



RELAYS

FAST-ACTING MONOSTABLE RELAYS WITH 6 CONTACTS

RV SERIES

USER SECTORS



Power generation



Nuclear



Power transmission



Rolling Stock



Fixed railway installations



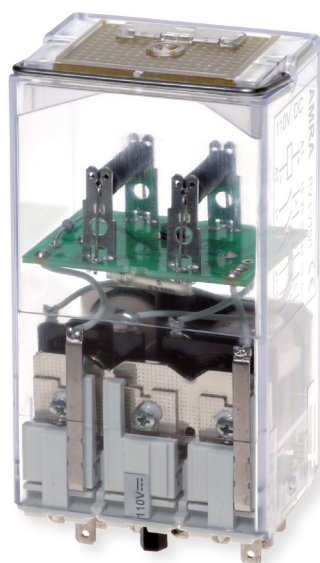
Shipbuilding



Shipbuilding



Heavy industry



RV

PRODUCT ADVANTAGES

- Plug-in monostable type fast-acting relay
- Ultra fast switching $\leq 6\text{ms}$, including bounces
- Solid and rugged construction
- Long life expectancy
- High electromagnetic interference immunity
- Separate arc breaking chambers
- Magnetic arc blow-out standard
- Independent and self-cleaning contacts
- Direct current operation
- Excellent shock and vibration resistance
- Wide range of sockets
- Retaining clip for secure locking of relay on socket
- Transparent cover, pull-out handle
- Positive mechanical keying for relay and socket

DESCRIPTION

The **RV series** is a range of 4 monostable relays able to guarantee **high speed switching**. These relays have 6 contacts rated 5 A, with different configurations including all normally open, or mixed (NO+NC). The relays are assembled with coils sized in such a way as to obtain magnetic flux of particularly high strength when powered up.

Accordingly, optimization of the ferromagnetic circuit enables **ultra fast switching of the contacts**. The relay is immune to strong electromagnetic interference, typical of high voltage electricity distribution stations.

The **self-cleaning contacts are independent**, being anchored neither one to another nor to a common operating mechanism. Positioned in separate chambers, they enable **better breaking of the arc**. In addition, they are equipped with magnetic arc blowout, guaranteeing a particularly efficient break of direct current loads. The common contact is mounted to a separate return device, consisting in a flexible blade designed to ensure uniformity of the pressures on break contacts.

Excellent electrical and mechanical performance levels allow the product to be used in the most demanding of sectors such as, for example, control and signalling functions in electricity generating stations, electrical transformer stations or heavy industry. The most common application is as a trip relay downstream of high voltage line protection systems.

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.

The performance and reliability of the component have secured its **approval with ENEL and other multi-utilities**.

Models	Number of NO contacts	Number of NC contacts
RV LV16/1	6	0
RV LV16/2	4	2
RV LV16/3	3	3
RV LV16/5	2	4

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

Coil specifications	
Nominal voltages Un	DC: 110-125
Max. consumption at Un (DC)	< 7W
Operating range	80...110% Un
Type of duty	Continuous
Drop-out voltage ⁽¹⁾	> 5% Un

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

Contact specifications	RV LV16/1	RV LV16/2	RV LV16/3	RV LV16/5
Nombre et type	6 NO	4 NO + 2 NC	3 NO + 3 NC	2 NO + 4 NC
Current	5 A			
Nominal ⁽¹⁾	10 A			
Maximum peak (1 min) ⁽²⁾	100 A			
Maximum pulse (10 ms) ⁽²⁾				
Example of electrical life expectancy 1,800 operations / h	opening 0.3A - 110Vdc - L/R = 40ms: 10 ⁵ operations closing 30A - 110Vdc - L/R = 0ms: 2,000 operations			
Minimum load	500 mW (20V, 20 mA)			
Standard contacts	100 mW (10V, 5 mA)			
Gold-plated contact ⁽³⁾				
Maximum breaking voltages	250 Vdc / 350 Vac			
Contact material	AgCu			
Operating time at Un (ms) ⁽⁴⁾				
Pick-up (NO contact closing / NC contact opening)	≤ 6			

(1) Nominal current: 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) Specifications of contacts on new relay

a) Plating material: gold-nickel alloy (>6μ)

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.

