

# Current-monitoring relay

## 4 contacts

2.13

## TD SERIES



TD2003

### OVERVIEW

- Plug-in instantaneous monostable relay, current-monitoring
- High performance, compact dimensions
- Self-cleaning knurled contacts
- Relay coupled automatically to socket, with no need for a retaining clip
- Wide variety of configurations and customizations
- Transparent cover, pull-out handle
- Label holder in cover for customer's use
- Positive mechanical keying for relay and socket

### APPLICATIONS



Shipbuilding



Petroleum industry



Heavy industry



Power generation



Power distribution



Railway equipment




### DESCRIPTION

The TD series comprises current-monitoring relays having 4 change-over contacts, which are derived from the RDME series and offer the same mechanical specifications and benefits. These relays can be wired in series with a circuit and used to detect the status of a load when under power. One specific application for this series of relays is the control of obstruction warning lights (obstructions on land, in the air, in the sea, navigation lights) where high levels of reliability and efficiency are indispensable factors in ensuring safety. These components are suitable both for general current monitoring purposes, and for specific types of warning light signals having different electrical specifications and response characteristics, such as filament, strobe and halogen lamps (courtesy of certain design stratagems and adjustment features).

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 are of a type designed to give good levels of performance both with high and strongly inductive 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.

Like all AMRA relays, models of the TD 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	Type of lamp		
	Filament	Strobe	Halogen
			
TD2001		•	
TD2002	• $\geq 1A$		
TD2003	• $< 1A$		
TD2004			•



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

Coil data	
Input current	According to type of lamp (from 40mA to 5A) <sup>(1)</sup>
Consumption at Un (DC/AC)	1 W
Operating range	80...110% Un
Type of duty	Continuous

(1) It may be necessary to provide us with a sample of the lamp to be monitored, in order to ensure correct sizing of the relay.

Contact data	
Number and type	4 SPDT, form C
Current	10A 13A for 1min - 20A for 1s 100A for 10ms
Example of electrical life expectancy <sup>(3)</sup>	0.2A - 110Vdc - L/R 40ms - 10 <sup>5</sup> operations - 1,800 operations/hour
Minimum load	200mW (10V, 10mA)
Maximum breaking voltage	250 Vdc / 300 Vac
Contact material	AgCdO (moving contacts) - AgNi (fixed contacts)

(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 500Vdc) between electrically independent circuits and between these circuits and ground	> 10,000 M $\Omega$
between open contact parts	> 10,000 M $\Omega$
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 (1.2/50 $\mu$ s - 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	20x10 <sup>5</sup> operations
Maximum switching rate	3600 operations/hour
Degree of protection	IP40
Dimensions (mm)	40x40x75 <sup>(1)</sup>
Weight (g)	130

(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	Electromechanical elementary relays
EN 60695-2-10	Fire behaviour
EN 50082-2	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 ±7%.

## Configurations - Options

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

Product code	Application <sup>(1)</sup>	Type of power supply	Nominal voltage (A) <sup>(1)</sup>	Finish <sup>(2)</sup>	Keying position code <sup>(3)</sup>
TD200	1: Strobe lamps 2: Filament lamps (I ≥ 1A) 3: Filament lamps (I < 1A) 4: Halogen lamps	U: I dc/ac	0.04 - 5.0 <sup>(4)</sup>	T: Tropicalized coil	xx

Example	TD200	1	U	070	
	Example: TD2001-U070/T = ENERGY series relay with 4 standard SPDT contacts, 70mA coil				

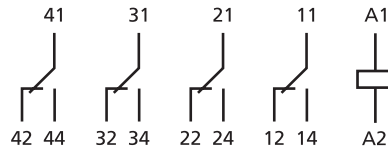
- (1) Value depending on the lamp (model, power, input voltage, etc.).  
 (2) Optional value.  
 (3) Optional value. Positive mechanical keying is defined according to the manufacturer's model.  
 (4) For currents < 1A the power input to the coil is expressed in mA (e.g. 40mA = U040).  
 For currents ≥ 1A the power input to the coil is expressed in A (e.g. 2A = U2.0 - 1.7A = U1.7).

## Available values (others on request)

Relay type	Circuit power input	Filament								Halogen	Strobe
		15	25	40	50	60	65	100	300	W	J
	U									50	2
		Relay power input (symbol)									
TD2001	12-24	-	-	-	-	-	-	-	-	-	U450
	110	-	-	-	-	-	-	-	-	-	U070
	230	-	-	-	-	-	-	-	-	-	U040
TD2002	24	-		U1.6		U2.5		U4.1	-	-	-
	220	-	-	-	-	-	-	-	U1.4	-	-
TD2003	110			U360	U450	U540		U900	-	-	-
	220	U070	U110	U180	U225	U270	U300	U450	-	-	-
TD2004	24	-	-	-	-	-	-	-	-	U2.1	-

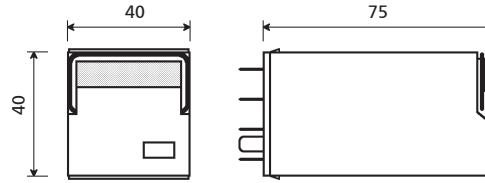
Note: contact us for other values.

## Schema elettrico



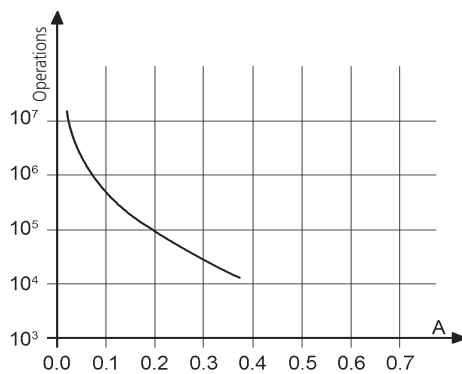
TD200x

## Dimensions



TD200x

## Electrical life expectancy



Contact loading: 110Vdc, L/R 40 ms

U	I (A)	L/R (ms)	Operations
110Vdc	0.2	40	500,000
220Vdc	0.2	10	80,000
U	I (A)	cosφ	Operations
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

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

## Sockets and retaining clips

Type of installation	Type of outputs	Model	Retaining clip
Wall or DIN H35 rail mounting	Screw	PAVD161	VM1822
Flush mounting	Screw	PRVD161	-
PCB-mount		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 application conditions 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.