Test Report

Project designation	**Type Test according to IEC/EN 60947-3 in conjunction with IEC/EN 60947-1**
Product description	**Low-Voltage Fuse-Switch-Disconnectors for Cylindrical Fuse-Links 8x31 type EFD 8**
Client	ETI Elektroelement d.d. Obrezija 5 1411 Izlake SLOVENIA
Order from / No.	01/2014 / ---
Project number	2.03.02769.1.0/EFD8
Date of issue	17.04.2014
Test engineer	Ing.J.Ainetter
Total number of issues / No.	1 / 1
Number of pages	5
Annex: Number of pages	CB - Test Report No. 2.03.02769.1.0/EFD8/CB (70 pages) CCA - Test Report No. 2.03.02769.1.0/EFD8/CCA (2 pages)

Test item

Identification:

Low-voltage fuse-switch-disconnectors for cylindrical fuse-links 8x31 type EFD 8

Manufacturer:	ETI Elektroelement d.d.
Trademark:	ETI
Number of poles:	1p, 1p+N, 2p, 3p, 3p+N
Rated operational voltage:	400V a.c.
Rated operational current:	Up to 20A (with gG fuse-links) Up to 10A (with aM fuse-links)
Rated frequency:	50/60Hz

Technical data, Description:

See page 4

Testing location, Period of testing

Testing location:

AIT Austrian Institute of Technology GmbH
Business Unit Electric Energy Systems
Power Service Center
Giefinggasse 2
1210 Vienna
AUSTRIA

Period of testing:

10/2008 to 12/2008 and 02/2014 to 03/2014

Test(s)

Test(s) performed:

Type test

Test standard(s):

IEC 60947-1:2011 (Edition 5.1) and EN 60947-1:2007+A1:2011
IEC 60947-3:2012 (Edition 3.1) and EN 60947-3:2009+A1:2012

Test procedure(s):

CB Scheme and CCA Scheme

Result

The low-voltage fuse-switch-disconnectors for cylindrical fuse-links 8x31 type EFD 8 have passed the type test successfully.

Seal

Test engineer

Ing. Johann Ainetter

Responsible for the content

Ing. Karl Farthofer

Testing laboratory

Confirmation of Accreditation

The Federal Ministry of Economy, Family and Youth confirms that

AIT Austrian Institute of Technology GmbH
Donau-City-Straße 1, A-1220 Wien
(sites: Giefinggasse 2, A-1210 Wien und Konrad-Lorenz-Straße 24, A-3430 Tulln)
Identification number: 1
Initial date of Accreditation: December 01, 1993

is accredited as Testing Laboratory and Inspection Body and fulfills the requirements of ÖVE/ÖNORM EN ISO/IEC 17025:2007 and ÖVE/ÖNORM EN ISO/IEC 17020:2004 Type A.

The detailed scope of accreditation is available in the currently valid decree.
The Conformity Assessment Body is published in the list of accredited bodies under www.en.bmwfj.gv.at/accreditation.

Vienna, October 09, 2012

Norman Brunner

ACCREDITED
according to
EN ISO/IEC 17025
confirmed by
BMWFJ
with GZ 92714/237-IV/9/00

CERTIFICATE

AIT-Austrian Institute of Technology GmbH
A-1220 Wien, Donau-City-Straße 1

QUALITY MANAGEMENT SYSTEM
complying with the requirements of standard
ISO 9001:2008

Registration No.: 00229/1
Date of initial issue: 30 June 1994
Valid until: 23 June 2015

Vienna, 11 October 2012

Signatures removed for security reasons

CERTIFIED
according to
ISO 9001
confirmed by
Quality Austria
with Reg. No. 00229/1

CERTIFICATE OF ACCEPTANCE
TO PARTICIPATE IN THE IECEE CB-SCHEME

AIT Austrian Institute of Technology GmbH
Giefinggasse 2, A-1210 Vienna, Austria

has been assessed and determined to fully comply with the requirements of ISO/IEC 17025: 2005-05, The Basic Rules, IECEE 01: 2012-06 and Rules of Procedure IECEE 02: 2012-06, and the relevant IECEE CB-Scheme Operational Documents.

AIT Austrian Institute of Technology GmbH

is therefore entitled to operate as an Austrian CB Testing Laboratory under the responsibility of OVE as National Certification Body and to carry out testing within the IECEE CB Scheme for the Scope (Product Category(ies) and Standard(s)) as listed in the relevant part of the IECEE Web Site at www.iecee.org, and is subject to all other terms as set forth in the IECEE Basic Rules and Rules of Procedure.

This certificate remains valid until September 26th 2016 at which time it will be reissued by the IECEE Executive Secretary upon successful completion of the normally scheduled 3-year Reassessment Programme administered by the IECEE CB Scheme.

Signed by:

Kerry McMANAMA
IECEE EXECUTIVE SECRETARY AND COO

Date of Issue: 2014-01-13
TL001

RECOGNIZED CB TESTING LABORATORY
confirmed by
International Electrotechnical Commission
under the responsibility of
OVE
as the National Certification Body

Technical data, Description

Test item	Low-voltage fuse-switch-disconnectors for cylindrical fuse-links 8x31
Trademark	ETI
Model/Type reference	EFD 8
Manufacturer	ETI Elektroelement d.d.
Factory location	1411 Izlake, Obrezija 5, SLOVENIA
Type of terminals	Pillar terminals
Method of operation	Dependent manual operation
Switching positions	O / I
Number of poles	1p, 1p+N, 2p, 3p, 3p+N
Nature of supply	AC
Utilization category	AC-22B at 400V/20A
Rated operational voltage	400V
Rated operational current	20A (with gG fuse-links) 10A (with aM fuse-links)
Rated frequency	50/60Hz
Conventional free air thermal current	20A max. (with gG fuse-links) 10A max. (with aM fuse-links)
Rated insulation voltage	690V
Rated impulse withstand voltage	8kV
Rated short-time withstand current	240A / 1s
Rated conditional short-circuit current	100kA (with 20A gG fuse-links) 50kA (with 10A aM fuse-links)
Kind of protective device	Cylindrical fuse-links 8x31, up to 20A (gG) Cylindrical fuse-links 8x31, up to 10A (aM)
Max. power dissipation of protective device	gG fuse-links: 2,3W aM fuse-links: 0,6W
Degree of protection	IP20

Measuring equipment

Measured quantity	Device	Manufacturer	Code
Voltage (tests up to 10kA)	Voltage divider 1:2000 Difference amplifier AM 502 Signal memory recorder TRA 800	AIT Tektronix W&W	- AM 502/1…3 TRA800
Current (tests up to 10kA)	Lin. Current transformer LGSSO Burden 1Ω Signal memory recorder TRA 800	Ritz AIT W&W	WLIN5000/1…3 - TRA800
Voltage (tests above 10kA)	Insulating measuring amplifier Arcus Signal memory recorder 2580-P	Rohrer Nicolet	T908D 2580-P
Current (tests above 10kA)	Lin current transformer LGSSO Burden 0,7mΩ Signal memory recorder 2580-P	Ritz AIT Nicolet	WLIN6000.HVF/1…3 - 2580-P
Current (tests at reduced voltage)	Current transformer GE 4461 Current transformer AETt10 True-RMS amperemeter Cl. 0,5 Digital multimeter Fluke 185	Goerz Siemens Norma Fluke	WI600/1…3 WI4000/1…3 A0,5/4 FLUKE185/2
Transient recovery voltage	Adjustment equipment for TRV Oscilloscope G 801.1	AIT Tektronix	- G801.1
Dielectric properties	High-voltage test equipment 90-1F with measuring equipment Impulse tester 35 Impulse voltmeter 64M Oscilloscope 9430	 Elabo Haefely Haefely Le Croy	 HSG5KV G304 G502 G805
Leakage current	High-voltage test equipment 90-1F Digital multimeter Fluke 185 Digital multimeter Fluke 187	Elabo Fluke Fluke	HSG5KV FLUKE185/2 G922
Time	Signal memory recorders Digital stopwatch	W&W, Nicolet Quantum	TRA800, 2580-P 938-3
Temperature	Data Logger Unit 34970A Temperature meter TESTO 901	Agilent Testoterm	942 TESTO
Abnormal heat and fire	Glow-wire test device with measuring equipment	Friborg	GLOW
Mechanical strength of terminals	Test equipment	AIT	MSD
Insertability of unprepared conductors	Test gauge	AIT	Gauge 1…16
Strength of actuator mechanism	Test equipment	Sauter GmbH	FH1K
Degree of protection	Test probe, dust chamber Test equipment for ingress of water	PTL, Friborg PTL, Friborg	PTL1…3, DUST X1…X4
Clearances, creepage distances	Digital slide gauge	Spiral	SCHUB-1

Test Report issued under the responsibility of:

TEST REPORT
IEC 60947-3
Low-voltage switchgear and controlgear
Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units

Report Number .....:	2.03.02769.1.0/EFD8/CB
Date of issue .....:	17.04.2014
Total number of pages.....:	70
CB Testing Laboratory.....:	AIT Austrian Institute of Technology GmbH
Address .....:	1210 Vienna, Giefinggase 2, AUSTRIA
Applicant's name.....:	ETI Elektroelement d.d.
Address .....:	1411 Izlake, Obrezija 5, SLOVENIA
Test specification:	
Standard .....:	IEC 60947-3:2008 (Third Edition) + A1:2012 in conjunction with IEC 60947-1:2007 (Fifth Edition) + A1:2010
Test procedure.....:	CB-Scheme
Non-standard test method.....:	N/A
Test Report Form No. .....:	IEC60947_3C
Test Report Form(s) Originator ....:	OVE
Master TRF .....:	Dated 2013-05

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

Test item description .....:	Fuse-switch-disconnectors for cylindrical fuse-links 8x31
Trade Mark .....:	ETI
Manufacturer.....:	ETI Elektroelement d.d.
Model/Type reference .....:	EFD 8
Ratings .....:	400V / up to 20A (with gG) / 50/60Hz / 1p up to 3p+N 400V / up to 10A (with aM) / 50/60Hz / 1p up to 3p+N

Testing procedure and testing location:

☒ **CB/CCA Testing Laboratory**:

Testing location/ address.....: AIT Austrian Institute of Technology GmbH,
1210, Vienna, Giefinggasse 2, AUSTRIA

☐ **Associated CB Laboratory:**

Testing location/ address.....: ---

Tested by (name + signature) ..: Ing.J.Ainetter .....