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

Insulation	
Insulation resistance (at 500Vdc)	
between electrically independent circuits and between these circuits and ground	> 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) - 2.2kV (1 s)
between open contact parts	1 kV (1 min) - 1.1kV (1 s)
between adjacent contacts	2,5 kV (1 min) - 3kV (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 ⁶ operations
Maximum switching rate	900 operations/hour
Degree of protection (with relay mounted)	IP40
Dimensions (mm)	45x60x109 ⁽¹⁾
Weight (g)	~ 300

(1) Excluding output terminals



Environmental specifications

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



Standards and reference values

EN 61810-1, EN 61810-2, EN 61810-7	Electromechanical elementary relays
EN 60695-2-10	Fire behavior
EN 61000	Electromagnetic compatibility
EN 60529	Degree of protection provided by enclosures

Unless otherwise specified, products are designed and manufactured according to the requirements of the European and International standards indicated above.
In accordance with EN 61810-1, all items of technical data are referred to ambient temperature 23 °C, atmospheric pressure 96kPa and 50% humidity.
Tolerance for coil resistance, nominal electrical input and nominal power is $\pm 7\%$.



Configurations - Options

P2	Tropicalization of the coil with epoxy resin for use with 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 acid atmospheres (typical of geothermal power stations) or saline atmospheres.
P4GEO	Gold plating of contacts with gold-nickel alloy, thickness $\geq 6\mu$. 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	P4GEO gold-plating of contacts + P2 coil tropicalization.



RV Ordering scheme

Product code	Number of contacts	Configuration A	Configuration B	Label	Type of power supply	Nominal voltage (V)	Keying position ⁽²⁾
RVLV16/1	6 NO	1: Standard	0: Standard	F	C: Vdc	110 - 125	XXX
RVLV16/2	4 NO + 2 NC		2: P2				
RVLV16/3	3 NO + 3 NC		4: P4 GEO				
RVLV16/5	2 NO + 4 NC		5: P5 GEO				

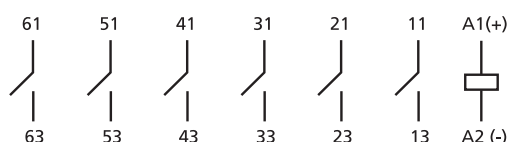
Example	RVLV16/1	1	2	F	C	110	
	RVLV16/112F-C110 : RV relay with 6 NO contacts, ENEL-approved according to LV16 specification, nominal voltage 110Vdc, P2 finish						
	RVLV16/5	1	0	F	C	110	
	RVLV16/510F-C110 : RV relay with 2 NO contacts + 4 NC contacts, ENEL-approved according to LV16 specification, nominal voltage 110Vdc						

(1) This product is available only in the ENEL type-approved version, according to LV15/LV16 specification. The designation "LV16/x" contained in the product code identifies the type-approved model.

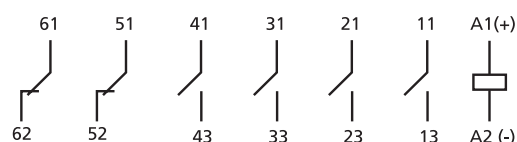
For a full list of ENEL compliant and type-approved products, refer to the dedicated catalog "STATIONS SERIES"

(2) Optional value. Mechanical keying is applied according to the manufacturer's coding.

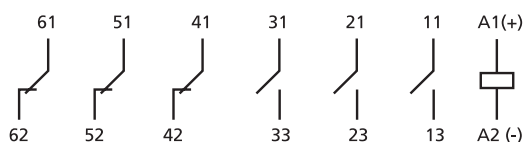
Wiring diagram



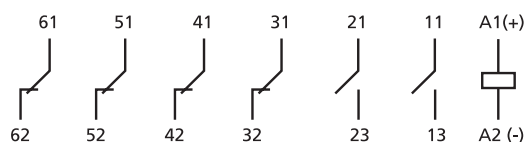
RV LV16/1



RV LV16/2

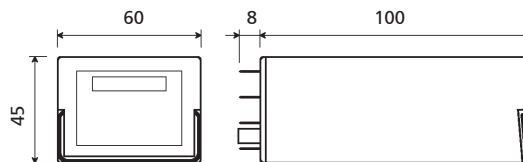


RV LV16/3



RV LV16/5

Dimensions



RV

Sockets and retaining clips	RV	
Number of terminals (standard dimensions 5x0.8mm)	14	Retaining clip
For wall or rail mounting		
Spring clamp, wall or DIN H35 rail mounting	PAIR240	RL48
Screw, wall or DIN H35 rail mounting	78BIP20-I DIN	RL48
Screw, wall mounting	78BL	RL48
Double faston, wall mounting	78L	RL48
For flush mounting		
Double faston (4.8 × 0.8 mm)	ADF3	RL48
Screw	73IL ⁽¹⁾	RL43

(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.