



RELAYS

FAST-ACTING BISTABLE (LOCK-OUT) RELAYS, 4 - 8 - 12 CONTACTS

RGBV | RMBV

USER SECTORS



Power generation



Nuclear



Power transmission



Rolling Stock



Fixed railway installations



Shipbuilding



Shipbuilding



Heavy industry



RMBV12X

PRODUCT ADVANTAGES

- High speed operation, tripping applications
- High Burden configuration, providing immunity to capacitance discharges
- Plug-in relays
- High performance, compact dimensions, light weight
- Solid and rugged construction for intensive duty
- Self-cleaning knurled contacts, C/O type
- Wide contact gap for a very high breaking capacity, electrical life expectancy and insulation.
- Magnetic arc blow-out as standard
- Wide range of sockets
- Retaining clip for secure relay locking on socket
- Transparent cover, LED as standard and pull-out handle

DESCRIPTION

RGBV and RMBV relays are highly reliable, high performance products, suitable for applications in very harsh and disturbed environments, such as protection, command and control systems for HV electrical substations or power stations.

The range includes relays with 4, 8 and 12 contacts.

These lockout (latching) relays have 2 stable positions; contacts are able to hold their position after energizing the "SET" coil or the "RESET" coil.

All models are equipped with an automatic coil cut-off system, designed to have no power consumption once the operation is completed.

A manual lever allows the relays to be operated manually.

These relays are designed for **circuit breaker tripping applications**, where **fast-acting** contact is essential in order to **minimize the total trip time** and avoid, in case of emergency situation, damages to the **transmission station** equipments.

The **high speed** in operation, the high breaking capacity and the **ability also to switch very low loads** (few mA) make them suitable for use in demanding applications such as:

- Duplication of HV/MV protection outputs
- Direct action on HV/MV primary equipment
- Trip alarms transmission

The **knurled contact surface** ensures excellent self-cleaning, and a lower ohmic resistance thanks to the various points of electrical contact, while also improving the electrical life expectancy of the component.

The contacts are designed to achieve **remarkable performance both for high, inductive loads and very low loads**. Contact is able to switch from 10mA – 10V without gold-plating the contacts.

Magnetic arc blow-out helps to increase the breaking capacity: the relay can manage heavy duty loads with intensive switching frequency.

The "High burden" (HB) configuration provides immunity against capacitance (currents and power) discharge to the coil, in order to avoid relay operations in the event of transients due to extensive wiring, for example.



Models	Number of contacts	HIGH BURDEN ⁽¹⁾ configuration	Manual operation	Operating tim Pick-up (ms)
RGBV14X	4	-	Option	≤ 10 ms
RGBV16X	4	✓		
RMBV12X	8	-	✓	≤ 10 ms
RMBV14X	8	✓		
RMBV15	12	-	Option	≤ 10 ms
RMBV16	12	✓		

(1) HIGH BURDEN Configuration: for the operating and the specifications refer to the paragraph "COIL DATA - HIGH BURDEN Configuration" (see the table below).



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



COIL DATA - STANDARD Configuration	4 CO	8 CO	12 CO
Nominal voltages at Un	DC: 24-48-110-125-220V / AC: 230V		
Consumption at Un	< 22 W	< 35 W	≤ 75 W
Current AVG peak at pick-up ⁽¹⁾	24Vdc < 0.8A / 20ms 48 - 110 - 125Vdc: < 0.3A / 20ms 220Vdc: < 0.1A / 20ms		24Vdc: < 1.2A / 20ms 48 - 110 - 125Vdc: < 0.5A / 20ms 220Vdc: < 0.1A / 20ms
Operating range	DC: 80 ÷ 110% Un / AC: 80 ÷ 110%		
Type of duty	Continuous		



