



Test Report issued under the responsibility of:



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**TEST REPORT
IEC/EN 60898-1
Circuit-breakers for over current protection for
household and similar installations**

Report Reference No.....: 3303848.52
Date of issue.....: 2012-10-12
Total number of pages.....: 151

CB Testing Laboratory.....: DEKRA Testing Services (Zhejiang) Co., Ltd.
Address.....: No.5, Changjiang Road, Great Bridge Industrial Park, North
Baixiang, Wenzhou, Zhejiang, 325603 P.R. China

Applicant's name.....: HIMEL TECHNOLOGY, S.L.
Address.....: calle Bac de Roda, No.52 edificio A 08019, Barcelona, Spain

Test specification:
Standard.....: IEC 60898-1:2002 (1st Edition) + A1:2002 + A2:2003 and/or
 EN 60898-1:2003 + A1:2004 + A11:2006
Test procedure.....: CB
Non-standard test method.....: N/A

Test Report Form No.....: IECEN60898_1C
Test Report Form(s) Originator.....: OVE
Master TRF.....: Dated 2007-12

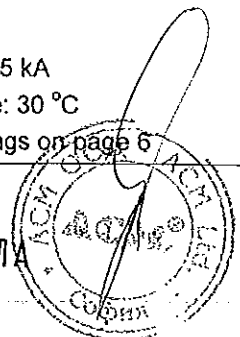
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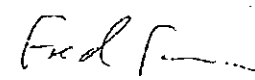
Test item description.....: Circuit breaker for overcurrent protection
Trade Mark.....: Himel
Manufacturer.....: DELIXI ELECTRIC (NINGBO) LTD
No. 1958, Jiangnan Road, National Hi-Tech Industrial Development
Zone, Ningbo, Zhejiang, China
Model/Type reference.....: HDB9H
Ratings.....: 1 A, 2 A, 4 A, 6 A, 10 A, 16 A, 20 A, 25 A, 32 A, 40 A, 50 A, 63 A
230 / 400 V for 1P, 400 V for 2P / 3P / 4P, All poles are protected
B, C and D type,
Uimp: 6 kV,
Icn=Icn1: 10 kA, Ics: 7,5 kA
Reference temperature: 30 °C
See more detailed ratings on page 6

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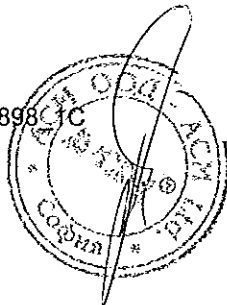
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ВЯНО С ОРИГИНАЛА



Testing procedure and testing location:	
<input type="checkbox"/> CB Testing Laboratory:	N/A
Testing location/ address	N/A
<input type="checkbox"/> Associated CB Laboratory:	N/A
Testing location/ address	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
<input type="checkbox"/> Testing procedure: TMP	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
Testing location/ address	N/A
<input checked="" type="checkbox"/> Testing procedure: WMT	DELIXI LABORATORY
Tested by (name + signature).....	Feng Qiang 
Witnessed by (+ signature)	Eric Wang 
Approved by (+ signature).....	Fred Fu 
Testing location/ address	Delixi High Tech Industrial Park, Liushi Town, Yueqing City, Zhejiang Province, China 325604
<input type="checkbox"/> Testing procedure: SMT	N/A
Tested by (name + signature).....	N/A
Approved by (+ signature).....	N/A
Supervised by (+ signature).....	N/A
Testing location/ address	N/A
<input type="checkbox"/> Testing procedure: RMT	N/A
Tested by (name + signature).....	N/A
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Supervised by (+ signature).....	N/A
Testing location/ address	N/A

TRF No. IECEN60898C1C



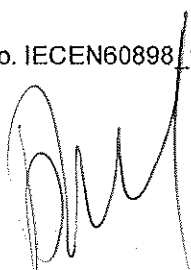
ВЕРНО С ОРИГИНАЛА

Summary of testing:									
Tests performed:									
The following samples were chosen for the type test according to annex ZA of EN 60898-1 and annex C of IEC/EN 60898-1:									
Test sequence	D type			C type			B type		
	1P	2P	4P	1P	2P	4P	1P	2P	4P
A	63 A x 1		63 A x 1						
B	63 A x 3		63 A x 3				63 A x 3 32 A x 3		63 A x 3 32 A x 3
C1				63 A x 3		63 A x 3			
C2	63 A x 3	63 A x 2	63 A x 1						
D0	1 A x 1 2 A x 1 4 A x 1 6 A x 1 10 A x 1 16 A x 1 20 A x 1 25 A x 1 32 A x 1 40 A x 1 50 A x 1			1 A x 1 2 A x 1 4 A x 1 6 A x 1 10 A x 1 16 A x 1 20 A x 1 25 A x 1 32 A x 1 40 A x 1 50 A x 1 63 A x 1			1 A x 1 2 A x 1 4 A x 1 6 A x 1 10 A x 1 16 A x 1 20 A x 1 25 A x 1 32 A x 1 40 A x 1 50 A x 1 63 A x 1		
D0 + D1	63 A x 3		63 A x 6						
E1	63 A x 6 1 A x 6	63 A x 3 1 A x 3	63 A x 3 1 A x 3						
E2	63 A x 7 1 A x 7	63 A x 3 1 A x 3	63 A x 3 1 A x 3						
E2*				40 A x 3	40 A x 3	40 A x 3	40 A x 3 16 A x 3	40 A x 3	40 A x 3

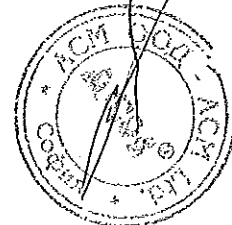
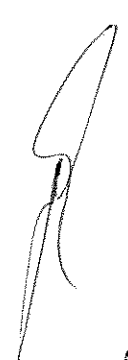
Note:

- The MCBs from 1 A - 32 A have same fundamental design, MCBs from 40 - 63 A have same fundamental design, the difference is material of the terminal, B 32A was subjected to additional temperature rise.
- "*" To determine the energy limiting class according to annex ZA of EN 60898-1.
- The measured i^2t values of MCBs C40 with 1P, 2P and 4P were below the limit both of C32 and C16 with 1P, 2P and 4P. So tests of MCBs C40 were deemed to cover tests of C32 and C16.
The measured i^2t values of MCBs B40 with 1P, 2P and 4P were below the limit of B32 with 1P, 2P and 4P and B16 with 2P and 4P. So tests of MCBs B40 were deemed to cover tests of B32 and B16 except B16 with 1P.

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ВЕРНО С ОРИГИНАЛА

Testing location:

Test location for sequence A, B, C1, C2 and D0+D1:

DELIXI LABORATORY

Delixi High Tech Industrial Park, Liushi Town, Yueqing City, Zhejiang Province, China

Test Location for sequence E1 and E2:

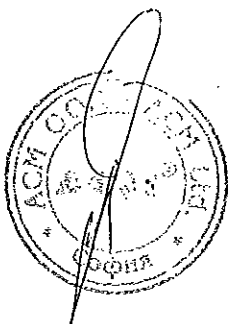
Zhejiang Fangyuan Electrical Equipment Testing Co., Ltd.

West Zhonghuan Road, Jiaying City, Zhejiang Province, China

Summary of compliance with National Differences:

N/A

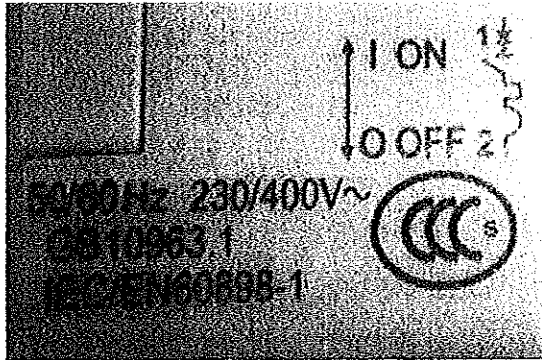
TRF No. IECEN60898_1C



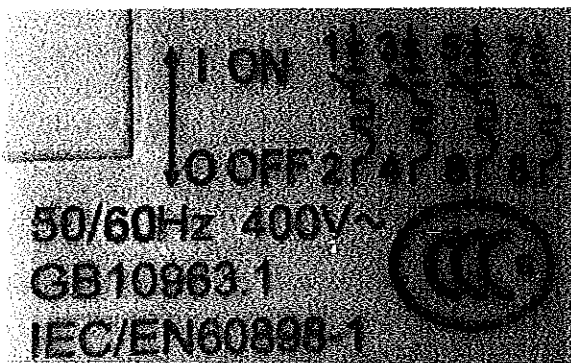
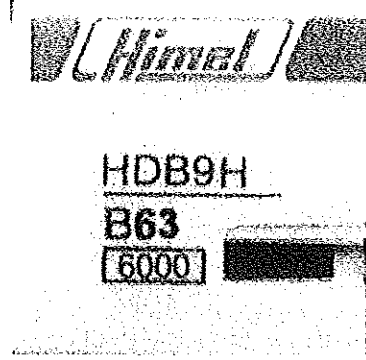
ВЯРНО С ОРИГИНАЛА

Copy of marking plate:

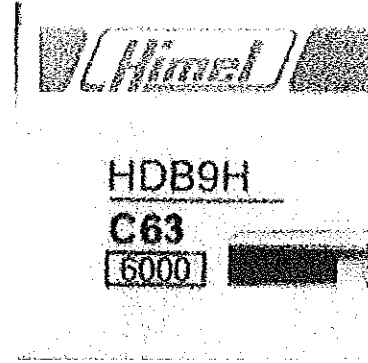
Example of the markings:



Marking for 1P circuit-breaker



Marking for 4P circuit-breaker



Note:

The markings for circuit breakers are same except the rated current, the tripping characteristic type and the number of poles maybe different.

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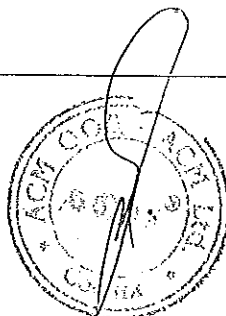
ВЯРНО С ОРИГИНАЛА



CA

Test item particulars..... :	Circuit breaker for overcurrent protection
Type of circuit-breaker	HDB9H
Number of poles	<input checked="" type="checkbox"/> 1-P <input type="checkbox"/> 1-P+N (N pole has the protection) <input checked="" type="checkbox"/> 2-P <input checked="" type="checkbox"/> 3-P <input type="checkbox"/> 3-P+N (N pole has the protection) <input checked="" type="checkbox"/> 4-P <input type="checkbox"/> Other
Protection against external influences	<input type="checkbox"/> enclosed <input checked="" type="checkbox"/> unenclosed
Method of mounting	<input type="checkbox"/> surface <input checked="" type="checkbox"/> flush <input checked="" type="checkbox"/> panel board / distribution board
Method of connection	<input checked="" type="checkbox"/> not associated with the mechanical mounting <input type="checkbox"/> associated with the mechanical mounting
Instantaneous tripping current	<input checked="" type="checkbox"/> B <input checked="" type="checkbox"/> C <input checked="" type="checkbox"/> D (The upper value of instantaneous tripping is 14 In)
Ambient air temperature (°C)	<input checked="" type="checkbox"/> 30°C <input type="checkbox"/> 40°C <input type="checkbox"/> Other _____°C
Energy limiting class	<input type="checkbox"/> Class 1 <input type="checkbox"/> Class 2 <input checked="" type="checkbox"/> Class 3 for circuit breakers with In ≤ 40 A <input checked="" type="checkbox"/> Not applicable for circuit breakers with In > 40 A (no limits specified by the standard) (Class 3 for B and C type 1 A to 40 A circuit breakers)
Rated short-circuit capacity (A)	<input type="checkbox"/> 1,5 kA <input type="checkbox"/> 3 kA <input type="checkbox"/> 4,5 kA <input type="checkbox"/> 6 kA <input checked="" type="checkbox"/> 10 kA <input type="checkbox"/> 15 kA <input type="checkbox"/> 20 kA <input type="checkbox"/> 25 kA
Type of terminal	<input checked="" type="checkbox"/> screw ^{a)} <input type="checkbox"/> pillar ^{a) b)} <input type="checkbox"/> cage ^{a) b)} <input type="checkbox"/> lug <input type="checkbox"/> screw less ^{a)} <input type="checkbox"/> flat quick connect ^{a)} <input type="checkbox"/> plug-in <input type="checkbox"/> screw-in ^{a)} copper conductors ^{b)} aluminium conductors***
Value of rated operational voltage	<input type="checkbox"/> 120 V ** <input type="checkbox"/> 230 V <input type="checkbox"/> 240 V ** for 1P + N circuit-breakers <input type="checkbox"/> 120/240 V ** <input checked="" type="checkbox"/> 230/400 V for 1P circuit breakers <input checked="" type="checkbox"/> 400 V for 2P, 3P and 4P circuit-breakers <input type="checkbox"/> 240/415 V <input type="checkbox"/> 415 V
Value of rated current	1 A, 2 A, 4 A, 6 A, 10 A, 16 A, 20 A, 25 A, 32 A, 40 A, 50 A, 63 A
Value of rated frequency	<input checked="" type="checkbox"/> 50 Hz <input checked="" type="checkbox"/> 60 Hz
Rated impulse withstand voltage (Uimp)	<input type="checkbox"/> 2,5 kV** <input checked="" type="checkbox"/> 6 kV <input type="checkbox"/> declared ___ kV
Material group and CTI declared by manufacturer..... :	<input type="checkbox"/> Group I, (600 V ≤ CTI) <input type="checkbox"/> Group II, (400 V ≤ CTI < 600 V) <input checked="" type="checkbox"/> Group IIIa, (175 V ≤ CTI < 400 V)
Remark: ** delete for EN and *** only for EN	

TRF No. IECEN60898_1C



ВЯРНО С ОРЖИНАЛА

**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.

Note: This TRF includes EN Group Differences together with National Differences and Special National Conditions, if any. All Differences are located in the Appendix to the main body of this TRF.

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

This report is based on report 3303848.50, it is issued due to that:

1. Applicant is added
2. The model reference/trade mark is added: HDB9H the model is identical to CDB9H in report 3303848.50 issued on 2012-10-10.

The basic part of this test report covers the evaluation of the IEC requirements.

Annex 1 of this test report covers the evaluation of the CENELEC common modifications.

Although it is not mentioned on first page, the following standards were also taken into consideration, no deviation was found:

- EN 60898-1/A12: 2008

General product information:

See page 6 for the detailed technical data.

Grid distance "a": 35 mm

Nominal diameter of thread of terminal screw:

M5 for 1 - 32 A circuit breakers,

M6,5 for 40 - 63 A circuit breakers

The terminal test (cl. 9.4, 9.5, 9.16) on terminal with M5 screw was conducted in test report No. 3303848.53, which is for the type test of HDB9N circuit breakers, since HDB9H circuit breakers and HDB9N circuit breakers have same terminals

Factory:

DELIXI ELECTRIC (NINGBO) LTD

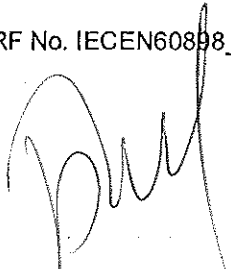
No. 1958, Jiangnan Road, National Hi-Tech Industrial Development Zone

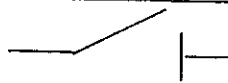
Ningbo, Zhejiang

China

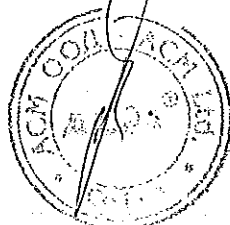


TRF No. IECEN60898_1C



IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	TESTS „A“ 1 SAMPLE	#01	P
		D63, 1-P	
6 *)	MARKING AND OTHER INFORMATION		
<i>*see Annex 1</i>	Circuit-breaker marked with:		P
	a) Manufacturer's name or trade mark	Himel	P
	b) Type designation, catalogue number or other identification number	HDB9H	P
	c) Rated voltage (V).....	230 / 400 V~	P
	d) Rated current (A).....	63 A	P
	e) Rated frequency (Hz)	50 / 60 Hz	P
	f) Rated short circuit capacity (A)	10000 A	P
	g) Wiring diagram		P
	h) Ambient air temperature, if different from 30°C		N/A
	i) Degree of protection, if different from IP20		N/A
	j) For D-type circuit-breakers: the maximum instantaneous tripping current, if higher than 20 In(see table 2)		N/A
	k) Rated impulse withstand voltage Uimp if it is 2,5 kV	6 kV	P
	Symbol for instantaneous tripping current	D	P
	Symbol for nature of supply	~	P
	Marking for rated current and for instantaneous tripping shall be readily visible when CB is installed		P
	Other marking shall be easily discernible		P
	The suitability for isolation, which is provided by all circuit-breakers of this standard, may be indicated by the symbol on the device		P
	Energy limiting class	3 for B / C type circuit breakers with $1 A \leq I_n \leq 40 A$ Not applicable for D type circuit breakers and B / C type circuit breakers with $I_n > 40 A$	P
	I ² t characteristic (documentation)		P
	Symbols on supply and load terminal		N/A
	Terminal for neutral conductor N		N/A
	Earthing terminal if any (IEC 60417-5019)		N/A

TRF No. IECEN60898_1C

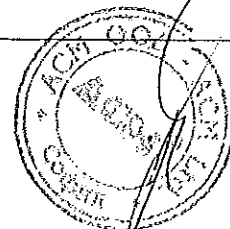


ВЯРНО С ОРГИНАЛА

IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	On - off position shall be clearly indicated - 0 I -		P
	For push-button CB the off push-button shall either be red or be marked with the symbol '0'		N/A
	Red not used for other push-button		N/A
	This symbol shall be easily discernible		P
	For CB with multiple current ratings, the maximum value is marked, the adjusted value indicated without ambiguity		N/A
	Marking shall be indelible and easily legible (not on removable parts), 15 s with water, 15 s with hexane (see cl. 8.3)		P
8.	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		
8.1.1	General		P
8.1.2	Mechanism		P
	The moving contact shall be mechanically coupled so that all poles make and break together, whether operated manually or automatically, even if an overload occurs on one pole only		P
	The switched neutral shall close before and open after the protected pole (s)		N/A
	Neutral pole having adequate making and breaking capacity and CB with independent manual operation: all poles operate together including neutral pole		N/A
	CB shall have a trip free mechanism		P
	It shall be possible to switch the CB on and off by hand		P
	No intermediate position of the contacts		P
	Position of contacts shall be indicated		P
	Indication visible from the outside		P
	If the indication is on the actuating means, it shall, when released, automatically take up or stay in the position corresponding to that of the moving contacts; operating means shall have two different rest positions, except that, for automatic operation, a third distinct rest position may be provided		N/A
	If a separate mechanical indicator is used to indicate the position of the main contacts, colour red shall be used for the on position and green for the off position.		P

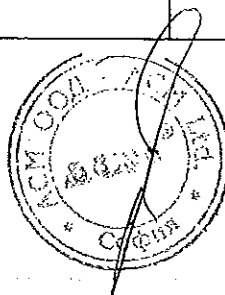
TRF No. IECEN60898_1C

ВЕРНО С ОРИГИНАЛА



IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	The action of the mechanism shall not be influenced by the position of enclosures		P
	If the cover is used as a guiding means for push-button, it shall not be possible to remove this button from the outside		N/A
	Operating means securely fixed, not possible to remove them without a tool		P
	For the up-down operating means the contacts shall be closed by the up movement.		P
8.1.3	Clearances and creepage distances		P
8.1.3	Clearances [mm] see table 4		P
	1.between live parts (of the main circuits) which are separated when the CB is in off position	5,6 mm	P
	2.between live parts of different polarity.....	10,2 mm	P
	3.between circuits supplied from different sources, one of which being PELV or SELV.....		N/A
	4. between live parts and		P
	- accessible surfaces of operating means.....	9,3 mm	P
	- screws or other means for fixing covers		N/A
	- surface on which the base is mounted.....	5,1 mm	P
	- screws or other means for fixing the circuit breaker.....		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts	17,0 mm	P
	- metal frames supporting the base (flush-type) ..	5,1 mm	P
	5.between metal parts of mechanism and:		N/A
	- accessible metal parts.....		N/A
	- screws or other means for fixing the circuit breaker.....		N/A
	- metal frames supporting the base (flush type)...		N/A
8.1.3	Creepage distances [mm] (see table 4)		P
	Material group	<input checked="" type="checkbox"/> IIIa <input type="checkbox"/> II <input type="checkbox"/> I	P
	1.between live parts (of the main circuits) which are separated when the CB is in off position	9,0 mm	P
	2.between live parts of different polarity.....	10,2 mm	P
	3.between circuits supplied from different sources, one of which being PELV or SELV.....		N/A
	4. between live parts and		P

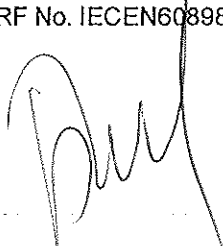
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ВЕРНО С ОРИГИНАЛА

IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- accessible surfaces of operating means.....:	9,3 mm	P
	- screws or other means for fixing covers.....:		N/A
	- surface on which the base is mounted.....:	5,1 mm	P
	- screws or other means for fixing the circuit breaker.....:		N/A
	- metal covers or boxes.....:		N/A
	- other accessible metal parts.....:	17,0 mm	P
	- metal frames supporting the base (flush-type) ..:	5,1 mm	P
	5.between metal parts of mechanism and:		N/A
	- accessible metal parts.....:		N/A
	- screws or other means for fixing the circuit breaker.....:		N/A
	- metal frames supporting the base (flush type)..:		N/A
8.1.4	Screws, current-carrying parts and connections		P
8.1.4.1	Connections, withstand mechanical stresses occurring in normal use		P
	Screws for mounting of the CB not of the thread-cutting type		P
	Test according to cl. 9.4:		P
	- 10 times (screw Ø / torque Nm)		N/A
	- 5 times (screw Ø / torque Nm)	3,5 Nm	P
	Plug in connections tested by plugging in and pulling out five times		N/A
	After test connections have not become loose nor electrical function impaired		P
8.1.4.2	Screws with a thread of insulating material ensured correct introduction		N/A
8.1.4.3	Electrical connection: contact pressure not transmitted through insulating material, unless there is sufficient resilience in the metallic parts		P
	- copper		P
	- alloy 58% copper for worked cold parts		N/A
	- alloy 50% copper for other parts		N/A
	- other metal		N/A
8.1.5	Terminals for external conductors		P
8.1.5.1	Terminals ensure correct connection of conductors (Test acc. to cl. 9.5 or annex J or K)	Clause 9.5	P

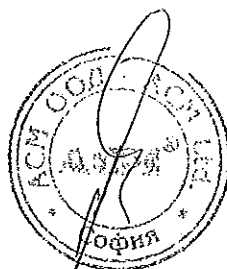
TRF No. IECEN60898_1C




ВЯРНО С ОРИГИНАЛА

IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.5	Torque Ø 6,5 mm, 3,5 Nm max. sect. 25 mm ²		P
9.5.1	Pull test: Torque (2/3)= 2,33 Nm min sect. 1 mm ² Pull 50 N for 1 min Torque (2/3)= 2,33 Nm max sect. 25 mm ² Pull 100 N for 1 min During the test conductor does not move noticeably		P
9.5.2	min sect. 1 mm ² max sect. 25 mm ² Torque (2/3)= 2,33 Nm The conductor shows no damage		P
9.5.3	Nominal cross-section from 1 mm ² to 25 mm ² min No of wires 7 Ø of wires 0,67 mm Torque (2/3) = 2,33 Nm max No of wires 7 Ø of wires 2,14 mm Torque (2/3) = 2,33 Nm After the test no wire escaped outside		P
8.1.5.2	Terminals allow the connection of conductors of the following cross-sectional areas: (table 5)		P