Approved by (+ signature).....: Ing.K.Farthofer .....

☐ **Testing procedure: TMP**

Tested by (name + signature) ..: --- .....

Approved by (+ signature).....: --- .....

Testing location/ address.....: ---

☐ **Testing procedure: WMT**

Tested by (name + signature) ..: --- .....

Witnessed by (+ signature) .....: --- .....

Approved by (+ signature).....: --- .....

Testing location/ address.....: ---

☐ **Testing procedure: SMT**

Tested by (name + signature) ..: --- .....

Approved by (+ signature).....: --- .....

Supervised by (+ signature).....: --- .....

Testing location/ address..... : ---

☐ **Testing procedure: RMT**

Tested by (name + signature) ..: --- .....

Approved by (+ signature).....: --- .....

Supervised by (+ signature).....: --- .....

Testing location/ address.....: ---

List of Attachments:

Summary of testing:

Tests performed:

A type test was performed according to

- IEC 60947-1:2011 (Edition 5.1)
- IEC 60947-3:2012 (Edition 3.1)

The fuse-switch-disconnectors
for cylindrical fuse-links 8x31

- EFD 8

have passed the type test successfully.

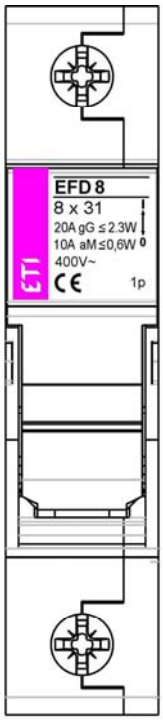
Testing location:

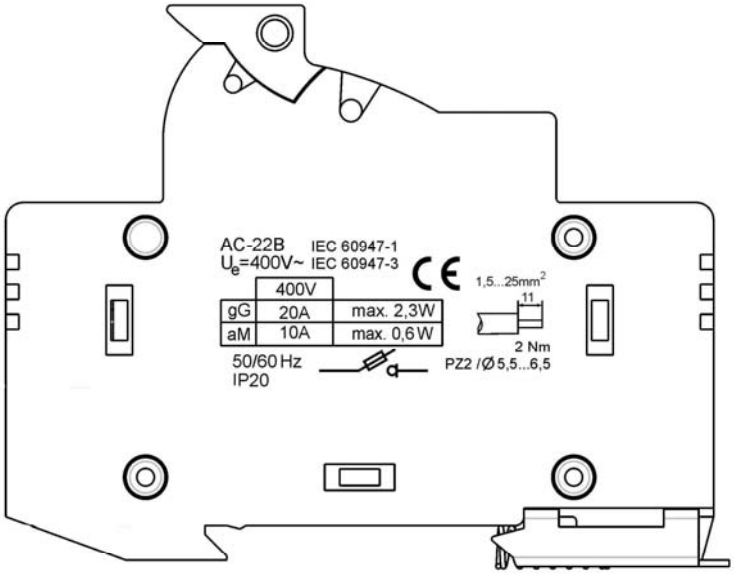
AIT Austrian Institute of Technology GmbH
Business Unit Electric Energy Systems
Power Service Center
Giefinggasse 2
1210 Vienna
AUSTRIA

The AIT Austrian Institute of Technology GmbH is a recognized CB/CCA Testing Laboratory under the responsibility of OVE as the National Certification Body.

Summary of compliance with National Differences:

Copy of marking plate:





Test item particulars:	
- method of operation ..... :	Dependent manual operation
- suitability for isolation ..... :	Suitable for isolation
- degree of protection ..... :	IP20
- number of poles..... :	1p, 1p+N, 2p, 3p, 3p+N
- kind of current..... :	AC
- in the case of a.c., number of phases and rated frequency..... :	1 up to 3 / 50/60Hz
- number of positions of the main contacts ..... :	2 (O / I)
- breaking arrangement for fused devices ..... :	Double break
Rated and limiting values, main circuit:	
- rated operational voltage U_e (V)..... :	400
- rated insulation voltage U_i (V) ..... :	690
- rated impulse withstand voltage U_{imp} (kV) ..... :	8
- conventional free air thermal current I_{th} (A) ..... :	20 (2,3W max. with gG fuse-links) 10 (0,6W max. with aM fuse-links)
- conventional enclosed thermal current I_{the} (A)..... :	-
- rated operational current I_e (A)..... :	20 (with gG fuse-links) 10 (with aM fuse-links)
- rated uninterrupted current I_u (A) ..... :	20 (2,3W max. with gG fuse-links) 10 (0,6W max. with aM fuse-links)
- rated frequency (Hz)..... :	50/60
- utilization category..... :	AC-22B at 400V/20A
Short-circuit characteristic:	
- rated short-time withstand current I_{cw} (kA)..... :	240A / 1s
- rated short-time making capacity I_{cm} (kA)..... :	-
- rated conditional short-circuit current..... :	100kA (with 20A gG fuse-links) 50kA (with 10A aM fuse-links)
Control circuits ..... :	-
Auxiliary circuits ..... :	-
Relays and releases..... :	-
Co-ordination with short-circuit protective devices:	
- kind of protective device..... :	Cylindrical fuse-links 8x31, up to 20A (gG) Cylindrical fuse-links 8x31, up to 10A (aM)
Possible test case verdicts:	
- test case does not apply to the test object ..... :	N/A
- test object does meet the requirement ..... :	P (Pass)
- test object does not meet the requirement ..... :	F (Fail)
Testing:	
Date of receipt of test item..... :	10/2008 and 02/2014
Date (s) of performance of tests..... :	10/2008 to 12/2008 and 02/2014 to 03/2014

General remarks:

The test results presented in this report relate only to the object tested.
This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a ☒ comma / ☐ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided .....: ☐ **Yes** ☒ **Not applicable**

When differences exist; they shall be identified in the General product information section.

Name and address of factory (ies)..... : ETI Elektroelement d.d.
Obrezija 5
1411 Izlake
SLOVENIA

General product information:

Low voltage
fuse-switch-disconnectors
for cylindrical fuse-links 8x31

type

EFD 8

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
5.2	MARKING		
	Marking on equipment itself or on nameplate or nameplates attached to the equipment and legible from the front after mounting		P
	- indication of the open and closed position	O / I	P
	- suitability for isolation	In the open position (O)	P
	- disconnectors AC-20 and DC-20 only: marked "Do not operate under load"		N/A
	Following marking is visible after mounting:		
	- direction of movement of the actuator (see 7.1.5.2)	Up / Down	P
	- indication of the position of the actuator (see also 7.1.6.1 and 7.1.6.2)	O / I	P
	- approval or certification mark, if applicable		N/A
	- for miniaturized equipment, symbol, colour code or letter code		N/A
	- terminal identification and marking (see 7.1.8.4)		P
	- IP code and class of protection against electric shock, when applicable (marked preferably on the equipment as far as possible)		N/A
	- suitability for isolation, where applicable, with the isolation function symbol according to IEC 60617-7, reference 07-01-03, combined with the appropriate function symbol for the equipment		P
	- this symbols clearly and unmistakably marked		P
	- this symbols are visible when the equipment is installed as in service and the actuator is accessible		P
	In the case of electronically controlled electromagnets, information other than that given in 5.1 may also be necessary (see also 4.5 and Annex U)		N/A
	The indication "s", "sol", "r" or "f" for non-universal screwless terminals shall be marked on the device or, if the space available is not sufficient, on the smallest package unit or in technical information provided with the product		N/A
	Marking on equipment not needed to be visible after mounting:		
	- manufacturer's name or trademark	ETI	P
	- type designation or serial number	EFD 8	P
	- rated operational currents or powers	20A gG 10A aM	P
	- rated operational voltages	400V~	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- utilization category	AC-22B	P
	- rated frequency or the indication “DC”	50/60Hz	P
	- manufacturer's claim for compliance with IEC 60947-3	IEC 60947-1 IEC 60947-3	P
	- degree of protection	IP20	P
	Marking on fuse-combination units:		P
	- fuse type	8 x 31	P
	- maximum rated current	20A gG 10A aM	P
	- power loss of the fuse-link	≤ 2,3W (gG) ≤ 0,6W (aM)	P
	Identification of terminals:		P
	- line terminals, unless connection is immaterial		P
	- load terminals, unless connection is immaterial		P
	- neutral pole terminal		P
	- protective earth terminal		N/A
	Data in the manufacturer's published information:		P
	- rated insulation voltage	690V	P
	- rated impulse withstand voltage for equipment suitable for isolation or when determined	8kV	P
	- pollution degree, if different from 3	3	P
	- rated duty	Uninterrupted duty	P
	- rated short-time withstand current and duration	240A / 1s	P
	- rated short-circuit making capacity	-	N/A
	- rated conditional short-circuit current	100kA (with 20A/gG) 50kA (with 10A/aM)	P
5.3	Instructions for installation, operation and maintenance		P
6	NORMAL SERVICE, MOUNTING AND TRANSPORT CONDITIONS		
6.1	Normal service conditions		P
6.1.1	Ambient air temperature		P
6.1.2	Altitude		P
6.1.3	Atmospheric conditions		P
6.1.3.1	Humidity		P
6.1.3.2	Pollution degree		P
6.1.4	Shock and vibration		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
6.2	Conditions during transport and storage		P
6.3	Mounting		P
7	CONSTRUCTIONAL AND PERFORMANCE REQUIREMENTS		
7.1	Constructional requirements		
7.1.1	General		
7.1.2	Materials		
7.1.2.1	General material requirements		
	Parts of insulating materials which might be exposed to thermal stresses due to electrical effects within the equipment shall not be adversely affected by abnormal heat and by fire.		P
	The manufacturer specifies which test method, 7.1.2.2 or 7.1.2.3, is to be used .....:	Test method acc. to 7.1.2.2	
7.1.2.2	Glow wire Testing		
	The suitability of materials used is verified by making tests on .....: or	Sections taken from the equipment	P
	- providing data from the insulating material supplier fulfilling the requirements according to IEC 60695-2-12		N/A
	Glow-wire test according to IEC 60695-2-10 and IEC 60695-2-11		—
	Parts made of insulating material necessary to retain current-carrying parts in position: test temperature 960 °C		P
	No visible flame and no sustained glowing		N/A
	Flames and glowing extinguish within 30 s	Extinguishing within 2s	P
	No ignition of the tissue paper		P
	Parts of insulating material not necessary to retain current-carrying parts in position, even though in contact with them: test temperature 650 °C		
	No visible flame and no sustained glowing	No visible flame	P
	Flames and glowing extinguish within 30 s		N/A
	No ignition of the tissue paper		P
7.1.2.3	Test based on flammability category		
	For parts of insulating materials, hot wire ignition and, where applicable, arc ignition tests as specified in 8.2.1.1.2, shall be made based on flammability category		N/A
	Tests on materials are made in accordance with Annex M		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	The hot wire ignition (HWI) and arc ignition (AI) test value requirements related to the material flammability category shall conform to Table M.1 or M.2		N/A
	Alternatively, the manufacturer may provide data from the insulating material supplier fulfilling the requirements given in Annex M		N/A
7.1.3	Current-carrying parts and their connections		P
	Current-carrying parts have the necessary mechanical strength and current-carrying capacity for their intended use		P
	For electrical connections, no contact pressure is transmitted through insulating material other than ceramic or other material with characteristics not less suitable, unless there is sufficient resiliency in the metallic parts to compensate for any possible shrinkage or yielding of the insulation material		P
7.1.4	Clearances .....:	See appended table 7.1.4	P
	Creepage distances .....:	See appended table 7.1.4	P
	Pollution degree .....:	2	—
	Comparative tracking index (V) .....:	450	—
	Material group .....:	II	—
7.1.5	Actuator		P
7.1.5.1	Insulation		—
	Actuator insulated from live parts for		—
	- rated insulation voltage	690V	P
	- rated impulse withstand voltage	8kV	P
	Actuator made of metal	No	—
	- connected to a protective conductor or provided with an additional insulation		N/A
	Actuator made of or covered by insulating material:	Made of insulating material	—
	- internal metal parts, which might become accessible in the event of an insulation failure, are also insulated from live parts for the rated insulation voltage		P
7.1.5.2	Direction of movement		P
	The direction of operation for actuators shall where applicable conform to IEC 60447		P
	There is no doubt of the “I” and “O” position and the direction of operation		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.6	Indication of contact position		
7.1.6.1	Indicating means	Actuator	P
7.1.6.2	Indication by the actuator		P
7.1.7	Additional safety requirements for equipment suitable for isolation		
7.1.7.1	Additional constructional requirements		
	- marking according to 5.2.1b		P
	- indication of the position of the contacts	Yes	P
	- construction of the actuating mechanism	See 7.1.5.2	P
	- minimum clearances across open contacts (see Table 13, Part 1) (mm) .....:	8	—
	- measured clearances (mm) .....:	> 8	P
	- test Uimp across gap (kV) .....:	12,3	P
7.1.7.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers:		N/A
	Auxiliary switch is rated according to IEC 60947-5-1 (unless the equipment is rated AC-23)		N/A
	Time interval between opening of the contacts of the auxiliary contact and the contacts of the main poles: ≥20 ms .....:	-	—
	Measured time interval (ms) .....:	-	N/A
	During the closing operation the contacts of the auxiliary switch closes after or simultaneously with the contacts of the main poles		N/A
7.1.7.3	Supplementary requirements for equipment provided with means for padlocking the open position:		
	The locking means is so designed that it cannot be removed with the appropriate padlock(s) installed		N/A
	Test force F applied to the actuator in an attempt to operate to the closed position (N) .....:	-	—
	Rated impulse withstand voltage (kV) .....:	-	—
	Test Uimp on open main contacts at the test force		N/A
7.1.8	Terminals		
7.1.8.1	All parts of terminals which maintain contact and carry current are of metal having adequate mechanical strength	(see 8.2.4 below)	P
	Terminal connections are such that necessary contact pressure is maintained	(see 8.2.4 below)	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Terminals are so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal	(see 8.2.4 below)	P
	Terminals do not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operator of equipment and the insulation voltage is not reduced below the rated value	(see 8.2.4 below)	P
	Screwless-type clamping units, unless otherwise specified by the manufacturer, shall accept rigid and flexible conductors as indicated in Table 1		N/A
	On screwless-type clamping unit, the connection or disconnection of conductors shall be made as follows:		
	– on universal clamping units by the use of a general purpose tool or a convenient device, integral with the clamping unit to open it for the insertion or withdrawal of the conductors		N/A
	– on push-wire clamping units by simple insertion. For the disconnection of the conductors an operation other than a pull only on the conductor shall be necessary. The use of a general purpose tool or of a convenient device, integral with the clamping unit is allowed in order to "open" it and to assist the insertion or the withdrawal of the conductor		N/A
8.2.4	Mechanical properties of terminals		
	Mechanical strength of terminals		P
	Maximum cross-sectional area of conductor (mm²) .....:	10	—
	Diameter of thread (mm) .....:	M5	—
	Torque (Nm) .....:	2 (acc. to manufacturers instruction)	—
	5 times on 2 separate clamping units		P
	Testing for damage to and accidental loosening of conductor (flexion test)		
	Conductor of the smallest cross-sectional area (mm²) .....:	1,5	—
	Number of conductor of the smallest cross section .....:	1	—
	Diameter of bushing hole (mm) .....:	6,5	—
	Height between the equipment and the platen .....:	260	—
	Mass at the conductor(s) (kg) .....:	0,4	—
	135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Pull-out test		
	Force (N), applied for 1 min. .....:	40	—
	During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit		P
	Conductor of the largest cross-sectional area (mm²) .....:	2,5	—
	Number of conductor of the largest cross section .....:	1	—
	Diameter of bushing hole (mm) .....:	9,5	—
	Height between the equipment and the platen .....:	280	—
	Mass at the conductor(s) (kg) .....:	0,7	—
	135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit		P
	Pull-out test		
	Force (N), applied for 1 min. .....:	50	—
	During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit		P
	Conductor of the largest and smallest cross-sectional area (mm²) .....:	-	—
	Number of conductor of the smallest cross section, number of conductor of the largest cross section ...:	-	—
	Diameter of bushing hole (mm) .....:	-	—
	Height between the equipment and the platen .....:	-	—
	Mass at the conductor(s) (kg) .....:	-	—
	135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit		N/A
	Pull-out test		
	Force (N), applied for 1 min. .....:	-	—
	During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit		N/A
7.1.8.2	Connection capacity		
	Type of conductors .....:	Copper, rigid or flexible	—
	Minimum cross-sectional area of conductor (mm²) .....:	1,5	—
	Maximum cross-sectional area of conductor (mm²) .....:	10	—
	Number of conductors simultaneously connectable to the terminal .....:	1	—