Coil data HIGH BURDEN configuration	4 CO	8 CO	12 CO
Nominal voltages at Un	DC: 24 - 48 - 110 - 125 - 220V		
AVG consumption at Un (only while switching)	< 22 W	< 35 W	≤ 75 W
Peak consumption	24 - 48Vdc: 300 W 110 - 125 - 220Vdc: 300 W		
Immunity to capacitive discharge	10 µF @ 120% Un across the coil		
Operating range	80 ÷ 110% Un		
Type of duty	Continuous		
Drop-out voltage	DC: > 5% Un		

The **CONFIGURATION HIGH BURDEN** provides higher security in plant control system, avoiding unwanted relay operation due to capacitive discharge currents, for example in case of an earth fault in long DC cables.

A typical application is where the initiating contact may be remote from tripping relay.

HIGH BURDEN Tripping Relays is designed to withstand a "10µF capacitor discharge test".

- Relay will not operate when a 10 µF capacitor, charged @ 120% Un, is applied across the coil.

While switching, high energy is required. After operation, the high coil burden is reduced to a very low value, ensuring energy saving and avoiding overload on the power supply circuit or station battery.

An electronic circuit acts as a coil voltage regulator and controls the duration of the burden.

Contact data		4 CO	8 CO	12 CO
Current	Nominal ⁽¹⁾	10A		
	Maximum pulse ⁽²⁾	20A for 1min 40A for 1s 150A for 10ms		
Example of electrical life ⁽³⁾		1A - 110Vdc - L/R 0ms - 350,000 operations 0.5A - 220Vdc - L/R 0ms - 300,000 operations		
Making capacity		30A (for 200ms) - 110Vdc - L/R 0ms: 2,000 operations		
Minimum load ⁽⁴⁾	Standard contacts	200mW (10V, 10mA)		
	Gold-plated contact ⁽⁵⁾	50mW (5V, 5mA)		
Maximum breaking voltage		250Vdc / 350Vac		
Contact material		AgCdO		
Operating time at Un (ms) ⁽⁶⁾				
	Pick-up ms	Vdc: ≤ 10	Vac: ≤ 10	
	Drop-out ms	Vdc: ≤ 10	Vac: ≤ 10	

(1) On all contacts simultaneously, reduction of 30%.

(2) The maximum pulse currents are those currents that can be handled, for a specified time, by the contact. They do not refer to make or break currents.

(3) For other examples, see electrical life expectancy curves.

(4) Values referred to a new product, measured in laboratory.

The ability to maintain this performance over the time depends on the environmental conditions and the contact' frequency use.

The use of gold plated contacts is recommended in the case of very low loads.

(5) A gold contact, if subjected to high loads, degrades superficially. In this case, the characteristics of the standard contact must be considered. This does not affect the operation of the relay.

(6) Unless specified otherwise, the operating times are expressed excluding bounces.

Only for Vac power supply: actual value may increase of max 5ms (pick-up, worst case) or 10ms (drop-out, worst case). It depends on the sinusoid front (rising or falling) while energizing or de-energizing.

Insulation	
Insulation resistance (at 500Vdc) between electrically independent circuits and between these circuits and ground	> 1,000 MΩ
Dielectric withstanding voltage at industrial frequency between electrically independent 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 between open contact parts	5 kV 3 kV

Mechanical specifications		4 CO	8CO	12 CO
Mechanical life expectancy		10x10 ⁶ operations		
Maximum switching rate	Mechanical	3,600 operations / h		
Degree of protection (with relay mounted)		IP40		
Dimensions (mm) ⁽¹⁾		45x50x86	45x90x100	58x188x84
Weight (g)		270	400	810

(1) Output terminals excluded.

