

**Bundesamt
für
Wehrtechnik
und
Beschaffung**

Harmonisiertes Gütebestätigungssystem für Bauelemente der Elektronik
Bauartspezifikation
Gütebestätigte elektromechanische Schaltrelais hoher Belastbarkeit
Relais 4/10 Kubikzoll, monostabil, 4 Wechsler, 5 A
(CECC 16 303-004)

VG
95 302
Teil 403

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

CECC 16 303-004
1.Ausgabe

Harmonized system of quality assessment for electronic components; detail specification:
Electromechanical all-or-nothing heavy load relays of assessed quality;
Relay 4/10 cubic inch, monostable, 4 change-over, 5 A (CECC 16 303-004)

Diese Anwenderspezifikation des Bundesamtes für Wehrtechnik und Beschaffung (BWB) ist ausgerich-
tet nach dem Vordruck für Bauartspezifikationen CECC 16 303 des CENELEC-Komitees für Bauele-
mente 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 28 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 16 303-004
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Electronic components of assessed quality
in accordance with
CECC 16 000/I Issue I and Amendments I and II
CECC 16 300 Issue I

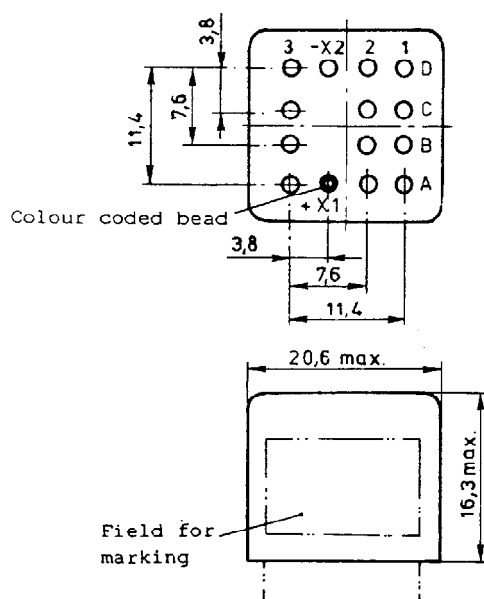
User specification of the Bundesamt
für Wehrtechnik und Beschaffung (BWB)
Holder of specification:
Normenstelle Elektrotechnik (NE) im DIN
Deutsches Institut für Normung e.V.

Detail specification for electromechanical all-or-nothing heavy load relays

Type: 4/10 cubic inch, monostable, 4 change-over, 5 A

Construction: Hermetically sealed (RT V), welded construction
Application category of contacts: CA 4 (5 A to 25 A)
Solder pins, solder hooks, or plug-in type pins
Life: 100 000 switching cycles, resistive load

Outline dimensions in mm; tolerances $\pm 0,25$ mm,
if not otherwise specified. Variants, terminals
and wiring diagram see Annexes A, B and C.



Application:

Relays according to this
standard are capable of the
following loads: 5 A at
28 V d.c. or 115/200 V a.c.
400 Hz.

The relays are circuit
breaker compatible.

The relays may be delivered
with or without screening
(assessment level Y or E).

Suitable base under
consideration.

Coil data: 6 V, 12 V, or 28 V d.c.

Contact data: 4 change-over for 28 V d.c. or AC 115/200 V, 400 Hz, one- and
three-phase

Operate ambient temperature range: - 65 to 125 °C
Storage temperature range: - 70 to 125 °C
Climatic category: 65/125/21

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/II (1991)	Quality Assessment Procedures; Part II: Qualification Approval of Electronic Components
CECC 00 200 Issue 1	Harmonized System of Quality Assessment for Electronic Components; Qualified Products List
CECC 16 000/I 2nd Issue 1990	Generic specification; Electromechanical all-or-nothing relays; Part 1: General
CECC 16 300 1st Issue 1991	Sectional specification; Electromechanical all-or-nothing heavy load relays of assessed quality
CECC 16 303 Issue 1991	Blank Detail Specification; Electromechanical all-or-nothing heavy load relays of assessed quality
CECC 50 000 Issue 4	Harmonized System of Quality Assessment for Electronic Components; Generic Specification: Discrete Semiconductor Devices
IEC 68-2-14	Basic Environmental Testing Procedures; Part 2: Tests; Test N: Change of temperature
IEC 68-2-20	Basic Environmental Testing Procedures; Part 2: Tests; Test T: Soldering
IEC 68-2-21	Basic Environmental Testing Procedures; Part 2: Tests; Test U: Robustness of terminations and integral mounting devices
IEC 68-2-42	Basic Environmental Testing Procedures; Part 2: Tests; Test Kc: Sulphur dioxide test for contacts and connections
IEC 68-2-43	Basic Environmental Testing Procedures; Part 2: Tests; Test Kd: Hydrogen sulphide test for contacts and connections
IEC 68-2-47	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
MUAHAG-PPL Volume 5	Cenelec Electronic 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

- Contact load: 5 A at 28 V d.c. or 115/200 V a.c. 400 Hz
- Category of contacts: Contact application 4
- Mass (Weight): max. 27 g
- Finish of the relay housing: black painted or black nickel plated
- Finish of the terminals: tinned or gold plated (according to section 2.5)
- Insulation resistance: min. 100 MΩ 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 (26 600 m height)
Between open contacts	1000	350
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:

	Heavy load relay	CECC 16 303-004	G	1	B	Y
Denomination	_____	_____	_____	_____	_____	_____
CECC-Number of the detail specification	_____	_____	_____	_____	_____	_____
Coil voltage (according to section 2.3)	_____	_____	_____	_____	_____	_____
Terminations (according to section 2.5 and annex B)	_____	_____	_____	_____	_____	_____
Mounting (according to 2.6 and annex A)	_____	_____	_____	_____	_____	_____
Assessment level and screening (according to section 2.8)	_____	_____	_____	_____	_____	_____

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

2.3 Coil data

Table 2.

