



RELAYS

INSTANTANEOUS RELAYS WITH 4 FORCIBLY GUIDED CONTACTS

RGG SERIES with forcibly guided contacts

USER SECTORS



Power generation



Nuclear



Power transmission



Rolling Stock



Fixed railway installations



Shipbuilding



Petroleum industry



Heavy industry



RGG

**PRODUCT ADVANTAGES**

- Forcibly guided (mechanically linked) contacts, relay compliant with **EN 61810-3, type A**
- Weld-no-transfer technology
- Plug-in monostable instantaneous relay
- Suitable for safety applications
- Solid and rugged construction for heavy or intensive duty
- Self-cleaning knurled contacts
- Very long electrical life expectancy and exceptional endurance
- Magnetic arc blow-out for higher breaking capacity
- Wide range of options: LED indicating power on, FLYBACK DIODE
- Retaining clip for secure locking of relay on socket
- Transparent cover, pull-out handle

DESCRIPTION

The relays in the RGG line are highly reliable products featuring high performance, suitable for applications in very harsh and disturbed environments. They are provided with forcibly guided (mechanically linked) contacts. The component conforms to the **EN 61810-3** requirements, **type A relay** (all contacts are mechanically linked). Forcibly guided contacts are also known as weld-no-transfer contacts. A typical application is the check reading of a contact for determining, with absolute certainty, the state of the other contacts in self-monitoring control systems.

Thanks to the exceptional breaking capacity, the relay is suitable for controlling heavy duty loads with intensive switching frequency where safety and electrical continuity is an all-important factor.

The versatility in manufacture allows producing relays with any voltage in the range 12 to 230VDC and with a great number of operating ranges adaptable to the various application requirements.

The types of contacts allow obtaining remarkable performance levels both for high, very inductive loads or very low loads; the optional presence of the **magnetic arc blow-out** contributes considerably to the **breaking capacity**. The knurled contacts ensure **better self-cleaning characteristics** and **lower ohmic resistance** thanks to the various points of electrical connection, thereby **improving the electrical life** of the component.

In relays with forcibly guided (mechanically linked) or weld-no-transfer contacts, special design and constructional measures are used to ensure that make (normally-open) contacts can not assume the same state as break (normally-closed) contacts.

- If, when powering up a relay, a NC contact fails to open, the remaining NO contacts must not close, maintaining a contact gap ≥ 0.5 mm.
- When the relay is de-energized, if a NO contact fails to open, the remaining NC contact must not close, maintaining a contact gap ≥ 0.5 mm.

EN 61810-3 lays down the standard requirements for relays with forcibly guided contacts. This standard defines two types of relay with forcibly guided contacts, namely:

- **Type A:** Relay whose contacts are all mechanically linked (forcibly guided).
- **Type B:** Relay containing mechanically linked contacts and contacts which are not mechanically linked.

In the case of relays that include changeover contacts, either the make circuit or the break circuit of a changeover contact can be considered to meet the requirements of this standard.

Models	Number of contacts	Magnetic arc blow-out
RGG.x3X	4	
RGG.x7X	4	•

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

Coil specifications	RGGExyX / RGGFxyX	RGGRxyX ⁽³⁾
Nominal voltages Un	DC: 12-24-48-110-125-132-144-230 ⁽¹⁾	DC: 24-36-72-110 ⁽¹⁾
Consumption at Un (DC/AC)	3,5W	
Operating range	80...120% Un	70...125% 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 certainly de-energized.

(3) Suitable for application on ROLLING STOCK. Operating range in accordance with EN60077.