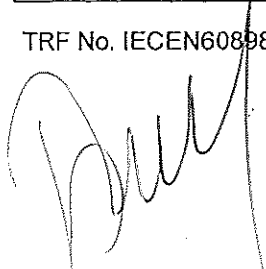
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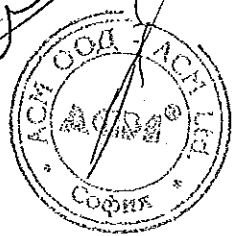
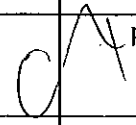
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IEC/EN 60 898-1																														
Clause	Requirement + Test	Result - Remark	Verdict																											
	<table border="1"> <tr> <td>Rated current (A)</td> <td colspan="2">Range of nominal cross sections to be clamped (mm²)</td> </tr> <tr> <td>≤ 13</td> <td>1</td> <td>to 2,5</td> </tr> <tr> <td>> 13 ≤ 16</td> <td>1</td> <td>to 4</td> </tr> <tr> <td>> 16 ≤ 25</td> <td>1,5</td> <td>to 6</td> </tr> <tr> <td>> 25 ≤ 32</td> <td>2,5</td> <td>to 10</td> </tr> <tr> <td>> 32 ≤ 50</td> <td>4</td> <td>to 16</td> </tr> <tr> <td>> 50 ≤ 80</td> <td>10</td> <td>to 25</td> </tr> <tr> <td>> 80 ≤ 100</td> <td>16</td> <td>to 35</td> </tr> <tr> <td>> 100 ≤ 125</td> <td>25</td> <td>to 50</td> </tr> </table>	Rated current (A)	Range of nominal cross sections to be clamped (mm ²)		≤ 13	1	to 2,5	> 13 ≤ 16	1	to 4	> 16 ≤ 25	1,5	to 6	> 25 ≤ 32	2,5	to 10	> 32 ≤ 50	4	to 16	> 50 ≤ 80	10	to 25	> 80 ≤ 100	16	to 35	> 100 ≤ 125	25	to 50	1 mm ² to 25 mm ²	P
Rated current (A)	Range of nominal cross sections to be clamped (mm ²)																													
≤ 13	1	to 2,5																												
> 13 ≤ 16	1	to 4																												
> 16 ≤ 25	1,5	to 6																												
> 25 ≤ 32	2,5	to 10																												
> 32 ≤ 50	4	to 16																												
> 50 ≤ 80	10	to 25																												
> 80 ≤ 100	16	to 35																												
> 100 ≤ 125	25	to 50																												
	It is required that, for current ratings up to and including 50 A terminals are designed to clamp solid conductors as well as rigid stranded conductors; the use of flexible conductors is permitted		P																											
	Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm ² up to 6 mm ² are designed to clamp solid conductors only.		N/A																											
8.1.5.3	Means for clamping the conductors in the terminals not serve to fix any other component (See test sub-clause 9.5)		P																											
8.1.5.4	Terminals for In ≤ 32 A allow the connection of conductors without special preparation		P																											
8.1.5.5	Terminals shall have adequate mechanical strength; ISO thread or equivalent (See tests of sub-clause 9.4 and 9.5.1)		P																											
8.1.5.6	Clamping of conductor without damage to the conductor (See test of sub-clause 9.5.2)		P																											
8.1.5.7	Clamping of conductor between metal surfaces (See tests of sub-clause 9.4 and 9.5.1)		P																											
8.1.5.8	Conductor shall not slip-out when the clamping screw or nuts are tightened (See test of sub-clause 9.5.3)		P																											
8.1.5.9	Terminals shall be properly fixed. No work loose when the clamping screws or nuts are tightened or loosened (See test of sub-clause 9.4)		P																											
8.1.5.10	Clamping screws or nuts of terminals for protective conductors adequately secured against accidental loosening		P																											
8.1.5.12	Screws and nuts of terminals for external conductors shall be in engagement with a metal thread, and the screws shall not be of tapping screw type		P																											

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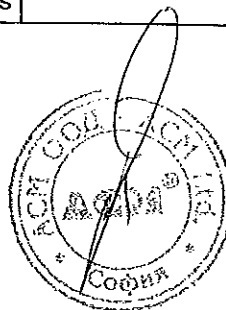
ВЕРНО С ОРИГИНАЛА


IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.1.6	Non interchangeability		N/A
	For circuit-breakers intended to be mounted on bases forming a unit therewith (plug-in or screw-in type) it shall not be possible, without the aid of a tool, to replace a circuit-breaker when mounted as for normal use by another of the same make having a higher rated current, compliance is checked by inspection		N/A
8.1.7	Plug-in type circuit-breakers, the holding in position of which does not depend solely on their plug-in connection(s), shall be reliable and have adequate stability		N/A
8.1.7.1	Plug-in type circuit-breakers, the holding in position of which does not depend solely on their plug-in connection(s) Compliance of the mechanical mounting is checked by the relevant test 9.13		N/A
8.1.7.2	Plug-in type circuit-breakers, the holding in position of which does depend solely on their plug-in connection(s) Compliance of the mechanical mounting is checked by the relevant test 9.13		N/A
8.2	Protection against electric shock		P
	Live parts not accessible in normal use		P
	For CB, other than plug-in type, external parts, other than screws and other means for fixing covers, which are accessible shall be of insulating material		P
	Unless the live parts are within an internal enclosure of insulating material: Lining - reliable fixed, - adequate thickness and - mechanical strength		N/A
	Inlet openings for cables shall be in insulating material or be provided with bushings or similar devices in insulating material Such device - shall be reliable fixed - shall have adequate mechanical strength		N/A
	For plug-in CB, external parts, other than screws and other means for fixing covers, which are accessible shall be in insulating material		N/A
	Metallic operating means insulated from live parts		N/A

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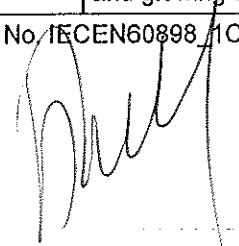
ВАРНО С ОРИГИНАЛА



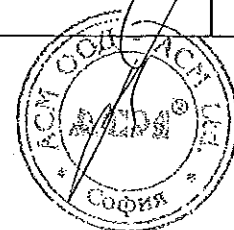


IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Metal parts of the mechanism not accessible and insulated from accessible metal parts, metal frames (for flush-type), screws or other means for fixing the base		P
	Replacement of plug-in CB possible without touching live parts		N/A
	Lacquer or enamel not considered		P
9.6	Test of protection against electric shock		P
	Use of test finger so designed that each jointed can be turned through an angle of 90° with respect to the finger		P
	Circuit-breaker with enclosures of thermoplastic material are additional tested at 35 °C for 1 min with a force of 75 N		P
7.10	Resistance to heat		P
	CB sufficiently resistant to heat		P
9.14	Test of resistance to heat		P
9.14.1	Test:		P
	- without removable covers 1 h (100 ± 2) °C		P
	- removable covers 1 h (70 ± 2) °C		N/A
	After the test no access to live parts, marking still legible		P
9.14.2	Ball pressure test for external parts of insulating material (parts retaining current-carrying parts and parts of the protective circuit in position) T = 125 °C Ø of impression ≤ 2 mm	Enclosure 125 °C 0,68 mm	P
9.14.3	Ball pressure test for external parts of insulating material (parts not retaining current-carrying parts and parts of the protective circuit in position) T = (70 ± 2)°C or T = ___ °C = (40 ± 2)°C + max. temperature rise of sub-clause 8.8 Ø of impression ≤ 2 mm	Operating means 83 °C 0,16 mm	P
8.11	Resistance to abnormal heat and to fire		P
	External parts of insulating material shall not ignite or spread fire under fault or overload conditions		P
9.15	Resistance to abnormal heat and to fire		P
	Glow wire test: No visible flame, no sustained glowing or flames and glowing extinguish within 30 s		P

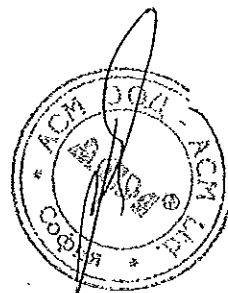
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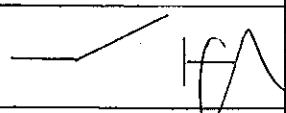
ВЯРНО С ОРИГИНАЛА



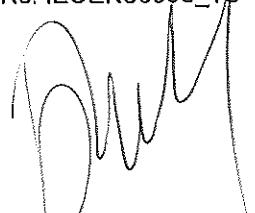
IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	external parts retaining current-carrying parts and parts of the protective circuit in position (960 ± 15)°C	Enclosure	P
	all other external parts (650 ± 10)°C	Operating means	P
8.12	Resistance to rusting		P
	Ferrous parts adequately protected against rusting		P
9.16	Test of resistance to rusting:		P
	- 10 min immersed in a cold chemical degreaser such as methyl-chloroform or refined petrol		P
	- 10 min immersed in a 10% solution of chloride in water at 20°C		P
	- 10 min at 95% humidity at 20°C		P
	- 10 min at 100°C		P
	No sign of rust		P



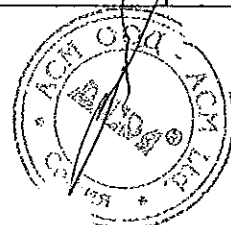


IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	TESTS „A“ 1 SAMPLE	#02	P
		D63, 4-P	
6 *)	MARKING AND OTHER INFORMATION		
<i>*see Annex 1</i>	Circuit-breaker marked with:		P
	a) Manufacturer's name or trade mark	Himel	P
	b) Type designation, catalogue number or other identification number	HDB9H	P
	c) Rated voltage (V).....	400 V~	P
	d) Rated current (A)	63 A	P
	e) Rated frequency (Hz)	50 / 60 Hz	P
	f) Rated short circuit capacity (A)	10000 A	P
	g) Wiring diagram		P
	h) Ambient air temperature, if different from 30°C		N/A
	i) Degree of protection, if different from IP20		N/A
	j) For D-type circuit-breakers: the maximum instantaneous tripping current, if higher than 20 In(see table 2)		N/A
	k) Rated impulse withstand voltage Uimp if it is 2,5 kV	6 kV	P
	Symbol for instantaneous tripping current	D	P
	Symbol for nature of supply	~	P
	Marking for rated current and for instantaneous tripping shall be readily visible when CB is installed		P
	Other marking shall be easily discernible		P
	The suitability for isolation, which is provided by all circuit-breakers of this standard, may be indicated by the symbol on the device		P
	Energy limiting class	3 for B / C type circuit breakers with 1 A ≤ In ≤ 40 A Not applicable for D type circuit breakers and B / C type circuit breakers with In > 40 A	P
	I ² t characteristic (documentation)		P
	Symbols on supply and load terminal		N/A
	Terminal for neutral conductor N		N/A
	Earthing terminal if any (IEC 60417-5019)		N/A

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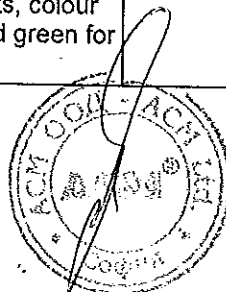
ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	On - off position shall be clearly indicated - 0 I -		P
	For push-button CB the off push-button shall either be red or be marked with the symbol '0'		N/A
	Red not used for other push-button		N/A
	This symbol shall be easily discernible		P
	For CB with multiple current ratings, the maximum value is marked, the adjusted value indicated without ambiguity		N/A
	Marking shall be indelible and easily legible (not on removable parts), 15 s with water, 15 s with hexane (see cl. 8.3)		P
8.	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		
8.1.1	General		P
8.1.2	Mechanism		P
	The moving contact shall be mechanically coupled so that all poles make and break together, whether operated manually or automatically, even if an overload occurs on one pole only		P
	The switched neutral shall close before and open after the protected pole (s)		N/A
	Neutral pole having adequate making and breaking capacity and CB with independent manual operation: all poles operate together including neutral pole		N/A
	CB shall have a trip free mechanism		P
	It shall be possible to switch the CB on and off by hand		P
	No intermediate position of the contacts		P
	Position of contacts shall be indicated		P
	Indication visible from the outside		P
	If the indication is on the actuating means, it shall, when released, automatically take up or stay in the position corresponding to that of the moving contacts; operating means shall have two different rest positions, except that, for automatic operation, a third distinct rest position may be provided		N/A
	If a separate mechanical indicator is used to indicate the position of the main contacts, colour red shall be used for the on position and green for the off position.		P

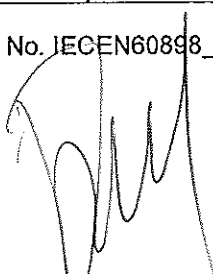
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ВЯРНО С СРИГИНАЛА

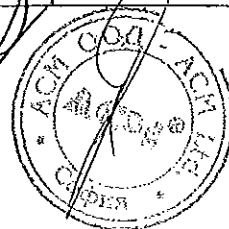


IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	The action of the mechanism shall not be influenced by the position of enclosures		P
	If the cover is used as a guiding means for push-button, it shall not be possible to remove this button from the outside		N/A
	Operating means securely fixed, not possible to remove them without a tool		P
	For the up-down operating means the contacts shall be closed by the up movement.		P
8.1.3	Clearances and creepage distances		P
8.1.3	Clearances [mm] see table 4		P
	1.between live parts (of the main circuits) which are separated when the CB is in off position	5,6 mm	P
	2.between live parts of different polarity.....	10,2 mm	P
	3.between circuits supplied from different sources, one of which being PELV or SELV.....		N/A
	4. between live parts and		P
	- accessible surfaces of operating means.....	9,3 mm	P
	- screws or other means for fixing covers		N/A
	- surface on which the base is mounted.....	5,1 mm	P
	- screws or other means for fixing the circuit breaker.....		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts	17,0 mm	P
	- metal frames supporting the base (flush-type) ..	5,1 mm	P
	5.between metal parts of mechanism and:		N/A
	- accessible metal parts.....		N/A
	- screws or other means for fixing the circuit breaker.....		N/A
	- metal frames supporting the base (flush type)..		N/A
8.1.3	Creepage distances [mm] (see table 4)		P
	Material group	<input checked="" type="checkbox"/> IIIa <input type="checkbox"/> II <input type="checkbox"/> I	P
	1.between live parts (of the main circuits) which are separated when the CB is in off position	9,0 mm	P
	2.between live parts of different polarity.....	10,2 mm	P
	3.between circuits supplied from different sources, one of which being PELV or SELV.....		N/A
	4. between live parts and		P

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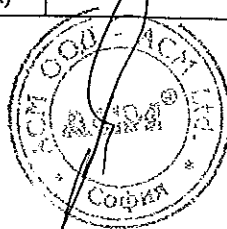
ОДРНО С ОРИГИНАЛА



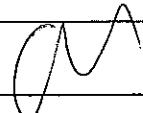

IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- accessible surfaces of operating means.....:	9,3 mm	P
	- screws or other means for fixing covers		N/A
	- surface on which the base is mounted.....:	5,1 mm	P
	- screws or other means for fixing the circuit breaker.....:		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts	17,0 mm	P
	- metal frames supporting the base (flush-type) ..:	5,1 mm	P
	5.between metal parts of mechanism and:		N/A
	- accessible metal parts.....:		N/A
	- screws or other means for fixing the circuit breaker.....:		N/A
	- metal frames supporting the base (flush type)...:		N/A
8.1.4	Screws, current-carrying parts and connections		P
8.1.4.1	Connections, withstand mechanical stresses occurring in normal use		P
	Screws for mounting of the CB not of the thread-cutting type		P
	Test according to cl. 9.4:		P
	- 10 times (screw Ø / torque Nm)		N/A
	- 5 times (screw Ø / torque Nm)	3,5 Nm	P
	Plug in connections tested by plugging in and pulling out five times		N/A
	After test connections have not become loose nor electrical function impaired		P
8.1.4.2	Screws with a thread of insulating material ensured correct introduction		N/A
8.1.4.3	Electrical connection: contact pressure not transmitted through insulating material, unless there is sufficient resilience in the metallic parts		P
	- copper		P
	- alloy 58% copper for worked cold parts		N/A
	- alloy 50% copper for other parts		N/A
	- other metal		N/A
8.1.5	Terminals for external conductors		P
8.1.5.1	Terminals ensure correct connection of conductors (Test acc. to cl. 9.5 or annex J or K)	Clause 9.5	P

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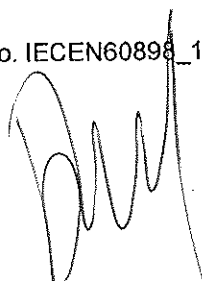
ВЯРНО С СРИГИНАЛА




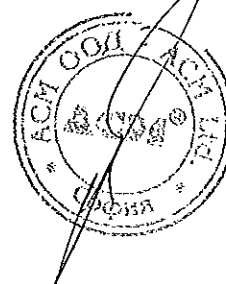


IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.5	Torque Ø 6,5 mm, 3,5 Nm max. sect. 25 mm ²		P
9.5.1	Pull test: Torque (2/3)= 2,33 Nm min sect. 1 mm ² Pull 50 N for 1 min Torque (2/3)= 2,33 Nm max sect. 25 mm ² Pull 100 N for 1 min During the test conductor does not move noticeably		P
9.5.2	min sect. 1 mm ² max sect. 25 mm ² Torque (2/3)= 2,33 Nm The conductor shows no damage		P
9.5.3	Nominal cross-section from 1 mm ² to 25 mm ² min No of wires 7 Ø of wires 0,67 mm Torque (2/3) = 2,33 Nm max No of wires 7 Ø of wires 2,14 mm Torque (2/3) = 2,33 Nm After the test no wire escaped outside		P
8.1.5.2	Terminals allow the connection of conductors of the following cross-sectional areas: (table 5)		P

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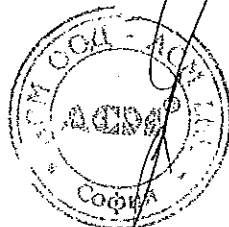


ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1				
Clause	Requirement + Test		Result - Remark	Verdict
	Rated current (A)	Range of nominal cross sections to be clamped (mm ²)	1 mm ² to 25 mm ²	P
	≤ 13	1 to 2,5		
	> 13 ≤ 16	1 to 4		
	> 16 ≤ 25	1,5 to 6		
	> 25 ≤ 32	2,5 to 10		
	> 32 ≤ 50	4 to 16		
	> 50 ≤ 80	10 to 25		
	> 80 ≤ 100	16 to 35		
	> 100 ≤ 125	25 to 50		
	It is required that, for current ratings up to and including 50 A terminals are designed to clamp solid conductors as well as rigid stranded conductors; the use of flexible conductors is permitted			P
	Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm ² up to 6 mm ² are designed to clamp solid conductors only.			N/A
8.1.5.3	Means for clamping the conductors in the terminals not serve to fix any other component (See test sub-clause 9.5)			P
8.1.5.4	Terminals for I _n ≤ 32 A allow the connection of conductors without special preparation			P
8.1.5.5	Terminals shall have adequate mechanical strength; ISO thread or equivalent (See tests of sub-clause 9.4 and 9.5.1)			P
8.1.5.6	Clamping of conductor without damage to the conductor (See test of sub-clause 9.5.2)			P
8.1.5.7	Clamping of conductor between metal surfaces (See tests of sub-clause 9.4 and 9.5.1)			P
8.1.5.8	Conductor shall not slip-out when the clamping screw or nuts are tightened (See test of sub-clause 9.5.3)			P
8.1.5.9	Terminals shall be properly fixed. No work loose when the clamping screws or nuts are tightened or loosened (See test of sub-clause 9.4)			P
8.1.5.10	Clamping screws or nuts of terminals for protective conductors adequately secured against accidental loosening			P
8.1.5.12	Screws and nuts of terminals for external conductors shall be in engagement with a metal thread, and the screws shall not be of tapping screw type			P

TRF No. IECEN60898_1C

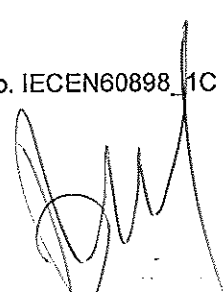
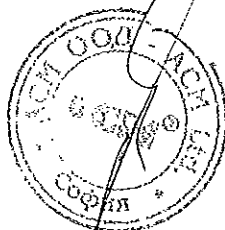


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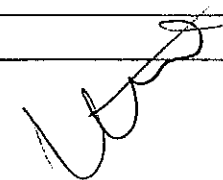


IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
8.1.6	Non interchangeability		N/A
	For circuit-breakers intended to be mounted on bases forming a unit therewith (plug-in or screw-in type) it shall not be possible, without the aid of a tool, to replace a circuit-breaker when mounted as for normal use by another of the same make having a higher rated current, compliance is checked by inspection		N/A
8.1.7	Plug-in type circuit-breakers, the holding in position of which does not depend solely on their plug-in connection(s), shall be reliable and have adequate stability		N/A
8.1.7.1	Plug-in type circuit-breakers, the holding in position of which does not depend solely on their plug-in connection(s) Compliance of the mechanical mounting is checked by the relevant test 9.13		N/A
8.1.7.2	Plug-in type circuit-breakers, the holding in position of which does depend solely on their plug-in connection(s) Compliance of the mechanical mounting is checked by the relevant test 9.13		N/A
8.2	Protection against electric shock		P
	Live parts not accessible in normal use		P
	For CB, other than plug-in type, external parts, other than screws and other means for fixing covers, which are accessible shall be of insulating material		P
	Unless the live parts are within an internal enclosure of insulating material: Lining - reliable fixed, - adequate thickness and - mechanical strength		N/A
	Inlet openings for cables shall be in insulating material or be provided with bushings or similar devices in insulating material Such device - shall be reliable fixed - shall have adequate mechanical strength		N/A
	For plug-in CB, external parts, other than screws and other means for fixing covers, which are accessible shall be in insulating material		N/A
	Metallic operating means insulated from live parts		N/A

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ВЕРНО С ОРИГИНАЛА




IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Metal parts of the mechanism not accessible and insulated from accessible metal parts, metal frames (for flush-type), screws or other means for fixing the base		P
	Replacement of plug-in CB possible without touching live parts		N/A
	Lacquer or enamel not considered		P
9.6	Test of protection against electric shock		P
	Use of test finger so designed that each jointed can be turned through an angle of 90° with respect to the finger		P
	Circuit-breaker with enclosures of thermoplastic material are additional tested at 35 °C for 1 min with a force of 75 N		P
7.10	Resistance to heat		P
	CB sufficiently resistant to heat		P
9.14	Test of resistance to heat		P
9.14.1	Test:		P
	- without removable covers 1 h (100 ± 2) °C		P
	- removable covers 1 h (70 ± 2) °C		N/A
	After the test no access to live parts, marking still legible		P
9.14.2	Ball pressure test for external parts of insulating material (parts retaining current-carrying parts and parts of the protective circuit in position) T = 125 °C Ø of impression ≤ 2 mm	Enclosure 125 °C 1,12 mm	P
9.14.3	Ball pressure test for external parts of insulating material (parts not retaining current-carrying parts and parts of the protective circuit in position) T = (70 ± 2)°C or T = ____ °C = (40 ± 2)°C + max. temperature rise of sub-clause 8.8 Ø of impression ≤ 2 mm	Operating means 70 °C 0,68 mm	P
8.11	Resistance to abnormal heat and to fire		P
	External parts of insulating material shall not ignite or spread fire under fault or overload conditions		P
9.15	Resistance to abnormal heat and to fire		P
	Glow wire test: No visible flame, no sustained glowing or flames and glowing extinguish within 30 s	glowing extinguish within 30 s	P

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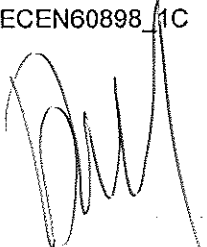
ВЯРНО С ОРИГИНАЛА



