

RGMZ41X RGMZ42X
RGMZ59X RGMZ60X

INSTANTANEOUS RELAYS,
WELD-NO-TRANSFER 4 CONTACTS

FORCIBLY GUIDED CONTACTS

APPLICATIONS



OVERVIEW

- Forcibly guided (mechanically linked) contacts, relays compliant with **EN 61810-3, type A**
- Weld-no-transfer technology
- High performance, compact dimensions, light weight
- Compact plug-in monostable instantaneous relays
- Suitable for safety applications
- Solid and rugged construction for intensive duty
- Self-cleaning knurled contacts, C/O type
- Very high electrical life expectancy
- Magnetic arc blow-out for higher breaking capacity
- Wide option range: signalling LED, FLYBACK DIODE, varistor, etc.
- Retaining clip for secure locking of relay on socket
- Transparent cover, pull-out handle

DESCRIPTION

RGMZ relays are highly reliable products featuring high performance, suitable for applications in very harsh and disturbed environments, such as **ROLLING STOCK** applications.

Referring to the standard **EN61810-3**, these relays are classified as fully compliant and identified as **type A** relays, (all the contacts are mechanically linked). Forcibly guided contacts are also known as weld-no-transfer contacts.

Wide contact gap for a very high breaking capacity, electrical life expectancy and insulation.

The construction of the relays and careful choice of the materials ensure long life and considerable ruggedness even in harsh operating environments and in the presence of strong temperature fluctuations.

Wide range of coil's nominal voltage are available; easy to adapt to any customer needs.

The operating temperature range is -25°C to +85°C.

RGMZ can operate in environment with high thermal shocks.

The contacts are designed to obtain remarkable performances both for high, inductive loads or very low loads. Each contact is able to switch from 5mA – 10V even without contact gilding

The knurled surface ensures an excellent self-cleaning effect, a lower ohmic resistance thanks to the various points of electrical contact, and will also improve the electrical life of the component.

By way of further quality and safety certification for users, RGMZ41X is certified compliant to EN 50205 (now EN 61810-3) by TUV RHEINLAND laboratories. Registration No.: AK 60036065 0001.

In this relay range, with forcibly guided contacts (mechanically linked), special design and constructional measures are used to ensure that make (NO) contacts can not assume the same state as break (NC) 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

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.

STANDARD COMPLIANCE

EN 61810-3	ASTM E162, E662
EN 60077	EN 61810-1
EN 50155	EN 61810-7
EN 61373	EN 60695-2-10
EN 45545-2	EN 60529

MODELS	NUMBER OF CONTACTS	GOLD PLATING	FLYBACK DIODE, LED AND VARISTOR
RGMZ41X	4		
RGMZ42X	4	•	
RGMZ59X	4		•
RGMZ60X	4	•	•

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

COIL DATA

Nominal voltages Un	24	37.5	72	110
Consumption at Un (DC/AC)	3W			
Operating range	16.8÷33V	23÷42.5V	55÷96V	77÷144V
Type of duty	Continuous			
Drop-out voltage ⁽¹⁾	DC : > 5% Un			

(1) Limit value for supply voltage, expressed as % of the nominal value, beneath which the relay is certainly de-energized.

CONTACT DATA

Number and type		4 SPDT, 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⁾		1A - 110Vdc - L/R 40ms - 10 ⁵ operations - 1,200 operations / hour
Minimum load ⁽⁴⁾	Standard contacts	200mW (10V, 10mA)
	Gold-plated contact	50mW (5V, 5mA)
Maximum breaking voltage		350 VDC / 440 VAC
Contact material		AgCdO
		RGMZ41X - RGMZ42X
Operating time at Un (ms) ⁽⁵⁾		DC
Pick-up (NC contact opening)		≤ 20
Pick-up (NO contact closing)		≤ 35
Drop-out (NO contact opening)		≤ 10
Drop-out (NC contact closing)		≤ 53

(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) 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) 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	3,600 operations / h
	Degree of protection	IP40
	Dimensions (mm)	45x50x86 ⁽¹⁾
	Weight (g)	280

(1) Output terminals excluded.



ENVIRONMENTAL SPECIFICATIONS

Operating temperature	-25 to +85°C
Storage and shipping temperature	-40 to +85°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 behaviour
EN 60529	Degree of protection provided by enclosures
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

EN 60077	Electric equipment for rolling stock - General service conditions and general rules
EN 50155	Electronic equipment used on rolling stock
EN 61373 ⁽¹⁾	Shock and vibration tests, Cat 1, Class B
EN 45545-2	Fire behaviour, Cat E10, Requirement R26, V0
ASTM E162, E662	Fire behaviour

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



CONFIGURATIONS - OPTIONS

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 designed to suppress overvoltages generated by the coil when de-energized.
VARISTOR	Non-polarized component connected in parallel with the coil, designed to suppress overvoltages higher than the clamping voltage, generated by the coil when de-energized.