Contact specifications		
	Number and type	4 CO, form C
Current	Nominal ⁽¹⁾	12A
	Maximum peak ⁽²⁾	20A for 1min - 40A for 1s
	Maximum pulse ⁽²⁾	150A for 10ms
Example of electrical life expectancy ⁽³⁾		RGG.x3: 0.5A - 110Vdc - L/R 40ms - 10 ⁵ Manœuvres - 1,800 operations/hour RGG.x7: 1A - 110Vdc - L/R 40ms - 10 ⁵ Manœuvres - 1,800 operations/hour 1A - 110Vdc - L/R 40ms - 2x10 ⁵ Manœuvres - 600 operations/hour
Minimum load	Standard contacts	200mW (10V, 10mA)
	Gold-plated contact	50mW (5V, 5mA)
Maximum breaking voltage		350 VDC / 440 VAC
Contact material		AgCdO
Operating time at Un (ms) ⁽⁴⁾	RGG.13X-17X-43X-47X	
	RGG.33X-37X-63X-67X-53X-57X	
	DC	DC
	Pick-up (NC contact opening)	≤ 20
	Pick-up (NO contact closing)	≤ 40
	Drop-out (NO contact opening)	≤ 55
	Drop-out (NC contact closing)	≤ 85

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

(2) The max. 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) - 2.2kV (1 s)
	between open contact parts	2 kV (1 min) - 2.2kV (1 s)
	between adjacent contacts	2 kV (1 min) - 2.2kV (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

	Mechanical life expectancy	10x10 ⁶ operations
Maximum switching rate	Mechanical	3600 operations/h
	Degree of protection	IP40
	Dimensions (mm)	45x50x86 ⁽¹⁾
	Weight (g)	280

(1) Excluding output terminals



Environmental specifications

Operating temperature	Standard	-25 to 55°C
	Version for railways, rolling stock	-25 to 70°C
Storage and shipping temperature		-50 to 85°C
Relative humidity		-25 to +70°C (+85°C for 10 min) -40°C as option
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 60529	Degree of protection provided by enclosures
EN 61000	Electromagnetic compatibility
EN 61810-3, Type A	Relays with forcibly guided (mechanically linked) contacts

Unless otherwise specified, the products are designed and manufactured according to the requirements of the above-mentioned European and International standards.
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%.



Railways, rolling stock - Standards

Applicable to RGGRX version

EN 60077	Electric equipment for rolling stock - General service conditions and general rules
EN 61373 ⁽¹⁾	Shock and vibration tests, Cat 1, Class B
EN 45545-2	Fire behavior, Cat E10, Requirement R26, V0
ASTM E162, E662	Fire behavior

(1) Permissible opening time of contacts on a de-energized relay t<3ms.



Railways, rolling stock - Special operating ranges

Nominal voltage	Minimum pick-up voltage	Maximum operating voltage	Order symbol ⁽¹⁾
24 Vdc	16.8	32	Z01
36 Vdc	23	42.5	Z01
72 Vdc	55	96	Z01
110 Vdc	77	144	Z01

(1) To order the relay with the special operating range, indicate the "Z0x" symbol in the "Keying position" field of the ordering scheme. The special range may be subject to operating specifications different from standard specifications. Please contact us for further information.



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 capacity of the contact to conduct lower currents.
LED	LED indicator showing presence of power supply, wired in parallel with the coil.
FLYBACK DIODE	Component connected in parallel with the coil (type 1N4007) designed to suppress overvoltages generated by the coil when de-energized.
TRANSIL	Non-polarized component connected in parallel with the coil. Behaviour is similar to that of a varistor, with faster operating times.
LOW TEMPERATURE	Minimum operating temperature -50°C, only for rolling stock version (option L)



Ordering scheme

Product code	Application ⁽¹⁾	Configuration A	Configuration B	Label	Type of power supply	Nominal voltage (V) ⁽²⁾	Finish ⁽³⁾
RGG	E: Energy F: Railway, Fixed Equipment R: Railway, Rolling Stock	1: Standard 2: Gold plating + Diode // + Led 3: Diode // 4: Gold plating 5: Led 6: Gold plating + Diode // 7: Diode // + Led 8: Transil 9: Transil + Led 0: Gold plating + Transil + Led	3X: 4 CO contacts 7X: 4 CO contacts with magnetic arc blow-out	F	C: Vdc	012 - 024 - 036 048 - 072 - 110 125 - 132 - 144 220	Z0x: Special operating range (only for "R" applications) T: Tropicalized coil L: Low temperature