Environmental characteristics	
Operating temperature	-25 ÷ +70°C
Storage and shipping temperature	-40 ÷ +85°C
Relative humidity	Standard: 75% UR - Tropicalized: 95% UR
Fire behaviour	V0

Standards and reference values	
EN 61810-1, EN 61810-2, EN 61810-7 EN 60695-2-10 EN 60529 EN 61000	Electromechanical elementary relays Fire behaviour Degree of protection provided by enclosures Electromagnetic compatibility



Configurations - Options

TROPICALIZATION	Surface treatment of the coil with protective coating for use with RH 95%.
GOLD PLATING	Surface treatment of the contacts, blades and output terminals with gold-cobalt alloy $\geq 2\mu$. This treatment ensures long-term ability of the contact to conduct lower currents.
LEVER FOR MANUAL OPERATION	Allow to manual operating the relay (available only for the RMMV11 and RMMV17 models)
HIGH BURDEN (HB)	The HB "High Burden" Configuration provide immunity to capacitance discharge currents & power to the coil, in order to avoid relay operations, for example in case of transients coming from extensive wiring.



Ordering scheme

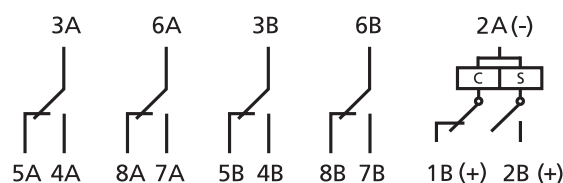
Product code	Configuration A	Configuration B	Label	Type of power supply	Nominal voltage (V)	Finish ⁽¹⁾
RGBV	1: Standard 4: Gold Plating	4X: 4 contacts 6X: 4 contacts with HB	F	C: Vdc A: Vac	Vdc 024 - 048 - 110 - 125 Vac 230 ⁽²⁾	T: Tropicalized coil M: Lever for manual operation
RMBV	1: Standard 4: Gold Plating	2X: 8 contacts 4X: 8 contacts with HB		C: Vdc A: Vac	Vdc 024 - 048 - 110 - 125 Vac 230 ⁽²⁾	T: Tropicalized coil (lever for manual operation always included)
RMBV	1: Standard 4: Gold Plating	5: 12 contacts 6: 12 contacts with HB		C: Vdc A: Vac	Vdc 024 - 048 - 110 - 125 Vac 230 ⁽²⁾	T: Tropicalized coil M: Lever for manual operation

(1) Optional value. Possible the multiple choice (Ex. TM)

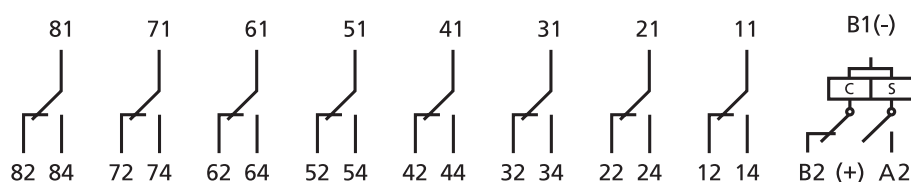
(2) NOT AVAILABLE FOR HB Configuration

Example	RGBV	1	6X	C	024	
	RGBV16X-C024= Relay with standard contacts, 4 C/O, High Burden configuration, 24Vdc coil					
	RMBV	4	5		230	M
	RMBV45-A230/M= Relay with gold plating, 12 C/O, 230Vac coil, lever for manual operation					