ORDERING SCHEME

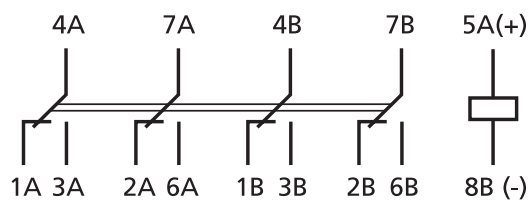
PRODUCT CODE	CONFIGURATION	TYPE OF POWER SUPPLY	NOMINAL VOLTAGE (V) ⁽²⁾
RGMZ	41X: standard contacts	C: Vdc	024 - 037 072 - 110
	42X: gold plating contacts		
	59X: standard contacts with flyback diode, led and varistor		
	60X: gold plating contacts with flyback diode, led and varistor		

Example

RGMZ	42X	C	072
RGMZ42X-C072 = relay with gold plating contacts and 72Vdc coil.			
RGMZ	59X	C	037
RGMZ59X-C037 = relay with flyback diode, varistor, with LED indicator and 37,5Vdc coil.			



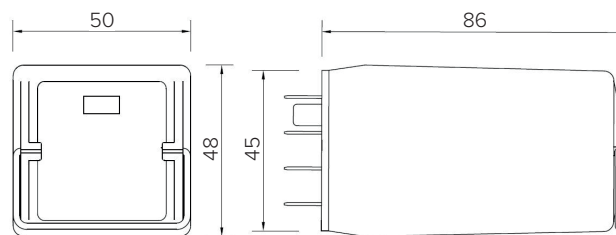
WIRING DIAGRAM



Only for RGMZ59X , RGMZ60X
flyback diode and varistor
are connected in parallel to coil

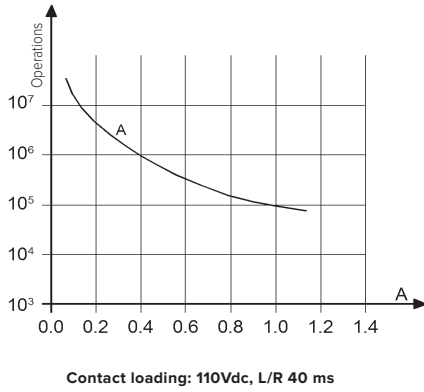


DIMENSIONS





Some examples of electrical life expectancy



RGMZx			
U	I (A)	L/R (ms)	Operations
24Vdc	1	0	7,000,000
24Vdc	1	40	3,000,000
24Vdc	2	40	2,000,000
24Vdc	5	0	3,000,000
24Vdc	5	40	200,000
24Vdc	9	0	800,000
48Vdc	5	20	200,000
110Vdc	0.4	40	1,000,000
110Vdc	1	40	200,000 ⁽¹⁾
110Vdc	1	40	350,000 ⁽²⁾
110Vdc	5	0	200,000 ⁽¹⁾
110Vdc	10	0	10,000 ⁽¹⁾

⁽²⁾ 2 series contacts

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

SOCKETS AND RETAINING CLIPS

RETAINING CLIP



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 x 0.8 mm)	ADF2	

INSTALLATION, OPERATION AND MAINTENANCE



Installation

Before installing the relay on a wired socket, disconnect the power supply.

The preferential mounting position is on the wall, with the relay positioned horizontally in the "reading orienting" of marking so that the label is readable in the correct sense.

Spacing: the distance between adjacent relays depends on use' conditions.

If a relay is used in the "less favorable" conditions that occur with "simultaneously":

- Power supply: the maximum allowed, permanently
- Ambient temperature: the maximum allowed, permanently
- Current on the contacts: the maximum allowed, permanently
- Number of contacts used: 100%

it is strongly recommended to space relay at least 5 mm horizontally and 20 mm vertically, to allow for proper upward heat' dissipation and increase the longevity of the component.

Actually, relays could be used in less severe conditions. In this case, the distance between adjacent relays can be reduced or abolished. A correct interpretation of the use' conditions allows the optimization of the available spaces. Contact AMRA for more information.

To increase relay' longevity, we recommend mounting relays intended for "continuous use" (permanent power supply), alternating them with relays intended for less frequent use.

For a safe use, the retaining clip is recommended. For use on rolling stock, relays have been tested to EN 61373 standard equipped with retaining clip(s).

Operation

Before use: if relay is not used, for example after long storage periods, contact resistance may increase due to a natural and slight oxidation or polluting deposits.

