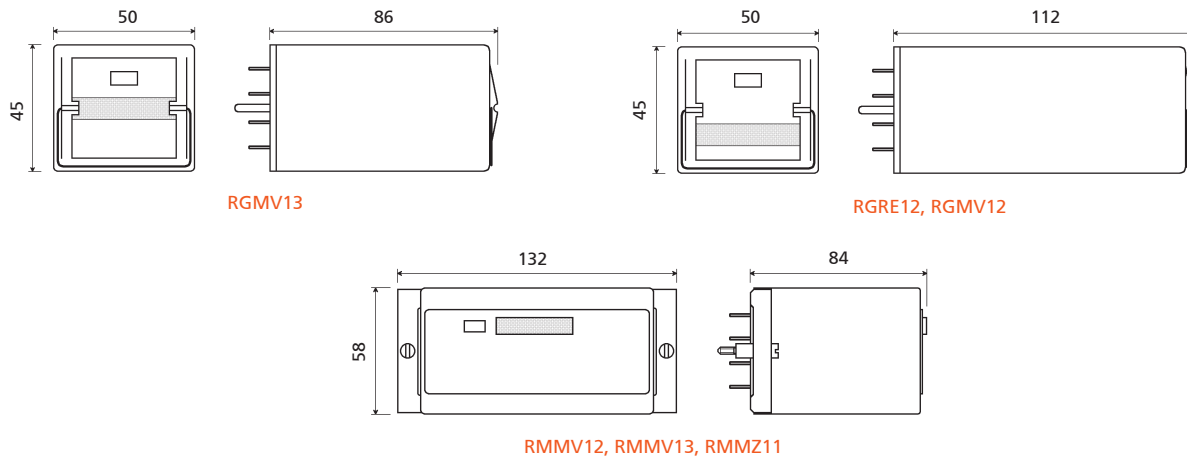
(3) Optional value. Positive mechanical keying is defined according to the manufacturer's model.

(4) RMMZ11 only.

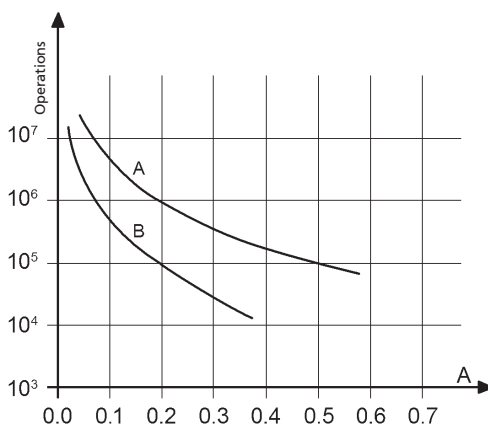
Wiring diagram



Dimensions



Electrical life expectancy



Contact loading: 110Vdc, L/R 40 ms
Curve A: RMMZ11
Curve B: RGMV12-13, RMMV12-13

RMMZ11			
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

RGMV12 - 13			
U	I (A)	L/R (ms)	Operations
110Vdc	0.2	40	500,000
220Vdc	0.2	10	80,000
U	I (A)	cosφ	Operations
110 Vac	1	1	1,200,000
110 Vac	1	0.5	1,000,000
110 Vac	5	1	500,000
110 Vac	5	0.5	300,000
220 Vac	0.5	1	1,200,000
220 Vac	1	0.5	500,000
220 Vac	5	1	400,000
220 Vac	5	0.5	300,000

Switching frequency: 1,200 operations/h
(*) = 600 operations/hour

Sockets and retaining clips

		RGRE - RGMV12 - RGMV13			RMMV12 - RMMV13 - RMMZ11
Type of installation	Type of outputs	Sockets	Clip for RGRE/RGMV12	Clip for RGMV13	Sockets
Wall or DIN rail mounting	Screw	PAVG161	VM1222	VM1223	PAVM321
Flush mounting	Double faston (4.8 × 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 correct use of the relays, they should be spaced apart by at least 5 mm in the horizontal direction (G series) and 20 mm in the vertical direction (G and M series). This is to allow correct upward dissipation of the heat generated by the coil. Set these distances according to the socket used. Distances can be reduced depending on the environmental conditions during operation, and on the relay duty cycle. 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.