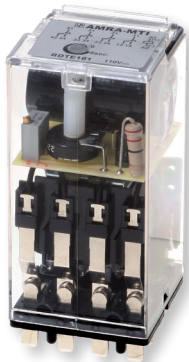


# Relay with time delay on drop-out, capacitor type

2.12

## RDTE15-16 · RGTO SERIES



RDTE161



RGTO233

### OVERVIEW

- Plug-in relay with time delay on drop-out
- Time settings up to 60s, no auxiliary power supply required
- Self-cleaning knurled contacts
- High performance, compact dimensions
- Solid and rugged construction for heavy or intensive duty
- Very high electrical life expectancy and exceptional endurance
- 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

### DESCRIPTION

Timer relays of the RDT.15 / RDT.16 and RGTO series are delay-on-drop-out devices using a capacitor wired in parallel with the coil. They require no auxiliary power supply during the timing step. The delay can be fixed (RDT.15), or adjustable (RDT.16, RGTO), from 0.1s to 60s. The delay capacitor is fitted internally on all versions.

The construction of the relays and their simplified mechanical design combine to ensure these products offer high reliability in operation, as proven by their use for over 40 years in electrical energy transport and distribution systems, and fixed equipment used in the railway sector.

The contacts used for relays of the RDT.15 and RDT.16 series are of a type able to give good levels of performance both with high and strongly inductive d.c. loads, and with particularly low loads such as interface signals. 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.

Typical sectors of use are among the most demanding, such as, for example, electricity generating stations, electrical transformer stations, fixed equipment for railways, or industries using continuous production processes (chemical and petrochemical, rolling mills, cement factories, etc.).

Like all AMRA relays, models of the RDT.15-16 and RGTO series are assembled as part of a controlled manufacturing process in which every step of production is verified by the next step in succession. In effect, each relay is calibrated and tested individually, by hand, in such a way as to guarantee top reliability.

Models	Number of timed contacts	Nominal current	Time delay	Time settings range
RDT.15x	4	10A	On drop-out, fixed	0.1...1s
RDT.161	4	10A	On drop-out, adjustable	0.1...6s
RGTO23x	1	10A	On drop-out, adjustable	3...60s

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

Coil data	RDT.15x	RDT.161	RGTO23x
Nominal voltages Un <sup>(1)</sup>	DC: 24-48-110-125-220	DC: 48-110-125-220	AC: 24-48-110-125-220
Consumption at Un (DC/AC)	3.5W		1.5W
Operating range	DC: 80...120% Un AC: 85...110% Un		
Type of duty	Continuous		
Drop-out voltage <sup>(2)</sup>	DC: > 5% Un AC: > 15% Un		

(1) Other values on request.

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

Contact data	RDT.15x, RDT.161	RGTO23x
Number and type	4 SPDT, form C	2 SPDT, form C
Current	10A	10A
Nominal <sup>(1)</sup>	13A for 1min - 20A for 1s	-
Maximum peak <sup>(2)</sup>	100A for 10ms	-
Maximum pulse <sup>(2)</sup>		
Example of electrical life expectancy <sup>(3)</sup>	0.2A - 110Vdc - L/R 40ms - 10 <sup>5</sup> operations - 1,800 operations/hour	0.2A - 110Vdc - L/R 40ms - 10 <sup>5</sup> operations - 1,200 operations/hour
Minimum load	200mW (10V, 10mA)	
Maximum breaking voltage	250 Vdc / 300 Vac	

(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.

Insulation	RDT.15x - RDT.161	RGTO23x
Insulation resistance (at 500Vdc) between electrically independent circuits and between these circuits and ground between open contact parts	> 10,000 MΩ > 10,000 MΩ	> 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)	2 kV (1 min.) - 2.2kV (1 s) 1 kV (1 min.) - 1.1kV (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 2.5 kV	2.5 kV 2 kV

Mechanical specifications	RDT.15x	RDT.161	RGTO23x
Mechanical life expectancy	20x10 <sup>6</sup> operations		
Maximum switching rate Mechanical	3600 operations/hour		
Degree of protection	IP40		
Dimensions (mm)	40x40x75 <sup>(1)</sup>	40x40x82 <sup>(1)</sup>	50x45x112 <sup>(1)</sup>
Weight (g)	130	130	260

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 61000  
 EN 60529

Electromechanical elementary relays  
 Fire behaviour  
 Electromagnetic compatibility  
 Degree of protection provided by enclosures

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

## Configurations - Options

TROPICALIZATION Surface treatment of the coil with protective coating for use with RH 95%.

## Ordering scheme

Product code	Application <sup>(1)</sup>	Configuration A	Configuration B	Type of power supply	Type of input supply (V) <sup>(2)</sup>	Finish <sup>(3)</sup>	Keying position code <sup>(4)</sup>
RDT	E: Energy	15: fixed duration	1: Fixed duration 0.1s	C: Vdc	024 - 048 - 110 125 - 220	T: Tropicalized coil	xx
	F: Railway Fixed Equipment		2: Fixed duration 0.2s				
		16: adjustable duration	3: Fixed duration 0.5s	A: Vac 50 Hz	048 - 110 125 - 220		
			4: Fixed duration 1s	H: Vac 60 Hz			
RGTO	-	23: adjustable duration	3: Adjustable from 3 to 10s		024 - 048 - 110 125 - 220		
			4: Adjustable from 10 to 30s				
			5: Adjustable from 20 to 60s				

Example	RDT	E	16	1	C	110	T	
	RDTE161-C110/T = ENERGY series relay, with 4 SPDT contacts, time delay on drop-out adjustable from 0.1 to 6s, and 110Vdc tropicalized coil.							
	RGTO		23	3	C	024		
	RGTO233-C024 = Relay with 2 contacts: 1 SPDT instantaneous, 1 SPDT time delay on drop-out adjustable from 3 to 10 seconds, and 24Vdc coil.							

