

RELAYS

ENERGY | RAILWAY SERIES

AMRA and MTI lines



UPDATE

Ed.2 07/18

RCG/RDG	RELAYS WITH 2-4 FORCIBLY GUIDED CONTACTS EN61810-3
RMGX	RELAY WITH 8 FORCIBLY GUIDED CONTACTS EN61810-3
RMGW	RELAY WITH 8 FORCIBLY GUIDED CONTACTS
RMMX	MONOSTABLE RELAY WITH 8 CONTACTS
RMBX	BISTABLE (LATCHING) RELAY WITH 7-8 CONTACTS
TMM	MULTIFUNCTION MULTISCALE RELAY WITH 4 CONTACTS
PRIR	SOCKET WITH REAR CONNECTION SPRING CLAMP



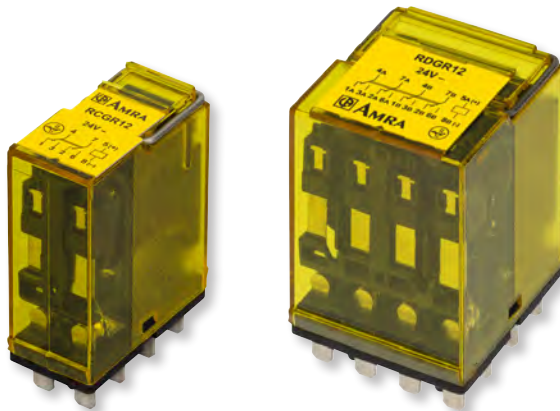
INSTANTANEOUS RELAY, WELD-NO-TRANSFER 2-4 CONTACTS



RCG - RDG SERIES WITH FORCIBLY GUIDED CONTACTS

OVERVIEW

- Forcibly guided (mechanically linked) contacts, relay compliant with **EN 61810-3, type A**
- Weld-no-transfer technology
- Compact plug-in monostable instantaneous relay
- Suitable for safety applications
- Solid and rugged construction for heavy or intensive duty, IP50 protection
- Self-cleaning knurled contacts
- High electrical life expectancy
- New "HIGH POWER" magnetic arc blow-out for improved breaking capacity, as option
- Wide range of option: LED indicating power on, FLYBACK DIODE i.e.
- Retaining clip for secure locking of relay on socket
- Transparent cover, pull-out handle



RCG

RDG

APPLICATIONS



Shipbuilding



Petroleum industry



Heavy industry



Power generation



Power distribution



Railway equipment



Rolling stock

DESCRIPTION

Relays of the RCG / RDG 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 various voltages.

The types of contacts allow obtaining remarkable performance levels both for high, 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 ohm 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	HIGH POWER Magnetic arc blow-out
RCG.x2	2		
RCG.x6	2	•	
RCG.x8	2		•
RDG.x2	4		
RDG.x6	4	•	
RDG.x8	4		•



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



Coil data	RCG	RDG
Nominal voltages Un	DC: 24-36-48-72-96-110-125 ⁽¹⁾	
Consumption at Un	2,2 W	2,7 W
Operating range	80 ÷ 115 % Un	
Operating range for rolling stock version ⁽²⁾	70 ÷ 125 % Un	
Type of duty	Continuous	
Drop-out voltage ⁽³⁾	DC: > 5% Un	

(1) Other values on request.

(2) See "Ordering scheme" table for order code. Suitable for application on ROLLING STOCK. Operating range in accordance with EN60077.

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

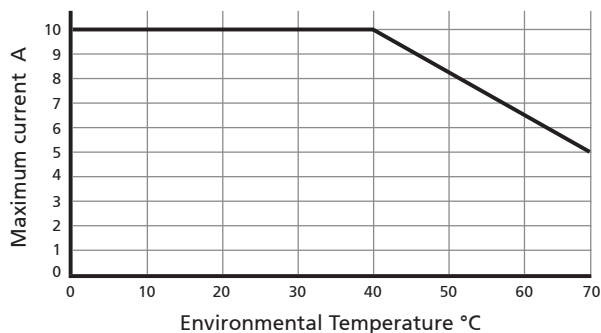


Contact data		RCG		RDG	
Number and type		2 SPDT, form C		4 SPDT, form C	
Current	Nominal Maximum peak ⁽¹⁾ Maximum pulse ⁽¹⁾	See the following chart 13A for 1min - 20A per 1s 100A for 10ms			
Example of electrical life ⁽²⁾ * 1.200 oper./h ** 600 oper./h		Standard: RCG.x2 / RDG.x2: 0,2A - 110Vdc - L/R 40ms - 5x10 ⁵ oper. * With Magnetic arc blowout: RCG.x6 / RDG.x6: 0,5A - 110Vdc - L/R 40ms - 1,5x10 ⁵ oper. * With HIGH POWER Magn. arc blowout: RCG.x8 / RDG.x8: 0,7A - 132Vdc - L/R 40ms - 7x10 ⁴ oper. **			
Minimum load	Standard contacts Gold-plated contact	100mW (10V, 5mA) 50mW (5V, 5mA)			
Making capacity		30 A - 110Vdc - L/R 0 ms : 2.000 operations			
Maximum breaking voltage		250 Vdc / 300 Vac			
Contact material		AgSnO ₂ (mobile contacts) - AgNi (fixed contacts)			
Operating time at Un (ms) ⁽³⁾		Standard	With diode	Standard	With diode
Pick-up (NC contact opening)		≤ 13	≤ 13	≤ 17	≤ 17
Pick-up (NO contact closing)		≤ 19	≤ 19	≤ 25	≤ 25
Drop-out (NO contact opening)		≤ 4	≤ 11	≤ 4	≤ 20
Drop-out (NC contact closing)		≤ 16	≤ 25	≤ 14	≤ 34

(1) 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.

(2) For other examples, see electrical life expectancy table.

(3) Unless specified otherwise, the operating times refer to the stabilization of the contact (including bounces).



Insulation	
Insulation resistance (at 500Vdc) between electrically independent circuits and between these circuits and ground between open contact parts	> 1.000 MΩ > 1.000 MΩ
Dielectric withstanding voltage at industrial frequency between electrically independent circuits and ground between coil and contacts parts between adjacent contacts between open contact parts	4 kV (1 min) 3 kV (1 min) 3,5 kV (1 min) 2 kV (1 min)
Impulse withstand (1.2/50μs - 0.5J) between electrically independent circuits and ground between open contact parts	5 kV 3 kV

Mechanical specifications	
Mechanical life expectancy	20x10 ⁶ operations
Maximum switching rate	3.600 operations / h
Protection rating	IP50
	RCG RDG
Dimensions (mm)	40x20x50 ⁽¹⁾ 40x40x50 ⁽¹⁾
Weight (g)	60 115

1. Output terminals excluded.

Environmental characteristics	
Operating temperature	Standard -25 ÷ +55°C
Version for railways, rolling stock	-25 ÷ +70°C (+85°C for 10min) -40°C as option
Storage and shipping temperature	-40 ÷ +85°C
Relative humidity	Standard: 75% RH - Tropicalized: 95% RH
Fire behaviour	V0

Standards and reference values	
EN 61810-1, EN 61810-7 EN 61810-3, type A EN 60695-2-10 EN 60529 EN 61000-4	Electromechanical elementary relays Relays with forcibly guided (mechanically linked) contacts, type A Fire behaviour Degree of protection provided by enclosures Electromagnetic compatibility

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 technical data are referred to ambient temperature of 23°C, atmospheric pressure of 96kPa and 50% humidity. Tolerance for coil resistance and nominal power is ±5%.

Railways, rolling stock - Standards	Applicable to RCGR & RDGR versions
EN 60077 EN 50155 EN 61373 EN 45545-2 ASTM E162, E662	Electric equipment for rolling stock - General service conditions and general rules Electronic equipment used on rolling stock - T3 class Shock and vibration tests, Cat 1, Class B Fire behaviour, HL3 : Cat E10 (Requirement R26) Fire behaviour

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 ≥ 2μ. This treatment ensures long-term capacity of the contact to conduct lower currents.
LED	LED indicator showing presence of power supply. Flyback diode mounted as standard.
FLYBACK DIODE	Component connected in parallel to the coil (type BYW56) designed to dampen overvoltages generated by the coil when de-energized.
TRANSIL	Non-polarized component connected in parallel to the coil. Behaviour is similar to that of a varistor with faster operating times.
LOW TEMPERATURE	Minimum operating temperature -40°C, only for rolling stock version (option "L").



Ordering scheme

Product code	Application ⁽¹⁾	Configuration A	Configuration B	Type of power supply	Nominal voltage (V) ⁽²⁾	Finish ⁽³⁾	Keying position code ⁽⁴⁾
RCG (2 contacts)	E: Energy F: Railway Fixed Equipment	1: Standard 3: Diode // 4: Gold plating 6: Gold plating + Diode //	2: Standard 6: With magnetic arc blow-out	C: Vdc	024 - 036 048 - 072 096 - 110 - 125	T: Tropicalized coil L: Low temperature	XX
RDG (4 contacts)	R: Railway Rolling stock	7: Diode // + Led 8: Transil	8: With HIGH POWER magnetic arc blow-out				

Example

RCG	E	4	2	C	048		
RCGE42-C048 = ENERGY series relay with 2 SPDT gold-plated contacts, 48Vdc coil							
RDG	R	1	6	C	110		
RDGR16-C110 = RAILWAY series relay, rolling stock, with 4 SPDT contacts, magnetic arc blow-out, 110Vdc coil							

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

RAILWAYS, FIXED EQUIPMENT: application on fixed power systems and electrical railway traction. Construction according to RFI (FS Group, Italy) specification n° RFI DPRIM STF IFS TE 143 A, if applicable for list of RFI approved and conforming products, consult dedicated catalogue "RAILWAY SERIES - RFI APPROVED"

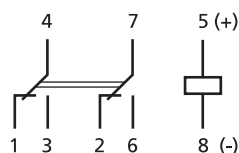
RAILWAYS, ROLLING STOCK: Application on board rolling stock. Electrical characteristics according to EN60077.

2. Other values on request.

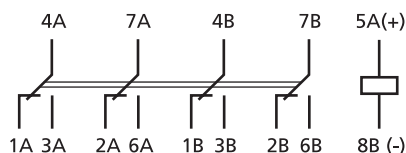
3. Optional value.

4. Optional value. The positive mechanical keying is applied according to the manufacturer's model.

Wiring diagram

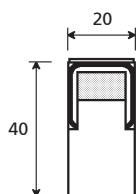


RCGR

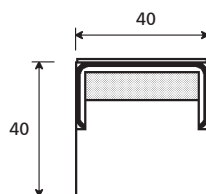


RDGR

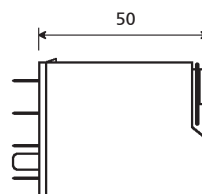
Dimensions



RCG



RDG



Electrical life expectancy

Some examples of electrical life expectancy.

RCG.12, RDG.12 (without magnetic arc blow-out)			
U	I (A)	L/R (ms)	Oper.
110Vdc	0,2	40	500.000
220Vdc	0,2	10	80.000
U	I (A)	cosφ	Oper.
110Vac	1	1	1.200.000
110Vac	1	0,5	1.000.000
110Vac	5	1	500.000
110Vac	5	0,5	300.000
220Vac	0,5	1	1.200.000
220Vac	1	0,5	500.000
220Vac	5	1	400.000
220Vac	5	0,5	300.000

RCG.16, RDG.16 (with magnetic arc blow-out)			
U	I (A)	L/R (ms)	Oper.
110Vdc	0,2	40	1.000.000
110Vdc	0,5	40	150.000
110Vdc	0,6	10	300.000
110Vdc	1	10	100.000
220Vdc	0,2	10	100.000
U	I (A)	cosφ	Oper.
110Vac	1	1	2.000.000
110Vac	1	0,5	1.500.000
110Vac	5	1	950.000
110Vac	5	0,5	500.000
220Vac	0,5	1	2.000.000
220Vac	1	0,5	800.000
220Vac	5	1	600.000
220Vac	5	0,5	500.000

RCG.18, RDG.18 (with HIGH POWER magnetic arc blow-out)			
U	I (A)	L/R (ms)	Oper.
24Vdc	1	0	5.100.000
24Vdc	2	0	3.900.000
24Vdc	3	0	2.900.000
24Vdc	4	0	2.600.000
24Vdc	5	0	2.200.000
24Vdc	1	20	2.700.000
24Vdc	2	20	2.100.000
24Vdc	3	20	1.500.000
24Vdc	3,5	20	1.000.000
24Vdc	1	40	2.000.000
24Vdc	2	40	1.500.000
24Vdc	3	40	1.100.000
24Vdc	3,5	40	800.000
110Vdc	0,3	0	1.000.000
110Vdc	0,5	0	700.000
110Vdc	1	0	190.000
110Vdc	0,3	20	450.000
110Vdc	0,5	20	260.000
110Vdc	1	20	100.000
110Vdc	0,3	40	300.000
110Vdc	0,5	40	180.000
110Vdc	0,6	40	150.000
110Vdc	0,7	40	100.000
132Vdc	0,7	40	70.000

Switching frequency: 1200 operations/hour.