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Clause	Requirement + Test	Result - Remark	Verdict
7.1.8.3	Connection		
	Terminals for connection to external conductors are readily accessible during installation		P
	Clamping screws and nuts do not serve to fix any other component		P
7.1.8.4	Terminal identification and marking		
	Terminal intended exclusively for the neutral conductor		P
	Protective earth terminal		N/A
	Other terminals		P
7.1.9	Additional requirements for equipment provided with a neutral pole		
	Equipment provided with a pole intended for the connection of neutral, this pole shall be clearly marked by the letter “N”		P
	The switched neutral pole does not break before and does not make after the other poles except		P
	- a pole having the appropriate short-circuit breaking and making capacity is used as neutral pole, all poles may operate together		P
	Conventional thermal current of neutral pole	20A	P
7.1.10	Provisions for protective earthing		
7.1.10.1	The exposed conductive parts are electrically interconnected and connected to a protective earth terminal		N/A
7.1.10.2	Protective earth terminal is readily accessible		N/A
	Protective earth terminal is suitably protected against corrosion		N/A
	Electrical continuity between the exposed conductive parts of the protective earth terminal and the metal sheathing of connecting conductors		N/A
	Protective earth terminal has no other functions		N/A
7.1.10.3	Protective earth terminal marking and identification		N/A
7.1.11	Enclosure for equipment		
7.1.11.1	Design		
	When the enclosure is opened, all parts requiring access for installation and maintenance are readily accessible		N/A
	Sufficient space is provided inside the enclosure		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The fixed parts of a metal enclosure are electrically connected to the other exposed conductive parts of the equipment and connected to a terminal which enables them to be earthed or connected to a protective conductor		N/A
	Under no circumstances a removable metal part of the enclosure is insulated from the part carrying the earth terminal when the removable part is in place		N/A
	The removable parts of the enclosure are firmly secured to the fixed parts by a device such that they cannot be accidentally loosened or detached owing to the effects of operation of the equipment or vibrations		N/A
	When an enclosure is so designed as to allow the covers to be opened without the use of tools, means is provided to prevent loss of the fastening devices		N/A
	If the enclosure is used for mounting push-buttons, it is not possible to remove the buttons from the outside of the enclosure		N/A
7.1.11.2	Insulation		
	If, in order to prevent accidental contact between a metallic enclosure and live parts, the enclosure is partly or completely lined with insulating material, then this lining is securely fixed to the enclosure		N/A
7.1.12	Degree of protection of enclosed equipment		
	Degree of protection .....:	IP20	P
7.1.13	Conduit pull-out, torque and bending with metallic conduits		
	Withstand the stress occurring during its installation .....:	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		
8.3.3.1	Temperature-rise		P
	EFD 8, 1p		
	ambient temperature 10-40 °C .....:	22,5	—
	test enclosure W x H x D (mm x mm x mm) .....:	-	—
	material of enclosure .....:	-	—
	Main circuits, test conditions:		P
	- rated operational current Ie (A) .....:	20	—
	- cable/busbar cross-section (mm²) / length (mm) ...:	2,5 / 1000	—
	Fuse-link details (fuse-combination units only):		P
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	Measured temperature-rise .....:	See appended table 8.3.3.1	P
	Auxiliary circuits, test conditions:		N/A
	- rated operation current (A) .....:	-	—
	- cable cross-section (mm²) .....:	-	—
	Measured temperature-rise .....:	-	

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.1	Temperature-rise		P
	EFD 8, 2p		
	ambient temperature 10-40 °C .....:	23	—
	test enclosure W x H x D (mm x mm x mm) .....:	-	—
	material of enclosure .....:	-	—
	Main circuits, test conditions:		P
	- rated operational current Ie (A) .....:	20	—
	- cable/busbar cross-section (mm²) / length (mm) ...:	2,5 / 1000	—
	Fuse-link details (fuse-combination units only):		P
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	Measured temperature-rise .....:	See appended table 8.3.3.1	P
	Auxiliary circuits, test conditions:		N/A
	- rated operation current (A) .....:	-	—
	- cable cross-section (mm²) .....:	-	—
	Measured temperature-rise .....:	-	

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.1	Temperature-rise		P
	EFD 8, 3p+N		
	ambient temperature 10-40 °C .....:	23	—
	test enclosure W x H x D (mm x mm x mm) .....:	-	—
	material of enclosure .....:	-	—
	Main circuits, test conditions:		P
	- rated operational current Ie (A) .....:	20	—
	- cable/busbar cross-section (mm²) / length (mm) ...:	2,5 / 1000	—
	Fuse-link details (fuse-combination units only):		P
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	Measured temperature-rise .....:	See appended table 8.3.3.1	P
	Auxiliary circuits, test conditions:		N/A
	- rated operation current (A) .....:	-	—
	- cable cross-section (mm²) .....:	-	—
	Measured temperature-rise .....:	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.3.2	Test of dielectric properties		P
	EFD 8, 1p		
	Rated impulse withstand voltage (kV) .....:	8	—
	- test Uimp main circuits (kV) .....:	9,8	P
	- test Uimp auxiliary circuits (kV) .....:	-	N/A
	- test Uimp on open main contacts (equipment suitable for isolation) (kV) .....:	12,3	P
	Power-frequency withstand voltage (V) .....:	690	—
	- main circuits, test voltage for 5 sec. (V) .....:	1890	P
	- control and auxiliary circuits, test voltage for 5 sec. (V) .....:	-	N/A
	Devices, which have been disconnected for the power-frequency withstand voltage test.....	-	N/A
	Equipment suitable for isolation, leakage current not exceed 0,5 mA		—
	Test voltage 1,1 Ue (V).....:	440	—
	Measured leakage current (mA).....:	< 0,1	P

