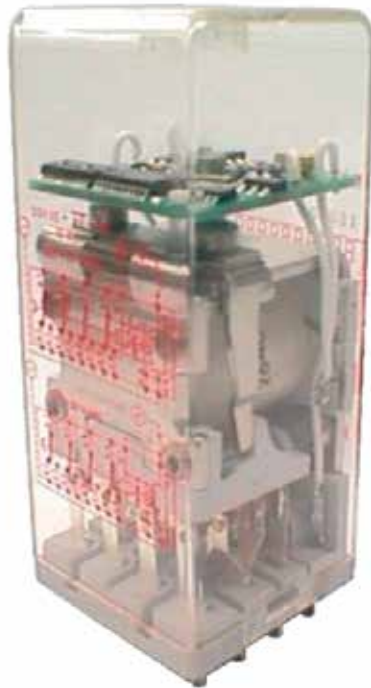


# TBAR 400 relay - Delay-on drop-out, 4 C/O

## Datasheet



### Description

The TBAR 400 is a delay-on drop-out relay with 4 double make / double break C/O contacts (form Z). The time delay is less than 10 s and fixed.

The plug-in design offers secure locking feature for maximum ease of maintenance (no wires need to be disconnected or other hardware removed for relay inspection or replacement). The resistance to impact and vibration is conform to standards in force for Railway Transported Equipment.

Positive mechanical keying of relay to socket is built into relay and socket during manufacture and terminal identifications are clearly marked on identification plate that is permanently attached to the relay.

The TBAR 400 relay is pluggable in the following sockets: EA 102 B, EA 102 BF, EA 103 BF, EA 104 B, EA 104 BF, EA 105 BF, EA 112 BF.

### Application

The TBAR 400 timing relay is designed for heavy duty applications with a programmable timing function used for example in HVAC and lighting.

#### Features

- Delay-on drop-out relay
- Fixed time delay < 10 s (set in factory)
- Plug-in design with secure locking feature for maximum ease of maintenance
- 4 double make / double break C/O contacts (form Z), 8 A
- Contact life (mechanical) of 100 million cycles
- -40 °C...+85 °C operating temperature

#### Benefits

- Proven reliable in heavy duty application
- Long life cycle
- Accurate timing selection finger safe
- Easy to maintain and replace
- Low life cycle cost
- No maintenance

#### Railway compliancy

- NF F 62-002 Rolling stock - Instantaneous relays contacts and sockets
- NF F 16-101/102 Fire behaviour - Railway rolling stock
- EN 50155 Railway application - Electronic equipment used on rolling stock
- IEC 61373 Railway application - shock and vibration tests

