SLOVENSKI STANDARD
SIST EN 116303:2002

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Blank Detail Specification: Electromechanical all-or-nothing heavy load relays of assessed quality (hermetically sealed, 5 A to 25 A)

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Vordruck für Bauartspezifikation: Gütebestätigte elektromechanische Schaltrelais von hoher Belastbarkeit (hermetisch dicht, 5 A bis 25 A)

Spécification particulière cadre: Relais électromécaniques de tout-ou-rien soumis au régime d'assurance de la qualité, haute limite de charge (hermétique, 5 A à 25 A)

Ta slovenski standard je istoveten z: **EN 116303:1993**

ICS:

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This European Standard was approved by the CENELEC Electronic Components Committee (CECC) on 10 August 1992. CENELEC members are bound to comply with 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 General Secretariat of the CECC or to any CENELEC 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 CENELEC member into its own language and notified to the CECC General Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom. The membership of the CECC is identical, with the exception of the national electrotechnical committees of Greece, Iceland and Luxembourg.

CECC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B-1050 Brussels

Ref. No. EN 116303:1993 E

Foreword

The CENELEC Electronic Components Committee (CECC) is composed of those member countries of the European Committee for Electrotechnical Standardization (CENELEC) who wish to take part in a harmonized System for electronic components of assessed quality.

The object of the System is to facilitate international trade by the harmonization of the specifications and quality assessment procedures for electronic components, and by the grant of an internationally recognized Mark, or Certificate, of Conformity. The components produced under the System are thereby acceptable in all member countries without further testing.

This specification was prepared by CECC WG 16 "Relays".

The text of the draft based on document CECC (Secretariat)2827 was submitted to the formal vote; together with the voting report, circulated as document CECC(Secretariat)3144, it was approved by CECC as EN 116303 on 10 August 1992.

The following dates were fixed:

— latest date of announcement of the EN at national level	(doa)	1993-05-01
— latest date of publication of an identical national standard	(dop)	1993-11-01
— latest date of declaration of national standards obsolescence		1993-11-01
— latest date of withdrawal of conflicting national standards	(dow)	2003-05-01

Contents

	(1)	CECC 16303-xxx Issue: Pages 1 to 25	(2)
Electronic components of assessed quality in accordance with EN 116000-1:1992 (CECC 16000/I Issue 2) and EN 116300:1993	(3)		(4)
Detail specification for electromechanical all-or-nothing heavy load relays			
Type:			(5)
Construction:	Hermetically sealed (RT V) Application category of contacts: CA 4 (5 A to 25 A)		(6)
	(7)	Application	(8)
Outline Dimensions in mm Tolerances ± 0,25 mm, if not otherwise specified		Relays according to this standard are capable of the following loads: (see section 2.4). The relays are circuit breaker compatible. The relays may be delivered with or without screening (assessment level Y or E).	
Coil data:			(9)
Contact data:			(10)
Operate ambient temperature range:	– ... to + ... °C		
Storage temperature range:	– ... to + ... °C		
Climatic category:	$T_B/T_A/21$		
Information about manufacturers who have components qualified to this detail specification is available in the current CECC 00200.			

Key for page 3:

The first page of the DS should have the layout recommended on page 3. The numbers between brackets on page 3 correspond to the following indications which should be given:

Identification of the detail specification

(1) The name of the National Standardisation Organisation under whose authority the detail specification is published and, if applicable, the organisation from whom the detail specification is available.

(2) The CECC-symbol and the number allotted to the completed detail specification by the CECC General Secretariat.

(3) The number and year of availability of the EN generic specification and/or sectional specification, also national reference, if different.

(4) If different from the CECC number, the national number of the detail specification, date of issue and any further informations required by the national system, together with any amendment numbers.

Identification of the relay

(5) Type: sizes (e.g. half cubic inch), number and types of contacts, max. contact current.

(6) Construction: e.g. hermetically sealed, type of termination, type of mounting, type of sealing, coil data, coil protection, life, other typical data.

(7) Basic outline drawing and wiring diagram; the detailed variants for terminals and mounting shall be given in annexes, if necessary.

(8) Application of the relay:

Stated application, mechanical, electrical and environmental conditions;

Assessment level with or without screening.