8.3.3.2	Test of dielectric properties		P
	EFD 8, 3p+N		
	Rated impulse withstand voltage (kV) .....:	8	—
	- test Uimp main circuits (kV) .....:	9,8	P
	- test Uimp auxiliary circuits (kV) .....:	-	N/A
	- test Uimp on open main contacts (equipment suitable for isolation) (kV) .....:	12,3	P
	Power-frequency withstand voltage (V) .....:	690	—
	- main circuits, test voltage for 5 sec. (V) .....:	1890	P
	- control and auxiliary circuits, test voltage for 5 sec. (V) .....:	-	N/A
	Devices, which have been disconnected for the power-frequency withstand voltage test.....	-	N/A
	Equipment suitable for isolation, leakage current not exceed 0,5 mA		—
	Test voltage 1,1 Ue (V).....:	440	—
	Measured leakage current (mA).....:	< 0,1	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.3	Making and breaking capacity		P
	EFD 8, 1p: AC-22B at 400V/20A		
	- utilization category .....:	AC-22B	—
	- rated operational voltage Ue (V) .....:	400	—
	- rated operational current Ie (A) or power (kW) .....:	20A	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	Conditions for make operations, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue .....(V):	L1: - L2: - L3: -	—
	- test current, I = ... x Ie (A):	L1: - L2: - L3: -	—
	- power factor .....:	L1: - L2: - L3: -	—
	Conditions for break operations, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue .....(V):	L1: - L2: - L3: -	—
	- test current, I = ... x Ie (A):	L1: - L2: - L3: -	—
	- power factor .....:	L1: - L2: - L3: -	—
	Conditions for make/break operations, other than AC-23A and AC-23B:		P
	- test voltage, U = 1,05 Ue .....(V):	L1: 423 L2: - L3: -	—
	- test current, I = ... 3 Ie (A):	L1: 63 L2: - L3: -	—
	- power factor/ time constant .....:	L1: 0,64 L2: - L3: -	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Number of make/break or make and break operations .....:	5	P
	- recovery voltage duration (≥ 50 ms) (ms) .....:	Permanent	P
	- current duration (ms) .....:	290	—
	- time interval between operations .....:	30	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		P
	- oscillatory frequency (kHz) .....:	37,58	—
	- measured oscillatory frequency (kHz) .....:	L1: 37,7 L2: - L3: -	P
	- factor γ .....:	L1: 1,1 L2: - L3: -	P
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.3.4	Dielectric verification		
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories): ≤ 2 mA/pole) .....:	< 1	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.6	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.3.6	P
8.3.3.7	Strength of actuator mechanism		P
8.2.5	Verification of the strength of actuator mechanism and position indicating device		P
	- actuator type (fig.) .....:	1b	—
8.2.5.2.1	Dependent and independent manual operation		P
	- actuating force for opening (N) .....:	18	—
	- test force with blocked main contacts (N) .....:	55	—
	- used method to keep the contact closed .....:	Brazing	—
	During and after the test, open position not indicated .....:	No open position	P
	Equipment with locking mean, no locking in the open position while test force is applied.....:	No locking mechanism	P
8.2.5.2.2	Dependent power operation		N/A
	- main contacts fixed together in the closed position .....:	-	N/A
	- used method to keep the contact closed .....:	-	N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) .....:	-	N/A
	During and after the test, open position not indicated .....:	-	N/A
	Equipment show no damage impairing its normal operation.....:	-	N/A
	Equipment with locking mean, no locking in the open position while test force is applied.....:	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.2.5.2.3	Independent power operation		N/A
	- main contacts fixed together in the closed position .....:	-	N/A
	- used method to keep the contact closed .....:	-	N/A
	- stored energy of the power operator released (3 times).....:	-	N/A
	During and after the test, open position not indicated .....:	-	N/A
	Equipment show no damage impairing its normal operation.....:	-	N/A
	Equipment with locking mean, no locking in the open position while test force is applied.....:	-	N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.3	Making and breaking capacity		P
	EFD 8, 2p: AC-22B at 400V/20A		
	- utilization category .....:	AC-22B	—
	- rated operational voltage Ue (V) .....:	400	—
	- rated operational current Ie (A) or power (kW) .....:	20A	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	Conditions for make operations, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue .....(V):	L1: - L2: - L3: -	—
	- test current, I = ... x Ie (A):	L1: - L2: - L3: -	—
	- power factor .....:	L1: - L2: - L3: -	—
	Conditions for break operations, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue .....(V):	L1: - L2: - L3: -	—
	- test current, I = ... x Ie (A):	L1: - L2: - L3: -	—
	- power factor .....:	L1: - L2: - L3: -	—
	Conditions for make/break operations, other than AC-23A and AC-23B:		P
	- test voltage, U = 1,05 Ue .....(V):	L1: 424 L2: 424 L3: -	—
	- test current, I = ... 3 Ie (A):	L1: 62,5 L2: 62,5 L3: -	—
	- power factor/ time constant .....:	L1: 0,67 L2: 0,67 L3: -	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Number of make/break or make and break operations .....:	5	P
	- recovery voltage duration (≥ 50 ms) (ms) .....:	Permanent	P
	- current duration (ms) .....:	290	—
	- time interval between operations .....:	30	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		P
	- oscillatory frequency (kHz) .....:	37,58	—
	- measured oscillatory frequency (kHz) .....:	L1: 37,7 L2: 37,7 L3: -	P
	- factor γ .....:	L1: 1,1 L2: 1,1 L3: -	P
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.3.4	Dielectric verification		
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories): ≤ 2 mA/pole) .....:	< 1	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.6	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.3.6	P
8.3.3.7	Strength of actuator mechanism		P
8.2.5	Verification of the strength of actuator mechanism and position indicating device		P
	- actuator type (fig.) .....:	1b	—
8.2.5.2.1	Dependent and independent manual operation		P
	- actuating force for opening (N) .....:	20	—
	- test force with blocked main contacts (N) .....:	60	—
	- used method to keep the contact closed .....:	Brazing	—
	During and after the test, open position not indicated .....:	No open position	P
	Equipment with locking mean, no locking in the open position while test force is applied.....:	No locking mechanism	P
8.2.5.2.2	Dependent power operation		N/A
	- main contacts fixed together in the closed position .....:	-	N/A
	- used method to keep the contact closed .....:	-	N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) .....:	-	N/A
	During and after the test, open position not indicated .....:	-	N/A
	Equipment show no damage impairing its normal operation.....:	-	N/A
	Equipment with locking mean, no locking in the open position while test force is applied.....:	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.2.5.2.3	Independent power operation		N/A
	- main contacts fixed together in the closed position .....:	-	N/A
	- used method to keep the contact closed .....:	-	N/A
	- stored energy of the power operator released (3 times).....:	-	N/A
	During and after the test, open position not indicated .....:	-	N/A
	Equipment show no damage impairing its normal operation.....:	-	N/A
	Equipment with locking mean, no locking in the open position while test force is applied.....:	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.3	Making and breaking capacity		P
	EFD 8, 3p+N: AC-22B at 400V/20A		
	- utilization category .....:	AC-22B	—
	- rated operational voltage Ue (V) .....:	400	—
	- rated operational current Ie (A) or power (kW) .....:	20A	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	Conditions for make operations, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue .....(V):	L1: - L2: - L3: -	—
	- test current, I = ... x Ie (A):	L1: - L2: - L3: -	—
	- power factor .....:	L1: - L2: - L3: -	—
	Conditions for break operations, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue .....(V):	L1: - L2: - L3: -	—
	- test current, I = ... x Ie (A):	L1: - L2: - L3: -	—
	- power factor .....:	L1: - L2: - L3: -	—
	Conditions for make/break operations, other than AC-23A and AC-23B:		P
	- test voltage, U = 1,05 Ue .....(V):	L1: 422 L2: 423 L3: 422	—
	- test current, I = ... 3 Ie (A):	L1: 62,5 L2: 63,0 L3: 62,0	—
	- power factor/ time constant .....:	L1: 0,65 L2: 0,65 L3: 0,66	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Number of make/break or make and break operations .....:	5	P
	- recovery voltage duration (≥ 50 ms) (ms) .....:	Permanent	P
	- current duration (ms) .....:	290	—
	- time interval between operations .....:	30	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		P
	- oscillatory frequency (kHz) .....:	37,58	—
	- measured oscillatory frequency (kHz) .....:	L1: 37,7 L2: 37,7 L3: 37,7	P
	- factor γ .....:	L1: 1,1 L2: 1,1 L3: 1,1	P
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.3.4	Dielectric verification		
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories): ≤ 2 mA/pole) .....:	< 1	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.6	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.3.6	P
8.3.3.7	Strength of actuator mechanism		P
8.2.5	Verification of the strength of actuator mechanism and position indicating device		P
	- actuator type (fig.) .....:	1b	—
8.2.5.2.1	Dependent and independent manual operation		P
	- actuating force for opening (N) .....:	25	—
	- test force with blocked main contacts (N) .....:	75	—
	- used method to keep the contact closed .....:	Brazing	—
	During and after the test, open position not indicated .....:	No open position	P
	Equipment with locking mean, no locking in the open position while test force is applied.....:	No locking mechanism	P
8.2.5.2.2	Dependent power operation		N/A
	- main contacts fixed together in the closed position .....:	-	N/A
	- used method to keep the contact closed .....:	-	N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) .....:	-	N/A
	During and after the test, open position not indicated .....:	-	N/A
	Equipment show no damage impairing its normal operation.....:	-	N/A
	Equipment with locking mean, no locking in the open position while test force is applied.....:	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.2.5.2.3	Independent power operation		N/A
	- main contacts fixed together in the closed position .....:	-	N/A
	- used method to keep the contact closed .....:	-	N/A
	- stored energy of the power operator released (3 times).....:	-	N/A
	During and after the test, open position not indicated .....:	-	N/A
	Equipment show no damage impairing its normal operation.....:	-	N/A
	Equipment with locking mean, no locking in the open position while test force is applied.....:	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.4	TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY		
8.3.4.1	Operational performance test		P
	EFD 8, 1p: AC-22B at 400V/20A		
	- utilization category .....:	AC-22B	—
	- rated operational voltage (V) .....:	400	—
	- rated operational current (A) .....:	20	—
	Test conditions for electrical operation cycles:		
	- test voltage (V) .....:	L1: 405 L2: - L3: -	—
	- test current (A) .....:	L1: 21,5 L2: - L3: -	—
	- power factor/~~time constant~~ .....:	L1: 0,79 L2: - L3: -	—
	Number of cycles with current .....:	300	P
	Number of cycles without current .....:	1700	P
	First test sequence (with/without current) .....:	With	—
	Second test sequence (with/without current) .....:	Without	—
	- time interval between first and second test sequence .....:	10min	—
	- current duration (ms) .....:	290	P
	- time interval between operations (s) .....:	30	P
8.3.4.1.5	Behaviour of the equipment during operational performance test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.4.1.6	Condition of the equipment after operation performance capability test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.2	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2 mA/pole .....:	< 1	P
8.3.4.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.4.4	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.1	Operational performance test		P
	EFD 8, 2p: AC-22B at 400V/20A		
	- utilization category .....:	AC-22B	—
	- rated operational voltage (V) .....:	400	—
	- rated operational current (A) .....:	20	—
	Test conditions for electrical operation cycles:		
	- test voltage (V) .....:	L1: 404 L2: 404 L3: -	—
	- test current (A) .....:	L1: 22 L2: 22 L3: -	—
	- power factor/~~time constant~~ .....:	L1: 0,82 L2: 0,82 L3: -	—
	Number of cycles with current .....:	300	P
	Number of cycles without current .....:	1700	P
	First test sequence (with/without current) .....:	With	—
	Second test sequence (with/without current) .....:	Without	—
	- time interval between first and second test sequence .....:	10min	—
	- current duration (ms) .....:	290	P
	- time interval between operations (s) .....:	30	P
8.3.4.1.5	Behaviour of the equipment during operational performance test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.4.1.6	Condition of the equipment after operation performance capability test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.2	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2 mA/pole .....:	< 1	P
8.3.4.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.4.4	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.1	Operational performance test		P
	EFD 8, 3p+N: AC-22B at 400V/20A		
	- utilization category .....:	AC-22B	—
	- rated operational voltage (V) .....:	400	—
	- rated operational current (A) .....:	20	—
	Test conditions for electrical operation cycles:		
	- test voltage (V) .....:	L1: 403 L2: 405 L3: 404	—
	- test current (A) .....:	L1: 21,5 L2: 22,0 L3: 21,5	—
	- power factor/~~time constant~~ .....:	L1: 0,78 L2: 0,78 L3: 0,78	—
	Number of cycles with current .....:	300	P
	Number of cycles without current .....:	1700	P
	First test sequence (with/without current) .....:	With	—
	Second test sequence (with/without current) .....:	Without	—
	- time interval between first and second test sequence .....:	10min	—
	- current duration (ms) .....:	300	P
	- time interval between operations (s) .....:	30	P
8.3.4.1.5	Behaviour of the equipment during operational performance test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.4.1.6	Condition of the equipment after operation performance capability test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.2	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2 mA/pole .....:	< 1	P
8.3.4.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.4.4	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5	TEST SEQUENCE III: SHORT-CIRCUIT PERFORMANCE CAPABILITY		
8.3.5.1	Short-time withstand current test		P
	EFD 8, 1p: 240A/1s		
	Rated short-time withstand current Icw (A) (≥ 12 Ie max) .....:	240 / 1s	P
	test voltage (V) .....:	L1: 403 L2: - L3: -	—
	r.m.s. test current (A) .....:	L1: 244 L2: - L3: -	—
	peak test current (A) .....:	L1: 347 L2: - L3: -	—
	power factor/~~time constant~~ .....:	L1: 0,94 L2: - L3: -	—
	test duration (ms) .....:	1010	—
8.3.5.1.5	Behaviour of the equipment during short-time withstand current test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.5.1.6	Condition of the equipment after short-time withstand current test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Short-circuit making capacity		N/A
	Rated short-circuit making capacity Icm (A) .....:	-	N/A
	test voltage (1,05 x Ue) .....(V):	L1: - L2: - L3: -	—
	r.m.s. test current (A) .....:	L1: - L2: - L3: -	—
	maximum peak test current (A) / factor n .....:	-	N/A
	power factor/time constant .....:	L1: - L2: - L3: -	N/A
	current duration (ms) .....:	-	—
	Time interval between the cycles		—
8.3.5.2.5	Behaviour of the equipment during short-circuit making capacity test		N/A
	Test performed without:		—
	- endanger to the operator		N/A
	-cause damage to adjacent equipment		N/A
	No permanent arcing		N/A
	No flash over between poles and poles and frame		N/A
	No melting of the fuse in the detection circuit		N/A
8.3.5.2.6	Condition of the equipment after short-circuit making capacity test		N/A
	Immediately after the test equipment must work satisfactorily		N/A
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		N/A
	- equipment is able to carry its rated current after normal closing operation		N/A
8.3.5.3	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.5.4	Leakage current		P
	test voltage (1,1x Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2,0 mA/pole .....:	< 1	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.5.5	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.1	Short-time withstand current test		P
	EFD 8, 3p+N: 240A/1s		
	Rated short-time withstand current Icw (A) (≥ 12 Ie max) .....:	240 / 1s	P
	test voltage (V) .....:	L1: 403 L2: 405 L3: 402	—
	r.m.s. test current (A) .....:	L1: 244 L2: 246 L3: 243	—
	peak test current (A) .....:	L1: 349 L2: 348 L3: 346	—
	power factor/~~time constant~~ .....:	L1: 0,93 L2: 0,94 L3: 0,94	—
	test duration (ms) .....:	1015	—
8.3.5.1.5	Behaviour of the equipment during short-time withstand current test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.5.1.6	Condition of the equipment after short-time withstand current test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Short-circuit making capacity		N/A
	Rated short-circuit making capacity Icm (A) .....:	-	N/A
	test voltage (1,05 x Ue) .....(V):	L1: - L2: - L3: -	—
	r.m.s. test current (A) .....:	L1: - L2: - L3: -	—
	maximum peak test current (A) / factor n .....:	-	N/A
	power factor/time constant .....:	L1: - L2: - L3: -	N/A
	current duration (ms) .....:	-	—
	Time interval between the cycles		—
8.3.5.2.5	Behaviour of the equipment during short-circuit making capacity test		N/A
	Test performed without:		—
	- endanger to the operator		N/A
	-cause damage to adjacent equipment		N/A
	No permanent arcing		N/A
	No flash over between poles and poles and frame		N/A
	No melting of the fuse in the detection circuit		N/A
8.3.5.2.6	Condition of the equipment after short-circuit making capacity test		N/A
	Immediately after the test equipment must work satisfactorily		N/A
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		N/A
	- equipment is able to carry its rated current after normal closing operation		N/A
8.3.5.3	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.5.4	Leakage current		P
	test voltage (1,1x Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2,0 mA/pole .....:	< 1	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.5.5	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT		
	Conditional short-circuit current test:		P
	EFD 8, 1p: 100kA at 400V with 20A gG fuse-links		
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated voltage (V) .....:	20	—
	- rated current (A) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 x Ue) (V) .....:	L1: 425 L2: - L3: -	—
	test current (kA) .....:	L1: 100500 L2: - L3: -	—
	rated frequency (Hz) .....:	50	—
	power factor .....:	0,16	—
	Time constant (ms) .....:	-	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (A) .....:	L1: 3140 L2: - L3: - N: -	—
	- Joule integral I²dt (A²s) .....:	L1: 1790 L2: - L3: - N: -	—
	Fuse protected short-circuit making (equipment closing on to short-circuit)		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	0,95	—
	- point at which the measurement is made .....:	Actuator	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	0,96	—
	- max. let-through current (A) .....:	L1: 3520 L2: - L3: - N: -	—
	- Joule integral I²dt (A²s) .....:	L1: 1830 L2: - L3: - N: -	—