Example

RGG	E	3	7X	F	C	048	T
RGGE37XF-C048/T = ENERGY series relay with flyback diode, magnetic arc blow-out and 48Vdc tropicalized coil.							
RGG	F	5	3X	F	C	110	
RGGF53XF-C110 = RAILWAY series relay, fixed equipment, with LED indicator and 110Vdc coil.							

(1) ENERGY : all applications except for railway.

RAILWAYS, FIXED EQUIPMENT: application on fixed

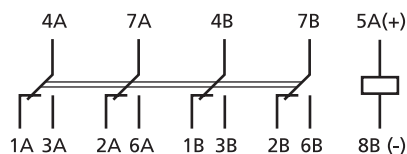
FERROVIAIRE ET ÉQUIPEMENT FIXE : application on fixed power systems and electrical railway traction. Construction according to RFI (FS Group) specification no. RFI DPRIM STF IFS TE 143 A, if applicable. For list of RFI approved and conforming products, consult dedicated catalog "RAILWAY SERIES – RFI APPROVED"

RAILWAYS, ROLLING STOCK: application on board rolling stock (wire-rail-tramway vehicles). Electrical characteristics according to EN60077.

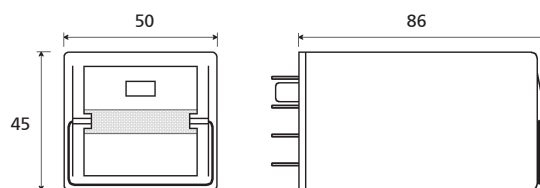
(2) Other values on request.

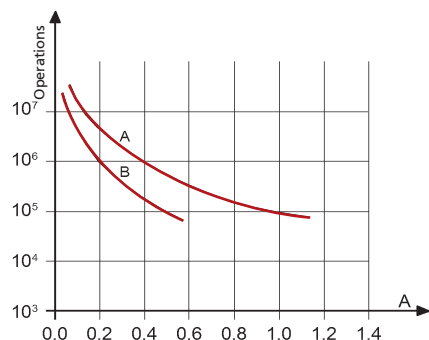
(3) Optional value: multiple selection possible (e.g. T-L)

Wiring diagram



Dimensions





Contact loading: 110Vdc, L/R 40 ms
Curve A: RGG_x7X
Curve B: RGG_x3X

Some examples of electrical life expectancy

RGG.x3X			
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

RGG.x7X			
U	I (A)	L/R (ms)	Operations
24 Vdc	1	0	7,000,000
24 Vdc	1	40	3 000,000
24 Vdc	2	40	2,000,000
24 Vdc	5	0	3,000,000
24 Vdc	5	40	200,000
24 Vdc	9	0	800,000
48 Vdc	5	20	200,000
110 Vdc	0.4	40	1,000,000
110 Vdc	1	40	200,000 ⁽¹⁾
110 Vdc	10	0	100,000
U	I (A)	cosφ	Operations
220 Vac	5	0.5	100,000
220 Vac	10	1	100,000
230 Vac	1	0.7	2,500,000
230 Vac	3	0.7	1,200,000

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

Sockets and retaining clips

Type of installation	Type of outputs	Model	Retaining clip
Wall or DIN rail mounting	Screw	48BIP20-I DIN	RG48
	Spring clamp	PAIR160	
Flush mounting	Screw	43IL	RG43
	Spring clamp	PRIR160	RG48
	Double faston (4.8 × 0.8 mm)	ADF2	

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 and 20 mm in the vertical direction. 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 application conditions and on the relay duty cycle. For maximum reliability in operation, it is advisable to use retaining clips. 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.