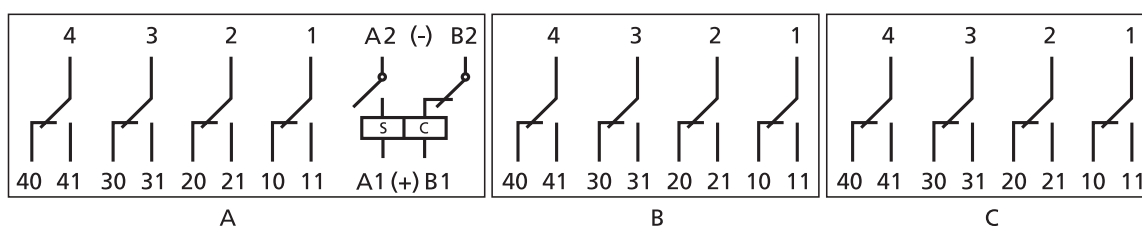
Wiring diagram



RGBV14X - RGBV16X

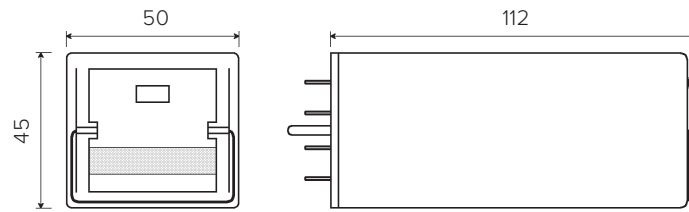


RMBV12X - RMBV14X

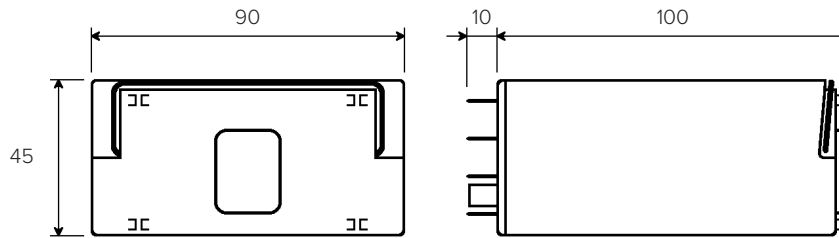


RMBV15 - RMBV16

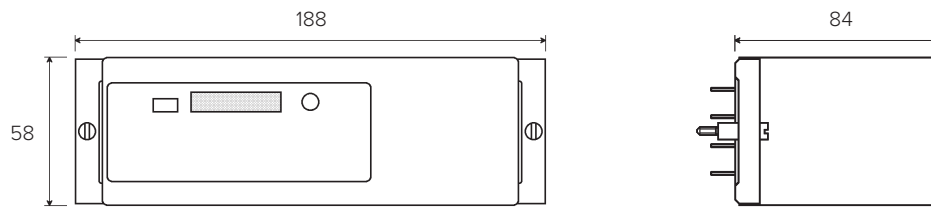
Dimensions



RGBV14X - RGBV16X

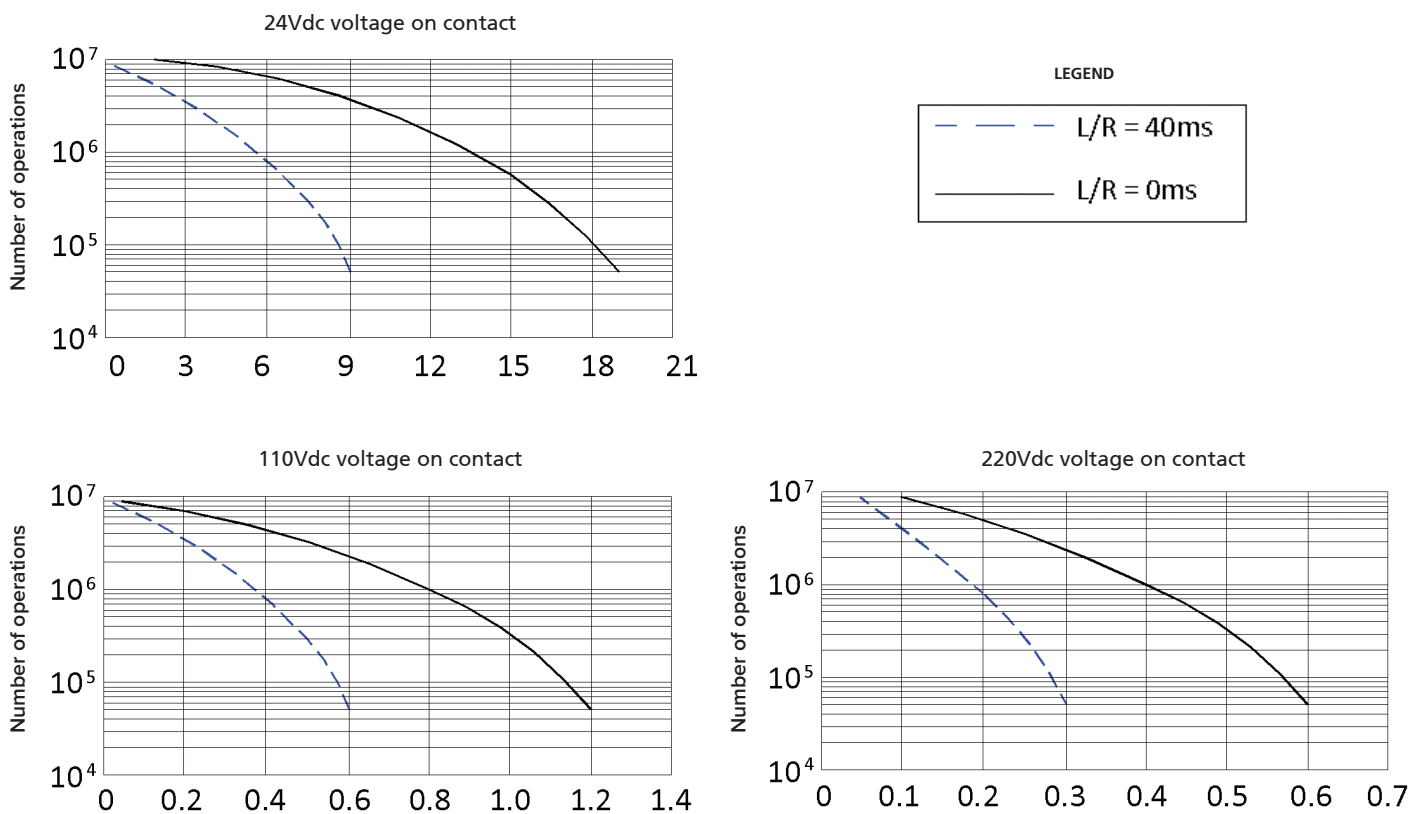


RMBV12X - RMBV14X



RMBV15 - RMBV16

Electrical life expectancy



Sockets		RGMV.x6X - RGMV.x7X	RMMVx2X - RMMVx6X	RMMVx1 - RMMVx7
Type of installation	Type of outputs	Model		
Wall or DIN H35 rail mounting	Screw	48BIP20-I DIN	96IP20-I DIN	PAVM481
	Spring clamp	PAIR160	PAIR320	-
Flush mounting	Screw	-	-	PRVM481
	Spring clamp	PRIR160	PRIR320	-
	Double faston (4.8 x 0.8 mm)	ADF2	ADF4	PRDM481

Retaining clip	RGMV.x6X - RGMV.x7X	RMMVx2X - RMMVx6X	RMMVx1 - RMMVx7
Sockets models	Modèle		
48BIP20-I DIN, 96IP20-I DIN	RG48	RMC48 ⁽¹⁾	-
PAIR160, PAIR320			-
ADF2, ADF4			-
PAVM481, PRVM481, PRDM481	-	-	Fixing with integrated screws

(1) 2 pieces for each relay

MONOSTABLE
INSTANTANEOUS

INSTANTANEOUS
MONOSTABLE WITH
FORCIBLY GUIDED
CONTACTS

BISTABLE

FAST-ACTING
(MONOSTABLE
AND BISTABLE)

TIME DELAY
(ON PICK-UP
OR DROP-OUT)

TIME DELAY WITH
FORCIBLY GUIDED
CONTACTS

MEASUREMENT

SOCKET
NUMBERING
EXPLANATIONS

FRONT
CONNECTION

BACK
CONNECTION

PCB MOUNT

RETAINING CLIPS

KEYING