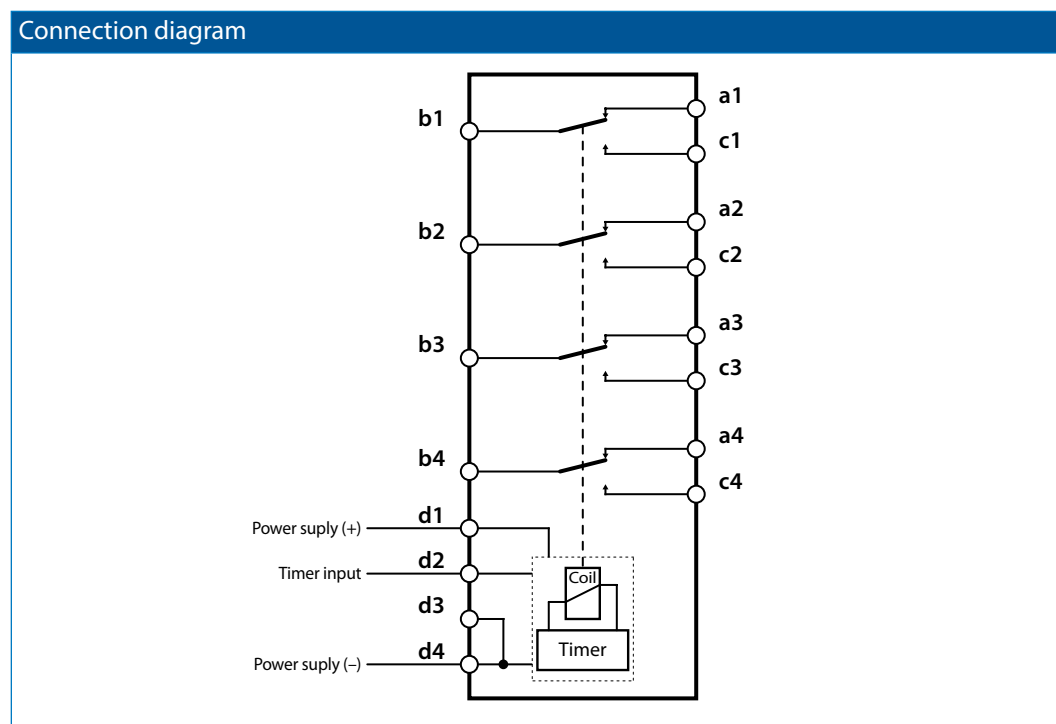
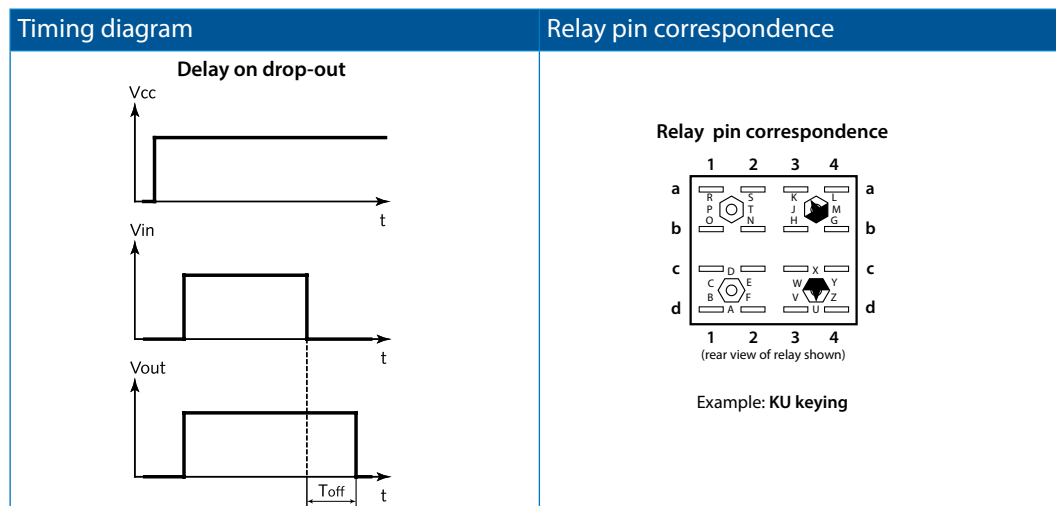


# TBAR 400 relay

## Technical specifications



### Functional and connection diagrams



# TBAR 400 relay

## Technical specifications

### Timing characteristics

Time function	Delay-on drop-out (with power supply)
Total time delay range	< 10 s
Time delay adjustment	Fixed (set in factory)
Adjustment / repeatability accuract	10 % / 2 %

### Coil data

Keying	Unom (VDC)	Uoperating (VDC)	Pnom (W)	R coil ( $\Omega$ ) <sup>(1)</sup>	L/R (ms) <sup>(2)</sup>
GU	24	16 / 33	3	185	30
HU	36	25 / 45	3	475	30
JU	48	33 / 60	3	750	30
KU	72	48 / 90	3	1700	30
MU	96	65 / 120	3	3000	30
LU	110	75 / 138	3	4000	30

(1) Coil resistance tol.:  $\pm 8\%$  at 20 °C

(2) Valid for closed relay.

### Contact data

Nominal current	8 A resistive		
Nominal breaking capacity and life	1 A at 72 VDC	L/R : 0 ms	Electrical life: $5 \times 10^6$ op.
	350 mA at 72 VDC	L/R: 30 ms	Electrical life: $2.5 \times 10^6$ op.
	1 A at 220 VAC 50 Hz	cos $\phi$ =1	Electrical life: $2.5 \times 10^6$ op.
	Lamp filament circuit: 120 W at 72 VDC		Electrical life: $5 \times 10^5$ op.
Contact overload withstand	At 24 VDC: 100 A at L/R = 0 for 10 ms (10 operations at the rate of 1 operation per minute)		
Contact closure time	Pick-up time N/O < 40 ms	Drop-out* time N/C < 15 ms	
Contact opening time	Pick-up time N/C < 35 ms	Drop-out* time N/O < 6 ms	
Minimum contact continuity	20 mA at 24 VDC		
Number of contacts	4 double make / double break contacts (form Z)		
Contact material	Hard silver overlay laminated to copper		
Contact resistance	initial	10 m $\Omega$ max at 5 A	
	end of life	40 m $\Omega$ max at 5 A	