Sockets and retaining clips		RCG	RDG	Retaining clip
Type of installation	Type of outputs	Model	Model	Molla di ritenuta
Wall or DIN H35 rail mounting	Spring clamp	PAIR080	PAIR160	VM1831
	Screw	50IP20-I DIN	48BIP20-I DIN	VM1831
Flush mounting	Spring clamp	PRIR080	PRIR160	VM1831
	Double faston (4.8 x 0.8 mm)	ADF1	ADF2-BIPOK	VM1831
PCB-mount	Solder	65 ⁽¹⁾	65	VM1841

(1) Suitable for mounting 2 relays side by side.

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.

INSTANTANEOUS RELAY, WELD-NO-TRANSFER 8 CONTACTS



RMGX SERIES WITH FORCIBLY GUIDED CONTACTS

OVERVIEW

- Mechanically linked contacts, relay compliant with IEC 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 high electrical life expectancy and exceptional endurance
- Magnetic arc blow-out (optional) for higher breaking capacity
- Wide range of option: LED indicating power on, FLYBACK DIODE i.e.
- Transparent cover, with access for manual operation (standard) and pull-out handle
- Retaining clip for secure locking of relay on socket

APPLICATIONS



Shipbuilding



Petrochemical industry



Heavy industry



Power generation



Power distribution



Railway equipment



Rolling stock

DESCRIPTION

RMGX relays are highly reliable products offering top performance, suitable for applications in particularly harsh and unsettled environments. Meeting the requirements of standard **EN 61810-3 type A**; the relay is equipped with mechanically linked contacts (forcibly guided), an indispensable feature for applications where there is a need to guarantee that make (NO) contacts will never assume the same status as break (NC) contacts. Forcibly guided contacts are also known as weld-no-transfer contacts. With change-over contacts, customers have the greatest possible flexibility in selecting the configuration (6 NC+2 NO, 5 NC+3 NO, etc.) best suited to their particular needs.

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.

Manual operation as standard for all models, allowing tests to be conducted in the absence of any power supply. The contacts used are of a type designed to give top performance both with high and strongly inductive DC loads, and with particularly low loads; inclusion of the magnetic arc blow-out function (optional) helps to achieve a considerable increase in breaking capacity. 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 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
RMG.x2X	6spdt+2 NC	
RMG.x6X	6spdt+2 NC	•

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

Electrical data	RMGExyX - RMGFxyX	RMGRxyX
Nominal voltages Un	DC : 24-48-110-125-132-220 ⁽¹⁾	DC : 24-36-72-96-110 ⁽²⁾
Consumption at Un (DC/AC)	3W	
Operating range	DC : 80÷115% Un	DC : 70÷125% Un
Type of duty	Continuous	
Drop-out voltage ⁽³⁾	DC : > 5% Un	

(1) Other values on request.

(2) Suitable for application on rolling stock. Operating range in compliance with EN 60077 standard.

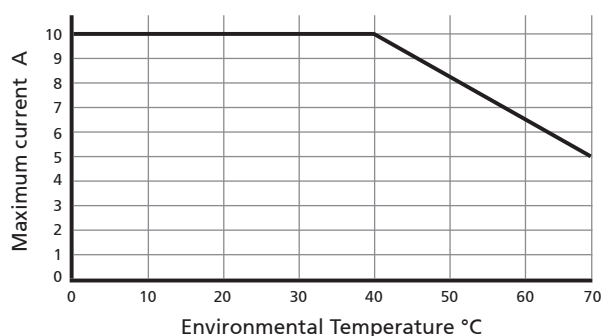
(3) Limit value for supply voltage, expressed as % of the nominal value, beneath which the relay is certain to be de-energized.

Contact data	RMG.12X-16X-42X-46X	RMG.32X-36X-62X-66X-52X-56X
Number and type	6 SPDT+ 2 NA, form C	
Current	See following graph	
Nominal	20A for 1min - 40A for 1s	
Maximum peak ⁽¹⁾	150A for 10ms	
Maximum pulse ⁽¹⁾		
Example of electrical life expectancy	RMG.x2X : 0.5A - 110Vdc - L/R 40ms - 10 ⁵ operations - 1800oper./h RMG.x6X : 1A - 110Vdc - L/R 40ms - 10 ⁵ operations - 1800oper./h	
Minimum load	200mW (10V, 10mA)	
Standard contacts	50mW (5V, 5mA)	
Gold-plated contacts		
Maximum breaking voltage	350 VDC / 440 VAC	
Contact material	AgCdO	
Operating time at Un (ms) ⁽²⁾	DC	
Pick-up (NC contact opening)	≤ 35	
Pick-up (NO contact closing)	≤ 60	
Drop-out (NO contact opening)	≤ 4	
Drop-out (NC contact closing):	≤ 45	

(1) 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.

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

Rated current contact



Note: reduction of 30% on all the contacts simultaneously.

Insulation



Insulation resistance (at 500VCD) between electrically independent circuits and between these circuits and ground between open contact parts	> 10.000 MΩ > 10.000 MΩ
Withstand voltage at industrial frequency between electrically independent circuits and between these circuits and ground between open contact parts between adjacent contacts	2 kV (1 min.) - 2,2kV (1 s) 2 kV (1 min.) - 2,2kV (1 s) 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 between open contact parts	5 kV 5 kV

Mechanical specifications

RMBE.x3X / RMBFx3X-RMBZ12X



Mechanical life expectancy	10x10 ⁶ operations
Maximum mechanical switching rate	3600 operations/h
Degree of protection	IP50 fitted to socket
Dimensions (mm) Weight (g)	45x90x100 ⁽¹⁾ 380

(1) Output terminals excluded.

Environmental specifications



Standard operating temperature	standard	-25 to +55 °C
Version for railways, rolling stock (RMGR)		-25 to +70°C (+85°C for 10 min) -40°C as option
Storage and shipping temperature		-25 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 EN 61810-3, type A EN 60695-2-10 EN 60529	All-or-nothing relays Relays with forcibly guided (mechanically linked) contacts Fire behaviour Degree of protection provided by enclosures
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Unless otherwise specified, products are designed and manufactured 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 ±7%.

Railways, rolling stock - Standards

Applicable to RMGRX version



EN 60077 EN 61373 ⁽¹⁾ EN 45545-2 ASTM E162, E662	Electric equipment for rolling stock - General service conditions and general rules Shock and vibration tests, cat 1, class B Fire behaviour, cat E10, requirement R26, V0 Fire behaviour
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(1) Opening of NC contacts allowed only at de-energized relay t<3ms.

Configurations - Options



TROPICALIZATION	Surface treatment of coil with protective coating for use in conditions of RH 95%. This treatment serves to give the coil added protection against corrosion that could occur as a result of moisture reacting with certain chemical agents such as those found in acid or saline atmospheres.
GOLD PLATING	Surface treatment of contacts, blades and output terminals with gold, thickness ≥ 2μ. This treatment ensures long-term capacity of the contact to conduct low levels of current, even in adverse ambient conditions.
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.
LOW TEMPERATURE	Minimum operating temperature -40°C, only for rolling stock version (option "L").



Ordering scheme

Product code	Application ⁽¹⁾	Configuration A	Configuration B	Type of power supply	Nominal voltage (V) ⁽²⁾	Finish ⁽³⁾	Keying position code ⁽⁴⁾
RMG	E: Energy F: Railway Fixed Equipment R: Railway Rolling stock	1: Standard 3: Diode // 4: Gold plating 5: Led 6: Gold plating + Diode // 7: Diode // + Led	2X: 6 SPDT contacts + 2 NO 6X: 6 SPDT contacts + 2 NO with magnetic arc blow-out	C: Vdc	024 - 036 - 048 072 - 096 - 110 125 - 132 - 220	T: Tropicalized coil L: Low temperature	XX

Example	RMG	E	3	6X	C	048	T	
	RMGE36X-C048/T = ENERGY series relay with back EMF suppression diode, magnetic arc blow-out and 48Vdc tropicalized coil.							
	RMG	R	7	2X	C	110		
	RMGR72X-C110 = RAILWAY series relay, equipped with flyback diode and indicator Led and 110Vdc coil.							

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

RAILWAYS, FIXED EQUIPMENT: application on fixed power systems and electrical railway traction. Construction according to RFI (FS Group, Italy) specification n° RFI DPRIM STF IFS TE 143 A, if applicable for list of RFI approved and conforming products, consult dedicated catalogue "RAILWAY SERIES - RFI APPROVED"

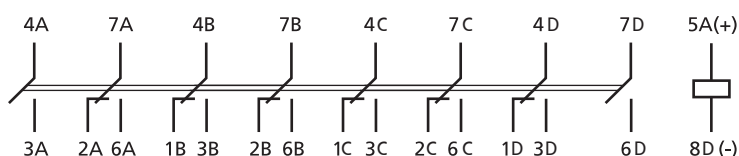
RAILWAYS, ROLLING STOCK: Application on board rolling stock. Electrical characteristics according to EN60077.

2. Other values on request.

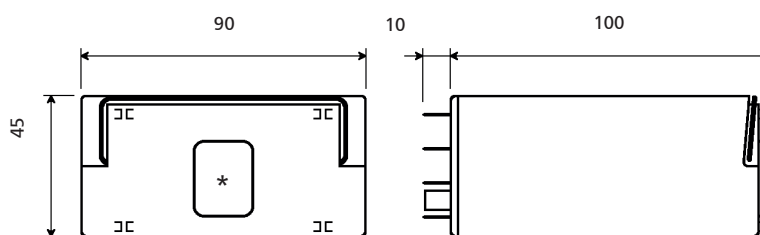
3. Optional value.

4. Optional value. The positive mechanical keying is applied according to the manufacturer's model.

Wiring diagram



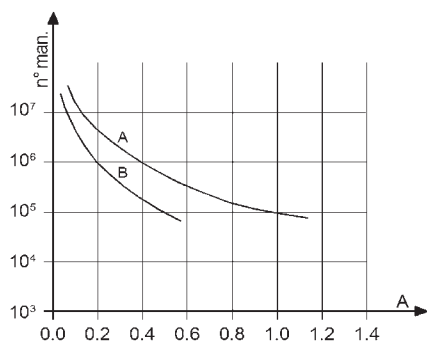
Dimensions



RMG.x2X - RMG.x6X

(*) access to the manual operating lever

Electrical life expectancy



Contact loading: 110Vdc, L/R 40 ms
Curve A: RMG.x6X
Curve B: RMG.x2X

RMG.x2X			
U	I (A)	L/R (ms)	Operations
110Vdc	0.5	40	100,000
110Vdc	0.6	10	300,000
120Vdc	0.7	40	50,000
125Vdc	1.2	0	1,000,000
220Vdc	0.1	40	100,000
220Vdc	0.25	10	100,000
U	I (A)	cosφ	Operations
110Vac	1	1	2,000,000
110Vac	1	0.5	1,500,000
110Vac	5	1	1,000,000
110Vac	5	0.5	500,000
220Vac	0.5	1	2,000,000
220Vac	1	0.5	600,000
220Vac	5	1	650,000
220Vac	5	0.5	600,000

RMG.x6X			
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	100,000
110Vdc	10	0	100,000
U	I (A)	cosφ	Operations
220Vac	5	0.5	100,000
220Vac	10	1	100,000
230Vac	1	0.7	2,500,000
230Vac	3	0.7	1,200,000

Switching frequency: 1,200 operations/hour

Sockets and retaining clips

Type of installation	Type of outputs	Model	Retaining clip
Wall or DIN rail mounting	Screw	96IP20-I DIN	RMC48
	Spring clamp	PAIR320	
Flush mounting	Double faston (4.8 x 0.8 mm)	ADF4-E1	
	Spring clamp	PRIR321	

Mounting tips

The preferred mounting position is on the wall, with the relay positioned horizontally in the reading direction on the nameplate.