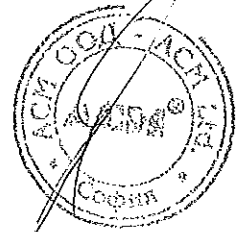


IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	external parts retaining current-carrying parts and parts of the protective circuit in position (960 ± 15)°C	Enclosure	P
	all other external parts (650 ± 10)°C	Operating means	P
8.12	Resistance to rusting		P
	Ferrous parts adequately protected against rusting		P
9.16	Test of resistance to rusting:		P
	- 10 min immersed in a cold chemical degreaser such as methyl-chloroform or refined petrol		P
	- 10 min immersed in a 10% solution of chloride in water at 20°C		P
	- 10 min at 95% humidity at 20°C		P
	- 10 min at 100°C		P
	No sign of rust		P

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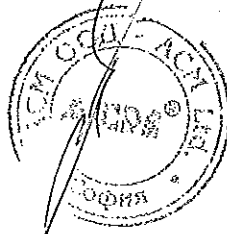

ВЯРНО С ОРИГИНАЛА




IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „B“ 3 SAMPLES	#03	#04	#05	P
		D63, 1-P			
8.3	Dielectric properties and isolating capability				P
	CB shall have adequate dielectric properties and shall ensure isolation:				P
8.3.1	Dielectric strength at power frequency				P
	Compliance is checked by the tests 9.7.1, 9.7.2 and 9.7.3 on circuit-breaker in new condition				P
8.3.2	Isolating capability				P
	Circuit-breakers shall be suitable for isolation. Compliance is checked by the verification of compliance with the minimum clearances and creepage distances of item 1 of table 4 and by tests of 9.7.6.1 and 9.7.6.3.				P
8.3.3	Dielectric strength at rated impulse withstand voltage (Uimp)				P
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.6.2.				P
9.7	Test of dielectric properties and isolating capability				P
9.7.1	Resistance to humidity				P
9.7.1.1	Preparation of the circuit-breaker for test				P
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.				P
9.7.1.2	Test conditions				P
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C	R. H. 93 % 25 °C			P
9.7.1.3	Test procedure:				P
	The sample is kept in the cabinet for 48 h.				P
9.7.1.4	Condition of the circuit-breaker after the test				P
	After this treat, the sample show no damage within the meaning of this standard and shall withstand the tests of 9.7.2 and 9.7.3				P
9.7.2	Insulation resistance of the main circuit				P
9.7.2	After an interval between 30 min and 60 min flowing this treatment, the insulation resistance is measured 5 s after application of a d.c. voltage of approximately 500 V, consecutively as follows:	#03	#04	#05	P

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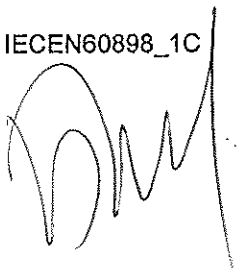
ВЯРНО С КРИГИНАЛА



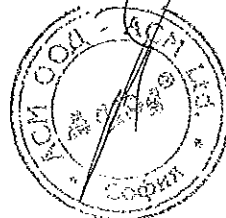
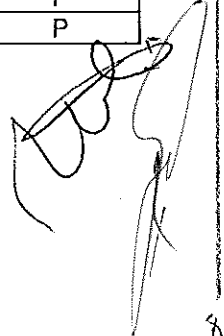


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position $\geq 2 \text{ M}\Omega$	500 M Ω	500 M Ω	500 M Ω	P
	b) in off-position, between each pole in turn and the others connected together $\geq 2 \text{ M}\Omega$				N/A
	c) in on-position, between all poles connected together and the frame $\geq 5 \text{ M}\Omega$	500 M Ω	500 M Ω	500 M Ω	P
	d) between metal parts of mechanism and the frame $\geq 5 \text{ M}\Omega$				N/A
	e) between the frame and metal foil in contact with the inner surface of the internal enclosure or lining of insulating material $\geq 5 \text{ M}\Omega$				N/A
9.7.3	Dielectric strength of the main circuit				P
	After the circuit-breakers have passed the tests of 9.7.2 the test voltage specified in 9.7.5 is applied for 1 min between the parts indicated in 9.7.2				P
	a) 2000 V				P
	b) 2000 V				N/A
	c) 2000 V				P
	d) 2000 V				N/A
	e) 2500 V				N/A
9.7.4	Dielectric strength of the auxiliary and control circuits				N/A
	For these tests, the main circuit shall be connected to the frame. The test voltage specified in 9.7.5 shall be applied for 1 min as follows:				N/A
	1) Between all the auxiliary or control circuits and the frame $U = \text{---} \text{ V}$				N/A
	2) Between each part of the auxiliary or control circuits which may be isolated from the other parts of the auxiliary or control circuits and these other parts connected together $U = [1000 \text{ V if } U_i \leq 60 \text{ V or } 2U_i + 1000 \text{ V if } U_i > 60 \text{ V}]$				N/A
9.7.6	Verification of the impulse withstand voltage (across clearances and across solid insulation) and leakage current across open contacts				P
9.7.6.1	Verification of the impulse withstand voltage across open contacts (suitability for isolation)				P
	The 1,2/50 μs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum				P
	- rated impulse withstand voltage (kV) :	6 kV			P
	- sea level of the laboratory:	Sea level			P

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ВЯРНО С ОРИГИНАЛА

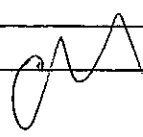
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- test Uimp on open main contacts (equipment suitable for isolating) (see table 13)	6,2 kV			P
	- no unintentional disruptive discharge during the test's				P
9.7.6.2	Verification of impulse withstand voltage for the parts not test in 9.7.6.1				P
	The 1,2/50µs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum				P
	- rated impulse withstand voltage (kV) :	6 kV			P
	- sea level of the laboratory:	Sea level			P
	- test Uimp main circuits (see table 14) :	4,9 kV			P
	Application of test voltage				P
	i) Between all the phase pole(s) connected together and to the neutral pole (or path) of the circuit-breaker				N/A
	ii) Between all the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminals intended for the protective conductor(s)				P
	- no unintentional disruptive discharge during the test's				P
9.7.6.3	Verification of leakage currents across open contacts (suitability for isolation)				P
	For circuit-breakers suitable for isolation, the leakage current shall be measured. Each pole having been submitted to the test of 9.12.11.2, or 9.12.11.3, or 9.12.11.4.2 or 9.12.11.4.3 is supplied at a test voltage of 1,1 times its rated operational voltage, the circuit-breaker being in the open position				P
	The leakage current flowing across the open contacts is measured and shall not exceed 2 mA				P
8.4	Temperature rise				P
	Temperature rise does not exceed the limiting values stated in table V:	16 mm²			P
9.8.2	Test current: In= (reach the steady-state value) Four-pole CB's: <input type="checkbox"/> 1) Three poles loaded 2) One pole and neutral pole loaded <input type="checkbox"/> 1) Four-poles loaded	63 A			P
	Ambient air temperature	24 °C			P
	Parts..... Temperature rise [K]				P
	Terminals for external connections..... 60	#03	#04	#05	P
	L1 upside	40 K	44 K	44 K	P
	L2 upside				
	L3 upside				
	L4(N) upside				

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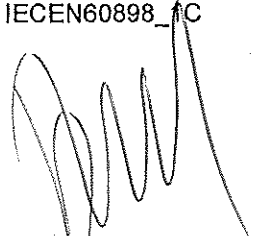
ВЯРНО С СРИГИНАЛА



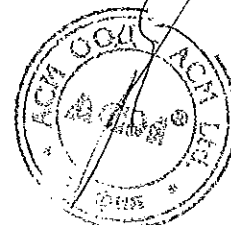
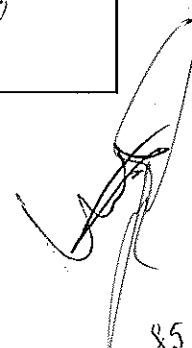


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	L1 downside	33 K	33 K	36 K	
	L2 downside				
	L3 downside				
	L4(N) downside				
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles..... 40	#03	#04	#05	P
		8 K	8 K	8 K	
	External metallic parts of operating means 25				N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface 60	#03	#04	#05	P
		36 K	33 K	38 K	
9.8.5	Measurement of power losses				P
	Power loss do not exceed the values stated in table 15				P
	Test current: In = 63 A (reach the steady state value)				P
	Loaded one pole after the other				P
	Max. power loss : 13 W	#03	#04	#05	P
	L1	5,7 W	5,8 W	6,1 W	
	L2				
	L3				
	L4(N)				
8.5	Uninterrupted duty				P
	Circuit-breakers operate reliable even after long service				P
9.9	28 day test				P
	28 cycles- 21 h with current - 3 h without current cross sectional area. 16 mm ²	63 A			P
	During the test no tripping during the last period, temperature rise shall be measured				P
	Ambient air temperature	23 °C			P
	Parts..... Temperature rise [K]				P
	Terminals for external connections..... 60	#03	#04	#05	P
	L1 upside	40 K	44 K	44 K	
	L2 upside				

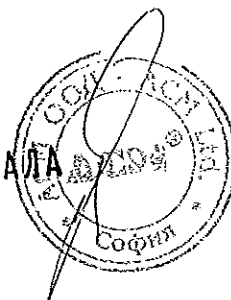
TRF No. IECEN60898_1C



ВЯРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	L3 upside				
	L4(N) upside				
	L1 downside	33 K	33 K	36 K	
	L2 downside				
	L3 downside				
	L4(N) downside				
	The temperature rise does not exceed the value measured during the temperature rise test (subclause 8.8) by more than 15 K	#03	#04	#05	P
	L1 upside	40 K	42 K	43 K	
	L2 upside				
	L3 upside				
	L4(N) upside				
	L1 downside	31 K	34 K	35 K	
	L2 downside				
	L3 downside				
	L4(N) downside				
	Test current 1,45 In	91,4 A			P
	- Tripping within	#03	#04	#05	P
	- 1h (≤ 63 A)	3 min 16 s	4 min 18 s	5 min 46 s	P
	- 2h (> 63 A)				N/A

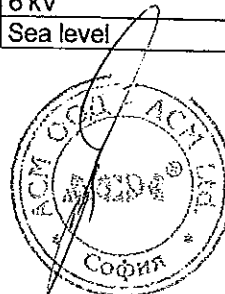


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „B“ 3 SAMPLES	#06	#07	#08	P
		D63, 4-P			
8.3	Dielectric properties and isolating capability				P
	CB shall have adequate dielectric properties and shall ensure isolation:				P
8.3.1	Dielectric strength at power frequency				P
	Compliance is checked by the tests 9.7.1, 9.7.2 and 9.7.3 on circuit-breaker in new condition				P
8.3.2	Isolating capability				P
	Circuit-breakers shall be suitable for isolation. Compliance is checked by the verification of compliance with the minimum clearances and creepage distances of item 1 of table 4 and by tests of 9.7.6.1 and 9.7.6.3.				P
8.3.3	Dielectric strength at rated impulse withstand voltage (Uimp)				P
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.6.2.				P
9.7	Test of dielectric properties and isolating capability				P
9.7.1	Resistance to humidity				P
9.7.1.1	Preparation of the circuit-breaker for test				P
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.				P
9.7.1.2	Test conditions				P
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C	R. H. 95 %		25 °C	P
9.7.1.3	Test procedure:				P
	The sample is kept in the cabinet for 48 h.				P
9.7.1.4	Condition of the circuit-breaker after the test				P
	After this treat, the sample show no damage within the meaning of this standard and shall withstand the tests of 9.7.2 and 9.7.3				P
9.7.2	Insulation resistance of the main circuit				P
9.7.2	After an interval between 30 min and 60 min flowing this treatment, the insulation resistance is measured 5 s after application of a d.c. voltage of approximately 500 V, consecutively as follows:	#06	#07	#08	P

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position $\geq 2 \text{ M}\Omega$	500 M Ω	500 M Ω	500 M Ω	P
	b) in off-position, between each pole in turn and the others connected together $\geq 2 \text{ M}\Omega$	500 M Ω	500 M Ω	500 M Ω	P
	c) in on-position, between all poles connected together and the frame $\geq 5 \text{ M}\Omega$	500 M Ω	500 M Ω	500 M Ω	P
	d) between metal parts of mechanism and the frame $\geq 5 \text{ M}\Omega$				N/A
	e) between the frame and metal foil in contact with the inner surface of the internal enclosure or lining of insulating material $\geq 5 \text{ M}\Omega$				N/A
9.7.3	Dielectric strength of the main circuit				P
	After the circuit-breakers have passed the tests of 9.7.2 the test voltage specified in 9.7.5 is applied for 1 min between the parts indicated in 9.7.2				P
	a) 2000 V				P
	b) 2000 V				P
	c) 2000 V				P
	d) 2000 V				N/A
	e) 2500 V				N/A
9.7.4	Dielectric strength of the auxiliary and control circuits				N/A
	For these tests, the main circuit shall be connected to the frame. The test voltage specified in 9.7.5 shall be applied for 1 min as follows:				N/A
	1) Between all the auxiliary or control circuits and the frame $U = \text{--- V}$				N/A
	2) Between each part of the auxiliary or control circuits which may be isolated from the other parts of the auxiliary or control circuits and these other parts connected together $U = [1000 \text{ V if } U_i \leq 60 \text{ V or } 2U_i + 1000 \text{ V if } U_i > 60 \text{ V}]$				N/A
9.7.6	Verification of the impulse withstand voltage (across clearances and across solid insulation) and leakage current across open contacts				P
9.7.6.1	Verification of the impulse withstand voltage across open contacts (suitability for isolation)				P
	The 1,2/50 μ s impulse voltage shall be applied three times for each polarity at intervals of 1s minimum				P
	- rated impulse withstand voltage (kV) :	6 kV			P
	- sea level of the laboratory:	Sea level			P

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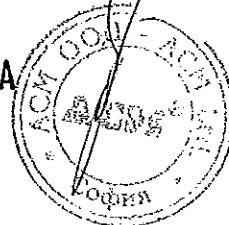
ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	L1 downside	43 K	43 K	46 K	
	L2 downside	48 K	53 K	53 K	
	L3 downside	50 K	50 K	51 K	
	L4(N) downside	45 K	45 K	46 K	
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles.....40	#06 19 K	#07 21 K	#08 24 K	P
	External metallic parts of operating means25				N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface60	#06 43 K	#07 49 K	#08 47 K	P
9.8.5	Measurement of power losses				P
	Power loss do not exceed the values stated in table 15				P
	Test current: In = 63 A (reach the steady state value)				P
	Loaded one pole after the other				P
	Max. power loss : 13 W	#06	#07	#08	P
	L1	6,8 W	6,3 W	6,1 W	
	L2	7,0 W	6,2 W	6,3 W	
	L3	6,3 W	6,0 W	6,3 W	
	L4(N)	6,2 W	6,7 W	5,6 W	
8.5	Uninterrupted duty				P
	Circuit-breakers operate reliable even after long service				P
9.9	28 day test				P
	28 cycles- 21 h with current - 3 h without current cross sectional area. 16 mm ²	63 A			P
	During the test no tripping during the last period, temperature rise shall be measured				P
	Ambient air temperature	23 °C			P
	Parts.....Temperature rise [K]				P
	Terminals for external connections.....60	#06	#07	#08	P
	L1 upside	47 K	52 K	48 K	
	L2 upside	53 K	55 K	52 K	

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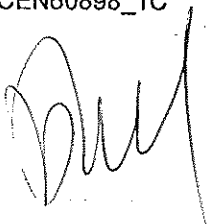
ВЕРНО С ОРИГИНАЛА



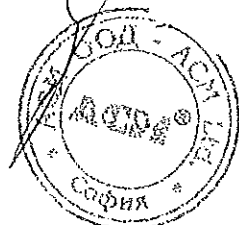


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- test Uimp on open main contacts (equipment suitable for isolating) (see table 13)	6,2 kV			P
	- no unintentional disruptive discharge during the test's				P
9.7.6.2	Verification of impulse withstand voltage for the parts not test in 9.7.6.1				P
	The 1,2/50µs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum				P
	- rated impulse withstand voltage (kV) :	6 kV			P
	- sea level of the laboratory:	Sea level			P
	- test Uimp main circuits (see table 14) :	4,9 kV			P
	Application of test voltage				P
	i) Between all the phase pole(s) connected together and to the neutral pole (or path) of the circuit-breaker				P
	ii) Between all the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminals intended for the protective conductor(s)				P
	- no unintentional disruptive discharge during the test's				P
9.7.6.3	Verification of leakage currents across open contacts (suitability for isolation)				P
	For circuit-breakers suitable for isolation, the leakage current shall be measured. Each pole having been submitted to the test of 9.12.11.2, or 9.12.11.3, or 9.12.11.4.2 or 9.12.11.4.3 is supplied at a test voltage of 1,1 times its rated operational voltage, the circuit-breaker being in the open position				P
	The leakage current flowing across the open contacts is measured and shall not exceed 2 mA				P
8.4	Temperature rise				P
	Temperature rise does not exceed the limiting values stated in table V:	16 mm ²			P
9.8.2	Test current: In= (reach the steady-state value) Four-pole CB's: <input type="checkbox"/> 1) Three poles loaded 2) One pole and neutral pole loaded <input checked="" type="checkbox"/> 1) Four-poles loaded	63 A			P
	Ambient air temperature	24 °C			P
	Parts..... Temperature rise [K]				P
	Terminals for external connections.....60	#06	#07	#08	P
	L1 upside	47 K	52 K	48 K	P
	L2 upside	53 K	55 K	52 K	
	L3 upside	55 K	51 K	52 K	
	L4(N) upside	53 K	47 K	50 K	

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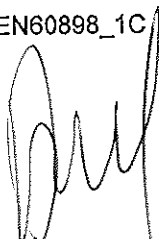
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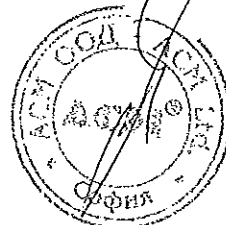


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	L3 upside	55 K	51 K	52 K	
	L1 downside	43 K	43 K	46 K	
	L2 downside	48 K	53 K	53 K	
	L3 downside	50 K	50 K	51 K	
	The temperature rise does not exceed the value measured during the temperature rise test (subclause 8.8) by more than 15 K	#06	#07	#08	P
	L1 upside	51 K	54 K	53 K	
	L2 upside	57 K	59 K	56 K	
	L3 upside	57 K	55 K	56 K	
	L1 downside	45 K	46 K	53 K	
	L2 downside	54 K	63 K	61 K	
	L3 downside	53 K	55 K	56 K	
	Test current 1,45 In	91,4 A			P
	- Tripping within	#06	#07	#08	P
	- 1h (≤ 63 A)	7 min 33 s	2 min 12 s	59 s	P
	- 2h (> 63 A)				N/A

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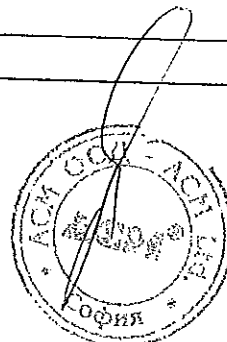
ВАРНО С ОРИГИНАЛА




IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „B“ 3 SAMPLES	#09	#10	#11	P
		B63, 1-P			
8.3	Dielectric properties and isolating capability				N/A
9.7	Test of dielectric properties and isolating capability				N/A
8.4	Temperature rise				P
	Temperature rise does not exceed the limiting values stated in table V:	16 mm ²			P
9.8.2	Test current: I _n = (reach the steady-state value) Four-pole CB's: <input type="checkbox"/> 1) Three poles loaded 2) One pole and neutral pole loaded <input type="checkbox"/> 1) Four-poles loaded	63 A			P
	Ambient air temperature	24 °C			P
	Parts Temperature rise [K]				P
	Terminals for external connections.....60	#09	#10	#11	P
	L1 upside	46 K	45 K	42 K	P
	L2 upside				
	L3 upside				
	L4(N) upside				
	L1 downside	38 K	38 K	35 K	
	L2 downside				
	L3 downside				
	L4(N) downside				
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles.....40	#09	#10	#11	P
		7 K	7 K	8 K	
	External metallic parts of operating means25				N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface60	#09	#10	#11	P
		39 K	36 K	37 K	
9.8.5	Measurement of power losses				P
	Power loss do not exceed the values stated in table 15				P
	Test current: I _n = 63 A (reach the steady state value)				P
	Loaded one pole after the other				P

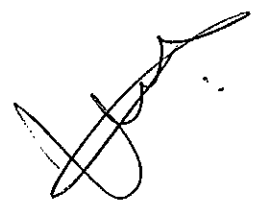
TRF No. IECEN60898_1C

ВЯРНО С ОРИГИНАЛА

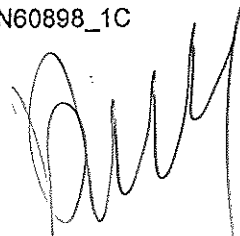




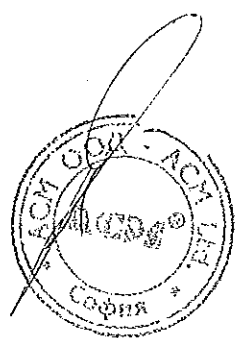

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	Max. power loss : 13 W	#09	#10	#11	P
	L1	5,6 W	5,5 W	5,4 W	
	L2				
	L3				
	L4(N)				
9.9	28 day test				N/A

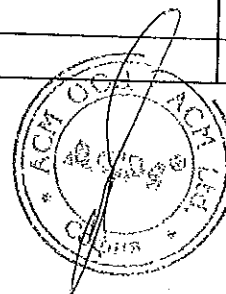
TRF No. IECEN60898_1C



ВЯРНО С ОРИГИНАЛА

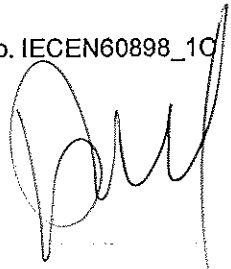
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „B“ 3 SAMPLES	#12	#13	#14	P
		B63, 4-P			
8.3	Dielectric properties and isolating capability				N/A
9.7	Test of dielectric properties and isolating capability				N/A
8.4	Temperature rise				P
	Temperature rise does not exceed the limiting values stated in table V:	16 mm ²			P
9.8.2	Test current: I _n = (reach the steady-state value) Four-pole CB's: <input type="checkbox"/> 1) Three poles loaded 2) One pole and neutral pole loaded <input checked="" type="checkbox"/> 1) Four-poles loaded	63 A			P
	Ambient air temperature	23 °C			P
	Parts.....Temperature rise [K]				P
	Terminals for external connections.....60	#12	#13	#14	P
	L1 upside	53 K	50 K	50 K	P
	L2 upside	57 K	59 K	54 K	
	L3 upside	56 K	56 K	55 K	
	L4(N) upside	52 K	54 K	46 K	
	L1 downside	48 K	47 K	44 K	
	L2 downside	52 K	59 K	52 K	
	L3 downside	49 K	60 K	52 K	
	L4(N) downside	46 K	47 K	41 K	
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles.....40	#12	#13	#14	P
		21 K	22 K	21 K	
	External metallic parts of operating means25				N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface60	#12	#13	#14	P
		42 K	42 K	41 K	
9.8.5	Measurement of power losses				P
	Power loss do not exceed the values stated in table 15				P
	Test current: I _n = 63 A (reach the steady state value)				P
	Loaded one pole after the other				P





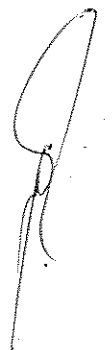
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	Max. power loss : 13 W	#12	#13	#14	P
	L1	5,6 W	5,3 W	5,0 W	
	L2	7,2 W	5,5 W	5,1 W	
	L3	5,6 W	5,7 W	5,4 W	
	L4(N)	5,5 W	5,3 W	5,0 W	
9.9	28 day test				N/A