In order to restore the optimal conductivity and for standard contacts (NOT gold plated) it is recommended to switch several time a load of at least 110Vdc - 100mA or 24Vdc - 500mA. The contacts will be "cleaned" thanks to the electric arc generated during the current interruption and the mechanical self-cleaning action.

The common contact rubs against the fixed poles (NO and NC contacts) both when opening and when closing, which ensures a self-cleaning action.

An increase in contacts' resistance, in most cases, does not represent a problem. Many factors contribute to the correct use of contact and consequently to the relay' long-term reliability:

- **Load:** the current switching generates an electric arc with cleaning effects. For proper electrical cleaning and performance keeping we recommend:
 - o Standard contacts: Minimum current = 20mA
 - o Gold plated contacts: Minimum current = 10mA
- **Operating frequency:** relays are components that can operate with a wide range of switching frequency. High frequency operation also allows a continuous cleaning effect by "sliding" (mechanical cleaning). In case of low frequency operation (for example few time a day), we advise:
 - o Use of contact with currents twice compared to those indicated.
 - o For currents lower than 10mA, use gold plated contacts and connect 2 contacts in parallel, in order to reduce the equivalent contact resistance
- **Pollution:** the presence of pollution can cause impurities on contact surface. Electric charges attract organic molecules and impurities that are deposited on the contact surface. Electrical and mechanical cleaning, respectively, burn and remove such impurities. In pollution presence, the minimum recommended currents must be respected. In extreme cases, provide double the cleaning current.

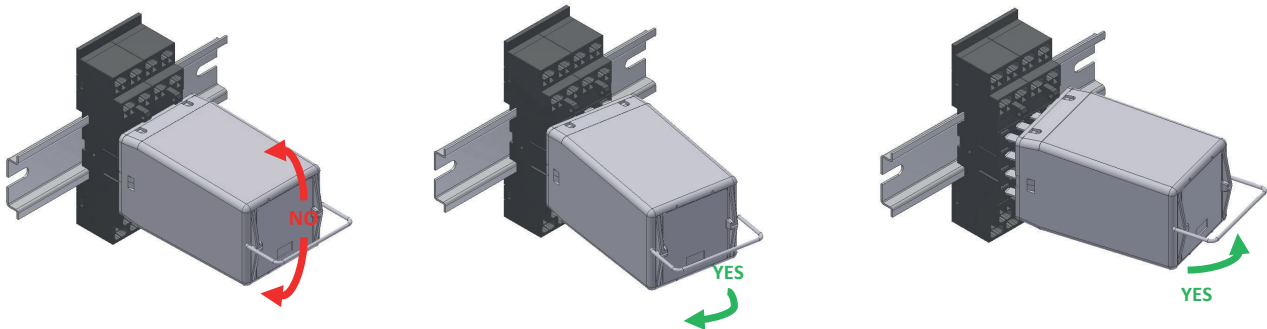
Condensation is possible inside the relay when energized and the outside ambient temperature is cold; this is quite normal and does not affect the operation of the relay. Plastic materials of relay do not possess hygroscopic properties.

Maintenance

No maintenance is required.

In case of normal relay wear (reaching the end of electrical or mechanical life), the relay cannot be restored and must be replaced.

To check the component, relay removal must be carried out with slight lateral movements. An "up and down" movement can cause terminals damage.



Often the malfunctions are caused by power supply with inverted polarity, by external events or by use with loads exceeding the contact performance.

In case of suspected malfunction, energize relay and observe if mechanical operation of contacts / relay mechanism is performed. Pay attention to the power supply polarity, if relay is equipped with polarized components (example: diode, led).

- In case of expected operation, clean the contacts (see paragraph "OPERATION") and check if the circuit load ranges within the contact performance. If necessary, replace with relays with gold contacts. Note: the electrical continuity of contacts must be checked with adequate current.
- If it does not work, we recommend to use a relay of the same model and configuration.

If an investigation by AMRA is required, pull-out the relay from the socket, don't remove the cap, avoid any other manipulation and contact us. You will be asked for the following data: environmental conditions, power supply, switching frequency, contact load, number of operations performed.

The fault can be described through the "TECHNICAL SUPPORT" section of the website www.amra-chauvin-arnoux.it.

In any case, the relay cannot be repaired by the user.

Storage

Storage conditions must guarantee the environmental conditions (temperature, humidity and pollution) required for the product conservation, in order to avoid deterioration.

The product must be stored in an environment sheltered from atmospheric agents and not polluted, with an ambient temperature between -40 and +85°C with max 75% RH. Humidity can reach peaks of 95%. In any case, there must be no condensation. Before use, please read carefully "OPERATION" section.