

Förderverein für Elektrotechnische Normung (FEN) e. V.  
Genelec Electronic Components Committee

# CECC

Harmonized System of Quality Assessment for  
Electronic Components

DETAIL SPECIFICATION:

**TO-5 SIZE RELAYS,  
2 CHANGE-OVER CONTACTS / 1 A**



# 1

Edition  
Issue  
Ausgabe

## CECC 16 205-801

1994



**Documents**

Document Sharing Hub

Information about the System may be obtained from:



FEN e.V. Secretariat  
and  
CECC General Secretariat  
Gartenstraße 179  
D - 60596 Frankfurt  
Telephone: Int. + 49 69 639171  
Telefax: Int. + 49 69 639427

or from the National Authorized Institutions  
of the participating countries listed  
who can supply copies of:

- 1 The Internal Regulations of the FEN e.V.
- 2 The Rules of Procedure of the System
- 3 CECC Specifications of the FEN and National Specifications for the System
- 4 CECC 00 200: Register of Firms, Products, and Services Approved under the CECC System
- 5 CECC 00 300: Register of National Documents Implementing CECC Publications and CECC European Standards
- 6 CECC 00 301: Register of CECC Specifications and Related Detail Specifications
- 7 Other CECC Publications and publicity documents

#### AUSTRIA

Österreichischer Verband für Elektrotechnik (ÖVE)  
Eschenbachgasse 9  
A-1010 VIENNA

#### BELGIUM

Comité Electrotechnique Belge  
Galerie Ravenstein 28 Boîte 2  
B-1000 BRUSSELS

#### DENMARK

Dansk Elektroteknisk Komite  
Dansk Standard  
Electrotechnical Sector  
Baunegårdsvej 73  
DK-2900 HELLERUP

#### FINLAND

Finnish Electrotechnical Standards Association (SESKO)  
P.O. Box 134  
SF-00211 HELSINKI 21

#### FRANCE

Union technique de l'Electricité  
Participation française au CECC  
F-92052 PARIS La Défense Cedex 64

#### GERMANY

Deutsche Elektrotechnische Kommission im DIN und VDE (DKE)  
Stresemannallee 15  
D-60596 FRANKFURT

#### IRELAND

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Glasnevin  
IRL-DUBLIN 9

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NL-2600 GB DELFT

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#### SPAIN

New Spanish Member  
to be determined.

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S-16428 KISTA-STOCKHOLM

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## 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 has been formally approved by the CECC, and has been prepared for those countries taking part in the System who wish to issue national harmonized specifications for TO-5 SIZE RELAYS. It should be read in conjunction with the current regulations for the CECC System.

At the date of printing of this specification, the member countries of the CECC are Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom, and copies of it can be obtained from the addresses shown on the blue fly sheet.

## PREFACE

This CECC detail specification is based, wherever possible, on the Publications of the International Electrotechnical Commission.

The text of this detail specification was circulated to the members of CECC WG 16: "Relais" and was approved for publication under the accelerated procedure for the acceptance of detail specifications in accordance with Decisions 10, 11 and 12 of the minutes of the CECC CD meeting in document CECC(Secretariat)1838.

| <u>Document</u>          | <u>Approval Date</u> |
|--------------------------|----------------------|
| CECC WG16 (Marqueteau)11 | 30 March 1993        |

**Note:** This specification is published in English only.

Specification available from the addresses  
shown on the blue fly sheet.

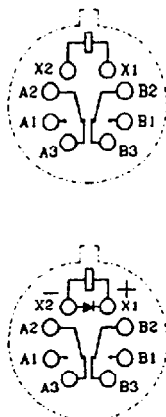
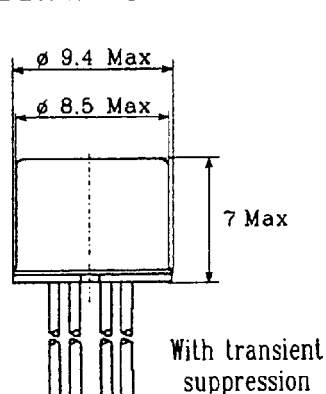
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**ELECTRONIC COMPONENTS OF ASSESSED QUALITY  
IN ACCORDANCE WITH :** EN 116 000-1 : 1992  
EN 116 200 : 1991  
EN 116 205 : 1992

**DETAIL SPECIFICATION FOR :** ALL-OR-NOTHING RELAYS  
**TYPE :** MONOSTABLE - 2 CHANGE-OVER - 1 A  
with or without transient suppression  
**CONSTRUCTION :** Hermetically sealed by all-welded metal can TO5 size

#### OUTLINE DRAWING



#### APPLICATION

Switching of circuit :  
- Low-level : applicable  
- High level : up to 1 A

In severe static  
environmental conditions

Relays delivered with screening:  
To assessment level Y

- Dimensions in mm; non-specified tolerances :  $\pm 0,25$  mm
- Wiring diagram as viewed from terminal side
- Terminal references are not marked on the relay
- Terminals and mounting variants, see Annex 1

#### Coil data:

| Rated voltage<br>(V d.c.) | Rated power<br>(mW) |
|---------------------------|---------------------|
| 5                         | 500                 |
| 6                         | 360                 |
| 9                         | 360                 |
| 12                        | 360                 |
| 18                        | 360                 |
| 28 (26,5)                 | 500                 |
| 30                        | 360                 |

#### Contact data:

Contact arrangement : 2 change-over

Low-level : 10 mA max / 10 mV to 30 mV

High current : - rated contact voltage:  $U_1 = 28$  V d.c.