To ensure correct use of the relays, they should be spaced apart by at least 20 mm in the vertical direction; this will allow the heat generated by the coils to rise and dissipate as necessary. Check the distances according to the socket used. These distances can be reduced, depending on the environmental conditions during operation and on the relay duty cycle.

Retaining clips are used to ensure that the relay is secured correctly to the socket.

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.

INSTANTANEOUS RELAY, WELD-NO-TRANSFER 8 CONTACTS

RMGW SERIES WITH FORCIBLY GUIDED CONTACTS



OVERVIEW

- Weld-no-transfer contacts, compliant to the standard NF F62-002 (§12.3.10)
- Plug-in monostable instantaneous relay
- Suitable for safety applications
- Solid and rugged construction for heavy or intensive duty
- Self-cleaning knurled contacts
- Very high electrical life expectancy and exceptional endurance
- Magnetic arc blow-out (optional) for higher breaking capacity
- Wide range of option: i.e. LED indicating power on, FLYBACK DIODE
- Transparent cover, with access for manual operation (standard) and pull-out handle
- Retaining clip for secure locking of relay on socket

APPLICATIONS



DESCRIPTION

RMGW relays are highly reliable products offering top performance, suitable for applications in particularly harsh and unsettled environments. The relay is equipped with mechanically linked contacts (forcibly guided), an indispensable feature for applications where there is a need to guarantee that make (NO) contacts will never assume the same status as break (NC) contacts. Forcibly guided contacts are also known as weld-no-transfer contacts.

The testing method is according to NF F62002 (§12.3.10).

With change-over contacts, customers have the greatest possible flexibility in selecting the configuration best suited to their particular needs.

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.

Manual operation as standard for all models, allowing tests to be conducted in the absence of any power supply. The contacts used are of a type designed to give top performance both with high and strongly inductive DC loads, and with particularly low loads; inclusion of the magnetic arc blow-out function (optional) helps to achieve a considerable increase in breaking capacity. 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 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, the other NC contacts may open.
- When the relay is de-energized, if a NO contact fails to open, the remaining NC contact must not close, the other NO contacts may open.

Testing method is according to NF F62002 (§12.3.10):

- The NC contact is kept closed. Relay is energized with a voltage of 150% of U_{max} ($150\% \times 125\% U_{nom} = 188\% U_{nom}$). NO contact should NOT close with a test load of 220V 50Hz, 10 mA.
- The NO contact is kept closed. NC contact should NOT close with a test load of 220V 50Hz, 10 mA.

Models	Number of contacts	Magnetic arc blow-out
RMG.x2W	8 SPDT	
RMG.x6W	8 SPDT	•



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



Electrical data	RMGExyW - RMGFxyW	RMGRxyW
Nominal voltages Un	DC : 24-48-110-125-132-220 ⁽¹⁾	DC : 24-36-72-96-110 ⁽²⁾
Consumption at Un (DC)	3W	
Operating range	DC : 80÷115% Un	DC : 70÷125% Un
Type of duty	Continuous	
Drop-out voltage ⁽³⁾	DC : > 5% Un	

(1) Other values on request.

(2) Suitable for application on rolling stock. Operating range in compliance with EN 60077 standard.

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

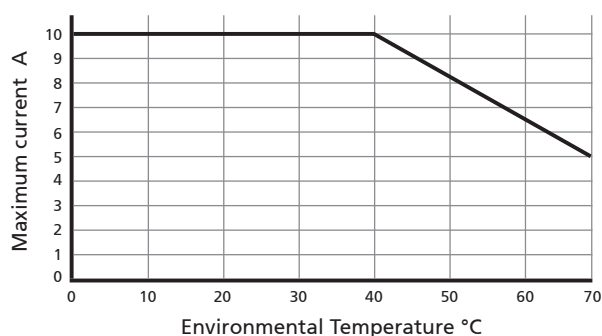


Contact data	RMG.12W-16W-42W-46W	RMG.32W-36W-62W-66W-52W-56W
Number and type	8 SPDT, form C	
Current	See following graph	
Nominal	20A for 1min - 40A for 1s	
Maximum peak ⁽¹⁾	150A for 10ms	
Maximum pulse ⁽¹⁾		
Example of electrical life expectancy	RMG.x2W : 0.5A - 110Vdc - L/R 40ms - 10 ⁵ operations - 1800oper./h RMG.x6W : 1A - 110Vdc - L/R 40ms - 10 ⁵ operations - 1800oper./h	
Minimum load	200mW (10V, 10mA)	
Standard contacts	50mW (5V, 5mA)	
Gold-plated contacts		
Maximum breaking voltage	350 VDC / 440 VAC	
Contact material	AgCdO	
Operating time at Un (ms) ⁽²⁾	DC	
Pick-up (NC contact opening)	≤ 20	
Pick-up (NO contact closing)	≤ 40	
Drop-out (NO contact opening)	≤ 6	
Drop-out (NC contact closing):	≤ 60	

(1) 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.

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

Rated current contact



Note: reduction of 30% on all the contacts simultaneously.

Insulation



Insulation resistance (at 500VCD) between electrically independent circuits and between these circuits and ground between open contact parts	> 10.000 MΩ > 10.000 MΩ
Withstand voltage at industrial frequency between electrically independent circuits and between these circuits and ground between open contact parts between adjacent contacts	2 kV (1 min.) - 2,2kV (1 s) 2 kV (1 min.) - 2,2kV (1 s) 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 between open contact parts	5 kV 5 kV

Mechanical specifications



Mechanical life expectancy	10x10 ⁶ operations
Maximum mechanical switching rate	3600 operations/h
Degree of protection	IP50 fitted to socket
Dimensions (mm) Weight (g)	45x90x100 ⁽¹⁾ 380

(1) Output terminals excluded.

Environmental specifications



Standard operating temperature	standard	-25 to +55 °C
Version for railways, rolling stock (RMGR)		-25 to +70°C (+85°C for 10 min) -40°C as option
Storage and shipping temperature		-25 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 EN 60695-2-10 EN 60529	All-or-nothing relays Fire behaviour Degree of protection provided by enclosures
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Unless otherwise specified, products are designed and manufactured 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 ±7%.

Railways, rolling stock - Standards

Applicable to RMGR version



EN 60077 EN 61373 ⁽¹⁾ NF F62-002 (§12.3.10) EN 45545-2 ASTM E162, E662	Electric equipment for rolling stock - General service conditions and general rules Shock and vibration tests, cat 1, class B Weld-no-transfer contacts, test method Fire behaviour, cat E10, requirement R26, V0 Fire behaviour
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(1) Opening of NC contacts allowed only at de-energized relay t<3ms.

Configurations - Options



TROPICALIZATION	Surface treatment of coil with protective coating for use in conditions of RH 95%. This treatment serves to give the coil added protection against corrosion that could occur as a result of moisture reacting with certain chemical agents such as those found in acid or saline atmospheres.
GOLD PLATING	Surface treatment of contacts, blades and output terminals with gold, thickness ≥ 2μ. This treatment ensures long-term capacity of the contact to conduct low levels of current, even in adverse ambient conditions.
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.
LOW TEMPERATURE	Minimum operating temperature -40°C, only for rolling stock version (option "L").



Ordering scheme

Product code	Application ⁽¹⁾	Configuration A	Configuration B	Type of power supply	Nominal voltage (V) ⁽²⁾	Finish ⁽³⁾	Keying position code ⁽⁴⁾
RMG	E: Energy F: Railway Fixed Equipment R: Railway Rolling stock	1: Standard 3: Diode // 4: Gold plating 5: Led 6: Gold plating + Diode // 7: Diode // + Led	2W: 8 SPDT contacts 6W: 8 SPDT contacts with magnetic arc blow-out	C: Vdc	024 - 036 - 048 072 - 096 - 110 125 - 132 - 220	T: Tropicalized coil L: Low temperature	XX

Example	RMG	E	3	6W	C	048	T	
	RMGE36W-C048/T = ENERGY series relay with back EMF suppression diode, magnetic arc blow-out and 48Vdc tropicalized coil.							
	RMG	R	7	2W	C	110		
	RMGR72W-C110 = RAILWAY series relay, equipped with flyback diode and indicator Led and 110Vdc coil.							

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

RAILWAYS, FIXED EQUIPMENT: application on fixed power systems and electrical railway traction. Construction according to RFI (FS Group, Italy) specification n° RFI DPRIM STF IFS TE 143 A, if applicable for list of RFI approved and conforming products, consult dedicated catalogue "RAILWAY SERIES - RFI APPROVED"

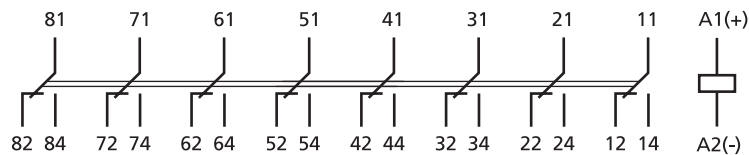
RAILWAYS, ROLLING STOCK: Application on board rolling stock. Electrical characteristics according to EN60077.

2. Other values on request.

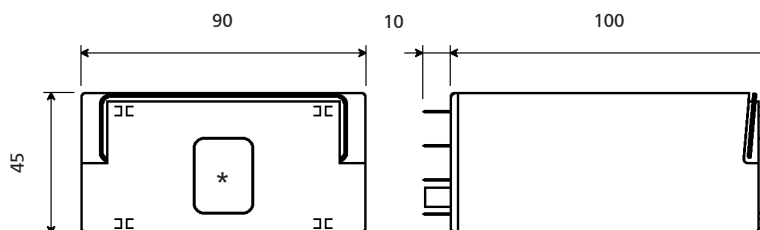
3. Optional value.

4. Optional value. The positive mechanical keying is applied according to the manufacturer's model.

Wiring diagram

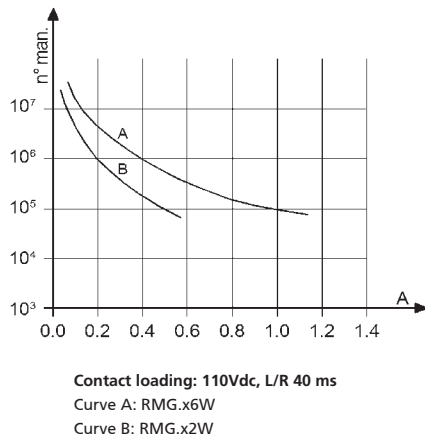


Dimensions



(*) access to the manual operating lever

Electrical life expectancy



RMG.x2W			
U	I (A)	L/R (ms)	Operations
110Vdc	0.5	40	100,000
110Vdc	0.6	10	300,000
120Vdc	0.7	40	50,000
125Vdc	1.2	0	1,000,000
220Vdc	0.1	40	100,000
220Vdc	0.25	10	100,000
U	I (A)	cosφ	Operations
110Vac	1	1	2,000,000
110Vac	1	0.5	1,500,000
110Vac	5	1	1,000,000
110Vac	5	0.5	500,000
220Vac	0.5	1	2,000,000
220Vac	1	0.5	600,000
220Vac	5	1	650,000
220Vac	5	0.5	600,000

RMG.x6W			
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	100,000
110Vdc	10	0	100,000
U	I (A)	cosφ	Operations
220Vac	5	0.5	100,000
220Vac	10	1	100,000
230Vac	1	0.7	2,500,000
230Vac	3	0.7	1,200,000

Switching frequency: 1,200 operations/hour

Sockets and retaining clips

Type of installation	Type of outputs	Model	Retaining clip
Wall or DIN rail mounting	Screw	96IP20-I DIN	RMC48
	Spring clamp	PAIR320	
Flush mounting	Double faston (4.8 x 0.8 mm)	ADF4	
	Spring clamp	PRIR320	

Mounting tips

The preferred mounting position is on the wall, with the relay positioned horizontally in the reading direction on the nameplate. To ensure correct use of the relays, they should be spaced apart by at least 20 mm in the vertical direction; this will allow the heat generated by the coils to rise and dissipate as necessary. Check the distances according to the socket used. These distances can be reduced, depending on the environmental conditions during operation and on the relay duty cycle.