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during conditional short-circuit current test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after conditional short-circuit current test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2,0 mA/pole .....:	< 1	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.6.5	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conditional short-circuit current test:		P
	EFD 8, 3p+N: 100kA at 400V with 20A gG fuse-links		
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated voltage (V) .....:	20	—
	- rated current (A) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 x Ue) (V) .....:	L1: 428 L2: 429 L3: 427	—
	test current (kA) .....:	L1: 100620 L2: 101250 L3: 100410	—
	rated frequency (Hz) .....:	50	—
	power factor .....:	0,15	—
	Time constant (ms) .....:	-	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (A) .....:	L1: 2260 L2: 4570 L3: 2450 N: 1850	—
	- Joule integral I²dt (A²s) .....:	L1: 1240 L2: 2030 L3: 1420 N: 950	—
	Fuse protected short-circuit making (equipment closing on to short-circuit)		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	0,95	—
	- point at which the measurement is made .....:	Actuator	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	0,96	—
	- max. let-through current (A) .....:	L1: 1540 L2: 3860 L3: 3710 N: 2140	—
	- Joule integral I²dt (A²s) .....:	L1: 970 L2: 1980 L3: 1310 N: 1020	—

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during conditional short-circuit current test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after conditional short-circuit current test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2,0 mA/pole .....:	< 1	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.6.5	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conditional short-circuit current test:		P
	EFD 8, 1p: 50kA at 400V with 10A aM fuse-links		
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / aM	—
	- rated voltage (V) .....:	400	—
	- rated current (A) .....:	10	—
	- rated breaking capacity (kA) .....:	50	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 x Ue) (V) .....:	L1: 425 L2: - L3: -	—
	test current (kA) .....:	L1: 50930 L2: - L3: -	—
	rated frequency (Hz) .....:	50	—
	power factor .....:	0,14	—
	Time constant (ms) .....:	-	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (A) .....:	L1: 3140 L2: - L3: - N: -	—
	- Joule integral I²dt (A²s) .....:	L1: 1620 L2: - L3: - N: -	—
	Fuse protected short-circuit making (equipment closing on to short-circuit)		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	0,95	—
	- point at which the measurement is made .....:	Actuator	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	0,96	—
	- max. let-through current (A) .....:	L1: 2680 L2: - L3: - N: -	—
	- Joule integral I²dt (A²s) .....:	L1: 1950 L2: - L3: - N: -	—

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during conditional short-circuit current test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after conditional short-circuit current test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2,0 mA/pole .....:	< 1	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.6.5	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Conditional short-circuit current test:		P
	EFD 8, 3p+N: 50kA at 400V with 10A aM fuse-links		
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / aM	—
	- rated voltage (V) .....:	400	—
	- rated current (A) .....:	10	—
	- rated breaking capacity (kA) .....:	50	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 x Ue) (V) .....:	L1: 424 L2: 425 L3: 424	—
	test current (kA) .....:	L1: 50660 L2: 51020 L3: 50280	—
	rated frequency (Hz) .....:	50	—
	power factor .....:	0,16	—
	Time constant (ms) .....:	-	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (A) .....:	L1: 2470 L2: 3600 L3: 2260 N: 2030	—
	- Joule integral I²dt (A²s) .....:	L1: 1390 L2: 1670 L3: 1260 N: 2330	—
	Fuse protected short-circuit making (equipment closing on to short-circuit)		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	0,95	—
	- point at which the measurement is made .....:	Actuator	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	0,96	—
	- max. let-through current (A) .....:	L1: 2340 L2: 3210 L3: 2960 N: 3210	—
	- Joule integral I²dt (A²s) .....:	L1: 980 L2: 1270 L3: 1430 N: 1050	—

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during conditional short-circuit current test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after conditional short-circuit current test		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2,0 mA/pole .....:	< 1	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.6.5	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.7	TEST SEQUENCE V: OVERLOAD PERFORMANCE CAPABILITY		
8.3.7.1	Overload test		P
	EFD 8, 1p		
	ambient temperature 10-40 °C .....:	23	—
	test enclosure W x H x D (mm x mm x mm) .....:	-	—
	material of enclosure .....:	-	—
	test current 1,6xIthe or 1,6xIth (A) .....:	32	—
	cable/busbar cross-section (mm²) / length (mm) ....:	2,5 / 1000	—
	Fuse-link details:		P
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- time duration of the overload test (s) .....:	818	—
	Within 3 to 5 min after the fuse(s) has(have) operated (or 1 h), the equipment has been operated once, i.e. opened and closed		P
	Required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	The equipment has not undergone any impairment hindering such operation		P
8.3.7.2	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.7.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2 mA)/pole .....:	< 1	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.7.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	Fuse links aged during the overload test are replaced by new fuse-links .....:	Yes	P
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.7.4	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.7.1	Overload test		P
	EFD 8, 3p+N		
	ambient temperature 10-40 °C .....:	23	—
	test enclosure W x H x D (mm x mm x mm) .....:	-	—
	material of enclosure .....:	-	—
	test current 1,6xIthe or 1,6xIth (A) .....:	32	—
	cable/busbar cross-section (mm²) / length (mm) ....:	2,5 / 1000	—
	Fuse-link details:		P
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	- time duration of the overload test (s) .....:	976	—
	Within 3 to 5 min after the fuse(s) has(have) operated (or 1 h), the equipment has been operated once, i.e. opened and closed		P
	Required opening force not greater than the test force of 8.2.5.2 and table 17 of IEC 60947-1		P
	The equipment has not undergone any impairment hindering such operation		P
8.3.7.2	Dielectric verification		P
	test voltage 2*Ue with a minimum of 1000V~ (V) ....:	1000	—
	No flashover or breakdown		P
8.3.7.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (mA) (other utilization categories) ≤ 2 mA)/pole .....:	< 1	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.7.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	ETI	—
	- manufacturer's model or type reference .....:	CH 8 (8x31) / gG	—
	- rated current (A) .....:	20	—
	- power loss (W) .....:	2,3 max.	—
	- rated breaking capacity (kA) .....:	100	—
	Fuse links aged during the overload test are replaced by new fuse-links .....:	Yes	P
	- conductor cross-section (mm²) .....:	2,5	—
	- test current Ie (A) .....:	20	—
	Measured temperature-rise .....:	See appended table 8.3.7.4	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict

8.4	ELECTROMAGNETIC COMPATIBILITY TESTS		
8.4.1	Immunity		P
8.4.1.1	Equipment not incorporating electronic circuits: no tests necessary		P
8.4.1.2	Equipment incorporating electronic circuits:		N/A
	Equipment utilizing circuits in which all components are passive are not required to be tested		N/A
	All other equipment, requirements according to 7.3.3.2 of IEC 60947-1 and limits according table 6 apply		N/A
	Performed tests.....:	-	N/A
	No unintentional separation or closing of contacts has occurred during these tests .....:	-	N/A
8.4.2	Emission		P
8.4.2.1	Equipment not incorporating electronic circuits: no tests necessary		P
8.4.2.2	Equipment incorporating electronic circuits:		N/A
	Equipment utilizing circuits in which all components are passive are not required to be tested		N/A
	All other equipment, requirements according to 7.3.3.2 and limits according table 7 apply		N/A
	Performed tests.....:	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Annex A (normative)		
A	Equipment for direct switching of a single motor		
A.2	Additional rated duties.....:	-	N/A
A.2.1	- intermittent periodic duty		N/A
	- intermittent duty		N/A
	Classes of intermittent duty:		
	-class 1: up to 1 operating cycle per hour		N/A
	-class 3: up to 3 operating cycle per hour		N/A
	-class 12: up to 12 operating cycles per hour		N/A
	-class 30: up to 30 operating cycles per hour		N/A
	-class 120: up to 120 operating cycles per hour		N/A
A.2.2	Temporary duty .....:	-	N/A
A.6	Mechanical durability:		
	Equipment mounted according to manufacturer's instruction		N/A
	Preferred number of no-load operating cycles expressed in millions.....:	-	N/A
	0,001 – 0,003 – 0,01 – 0,03 – 0,1 – 0,3 - 1		N/A
	If no mechanical endurance is stated by the manufacturer, a minimum mechanical endurance according to the class of intermittent duty shall be tested.		N/A
	Number of no-load operating cycles performed.....:	-	N/A
A.7	Electrical durability:		N/A
	- test according to manufacturer's instruction		N/A
A.8	Verification of making and breaking capacity:		
	- utilization category .....:	-	—
	- rated operational voltage Ue (V) .....:	-	—
	- rated operational current Ie (A) or power (kW) .....:	-	—
	Conditions for make/break operations or make operations:		—
	- test voltage, U = 1,05 Ue .....(V):	L1: - L2: - L3: -	—
	- test current, I = ...x Ie (A):	L1: - L2: - L3: -	—
	- power factor .....:	L1: - L2: - L3: -	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Conditions for make/break operations:		N/A
	- test voltage, U = 1,05 Ue .....(V):	L1: - L2: - L3: -	—
	- test current, I = ...x Ie (A):	L1: - L2: - L3: -	—
	- power factor/ time constant .....:	L1: - L2: - L3: -	—
	Number of make/break or make and break operations .....:	-	N/A
	- recovery voltage duration (≥ 50 ms)		N/A
	- current duration (ms) .....:	-	—
	- time interval between operations .....:	-	N/A
	Characteristic of transient recovery voltage if necessary:		N/A
	- oscillatory frequency (kHz) .....:	-	—
	- measured oscillatory frequency (kHz) .....:	L1: - L2: - L3: -	N/A
	- factor γ .....:	L1: - L2: - L3: -	N/A
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		N/A
	Test performed without:		—
	- endanger to the operator		N/A
	- cause damage to adjacent equipment		N/A
	No permanent arcing		N/A
	No flash over between poles and poles and frame		N/A
	No melting of the fuse in the detection circuit		N/A
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		N/A
	Immediately after the test equipment must work satisfactorily		N/A
	- required opening force not greater than the test force of 8.2.5.2 and table 8		N/A
	- equipment is able to carry its rated current after normal closing operation		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Dielectric verification		N/A
	test voltage: 2*Ue with a minimum of 1000V~ .....:	-	—
	No flashover or breakdown		N/A
8.3.3.5	Leakage current		N/A
	test voltage (1,1 Ue) (V) .....:	-	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (other utilization categories): ≤ 2 mA/pole) .....:	-	N/A
8.3.3.6	Temperature-rise verification		N/A
	- conductor cross-section (mm²) .....:	-	—
	- test current Ie (A) .....:	-	—
	Measured temperature-rise .....:	-	N/A
A.9	Operational performance test:		N/A
	- utilization category .....:	-	—
	- rated operational voltage (V) .....:	-	—
	- rated operational current (A) .....:	-	—
	Test conditions for electrical operation cycles:		N/A
	- test voltage (V) .....:	L1: - L2: - L3: -	—
	- test current (A) .....:	L1: - L2: - L3: -	—
	- power factor/time constant .....:	L1: - L2: - L3: -	—
	Number of cycles with current .....:	-	N/A
	Number of cycles without current .....:	-	N/A
	First test sequence (with/without current) .....:	-	—
	Second test sequence (with/without current) .....:	-	—
	- time interval between first and second test sequence .....:	-	—
8.3.4.1.5	Behaviour of the equipment during the operational performance test		N/A
	Test performed without:		—
	- endanger to the operator		N/A
	-cause damage to adjacent equipment		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No permanent arcing		N/A
	No flash over between poles and poles and frame		N/A
	No melting of the fuse in the detection circuit		N/A
8.3.4.1.6	Condition of the equipment after making and breaking capacity tests		N/A
	Immediately after the test equipment must work satisfactorily		N/A
	- required opening force not greater than the test force of 8.2.5.2 and table 8		N/A
	- equipment is able to carry its rated current after normal closing operation		N/A
8.3.4.2	Dielectric verification		N/A
	test voltage: 2*Ue with a minimum of 1000V~ .....:	-	—
	No breakdown or flashover		N/A
8.3.4.3	Leakage current		N/A
	test voltage (1,1 Ue) (V) .....:	-	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:	-	N/A
	Leakage current (other utilization categories) ≤ 2 mA/pole .....:	-	N/A
8.3.4.4	Temperature-rise verification		N/A
	- conductor cross-section (mm²) .....:	-	—
	- test current Ie (A) .....:	-	—
	Measured temperature-rise .....:	-	N/A
A.10	Special tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

Annex C (normative)			
C	Single pole operated three pole switches		
C.2	Additional-tests to be performed on single pole operated three pole switches		N/A
C.3.1	Test “8.3.3.3 Making and breaking capacities” according to test sequence I with following modifications:		N/A
	L1 and L2 are closed, L3 is subjected to the required make-break operation cycle.....:	-	N/A
	L2 closed and L3 opened, L1 is subjected to the required make-break operation cycle.....:	-	N/A
	Test performed in a three phase circuit according to Figure 5 of IEC 60947-1		N/A
C.3.1	Test “8.3.4.1 Operational performance” according to test sequence II with following modifications:		N/A
	L1 and L2 are closed, L3 is subjected to the required make-break operation cycle.....:	-	N/A
	L2 closed and L3 opened, L1 is subjected to the required make-break operation cycle.....:	-	N/A
	Test performed in a three phase circuit according to Figure 5 of IEC 60947-1		N/A
C.3.2	Test “8.3.6.2 Fuse protected short circuit test” according to test sequence IV with following modifications:		N/A
	For the making test L1 is open and L2 closed, L3 is subjected to the required make operation cycle .....:	-	N/A
	Test performed in a three phase circuit according to Figure 11 of IEC 60947-1		N/A
C.4	Condition of equipment after tests		N/A
	The equipment complies with the relevant clauses of 8.3.3.3.6, 8.3.4.1.6 and 8.3.5.2.6		N/A
C.5	Instruction for use		N/A
	The product literature includes following statement:		N/A
	These devices are intended for power distribution systems where switching and/or isolating of an individual phase may be necessary and shall not be used for the switching of the primary circuit of three-phase equipment.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

7.1.4	TABLE: Clearance and creepage distance measurements of EFD 8, 1p				
Clearance cl and creepage distance dcr between:		cl (mm) required	cl (mm) measured	dcr (mm) required	dcr (mm) measured
Terminals and mounting plate		8	> 9	5,6	> 9
Each pole and the other poles connected together		-	-	-	-
Line terminal(s) connected together and load terminal(s) connected together		8	> 9	5,6	> 9
Main circuit and other circuits		-	-	-	-
Supplementary information: ---					

7.1.4	TABLE: Clearance and creepage distance measurements of EFD 8, 2p				
Clearance cl and creepage distance dcr between:		cl (mm) required	cl (mm) measured	dcr (mm) required	dcr (mm) measured
Terminals and mounting plate		8	> 9	5,6	> 9
Each pole and the other poles connected together		8	> 9	5,6	> 9
Line terminal(s) connected together and load terminal(s) connected together		8	> 9	5,6	> 9
Main circuit and other circuits		-	-	-	-
Supplementary information: ---					

7.1.4	TABLE: Clearance and creepage distance measurements of EFD 8, 3p+N				
Clearance cl and creepage distance dcr between:		cl (mm) required	cl (mm) measured	dcr (mm) required	dcr (mm) measured
Terminals and mounting plate		8	> 9	5,6	> 9
Each pole and the other poles connected together		8	> 9	5,6	> 9
Line terminal(s) connected together and load terminal(s) connected together		8	> 9	5,6	> 9
Main circuit and other circuits		-	-	-	-
Supplementary information: ---					

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.3.1	**TABLE: Temperature-rise measurements of EFD 8, 1p**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		33	70
Manual operating means: non-metallic		6	25
Parts intended to be touched but not hand-held: non-metallic		12	40
Parts which need not be touched during normal operation: non-metallic		27	50
Supplementary information: ---			

8.3.3.1	**TABLE: Temperature-rise measurements of EFD 8, 2p**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		42	70
Manual operating means: non-metallic		9	25
Parts intended to be touched but not hand-held: non-metallic		19	40
Parts which need not be touched during normal operation: non-metallic		32	50
Supplementary information: ---			

8.3.3.1	**TABLE: Temperature-rise measurements of EFD 8, 3p+N**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		49	70
Manual operating means: non-metallic		10	25
Parts intended to be touched but not hand-held: non-metallic		21	40
Parts which need not be touched during normal operation: non-metallic		34	50
Supplementary information: ---			

