

**Bundesamt
für
Wehrtechnik
und
Beschaffung**

Harmonisiertes Gütebestätigungssystem für Bauelemente der Elektronik
Bauartspezifikation
Hermetisch dichte Relais für fliegendes Gerät
für erschwerte Umweltbedingungen
SMD-Relais 1/10 CC, Spule 5 bis 28 V DC, 2 Wechsler, 0,5 A,
empfindlich, (CECC 16 207-009)

VG
95 302
Teil 301

Diese Bauartspezifikation ist vom CECC-
Generalsekretariat unter der Nummer
registriert.

CECC 16 207-009

1.Ausgabe

Harmonized system of quality assessment for electronic components; detail specification:
Hermetically sealed relays for severe airborne environmental conditions;
SMD relay 1/10 size crystal can, coil 5 to 28 V d.c., 2 change-over, 0,5 A,
sensitive, (CECC 16 207-009)

Diese Anwenderspezifikation des Bundesamtes für Wehrtechnik und Beschaffung (BWB) ist ausge-
richtet nach dem Vordruck für Bauartspezifikationen CECC 16 207 des CENELEC-Komitees für
Bauelemente der Elektronik (CECC) im "Europäischen Komitee für elektrotechnische Normung
(CENELEC)".

Die grundlegenden Bestimmungen und die Verfahrensregeln für dieses harmonisierte Gütebestätigungs-
system sind in CECC 00 101 bis 00 106, 00 108, 00 109, 00 111 bis 00 114 festgelegt.

Das zuständige Arbeitsgremium für diese Spezifikation ist der NEA 671.1 "Relais" der Normenstelle
Elektrotechnik im DIN.

Zitierte Normen

- CECC 00 101 Harmonisiertes Gütebestätigungssystem für Bauelemente der Elektronik;
Das CENELEC-Komitee für Bauelemente der Elektronik (CECC)
- CECC 00 102 -; Organisation und Verwaltung
- CECC 00 103 -; Komitee für Gütesicherung von Bauelementen der Elektronik (ECQAC)
- CECC 00 104 -; CECC-Arbeitsgruppen
- CECC 00 105 -; CECC-Mitgliederverzeichnis
- CECC 00 106 -; Methoden zur Änderung der Verfahrensregeln des Systems
- CECC 00 108 -; Konformitäts-Bestätigung
- CECC 00 109 -; Bestätigte Prüfberichte
- CECC 00 111 -; Spezifikation
- CECC 00 112 -; Abstimmverfahren
- CECC 00 113 -; Nationale Erklärung über die Überwachungsmaßnahmen

Übrige Normen siehe Abschnitt 1

Fortsetzung 26 Seiten CECC-Spezifikation

Normenstelle Elektrotechnik (NE) im DIN Deutsches Institut für Normung e.V.

Deutsche Elektrotechnische Kommission im DIN
und VDE (DKE), Stresemannallee 15,
60596 Frankfurt/Main

CECC 16 207-009
Issue: 1 July 1993
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Electronic components of assessed quality
in accordance with
CECC 16 000
CECC 16 200
CECC 16 207

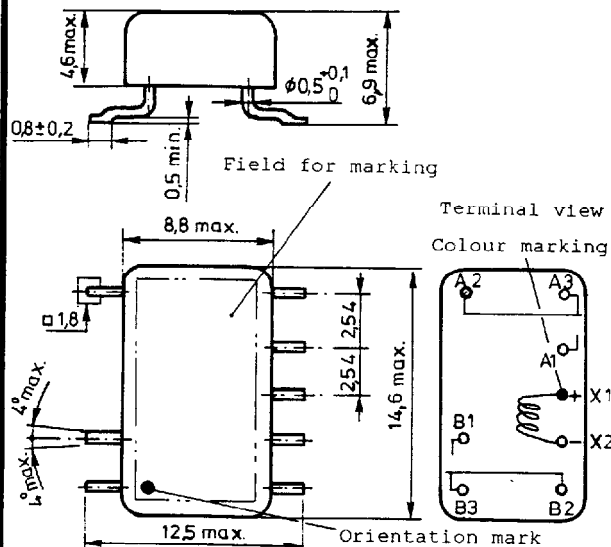
User specification of the Bundesamt
für Wehrtechnik und Beschaffung (BWB)
Holder of specification:
Normenstelle Elektrotechnik (NE) im DIN
Deutsches Institut für Normung e.V.

