



Test Report issued under the responsibility of



TEST REPORT

IEC 60898-2

Circuit-Breakers for overcurrent protection for household and similar installation

Part 2: Circuit-breakers for a.c. and d.c. operation

Report Reference No.: 2.03.02598.1.0/ETIMATP10DC/CB

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CB Testing Laboratory: AIT Austrian Institute of Technology GmbH

Address: Giefinggase 2, 1210 Vienna, AUSTRIA

Testing procedure: CBTL TMP WMT SMT RMT

Testing location / address: As above

Applicant's Name: ETI Elektroelement d.d.

Address: Obrezija 5, 1411 Izlake, Slovenia

Test specification:

Standard.....: IEC 60898-2:2000 + Amendment 1:2003

Test procedure: CB

Non-standard test method: N/A

Test Report Form No.: IEC60898_2A

Test Report Form(s) Originator.....: CQC-TILVA

Master TRF: Dated 2006-06

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Test item description	Circuit-breakers for overcurrent protection for household and similar installation
Trademark	ETI
Manufacturer	ETI DE GmbH, Dorfwiesenweg 13, 63828 Kleinkahl, GERMANY
Model/Type reference	ETIMAT P10 DC
Ratings	B-type, C-type / 6 ... 63A (B), 0,5 ... 63A (C) / 220V d.c. (1p), 440V d.c. (2p) Energy limiting class 3

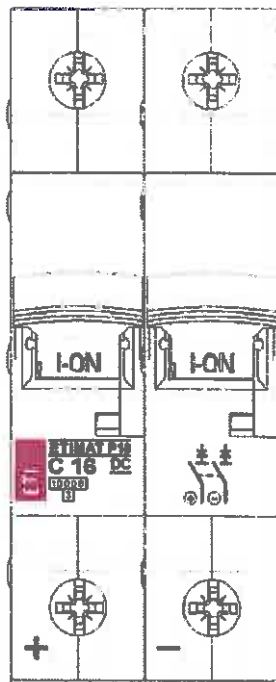
Copy of marking plate:

1p



Copy of marking plate (continued):

2p



3 838895 685005
 ETIMAT P10 B 16 A 1pol DC
 = 220V
 Art.:261600100
 MADE IN GERMANY

Summary of testing:

**A type test was performed
according to
IEC 60898-2:2003 (Ed. 1.1)
in conjunction with
IEC 60898-1:2003 (Ed. 1.2).**

**The circuit breakers for overcurrent protection
for household and similar installation
type
ETIMAT P10 DC
have passed type test successfully.**

General product information:

**Circuit breakers for overcurrent protection
for household and similar installations:**

Circuit breakers for d.c. operation

type

ETIMAT P10 DC

Reference list:

Rated current (A)	Rated voltage (V)	Reference number	
		B-type	C-type
1-pole CB's			
0,5	220 d.c.	-	260501107
1	220 d.c.	-	260101107
2	220 d.c.	-	260020108
4	220 d.c.	-	260401104
6	220 d.c.	260600109	260601100
10	220 d.c.	261000102	261001103
13	220 d.c.	261300101	261301102
16	220 d.c.	261600100	261601101
20	220 d.c.	262000103	262001104
25	220 d.c.	262500108	262501109
32	220 d.c.	263200100	263201101
40	220 d.c.	264000105	264001106
50	220 d.c.	265000106	265001107
63	220 d.c.	266300106	266301107
2-pole CB's			
0,5	440 d.c.	-	260521101
1	440 d.c.	-	260121109
2	440 d.c.	-	260221102
4	440 d.c.	-	260421108
6	440 d.c.	260620103	260621104
10	440 d.c.	261020106	261021107
13	440 d.c.	261320105	261321106
16	440 d.c.	261620104	261621105
20	440 d.c.	262020107	262021108
25	440 d.c.	262520102	262521103
32	440 d.c.	263201104	263221105
40	440 d.c.	264020109	264021100
50	440 d.c.	265020100	265021101
63	440 d.c.	266320100	266321101

List of circuit-breakers:

Rated current (A)		Range of instantaneous tripping / Number of poles			
		B-type		C-type	
0,5	Min *)	-	-	1	2
1	Other *)	-	-	1	2
2	Other *)	-	-	1	2
4	Other *)	-	-	1	2
6	Other *)	1	2	1	2
10	Other *)	1	2	1	2
13	Other *)	1	2	1	2
16	Other *)	1	2	1	2
20	Other *)	1	2	1	2
25	Other *)	1	2	1	2
32	Other *)	1	2	1	2
40	Other *)	1	2	1	2
50	Other *)	1	2	1	2
63	Max *)	1	2	1	2

- *) Min: Minimum rated current of CB's having the same fundamental design
 Other: Other rated current of CB's having the same fundamental design
 Max: Maximum rated current of CB's having the same fundamental design

Test sequences:

Test sequence		Clause or subclause	Test (or inspection)		
A		6	Marking		
		8.1.1	General		
		8.1.2	Mechanism		
		9.3	Indelibility of marking		
		8.1.3	Clearances and creepage distances (external parts only)		
		8.1.6	Non-interchangeability		
		9.4	Reliability of screws, current-carrying parts and connections		
		9.5	Reliability of screw-type terminals for external copper conductors		
		9.6	Protection against electric shock		
		8.1.3	Clearances and creepage distances (internal parts only)		
		9.14	Resistance to heat		
	9.15	Resistance to abnormal heat and to fire			
	9.16	Resistance to rusting			
B		9.7	Dielectric properties and isolating capability		
		9.8	Temperature rise and power loss		
		9.9	28-day test		
C	C ₁	9.11	a.c.		Mechanical and electrical endurance
		9.12.11.2.1			Test at reduced a.c. short-circuit currents
		9.12.12			Verification of circuit-breaker after short-circuit tests
	C ₂	9.11		d.c.	Mechanical and electrical endurance
		9.12.11.2.3			Test at reduced d.c. short-circuit currents
		9.12.11.2.4			Test at small direct currents up to and including 150 A
	9.12.12			Verification of circuit-breaker after short-circuit tests	
D	D ₀	9.10	a.c.	d.c.	Tripping characteristic
	D ₁	9.13			Mechanical stresses
		9.12.11.3	a.c.	d.c.	Short-circuit performance at 1 500 A
	9.12.12			Verification of circuit-breaker after short-circuit tests	
E	E ₁	9.12.11.4.2	a.c.	d.c.	Service short-circuit capacity (I_{cs})
		9.12.12			Verification of circuit-breaker after short-circuit tests
	E ₂	9.12.11.4.3	a.c.	d.c.	Performance at rated short-circuit capacity (I_{en})
	9.12.12			Verification of circuit-breaker after short-circuit tests	
NOTE With the agreement of the manufacturer the same samples may be used for more than one sequence.					

List of samples, tested according to simplified test procedure (C-type tested first):

Rated current (A)		Test sequence / Tested samples (according to number of poles and according to range of instantaneous tripping current)								
		No. of poles	A	B ^{a)}	C1	C2	D0+D1	D0 ^{b)}	E1	E2
0,5	Min ^{*)}	1	-	-	-	-	-	C	C	C
		2	-	-	-	-	-	-	C	C
1	Other ^{*)}	1	-	-	-	-	-	C	-	-
2	Other ^{*)}	1	-	-	-	-	-	C	-	-
4	Other ^{*)}	1	-	-	-	-	-	C	-	-
6	Other ^{*)}	1	-	-	-	-	-	C, B	-	-
10	Other ^{*)}	1	-	-	-	-	-	C, B	-	-
13	Other ^{*)}	1	-	-	-	-	-	C, B	-	-
16	Other ^{*)}	1	-	-	-	-	-	C, B	C	C
		2	-	-	-	-	-	-	C	C
20	Other ^{*)}	1	-	-	-	-	-	C, B	-	-
25	Other ^{*)}	1	-	-	-	-	-	C, B	-	-
32	Other ^{*)}	1	-	-	-	-	-	C, B	C	C
		2	-	-	-	-	-	-	C	C
40	Other ^{*)}	1	-	-	-	-	-	C, B	C	C
		2	-	-	-	-	-	-	C	C
50	Other ^{*)}	1	-	-	-	-	-	C, B	-	-
63	Max ^{*)}	1	C	C, B	C	-	C	B	C	C
		2	C	C, B	C	-	C	B	C	C

^{*)} Min: Minimum rated current of CB's having the same fundamental design
 Other: Other rated current of CB's having the same fundamental design
 Max: Maximum rated current of CB's having the same fundamental design

^{a)} Only the tests of 9.8 are required for instantaneous tripping current B

^{b)} Only the tests of 9.10.2 are required for instantaneous tripping current B

Remark: There are different maximum I^t values according to energy limiting class 3:

- 80000A²s for C-types with rated currents ≤ 16A
- 100000A²s for C-types with rated currents >16A to 32A
- 120000A²s for C-types with rated current 40A
- 145000A²s for C-types with rated currents >40A to 63A)

Therefore the test sequences E1 and E2 have also been performed at 16A, 32A and 40A CB's.

Test item particulars:

Type of circuit-breaker : B-type, C-type
 Number of poles : 1p, 2p
 Protection against external influences : Enclosed
 Method of mounting : Panel board type
 Method of connection : Not associated with the mechanical mounting
 Suitability for insulation : Suitable
 Instantaneous tripping current : B, C
 Ambient air temperature : -5°C to +40°C
 Energy limiting class : 3
 Rated short-circuit capacity : 10000A
 Type of terminals : Pillar terminals
 Value of rated operational voltage : 220V d.c. (1p), 440V d.c. (2p)
 Value of rated current : 6A ... 63A (B), 0,5A ... 63A (C)
 Nature of supply : DC T₄

Possible test case verdicts:

Test case does not apply to the test object : N/A
 Test item does meet the requirement : P(ass)
 Test item does not meet the requirement : F(ail)

Testing:

Date of receipt of test item : 07/2013
 Date(s) of performance of test : 07/2013 to 11/2013

General remarks

The test results presented in this report relate only to the object tested.
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"(see Enclosure #)" refers to additional information appended to the report.
 "(see appended table)" refers to a table appended to the report.

Throughout this report a comma is used as the decimal separator.

Type ETIMAT P10 DC / C0,5 / 1-pole

Test sequences performed according to simplified test procedure:

Test sequence D0:	1 sample
Test sequence E1:	3 samples
Test sequence E2:	3 samples