Retaining clips are used to ensure that the relay is secured correctly to the socket.

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.

INSTANTANEOUS MONOSTABLE RELAY WITH 8 C/O CONTACTS

RMMX SERIES



OVERVIEW

- Plug-in monostable instantaneous relay
- Compact dimensions than RMM Series
- Solid and rugged construction for heavy or intensive duty
- High electrical life expectancy and exceptional endurance
- Operation using d.c. or a.c. power supply (directly, without rectifiers or diodes)
- Magnetic arc blow-out (optional) for higher breaking capacity
- Self-cleaning knurled contacts
- Mechanical optical device (standard) or Led (optional for d.c. versions) indicating energized status of coil
- Transparent cover, with access for manual operation (standard) and pull-out handle
- Retaining clip for secure locking of relay on socket
- Positive mechanical keying for relay and socket

APPLICATIONS



Shipbuilding



Petrochemical
industry



Heavy
industry



Power
generation



Power
distribution



Railway
equipment

DESCRIPTION

RMMX relays line are derived from models of RGMX line, offering the same specifications and performance and available with a generous number of contacts (8): in short, highly reliable products providing top performance and suitable for applications in particularly harsh and unsettled environments, such as high voltage electricity distribution stations and medium voltage substations. The mechanical design of the relay is such as to allow the development of numerous custom solutions, in the event that the standard models do not fully respond to the required performance parameters.

Thanks to its high breaking capacity, the relay is suitable for controlling heavy duty loads with intensive switching frequency, where safety and continuity of operation are all-important.

Versatility in manufacture allows the production of relays with any voltage between 12 and 250Vd.c./380Va.c. Manual operation is specified for all models, allowing tests to be conducted in the absence of any power supply.

The contacts used are of a type designed to give top performance both with high and strongly inductive d.c. loads, and with particularly low loads; inclusion of the magnetic arc blow-out function (optional) helps to achieve a considerable increase in breaking capacity.

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.

Benefiting from careful selection of materials, plus the technical and professional skills of human resources involved in design and production, this is a product suitable for the most demanding of environments.

Like all AMRA relays, these models are assembled as part of a controlled manufacturing process in which every step of production is verified by the next step in succession. Each relay is calibrated and tested individually, by hand, so as to guarantee top reliability.

Model	Number of contacts	Magnetic arc blow-out
RMM.x2X	8	
RMM.x6X	8	•



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



Electrical data	RMM.x2X-x6X
Nominal voltages Un	DC : 12-24-48-110-125-132-220 ⁽¹⁾ - AC : 12-24-48-110-125-230-380-440 ⁽¹⁻²⁾
Consumption at Un (DC/AC)	3W / 6,5VA ⁽³⁾ - 11,5VA ⁽⁴⁾
Operating range	DC : 80÷115% Un - AC : 85÷110% Un
Type of duty	Continuous
Drop-out voltage ⁽⁵⁾	DC : > 5% Un - AC : > 15% Un

(1) Other values on request.

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

(3) In operation.

(4) On pick-up.

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



Contact data	RMM.12X-16X-42X-46X	RMM.32X-36X-52X-56X-62X-66X-72X-76X
Number and type	8 SPDT, form C	
Current	Nominal ⁽¹⁾	10A
	Maximum peak ⁽²⁾	20A for 1min - 40A for 1s
	Maximum pulse ⁽²⁾	150A for 10ms
	Example of electrical life expectancy ⁽³⁾	RMMEx2X : 0.5A - 110Vdc - L/R 40ms - 10 ⁵ operations - 1800 operations/hour RMMEx6X : 1A - 110 Vdc - L/R 40ms - 10 ⁵ operations - 1800 operations/hour
Minimum load	Standard contacts	200mW (10V, 10mA)
	Gold-plated contacts	50mW (5V, 5mA)
Maximum breaking voltage	350 VDC / 440 VAC	
Contact material	AgCdO	
Operating time at Un (ms) ⁽⁴⁾	DC - AC	DC
Pick-up (NC contact opening)	≤ 20 - ≤ 13	≤ 20
Pick-up (NO contact closing)	≤ 45 - ≤ 50	≤ 45
Drop-out (NO contact opening)	≤ 8 - ≤ 25	≤ 42
Drop-out (NC contact closing):	≤ 45 - ≤ 60	≤ 85

(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 500VCD) between electrically independent circuits and between these circuits and ground between open contact parts	> 10.000 MΩ > 10.000 MΩ
Withstand voltage at industrial frequency between electrically independent circuits and between these circuits and ground between open contact parts between adjacent contacts	2 kV (1 min.) - 2,2kV (1 s) 2 kV (1 min.) - 2,2kV (1 s) 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 between open contact parts	5 kV 5 kV

Mechanical specifications		
Mechanical life expectancy		20x10 ⁶ operations
Maximum mechanical switching rate		3600 operations/h
Degree of protection		IP50 fitted to socket
Dimensions (mm)		45x90x100 ⁽¹⁾
Weight (g)		380

(1) Output terminals excluded.

Environmental specifications		
Operating temperature		-25 ÷ +55°C
Storage and shipping temperature		-25 ÷ +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		All-or-nothing relays
EN 60695-2-10		Fire behaviour
EN 60529		Degree of protection provided by enclosures

Unless otherwise specified, products are designed and manufactured 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 ±7%.

Configurations - Options		
TROPICALIZATION		Surface treatment of coil with protective coating for use in conditions of RH 95%. This treatment serves to give the coil added protection against corrosion that could occur as a result of moisture reacting with certain chemical agents such as those found in acid or saline atmospheres.
GOLD PLATING		Surface treatment of contacts, blades and output terminals with gold, thickness ≥ 2μ. This treatment ensures long-term capacity of the contact to conduct low levels of current, even in adverse ambient conditions.
LED		Luminous indicator showing presence of power supply, wired in parallel with the coil, as alternative to mechanical optical indicator.
FLYBACK DIODE		Component connected in parallel with the coil designed to suppress overvoltages generated by the coil when de-energized.

Ordering scheme							
Product code	Application ⁽¹⁾	Configuration A	Configuration B	Type of power supply	Nominal voltage (V) ⁽²⁾	Finish ⁽³⁾	Keying position code ⁽⁴⁾
RMM	E: Energy F: Railway Fixed Equipment	1: Standard 3: Diode // 4: Gold plating 5: Led 6: Gold plating + Diode // 7: Diode // + Led	2X: 8 SPDT contacts 6X: 8 SPDT contacts with magnetic arc blow-out	C: Vdc A: Vac 50 Hz H: Vac 60 Hz	012 - 024 - 048 110 - 125 - 132 220 - 230 - 380 440	T: Tropicalized coil	XX

Example	RMM	E	4	6X	A	024	
	RMME46X-A024 = ENERGY series relay with 8 gold-plated contacts, magnetic arc blow-out and 24Vac coil.						
	RMM	F	1	2X	C	110	T
	RMMF12X-C110/T = Standard RAILWAY series relay with 8 contacts and 110Vdc tropicalized coil.						

(1) ENERGY: all applications except for railway.

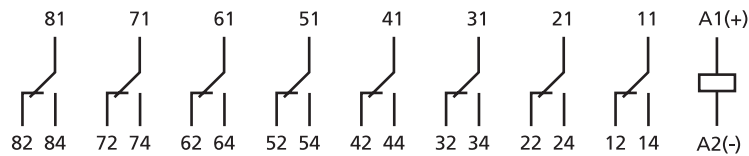
RAILWAYS, FIXED EQUIPMENT: application on fixed power systems and electrical railway traction. For list of RFI compliant and type-approved products, consult dedicated catalogue "RAILWAY SERIES – RFI APPROVED".

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 catalogue "STATIONS SERIES – LV15-LV16-LV20".

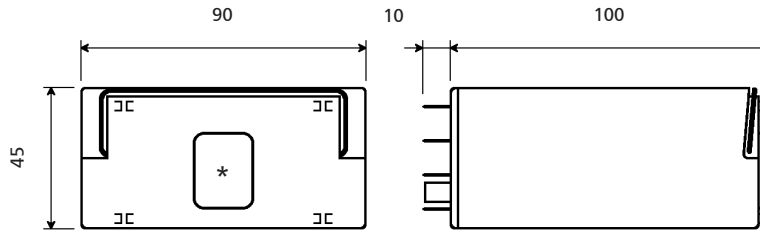
(2) Other values on request. Voltages 380V and 440V available as Vac only.

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

Wiring diagram

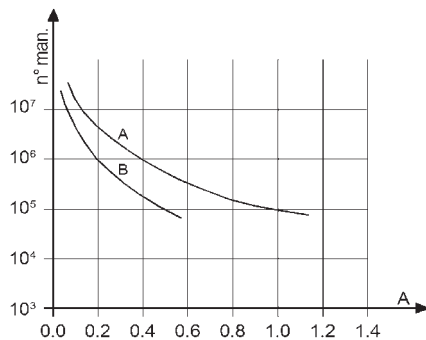


Dimensions



(*) access to the manual operating lever

Electrical life expectancy



Contact loading: 110Vdc, L/R 40 ms
Curve A: RMM.x6X
Curve B: RMM.x2X

RMM.x2X			
U	I (A)	L/R (ms)	Operations
110Vdc	0.5	40	100,000
110Vdc	0.6	10	300,000
120Vdc	0.7	40	50,000
125Vdc	1.2	0	1,000,000
220Vdc	0.1	40	100,000
220Vdc	0.25	10	100,000
U	I (A)	cosφ	Operations
110Vac	1	1	2,000,000
110Vac	1	0.5	1,500,000
110Vac	5	1	1,000,000
110Vac	5	0.5	500,000
220Vac	0.5	1	2,000,000
220Vac	1	0.5	600,000
220Vac	5	1	650,000
220Vac	5	0.5	600,000

RMM.x6X			
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	100,000
110Vdc	10	0	100,000
U	I (A)	cosφ	Operations
220Vac	5	0.5	100,000
220Vac	10	1	100,000
230Vac	1	0.7	2,500,000
230Vac	3	0.7	1,200,000

Switching frequency: 1,200 operations/hour

Sockets and retaining clips

Type of installation	Type of outputs	Model	Retaining clip
Wall or DIN rail mounting	Screw	96IP20-I DIN	RMC48
	quick wiring	PAIR320	
Flush mounting	Double faston (4.8 x 0.8 mm)	ADF4	
	quick wiring	PRIR320	

(1) Suitable for mounting 2 relays side by side.

Mounting tips

The preferred mounting position is on the wall, with the relay positioned horizontally in the reading direction on the nameplate. To ensure correct use of the relays, they should be spaced apart by at least 20 mm in the vertical; this will allow the heat generated by the coils to rise and dissipate as necessary. Check the distances according to the socket used. Distances can be reduced depending on the environmental application conditions and on the relay duty cycle.

Retaining clips are used to ensure that the relay is secured correctly to the socket.

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.

INSTANTANEOUS BISTABLE (LATCHING) RELAY WITH 7-8 CONTACTS

RMBX SERIES



OVERVIEW

- Plug-in instantaneous bistable relay
- Compact dimensions than RMB Series
- Solid and rugged construction for heavy or intensive duty
- Self-cleaning knurled contacts
- Pulsed or permanent power supply and de-energization system
- High electrical life expectancy and exceptional endurance
- Operation with DC or AC power supply
- Fitted with mechanical optical contact status indicator as standard
- Transparent cover, with access for manual operation (standard) and pull-out handle
- Retaining clip for secure locking of relay on socket
- Wide variety of configurations and customizations
- Positive mechanical keying for relay and socket

APPLICATIONS



Shipbuilding



Petrochemical
industry



Heavy
industry



Power
generation



Power
distribution



Railway
equipment

DESCRIPTION

RMBX relays are derived from models of the RMB line, offering the same specifications and performance and available with a generous number of contacts (up to 8); in short, highly reliable products providing top performance and suitable for applications in particularly harsh and unsettled environments, such as high voltage electricity distribution stations and medium voltage substations. The mechanical design of the relay is such as to allow the development of numerous custom solutions, in the event that the standard models do not fully respond to the required performance parameters.