Detail specification for All-or-Nothing Relays

Type: 1/10 Size Crystal Can, 2 change-over contacts 0,5 A
Construction: SMD, monostable, sensitive, hermetically sealed, welded construction
Application category of contacts: CA 0 10 μ A max.
CA 2 0,5 A max. resistive
Life: 500 000 switching cycles, low level load
100 000 switching cycles, 0,5 A resistive

Outline drawing and wiring diagram
Dimensions in mm, tolerances $\pm 0,25$ mm
if not otherwise specified. Terminals
see Annex A.

Wiring diagram marked on top; figures
show terminal view.



Application:

Relays according to this standard are
provided for the operation in military
and/or commercial equipment and/or in-
stallations with increased mechanical
and environmental requirements. The
applicable load range is from low
level to 0,5 Ampere.

Test schedule 7 of CECC 16 200

The relays have a quality assessment
level Y.

Coil data: 5 V, 12 V, or 28 V d.c.

Contact data: 2 change-over contacts for 28 V d.c.
Low level: 10 mA max., 10 mV to 50 mV
High current: rated current voltage 28 V d.c.
contact current 0,5 A resistive load;
further data see table 3

Temperature range:
Storage temperature: - 65 to + 150 °C
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: Qualified Products List, the MUAHAG-PPL Volume 5 and VG 95 212 Part 10 (LZB).

1 Related documents

CECC 00 114 (Issue 1)	Quality assessment procedures
CECC 00 200 (Issue 1)	Harmonized System of Quality Assessment for Electronic Components; Qualified Products List
CECC 00 802 (Issue 1)	-; guidance document: CECC standard method for the specification of surface mounting components (SMDs) of assessed quality
CECC 16 000 (Issue 2)	-; generic specification; electromechanical all or nothing relays
CECC 16 200 (Issue 1)	-; sectional specification; electromechanical all or nothing relays
CECC 16 207 (Issue 1)	-; blank detail specification; hermetically sealed relays for severe airborne environmental conditions
IEC 62	Marking codes for resistors and capacitors
IEC 68 - 1	Environmental testing, Part 1: General and guidance
IEC 68 - 2 - 17	Basic environmental testing procedures; Part 2: Tests - Test Q: Sealing
IEC 68 - 2 - 20	-; Part 2: Tests - Test T: Soldering
IEC 68 - 2 - 47	-; 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
IEC 410	Sampling plans and procedures for inspection by attributes
MUAHAG-PPL Volume 5	Cenelec Electronics Components Committee; Military Usage and Harmonisation Advisory Group; Preferred Products List; Relays
VG 95 212 part 10	Listen zugelassener Bauelemente (LZB); Hermetisch dichte Relais

2 Characteristic values of the relay

2.1 General data

- Thermal resistance: max. 250 °C/W
- Application category: CA 0/ CA 2
- Contact arrangement: 2 change-over
- Mass (Weight): max. $(2 \pm 0,5)$ g
- Finish of the relay housing: tin-plated
- Finish of the terminals: tin-plated or gold plated
- Insulation resistance: 10 000 M Ω min. at 500 V d.c.
- Dielectric withstand voltage: according to table 1
- Free volume: 270 mm³ max.

Table 1 Dielectric test voltages

	at sea level V a.c. min.	at 2 kPa (26 600 m) V a.c. min.
Open contacts:	350	250
Between adjacent contacts:	500	250
Contacts to case:	500	250
Coil to contacts:	350	250
Coil to case:	500	250