\* Option P = less than 70 ms



# TBAR 400 relay

## Technical specifications

### Electrical characteristics

Dielectric strength	2000 VAC, 1 min between contacts 2600 VAC, 1 min between contacts, coil and frame
Insulation resistance	≥ 1000 MΩ at 500 VDC

### Mechanical & environmental characteristics

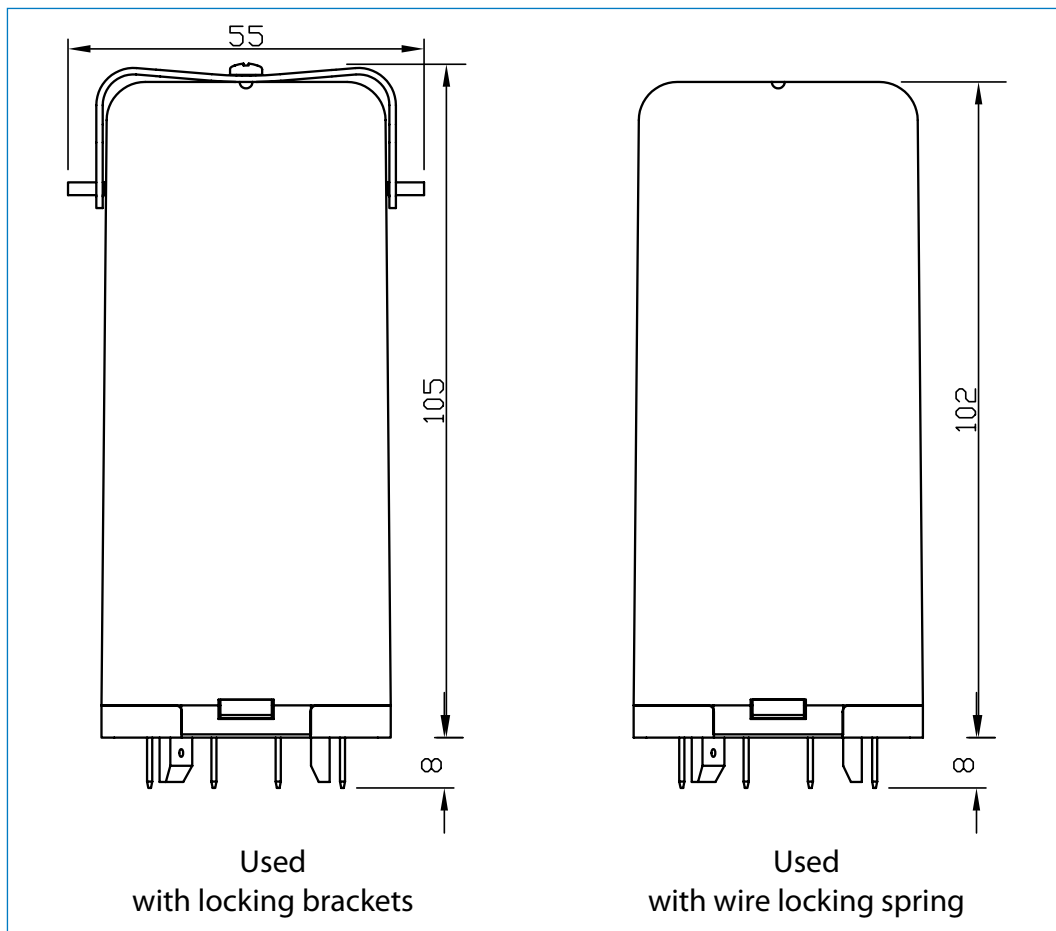
Vibration	NF F 62-002 The tests are conducted in the X, Y, Z planes at frequency between 10 & 150 cycles (sinusoidal) at 2 g
Shock	NF F 62-002 Tests are applied in both directions in the X, Y & Z planes. Then successive shocks are administered consisting of the positive component of sinusoidal with a value of 30 g, 11 ms Other vibration and shock tests can be performed on request
Mechanical life	> 100 x 10 <sup>6</sup> operations
Weight	300 g (10.6 ounces)
Temperature	-40 °C...+85 °C
Humidity	93% RH, 40° C for 4 days
Salt mist	5% NaCl, 35° C for 4 days
Protection	IP40 (relay on socket)
Fire & smoke	Materials: Polycarbonate (cover) / polyester melamine (base) Note: These materials have been tested for fire propagation and smoke emission according standards NF F 16-101, NF F 16-102.