Code letter of coil with/without coil transient suppression device ¹⁾		Type d.c.	Voltage Value V		Resistance at 23±2°C Ohm ±10%	Operate voltage d.c. V max. at 23±2°C 125°C		Release voltage d.c. V max. at 23±2°C 125°C min. at 23±2°C -65°C				Permissible coil suppression output voltage V
-	G	d.c.	28	29 ²⁾	400	14	18	5,5	7,0	2,2	1,5	-
	D		12	14,5	100	6,8	9	3,0	4,5	0,9	0,7	
	B		6	7,3	25	3,5	4,5	1,7	2,5	0,4	0,35	

¹⁾ Screened semiconductors according to CECC 50 000 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 see Annex C.

²⁾ 32 V for 5 min

2.4 Contact data

2.4.1 Contacts

4 change-over (open before close), application category 4

2.4.2 Nominal load life and switching frequency

Table 3.

	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	5 A	5 A	100 000	1,5 s ON / 1,5 s OFF
Inductive	3 A	5 A	20 000	0,5 s ON / 3 s OFF
Motor	2 A 12 A for 70 ms ¹⁾	3 A 15 A for 70 ms ¹⁾	100 000	0,35 s ON / 2 s OFF
Lamp	1 A 12 A for 15 ms ¹⁾	1 A	100 000	2 s ON / 7 s OFF
Intermediate load:				
- resistive	0,5 A	n.a.	10 000	30 s ON / 1,5 s OFF
- inductive	0,3 A	n.a.	2 000	30 s ON / 1,5 s OFF
- resistive	0,1 A	n.a.	10 000	30 s ON / 1,5 s OFF
- resistive	5 A	n.a.	10 000	30 s ON / 1,5 s OFF
Overload	20 A	30 A	50	0,2 s ON / 20 s OFF

1) Starting current (peak value)

Max. contact voltage: 29 V d.c. resp. 115/200 V a.c. 400 Hz
 Min. contact voltage: 2 V d.c.
 Min. contact current: 20 mA

2.4.3 Statical voltage drop per contact

max. 150 mV for brand-new relays, test load max. 6 V d.c., 5 A
 max. 175 mV after life test, test load max. 6 V d.c., 5 A

2.4.4 Mechanical life

400 000 switching cycles at 1,25 A resistive load

2.4.5 Intermediate load, load distribution

Test specimen No.	1	2	3
Changer No.			
1	5 A resistive	0,1 A resistive	0,3 A resistive
2	0,5 A resistive	5 A resistive	0,1 A resistive
3	0,3 A resistive	0,5 A resistive	5 A resistive
4	0,1 A resistive	0,3 A inductive	0,5 A resistive

2.4.6 Timing (over the whole temperature range):

	Coil for d.c. voltage
Operating time max.	6 ms
Release time max.	6 ms
Bounce time max.	1 ms

2.4.7 Time current characteristic

Table 4.

Load A (resistive load)	Load duration max.
10	1 h
15	20 s
37,5	2 s
75	0,53 s

2.5 Terminations

Table 5.

Termination variants	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

Mounting variants	Code letter
without mounting flanges	A
with mounting flanges	B
with side mounting flanges	C
with captive screws	D

Details and drawings according to annex A

2.7 Environmental data

The relays shall withstand the following environmental stresses:

Shock, half sine	Acceleration duration	1 000 m/s ² (100 g) 11 ms
Vibration (sinusoidal)	Amplitude Acceleration	1,5 mm at 10 to 70 Hz 300 m/s ² at 70 to 3 000 Hz
Vibration (random)	Acceleration spectral density	0,4 g ² /Hz 50 to 2 000 Hz
Acceleration (steady state)	Acceleration Duration	200 m/s ² (20 g) 5 min
Mechanical robustness of terminals	Tensile force	45 N + 10 % according to IEC 68-2-21, Test Ua

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 00 114/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
- group C and D: periodic tests.

Unless otherwise stated in this 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 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 6.

5 Marking, packaging 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
- d) Date of manufacture, year/week coded according to IEC 62
- e) Wiring diagram or codification of terminals
- 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 *)
- e) Number of relays

5.3 Packaging

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 00 114/II section 2.7 shall be added.

6 Annexes

Annex A: mounting variants, their dimensions and corresponding code
 Annex B: termination variants, their dimensions and corresponding code
 Annex C: wiring diagram

7 Tests

7.1 Standard conditions for testing:

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

7.2 Mounting of test specimens during the test

The following indications shall apply for mechanic-dynamical 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 been 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 CECC 16 000 section 5.5.1.

These are:

Temperature 15 to 35 °C
 Relative humidity 45 to 75 %
 Air pressure 86 to 106 kPa (860 to 1060 mbar)

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

8 Ordering information

See section 2.2

*) The date of manufacture of the oldest relay within the package shall be stated.

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 ²⁾ 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 Ω
5.8.1 Coil resistance (ND) (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) n.a.	-	-
5.12 Static contact voltage drop (ND)	Application points: all contacts Test load = rated current at 6 V d.c. 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⁾
1) Section numbers for tests and requirements refer to CECC 16 000, if not otherwise specified.		
2) Section number according to this specification.		