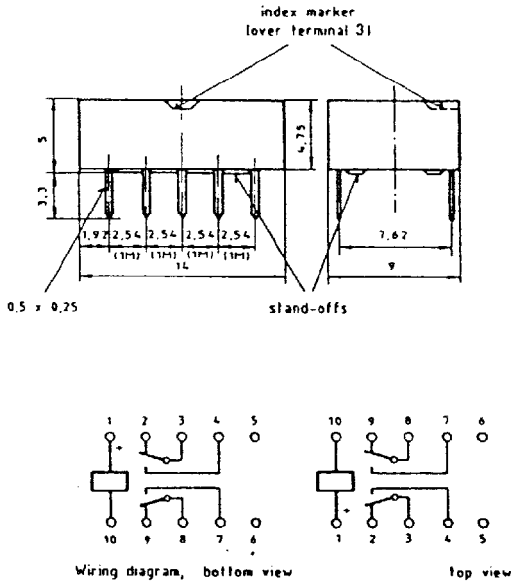


Schweizerischer Elektrotechnischer Verein (SEV) Postfach, CH-8034 Zürich	CECC 16 503 - 001 Issue 1, November 1993 Page 1 of 26 
Specification available from: as shown in CECC 00 200, and Alcatel STR AG, Product Division Relays, Seestr. 295, P.O. Box 220 CH-8804 Au / ZH, Tel.: + 41 1 782 4111 Electronic components of assessed quality in accordance with: EN 116 000 - 1 : 1992 EN 116 500 : 1992	Manufacturer's type: FP2 For ordering information see page 2, clause 2.2 and annex A
Detail specification for electromechanical all-or-nothing TELECOM relays of assessed quality, dual-in-line, with 14 x 9 mm base, 2 change-over contacts Type: Monostable - polarized, change-over contacts Construction: Dual-in-line, with 14 x 9 mm base Plastic sealed case, overall height of 5 mm max. Relay properties RT III For conventional assembling techniques of printed circuit boards using mounting holes.	
Outline drawing resp. wiring diagram Dimensions in mm 	Application: Relays according to this standard are provided for the operation in telecommunication applications. However, as printed circuit board relays they are suitable also for control or switching functions in particular industrial and other applications.
Coil data Rated voltages: 4,5 V d. c. to 48 V d. c. Rated power: 100 mW to 300 mW respectively	
Contact data Change-over break-before-make contacts Rated contact voltage: 125 V d.c. / 110 V a.c. Rated contact current: 1,25 A Rated contact power: 30 W / 50 VA Limiting continuous current: 2 A	
Component climatic category: 55 / 85 / 56 Temperature range - operating ambient temperature: - 55 to + 85 °C - storage temperature: - 55 to + 85 °C	
Information about manufacturers who have components qualified to this detail specification is available in the current CECC 00 200.	

1 Related documents

- EN 116 000 - 1 : 1992 Generic specification for electromechanical all-or-nothing relays, Part I: General
- EN 116 500 : 1992 Sectional specification for electromechanical all-or-nothing telecom relays of assessed quality

2 Characteristic values of the relay

2.1 General data

- Thermal resistance: max. 200 K / W
- Contact application: 0, 1 and 2
- Relay mass: max. 2 g
- Finish of the terminals: SnPb coating; admissible non-presoldered part: max. 0,5 mm to the stand offs' plane
- Insulation resistance: 1000 Mohm min. at 500 V d. c. initial value
100 Mohm min. at 500 V d. c. after tests
- Dielectric strength: see table 1

Table 1 Dielectric test voltages

	Dielectric test V a. c. / d. c. min.	Impulse voltage test 10 μ s / 700 μ s V min.
Opened contact circuits	700 / 1000	1000
Between adjacent contact circuits	1000 / 1500	1500
Coil to contact circuits	1000 / 1500	1500

2.2 CECC type designation (ordering information):

When ordering relays to this specification the following information shall be given:

	Relay	CECC 16 503 - 001 - XYZ
Denomination _____		
CECC number _____		
Type code (CECC registration number) _____		
Rated coil voltage (first letter of identification code of table 2) _____		
Rated power (second letter of identification code of table 2) _____		
Special attributes _____		

For conversion of the CECC type designation into manufacturer's part number marked on the relay see annex A.