# TBAR 400 relay

## Technical specifications

### Dimensions (mm)



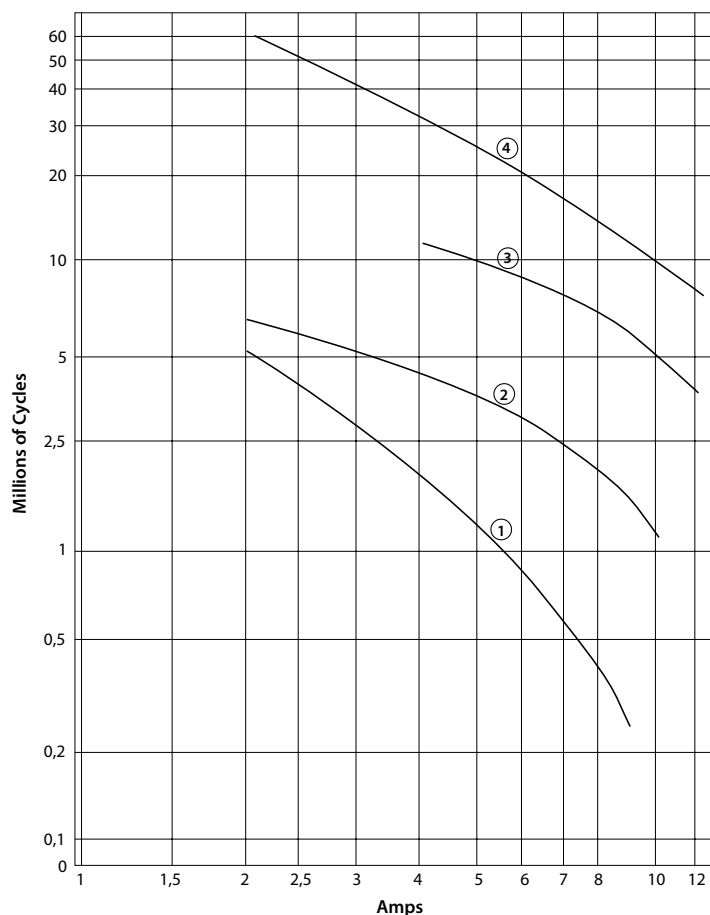
# TBAR 400 relay

## Technical specifications

### Dynamic relay selection curve No 1

AC Current breaking capacity versus life expectancy in millions of cycles.  
Rate of contacts opening and closing = 1200 operations per hour.  
Curves shown for resistive load (Power Factor = 1).

Curve	1	2	3	4
VAC	220	125	48	24



# TBAR 400 relay

## Technical specifications

### Dynamic relay selection curve No 2

DC Current breaking capacity versus life expectancy in millions of cycles.

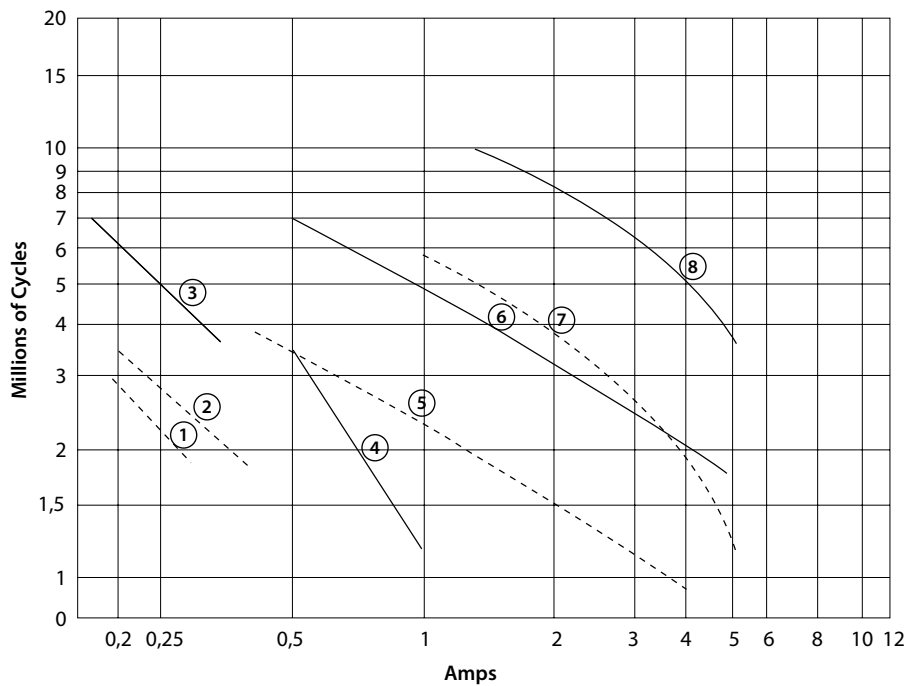
Rate of contacts opening and closing = 1200 operations per hour.