TRF No. IECEN60898_10



ВЯРНО С ОРИГИНАЛА



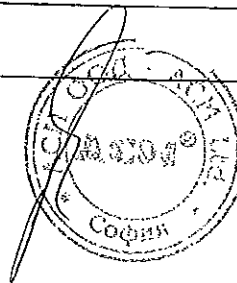


IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „B“ 3 SAMPLES	#15	#16	#17	P
		B32, 1-P			
8.3	Dielectric properties and isolating capability				N/A
9.7	Test of dielectric properties and isolating capability				N/A
8.4	Temperature rise				P
	Temperature rise does not exceed the limiting values stated in table V:	6 mm ²			P
9.8.2	Test current: I _n = (reach the steady-state value) Four-pole CB's: <input type="checkbox"/> 1) Three poles loaded 2) One pole and neutral pole loaded <input type="checkbox"/> 1) Four-poles loaded	32 A			P
	Ambient air temperature	24 °C			P
	PartsTemperature rise [K]				P
	Terminals for external connections.....60	#15	#16	#17	P
	L1 upside	46 K	45 K	42 K	P
	L2 upside				
	L3 upside				
	L4(N) upside				
	L1 downside	38 K	38 K	35 K	
	L2 downside				
	L3 downside				
	L4(N) downside				
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles.....40	#15	#16	#17	P
		7 K	7 K	8 K	
	External metallic parts of operating means25				N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface60	#15	#16	#17	P
		39 K	36 K	37 K	
9.8.5	Measurement of power losses				P
	Power loss do not exceed the values stated in table 15				P
	Test current: I _n = 63 A (reach the steady state value)				P


TRF No. IECEN60898_1C

ВАРНО С ОРИГИНАЛА

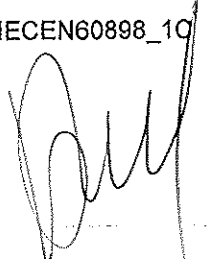




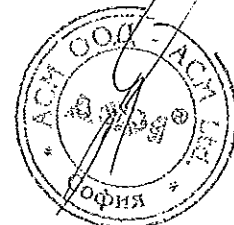
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	Loaded one pole after the other				P
	Max. power loss : 13 W	#15	#16	#17	P
	L1	5,6 W	5,5 W	5,4 W	
	L2				
	L3				
	L4(N)				
9.9	28 day test				N/A

TRF No. IECEN60898_10



ВЯРНО С ОРИГИНАЛА

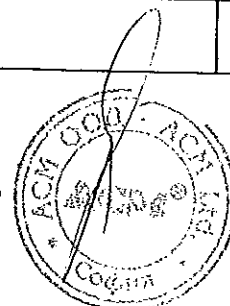



IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „B“ 3 SAMPLES	#18	#19	#20	P
		B32, 4-P			
8.3	Dielectric properties and isolating capability				N/A
9.7	Test of dielectric properties and Isolating capability				N/A
8.4	Temperature rise				P
	Temperature rise does not exceed the limiting values stated in table V:	6 mm ²			P
9.8.2	Test current: In= (reach the steady-state value) Four-pole CB's: <input type="checkbox"/> 1) Three poles loaded 2) One pole and neutral pole loaded <input checked="" type="checkbox"/> 1) Four-poles loaded	32 A			P
	Ambient air temperature	23 °C			P
	Parts..... Temperature rise [K]				P
	Terminals for external connections.....60	#18	#19	#20	P
	L1 upside	46 K	50 K	47 K	P
	L2 upside	52 K	53 K	51 K	
	L3 upside	55 K	55 K	54 K	
	L4(N) upside	54 K	53 K	43 K	
	L1 downside	43 K	41 K	39 K	
	L2 downside	56 K	57 K	48 K	
	L3 downside	40 K	53 K	56 K	
	L4(N) downside	54 K	49 K	42 K	
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles.....40	#18	#19	#20	P
		19 K	21 K	21 K	
	External metallic parts of operating means25				N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface60	#18	#19	#20	P
		52 K	55 K	56 K	
9.8.5	Measurement of power losses				P
	Power loss do not exceed the values stated in table 15				P
	Test current: In = 63 A (reach the steady state value)				P

TRF No. IECEN60898_1C

ВЕРНО С СРИГИНАЛА

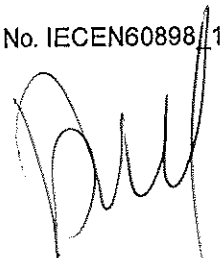




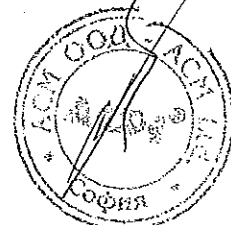
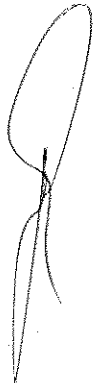
IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
	Loaded one pole after the other					P
	Max. power loss : 13 W	#18	#19	#20		P
	L1	3,4 W	3,5 W	4,1 W		
	L2	5,3 W	4,4 W	3,7 W		
	L3	3,2 W	4,1 W	5,5 W		
	L4(N)	5,2 W	5,3 W	3,6 W		
9.9	28 day test					N/A



TRF No. IECEN60898/1C



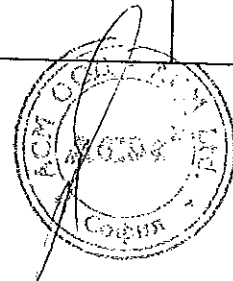
ВЯРНО С ОРИГИНАЛА

IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
	TESTS „C1“ 3 SAMPLES	#21	#22	#23	P	
		C63, 1-P				
8.7	Test C1. Mechanical and electrical endurance				P	
	Circuit-breaker shall be capable to perform an adequate number of cycles with rated current				P	
9.11.1	General test conditions				P	
	Test: Test Voltage (Un = 230/400 V) Test Current (In = 63 A) Power factor (0,85-0,9) Cross sect. area	242 V 64,3 A 0,86 16 mm ²			P	
9.11.2	Test procedure				P	
	The circuit-breaker is submitted to 4000 operating cycles with rated current.				P	
	- In ≤ 32 A: 2 s on - 13 s off				N/A	
	- In > 32 A: 2 s on - 28 s off				P	
	During the test the circuit-breaker shall be operated as in normal use.				P	
9.11.3	Condition of the circuit-breaker after the test				P	
	Following the test 9.11.2 the sample shall not show:				P	
	- undue wear				P	
	- discrepancy between the position of the moving contacts and corresponding position of the Indicating device				P	
	- damage to the enclosure permitting access to live parts by test finger (see 9.6)				P	
	- loosening of electrical or mechanical connections				P	
	- seepage of sealing compound				N/A	
	Moreover test current2,55 In	160,7 A			P	
	Opening time not less 1 s or more than	#21	#22	#23	P	
	- 60 s (≤ 32 A)				N/A	
	- 120 s (> 32 A)	17 s	16 s	11 s	P	
	Dielectric strength reduced to 1500 V *)see Annex 1				P	
9.12.11.2	Test at reduced short-circuit currents				P	
9.12.11.2.1	Test on all circuit-breakers				P	

TRF No. IECEN60898_1C

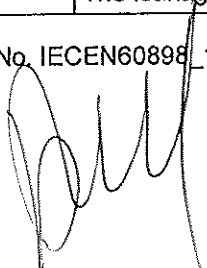
ВЕРНО С ОРИГИНАЛА



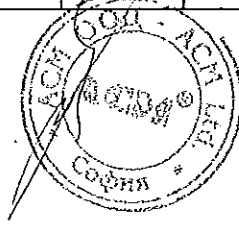


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
9.12.11.2.1	Test at reduced short-circuit currents: Fig. 3				P
	Test current:	Obtained			P
	- 500 A or 10 In	630 A			P
	Test voltage 1,05 Un	250,1 V			P
	Power factor 0,93-0,98	0,95			P
9.12.9.1	Test in free air copper wire F': <input checked="" type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	Sequence: 6 x "0" and 3 x "CO"				P
	I _{Peak} (A) max. value	#21	#22	#23	P
	L1	940 A	940 A	940 A	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#21	#22	#23	P
	L1	4,8 kA ² s	4,9 kA ² s	4,0 kA ² s	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12	Verification of the circuit-breaker after short-circuit tests				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit-breaker is in the open position	253 V			P
	The leakage current shall not exceed 2 mA	#21	#22	#23	P

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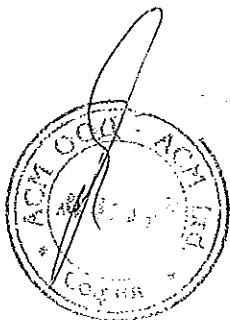
ВЕРНО С ОРИГИНАЛА



IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
		L1	6,0 μ A	4,0 μ A	4,0 μ A	P
		L2				N/A
		L3				N/A
		L4(N)				N/A
	Electric strength test:					P
	Test voltage 1500 V (see 8.7.2)					P
	a)					P
	b)					N/A
	c)					P
	d)					N/A
	e) 2000 V					N/A

TRF No. IECEN60898_1C

ВЯРНО С ОРИГИНАЛА

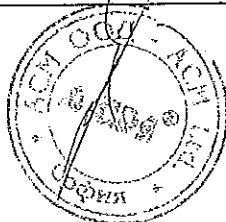
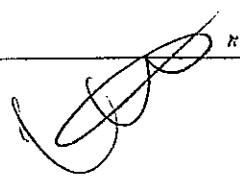




IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „C1“ 3 SAMPLES	#24	#25	#26	P
		C63, 4-P			
8.7	Test C1:..... Mechanical and electrical endurance				P
	Circuit-breaker shall be capable to perform an adequate number of cycles with rated current				P
9.11.1	General test conditions				P
	Test: Test Voltage (Un = 230/400 V) Test Current (In = 63 A) Power factor (0,85-0,9) Cross sect. area	420 V 64,6 A 0,87 16 mm ²			P
9.11.2	Test procedure				P
	The circuit-breaker is submitted to 4000 operating cycles with rated current.				P
	- In ≤ 32 A: 2 s on - 13 s off				N/A
	- In > 32 A: 2 s on - 28 s off				P
	During the test the circuit-breaker shall be operated as in normal use.				P
9.11.3	Condition of the circuit-breaker after the test				P
	Following the test 9.11.2 the sample shall not show:				P
	- undue wear				P
	- discrepancy between the position of the moving contacts and corresponding position of the Indicating device				P
	- damage to the enclosure permitting access to live parts by test finger (see 9.6				P
	- loosening of electrical or mechanical connections				P
	- seepage of sealing compound				N/A
	Moreover test current2,55 In	160,7 A			P
	Opening time not less 1 s or more than	#24	#25	#26	P
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)	21 s	18 s	19 s	P
	Dielectric strength reduced to 1500 V *)see Annex 1				P
9.12.11.2	Test at reduced short-circuit currents				P
9.12.11.2.1	Test on all circuit-breakers				P

TRF No. IECEN60898_1C

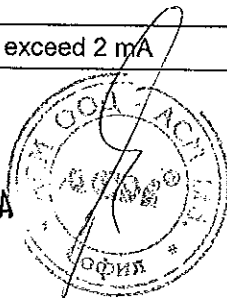
ВЕРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
9.12.11.2.1	Test at reduced short-circuit currents: Fig. 3				P
	Test current:	Obtained			P
	- 500 A or 10 In	630 A			P
	Test voltage 1,05 Un	250,1 V			P
	Power factor 0,93-0,98	0,95			P
9.12.9.1	Test in free air copper wire F': <input checked="" type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	Sequence: 6 x "0" and 3 x "CO"				P
	I _{Peak} (A) max. value	#24	#25	#26	P
	L1	940 A	950 A	960 A	P
	L2	940 A	950 A	960 A	P
	L3	950 A	950 A	970 A	P
	L4(N)	950 A	960 A	970 A	P
	Max. I ² t ≤ no specified value	#24	#25	#26	P
	L1	3,9 kA ² s	3,9 kA ² s	4,8 kA ² s	P
	L2	3,8 kA ² s	3,9 kA ² s	4,7 kA ² s	P
	L3	4,7 kA ² s	4,0 kA ² s	3,9 kA ² s	P
	L4(N)	3,8 kA ² s	4,1 kA ² s	4,2 kA ² s	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12	Verification of the circuit-breaker after short-circuit tests				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#24	#25	#26	P

TRF No. IECEN60898_1C

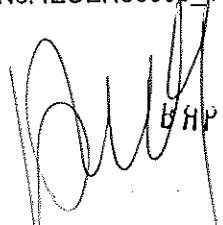
ВЕРНО С ОРИГИНАЛА



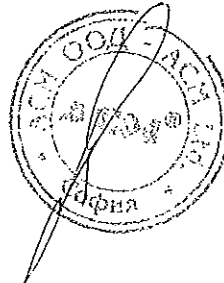
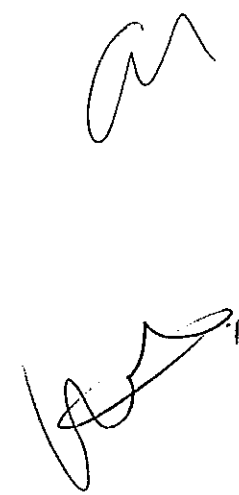


IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
		L1	5,0 µA	4,0 µA	5,0 µA	P
		L2	5,0 µA	6,0 µA	5,0 µA	P
		L3	4,0 µA	5,0 µA	4,0 µA	P
		L4(N)	4,0 µA	4,0 µA	4,0 µA	P
	Electric strength test:				P	
	Test voltage 1500 V (see 8.7.2)				P	
	a)				P	
	b)				P	
	c)				P	
	d)				N/A	
	e) 2000 V				N/A	

TRF No. IECEN60898_1C



ВІДПОВІДНО С ОРИГІНАЛОМ


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „C2“ 3 SAMPLES	#27	#28	#29	P
		D63, 1-P			
9.12.11.2.2	Test C2 : Short-circuit test on circuit-breakers rated 230 V, or 240 V or 230/400 V for verifying for use in IT systems				P
	Test current:	Obtained			P
	- 500 A or 1,2 times the upper limit of the standard	1,07 kA			P
	Test voltage 1,05 Un	423 V			P
	Power factor 0,93-0,98	0,93			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	Sequence: "O" + "CO" on each protected pole				P
	Shifted point 30 ° on the other protected pole				P
	I _{Peak} (A) max. value	#27	#28	#29	P
	L1	1,57 kA	1,52 kA	1,34 kA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#27	#28	#29	P
	L1	8,9 kA ² s	8,8 kA ² s	10,0 kA ² s	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P

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ВЯРНО С БРИГИНАЛА



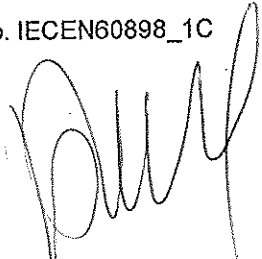
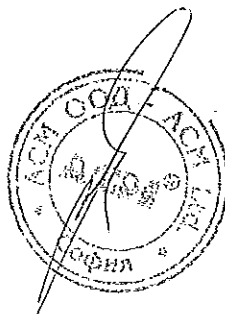
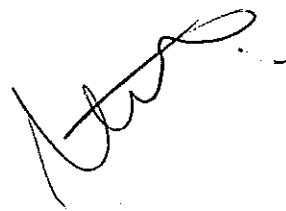


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#27	#28	#29	P
	L1	5,0 µA	4,0 µA	4,0 µA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A



ВЯРНО С ОРИГИНАЛА

TRF No. IECEN60898_1C


IEC/EN 60 898-1				
Clause	Requirement + Test	Result - Remark		Verdict
	TESTS „C2“ 2 SAMPLES	#30	#31	P
		D63, 2-P		
9.12.11.2.2	Test C2 :Short-circuit test on circuit-breakers rated 230 V, or 240 V or 230/400 V for verifying for use in IT systems			P
	Test current:	Obtained		P
	- 500 A or 1,2 times the upper limit of the standard	1,07 kA		P
	Test voltage 1,05 Un	423 V		P
	Power factor 0,93-0,98	0,93		P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm		P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm			N/A
	Sequence: "0" + "CO" on each protected pole			P
	Shifted point 30 ° on the other protected pole			P
	I _{Peak} (A) max. value	#30	#31	P
	L1	1,53 kA	1,53 kA	P
	L2	1,49 kA	1,52 kA	P
	L3			N/A
	L4(N)			N/A
	Max. I ² t ≤ no specified value	#30	#31	P
	L1	10,3 kA ² s	10,0 kA ² s	P
	L2	9,4 kA ² s	11,7 kA ² s	P
	L3			N/A
	L4(N)			N/A
	- No permanent arcing			P
	- No flash-over between poles or between poles and frame			P
	- No blowing of the fuses F and F'			P
	- Polyethylene foil shows no holes			P
	After the test:			P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.			P





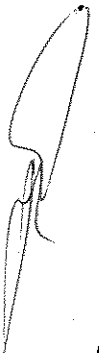
IEC/EN 60 898-1				
Clause	Requirement + Test	Result - Remark		Verdict
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V		P
	The leakage current shall not exceed 2 mA	#30	#31	P
	L1	4,0 µA	4,0 µA	P
	L2	4,0 µA	5,0 µA	P
	L3			N/A
	L4(N)			N/A
	Electric strength test:			P
	Test voltage 1500 V (see 8.7.2)			P
	a)			P
	b)			P
	c)			P
	d)			N/A
	e) 2000 V			N/A



ВЕРНО С ОРИГИНАЛА

TRF No. IECEN60898_1C

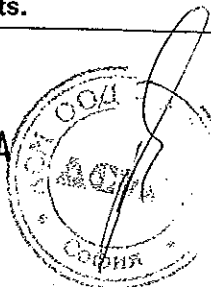




IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	TESTS „C2“ 1 SAMPLE	#32	P
		D63, 4-P	
9.12.11.2.2	Test C2 : Short-circuit test on circuit-breakers rated 230 V, or 240 V or 230/400 V for verifying for use in IT systems		P
	Test current:	Obtained	P
	- 500 A or 1,2 times the upper limit of the standard	1,07 kA	P
	Test voltage 1,05 Un	423 V	P
	Power factor 0,93-0,98	0,93	P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm	P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm		N/A
	Sequence: "0" + "CO" on each protected pole		P
	Shifted point 30 ° on the other protected pole		P
	I _{Peak} (A) max. value	#32	P
	L1	1,52 kA	P
	L2	1,33 kA	P
	L3	1,53 kA	P
	L4(N)	1,53 kA	P
	Max. I ² t ≤ no specified value	#32	P
	L1	9,2 kA ² s	P
	L2	4,4 kA ² s	P
	L3	7,9 kA ² s	P
	L4(N)	11,6 kA ² s	P
	- No permanent arcing		P
	- No flash-over between poles or between poles and frame		P
	- No blowing of the fuses F and F'		P
	- Polyethylene foil shows no holes		P
	After the test:		P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.		P

TRF No. IECEN60898_1C

ВЯРНО С ОРИГИНАЛА



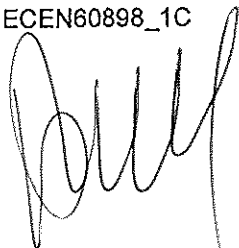
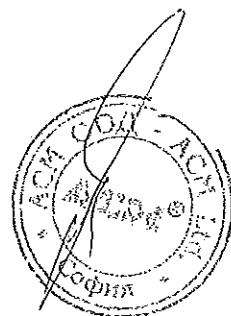
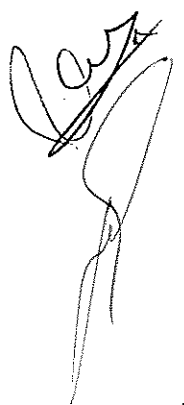


IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V	P
	The leakage current shall not exceed 2 mA	#32	P
	L1	4,0 µA	P
	L2	4,0 µA	P
	L3	4,0 µA	P
	L4(N)	5,0 µA	P
	Electric strength test:		P
	Test voltage 1500 V (see 8.7.2)		P
	a)		P
	b)		P
	c)		P
	d)		N/A
	e) 2000 V		N/A



ВЯРНО С ОРИГИНАЛА

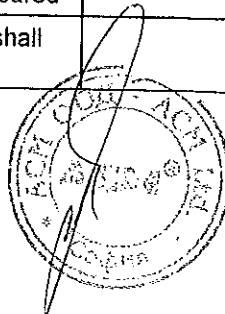
TRF No. IECEN60898_1C

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „D0+D1“ 3 SAMPLES	#68	#69	#70	P
		D63, 1-P			
8.6	Automatic operation				P
8.6.1	Standard time-current zone				P
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.				P
9.10	Tests: D₀				P
	In (A)	63 A			P
	Sect. (mm ²)	16 mm ²			P
	Instantaneous tripping current	<input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D			P
9.10.1	Test of time-current characteristic				P
9.10.1.1	Test current 1,13 In (A) starting from cold for:	71,2 A			P
	- 1 h (In ≤ 63 A)				P
	- 2 h (In > 63 A)				N/A
	No tripping				P
	Then steadily increased within 5 s to 1,45 In (A)	91,4 A			P
	- Tripping within	#68	#69	#70	P
	- 1h (≤ 63 A)	42 s	2 min 11 s	37 s	P
	- 2h (> 63 A)				N/A
9.10.1.2	Test current 2,55 In (A) starting from cold for:	160,7 A			P
	opening time not less than 1 s or more than	#68	#69	#70	P
	- 60 s				N/A
	- 120 s	32 s	16 s	31 s	P
9.10.2	Test of instantaneous tripping and of correct opening of the contacts				P
9.10.2.1	General test conditions				P
	For the lower values of the test current the test is made once, at any convenient voltage.				P
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.				P
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min				P
	The tripping time of the O operation is measured				P
	After each operation the indicating means shall show the open position of the contacts				P

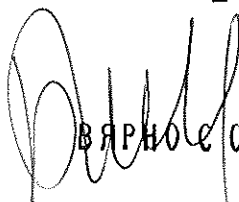
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ВЕРНО С ОРИГИНАЛА

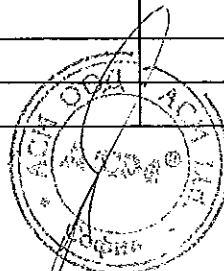
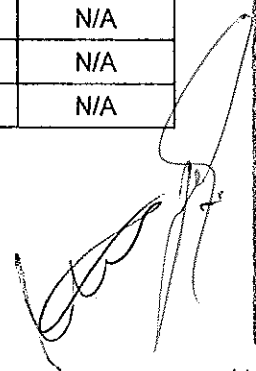


IEC/EN 60 898-1				
Clause	Requirement + Test	Result - Remark		Verdict
9.10.2.2 *)	<input type="checkbox"/> For circuit-breakers of the B – Type			N/A
*see Annex 1	Test current $3I_N$ (A), starting from cold			N/A
	Opening time:			N/A
	- 0,1s $\leq t \leq 45s$ ($\leq 32A$) *)acc. EN60898]			N/A
	- 0,1s $\leq t \leq 90s$ ($> 32A$) *)acc. EN60898]			N/A
	Test current $5 I_n$ (A), starting from cold			N/A
	Tripping less than 0,1 s			N/A
9.10.2.3 *)	<input type="checkbox"/> For circuit-breakers of the C – Type			N/A
*see Annex 1	Test current $5I_N$ (A), starting from cold			N/A
	Opening time:			
	- 0,1s $\leq t \leq 15s$ ($\leq 32A$) *)acc. EN60898]			N/A
	- 0,1s $\leq t \leq 30s$ ($> 32A$) *)acc. EN60898]			N/A
	Test current $10 I_n$ (A), starting from cold			N/A
	Tripping less than 0,1 s			N/A
9.10.2.4 *)	<input checked="" type="checkbox"/> For circuit-breakers of the D – Type			P
*see Annex 1	Test current $10I_N$ (A), starting from cold	630 A		P
	Opening time:	#68	#69	#70
	- 0,1s $\leq t \leq 4s$ ($10A < I_n \leq 32A$ *)acc. EN60898]			
	- 0,1s $\leq t \leq 8s$ ($> 32A$) *)acc. EN60898]	720 ms	860 ms	860 ms
	Test current $20 I_n$ (A) or to the maximum instantaneous tripping current(see cl. 6, item j)), starting from cold	885 A ($14 I_n$)		P
	Tripping less than 0,1 s	#68	#69	#70
		14,8 ms	16,8 ms	14,8 ms
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:			N/A
	Test current 1,1 It (A), (two pole) starting from cold			N/A
	Tripping within			N/A
	- 1h			N/A
	- 2h			N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold			N/A
	Tripping within			N/A
	- 1h			N/A
	- 2h			N/A