- contact current :  $I_1 = 1$  A , resistive load  
 $I_2 = 0,2$  A ,  $L = 0,32$  H

#### Temperature range:

Storage temperature : - 65 to 150 °C

Operating ambient temperature : - 65 to 125 °C

Information about manufacturers who have components qualified to this detail  
specification is available in the current CECC 00 200 (Register of Approvals).

1. RELATED DOCUMENTS

- CECC 00 200
- EN 116 000-1 : 1992
- EN 116 200 : 1991
- EN 116 205 : 1992
- IEC 62
- IEC 68
- IEC 410
- CECC 00 114/II

2. CHARACTERISTIC VALUES

## 2.1 General data

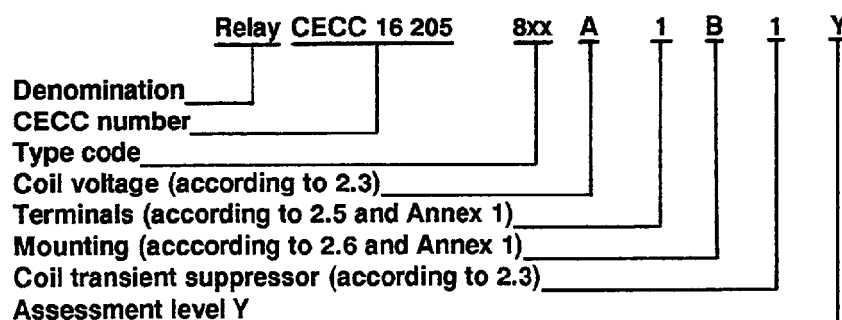
- Thermal resistance : Not applicable
- Application category : 0, 1 and 2
- Contact arrangement : 2 change-over contacts
- Mass (weight) : 2,5 g max
- Finish of the housing : anti corrosion
- Finish of the terminals : tin or gold plated
- Insulation resistance : 10 000 M $\Omega$  min. at 500 V d.c., unless otherwise stated in Table 5
- Dielectric withstand voltage : see Table 1
- Nominal internal free volume : 0,16 cm<sup>3</sup>

TABLE 1

Dielectric test voltages

|                           | at sea level<br>V a.c. min. | at 2 kPa (26 600 m)<br>V a.c. min. |
|---------------------------|-----------------------------|------------------------------------|
| Open contacts             | 500                         | 250                                |
| Between adjacent contacts | 500                         | 250                                |
| Contacts to case          | 500                         | 250                                |
| Coil to contacts          | 500                         | 250                                |
| Coil to case              | 500                         | 250                                |

## 2.2 Construction of designation (ordering information)



Relays are delivered with screening.

## 2.3

### Coil data

### TABLE 2

### List of coil data

| IDENTIFICATION<br>LETTER<br><br>OF THE COIL | VOLTAGE<br>(V d.c.) |     | COIL<br>RESISTANCE | MUST OPERATE<br>VOLTAGE |       | RELEASE VOLTAGE                  |                                   |      |       | COIL TRANSIENT<br>SUPPRESSOR * |
|---------------------------------------------|---------------------|-----|--------------------|-------------------------|-------|----------------------------------|-----------------------------------|------|-------|--------------------------------|
|                                             |                     |     | AT 23°C            | (V d.c.)                |       | max<br>(non release)<br>(V d.c.) | min<br>(must release)<br>(V d.c.) |      |       | CODE NUMBER                    |
|                                             | rated               | max | ± 10 %             | 23°C                    | 125°C | 23°C                             | 125°C                             | 23°C | -65°C |                                |
| A                                           | 5                   | 5,8 | 50                 | 2,7                     | 3,5   | 1,4                              | 2,3                               | 0,22 | 0,14  | 1                              |
| B                                           | 6                   | 8   | 98                 | 3,5                     | 4,5   | 2                                | 3,2                               | 0,28 | 0,18  | 1                              |
| C                                           | 9                   | 12  | 220                | 5,3                     | 6,8   | 3                                | 4,9                               | 0,54 | 0,35  | 1                              |
| D                                           | 12                  | 16  | 390                | 7                       | 9     | 4                                | 6,5                               | 0,63 | 0,41  | 1                              |
| E                                           | 18                  | 24  | 880                | 10,5                    | 13,5  | 6                                | 10                                | 0,91 | 0,59  | 1                              |
| G                                           | 28                  | 32  | 1560               | 14,2                    | 18    | 8                                | 13                                | 1,37 | 0,89  | 1                              |
| H                                           | 30                  | 36  | 2500               | 17,7                    | 22    | 10                               | 16                                | 1,50 | 1     | 1                              |