Curves shown for inductive load:

- L/R= 20 ms continuous current
- - - L/R= 40 ms continuous current

\* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curves	1-3	2-4	5-6	7-8
VDC	220	125	48	24



# TBAR 400 relay

## Technical specifications

### Dynamic relay selection curve No 3

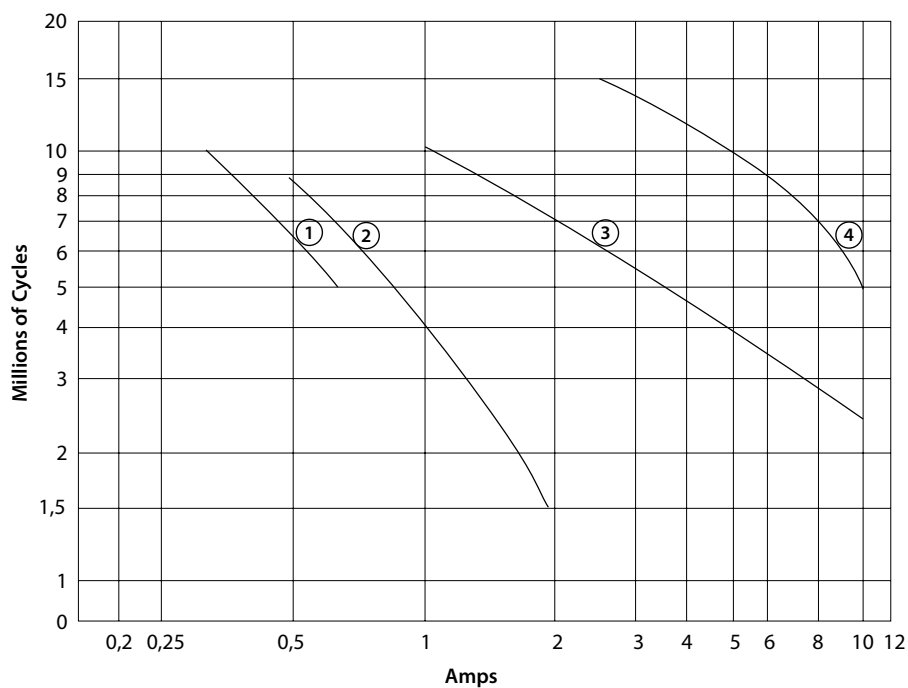
DC Current breaking capacity versus life expectancy in millions of cycles.

Rate of contacts opening and closing = 1200 operations per hour.

Curves shown for resistive load (L/R = 0). Continuous current.

\* By connecting 2 contacts in series, DC current breaking capacity increases by 50 %