Thanks to its exceptional breaking capacity, the relay is suitable for controlling heavy duty loads where safety and continuity of operation are all-important.

Versatility in manufacture allows the production of relays with any voltage between 12 and 250Vd.c./230Va.c., and with a variety of operating ranges adaptable to different application requirements.

Manual operation is specified for all models, allowing tests to be conducted in the absence of any power supply.


RMBX relays are equipped with an automatic coil de-energization system, operated mechanically, designed to reduce the power consumption of the device to zero on completion of the cycle.

The contacts used are of a type designed to give top 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.

Benefiting from careful selection of materials, plus the technical and professional skills of human resources involved in design and production, this is a product suitable for the most demanding of environments.

Like all AMRA relays, these models are assembled as part of a controlled manufacturing process in which every step of production is verified by the next step in succession. Each relay is calibrated and tested individually, by hand, so as to guarantee top reliability.

 Models	Number of contacts	Power input to coils
RMB.x3X	7	Common negative
RMB.x2X	8	Common negative


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

 Electrical data	RMB.x3X	RMB.x2X
Nominal voltages Un	DC / AC: 12-24-48-110-125-132-220-230-380-440 ⁽¹⁾	
Consumption at Un (DC/AC) ⁽²⁾	15W / 15VA	19W / 19VA
Operating range	DC: 80÷120% Un - AC: 85÷110% Un	
Type of duty	Continuous	

Minimum control pulse: 50ms.

(1) Other values on request.

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


 Contact data	RMBE.x3X	RMB.x2X
Number and type	7 SPDT, form C	8 SPDT, form C
Current	10A	
Nominal ⁽¹⁾	20A for 1min - 40A for 1s	
Maximum peak ⁽²⁾	150A for 10ms	
Maximum pulse ⁽²⁾		
Example of electrical life expectancy ⁽³⁾	0.7A - 132Vdc - L/R 40ms - 10 ⁵ operations - 600 operations/hour	
Minimum load	200mW (10V, 10mA)	
Standard contacts	50mW (5V, 5mA)	
Gold-plated contacts		
Maximum breaking voltage	350 VDC / 440 VAC	
Contact material	AgCdO	
Operating time at Un (ms) ⁽⁴⁾	DC - AC	DC - AC
Pick-up (NC contact opening)	≤ 25 - ≤ 25	≤ 25 - ≤ 25
Pick-up (NO contact closing)	≤ 45 - ≤ 40	≤ 28 - ≤ 35
Drop-out (NO contact opening)	≤ 12 - ≤ 25	≤ 10 - ≤ 20
Drop-out (NC contact closing):	≤ 45 - ≤ 55	≤ 43 - ≤ 53

(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 500VCD)	
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 mechanical switching rate	900 operations/hour
Degree of protection	IP50 fitted to socket
Dimensions (mm) ⁽¹⁾	45x90x100 ⁽¹⁾
Weight (g)	RMB.x3X: 400 RMB.x2X: 410

(1) Output terminals excluded.

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 EN 60695-2-10 EN 60529	All-or-nothing relays Fire behaviour Degree of protection provided by enclosures
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Unless otherwise specified, products are designed and manufactured 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 ±7%.

Configurations - Options



TROPICALIZATION	Surface treatment of coil with protective coating for use in conditions of RH 95%. This treatment serves to give the coil added protection against corrosion that could occur as a result of moisture reacting with certain chemical agents such as those found in acid or saline atmospheres.
GOLD PLATING	Surface treatment of contacts, blades and output terminals with gold, thickness ≥ 2μ. This treatment ensures long-term capacity of the contact to conduct low levels of current, even in adverse ambient conditions.
FLYBACK DIODE	Component connected in parallel with the coil designed to suppress overvoltages generated by the coil when de-energized.

Ordering scheme



Product code	Application ⁽¹⁾	Configuration A	Configuration B	Type of power supply	Nominal voltage (V) ⁽²⁾	Finish ⁽³⁾	Keying position code ⁽⁴⁾
RMB	E: Energy F: Railway Fixed Equipment	1: Standard 3: Diode // 4: Gold plating 6: Gold plating + Diode //	2X: 8 SPDT contacts 3X: 7 SPDT contacts	C: Vdc A: Vac 50 Hz H: Vac 60 Hz	012 - 024 - 048 110 - 125 - 132 220 - 230 - 380 440	T: Tropicalized coil	XX

Example	RMB	E	4	3X	C	110	
	RMBE43X-C110 = ENERGY series relay with 7 SPDT gold-plated contacts and 110Vdc coil						
	RMB	E	1	2X	C	110	T
	RMBE12X-C110T = ENERGY series relay with 8 SPDT contacts and 110Vdc 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 catalogue "RAILWAY SERIES – RFI APPROVED".

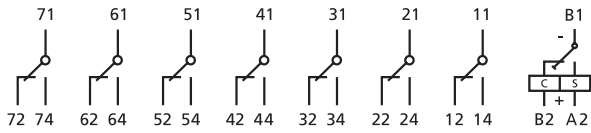
Also available is the **STATIONS** series, with ENEL approved material meeting LV15/LV16 specifications. For list of ENEL compliant and type-approved products, consult dedicated catalogue "STATIONS SERIES – LV15-LV16-LV20".

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

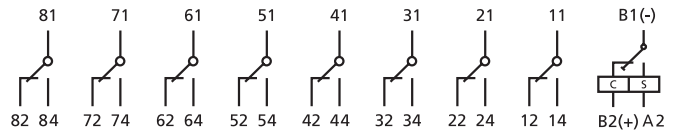
(3) Optional value.

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

Wiring diagram

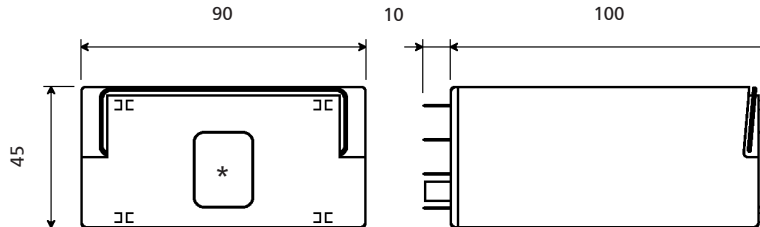


RMB.x3X



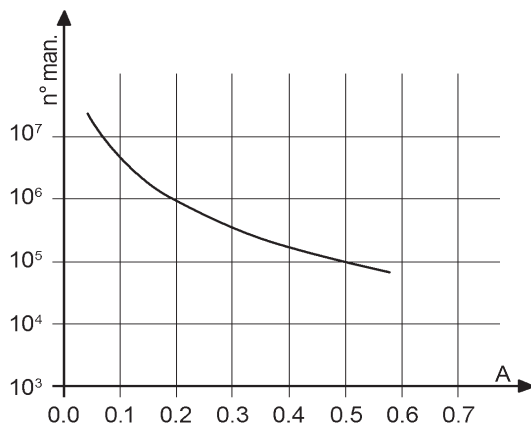
RMB.x2X

Dimensions



(*) access to the manual operating lever

Electrical life expectancy



Contact loading: 110Vdc, L/R 40 ms

U	I (A)	L/R (ms)	Operations
110Vdc	0.5	40	150,000
110Vdc	0.6	10	300,000
132Vdc	0.7	40	100,000
125Vdc	1.2	0	1,000,000
220Vdc	0.1	40	100,000
220Vdc	0.25	10	100,000
U	I (A)	cosφ	Operations
110Vac	1	1	2,000,000
110Vac	1	0.5	1,500,000
110Vac	5	1	1,000,000
110Vac	5	0.5	500,000
220Vac	0.5	1	2,000,000
220Vac	1	0.5	600,000
220Vac	5	1	650,000
220Vac	5	0.5	600,000

Switching frequency: 1,200 operations/hour

Sockets and retaining clips

Type of installation	Type of outputs	Model	Retaining clip
Wall or DIN rail mounting	Screw	96IP20-I DIN	RMC48
	quick wiring	PAIR320	
Flush mounting	Double faston (4.8 x 0.8 mm)	ADF4	
	quick wiring	PRIR320	

(1) Suitable for mounting 2 relays side by side.

Mounting tips

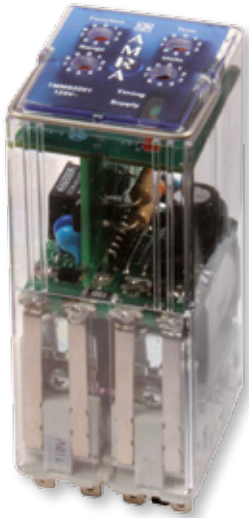
The preferred mounting position is on the wall, with the relay positioned horizontally in the reading direction on the nameplate. Retaining clips are used to ensure that the relay is secured correctly to the socket.

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.

Multifunction multiscale timer relay - 4 contacts

TMM SERIES



TMM

OVERVIEW

- Plug-in relay with time delay, multifunction
- 10 different time delay functions
- 4 time delay contacts or 2 time delay contacts + 2 instantaneous contacts
- Wide time setting range from 0.1s to 99 hours, extreme accuracy across the adjustment range
- High electromagnetic interference immunity
- Solid and rugged construction for heavy or intensive duty, considerable long-life
- Independent and self-cleaning contacts
- Magnetic arc blow-out standard
- Separate arc breaking chambers
- Excellent shock and vibration resistance
- Wide range of sockets
- Wide variety of configurations and customizations
- Retaining clip for secure locking of relay on socket
- Transparent cover, pull-out handle
- Positive mechanical keying for relay and socket

APPLICATIONS



Shipbuilding



Petroleum industry



Heavy industry



Power generation



Power distribution



Railway equipment



Rolling stock

DESCRIPTION

The TMM series is a range of MULTIFUNCTION relays with electronic time delay, consisting of 2 models with 4 change-over contacts, rated 10 A (nominal). They are obtained by assembling the electromechanical units of the POKS series with a digital electronic circuit.

The electromechanical part features the reliability and ruggedness of relays belonging to the POKS series, while the electronics offers high reliability thanks to the use of a circuit requiring few components and to the careful choice of professional products.

A single TMM series relay offers 10 different timer functions, freely programmable by the user; these include, by way of example, time delay on pick-up or on drop-out, flasher, one-shot, etc.

The switching time can be selected within a wide range extending from 0.1 second to 99 hours, with extreme accuracy guaranteed across the full scale of adjustment. This is made possible by providing the relay with 10 intermediate scales.

The timer function, the scale and the switching time are adjustable by means of 4 rotary switches, each having 10 positions, located on the front of the relay.

The electronic circuit is immune to high electromagnetic interference, typical of high voltage electricity distribution stations. The construction of the relays and careful choice of the materials are such that they ensure long life and considerable ruggedness even in harsh operating environments and in the presence of strong temperature fluctuations.

Excellent electrical and mechanical performance levels allow the product to be used in the most demanding of sectors such as, for example, rail transport, control and signalling functions in electricity generating stations, electrical transformer stations, or in industries with continuous production processes (chemical and petroleum industries, rolling mills, cement factories, etc.). Above all, the excellent ability to withstand shock and vibration allow their use on rolling stock.

Models	Nominal current	Number of contacts		Rolling stock application
		Time-delayed	Instantaneous	
TMM2	10 A	2	2	•
TMM4	10 A	4	-	•



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



Coil data	
Nominal voltages Un ⁽¹⁾	DC: 12-24-36-48-72-110-125-132-144-220 AC: 12-24-48-110-127-220-230
Max. consumption at Un (DC/AC)	TMM2: 5,5 W / 7,5VA TMM4: 4,5 W / 6,5 VA
Operating range ⁽¹⁾	80 ÷ 115 % Un
Rolling stock version ^{(2) (3)}	DC : 70 ÷ 125 % Un
Type of duty	Continuous
Drop-out voltage ⁽⁴⁾	> 15% Un

(1) Other values on request.