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Clause	Requirement + Test	Result - Remark	Verdict

8.3.3.6	**TABLE: Temperature-rise measurements of EFD 8, 1p**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		37	80
Manual operating means: non-metallic		8	35
Parts intended to be touched but not hand-held: non-metallic		15	50
Parts which need not be touched during normal operation: non-metallic		31	60
Supplementary information: ---			

8.3.3.6	**TABLE: Temperature-rise measurements of EFD 8, 2p**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		48	80
Manual operating means: non-metallic		9	35
Parts intended to be touched but not hand-held: non-metallic		22	50
Parts which need not be touched during normal operation: non-metallic		34	60
Supplementary information: ---			

8.3.3.6	**TABLE: Temperature-rise measurements of EFD 8, 3p+N**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		52	80
Manual operating means: non-metallic		10	35
Parts intended to be touched but not hand-held: non-metallic		23	50
Parts which need not be touched during normal operation: non-metallic		36	60
Supplementary information: ---			

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.4.4	**TABLE: Temperature-rise measurements of EFD 8, 1p**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		35	80
Manual operating means: non-metallic		8	35
Parts intended to be touched but not hand-held: non-metallic		16	50
Parts which need not be touched during normal operation: non-metallic		30	60
Supplementary information: ---			

8.3.4.4	**TABLE: Temperature-rise measurements of EFD 8, 2p**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		47	80
Manual operating means: non-metallic		9	35
Parts intended to be touched but not hand-held: non-metallic		21	50
Parts which need not be touched during normal operation: non-metallic		35	60
Supplementary information: ---			

8.3.4.4	**TABLE: Temperature-rise measurements of EFD 8, 3p+N**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		52	80
Manual operating means: non-metallic		11	35
Parts intended to be touched but not hand-held: non-metallic		25	50
Parts which need not be touched during normal operation: non-metallic		38	60
Supplementary information: ---			

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.5.5	**TABLE: Temperature-rise measurements of EFD 8, 1p**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		35	80
Manual operating means: non-metallic		7	35
Parts intended to be touched but not hand-held: non-metallic		12	50
Parts which need not be touched during normal operation: non-metallic		28	60
Supplementary information: ---			

8.3.5.5	**TABLE: Temperature-rise measurements of EFD 8, 3p+N**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		50	80
Manual operating means: non-metallic		10	35
Parts intended to be touched but not hand-held: non-metallic		23	50
Parts which need not be touched during normal operation: non-metallic		37	60
Supplementary information: ---			

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.6.5	**TABLE: Temperature-rise measurements of EFD 8, 1p**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		37	80
Manual operating means: non-metallic		9	35
Parts intended to be touched but not hand-held: non-metallic		18	50
Parts which need not be touched during normal operation: non-metallic		32	60
Supplementary information: **After test with 100kA at 400V with 20A gG fuse-links**			

8.3.6.5	**TABLE: Temperature-rise measurements of EFD 8, 3p+N**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		54	80
Manual operating means: non-metallic		12	35
Parts intended to be touched but not hand-held: non-metallic		26	50
Parts which need not be touched during normal operation: non-metallic		39	60
Supplementary information: **After test with 100kA at 400V with 20A gG fuse-links**			

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.6.5	**TABLE: Temperature-rise measurements of EFD 8, 1p**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		35	80
Manual operating means: non-metallic		9	35
Parts intended to be touched but not hand-held: non-metallic		15	50
Parts which need not be touched during normal operation: non-metallic		30	60
Supplementary information: **After test with 50kA at 400V with 10A aM fuse-links**			

8.3.6.5	**TABLE: Temperature-rise measurements of EFD 8, 3p+N**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		58	80
Manual operating means: non-metallic		12	35
Parts intended to be touched but not hand-held: non-metallic		25	50
Parts which need not be touched during normal operation: non-metallic		42	60
Supplementary information: **After test with 50kA at 400V with 10A aM fuse-links**			

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict

8.3.7.4	**TABLE: Temperature-rise measurements of EFD 8, 1p**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		34	80
Manual operating means: non-metallic		6	35
Parts intended to be touched but not hand-held: non-metallic		13	50
Parts which need not be touched during normal operation: non-metallic		31	60
Supplementary information: ---			

8.3.7.4	**TABLE: Temperature-rise measurements of EFD 8, 3p+N**		
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals, max.: silver-plated copper		47	80
Manual operating means: non-metallic		10	35
Parts intended to be touched but not hand-held: non-metallic		23	50
Parts which need not be touched during normal operation: non-metallic		35	60
Supplementary information: ---			

List of test equipment used:

Measured quantity	Device	Manufacturer	Code
Voltage (tests up to 10kA)	Voltage divider 1:2000 Difference amplifier AM 502 Signal memory recorder TRA 800	AIT Tektronix W&W	- AM 502/1…3 TRA800
Current (tests up to 10kA)	Lin. Current transformer LGSSO Burden 1Ω Signal memory recorder TRA 800	Ritz AIT W&W	WLIN5000/1…3 - TRA800
Voltage (tests above 10kA)	Insulating measuring amplifier Arcus Signal memory recorder 2580-P	Rohrer Nicolet	T908D 2580-P
Current (tests above 10kA)	Lin current transformer LGSSO Burden 0,7mΩ Signal memory recorder 2580-P	Ritz AIT Nicolet	WLIN6000.HVF/1…3 - 2580-P
Current (tests at reduced voltage)	Current transformer GE 4461 Current transformer AETt10 True-RMS amperemeter Cl. 0,5 Digital multimeter Fluke 185	Goerz Siemens Norma Fluke	WI600/1…3 WI4000/1…3 A0,5/4 FLUKE185/2
Transient recovery voltage	Adjustment equipment for TRV Oscilloscope G 801.1	AIT Tektronix	- G801.1
Dielectric properties	High-voltage test equipment 90-1F with measuring equipment Impulse tester 35 Impulse voltmeter 64M Oscilloscope 9430	 Elabo Haefely Haefely Le Croy	 HSG5KV G304 G502 G805
Leakage current	High-voltage test equipment 90-1F Digital multimeter Fluke 185 Digital multimeter Fluke 187	Elabo Fluke Fluke	HSG5KV FLUKE185/2 G922
Time	Signal memory recorders Digital stopwatch	W&W, Nicolet Quantum	TRA800, 2580-P 938-3
Temperature	Data Logger Unit 34970A Temperature meter TESTO 901	Agilent Testoterm	942 TESTO
Abnormal heat and fire	Glow-wire test device with measuring equipment	Friborg	GLOW
Mechanical strength of terminals	Test equipment	AIT	MSD
Insertability of unprepared conductors	Test gauge	AIT	Gauge 1…16
Strength of actuator mechanism	Test equipment	Sauter GmbH	FH1K
Degree of protection	Test probe, dust chamber Test equipment for ingress of water	PTL, Friborg PTL, Friborg	PTL1…3, DUST X1…X4
Clearances, creepage distances	Digital slide gauge	Spiral	SCHUB-1

TEST REPORT SUMMARY

Report Reference No. .....: **2.03.02769.1.0/EFD8/CCA**

Date of issue.....: 17.04.2014

Tested by (name + signature) .....: Ing.J.Ainetter .....

Witnessed by (name + signature) ....: --- .....

Approved by (name + signature).....: Ing.K.Farthofer .....

Supervised by (name + signature) ...: --- .....

Testing Laboratory.....: **AIT Austrian Institute of Technology GmbH**

Address .....: 1210 Vienna, Giefinggasse 2, AUSTRIA

Testing procedure .....: ☒ ENEC/CCA-TL ☐ TMP ☐ WMT ☐ SMT

Testing location.....: **AIT Austrian Institute of Technology GmbH**

Address .....: 1210 Vienna, Giefinggasse 2, AUSTRIA

Applicant.....: **ETI Elektroelement d.d.**

Address .....: Obrezija 5, 1411 Izlake, SLOVENIA

Manufacturer.....: **ETI Elektroelement d.d.**

Address .....: Obrezija 5, 1411 Izlake, SLOVENIA

Product.....: **Fuse-switch-disconnectors for cylindrical fuse-links 8x31**

Model/Type reference .....: EFD 8

Trademark.....: ETI

Ratings .....: 400V / up to 20A (with gG) / 50/60Hz / 1p up to 3p+N
400V / up to 10A (with aM) / 50/60Hz / 1p up to 3p+N

Certification Scheme .....: ☐ ENEC ☒ CCA ☐ Other: _____

Standard(s).....: **EN 60947-3:2009+A1:2012 in conjunction with EN 60947-1:2007+A1:2011**

☒ The text of the a.m. European Standard was approved by CENELEC under the Unique Acceptance Procedure and is identical with the corresponding IEC Publication.

☐ The text of the a.m. European Standard was approved by CENELEC with agreed common modifications and is not identical with the corresponding IEC Publication.

This EN test report consists of the following parts:

☒ **IEC TRF No. IEC60947_3C** Report Reference No. ..... : 2.03.02769.1.0/EFD8/CB

☒ **EN Common modifications SNCs and A-deviations** Report Reference No. or Annex No. ..... : 2.03.02769.1.0/EFD8/CCA

EN 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict

Annex 1	**COMMON MODIFICATIONS**		**P**
	No modifications to IEC 60947-1 and IEC 60947-3		P
	EN 60947-1 and EN 60947-3 summarizes IEC 60947-1 and IEC 60947-3		P

Annex 2	**SPECIAL NATIONAL CONDITIONS**	**N/A**

Annex 3	**A - DEVIATIONS**	**N/A**