Curve	1	2	3	4
VDC	220	125	48	24





# TBAR 400 relay

## Technical specifications

### Dynamic relay selection curve No 4

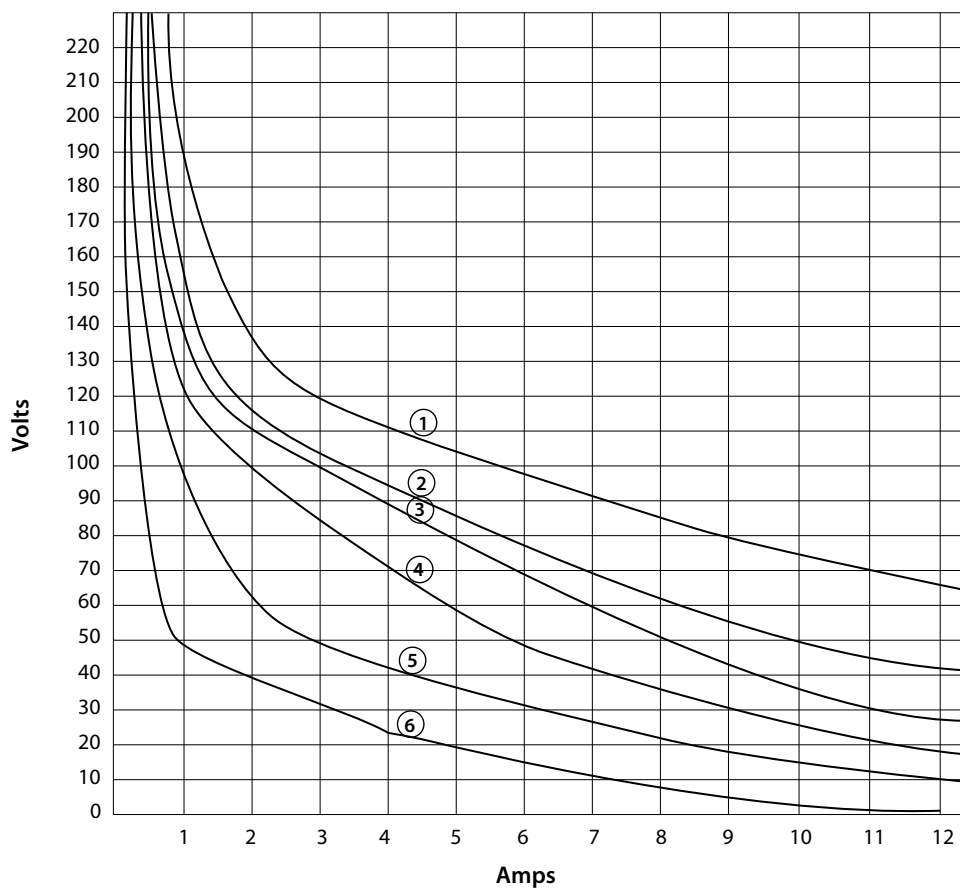
**Maximum contact breaking capacity versus voltage for a given L/R.**

Rate of contacts opening and closing = 600 operations per hour.

Curves shown for resistive load (L/R=0) and inductive loads. Continuous current.

Life expectancy: 2 Millions of Cycles

Curve	1	2	3	4	5	6
L/R=	0ms	15ms	20ms	40ms	60ms	100ms



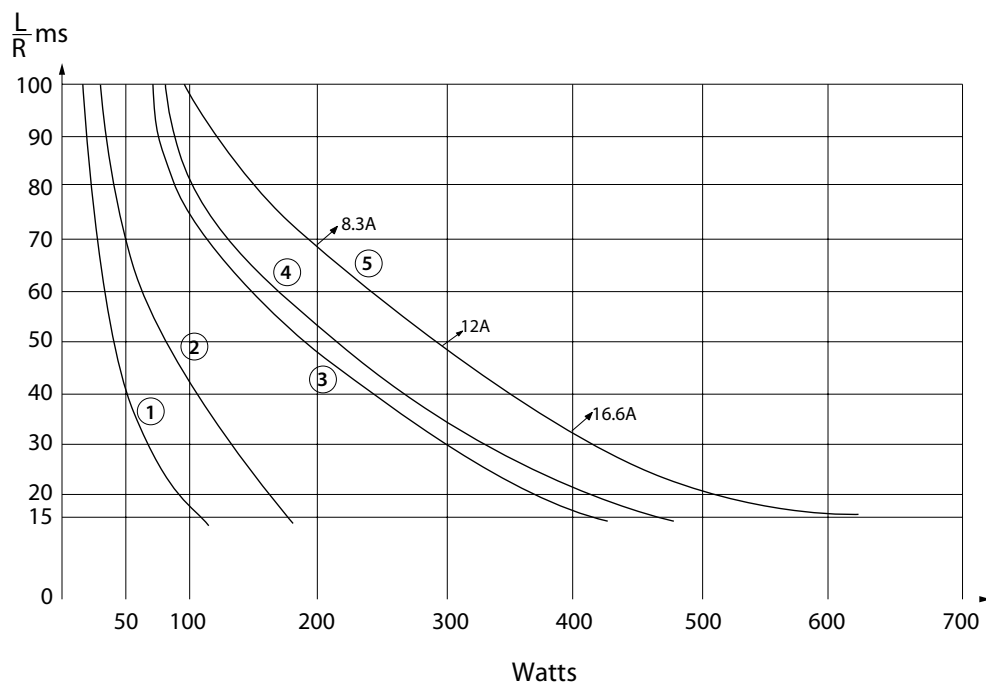
# TBAR 400 relay

## Technical specifications

### Dynamic relay selection curve No 5

Maximum power interruption versus load time constant (L/R) for a given voltage.  
Curves shown for resistive loads.  $I = P/V$ .