(1) ENERGY: all applications except for railway.

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

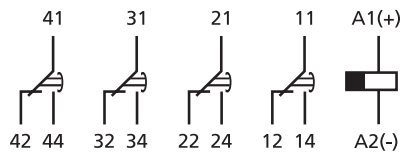
Also available is the STATIONS series, with ENEL approved material meeting LV15/LV16 specifications. For list of ENEL compliant and type-approved products, consult dedicated catalogue "STATIONS SERIES – LV15-LV16-LV20".

(2) Other values on request.

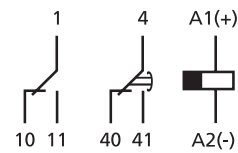
(3) Optional value.

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

## Wiring diagram



RDT.15x, RDT.161

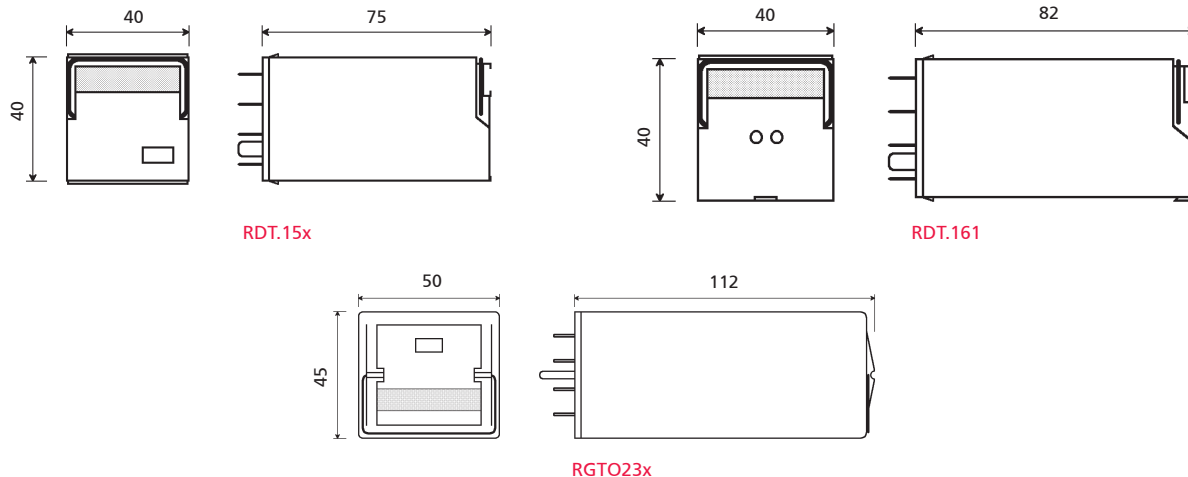


RGTO23x

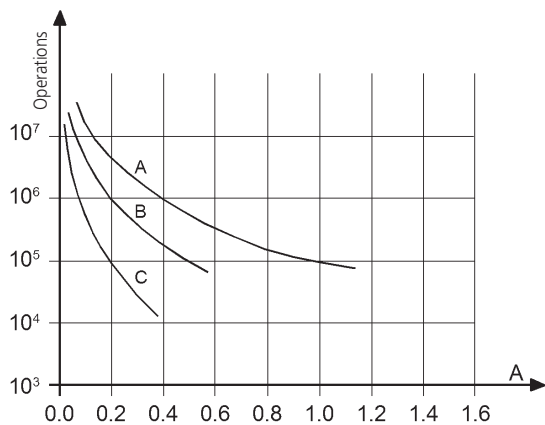
Time delay – Switching time setting	RDT.15x	RDT.161	RGTO23x		
Time setting	Fixed duration	By way of potentiometer, with slotted head screw	By way of potentiometer		
Full scale times available	0.1s - 0.2s - 0.5s - 1s	6s	10s	30s	60s
Time setting range	-	0.1 - 6s <sup>(1)</sup>	3...10s	10...30s	30...60s
Operating accuracy (0.8...1.1 Un, t=20°C)	$\pm 10\%$ at high end of scale				
Accuracy, repeatability	$\pm 2\%$				
Reset	<200ms				

(1) The setting controls are accessible by opening the flap on the cover of the relay.

## Dimensions



## Electrical life expectancy



Contact loading: 110Vdc, L/R 40 ms  
(Except RGTO)

RDT_15x, RDT_161			
U	I (A)	L/R (ms)	Operations
110Vdc	0.2	40	1,000,000
110Vdc	0.5	40	150,000
110Vdc	1	10	100,000 (*)
220Vdc	0.2	10	100,000
U	I (A)	cosφ	Operations
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
220Vac	0.5	1	2,000,000
220Vac	5	1	500,000

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

Sockets and retaining clips		RDTE15x, RDTE161			RGTO23x	
Type of installation	Type of outputs	Socket	Clip for RDTE15x	Clip for RDTE161	Socket	Clip
Wall or DIN H35 rail mounting	Screw	PAVD161	VM1822	VM1823	PAVG161	VM1222
Flush mounting	Double faston (4.8 x 0.8 mm)	-	-	-	PRDG161	VM1222
	Screw	PRVD161	-	-	PRVG161	VM1222
PCB-mount	Solder	PRCD161	-	-	-	-

## 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 conditions during operation, and on the relay duty cycle. 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.