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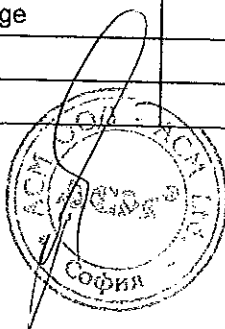
ВЕРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of $(35 \pm 2)^\circ\text{C}$ below the ambient air reference temperature	- 5 °C			P
	Test current 1,13 In (A)	71,2 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 In (A) within 5s	119,7 A			P
	Tripping within	#68	#69	#70	P
	- 1h	1 min 52 s	26 s	1 min 59 s	P
	- 2h				N/A
	b) Ambient temperature of $(40 \pm 2)^\circ\text{C}$	40 °C			P
	Test current In (A)	63 A			P
	No tripping within				P
	- 1h				P
	- 2h				N/A
	TESTS: D ₁	#68	#69	#70	P
		D63, 1-P			
8.9	Resistance to mechanical shock and impact				P
	CB shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use				P
9.13.1	Mechanical shock				P
	- 50 falls on two sides of vertical board C				P
	- Vertical board turned 90°				P
	- 50 falls on two sides of vertical board C				P
	During the test the circuit-breakers shall not open				P
9.13.2	Mechanical impact				P
9.13.2.1	All types:				P
	- Impact test: 10 blows-height 10 cm, no damage				P
9.13.2.2	Screw-in types:				N/A
	- Torque 2,5 Nm for 1 min, no damage				N/A
9.13.2.3	CB intended to be mounted on a rail				P
	- downward vertical 50 N for 1 min				P

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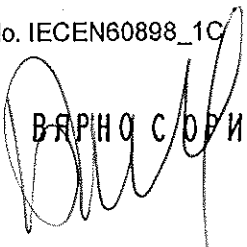
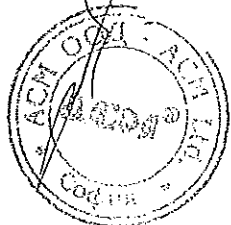
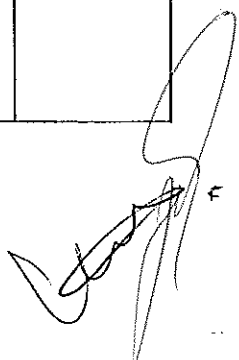
ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- upward vertical 50 N for 1 min, no damage		P
9.13.2.4	Plug-in types		N/A
	The circuit-breaker are mounted in there normal position, complete with plug-in base but without cables and any cover plate		N/A
	A force of 20 N applied for 1min to the circuit-breaker (see fig 17).		N/A
	During this test the circuit-breaker part shall not become loose from the base and shall not show damage impairing further use.		N/A
9.12.11.3	Test at 1500 A:		P
	Prospective current of 1500 A - power factor 0,93 to 0,98		P
	Prospective current obtained (A)		P
	For 6O + 2CO:		P
	L1	1,54 kA	
	L2		N/A
	L3		N/A
	L4(N)		N/A
	For last O:		P
	L1	1,55 kA	
	L2	1,55 kA	P
	L3	1,55 kA	P
	L4(N)		N/A
	Power factor	For 6O + 2CO: 0,96	P
		For last O: 0,95	
	Test voltage 1,05 Un	For 6O + 2CO: 249 V	P
		For last O: 424 V	
	Test circuit: figure	For 6O + 2CO : Figure 3	P
		For last O : Figure 5	

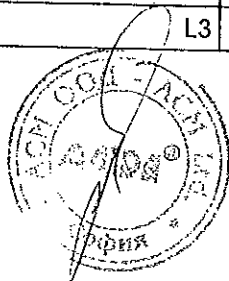
TRF No. IECEN60898_1C

ВЕРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input checked="" type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm F': 0,16 mm for last O F': 0,12 mm for others			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	Sequence	60 + 2CO + O (three phases test for single pole circuit-breaker)			P
	I _{Peak} (A) max. value	#68	#69	#70	P
	L1	2,01 kA	2,00 kA	1,95 kA	P
	L2				N/A
	L3				N/A
	L4				N/A
	Max. I ² t ≤ no specified value	#68	#69	#70	P
	L1	10,2 kA ² s	11,2 kA ² s	11,6 kA ² s	P
	L2				N/A
	L3				N/A
	L4				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U _n . The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#68	#69	#70	P
	L1	4,0 μA	5,0 μA	5,0 μA	P
	L2				N/A
	L3				N/A

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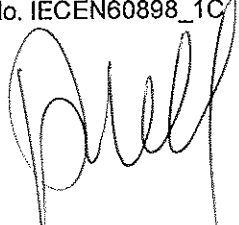
ВЯРНО СЪР АГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
		L4			N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 In)	60,5 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 In) within 5s	100 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	#68	#69	#70	P
		32 s	49 s	52 s	

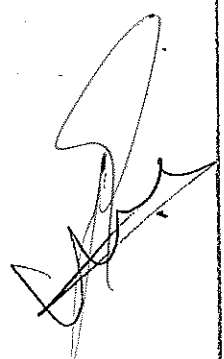
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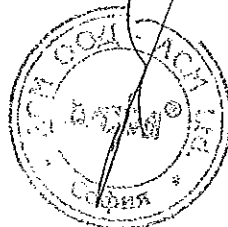
ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „D0+D1“ 3 + 3 SAMPLES	#71	#72	#73	P
		#74	#75	#76	
		D63, 4-P			
8.6	Automatic operation				P
8.6.1	Standard time-current zone				P
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.				P
9.10	Tests: D ₀	#71	#72	#73	P
	In (A)	63 A			P
	Sect. (mm ²)	16 mm ²			P
	Instantaneous tripping current	<input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D			P
9.10.1	Test of time-current characteristic				P
9.10.1.1	Test current 1,13 In (A) starting from cold for:	71,2 A			P
	- 1 h (In ≤ 63 A)				P
	- 2 h (In > 63 A)				N/A
	No tripping				P
	Then steadily increased within 5 s to 1,45 In (A)	91,4 A			P
	- Tripping within	#71	#72	#73	P
	- 1h (≤ 63 A)	1 min 06 s	2 min 29 s	57 s	P
	- 2h (> 63 A)				N/A
9.10.1.2	Test current 2,55 In (A) starting from cold for:	160,6 A			P
	opening time not less than 1 s or more than	#71	#72	#73	P
	- 60 s				N/A
	- 120 s	24 s	33 s	19 s	P
9.10.2	Test of instantaneous tripping and of correct opening of the contacts				P
9.10.2.1	General test conditions				P
	For the lower values of the test current the test is made once, at any convenient voltage.				P
	For the upper values of the test current the test is made at rated voltage Un (phase to neutral) with a power factor between 0,95 and 1.				P
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min				P
	The tripping time of the O operation is measured				P

TRF No. IECEN60898_1C

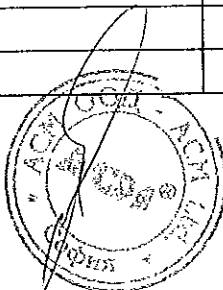
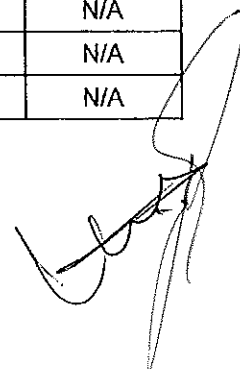
ВЕРНО С ОРИГИНАЛА



IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	After each operation the indicating means shall show the open position of the contacts				P
9.10.2.2 *)	<input type="checkbox"/> For circuit-breakers of the B – Type				N/A
*see Annex 1	Test current $3I_N$ (A), starting from cold				N/A
	Opening time:				N/A
	- 0,1s ≤ t [≤ 45s (≤ 32A) *)acc. EN60898]				N/A
	- 0,1s ≤ t [≤ 90s (> 32A) *)acc. EN60898]				N/A
	Test current $5 I_N$ (A), starting from cold				N/A
	Tripping less than 0,1 s				N/A
9.10.2.3 *)	<input type="checkbox"/> For circuit-breakers of the C – Type				N/A
*see Annex 1	Test current $5I_N$ (A), starting from cold				N/A
	Opening time:				N/A
	- 0,1s ≤ t [≤ 15s (≤ 32A) *)acc. EN60898]				N/A
	- 0,1s ≤ t [≤ 30s (> 32A) *)acc. EN60898]				N/A
	Test current $10 I_N$ (A), starting from cold				N/A
	Tripping less than 0,1 s				N/A
9.10.2.4 *)	<input checked="" type="checkbox"/> For circuit-breakers of the D – Type				P
*see Annex 1	Test current $10I_N$ (A), starting from cold	630 A			P
	Opening time:	#71	#72	#73	P
	- 0,1s ≤ t [≤ 4s (10A < I_N ≤ 32A) *)acc. EN60898]				N/A
	- 0,1s ≤ t [≤ 8s (> 32A) *)acc. EN60898]	1,05 s	1,05 s	1,00 s	P
	Test current $20 I_N$ (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold	885 A (14 I_N)			P
	Tripping less than 0,1 s	#71	#72	#73	P
	L1	15,6 ms	14,4 ms	14,8 ms	P
	L2	14,8 ms	14,2 ms	15,0 ms	
	L3	15,6 ms	13,8 ms	13,8 ms	
	L4(N)	15,0 ms	15,6 ms	14,8 ms	
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				P
	Test current 1,1 I_t (A), (two pole) starting from cold				N/A
	Tripping within				N/A
	- 1h				N/A
	- 2h				N/A

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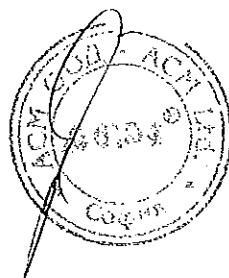
ВЕРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	Test current 1,2 It (A), (three pole or four pole) starting from cold	109,6 A			P
	Tripping within				P
	- 1h	#71	#72	#73	P
	L1	4 min 29 s	5 min 23 s	4 min 17 s	P
	L2	5 min 18 s	4 min 48 s	5 min 10 s	P
	L3	4 min 10 s	4 min 17 s	4 min 33 s	P
	L4(N)	4 min 51 s	5 min 22 s	4 min 48 s	P
	- 2h				N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P
	a) Ambient temperature of $(35 \pm 2)^\circ\text{C}$ below the ambient air reference temperature	-5 °C			P
	Test current 1,13 In (A)	71,2 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,9 In (A) within 5s	119,7 A			P
	Tripping within	#71	#72	#73	P
	- 1h	28 s	53 s	16 s	P
	- 2h				N/A
	b) Ambient temperature of $(40 \pm 2)^\circ\text{C}$	40 °C			P
	Test current In (A)	63 A			P
	No tripping within				P
	- 1h				P
	- 2h				N/A

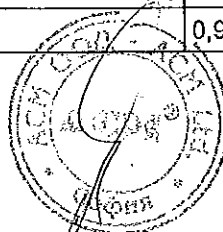
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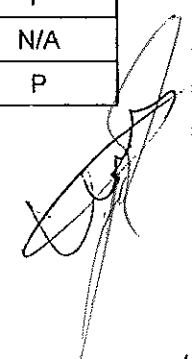


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	Tests: D₁				P
8.9	Resistance to mechanical shock and impact	#71	#72	#73	P
	CB shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use				P
9.13.1	Mechanical shock				P
	- 50 falls on two sides of vertical board C				P
	- Vertical board turned 90°				P
	- 50 falls on two sides of vertical board C				P
	During the test the circuit-breakers shall not open				P
9.13.2	Mechanical impact				P
9.13.2.1	All types:				P
	- Impact test: 10 blows-height 10 cm, no damage				P
9.13.2.2	Screw-in types:				N/A
	- Torque 2,5 Nm for 1 min, no damage				N/A
9.13.2.3	CB intended to be mounted on a rail				P
	- downward vertical 50 N for 1 min				P
	- upward vertical 50 N for 1 min, no damage				P
9.13.2.4	Plug-in types				N/A
	The circuit-breaker are mounted in there normal position, complete with plug-in base but without cables and any cover plate				N/A
	A force of 20 N applied for 1min to the circuit-breaker (see fig 17).				N/A
	During this test the circuit-breaker part shall not become loose from the base and shall not show damage impairing further use.				N/A
9.12.11.3	Test at 1500 A:	#71	#72	#73	P
		#74	#75	#76	
	Prospective current of 1500 A - power factor 0,93 to 0,98				P
	Prospective current obtained (A)				P
	L1	1,55 kA			P
	L2	1,55 kA			P
	L3	1,54 kA			P
	L4(N)				N/A
	Power factor	0,95			P

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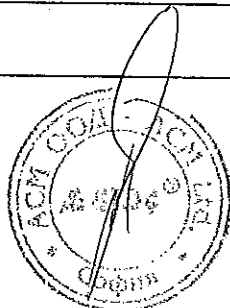


 ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	Test voltage 1,05 Un	424 V			P
	Test circuit: figure	Figure 6			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	Sequence	60 + 3 CO			P
	I _{Peak} (A) max. value	#71	#72	#73	P
	L1	1,99 kA	1,98 kA	1,89 kA	P
	L2	1,87 kA	1,90 kA	1,87 kA	P
	L3	1,79 kA	1,99 kA	1,92 kA	P
	L4(N)				N/A
	I _{Peak} (A) max. value	#74	#75	#76	P
	L1		1,91 kA	1,98 kA	P
	L2	1,88 kA		1,94 kA	P
	L3	1,95 kA	1,92 kA		P
	L4(N)	1,92 kA	1,91 kA	2,04 kA	P
	Max. I ² t ≤ no specified value	#71	#72	#73	P
	L1	9,33 kA ² s	9,30 kA ² s	9,65 kA ² s	P
	L2	8,41 kA ² s	10,1 kA ² s	8,41 kA ² s	P
	L3	9,11 kA ² s	13,8 kA ² s	11,0 kA ² s	P
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#74	#75	#76	P
	L1		9,06 kA ² s	9,30 kA ² s	P
	L2	11,9 kA ² s		11,5 kA ² s	P
	L3	10,7 kA ² s	10,9 kA ² s		P
	L4(N)	8,95 kA ² s	10,8 kA ² s	10,4 kA ² s	P

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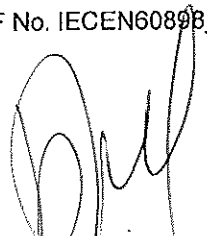


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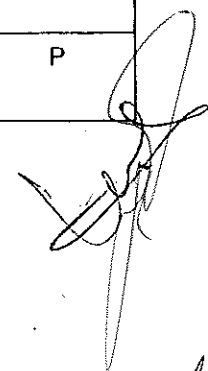


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#71	#72	#73	P
	L1	5,0 µA	4,0 µA	4,0 µA	P
	L2	4,0 µA	4,0 µA	5,0 µA	P
	L3	4,0 µA	4,0 µA	5,0 µA	P
	L4(N)	4,0 µA	5,0 µA	5,0 µA	P
	The leakage current shall not exceed 2 mA	#74	#75	#76	P
	L1	5,0 µA	5,0 µA	4,0 µA	P
	L2	4,0 µA	4,0 µA	4,0 µA	P
	L3	6,0 µA	5,0 µA	5,0 µA	P
	L4(N)	5,0 µA	4,0 µA	5,0 µA	P
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 In)	60,5 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 In) within 5s	100 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	#71	#72	#73	P
		27 s	47 s	42 s	

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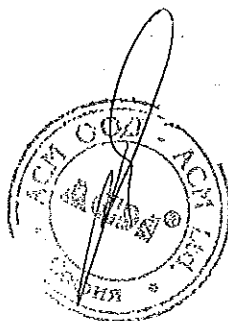



ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
		#74	#75	#76	
		34 s	1 min 01 s	1 min 44 s	

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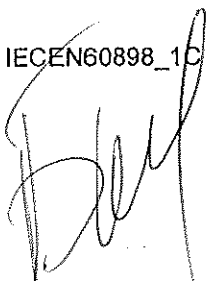
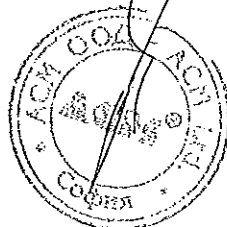
ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	TESTS „D0 “		P
8.6	AUTOMATIC OPERATION		P
8.6.1	STANDARD TIME-CURRENT ZONE		P
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.		P



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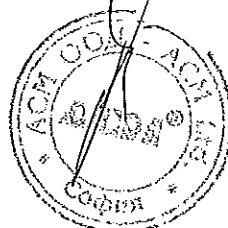
ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
9.10	Tests: D ₀ In (A)	#33	#34	#35	P	P
		D50	D40	D32		
		#36	#37	#38		
		D25	D20	D16		
		#39	#40	#41		
		D10	D6	D4		
		#42	#43			
		D2	D1			
		#44	#45	#46		
		C63	C50	C40		
		#47	#48	#49		
		C32	C25	C20		
		#50	#51	#52		
		C16	C10	C6		
		#53	#54	#55		
		C4	C2	C1		
		#56	#57	#58		
		B63	B50	B40		
		#59	#60	#61		
		B32	B25	B20		
#62	#63	#64				
B16	B10	B6				
#65	#66	#67				
B4	B2	B1				
	Sect. (mm ²)	#33	#34	#35	P	P
		10 mm ²	10 mm ²	6 mm ²		
		#36	#37	#38		
		4 mm ²	2,5 mm ²	2,5 mm ²		
		#39	#40	#41		
		1,5 mm ²	1 mm ²	1 mm ²		
		#42	#43			
		1 mm ²	1 mm ²			
		#44	#45	#46		
		16 mm ²	10 mm ²	10 mm ²		

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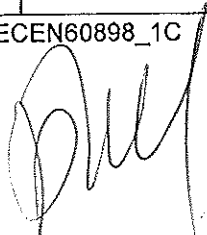
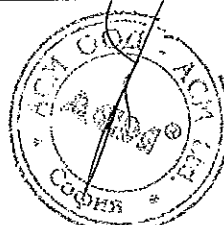
ВЯРНО С ОРИГИНАЛА





IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
		#47	#48	#49		
		6 mm ²	4 mm ²	2,5 mm ²		
		#50	#51	#52		
		2,5 mm ²	1,5 mm ²	1 mm ²		
		#53	#54	#55		
		1 mm ²	1 mm ²	1 mm ²		
		#56	#57	#58		
		16 mm ²	10 mm ²	10 mm ²		
		#59	#60	#61		
		6 mm ²	4 mm ²	2,5 mm ²		
		#62	#63	#64		
		2,5 mm ²	1,5 mm ²	1 mm ²		
		#65	#66	#67		
		1 mm ²	1 mm ²	1 mm ²		
	Instantaneous tripping current	<input checked="" type="checkbox"/> B	<input checked="" type="checkbox"/> C	<input checked="" type="checkbox"/> D		P
9.10.1	Test of time-current characteristic					P
9.10.1.1	Test current 1,13 I _n (A) starting from cold for:	#33	#34	#35		P
		56,5 A	45,2 A	36,2 A		
		#36	#37	#38		
		28,3 A	22,6 A	18,1 A		
		#39	#40	#41		
		11,3 A	6,78 A	4,52 A		
		#42	#43			
		2,26 A	1,13 A			
	- 1 h (I _n ≤ 63 A)					P
	- 2 h (I _n > 63 A)					N/A
	No tripping					P
	Then steadily increased within 5 s to 1,45 I _n (A)	#33	#34	#35		P
		72,5 A	58,0 A	46,4 A		
		#36	#37	#38		
		36,3 A	29,0 A	23,2 A		
		#39	#40	#41		
		14,5 A	8,7 A	5,8 A		
		#42	#43			
		2,9 A	1,45 A			

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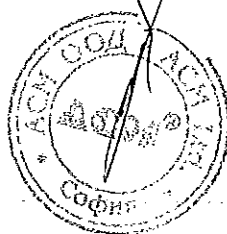



ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
	- Tripping within				P	
	- 1h (≤ 63 A)	#33	#34	#35	P	
		3 min 14 s	11 min 21 s	9 s		
		#36	#37	#38		
		3 min 48 s	18 s	5 min 57 s		
		#39	#40	#41		
		16 s	6 min 24 s	3 min 20 s		
		#42	#43			
		16 s	15 s			
	- 2h (> 63 A)				N/A	
9.10.1.2	Test current 2,55 In (A) starting from cold for:	#33	#34	#35	P	
		127,5 A	102 A	81,6 A		
		#36	#37	#38		
		63,8 A	51,0 A	40,8 A		
		#39	#40	#41		
		25,5 A	15,3 A	10,2 A		
		#42	#43			
		5,1 A	2,55 A			
	opening time not less than 1 s or more than				P	
	- 60 s	#35	#36	#37	P	
		10 s	12 s	11 s		
		#38	#39	#40		
		13 s	13 s	12 s		
		#41	#42	#43		
		15 s	15 s	17 s		
	- 120 s	#33	#34		P	
		14 s	16 s			
9.10.2	Test of instantaneous tripping and of correct opening of the contacts				P	
9.10.2.1	General test conditions				P	
	For the lower values of the test current the test is made once, at any convenient voltage.				P	
	For the upper values of the test current the test is made at rated voltage U_n (phase to neutral) with a power factor between 0,95 and 1.				P	

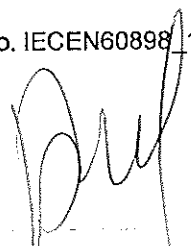
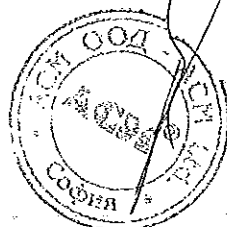
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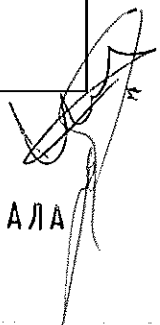
ВЯРНО С ОРИГИНАЛА

IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min				P	
	The tripping time of the O operation is measured				P	
	After each operation the indicating means shall show the open position of the contacts				P	
9.10.2.2 *)	<input checked="" type="checkbox"/> For circuit-breakers of the B – Type				P	
*see Annex 1	Test current $3I_N$ (A), starting from cold	#56 189 A	#57 150 A	#58 120 A	P	
		#59 96 A	#60 78 A	#61 60 A		
		#62 48 A	#63 30 A	#64 18 A		
		#65 12 A	#66 6 A	#67 3 A		
	Opening time:					
	- $0,1s \leq t \leq 45s (\leq 32A)$ *)acc. EN60898]	#59 8,34 s	#60 7,54 s	#61 7,00 s		
		#62 6,87 s	#63 8,56 s	#64 7,32 s		
		#65 16,3 s	#66 12,7 s	#67 8,29 s		
	- $0,1s \leq t \leq 90s (> 32A)$ *)acc. EN60898]	#56 11,9 s	#57 6,89 s	#58 7,37 s	P	
	Test current $5 I_n$ (A), starting from cold	#56 315 A	#57 251 A	#58 201 A	P	
		#59 161 A	#60 129 A	#61 102 A		
		#62 80,6 A	#63 50,2 A	#64 30,6 A		
		#65 20,2 A	#66 10,6 A	#67 5,0 A		
	Tripping less than 0,1 s	#56 15,0 ms	#57 16,8 ms	#58 22,8 ms		
		#59 15,0 ms	#60 11,7 ms	#61 16,2 ms		