Curve	1	2	3	4	5
VDC	220	125	72	48	24



# TBAR 400 relay

## Technical specifications

### Dynamic relay selection curve No 6

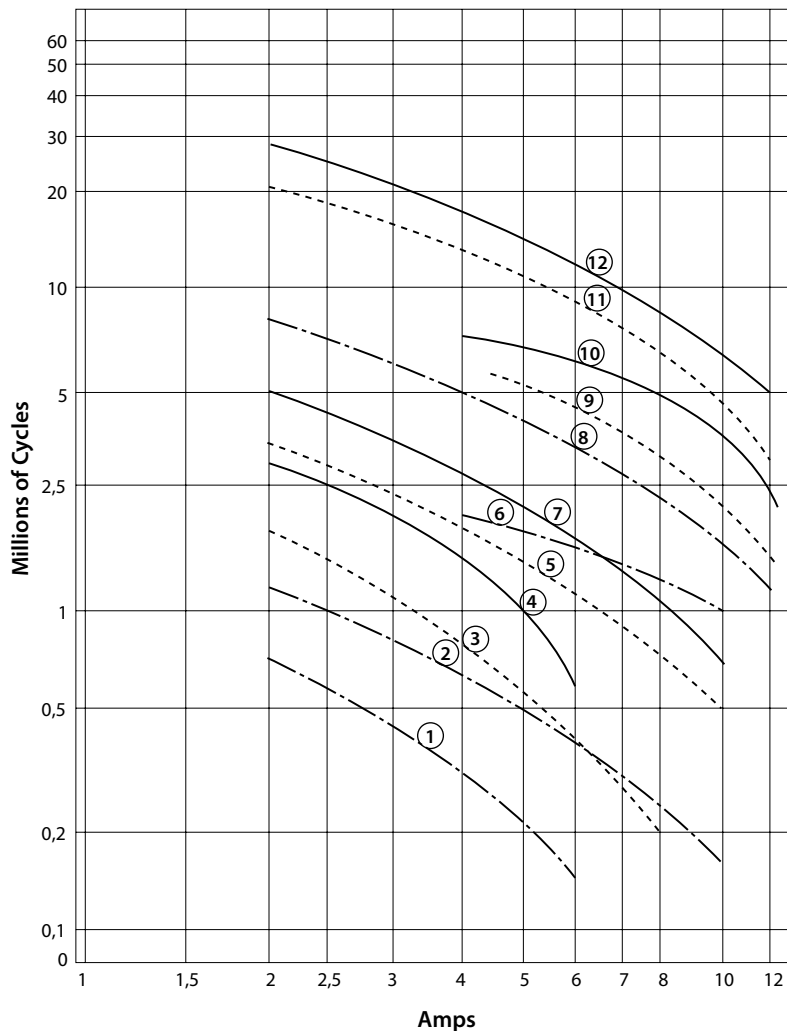
AC Current breaking capacity versus life expectancy in millions of cycles.

Rate of contacts opening and closing = 1200 operations per hour.

Values shown for inductive loads -

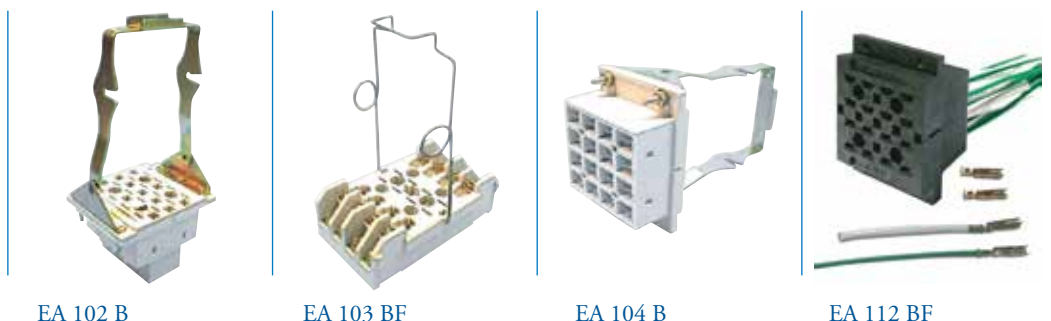
- Cos  $\phi$  = 0.7
- Cos  $\phi$  = 0.5
- - - - - Cos  $\phi$  = 0.3