(9) Available nominal coil voltages and, if applicable, nominal power.

(10) Contact arrangement, contact current and voltage.

(11) Temperature range and climatic category.

1 Related documents

CECC 00114/II (1991)	*Quality Assessment Procedures; Part II: Qualification Approval of Electronic Components*
EN 116000-1:1992 (CECC 16000/I 2nd Issue 1990)	*Generic specification: Electromechanical all-or-nothing relays; Part 1: General*
EN 116300:1993	*Sectional specification: Electromechanical all-or-nothing heavy load relays of assessed quality*
IEC 68-2-20 (1987)	*Basic Environmental Testing Procedures; Part 2: Tests; Test T: Soldering*
IEC 68-2-21 (1985)	*Basic Environmental Testing Procedures; Part 2: Tests; Test U: Robustness of terminations and integral mounting devices*
IEC 68-2-47 (1982)	*Basic Environmental Testing Procedures; Part 2: Tests; Mounting of components equipment and other articles for dynamic tests including shock (Ea), bump (Eb), vibration (Fc and Fd) and steady-state acceleration (Ga) and guidance.*

(Any other documents referred to in the DS shall be listed.)

2 Characteristic values of the relay

2.1 General data

— Contact load: (current, voltage and frequency)

— Category of contacts: according to EN 116000-1:1992 (CECC 16000/I, 1990), section 3.8

— Mass (Weight): max. .. g

— Finish of the relay housing:

— Finish of the terminals:

— Insulation resistance: min. 100 M Ohm at 500 V d.c.

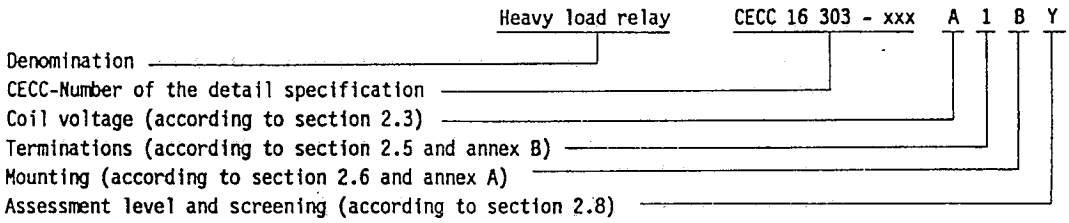
— Voltage proof: according to Table 1

Table 1 — Dielectric test voltages

	Dielectric test voltages r.m.s. at 50 to 60 Hz V	
	at sea level	at 2 kPa (25 000 m height)
Between open contacts		
Between adjacent contacts		
Contact to case		
Coil to contacts		
Coil to case		

2.2 Construction of CECC type designation (ordering informations):

Relays according to this specification shall be ordered according to the following example:



Further informations shall be added, if necessary.

For data processing purposes the ordering informations shall be written without blanks.

2.3 Coil data

Table 2 — Coil data

Code letter of coil with/without coil tansient suppression device 1)		Voltage			Resistance at	Operate voltage d.c. or a.c.		Release voltage d.c. or a.c.				Permissible coil suppression output voltage
		Type d.c. or a.c.	Value		23 ± 2 °C	V		V				V
			rated	max.	Ohm ± 10 % 2)	max. at		max. at		min. at		
						23 ± 2 °C	UCT	23 ± 2 °C	UCT	23 ± 2 °C	LCT	

1) Screened semiconductors according to CECC 50000 Level Y or JAN-TX or equivalent screened semiconductors shall be used. The relay shall continue to operate even in case of failure of the suppression circuit. The suppression device shall sustain a peak value of 600 V, duration 10 µs. Wiring diagram shall be added.

2) Coil suppression device included, if applicable.

Abbreviations: UCT Upper category temperature
LCT Lower category temperature
JAN-TX Product assurance requirements according to MIL-S-19500, clause 3.4.1

2.4 Contact data

2.4.1 *Contacts*

(number, configuration and applicable categories)

2.4.2 *Nominal load life and switching frequency*

Table 3 — Nominal load life and switching frequency

	Nominal load		Number of switching cycles	Switching frequencies at nominal load
	at d.c. 28 V	at 115/200 V 400 Hz (one- and three-phase)		
Resistive	...	...	... ...	...
Inductive	...	...	... ...	...
Motor	...	...	... ...	...
Lamp	...	...	... ...	...
Intermediate load:				
— resistive	...	...	... ...	...
— inductive	...	...	... ...	...
Overload	...	...	50	...