(2) See "Ordering scheme" table for order code.

(3) For operating ranges different to that specified by EN60077, refer to table "Rolling stock versions - Special Ranges".

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



Contact data	TMM2	TMM4
Number and type	2 timed + 2 instantaneous SPDT, form C	4 timed, SPDT, form C
Current		
Nominal ⁽¹⁾	10 A	
Maximum peak (1s) ⁽²⁾	20 A (1min) / 40 A (500ms)	
Maximum pulse (10ms) ⁽²⁾	150 A	
Example of electrical life expectancy ⁽³⁾		
1.800 operations/h	0,7 A – 132 Vdc – L/R 40 ms : 10 ⁵ operations 1 A – 110 Vdc – L/R 0 ms : 10 ⁵ operations	
Making capacity	30 A (for 200 ms) – 110Vdc – L/R 0 ms : 2.000 operations	
Minimum load		
Standard contacts	500 mW (20V, 20 mA)	
Gold-plated contact P4GEO ⁽⁴⁾	100 mW (10V, 5 mA)	
Gold-plated contact P8 ⁽⁴⁾	50 mW (5V, 5 mA)	
Maximum breaking voltage	250 Vdc / 350 Vac	
Contact material	AgCu	
Operating time at Un (ms) ^{(5) (6)}	DC ⁽⁷⁾ – AC	
Pick-up (NO contact closing)	≤ 20 - ≤ 20	
Drop-out (NC contact closing)	≤ 15 - ≤ 20	

(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 values, see electrical life expectancy curves.

(4) Specifications of contacts on new relay

a) Plating material: P4 GEO: gold-nickel alloy (>5μ) P8: gold-cobalt alloy (>5μ), knurled contact

b) When the gold-plated contact is subject to heavy loads, it will be degraded on the surface. In such case, the characteristics of the standard contact should be taken into consideration. This does not impair relay operation.

(5) Times for the instantaneous component of the relay (TMM2 model).

(6) Unless specified otherwise, the operating time signifies until stabilization of the contact (including bounces). They should be added to the preset delay time.

(7) Addition of a flyback diode connected in parallel with the coil (DC version only) causes an increase in operating time when the relay drops out.



Insulation	
Insulation resistance (at 500Vdc)	
between electrically independent circuits and between these circuits and ground	> 1.000 MΩ
between open contact parts	> 1.000 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	1 kV (1 min) - 1,1 kV (1 s)
between adjacent contacts	2,5 kV (1 min) - 3 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	3 kV

Mechanical Specifications



Mechanical life expectancy	10 x 10 ⁶
Maximum switching rate	Mechanical 3.600 operations / h
Degree of protection (with relay mounted)	IP40
Dimensions (mm) ⁽¹⁾	40 x 50 x 97
Weight (g)	~ 220

(1) Output terminals excluded.

Environmental specifications



Operating temperature	Standard -25 ÷ + 55 °C
	Rolling stock version -25 ÷ + 70 °C
Storage and shipping temperature	-40 ÷ + 70 °C
Relative humidity	Standard: 75% UR, Tropicalized: 95% UR
Resistance to vibrations	5g - 10 ÷ 55 Hz - 1min.
Resistance to shock	20g - 11ms
Fire behaviour	V0

Standards and reference values



EN 61810-1, EN 61810-2, EN 61810-7	Electromechanical elementary relays
EN 61812-1	Timer relays
EN 60695-2-10	Fire behaviour
EN 50082, EN 61000-4	Electromagnetic compatibility
EN 60529	Degree of protection provided by enclosures

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 technical data are referred to ambient temperature of 23°C, atmospheric pressure of 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	Shock and vibration tests, Cat 1 Class B
EN 45545-2	Fire behaviour, Cat E10, Requirement R26, V0
NF F 16-101/102	Fire behaviour, Cat A1 rolling stock
ASTM E162, E662	Fire behaviour
UNI CEI 11170-3	Fire behaviour, Level of risk 4

Railways, rolling stock – Special operating ranges ⁽¹⁾



Nominal voltage	Minimum pick-up voltage	Maximum operating voltage	Order symbol ⁽¹⁾
24 Vdc	16,8	32	Z01
72 Vdc	55	104	Z01
110 Vdc	77	144	Z01

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

Configurations - Options



P2	Tropicalization of coil with epoxy resin for exposure to 95% RH (@ T 50 °C). This treatment also protects the coil against corrosion which could occur by combination of the humidity with certain chemical agents, such as those found in acidic or saline atmospheres.
P4GEO	Gold plating of contacts with gold-nickel alloy, thickness ≥ 6μ. This treatment ensures long-term capacity of the contact to conduct lower currents in harsh ambient conditions such as acid atmospheres (typical of geothermal power stations) or saline atmospheres.
P5GEO	Gold-plating of contacts P4GEO + tropicalization of coil P2 .
P6GEO	P4GEO type gold-plating, but applied to contacts, contact terminals and output terminals + P2 coil tropicalization.
P7	AgCdO (silver cadmium oxide) contacts.
P8	Gold plating of contacts with gold-cobalt alloy, thickness ≥ 5μ, knurled fixed contact. This finish allows further improvement of the gold-plated contact performance compared to the treatment P4GEO.
FLYBACK DIODE	Polarized component connected in parallel with the coil (type 1N4007 or BYW56 for rolling stock version) 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.



Ordering scheme

Product code	Application ⁽¹⁾	Configuration A	Configuration B	Type of power supply	Nominal voltage (V) ⁽²⁾	Keying position ⁽³⁾
TMM2	E: Energy	1: Standard	0 : Standard	C: Vdc A: Vac 50 Hz	012 - 024 - 036 048 - 072 - 100 110 - 125 - 127 132 - 144 - 220 230	XXX
TMM4	F: Railway Fixed Equipment R: Railway Rolling Stock	2: Diode // 3: Varistor 7: Transil	2: P2 4: P4 GEO 5: P5 GEO 6: P6 GEO 7: P7 8: P8			

Example

TMM2	E	1	8	C	024	
TMM2E18-C024 - TMM2 relay, ENERGY series, nominal voltage 24 Vdc, with P8 finish (gold-plated contacts)						
TMM4	R	1	0	C	110	
TMM4R10-C024 - TMM4 relay, ROLLING STOCK series, nominal voltage 110 Vdc						

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

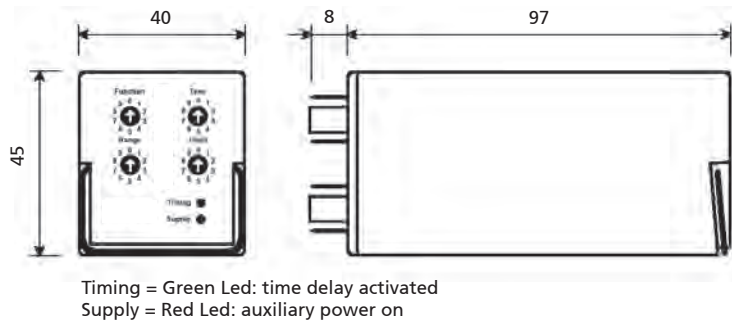
RAILWAYS, FIXED EQUIPMENT: application on fixed power systems and electrical railway traction. Construction according to RFI (FS Group) specification no. RFI DPRIM STF IFS TE 143 A, if applicable. For list of RFI compliant and type-approved products, consult dedicated catalogue "RAILWAY SERIES – RFI APPROVED"

RAILWAYS, ROLLING STOCK: Application on board rolling stock (rail-tram-trolley vehicles). Electrical characteristics according to EN60077.

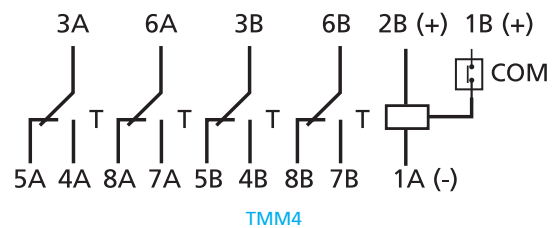
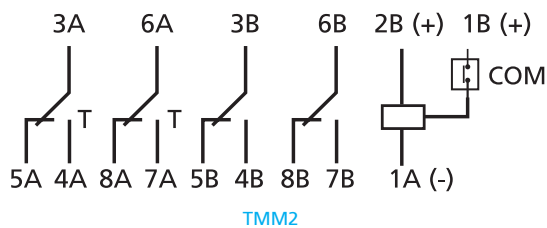
(2) Other values on request.

(3) Optional value. The positive mechanical keying is applied according to the manufacturer's model.

Dimensions and indicators



Wiring diagram



T= time delay contacts

Terminals 2B and 1A are allocated to the auxiliary power supply.

Terminal 1B is allocated to CONTROL. The negative of the control circuit is common with that of the auxiliary power supply.

Certain functions require an auxiliary power supply to guarantee operation of the time delay (terminal 2B).

Time delay – Switching time setting

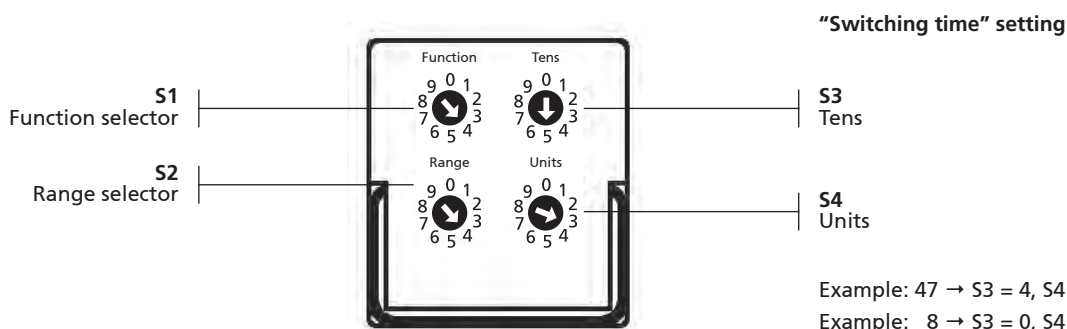


Controls setting function, range and time	4 rotary switches with 10 positions (0...9)	
Time setting range	100 ms...99 h	
Intermediate scales	10, from 9,9 seconds to 99 hours	
Resolution of switching time setting	1% of intermediate scale	
Accuracy, time delay (0.8...1.1 Un, t=20°C)	DC: $\pm 1\%$ of selected time or ± 5 ms (1) AC: $\pm 1\%$ of selected time; 0,1s...10s: $\pm 2\% \pm 20$ ms	
Accuracy, repeatability	DC: $\pm 0,5\%$	AC: $\pm 0,5\% + 20$ ms
Reset	< 200ms during time delay interval < 400ms	

(1) Whichever of the two values is higher.

The function and switching time are adjustable by means of 4 rotary-switch located on the front of the relay, each having 10 positions, with which the user can select time delay settings between 100 ms and 99 hours.

The position of the arrow point on each rotary switch indicates the number selected. Adjustments are made by discrete steps, which means that no intermediate settings are possible.



Adjustment of switching time (except for function F6)

To adjust the switching time, the first step is to adjust the intermediate scale T(s), by selecting one of the 10 available scales using the S2 rotary switch. The values available are given in table 1.