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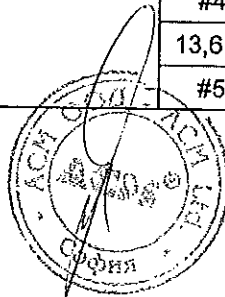



ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
		#62	#63	#64		
		22,2 ms	26,7 ms	14,4 ms		
		#65	#66	#67		
		24,2 ms	14,8 ms	35,2 ms		
9.10.2.3 *)	<input checked="" type="checkbox"/> For circuit-breakers of the C – Type				P	
*see Annex 1	Test current $5I_N$ (A), starting from cold	#44	#45	#46	P	
		315 A	250 A	200 A		
		#47	#48	#49		
		160 A	125 A	100 A		
		#50	#51	#52		
		80 A	50 A	30 A		
		#53	#54	#55		
		20 A	10 A	5 A		
	Opening time:				P	
	- 0,1s ≤ t [≤ 15s (≤ 32A) *)acc. EN60898]	#47	#48	#49	P	
		1,56 s	2,25 s	2,47 s		
		#50	#51	#52		
		2,22 s	2,59 s	2,80 s		
		#53	#54	#55		
		6,60 s	6,15 s	6,95 s		
	- 0,1s ≤ t [≤ 30s (> 32A) *)acc. EN60898]	#44	#45	#46	P	
		3,02 s	2,18 s	1,93 s		
	Test current $10 I_N$ (A), starting from cold	#44	#45	#46	P	
		634 A	502 A	402 A		
		#47	#48	#49		
		320 A	251 A	201 A		
		#50	#51	#52		
		161 A	102 A	60,5 A		
		#53	#54	#55		
		40,2 A	20,2 A	10,6 A		
	Tripping less than 0,1 s	#44	#45	#46	P	
		16,4 ms	14,8 ms	12,4 ms		
		#47	#48	#49		
		13,6 ms	13,6 ms	14,2 ms		
		#50	#51	#52		

TRF No. IECEN60898_1C

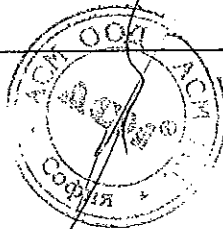


ВЕРНО С ОРИГИНАЛА

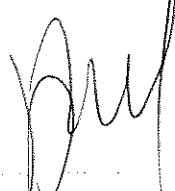
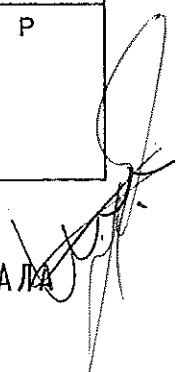


IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
		7,8 ms	13,0 ms	13,7 ms		
		#53	#54	#55		
		13,6 ms	14,4 ms	15,6 ms		
9.10.2.4 *)	<input checked="" type="checkbox"/> For circuit-breakers of the D – Type				P	
*see Annex 1	Test current $10I_N$ (A), starting from cold	#33	#34	#35	P	
		500 A	400 A	320 A		
		#36	#37	#38		
		250 A	200 A	160 A		
		#39	#40	#41		
		100 A	60 A	40 A		
		#42	#43			
		20 A	10 A			
	Opening time:				P	
	$- 0,1s \leq t \leq 4s$ ($10A < I_n \leq 32A$) *)acc. EN60898]	#35	#36	#37	P	
		500 ms	700 ms	710 ms		
		#38				
		170 ms				
	$- 0,1s \leq t \leq 8s$ ($\leq 10A, > 32A$) *)acc. EN60898]	#33	#34	#39	P	
		660 ms	670 ms	670 ms		
		#40	#41	#42		
		730 ms	2,40 s	2,12 s		
		#43				
		2,45 s				
	Test current $20 I_n$ (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold	#33	#34	#35	P	
		702 A	565 A	448 A		
		#36	#37	#38		
	14 I_n as per manufacturer's specification	352 A	281 A	225 A		
		#39	#40	#41		
		140 A	84,3 A	56,8 A		
		#42	#43			
		28,0 A	14 A			
	Tripping less than 0,1 s	#33	#34	#35	P	
		13,8 ms	11,6 ms	14,4 ms		
		#36	#37	#38		
		15,6 ms	14,2 ms	9,8 ms		

TRF No. IECEN60898_1C

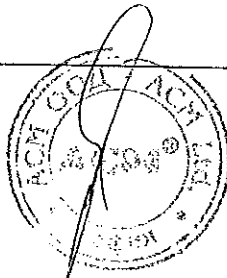


ВЯРНО С ОРИГИНАЛА

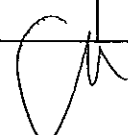
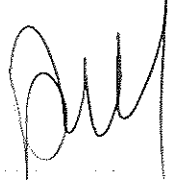
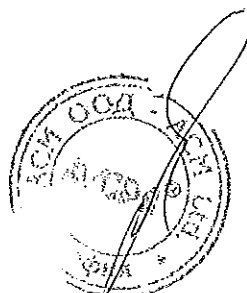
IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
		#39	#40	#41		
		12,9 ms	9,1 ms	11,6 ms		
		#42	#43			
		15,0 ms	14,4 ms			
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers:				N/A	
	Test current 1,1 It (A), (two pole) starting from cold				N/A	
	Tripping within				N/A	
	- 1h				N/A	
	- 2h				N/A	
	Test current 1,2 It (A), (three pole or four pole) starting from cold				N/A	
	Tripping within				N/A	
	- 1h				N/A	
	- 2h				N/A	
9.10.4	Test of effect of ambient temperature on the tripping characteristics				P	
	a) Ambient temperature of (35 ± 2)°C below the ambient air reference temperature	-5 °C			P	
	Test current 1,13 In (A)	#33	#34	#35	P	
		56,5 A	45,2 A	36,2 A		
		#36	#37	#38		
		28,3 A	22,6 A	18,1 A		
		#39	#40	#41		
		11,3 A	6,78 A	4,52 A		
		#42	#43			
		2,26 A	1,13 A			
	- Passed for 1h				P	
	- Passed for 2h				N/A	
	Current is then steadily increased to 1,9 In (A) within 5s	#33	#34	#35	P	
		95,0 A	76,0 A	60,8 A		
		#36	#37	#38		
		47,5 A	38,0 A	30,4 A		
		#39	#40	#41		
		19,0 A	11,4 A	7,6 A		

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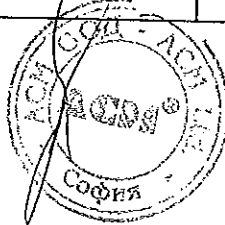
ВЕРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark		Verdict	
		#42	#43		
		3,8 A	1,9 A		
	Tripping within			P	
	- 1h	#33	#34	#35	P
		36 s	12 s	28 s	
		#36	#37	#38	
		33 s	17 s	27 s	
		#39	#40	#41	
		24 s	37 s	48 s	
		#42	#43		
		12 s	26 s		
	- 2h			N/A	
	b) Ambient temperature of (40 ± 2)°C	40 °C		P	
	Test current I _n (A)	#33	#34	#35	P
		50,0 A	40,0 A	32,0 A	
		#36	#37	#38	
		25,0 A	20,0 A	16,0 A	
		#39	#40	#41	
		10,0 A	6,0 A	4,0 A	
		#42	#43		
		2,0 A	1,0 A		
	No tripping within			P	
	- 1h			P	
	- 2h			N/A	
	TESTS: D ₁			N/A	

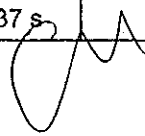

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E“ 3+3 SAMPLES *) SEE ANNEX 1				P
8.12.11.4.2	Test: E ₁ : Test at service short-circuit capacity	#77	#78	#79	P
		D63, 1-P			
	Service short-circuit capacity.....:	7,5 kA			P
	Test circuit: figure.....:	3			P
	Prospective current.....:	7,5 kA			P
	Prospective current obtained.....:				P
	L1	7,54 kA			P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Power factor.....:	0,45 - 0,50			P
	Power factor obtained.....:	0,47			P
	Sequence.....:	Table 19 of IEC/EN 60898-1			P
	T (min).....:	3 min			P
9.12.9.1	Test in free air copper wire F': <input checked="" type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#77	#78	#79	P
	L1	6,22 kA	5,15 kA	5,21 kA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#77	#78	#79	P
	L1	134 kA ² s	64,1 kA ² s	74,5 kA ² s	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P

TRF No. IECEN60898_1C

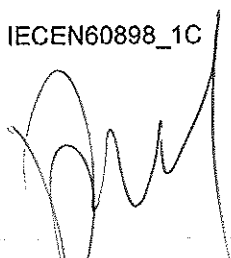
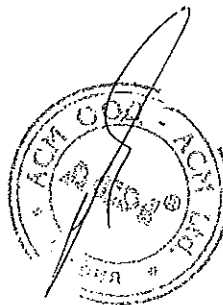


ВЯРНО С ОРИГИНАЛА

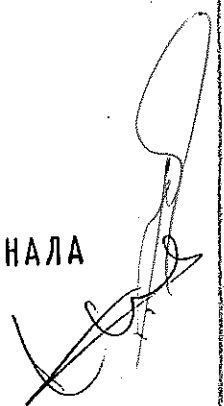
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#77	#78	#79	P
	L1	14,0 µA	56,2 µA	13,8 µA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 In)	60,5 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 In) within 5s	100 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	#77	#78	#79	P
		23 s	43 s	37 s	



TRF No. IECEN60898_1C

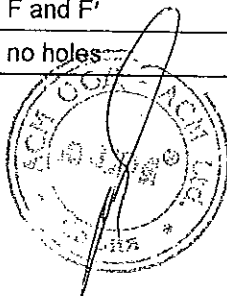



ВЯРНО С ОРИГИНАЛА




IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
8.12.11.4.2	Test: E ₁ (Test at service short-circuit capacity) three phase tests for single circuit-breakers	#80	#81	#82	P	
		D63, 1-P				
	Service short-circuit capacity.....	7,5 kA			P	
	Test circuit: figure	5			P	
	Prospective current	7,5 kA			P	
	Prospective current obtained.....				P	
		L1	7,52 kA		P	
		L2	7,76 kA		P	
		L3	7,52 kA		P	
		L4(N)			N/A	
		Power factor	0,45 - 0,50			P
		Power factor obtained	0,46			P
		Sequence	Table 21 of IEC/EN 60898-1			P
		T (min)	3 min			P
	9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
	9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
		I _{Peak} (A) max. value	#80	#81	#82	P
	L1	4,32 kA		P		
	L2	4,59 kA		P		
	L3	4,29 kA		P		
	L4(N)			N/A		
	Max. I ² t ≤ no specified value	#80	#81	#82	P	
	L1	46,3 kA ² s		P		
	L2	33,7 kA ² s		P		
	L3	45,5 kA ² s		P		
	L4(N)			N/A		
	- No permanent arcing				P	
	- No flash-over between poles or between poles and frame				P	
	- No blowing of the fuses F and F'				P	
	- Polyethylene foil shows no holes				P	

TRF No. IECEN60898_1C

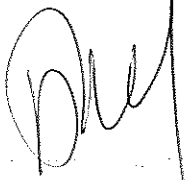
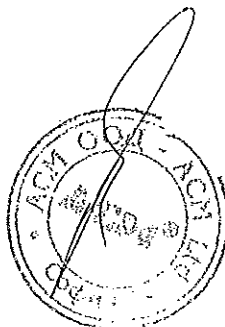


ВАРНО С СРИГИНАЛА

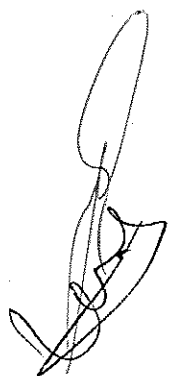
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#80	#81	#82	P
	L1	15,7 µA	70,0 µA	14,9 µA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 In)	60,5 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 In) within 5s	100 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	#80	#81	#82	P
		30 s	27 s	34 s	



TRF No. IECEN60898_1C

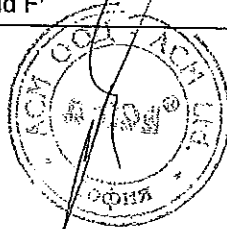



ВЕРНО С ОРИГИНАЛА



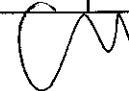
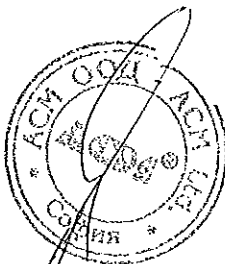
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E“ 3+3 SAMPLES *) SEE ANNEX 1				P
8.12.11.4.2	Test: E ₁ : Test at service short-circuit capacity	#83	#84	#85	P
		D1, 1-P			
	Service short-circuit capacity.....:	7,5 kA			P
	Test circuit: figure.....:	3			P
	Prospective current.....:	7,5 kA			P
	Prospective current obtained.....:				P
	L1	7,54 kA			P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Power factor.....:	0,45 - 0,50			P
	Power factor obtained.....:	0,47			P
	Sequence.....:	Table 19 of IEC/EN 60898-1			P
	T (min).....:	3 min			P
9.12.9.1	Test in free air copper wire F': <input checked="" type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#83	#84	#85	P
	L1	683 A	676 A	672 A	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ 84 kA ² s	#83	#84	#85	P
	L1	810 A ² s	831 A ² s	674 A ² s	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P

TRF No. IECEN60898_1C



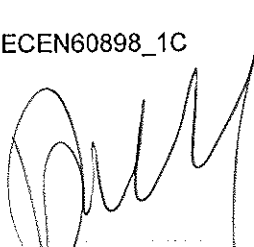
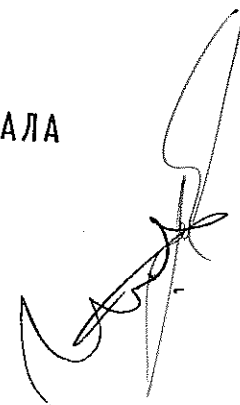
ВЕРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#83	#84	#85	P
	L1	12,9 µA	13,9 µA	13,1 µA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				N/A
	c)				O
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 In)	0,96 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 In) within 5s	1,59 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	#83	#84	#85	P
		36 s	46 s	35 s	

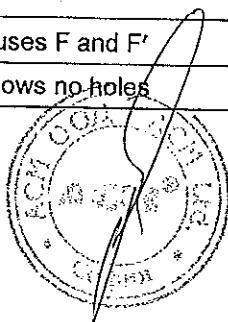
ВЯРНО С ОРИГИНАЛА

TRF No. IECEN60898_1C

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
8.12.11.4.2	Test: E ₁ (Test at service short-circuit capacity) three phase tests for single circuit-breakers	#86	#87	#88	P
		D1, 1-P			
	Service short-circuit capacity.....	7,5 kA			P
	Test circuit: figure	5			P
	Prospective current	7,5 kA			P
	Prospective current obtained.....				P
	L1	7,52 kA			P
	L2	7,76 kA			P
	L3	7,52 kA			P
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,46			P
	Sequence	Table 21 of IEC/EN 60898-1			P
	T (min)	3 min			P
	9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm		
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#86	#87	#88	P
	L1	594 A			P
	L2	610 A			P
	L3	552 A			P
	L4(N)				N/A
	Max. I ² t ≤ 84 kA ² s	#86	#87	#88	P
	L1	507 A ² s			P
	L2	532 A ² s			P
	L3	455 A ² s			P
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P

TRF No. IECEN60898_1C

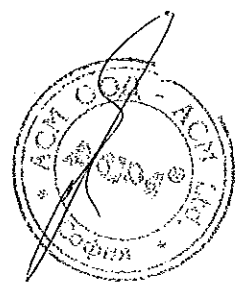


ВЕРНО С ОРИГИНАЛА



IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#86	#87	#88	P
	L1	14,4 µA	14,4 µA	14,2 µA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 In)	0,96 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 In) within 5s	1,59 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	#86	#87	#88	P
		50 s	36 s	1 min 02 s	

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ВЯРНО С ОРИГИНАЛА

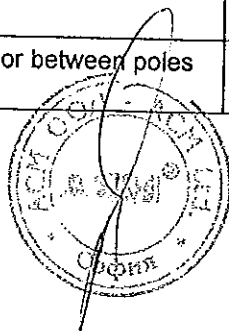
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IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E“ 3 SAMPLES *) SEE ANNEX 1				P
8.12.11.4.2	Test: E ₁ : Test at service short-circuit capacity	#89	#90	#91	P
		D63, 2-P			
	Service short-circuit capacity.....:	7,5 kA			P
	Test circuit: figure.....:	4b			P
	Prospective current.....:	7,5 kA			P
	Prospective current obtained.....:				P
	L1	7,55 kA			P
	L2	7,55 kA			P
	L3				N/A
	L4(N)				N/A
	Power factor.....:	0,45 - 0,50			P
	Power factor obtained.....:	0,46			P
	Sequence.....:	Table 19 of IEC/EN 60898-1			P
	T (min).....:	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#89	#90	#91	P
	L1	4,53 kA	4,62 kA	4,60 kA	P
	L2	4,53 kA	4,62 kA	4,60 kA	P
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#89	#90	#91	P
	L1	37,9 kA ² s	37,4 kA ² s	36,3 kA ² s	P
	L2	37,9 kA ² s	37,4 kA ² s	36,3 kA ² s	P
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P

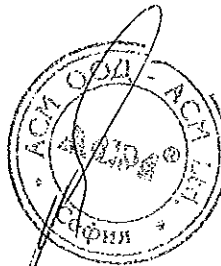
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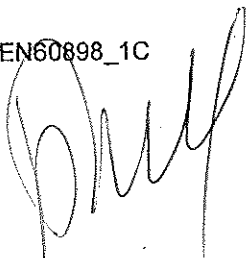
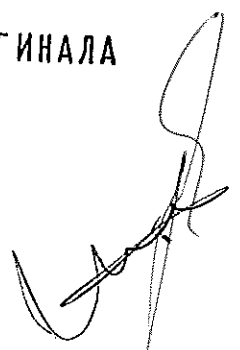
ВЯРНО С ОРИГИНАЛА



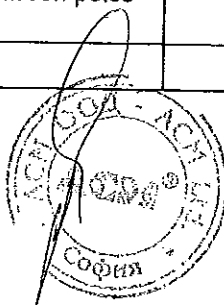
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#89	#90	#91	P
	L1	13,7 µA	2,7 µA	30,3 µA	P
	L2	14,0 µA	34,5 µA	127 µA	P
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 In)	60,5 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 In) within 5s	100 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	#89	#90	#91	P
		2 min 03 s	2 min 08 s	3 min 55 s	



ВЕРНО С ОРИГИНАЛА

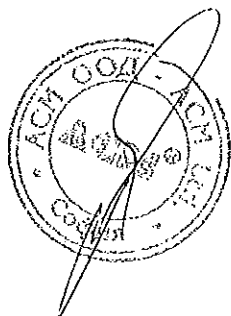



IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E“ 3 SAMPLES *) SEE ANNEX 1				P
8.12.11.4.2	Test: E ₁ : Test at service short-circuit capacity	#92	#93	#94	P
		D1, 2-P			
	Service short-circuit capacity.....:	7,5 kA			P
	Test circuit: figure	4b			P
	Prospective current	7,5 kA			P
	Prospective current obtained.....:				P
	L1	7,55 kA			P
	L2	7,55 kA			P
	L3				N/A
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,46			P
	Sequence	Table 19 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#92	#93	#94	P
	L1	630 A	790 A	715 A	P
	L2	630 A	790 A	715 A	P
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#92	#93	#94	P
	L1	637 A ² s	898 A ² s	737 A ² s	P
	L2	637 A ² s	898 A ² s	737 A ² s	P
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P


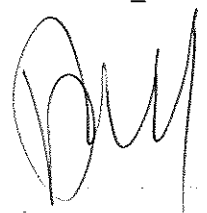




IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#92	#93	#94	P
	L1	30,9 µA	13,4 µA	13,3 µA	P
	L2	12,9 µA	13,3 µA	13,1 µA	P
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 In)	0,96 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 In) within 5s	1,59 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	#92	#93	#94	P
		57 s	46 s	39 s	

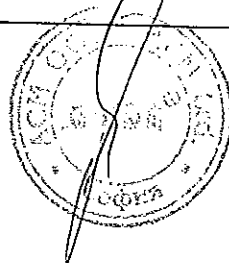



ВЕРНО С ОРИГИНАЛА

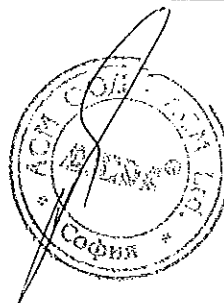
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Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E“ 3 SAMPLES *) SEE ANNEX 1				P
8.12.11.4.2	Test: E ₁ : Test at service short-circuit capacity	#95F1	#96F1	#97F1	P
		D63, 4-P			
	Service short-circuit capacity.....	7,5 kA			P
	Test circuit: figure.....	6			P
	Prospective current.....	7,5 kA			P
	Prospective current obtained.....				P
	L1	7,52 kA			P
	L2	7,76 kA			P
	L3	7,52 kA			P
	L4(N)				N/A
	Power factor.....	0,45 - 0,50			P
	Power factor obtained.....	0,46			P
	Sequence.....	Table 20 of IEC/EN 60898-1			P
	T (min).....	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#95F1	#96F1	#97F1	P
	L1	3,37 kA	4,72 kA	3,32 kA	P
	L2	4,73 kA	4,06 kA	3,38 kA	P
	L3	4,90 kA	4,87 kA	4,83 kA	P
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#95F1	#96F1	#97F1	P
	L1	23,3 kA ² s	43,2 kA ² s	21,1 kA ² s	P
	L2	37,8 kA ² s	31,1 kA ² s	32,2 kA ² s	P
	L3	45,3 kA ² s	56,8 kA ² s	55,7 kA ² s	P
	L4(N)				N/A
	- No permanent arcing				P

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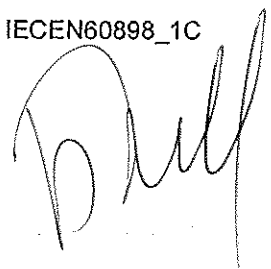
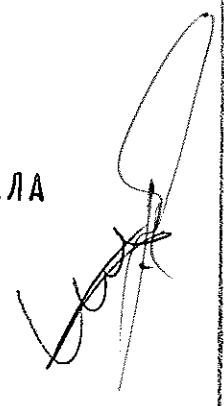
ВІРНО С ОРІГІНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#95F1	#96F1	#97F1	P
	L1	13,6 µA	13,8 µA	13,7 µA	P
	L2	14,0 µA	14,5 µA	14,1 µA	P
	L3	13,8 µA	14,2 µA	14,0 µA	P
	L4(N)	14,4 µA	17,8 µA	13,9 µA	P
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 In)	60,5 A			P
	- Passed for 1h				P
	- Passed for 2h				P
	Current is then steadily increased to 1,1 x tripping current (1,45 In) within 5s	100 A			N/A
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	#95F1	#96F1	#97F1	P
		59 s	46 s	51 s	