\* without suppressor the code number is 0

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|* without suppressor the code number is 0
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## 2.4

## Contact data

### 2.4.1

**Contact arrangement : 2 change-over**

**Applicable category : CA 0,1 or 2.**

### 2.4.2

### Contact load

**Low-level : 10 mA max / 10 mV to 30 mV max**

**Rated contact voltage :  $U_1 = 28 \text{ V d.c.}$**

**Nominal load life and switching frequency : see Table 3.**

### TABLE 3

### Loads, switching cycles and frequencies for endurance and overload tests

| Load                     | at 28 V d.c.   | at 115 V<br>400 Hz | Switching<br>cycles | Switching<br>frequencies |
|--------------------------|----------------|--------------------|---------------------|--------------------------|
| Low level                | 30 mV/10mA max | na                 | 1 000 000           | 1 to 10 per s            |
| Resistive I <sub>1</sub> | 1 A            | na                 | 100 000             | 20 ± 2 per min           |
| Inductive I <sub>2</sub> | 0,2 A          | na                 | 100 000             | 10 ± 2 per min           |
| Lamp                     | na             | na                 |                     |                          |
| Motor                    | na             | na                 |                     |                          |
| Intermediate load        | 0,1A           | na                 | 50 000              | 10 ± 2 per min           |
| Resistive overload       | 2 A            | na                 | 100                 | 20 ± 2 per min           |
| Inductive overload       | 0,4A           | na                 | 100                 | 10 ± 1 per min           |
| Lamp overload            | na             | na                 |                     |                          |
| Motor overload           | na             | na                 |                     |                          |

**The following values are for information only, not for inspection purposes.**

**Maximum contact voltage** : 90 V d.c. (0,1 A max)

|                                |        |
|--------------------------------|--------|
| <b>Minimum contact voltage</b> | : 1 mV |
|--------------------------------|--------|

Minimum contact current : 1  $\mu$ A

Maximum voltage drop per contact : na

- 2.4.3 Static contact resistance  
100 mΩ max at 3 mm max from the relay body,  
200 mΩ max after electrical life.
- 2.4.4 Dynamic contact voltage drop  
Voltage drop across closed contact less than 5 % of open circuit voltage.
- 2.4.5 Mechanical life  
900 000 switching cycles after low level electrical endurance.
- 2.4.6 Timing (over the whole temperature range) :
- Operate time : 2 ms max
  - Bounce time : 1,5 ms max
  - Release time : 1,5 ms max
  - 4 ms max with coil transient suppression
  - Time to stable closing on operate : 4 ms max  
on release : 3,5 ms max  
6 ms max with coil transient suppression

## 2.5 Terminals (see Annex 1)

TABLE 4-1: Terminal codes

| TYPE OF TERMINAL                   | FINISH      | TERMINAL CODE |
|------------------------------------|-------------|---------------|
| Special length defined by mounting | Tin plated  | 0             |
|                                    | Gold plated | 1             |
| 4,75 mm length                     | Tin plated  | 2             |
|                                    | Gold plated | 3             |
| 12,7 mm length                     | Tin plated  | 4             |
|                                    | Gold plated | 5             |
| 38 mm length                       | Tin plated  | 7             |
|                                    | Gold plated | 8             |

## 2.6 Mounting (see Annex 1)

TABLE 4-2: Mounting codes

| TYPE OF MOUNTING               | MOUNTING CODE |
|--------------------------------|---------------|
| Without mounting               | A             |
| 0,36 mm spacer                 | B             |
| 7,54 mm grid spreader pad      | C             |
| 5,08 mm grid spreader pad      | D             |
| Ground pin without mounting    | E             |
| Ground pin with 0,36 mm spacer | F             |

## 2.7 Environmental data

- Shock: peak acceleration : 981 m/s<sup>2</sup> (100 g)  
half-sine duration : 6 ms
- Bump: peak acceleration : 392 m/s<sup>2</sup> (40 g)  
number of bumps by direction : 1 000
- Vibration, sinusoidal : 10 Hz to 55 Hz =  
constant amplitude: 2,5 mm peak  
55 Hz to 3 000 Hz =  
peak acceleration : 294 m/s<sup>2</sup> (30 g)
- Vibration, random : 0,2 g<sup>2</sup>/Hz, 20 to 2 000 Hz
- Robustness of terminals :  
Test Ua1 Tensile : 5 N  
Ub Bending : 2,5 N  
Uc Torsion : Method A, Severity 2