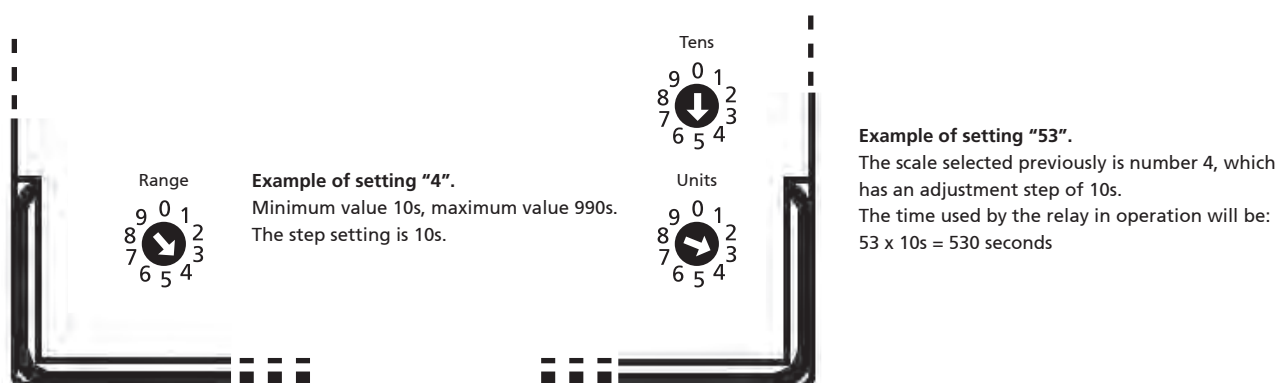
Scale	Minimum value	Maximum value	Step
0	0,1s	9,9s	100ms
1	1s	99s	1s
2	3s	297s	3s
3	5s	495s	5s
4	10s	990s	10s

Scale	Minimum value	Maximum value	Step
5	1min	99min	1min
6	3min	297min	3min
7	5min	495min	5min
8	10min	990min	10min
9	1h	99h	1h

Table 1 – Available scales

Next, the switching time is adjusted by means of rotary-switch selectors S3 and S4.

The combination of these two 10-position controls, located on the right, allows the selection of a number between 1 and 99. The number selected with the "Tens" arrow combined with the number selected with the "Units" arrow represents the multiplier of the step selected via the "Range" control. The resulting value gives the time used by the relay in operation.



Adjustment of switching time for function F6 – Asymmetric flash

Function F6 pilots an asymmetric flash. The "ON" time and the "OFF" time are adjustable independently

"ON" time (t) → selector S3

"OFF" time (T) → selector S4

In this instance, selector S3 and selector S4 are both calibrated in UNITS. Position "0" assumes the value of 10 integers.

Once the scale has been set by means of selector S2, selectors S3 and S4 are used to set the number that will provide the multiplier for the step of the selected scale.

Example: S2 = 1 → unit of time : seconds

S3 = 3 → t = 3 seconds

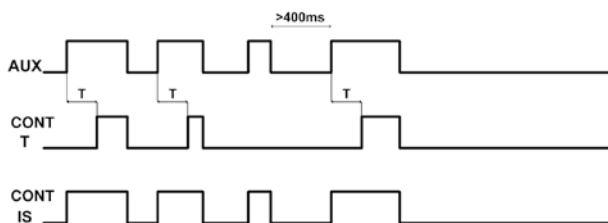
S4 = 0 → T = 10 seconds

Functions - selections and operating diagrams

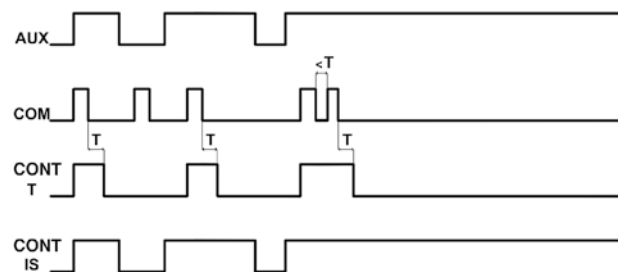
SELECTING THE FUNCTION

The function is selected by positioning the arrow of selector S1 so that the point is aligned with the number of the required function.

Function	Description
F0	Time delay on pick-up.
F1	Time delay on drop-out. Instantaneous contacts follow the status of the auxiliary power supply.
F2	Time delay on drop-out, instantaneous contacts on "CONTROL". Instantaneous contacts follow the status of the control signal.
F3	One-shot function.
F4	Flasher, symmetrical. The "ON" time and the "OFF" time are the same.
F5	Flasher, asymmetrical. The "ON" time and the "OFF" time are different, and adjustable independently.
F6	One-shot function on "CONTROL". The timing cycle starts on activation of the control signal.
F7	One-shot function with fixed pulse (3s), delayed at pick-up. Pulse delay adjustable.
F8	One-shot function, on "CONTROL", with fixed pulse (3s), delayed at pick-up. The timing cycle starts on activation of the control signal. Pulse delay adjustable.
F9	Step function

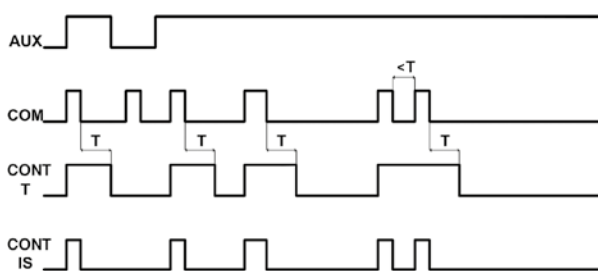


F0 – Time delay on pick-up.



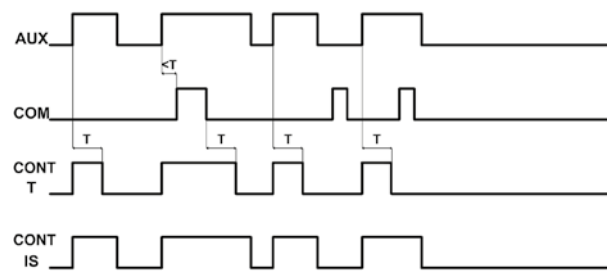
F1 – Time delay on drop-out.

The instantaneous contacts follow the status of the auxiliary power supply (2B terminal).



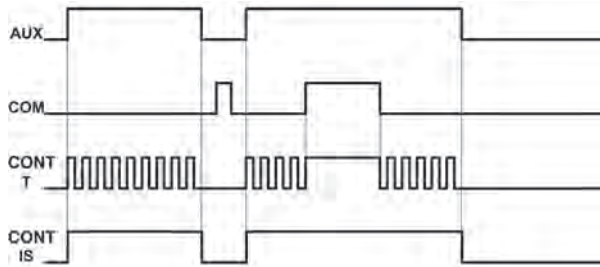
F2- Time delay on drop-out, instantaneous contacts on "CONTROL" (COM).

The instantaneous contacts follow the status of the control signal ("COM", 1B terminal).



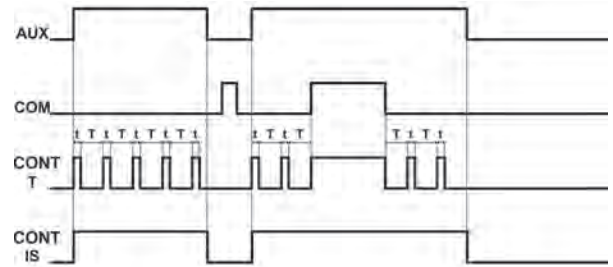
F3 – One-shot function.

The control signal ("COM", 1B terminal) resets the time "t", on drop-out.



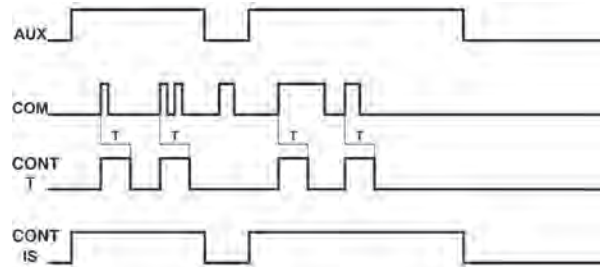
F4 – Flasher, symmetrical.

The control signal ("COM", 1B terminal) stops the flash.

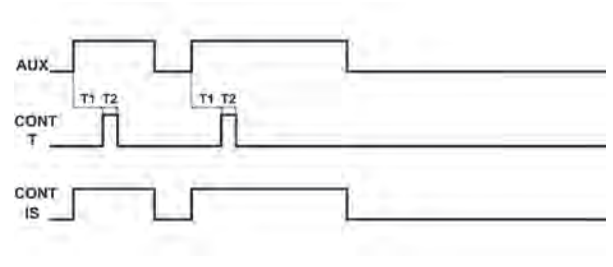


F5 – Flasher, asymmetrical.

The control signal ("COM", 1B terminal) stops the flash t and T are adjustable using the same unit of time.
 Example: S2 = 1 → unit of time: seconds
 S3 = 3 → t = 3 seconds
 S4 = 0 → T = 10 seconds

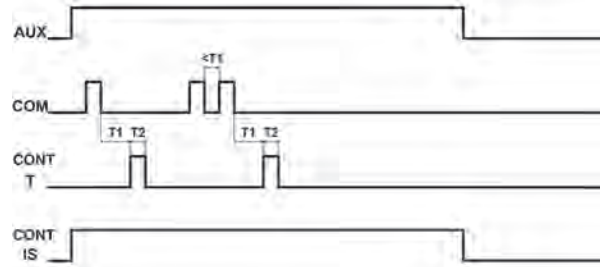


F6– One-shot function on "CONTROL" (COM).



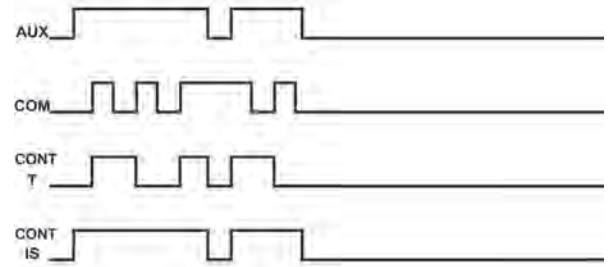
F7 – One-shot function with fixed pulse (3s), delayed at pick-up.

T1: adjustable by way of selector S3 / S4
 T2 : fixed, 3 seconds



F8 – One-shot function, on "CONTROL", with fixed pulse (3s), delayed at pick-up.

T1: adjustable by way of selector S3 / S4
 T2 : fixed, 3 seconds
 Control signal ("COM", 1B terminal) starts time delay T1
 Control signal ("COM", 1B terminal) restarts the time, if this appears during the time delay.



F9 – Step function

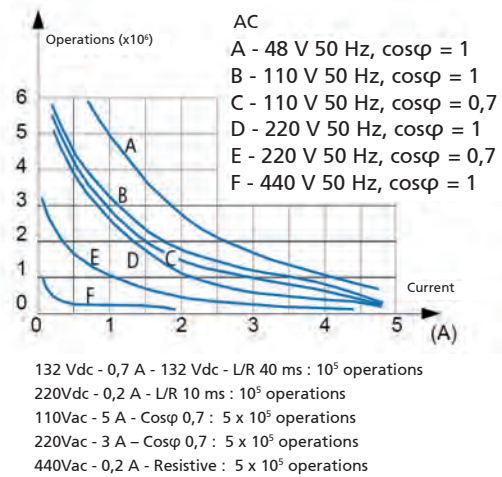
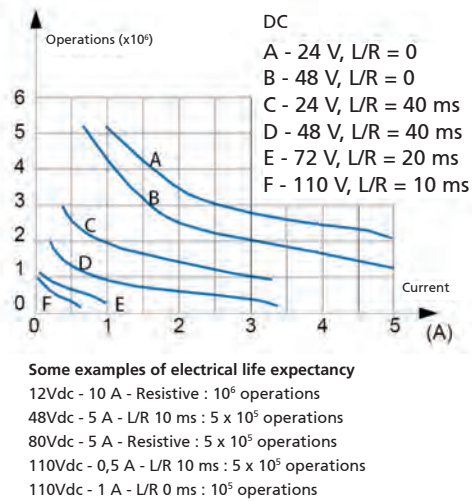
The S3 and S4 switches have no effect on the relay operation.

Applicable note for all operations diagrams:

AUX: 2B - 1A terminals
 COM: 1B terminal
 CONT T: timed contacts
 CONT I: instantaneous contacts

See "Wiring diagram" to identify the instantaneous and timed contacts terminals'.

Electrical life expectancy ⁽¹⁾



(1) Switching frequency 1,200 operations/hour, 50% cycle.