2.2 Construction of designation (ordering information):

Denomination: Relay CECC 16 207 - 009 A H O Ø Y

CECC-Number _____

Type code (CECC registration number) _____

Coil voltage (according to 2.3) _____

Terminals (according to 2.5) _____

Mounting (according to 2.6) _____

Special attributes (according to 2.3) _____

Assessment level _____

2.3 Coil data (see table 2)

Table 2 Coil data

Identi- fica- tion letter of the coil	Voltage d.c.		Coil resi- stance and/or impedance at 23°C W ±10%	Operate voltage d.c.		Release Voltage d.c.				Rated power/ burden mW/mVA max.	Special attributs, code number ¹⁾
	V			V		V					
	rated	max.		max. at 23°C	125°C	max. at		min. at			
						23°C	125°C	23°C	-65°C		
A	5	7	120	3	4,2	1,7	2,4	0,3	0,20	300	Ø
D	12	14	720	7	10	4,0	5,5	0,7	0,45	300	Ø
G	28 ²⁾	32	3100	15	22	8,5	12	1,5	1	300	Ø

1) Without suppression the code number is Ø, with suppression not available.

2) Substitutes relay with rated voltage 26,5 V d.c.

2.4 Contact data

2.4.1 Contacts, number, configuration and application categories

Performance for dry circuit, 2 change-over contacts,

CA 0: 10 μ A

CA 2: 0,5 A resistive

2.4.2 Load, switching cycles and frequencies for endurance and overload tests
see table 3

Table 3 Data for endurance and overload tests

Load	at 28 V d.c.	at 115 V 400 Hz	Switching cycles	Switching frequency
Low level	30 mV/ 10 μ A max	n.a.	1 000 000 ²⁾	(1 to 10)/ s
Resistive	0,5 A	n.a.	100 000	(20 $\pm$ 2)/ min.
Inductive ¹⁾	0,1 A	n.a.	100 000	(20 $\pm$ 2)/ min.
Lamp	n.a.	n.a.	n.a.	n.a.
Motor	n.a.	n.a.	n.a.	n.a.
Intermediate load	0,1 A	n.a.	50 000	(10 $\pm$ 2)/ min.
Resistive overload	1 A	n.a.	100	(10 $\pm$ 1)/ min.
Inductive overload	0,2 A	n.a.	100	(10 $\pm$ 1)/ min.
Lamp overload	n.a.	n.a.	n.a.	n.a.
Motor overload	n.a.	n.a.	n.a.	n.a.

¹⁾ Inductivity 200 mH max.
²⁾ Low level: 100.000 cycles plus 900.000 cycles mechanical life

The following values are for information only and not for inspection purposes.

Maximum contact voltage: 30 V d.c.
 Minimum contact voltage: 0,03 V d.c.
 Minimum contact current: 10 μ A d.c.
 Maximum voltage drop per contact: 0,1 V d.c.

2.4.3 Static contact resistance:

max. 200 m Ω initial resistance
 max. 300 m Ω after electrical life

2.4.4 Dynamic contact voltage drop (for low level load)

Voltage drop 5 % max. of voltage over closed contacts

2.4.5 Mechanical life:

1 000 000 switching cycles

2.4.6 Timing (Over the whole temperature range with rated coil voltage):

- Operate time max. 2,5 ms
 - Release time max. 2,5 ms
 - Bounce time max. 2,0 ms
 - Stabilisation time max. 2,5 ms

2.5 Terminals, variants and codes

Table 4.1

Code number	Terminals		Finish
H	SMD J-leads	flat	tinned
I			gold plated
K		round	tinned
L			gold plated

2.6 Mounting

Table 4.2

Code letter	Mounting variant
0	Without mounting hardware accessories

Soldering process and resistance to soldering heat

For Test-No. 19 (Solderability) and Test-No. 41 (Resistance to soldering heat) the following test conditions are applied. For detailed diagrams see CECC 00 802.

- Classification (figure 3 and 4 of CECC 00 802 are valid):

Soldering process	Class	Test	
		Conditions	Category
vapour phase infra-red double wave	A	260 °C/ 10 s	1
		and	and
		215 °C/ 40 s	3

- Resistance to soldering heat: immersion conditions

Category	Immersion conditions		Simulated process
	°C	s	
1	260 ± 5	10 ± 1	double wave infra-red
3	215 ± 5	40 ± 1	vapour phase

2.7 Environmental data

The relays shall withstand at least the following environmental stresses:

- shock: 981 m/s² (100 g) half sine acceleration, 6 ms duration.
- bump: 392 m/s² (40 g) acceleration, 6 ms duration.
- vibration (sinusoidal): amplitude 2,0 mm or 294 m/s², 10 Hz to 3000 Hz
- vibration (random): 0,2 g²/Hz, 20 Hz to 2000 Hz
- acceleration (constant): 98 m/s², duration 5 minutes
- mechanical robustness of terminals:
 - Test Ua1 tensile 5 N
 - Test Ua2 shear stress 1 N
 - Test Ub bending 2 N
 - Test Uc torsion n.a.