2.3 Coil data

Table 2

Identification code	Rated voltage V	Coil resistance at 23 ± 2 °C ohm $\pm 10\%$	Must not operate voltage V at ambient temperature 23 °C	Must operate voltage V at coil temperature		Maximum coil voltage V at 85 °C	Must not release voltage V	Must release voltage V	Rated power mW
				23 °C	85 °C				
A A	4,5	145	0,9	3,15	3,9	6,8	2,0	0,45	140
B A 1	5	178	1,0	3,35	4,2	7,5	2,2	0,5	140
B A	5	178	1,0	3,5	4,4	7,5	2,2	0,5	140
C A	9	574	1,8	6,3	7,0	13,5	4,2	0,9	140
D A	12	1 028	2,4	8,4	10,5	18,0	5,4	1,2	140
E B	24	2 880	4,8	16,8	21,0	36,0	10,8	2,4	200
F C	48	7 680	9,6	33,6	37,8	72,0	21,6	4,8	300

2.4 Contact data

2.4.1 Electrical endurance and switching frequency

Contact failure: Contact-circuit resistance of a closed contact higher than the value stated in 2.4.2, or resistance of an open contact circuit lower than 100 kohm, both more than once per 10^5 cycles or for the minimum switching cycles stated, calculated for each single contact; or a contact fault due to non-opening with a short circuit between break and make contact (resistance value lower than 100 ohm).

Table 3 Loads, contact-circuit resistance limits, switching cycles and frequencies for electrical endurance and overload tests at 70 °C

Loads	Contact-circuit resistance ohm max.	Number of switching cycles min.	Switching frequencies cycles per s max.
contact application 0	1	2 500 000	12,5
resistive - max. contact voltage / max. power	0,5	500 000	3
resistive - max. contact current / max. power	0,5	300 000	3
d.c. open-ended cable	1	2 000 000	12,5
overload 250 V d.c. / 0,24 A	*	100	0,3
overload 24 V a.c. / 2,5 A	*	100	0,3

* no monitoring

2.4.2 Static contact-circuit resistance

- 70 mohm max. initial value at rated voltage
- 10 mohm max. difference of contact-circuit resistance at other coil voltages, between must not release and maximum coil voltage values, initial value
- 0,1 ohm max. during / after environmental tests Nos. 23, 24, 25 and 37
- 1 ohm max. during / after electrical tests Nos. 12, 13, 19 and 22
- 0,5 ohm max. during / after the other electrical endurance and environmental tests at rated voltage, unless otherwise specified in Table 4

2.4.3 Mechanical endurance

10⁷ min. switching cycles

2.4.4 Timing (without suppression diode)

- Operate time: max. 4 ms
- Release time: max. 3 ms
- Bounce time when the contacts are closing: max. 1 ms
- Bounce time when the contacts are opening: max. 0,3 ms
- Transfer time on operation and release (last break contact opens before first make contact closes respectively last make contact opens before first break contact closes): min. 0,25 ms

2.4.5 Timing with suppression diode

- Operate time: max. 8 ms
- Release time: max. 9 ms

2.5 Mounting

The relay terminals are designed to be directly soldered onto the printed circuit board using conventional assembling techniques.

2.6 Environmental data

The relays shall withstand at least the following environmental stresses:

- shock, functional: 490 m/s² (50 g) half sine acceleration, 11 ms duration
- shock, survival: 14 700 m/s² (1500 g) half sine acceleration, 0,5 ms duration
- vibration (sinusoidal): amplitude 1,5 mm or 196 m/s² (20 g), 10 to 500 Hz
- mechanical robustness of terminals:
 - thrust 2 N
 - bending 2 bends
- soldering
 - solderability at 235 °C: 2 s
 - resistance to soldering heat, terminal immersion time for 260 °C: 10 s
 - resistance to soldering heat, terminal immersion time for 350 °C: 3,5 s
- enclosure
 - leakage rate max. 100 Pa · cm³/s
- resistance to cleaning solvents when rubbing with wrapping tissue paper
 - mixture of 1, 1, 2- trichlorotrifluoroethene and 2-propanol 70:30 by weight, at boiling temperature 5 min
 - demineralized or distilled water at 55 °C 5 min
- fire hazard, needle flame min. 20 s

2.7 Package of relays for automatic handling

The outline drawing of stick magazines for automatic handling (to facilitate automatic relay insertion) and its storage capacity see annex B.