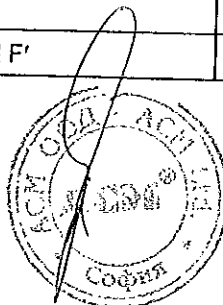
ВАРНО С ОРИГИНАЛА

TRF No. IECEN60898_1C

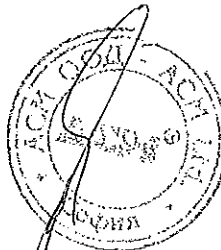
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E“ 3 SAMPLES *) SEE ANNEX 1				P
8.12.11.4.2	Test: E ₁ : Test at service short-circuit capacity	#98	#99	#100	P
		D1, 4-P			
	Service short-circuit capacity.....:	7,5 kA			P
	Test circuit: figure.....:	6			P
	Prospective current.....:	7,5 kA			P
	Prospective current obtained.....:				P
	L1	7,52 kA			P
	L2	7,76 kA			P
	L3	7,52 kA			P
	L4(N)				N/A
	Power factor.....:	0,45 - 0,50			P
	Power factor obtained.....:	0,46			P
	Sequence.....:	Table 20 of IEC/EN 60898-1			P
	T (min).....:	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#98	#99	#100	P
	L1	638 A	619 A	607 A	P
	L2	665 A	483 A	268 A	P
	L3	569 A	617 A	605 A	P
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#98	#99	#100	P
	L1	809 A ² s	641 A ² s	552 A ² s	P
	L2	861 A ² s	641 A ² s	137 A ² s	P
	L3	563 A ² s	605 A ² s	526 A ² s	P
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P

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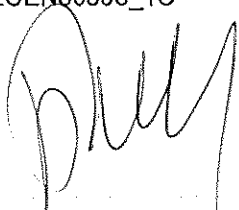


ВЯРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#98	#99	#100	P
	L1	12,7 µA	13,1 µA	12,9 µA	R
	L2	13,3 µA	13,4 µA	12,8 µA	P
	L3	13,3 µA	13,6 µA	13,4 µA	P
	L4(N)	13,1 µA	13,1 µA	12,9 µA	P
	Electric strength test:				P
	Test voltage 1500 V (see 8.7.2)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non tripping current (1,13 In)	0,96 A			P
	- Passed for 1h				P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 In) within 5s	1,59 A			P
	Tripping within <input checked="" type="checkbox"/> 1 hour / <input type="checkbox"/> 2 hour	#98	#99	#100	P
		49 s	1 min 07 s	37 s	

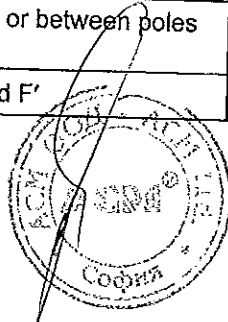



ВЕРНО С ОРИГИНАЛА




IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 + 4 samples				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#101	#102	#103	P
		D63, 1-P			
	Service short-circuit capacity.....:	10 kA			P
	Test circuit: figure	3			P
	Prospective current.....:	10 kA			P
	Prospective current obtained.....:				P
	L1	10,1 kA			P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,47			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input checked="" type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#101	#102	#103	P
	L1	4,37 kA	4,93 kA	4,91 kA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#101	#102	#103	P
	L1	42,1 kA ² s	49,2 kA ² s	40,5 kA ² s	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P

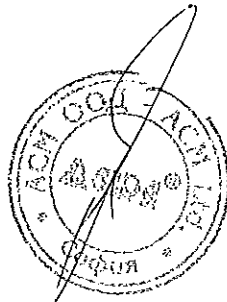
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ВЯРНО С ОРИГИНАЛА



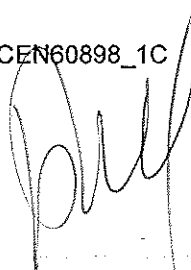
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#101	#102	#103	P
	L1	14,2 µA	14,1 µA	22,4 µA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 2,8 I _N	176 A			P
	Tripping within > 0,1 s up to	#101	#102	#103	P
	- 60 s				N/A
	- 120 s	13 s	16 s	19 s	P



01

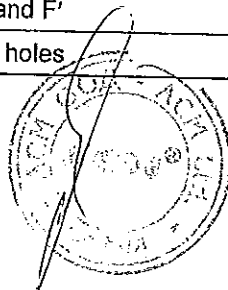
ВЕРНО С ОРИГИНАЛА

TRF No. IECEN60898_1C



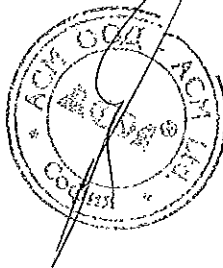

IEC/EN 60 898-1							
Clause	Requirement + Test	Result - Remark				Verdict	
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity) three phase tests for single circuit-breakers	#104	#105	#106	#107	P	
		D63, 1-P					
	Rated short-circuit capacity	10 kA				P	
	Test circuit; figure	5				P	
	Prospective current.....	10 kA				P	
	Prospective current obtained.....					P	
		L1	10,0 kA			P	
		L2	10,3 kA			P	
		L3	10,3 kA			P	
		L4(N)				N/A	
		Power factor	0,45 - 0,50				P
		Power factor obtained	0,46				P
		Sequence	Table 23 of IEC/EN 60898-1				P
		T (min)	3 min				P
	9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm				P
	9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm					N/A
		I_{Peak} (A) max. value	#104	#105	#106	#107	P
	L1	3,96 kA			P		
	L2	4,75 kA			P		
	L3	7,28 kA			P		
	L4(N)				N/A		
	Max. $I^2t \leq$ no specified value	#104	#105	#106	#107	P	
	L1	43,5 kA ² s			P		
	L2	42,3 kA ² s			P		
	L3	21,3 kA ² s			P		
	L4(N)				N/A		
	- No permanent arcing					P	
	- No flash-over between poles or between poles and frame					P	
	- No blowing of the fuses F and F'					P	
	- Polyethylene foil shows no holes					P	

TRF No. IECEN60898_1C



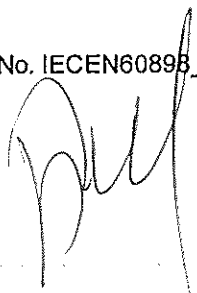
ВЯРНО С ОРГИНАЛА

IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark				Verdict
	After the test:					P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.					P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit -breaker is in the open position	440 V				P
	The leakage current shall not exceed 2 mA	#104	#105	#106	#107	P
	L1	14,7 μ A	15,5 μ A	15,2 μ A	14,6 μ A	P
	L2					N/A
	L3					N/A
	L4(N)					N/A
	Electric strength test:					P
	Test voltage 900 V (see 9.7.3)					P
	a)					P
	b)					N/A
	c)					P
	d)					N/A
	e) 2000 V					N/A
	Test current 2,8 I_N	176 A				P
	Tripping within > 0,1 s up to	#104	#105	#106	#107	P
	- 60 s					N/A
	- 120 s	13 s	14 s	12 s	13 s	P



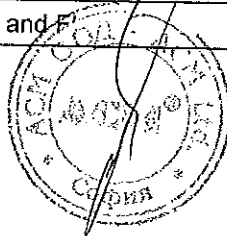
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ВЕРНО С ОРИГИНАЛА



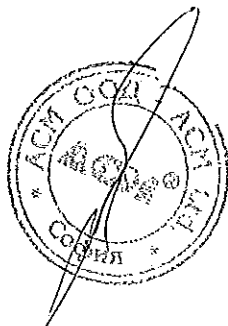

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 + 4 samples				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#108	#109	#110	P
		D1, 1-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	3			P
	Prospective current.....	10 kA			P
	Prospective current obtained.....				P
	L1	10,1 kA			P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,47			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input checked="" type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#108	#109	#110	P
	L1	698 A	689 A	634 A	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#108	#109	#110	P
	L1	994 A ² s	759 A ² s	561 A ² s	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P

TRF No. IECEN60898_1C



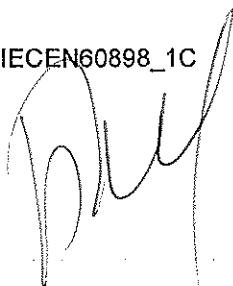
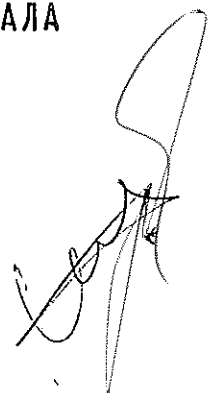
ВАРНО С СРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#108	#109	#110	P
	L1	12,8 μ A	12,6 μ A	12,5 μ A	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current $2,8 I_N$	2,8 A			P
	Tripping within > 0,1 s up to	#108	#109	#110	P
	- 60 s	6 s	8 s	9 s	P
	- 120 s				N/A



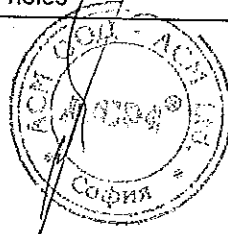
ВЕРНО С ОРИГИНАЛА

TRF No. IECEN60898_1C

IEC/EN 60 898-1							
Clause	Requirement + Test	Result - Remark				Verdict	
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity) three phase tests for single circuit-breakers	#111	#112	#113	#114	P	
		D1, 1-P					
		Rated short-circuit capacity	10 kA				P
		Test circuit: figure	5				P
		Prospective current.....	10 kA				P
		Prospective current obtained.....					P
		L1	10,0 kA				P
		L2	10,3 kA				P
		L3	10,3 kA				P
		L4(N)					N/A
		Power factor	0,45 - 0,50				P
		Power factor obtained	0,46				P
		Sequence	Table 23 of IEC/EN 60898-1				P
	T (min)	3 min				P	
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm				P	
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm					N/A	
	I _{Peak} (A) max. value	#111	#112	#113	#114	P	
	L1	699 A				P	
	L2	689 A				P	
	L3	488 A				P	
	L4(N)					N/A	
	Max. I ² t ≤ no specified value	#111	#112	#113	#114	P	
	L1	663 A ² s				P	
	L2	759 A ² s				P	
	L3	24,0 A ² s				P	
	L4(N)					N/A	
	- No permanent arcing					P	
	- No flash-over between poles or between poles and frame					P	
	- No blowing of the fuses F and F'					P	
	- Polyethylene foil shows no holes					P	

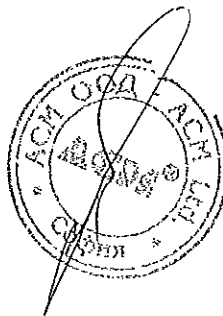
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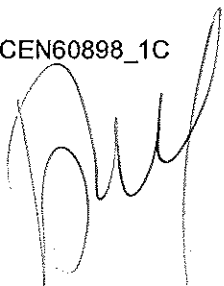
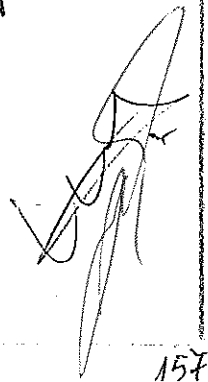
ВЯРНО С ОРИГИНАЛА



IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark				Verdict
	After the test:					P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.					P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit -breaker is in the open position	440 V				P
	The leakage current shall not exceed 2 mA	#111	#112	#113	#114	P
	L1	15,1 μ A	15,3 μ A	14,9 μ A	14,7 μ A	P
	L2					N/A
	L3					N/A
	L4(N)					N/A
	Electric strength test:					P
	Test voltage 900 V (see 9.7.3)					P
	a)					P
	b)					N/A
	c)					P
	d)					N/A
	e) 2000 V					N/A
	Test current $2,8 I_N$	2,8 A				P
	Tripping within > 0,1 s up to	#111	#112	#113	#114	P
	- 60 s	17 s	18 s	17 s	19 s	P
	- 120 s					N/A

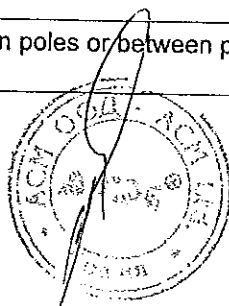



ВЕРНО С ОРИГИНАЛА

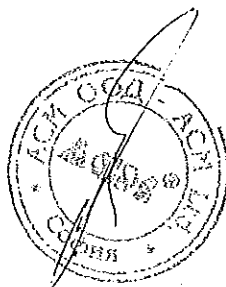
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 samples				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#115F1	#116F1	#117F1	P
		D63, 2-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	4b			P
	Prospective current.....	10 kA			P
	Prospective current obtained.....				P
	L1	10,0 kA			P
	L2	10,0 kA			P
	L3				N/A
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,45			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{peak} (A) max. value	#115F1	#116F1	#117F1	P
	L1	4,40 kA	4,40 kA	2,38 kA	P
	L2	4,40 kA	4,40 kA	2,38 kA	P
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#115F1	#116F1	#117F1	P
	L1	32,7 kA ² s	57,4 kA ² s	7,37 kA ² s	P
	L2	32,7 kA ² s	57,4 kA ² s	7,37 kA ² s	P
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P

TRF No. IECEN60898_1C



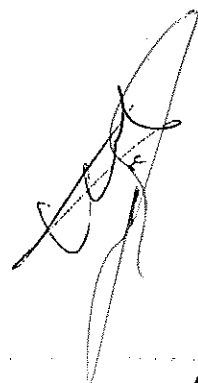
ВЕРНО С СРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#115F1	#116F1	#117F1	P
	L1	15,8 μ A	18,1 μ A	14,6 μ A	P
	L2	41,9 μ A	15,6 μ A	14,6 μ A	P
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 2,8 I_N	176 A			P
	Tripping within > 0,1 s up to	#115F1	#116F1	#117F1	P
	- 60 s				N/A
	- 120 s	22 s	20 s	17 s	P



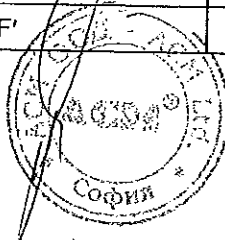

TRF No. IECEN60898_1C

ВЯРНО С ОРИГИНАЛА



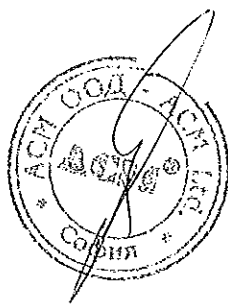
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 samples				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#118	#119	#120	P
		D1, 2-P			
	Rated short-circuit capacity.....:	10 kA			P
	Test circuit: figure.....:	4b			P
	Prospective current.....:	10 kA			P
	Prospective current obtained.....:				P
	L1	10,0 kA			P
	L2	10,0 kA			P
	L3				N/A
	L4(N)				N/A
	Power factor.....:	0,45 - 0,50			P
	Power factor obtained.....:	0,45			P
	Sequence.....:	Table 22 of IEC/EN 60898-1			P
	T (min).....:	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#118	#119	#120	P
	L1	700 A	420 A	223 A	P
	L2	700 A	420 A	223 A	P
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#118	#119	#120	P
	L1	755 A ² s	497 A ² s	89,2 A ² s	P
	L2	755 A ² s	497 A ² s	89,2 A ² s	P
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P

TRF No. IECEN60898_1C



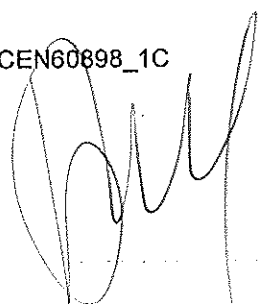
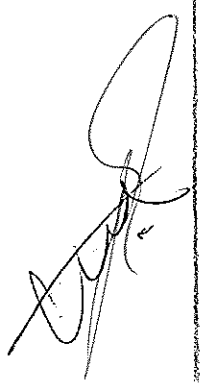
ВЯРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#118	#119	#120	P
	L1	12,9 μ A	13,5 μ A	13,8 μ A	P
	L2	13,8 μ A	13,8 μ A	13,6 μ A	P
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current $2,8 I_N$	2,8 A			P
	Tripping within > 0,1 s up to	#118	#119	#120	P
	- 60 s	113 s	103 s	83 s	P
	- 120 s				N/A

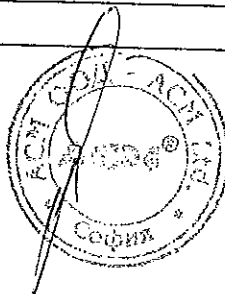


ВАРНО С ОРИГИНАЛА

TRF No. IECEN60898_1C

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 samples				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#121	#122	#123	P
		D63, 4-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	6			P
	Prospective current.....	10 kA			P
	Prospective current obtained.....				P
	L1	10,0 kA			P
	L2	10,3 kA			P
	L3	10,3 kA			P
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,46			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I_{Peak} (A) max. value	#121	#122	#123	P
	L1	5,76 kA	5,32 kA	6,79 kA	P
	L2	5,63 kA	4,91 kA	3,30 kA	P
	L3	6,18 kA	5,30 kA	5,55 kA	P
	L4(N)				N/A
	Max. I²t ≤ no specified value	#121	#122	#123	P
	L1	57,7 kA ² s	49,4 kA ² s	144 kA ² s	P
	L2	57,7 kA ² s	52,9 kA ² s	17,0 kA ² s	P
	L3	97,8 kA ² s	39,5 kA ² s	89,8 kA ² s	P
	L4(N)				N/A
	- No permanent arcing				P

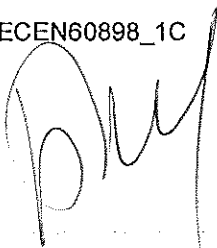
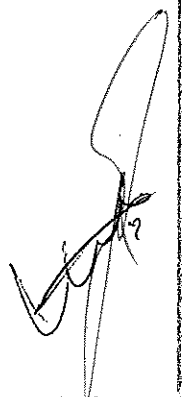


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#121	#122	#123	P
	L1	14,8 µA	53,0 µA	13,4 µA	P
	L2	15,0 µA	13,8 µA	14,4 µA	P
	L3	13,1 µA	14,1 µA	17,4 µA	P
	L4(N)	13,0 µA	13,0 µA	13,1 µA	P
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 2,8 I _N	176 A			P
	Tripping within > 0,1 s up to	#121	#122	#123	P
	- 60 s				N/A
	- 120 s	16 s	19 s	17 s	P



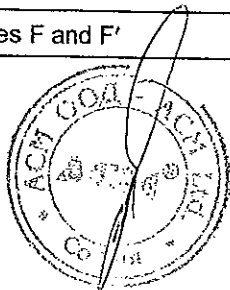
СМ

ВЯРНО С ОРИГИНАЛА

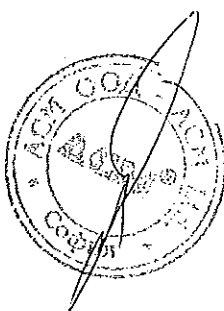
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 samples				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#124	#125	#126	P
		D1, 4-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	6			P
	Prospective current	10 kA			P
	Prospective current obtained				P
	L1	10,0 kA			P
	L2	10,3 kA			P
	L3	10,3 kA			P
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,46			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#124	#125	#126	P
	L1	471 A	648 A	692 A	P
	L2	656 A	644 A	568 A	P
	L3	622 A	447 A	689 A	P
	L4(N)				N/A
	Max. I ² t ≤ no specified value	#121	#122	#123	P
	L1	283 A ² s	565 A ² s	715 A ² s	P
	L2	623 A ² s	600 A ² s	508 A ² s	P
	L3	622 A ² s	672 A ² s	635 A ² s	P
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P

TRF No. IECEN60898_1C



ВЯРНО С ОРИГИНАЛА

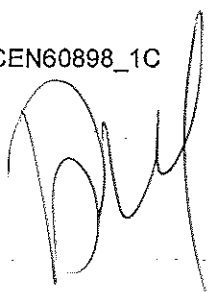
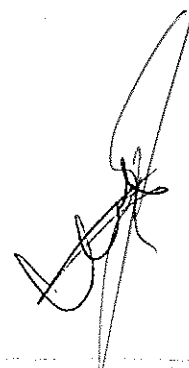
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#124	#125	#126	P
	L1	12,5 μ A	12,6 μ A	12,9 μ A	P
	L2	12,9 μ A	12,6 μ A	13,1 μ A	P
	L3	13,1 μ A	12,7 μ A	13,4 μ A	P
	L4(N)	13,2 μ A	12,5 μ A	13,6 μ A	P
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 2,8 I_N	2,8 A			P
	Tripping within > 0,1 s up to	#124	#125	#126	P
	- 60 s	9 s	7 s	9 s	P
	- 120 s				N/A



AM

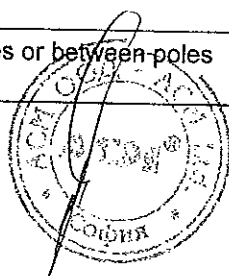
ВЕРНО С ОРИГИНАЛА

TRF No. IECEN60898_1C

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 samples To determine the energy limiting class according to annex ZA of EN 68988-1				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#127	#128	#129	P
		C40, 1-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	3			P
	Prospective current.....	10 kA			P
	Prospective current obtained.....				P
	L1	10,1 kA			P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,47			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input checked="" type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I_{Peak} (A) max. value	#127	#128	#129	P
	L1	4,06 kA	4,36 kA	4,13 kA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Max. I²t ≤ 132 kA²s	#127	#128	#129	P
	L1	35,8 kA ² s	39,1 kA ² s	35,7 kA ² s	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P

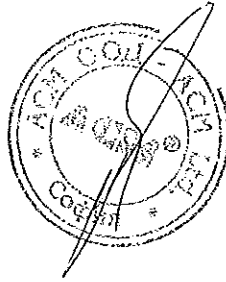
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ВЯРНО С ОРИГИНАЛА



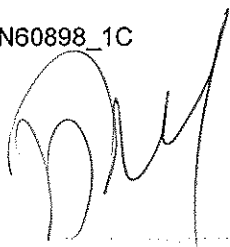
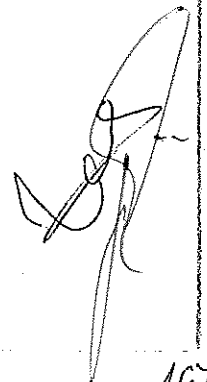
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#127	#128	#129	P
	L1	13,8 μ A	13,0 μ A	13,1 μ A	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current $2,8 I_N$	112 A			P
	Tripping within > 0,1 s up to	#127	#128	#129	P
	- 60 s				N/A
	- 120 s	6 s	13 s	8 s	P



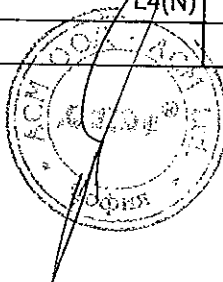
Ся

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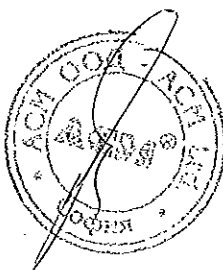
TRF No. IECEN60898_1C

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 samples To determine the energy limiting class according to annex ZA of EN 68988-1				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#130	#131	#132	P
		C40, 2-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	4b			P
	Prospective current.....	10 kA			P
	Prospective current obtained.....				P
	L1	10,0 kA			P
	L2	10,0 kA			P
	L3				N/A
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,45			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#130	#131	#132	P
	L1	4,10 kA	4,15 kA	3,33 kA	P
	L2	4,10 kA	4,15 kA	3,33 kA	P
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ 132 kA ² s	#130	#131	#132	P
	L1	32,0 kA ² s	29,7 kA ² s	15,7 kA ² s	P
	L2	32,0 kA ² s	29,7 kA ² s	15,7 kA ² s	P
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P

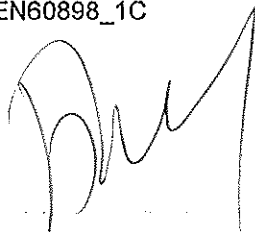
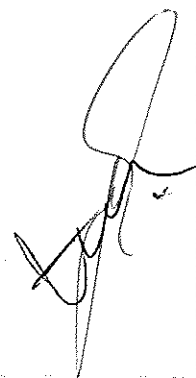