3 Qualification approval

- as stated in CECC 00 114/II section 1.4 (1) "fixed sampling"
- sampling and test schedule are specified in Table 6
- the tests specified and their order are mandatory.

4 Quality conformance inspection

Quality conformance inspection contains the tests stated in Table 5

- group A and B tests for inspection lots acceptance
- group C and D periodic tests.

Unless otherwise stated in this detail specification, all tests of Table 5 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 00 114/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 5.

5 Marking and documentation

Relays and their package supplied according to this detail specification shall be marked as follows:

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
- b) CECC-mark of conformity
- c) Date of manufacture, year/week coded according to IEC 62
- d) Wiring diagram
- e) CECC ordering information according to clause 2.2

5.2 Marking of packaging

- a) Manufacturer's name or trade mark
- b) Indication of place and/or country of manufacturing
- c) CECC ordering information according to clause 2.2
- d) Date of manufacture, year/week coded according to IEC 62
- e) Quantity

5.3 Documentation

For each delivery shall be added a certificate of conformance according to CECC 00 114.

6 Annexes

Not required

7 Tests

7.1 Standard conditions for testing:

If not otherwise stated all tests shall be performed according to 5.5 of CECC 16 000.

7.2 Mounting of test items during the test

The following indications shall apply for mechanical tests e.g. shock, vibration, acceleration, bump.

The relay shall be mounted by its normal mounting methods and additional fixtures to the test plate for minimization of resonances, so that the test results will not be invalidated; IEC 68-2-47 refers.

7.3 General conditions for testing

Unless otherwise stated, the tests shall be carried out under general test conditions according to IEC 68 part 1.

Unless otherwise stated, the rated coil voltage specified in table 2 shall be used for all tests.

8 Ordering information

See clause 2.2

Notes on Table 5

Note 1: Unless otherwise stated the sectional numbers of tests and performance requirements refer to CECC 16 000, Issue 2.

Note 2: Section number refers to this specification.

Note 3: Inspection Levels (IL) and Acceptable Quality Levels (AQL) are selected from IEC 410.

Note 4: P = periodicity (in months)

n = sample size

c = acceptance criterion (permitted number of defectives)

Note 5: More severe than CECC 16 207

Table 5

Test Group Screening

For all cumulative tests in this sub-group: 100 % test (individual test). Discard all failed relays.

The lot shall be rejected in case of a failure rate of more than 10 % cumulative and 5 % per single test.

No.	Clause number and test 1)	Conditions of test 1)	Performance requirements 1)
1	5.28 Vibration limited duration	-Amplitude and acceleration see 2.7 2) -Frequency 100 Hz to 3000 Hz -Test procedure: one half cycle each with energized and deenergized coil -The test items and the acceleration pickup shall be mounted onto a SMD test plate. - Duration of test: 2 h 5) -Test axes: one third of each batch in each of the three mutually perpendicular axes. -Final measurements: - Visual inspection (according to Test-No. 5 2) - Inspection of soldered connections - Insulation resistance (according to Test-No. 7 2) - Static contact resistance (according to Test-No. 12 2)	No opening of any closed contact circuit shall exceed 10 μs, no closing of any open contact circuit shall exceed 1 μs. No damages at the soldered connections
2	5.49 Free particle noise test	Test conditions A and B -Test axis: Perpendicular to the largest flat surface for test condition B	No audio or visual indications of free particles
3	5.21.3 Internal moisture	Method 1 5) -Rated voltage -Upper test temperature + 125 °C -Lower test temperature - 65 °C -Contact load: max. 10 mA, 6 V d.c.	Contacts shall be in normal contact position after stress.
Notes see on page 7			