Max. contact voltage: ...V d.c. resp. ... V ... Hz

Min. contact voltage: ...V d.c. resp. ... V ... Hz

Min. contact current: ... mA

2.4.3 *Statical voltage drop per contact*

max. ... mV for brand-new relays

max. ... mV after life test

2.4.4 *Mechanical life*

... ... switching cycles at 25 % of nominal load (resistive load)

2.4.5 *Intermediate load, load distribution*

Table 3.1 — Intermediate load, load distribution

Test specimen No. / Changer No.	1	2	3
1	.. A resistive	.. A resistive	.. A resistive
2	.. A resistive	.. A resistive	.. A resistive

2.4.6 Timing (over the whole temperature range):

	Coil for d.c. voltage	Coil for a.c. voltage
Operating time	... ms max.	... ms max.
Release time (without suppression device)	... ms max.	... ms max.
Release time (with suppression device)	... ms max.	... ms max.
Bounce time	... ms max.	... ms max.

2.4.7 *Time current characteristic*

Table 4 — Time current characteristic

Load A (resistive load)	Load duration max.

2.5 Terminations

The types and finish of terminations in relation to the respective code number shall be specified. Table 5 gives an example.

Table 5 — Terminations

	Code number
Solder pins, tinned	1
Solder hooks, tinned	2
Plug-in type pins, gold plated	3
Dimensions of terminations according to Annex B	

2.6 Mounting

The mounting variants and the respective code letters shall be specified. Details and drawings shall be given in Annex A.

2.7 Environmental data

The relays shall withstand at least the following environmental stresses:

Table 5.1 — Environmental stresses

Shock, half sine	Acceleration duration	1 000 m/s² (100 g) 6 ms
Vibration (sinusoidal)	Amplitude Acceleration	1,5 mm at 10 to 80 Hz 200 m/s² at 80 to 2 000 Hz
Vibration (random)	Acceleration spectral density	0,4 g²/Hz 50 to 2 000 Hz
Acceleration (steady state)	Acceleration Duration	200 m/s² (20 g) 5 min
Mechanical robustness of terminals	Tensile Bending Torsion	according to IEC 68-2-21

2.8 Screening, Assessment level

If screening is demanded, the following conditions shall be fulfilled for the delivery lot:

— The relays shall be marked by a serial number.

— The tests of test group screening shall be carried out. Documentation is demanded.

Assessment level (code letter) for not screened relays: E

Assessment level (code letter) for screened relays: Y

Any relay, which does not fulfill the requirements, shall be eliminated. If there are more than 10 % defectives in test group screening then the whole of the delivery lot shall be rejected.

3 Qualification approval procedures

— as stated in CECC 00114/II section 1.4 (1) "fixed sampling".

— sampling and test schedule are specified in Table 7.

— the tests specified and their order are mandatory.

4 Quality conformance inspection

Quality conformance inspection contains the tests stated in Table 6

— group A: tests for inspection lots acceptance

— groups C and D: periodic tests

Unless otherwise stated in this blank detail specification all tests of Table 6 are mandatory.

Where a sub-group contains cumulative tests, the order of the tests is mandatory.

Specimens subjected to tests denoted as destructive (D) shall not be released for delivery.

4.1 Formation of inspection lots

According to CECC 00114/II section 3.1.

4.2 Intervals between group C and group D tests

The tests of group C and D shall be performed in the intervals specified in Table 6.

5 Marking, package and documentation

5.1 Marking of the relay

The marking shall be durable and easily legible, the following items shall be present:

a) Manufacturer's name or trade mark or manufacturer's CECC code

b) CECC-type designation according to section 2.2

c) CECC in letters or CECC-mark of conformity (shall be specified in the detail specification)

d) Date of manufacture, year/week coded according to IEC 62

e) Wiring diagram or codification of terminals (shall be specified in the detail specification)

f) Serial number of screened relays

5.2 Marking of package

The following data shall be given on the package. Marking shall be durable and easily legible.

a) Manufacturer's name or trade mark or manufacturers CECC code

b) Manufacturer's type designation

c) CECC-type designation according to section 2.2

d) Date of manufacture or year/week according to IEC 62[1)]

e) Number of relays

5.3 Package

If not otherwise specified in the order, the relays shall be delivered in commercial package.