3 Qualification approval procedures

- as stated in CECC 00 114 Part II, § 1.4, (1) fixed sample
- sampling and test schedule are specified in table 5
- the tests specified and their order are mandatory

4 Quality conformance inspection

Quality conformance inspection contains the tests stated in table 4

- group A and B: lot-by-lot tests
- group C: periodic tests

Unless otherwise stated in this specification, all tests of table 4 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, § 3.1; the basis for determination of sample size for the quality conformance inspection is the relay quantity produced during 1 week.

4.2 Intervals between tests

- sub-group A4, B1 and B2: minimum once a week
- sub-group C1 and C2: once in 6 months
- sub-group C4 to C6: once in 2 years

5 Marking and documentation

Relays and their packaging 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: ALCATEL SWISS
- b) CECC type designation or manufacturer's part number according to annex A respectively and CECC mark of conformity
- c) Date of manufacture, year / week coded according to IEC 62
- d) Identification of terminal no. 1

5.2 Marking of the package

- a) Manufacturer's name: ALCATEL SWISS
- b) Detail specification reference
- c) CECC type designation or / and manufacturer's part number according to 2.2; CECC in letters or CECC mark of conformity
- d) Date of manufacture, year / week coded according to IEC 62
- e) Number of relays

5.3 Documentation

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

6 Annexes

Annex A: Conversion list CECC type designation and manufacturer's part number.

Annex B: Particulars for test and measurement procedures.

7 Tests

7.1 Standard conditions for testing

If not otherwise stated, all tests shall be performed under standard conditions for testing according to 5.5 of EN 116 000 - 1.

7.2 Mounting of test specimens during the test

The following indications shall apply for mechanic-dynamical tests (shock and vibration):
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 (see also IEC 68-2-47).

7.3 General conditions for testing

Unless otherwise stated, the rated coil voltage specified in table 2 and its suitable polarity shall be used for all tests and its application to the relay.

8 Ordering Information

See 2.2 and annex A.

Table 4 Quality conformance inspection

Group A

Sub-group A0

For all tests in this sub-group: 100%-test. Discard all failed relays. Tests in this sub-group shall be carried out as a screening or sorting function, possibly on-line, prior to the formation of lots from which samples for the other sub-groups are taken. The lot shall be rejected in case of a failure rate of more than 10% cumulative.

Test No.	Test	Test conditions according to EN 116 000 - 1	Performance requirements
A0 - 1	Coil resistance (ND)	Sub-clause 5.8.1	Values according to table 2
A0 - 2	Dielectric test (ND)	Sub-clause 5.9 Application points and test voltage: according to 2.1, table 1 of this specification Duration of test: 1 s	No breakdown or flashover Maximum leakage current: 1 mA
A0 - 3	Contact-circuit resistance, static (ND)	Sub-clause 5.12 Application points: terminals of all closed contacts Test voltage max.: 30 mV d. c. or a. c. Test current max.: 10 mA	Initial value according to 2.4.2 for each contact closing
A0 - 4	Functional tests (ND)	Sub-clause 5.13 Order of steps for monostable non-polarized relays: 1 1,5 x rated voltage for conditioning (not applicable*) 2 Zero voltage 3 Must not operate voltage 4 Must operate voltage 5 Rated voltage 6 Must not release voltage 7 Must release voltage One cycle Contact voltage: max. 6 V Mounting: optional	Values according to table 2 Checking the relay function by monitoring the contacts
A0 - 5	Timing tests (ND)	Sub-clause 5.14.2 Coil voltage: rated voltage Application points: all contacts Contact voltage: max. 6 V Mounting: optional	Values according to 2.4.4 Checking of contact sequencing by measuring the transfer time (see 5.4, note 4 of EN 116 500)
A0 - 6	Sealing (ND)	Sub-clause 5.20.2 Procedure 4	Value according to 2.6

* monitoring of "soft sticking" (contact non-opening)