



# SLOVENSKI STANDARD

## SIST EN 2349-304:2009

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Aerospace series - Requirements and test procedures for relays and contactors - Part  
304: Operate and release time

Luft- und Raumfahrt - Anforderungen und Prüfverfahren für Relais und Schaltschütze -  
Teil 304: Ansprechzeit und Rückfallzeit

Série aérospatiale - Exigences et méthodes d'essais des relais et contacteurs - Partie  
304 : Temps d'enclenchement et de déclenchement

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Ta slovenski standard je istoveten z: EN 2349-304:2006

### ICS:

49.060 Š^æ\ æß Å^•[ |b\ æ Aerospace electric  
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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**EN 2349-304**

October 2006

ICS 49.060

English Version

**Aerospace series - Requirements and test procedures for relays  
and contactors - Part 304: Operate and release time**

Série aérospatiale - Exigences et méthodes d'essais des  
relais et contacteurs - Partie 304 : Temps d'enclenchement  
et de déclenchement

Luft- und Raumfahrt - Anforderungen und Prüfverfahren für  
Relais und Schaltschütze - Teil 304: Ansprechzeit und  
Rückfallzeit

This European Standard was approved by CEN on 10 May 2006.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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COMITÉ EUROPÉEN DE NORMALISATION  
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## Foreword

This document (EN 2349-304:2006) has been prepared by the AeroSpace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 2007, and conflicting national standards shall be withdrawn at the latest by April 2007.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

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## EN 2349-304:2006 (E)

## 1 Scope

This standard specifies a method for testing the operating (actuating) and releasing time of relays and contactors. It shall be used together with EN 2349-100.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2349-100, *Aerospace series — Requirements and test procedures for relays and contactors — Part 100: General requirements* <sup>1)</sup>

ISO 2678, *Environmental tests for aircraft equipment — Insulation resistance and high voltage tests for electrical equipment*

## 3 Operate time

### 3.1 Test procedures

The operate time shall be measured from the application of the rated voltage to the coil until the last normally-open contact has closed, see Figure 2.

The operate time shall be evaluated without bounce time.

The contact load shall be between 5 mA and 100 mA. The open contact voltage shall be 6 V d.c. max. for relays or contactors of up to and including 25 A rating, and 28 V d.c. for relays or contactors above 25 A rating.

For qualification tests, five measurements shall be taken and recorded.

Figure 1 shows a typical test circuit.

### 3.2 Test criteria

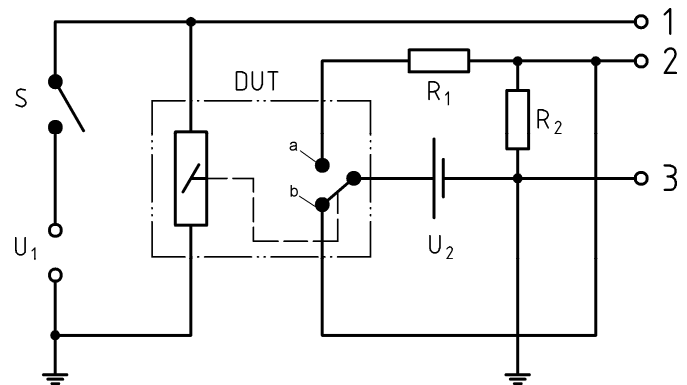
The relay or contactor shall operate within the time specified in the product standard.

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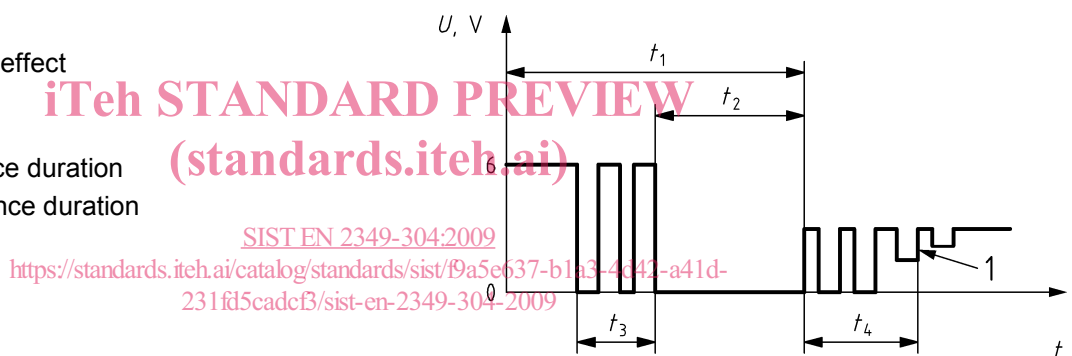
<sup>1)</sup> In preparation at the date of publication of this standard.

**Key**

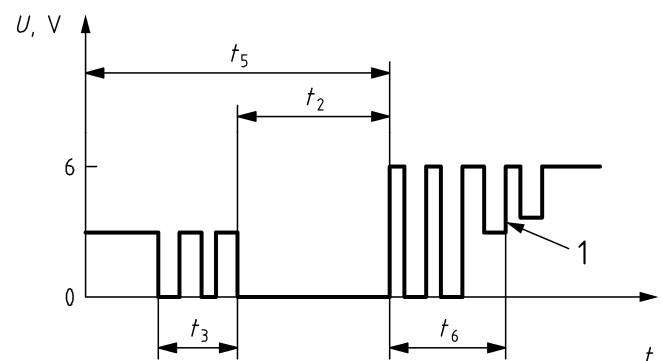
$R_1, R_2$	resistor $> 60 \Omega$
DUT	device under test (relay)
1	trigger input
2	signal input
3	ground input
$U_1$	control voltage
$U_2$	test voltage 6 V d.c.
S	switch
a	NO contact
b	NC contact

**Figure 1 — Test circuit for the determination of the actuation, release and bounce times****Key**

1	dynamic resistance effect
$t_1$	operate time
$t_2$	transfer time
$t_3$	contact break bounce duration
$t_4$	contact closing bounce duration (make bounces)

**Figure 2 — Switch closure at  $t = 0$ , Operate time characteristics****Key**

1	dynamic contact resistance effect
$t_2$	transfer time
$t_3$	contact break bounce duration
$t_5$	release time
$t_6$	contact make bounce duration

**Figure 3 — Switch opening at  $t = 0$ , Release time characteristics**

**EN 2349-304:2006 (E)****4 Release time****4.1 Test procedures**

The release time shall be measured from removal of the rated voltage, see Figure 3:

- for normally-open contacts: until the last normally-open contact has opened;
- for change-over contacts: until the last normally-closed contact has closed (this time includes the transfer time).

The contact load shall be between 5 mA and 100 mA. The open contact voltage shall be 6 V d.c. for relays or contactors of up to and including 25 A rating, and 28 V d.c. for relays or contactors above 25 A rating. The release time shall be evaluated without bounce time.

For qualification tests, five measurements shall be taken and recorded.

Figure 1 shows a typical test circuit.

**4.2 Test criteria**

The relay or contactor shall drop out within the time specified in the product standard.

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