5.4 Documentation

For each delivery a certificate of conformity according to CECC 00114/II section 2.7 shall be added.

6 Annexes

Annexes may be added, for example:

Annex A: mounting variants, their dimensions and corresponding code

Annex B: termination variants, their dimensions and corresponding code

Annex C: wiring diagrams

7 Tests

7.1 Standard conditions for testing

If not otherwise stated all tests shall be performed according to EN 116000-1:1992 (CECC 16000/1, 1990), section 5.5

7.2 Mounting of test specimens during the test

The following indications shall apply for dynamic tests e.g. shock, vibration, acceleration etc. The relay shall be mounted by its normal mounting method to the test fixture where inherent resonances have beer minimized so as not to invalidate the test, IEC 68-2-47 refers.

Relays for which several mounting variants are specified, each of these variants shall be tested.

7.3 General conditions for testing

Unless otherwise stated, the tests shall be carried out under general test conditions according to EN 116000-1:1992 (CECC 16000/1, 1990) section 5.5.1.

These are:

Temperature 15 to 35 °C

Relative humidity 45 to 75 %

Air pressure 86 to 106 kPa (860 to 1 060 mbar)

Unless otherwise stated, the rated energization voltage specified in Table 2 shall be used for all tests. Suitable polarity shall be observed.

[1)] The date of manufacture of the oldest relay within the package shall be stated.

8 Ordering information

See section 2.2

Table 6 — Lot-by-lot and periodic tests

Test group A 0

These tests shall be executed as final production tests.

For all cumulative tests in this group: 100 % test (individual tests), discard all rejects.

Section number and test 1)	Test conditions 1)	Requirements 1)
5.6.4 *Visual inspection (ND)*	Subclause 1 to 4	Satisfactory aspect of terminals, mounting and finish. Marking as specified in section 5.1 easily legible.
5.9 **Dielectric test (ND)**	Application points: all terminals as specified in section 5.9.2 Test voltage: see section 2.1 2) Duration of test: 1 s	No breakdown or flashover Leakage current max. 1 mA
5.11 **Insulation resistance (ND)**	Application points: all terminals as specified in section 5.11.2 Test voltage: 500 V d.c. Duration of test: max. 2 min	Insulation resistance min. 100 M Ohm
5.8.1 *Coil resistance (ND)* 3) (only for dc-relays)	—	Values according to Table 2 2)
5.8.3 *Coil impedance (ND)* (only for ac-relays)	—	Values according to Table 2 2)
5.8.4 *Coil transient suppression (ND)* (For relays with suppression device only)	1 test a) Impact voltage at 600 V d.c. for 10 µs Test conditions to be specified in the detail specification b) Coil voltage: rated voltage	Back-EMF: according to detail specification
5.12 **Static contact voltage drop (ND)**	Application points: all contacts Test load = rated current at 6 V d.c. for relays up to 10 A = rated current, rated voltage for relays > 10 A Reading time max. 10 s	Voltage drop: Individual readings max. 150 mV Average readings max. 125 mV
5.13 **Functional tests (ND)**	Order of steps: 1 Rated voltage for conditioning 2 Zero voltage 3 Operate voltage 4 Rated voltage 5 Release voltage Test position: optional	Values according to Table 2 2)
5.14 **Timing tests (ND)**	Test position: optional Coil voltage: rated voltage Application points: all contacts Contact current: 100 mA + 0/– 10 % Contact voltage: 6 V d.c.	Operate, release and bounce times of section 2.4.6 shall not be exceeded 2)
5.20.2 *Sealing (ND)*	1 Procedure 2: Test Q_K, method 1 2 Thereafter the test item shall be stored for 1 h under normal atmospheric conditions. 3 Procedure 1: Test Q_C, method 1	Test severity: 1 000 h No evidence of bubbles

1) Section numbers for tests and requirements refer to EN 116000-1:1992 (CECC 16000/1, 1990), if not otherwise specified.
2) Section number according to this specification
3) Coil suppression device included, if applicable.