



RELAYS

BISTABLE (LATCHING) RELAYS WITH 3-4 CONTACTS

RGB SERIES

USER SECTORS



Power generation



Nuclear



Power transmission



Rolling stock



Fixed railway installations



Shipbuilding



Petroleum industry



Heavy industry



RGBE13



RGBE14

PRODUCT ADVANTAGES

- Plug-in instantaneous bistable relay
- Solid and rugged construction for heavy or intensive duty
- Very long electrical life expectancy and notable endurance
- Magnetic arc blow-out for higher breaking capacity
- Fitted with mechanical optical contact status indicator as standard
- Lever for manual operation (optional)
- Self-cleaning knurled contacts
- Pulsed or permanent power supply, a.c. or d.c.
- Wide variety of configurations and customizations
- Retaining clip for secure locking of relay on socket
- Label holder in cover for customer's use
- Positive mechanical keying for relay and socket

DESCRIPTION

The bistable relays in the **RGB series** are reliable products **offering high performance**. These components have 2 stable operating states, which means that they are able to hold their current position in the event of a power supply failure, thereby guaranteeing that this can be stored as "memory" information should system faults occur during subsequent cycles. Given their superior reliability and durability, RGB relays are capable of filling roles that call for a high level of responsibility; in effect, they are used in environments where continuous duty is an essential requirement (e.g. high voltage electricity distribution stations and medium voltage substations). All models are equipped with an automatic coil de-energization system, operated mechanically or electronically, designed to reduce the power consumption of the device to zero once the operating cycle has been completed.

Thanks to its exceptional breaking capacity, the relay is suitable for controlling **heavy duty loads** with intensive switching frequency, where safety and continuity of operation are all-important. A product of proven reliability, as demonstrated by its use for over **40 years in electrical energy** transmission and distribution systems, and fixed equipment used in the railway sector.

Benefiting also from careful selection of materials, coupled with the technical and professional skills of human resources involved in design and production, this family of relays has found favour with many important and high profile customers.

The **versatility** in manufacture allows producing relays with any voltage in the range 12 to 250VDC/440VAC and with a great number of operating ranges adaptable to the various application requirements.

The contacts used are of a type designed to give notable levels of performance both with high and strongly inductive loads, and with particularly low loads. **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.

In the case of the version with 3 contacts, there is also the facility of **manual operation**, so that tests can be performed even in the absence of electrical power. Like all our relays, models in the G 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	Number of contacts	Power input to coils
RGBEx3	3	Common negative
RGBEx4	4	Coils galvanically separated

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

Coil specifications	
Nominal voltages Un ⁽¹⁾	DC / AC: 12-24-48-110-125-132-144-230-380 ⁽²⁾ -440 ⁽²⁾
Consumption at Un (DC/AC) ⁽³⁾	15W / 15VA
Operating range	80...120% Un
Type of duty	Continuous

Minimum control pulse 50ms.

(1) Other values on request.

(2) Maximum value, a.c. = 380V 50Hz - 440V 60Hz.

(3) Latch and unlatch. Power consumption is zero on completion of the operating cycle, as the coil de-energizes automatically.

Contact specifications	
Number and type	3 or 4 CO, form C
Current	12A
Nominal ⁽¹⁾	20A for 1min - 40A for 1s
Maximum peak ⁽²⁾	150A for 10ms
Maximum pulse ⁽²⁾	
Example of electrical life expectancy ⁽³⁾	0.5 A - 110 Vdc - L/R 40ms - 10 ⁵ operations - 1,200 operations/hour
Minimum load	200 mW (10 V, 10 mA)
Standard contacts	50 mW (5 V, 5 mA)
Gold-plated contacts	
Maximum breaking voltage	350 VDC / 440 VAC
Contact material	AgCdO
TOperating time at Un (ms) ⁽⁴⁾	
Pick-up (NC contact opening)	≤ 9 - ≤ 20
Pick-up (NO contact closing)	≤ 30 - ≤ 35
Drop-out (NO contact opening)	≤ 7 - ≤ 21
Drop-out (NC contact closing)	≤ 45 - ≤ 65

(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, the operating time signifies until stabilization of the contact (including bounces).

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	5 kV

Mechanical specifications	RGB.x3	RGB.x4
Mechanical life expectancy	20x10 ⁶ operations	
Maximum switching rate	900 operations/hour	
Degré de protection	IP40	
Dimensions (mm)	45x50x86 ⁽¹⁾	45x50x112 ⁽¹⁾
Weight (g)	270	350

(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 61000	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%.
GOLD PLATING	Surface treatment of contacts, blades and output terminals with gold-cobalt, thickness $\geq 2\mu$. This treatment ensures long-term capacity of the contact to conduct lower currents.
FLYBACK DIODE	Component connected in parallel with the coil (type 1N4007) designed to suppress overvoltages generated by the coil when de-energized.
LEVER FOR MANUAL	Allows manual operation of the relay, with the cover closed, using a screwdriver.