Curves	1,3 &4	2,5 &7	6,9 &10	8,11 &12
VAC	220	125	48	24



# TBAR 400 relay

## Mounting possibilities / sockets



### Panel/flush mounting

EA 102 B	Locking bracket (905843), rear connection, double Faston 5 mm
EA 102 BF	Wire locking spring (926853), rear connection, single Faston 5 mm
EA 104 B	Locking bracket (905843), rear connection, single Faston 5 x 0.8 mm
EA 104 BF	Wire locking spring (926853), rear connection, single Faston 5 x 0.8 mm
EA 112 BF	Wire locking spring (926853), rear connection, crimp contact

### Surface/wall mounting

EA 103 BF*	Wire locking spring (926853), front connection, M3 screw 6.5 mm ring terminals (2,5 mm <sup>2</sup> )
EA 105 BF*	Wire locking spring (926853), front connection, single Faston 5 mm





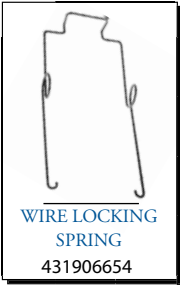


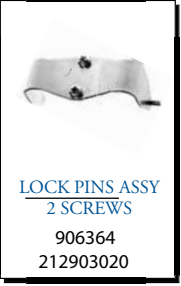
\* Mounting possibility on 35 mm rail EN 50022 by adding suffix D to the part number (see socket datasheet)

Note: Keying of relay to socket can be specified by adding the keying letters in the part number. See all details in the related socket datasheet.

# TBAR 400 relay

## Spare parts

### Spare parts - order part numbers

(1)  LOCKING BRACKET 905846	(1)  SCREW FOR BRACKET C927210	(1)  METAL STRAP (2) P928060	(1)  METAL STRAP (4) P928061
(1)  WIRE LOCKING SPRING 431906654	(1)  ROUND PLASTIC PLUGS 414928005	(2)  HEX. PLASTIC KEYS 414905678	(3)  LOCK PINS ASSY 2 SCREWS 906364 212903020

(1) Parts only for socket  
 (2) Parts for relay and socket  
 (3) Parts only for relay



# TBAR 400 relay

## Instructions

### Installation

Install socket and connect wiring correctly according identification to terminals. Plug relay into socket. Reverse installation into socket not possible due to mechanical blocking by snap-lock.

Don't reverse polarity of coil connection. Relays can be mounted (tightly) next to each other and in any attitude.

**Warning!** Never use silicon near by relays

### Operation

Before operating always apply voltage to coil to check correct operation.

Long term storage may corrode the silver on the relay pins. Just by plugging the relay into the socket, the female bifurcated receivers will automatically clean the corrosion on the pins and guarantee a good connection.

Do not use the relay in places with flammable gas as the arc generated from switching could ignite gasses.

### Maintenance

Correct operation of relay can easily be checked as transparent cover gives good visibility on the moving contacts. When the relay doesn't seem to operate correct, please check presence of coil voltage. Use a multimeter. If LED is used, coil presence should be indicated. If coil voltage is present, but the relay doesn't work, a short circuit of suppression diode is possible (The coil connection was reversed). If relay doesn't work after inspection, please replace relay unit by a similar model. Send defective relay back to manufacturer. Normal wear and tear excluded.



# TBAR 400 relay

## Ordering scheme

Configuration:



This example represents a **TBAR 400 72 KU F 3 1**.

**Description:** TBAA 400 relay,  $U_{nom}$ : 72 VDC, keying KU, relay cover for wire locking spring, time delay 3 s test report in English

### 1. Relay model

**TBAR 400**

### 2 & 3. Nominal voltage and keying

<b>24 GU</b>	24 VDC
<b>36 HU</b>	36 VDC
<b>48 JU</b>	48 VDC
<b>72 KU</b>	72 VDC
<b>96 MU</b>	96 VDC
<b>110 LU</b>	110 VDC

### 4. Relay cover type

–	Relay cover with lock pins
<b>F</b>	Relay cover for wire locking spring

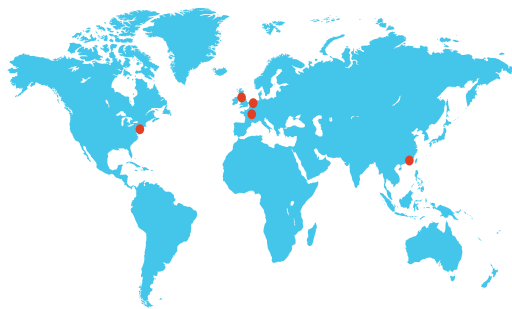
### 5. Time delay

*	In seconds (< 10 s)
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### 6. Language on test report

–	French
<b>1</b>	English
<b>2</b>	Spanish





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