Sockets and retaining clips

Number of terminals (standard dimensions 5x0.8mm)	16	Retaining clip
For wall or rail mounting		
Spring clamp, wall or DIN H35 rail mounting	PAIR160	RT48
Screw, wall or DIN H35 rail mounting	48BIP20-I DIN	RT48
Screw, wall mounting	48BL	RT48
For flush mounting		
Spring clamp	PRIR160	RT48
Double faston (4.8 x 0.8 mm)	ADF2	RT48
Screw	43IL ⁽¹⁾	RT43
For mounting on PCB		
	65	RT43

(1) Insert the clip before fastening the socket on the panel.
 For more details, see specifications of mounting accessories.

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 safe and secure 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.

Connection: **REAR**
Terminal type: **SPRING CLAMP**
Mounting: **PANEL**

Also suitable for



PRIR08x
PRIR16x
PRIR24x
PRIR32x
PRIR48x

OVERVIEW

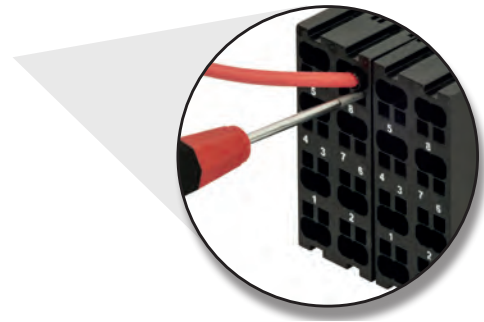
- Cable secured with spring clamp mechanism
- Insertion of lug with no need for tools
- Quick and easy wiring, saving more than half the time taken with conventional wiring
- Panel mounting
- Excellent contact pressure on relay terminals
- Sturdy construction, no internal soldering
- Compatible with cable up to 2.5mm², bare (flexible or rigid) and with lug; 2 inputs per terminal
- Provision for fitment of keying pins
- Provision for fitment of retaining clip
- Protection IP20



PRIR08x



PRIR16x



Detail of connections



PRIR24x

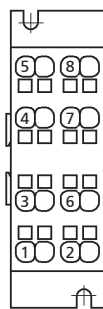
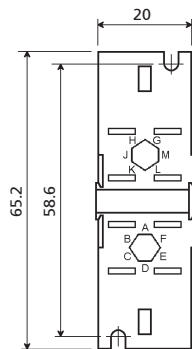


PRIR32x

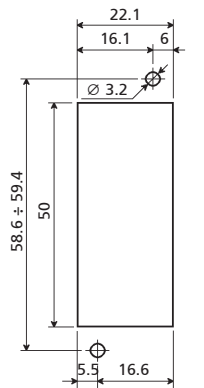


PRIR48x

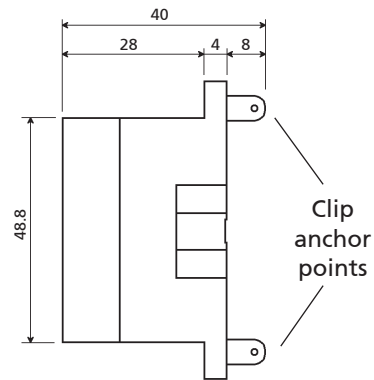
PRIR08x



PRIR080
Rear view

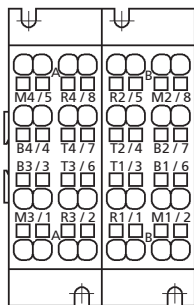
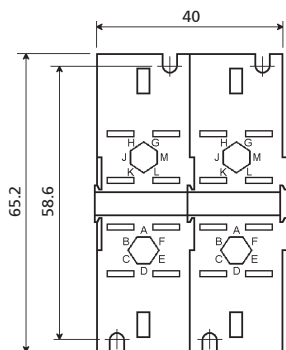


Drilling template

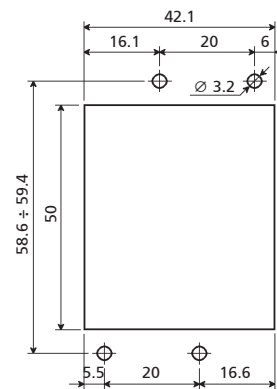


Side view

PRIR16x

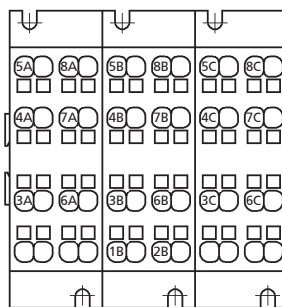
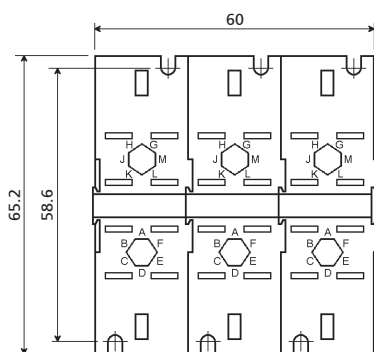


Rear view
PRIR160

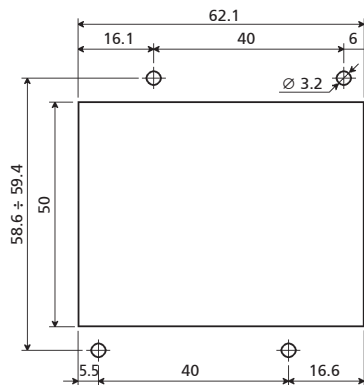


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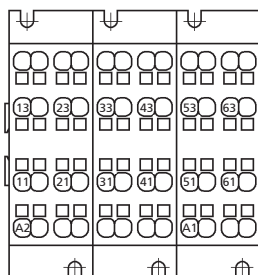
PRIR24x



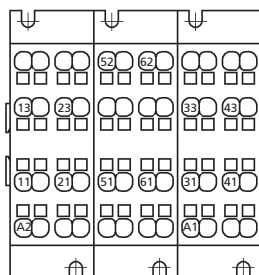
PRIR240
Model with "TRIPOK" numbering
Rear view



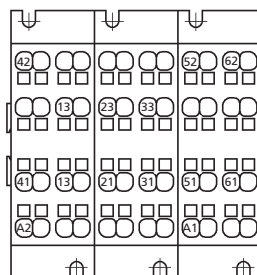
Drilling template



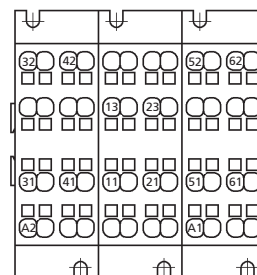
PRIR241
Model with
numbering for RVLV16/1



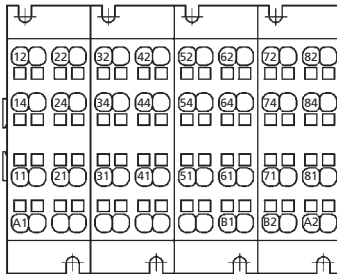
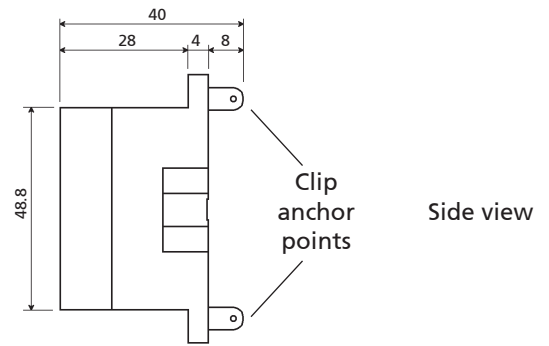
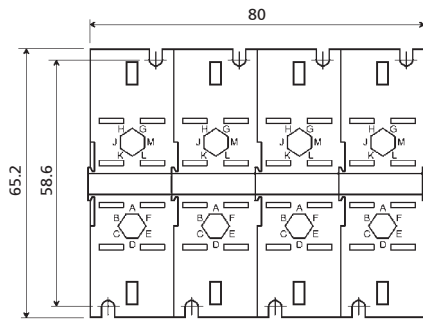
PRIR242
Model with
numbering for RVLV16/2



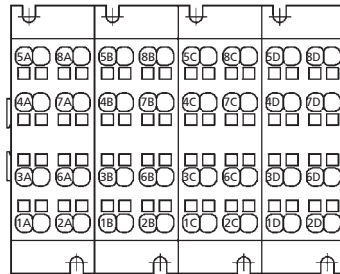
PRIR243
Model with
numbering for RVLV16/3



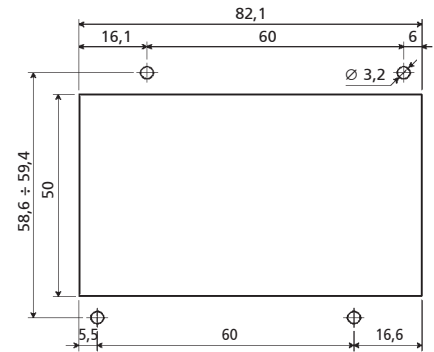
PRIR244
Model with
numbering for RVLV16/5



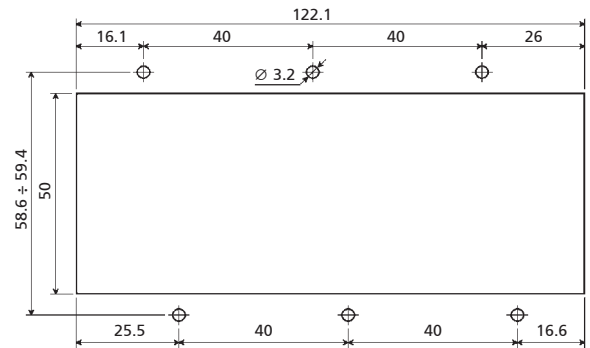
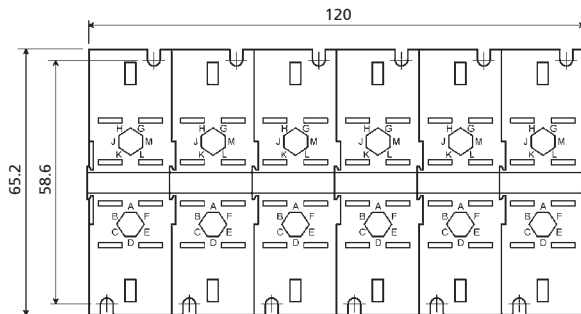
PRIR320 Rear view



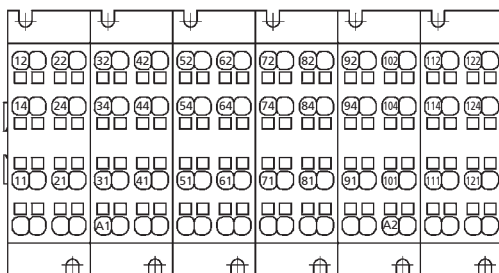
PRIR321 Rear view



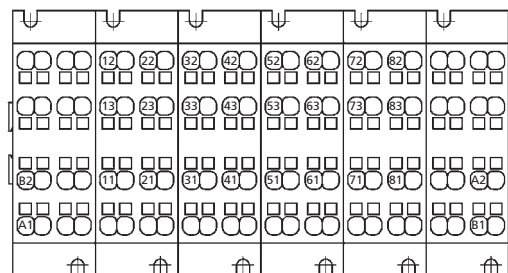
Drilling template



Drilling template



PRIR480 / Model with "ESAPOK" numbering



PRIR481 / Model with "BAS8NB" numbering

Specifications

Weight: 35 / 70 / 105 / 140 / 210 g

Operating temperature: -50°C...+70°C

Storage temperature: -50°C...+85°C

Panel mounting:

- Ø holes: 3,2mm

Degree of protection: IP20

Dielectric strength: 2.5kV 50Hz 1min

Fire resistance: EN60695-2-1, UL94 - V0, NF16-101, EN45545-2, UNI CEI11170 (LR4), NFPA130

Norme: EN 61810, EN61373

Terminal type: spring clamp

Inputs for each relay terminal: 2

Minimum section of cable: 2 x 1 mm²

Maximum section of cable: 2 x 2,5 mm²

Wire stripping length, mm: 10 mm ± 0,5 mm

Length of lug: 12 mm

Wiring with rigid cables or lug: pressure grip

Wiring with flexible cables, extraction of cables: using screwdriver type tool with slim shaft and slotted head measuring 2.5mm x 0.4mm, inserted perpendicularly to the socket.

FRANCE - Headquarter



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