Ordering scheme

Product code	Application ⁽¹⁾	Configuration A	Configuration B	Label	Type of power supply	Nominal voltage (V) ⁽²⁾	Finish ⁽³⁾	Keying position code ⁽⁴⁾
RGB	E: Energy F: Railway Fixed Equipment	1: Standard 3: Diode // 4: Gold plating 6: Gold plating + Diode //	3: 3 CO contacts 4: 4 CO contacts	F	C: Vdc A: Vac 50 Hz H: Vac 60 Hz	012 - 024 - 048 110 - 125 - 132 144 - 220 - 230 380 - 440	T: Tropicalized coil M: Manual operation ⁽⁵⁾	xxx

Example	RGB	E	3	3	F	C	048	T	
	RGBE33F-C048/T = ENERGY series relay with 3 CO contacts, flyback diode and 48Vdc tropicalized coil.								

(1) **ENERGY**: all applications except for railway.

RAILWAYS, FIXED EQUIPMENT: application on fixed power systems and electrical railway traction. For list of RFI compliant and type-approved products, consult dedicated catalog "RAILWAY SERIES – RFI APPROVED".

Also available is the STATIONS series, with ENEL approved material meeting LV15/LV16 specifications. For list of ENEL compliant and type-approved products, consult dedicated catalog "STATIONS SERIES - LV15-LV16-LV20"

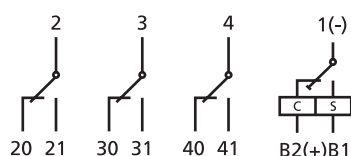
(2) Other values on request. Voltages 380V and 440V available as Vac only.

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

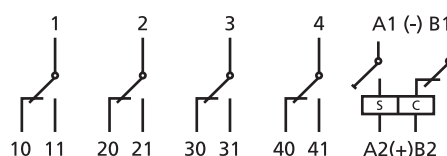
(4) Optional value. Positive mechanical keying is applied according to the manufacturer's model.

(5) With manual operation, no optical indicator. Option only available for 3 RT contacts.

Wiring diagram

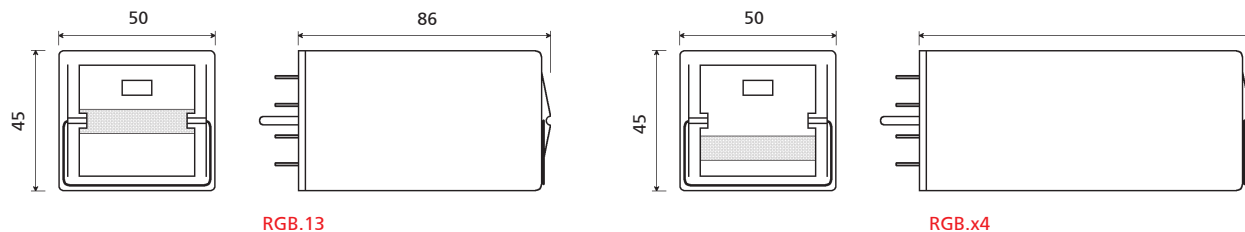


RGB.x3



RGB.x4

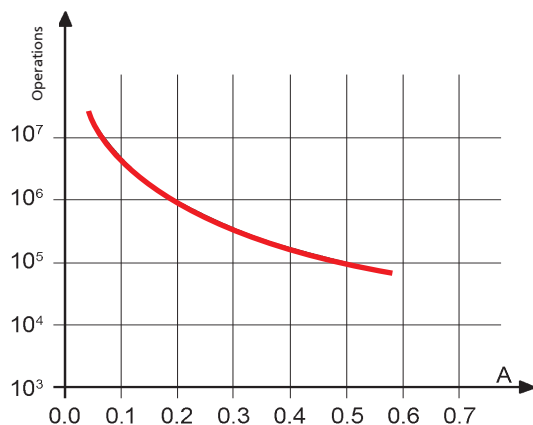
Dimensions



RGB.13

RGB.x4

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	50,000
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

Type of installation	Type of outputs	Model	RGBEx3	RGBEx4-x5
Wall or DIN rail mounting	Screw	PAVG161	VM1221	VM1222
Flush mounting	Double faston (4.8 x 0.8 mm)	PRDG161		
	Screw	PRVG161		

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, it is advisable to use retaining clips.
No special maintenance is required.