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#130	#131	#132	P
	L1	12,9 μ A	13,2 μ A	12,8 μ A	P
	L2	13,4 μ A	13,3 μ A	12,6 μ A	P
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current $2,8 I_N$	112 A			P
	Tripping within > 0,1 s up to	#130	#131	#132	P
	- 60 s				N/A
	- 120 s	13 s	11 s	10 s	P



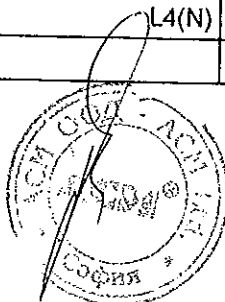
БЯРНО С ОРИГИНАЛА

TRF No. IECEN60898_1C

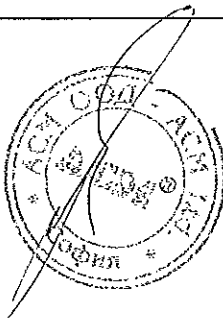
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 samples To determine the energy limiting class according to annex ZA of EN 68988-1				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#133	#134	#135	P
		C40, 4-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	6			P
	Prospective current.....	10 kA			P
	Prospective current obtained.....				P
	L1	10,0 kA			P
	L2	10,3 kA			P
	L3	10,3 kA			P
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,46			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I_{peak} (A) max. value	#133	#134	#135	P
	L1	4,47 kA	5,56 kA	4,54 kA	P
	L2	5,14 kA	4,35 kA	4,60 kA	P
	L3	5,01 kA	3,50 kA	2,89 kA	P
	L4(N)				N/A
	Max. I²t ≤ 132 kA²s	#133	#134	#135	P
	L1	24,5 kA ² s	46,4 kA ² s	39,5 kA ² s	P
	L2	29,3 kA ² s	29,4 kA ² s	31,4 kA ² s	P
	L3	61,8 kA ² s	12,4 kA ² s	13,5 kA ² s	P
	L4(N)				N/A
	- No permanent arcing				P

TRF No. IECEN60898_1C



ВЯРНО С ОРИГИНАЛА

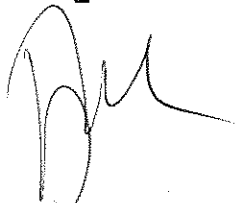
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#133	#134	#135	P
	L1	17,9 μ A	13,6 μ A	13,2 μ A	P
	L2	18,2 μ A	13,5 μ A	13,3 μ A	P
	L3	13,3 μ A	13,6 μ A	14,2 μ A	P
	L4(N)	13,2 μ A	13,2 μ A	13,0 μ A	P
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 2,8 I_N	112 A			P
	Tripping within > 0,1 s up to	#133	#134	#135	P
	- 60 s				N/A
	- 120 s	16 s	17 s	15 s	P



СМ

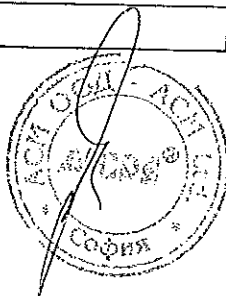
ВЯРНО С ОРИГИНАЛА

TRF No. IECEN60898_1C




IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 samples To determine the energy limiting class according to annex ZA of EN 68988-1				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#154	#155	#156	P
		B40, 1-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	3			P
	Prospective current.....	10 kA			P
	Prospective current obtained.....				P
	L1	10,1 kA			P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,47			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input checked="" type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#154	#155	#156	P
	L1	5,04 kA	4,32 kA	4,79 kA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ 108 kA ² s	#154	#155	#156	P
	L1	78,2 kA ² s	36,9 kA ² s	43,1 kA ² s	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P

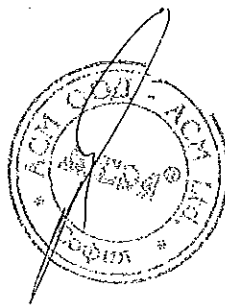
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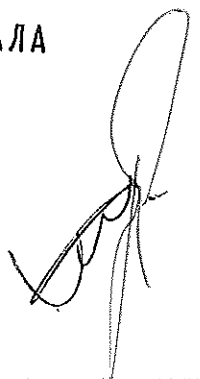
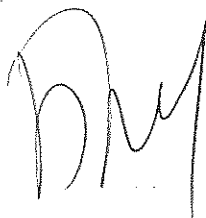


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#154	#155	#156	P
	L1	12,7 μ A	13,1 μ A	12,6 μ A	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 2,8 I_N	112 A			P
	Tripping within > 0,1 s up to	#154	#155	#156	P
	- 60 s				N/A
	- 120 s	9 s	10 s	9 s	P

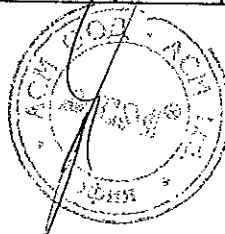


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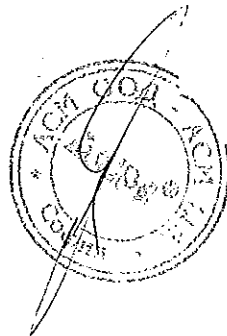
ВЯРНО С ОРИГИНАЛА

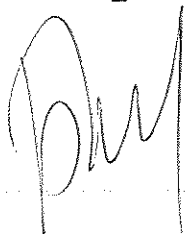
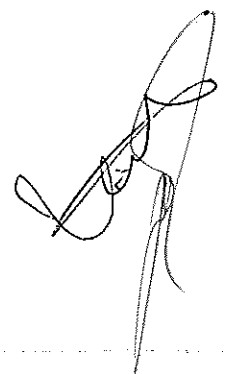
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E2“ 3 samples To determine the energy limiting class according to annex ZA of EN 68988-1				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#157	#158	#159	P
		B40, 2-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	4b			P
	Prospective current.....	10 kA			P
	Prospective current obtained.....				P
	L1	10,0 kA			P
	L2	10,0 kA			P
	L3				N/A
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,45			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#157	#158	#159	P
	L1	4,09 kA	4,14 kA	3,33 kA	P
	L2	4,09 kA	4,14 kA	3,33 kA	P
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ 108 kA ² s	#157	#158	#159	P
	L1	29,4 kA ² s	25,2 kA ² s	15,5 kA ² s	P
	L2	29,4 kA ² s	25,2 kA ² s	15,5 kA ² s	P
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P



IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#157	#158	#159	P
	L1	12,9 µA	13,5 µA	13,1 µA	P
	L2	13,2 µA	13,2 µA	12,8 µA	P
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 2,8 I _N	112 A			P
	Tripping within > 0,1 s up to	#157	#158	#159	P
	- 60 s				N/A
	- 120 s	12 s	13 s	12 s	P

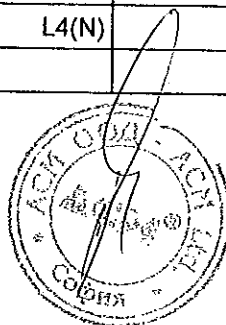


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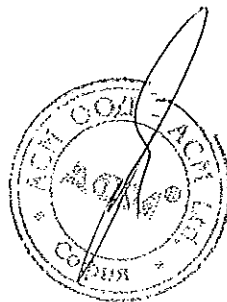
IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 samples To determine the energy limiting class according to annex ZA of EN 68988-1				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#160	#161	#162	P
		B40, 4-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	6			P
	Prospective current.....	10 kA			P
	Prospective current obtained.....				P
	L1	10,0 kA			P
	L2	10,3 kA			P
	L3	10,3 kA			P
	L4(N)				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,46			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input type="checkbox"/> 0,12 mm / <input checked="" type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I_{peak} (A) max. value	#160	#161	#162	P
	L1	4,87 kA	5,51 kA	5,24 kA	P
	L2	5,01 kA	4,16 kA	3,55 kA	P
	L3	5,34 kA	4,21 kA	3,82 kA	P
	L4(N)				N/A
	Max. I²t ≤ 108 kA²s	#160	#161	#162	P
	L1	34,7 kA ² s	45,4 kA ² s	55,1 kA ² s	P
	L2	29,4 kA ² s	50,2 kA ² s	16,4 kA ² s	P
	L3	52,6 kA ² s	27,9 kA ² s	38,4 kA ² s	P
	L4(N)				N/A
	- No permanent arcing				P

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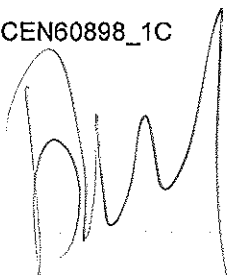


ВЯРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un. The circuit-breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#160	#161	#162	P
	L1	15,6 µA	12,9 µA	12,4 µA	P
	L2	13,1 µA	12,9 µA	12,7 µA	P
	L3	12,7 µA	13,0 µA	13,5 µA	P
	L4(N)	12,8 µA	12,8 µA	13,5 µA	P
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				P
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 2,8 I _N	112 A			P
	Tripping within > 0,1 s up to	#160	#161	#162	P
	- 60 s				N/A
	- 120 s	13 s	18 s	13 s	P

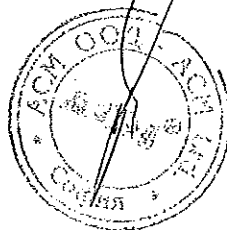



ВЕРНО С ОРИГИНАЛА

IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	TESTS „E₂“ 3 samples To determine the energy limiting class according to annex ZA of EN 68988-1				P
9.12.11.4.3	Test: E2 (Test at rated short-circuit capacity)	#172	#173	#174	P
		B16, 1-P			
	Rated short-circuit capacity	10 kA			P
	Test circuit: figure	3			P
	Prospective current.....	10 kA			P
	Prospective current obtained.....				P
	L1	10,1 kA			P
				N/A
				N/A
				N/A
	Power factor	0,45 - 0,50			P
	Power factor obtained	0,47			P
	Sequence	Table 22 of IEC/EN 60898-1			P
	T (min)	3 min			P
9.12.9.1	Test in free air copper wire F': <input checked="" type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input checked="" type="checkbox"/> 1,5 Ohm	"a" = 35 mm			P
9.12.9.2	Test in enclosures copper wire F': <input type="checkbox"/> 0,12 mm / <input type="checkbox"/> 0,16 mm resistor R' : <input type="checkbox"/> 0,75 Ohm / <input type="checkbox"/> 1,5 Ohm				N/A
	I _{Peak} (A) max. value	#172	#173	#174	P
	L1	2,43 kA	3,26 kA	3,69 kA	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Max. I ² t ≤ 70 kA ² s	#172	#173	#174	P
	L1	17,1 kA ² s	20,8 kA ² s	31,0 kA ² s	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P

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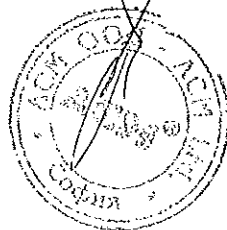


ВЕРНО С ОРИГИНАЛА

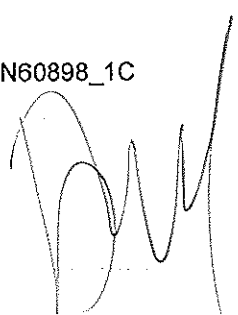


IEC/EN 60 898-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- No blowing of the fuses F and F'				P
	- Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times U_n . The circuit -breaker is in the open position	440 V			P
	The leakage current shall not exceed 2 mA	#172	#173	#174	P
	L1	12,5 μ A	12,7 μ A	12,4 μ A	P
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				P
	Test voltage 900 V (see 9.7.3)				P
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A
	Test current 2,8 I_N	44,8 A			P
	Tripping within > 0,1 s up to	#172	#173	#174	P
	- 60 s	10 s	11 s	10 s	P
	- 120 s				N/A

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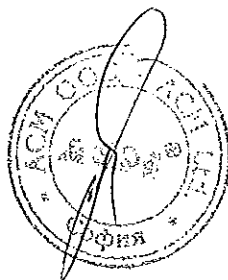
БАРНО С ОРИГИНАЛА




IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX C (NORMATIVE)			
Test sequence and number of samples to be submitted for certification purposes Table C.1 - 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	Clearance 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 terminals for external conductors	
	9.6	Protection against electric shock	
	9.14	Resistance to heat	
	8.1.3	Clearances and creepage distances (internal parts)	
9.15	Resistance to abnormal heat and to fire		
9.16	Resistance to rusting		
B	9.7	Dielectric properties	
	9.8	Temperature-rise	
	9.9	28-day test	
C	C ₁	9.11	Mechanical and electrical endurance
		9.12.11.2.1	Performance at reduced short-circuit currents
		9.12.12	Verification of the circuit-breaker after short-circuit tests
	C ₂	9.12.11.2.2	Short-circuit test for verifying the suitability of circuit-breakers for use in IT systems
		9.12.12	Verification of the circuit-breaker after short-circuit tests
D	D ₀	9.10	Tripping characteristic
	D ₁	9.13	Resistance to mechanical shock and impact
		9.12.11.3	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 and	Service short-circuit capacity (I _{cs})
		9.12.12	Verification of circuit-breaker after short-circuit tests
	E ₂	9.12.11.4.3 and	Performance at rated short-circuit capacity (I _{cn})
		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 test sequence.			

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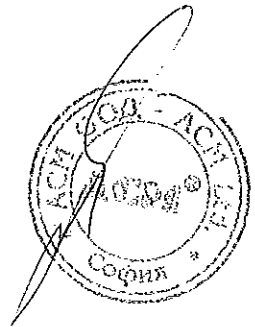
ВЯРНО С ОРИГИНАЛА

IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict

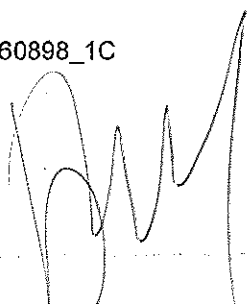
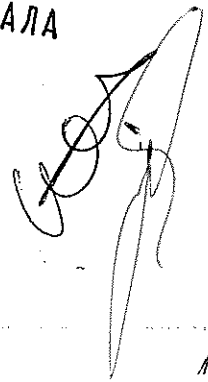
Test sequence	Number of samples	Minimum number of samples which shall pass the test ^{a) b)}	Maximum number of samples for repeated tests ^{c)}
A	1	1	—
B	3	2	3
C	C ₁	2 ^{e)}	3
	C ₂ ^{f)}	2 ^{e)}	3
D	3	2 ^{e)}	3
E ₁	3 + 3 ^{d)}	2 ^{e)} + 2 ^{d), e)}	3 + 4 ^{d)}
E ₂	3 + 4 ^{d)}	2 ^{e)} + 2 ^{d), e)}	3 + 4 ^{d)}

a) In total, a maximum of two test sequences may be repeated.
 b) It is assumed that a sample which has not passed a test has not met the requirements due to workmanship or assembly defects which are not representative of the design.
 c) In the case of repeated tests, all results shall be acceptable.
 d) Supplementary samples in the case of single-pole circuit-breakers rated 230/400 V or 240/415 V (see table 1).
 e) All samples shall meet the test requirements of 9.12.10, 9.12.11.2, 9.12.11.3 and 9.12.11.4, as appropriate.
 f) For this sequence read "number of protected poles" instead of "number of samples". In total a maximum of three test sequences may be repeated.

СЧ



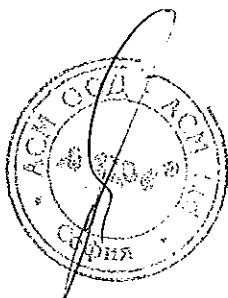
ВЯРНО С ОРИГИНАЛА

IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict

Test sequence	Number of samples depending on number of poles ^{a)}			
	One pole ^{b)}	Two poles ^{c)}	Three poles ^{d)}	Four poles ^{e)}
A	1 max. rated In	1 ^{g),h)} max. rated In	1 ^{h)} max. rated In	1 ^{h)} max. rated In
B	3 max. rated In	3 ^{g)} max. rated In	3 max. rated In	3 max. rated In
C	C ₁	3 ^{h)} max. rated In	3 max. rated In	3 max. rated In
	C ₂	3 max. rated In	2 max. rated In for 2 protected poles, or 3 max. rated In for one protected pole	1 max. rated In
D ₀ + D ₁	3 max. rated In	3 ^{h)} max. rated In	3 max. rated In	3 max. rated In
D ₀	1 of all other rated In			
E ₁	3+3 ^{h)} max. rated In	3 max. rated In	3 max. rated In	3 max. rated In
	3+3 ^{h)} min. rated In	3 min. rated In	3 min. rated In	3 min. rated In
E ₂	3+4 ^{h)} max. rated In	3 max. rated In	3 max. rated In	3 max. rated In
	3+4 ^{h)} min. rated In	3 min. rated In	3 min. rated In	3 min. rated In

- a) If a test is to be repeated according to the acceptance criteria of C.2, a new set of samples is used for the relevant test sequence. In repeated tests all results shall be satisfactory.
- b) If only multipole circuit-breakers are submitted, this column applies to the set of samples having the smallest number of poles (instead of the relevant column).
- c) Applicable to two-pole circuit-breakers whether with two protected poles or with one protected pole.
- d) This series is omitted when four-pole circuit-breakers are also tested.
- e) Also applicable to circuit-breakers with three protected poles and a neutral pole.
- f) Supplementary samples in case of single-pole circuit-breakers of 5.3.1.4.
- g) This test sequence is omitted when three-pole or four-pole circuit-breakers have been tested.
- h) This test sequence shall be omitted for two-pole circuit breakers with two protected poles, when three-pole or four-pole circuit-breakers have been tested.
- i) When multipole circuit-breakers are submitted, a maximum of four screw-type terminals for external conductors are subjected to the tests of 9.5, i.e. two supply and two load terminals.



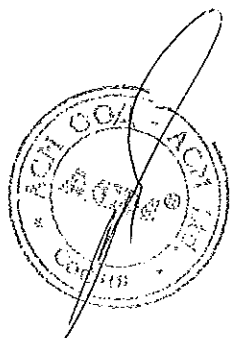
ВЕРНО С ОРИГИНАЛА



IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict

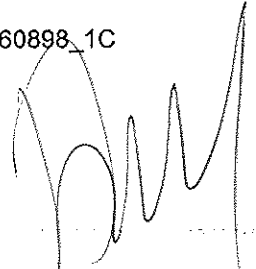
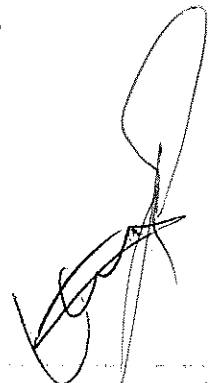
Table C.4 – Test sequences for a series of circuit-breakers being of different instantaneous tripping classifications			
Circuit-breaker type-tested first	Subsequent test sequences for circuit-breakers of		
	B-type	C-type	D-type
B-type	–	(D ₀ + D ₁) + E	(D ₀ + D ₁) + E
C-type	D ₀ ^{a)} + B ^{a)}		(D ₀ + D ₁) + E
D-type	D ₀ ^{a)} + B ^{a)}	D ₀ ^{a)} + B ^{a) b)}	–

a) For these test sequences only the tests of 9.8 and 9.10.2 are required.
b) When certification is requested at the same time for B-type, C-type and D-type circuit-breakers having the same rated short-circuit capacity, only test sequence D₀ is required if B-type and D-type samples have been tested.

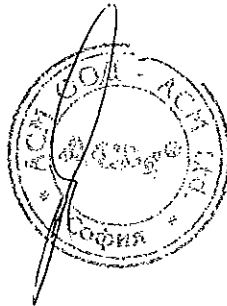



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IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Annex E		N/A
	Special requirements for auxiliary circuits for safety extra-low voltage (*) (*) For auxiliary contact units assembled or to be assembled separately to circuit-breakers see EN62019.		N/A
	Annex J		N/A
	Particular requirements for circuit-breakers with screw less type terminals for external copper conductors (In not exceeding 20 A, cross-sectional area up to 4 mm ²)		N/A
	Annex K		N/A
	Particular requirements for circuit-breakers with flat quick-connect terminations		N/A
	Annex L		N/A
	Specific requirements for circuit-breakers with screw-type terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors		N/A

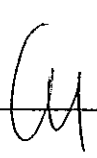


ВЯРНО С БРИГИНАЛА

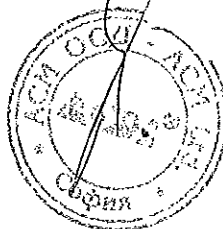



IEC/EN 60 898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Annex 1		P
	EN 60898-1 COMMON MODIFICATIONS		P

	GENERAL		P
9.12	Short-circuit tests		P
9.12.2	Value of the power frequency recovery voltage shall be equal to 110 % of the rated voltage.		P
9.12.3	Tolerances on test quantities		P
	voltage (including recovery voltage) : 0, -5%		P

	TESTS „A“ 1 sample		P
6	MARKING AND OTHER INFORMATION		P
6.1	Standard marking:		P
	f) Rated short circuit capacity (A): within a rectangle, without symbol "A"		P
	h) Calibration temperature, if different from 30°C		N/A
	j) Energy limiting class in a square in accordance with annex ZA, if applied	for B and C type circuit breakers with $I_n \leq 40$ A	P
	k) Making and breaking capacity on an individual protected pole of multipole circuit-breakers (I_{cn1}), if different from I_{cn}	10000 A	N/A
6.2	Additional marking		N/A
	Additional marking to other standards (EN or IEC or other) is allowed under the follow conditions:		N/A
	- the circuit-breaker shall comply with all the requirements of the additional standard;		N/A
	- the relevant standard to which the additional marking refers shall be indicated adjacent to this marking and shall be clearly differentiated or separated from the standard marking according to cl. 6.1		N/A
	Compliance is checked by inspection and by carrying out all the test sequences required by the relevant standard. Equivalent or less severe test sequences need not be repeated.		N/A

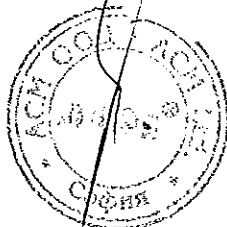
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ВЯРНО С ОРИГИНАЛА

IEC/EN 60 898-1						
Clause	Requirement + Test	Result - Remark			Verdict	
6.3	Guidance table for marking				P	
	EACH MCB SHALL BE MARKED IN A DURABLE MANNER WITH ALL OR, FOR SMALL APPARATUS, ACCORDING TABLE FOR MARKING				P	
	TESTS „C“	#21	#22	#23	P	
		#24	#25	#26		
9.11.3	Dielectric strength reduced to 900 V	Tested at 1500 V			P	
	TESTS „D“				P	
9.10	Tests: D ₀				P	
9.10.2.2	<input checked="" type="checkbox"/> For circuit-breakers of the B – Type				P	
	Moreover the C.B. shall perform following test:				P	
9.10.1.2	Test current 2,55 In (A) starting from cold for:	#56	#57	#58	P	
		160,7A	127,5 A	102,0 A		
		#59	#60	#61		
		81,6 A	63,8 A	51,0 A		
		#62	#63	#64		
		40,8 A	25,5 A	15,3 A		
		#65	#66	#67		
		10,2 A	5,10 A	2,55 A		
	opening time not less than 1 s or more than				P	
	- 60 s	#59	#60	#61	P	
		12 s	16 s	11 s		
		#62	#63	#64		
		17 s	18 s	15 s		
		#65	#66	#67		
		15 s	20 s	15 s		
	- 120 s	#56	#57	#58	P	
		15 s	21 s	20 s		
9.10.2.2	<input checked="" type="checkbox"/> For circuit-breakers of the C – Type				P	
	Moreover the C.B. shall perform following test:				P	
9.10.1.2	Test current 2,55 In (A) starting from cold for:	#44	#45	#46	P	
		160,7A	127,5 A	102,0 A		

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ВЯРНО С УРИГИНАЛА