



Accredited by BMWA, number GZ 92714/393-I/12/03

Test Report

Project Designation

TYPE TEST AT LOW-VOLTAGE FUSE-SWITCH-DISCONNECTORS FOR CYLINDRICAL FUSE-LINKS TYPE PCF10

Client **ETI Elektroelement d.d.**
1411 Izlake, Obrezija 5
SLOVENIA

Order from / No **07.05.2004 / --**

Project number **2.03.00357.1.0/PCF10** Test Engineer **Ing.J.Ainetter**

Date of issue	08.09.2004
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Annex: number of pages	CB/CCA– Test Report No.: 2.03.00357.1.0/PCF10/CB/CCA

The results relate exclusively to the terms tested.

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Test item

Identification:

Low-voltage fuse-switch-disconnector for cylindrical fuse-links type PCF10

Number of poles: 1-pole, 1-pole+N, 2-pole, 3-pole and 3-pole+N

Rated voltage: AC400V, AC 400/690V and AC 690V

Rated current: 32A

Technical data and description:

See page 4

Manufacturer:

ETI Elektroelement d.d.

Testing location, Period of testing

Testing location:

ÖFPZ Arsenal Ges.m.b.H.,

Business Unit Monitoring, Energy and Drive Technologies

Period of testing:

05-08/2004

Test(s)

Test(s) performed:

Type test

Test procedure(s):

CB-Scheme and CCA-Scheme

Test standard(s):


IEC 60947-1 Ed. 4.0:2004 and EN 60947-1:1999+A1:2000+A2:2001

IEC 60947-3 Ed. 2.1:2001 and EN 60947-3:1999+A1:2001

Result

The low-voltage fuse-switch-disconnectors for cylindrical fuse-links type PCF10 have passed the type test successfully.

Test engineer



Ing. J. Ainetter



Project engineer,
Technical responsibility



Ing. K. Farthofer

Testing location

All tests were performed at ÖFPZ Arsenal Ges.m.b.H.,
Business Unit Monitoring, Energy and Drive Technologies.



ACCREDITED ACCORDING TO EN ISO/IEC 17025
Number GZ 92714/393-I/12/03 by BMWA

CERTIFICATED ACCORDING TO ISO 9001
SQS Reg. No. 12769-03



Control room for tests up to 10kA



Control room for tests above 10kA

Technical data and description

Standard	IEC 60947-1 Ed. 4.0:2004 and EN 60947-1:1999+A1:2000+A2:2001 IEC 60947-3 Ed. 2.1:2001 and EN 60947-3:1999+A1:2001
Test	Type test
Test procedure	CB-Scheme and CCA-Scheme
Manufacturer	ETI Elektroelement d.d.
Place of manufacture	SI - 1411 Izlake, Obrezija 5
Test item	Low-voltage fuse-switch disconnecter for cylindrical fuse-links
Model/Type reference	PCF10
Trademark	ETI
Number of poles	1-pole, 1-pole+N, 2-pole, 3-pole and 3-pole+N
Method of mounting	Rail mounting
Method of operation	Dependent manual operation
Type of terminal	Pillar terminal
Type of fuse-links	Cylindrical fuse-links 10 x 38
Kind of current	AC
Utilization category	AC-22B
Rated voltage	1-pole: 400/690V 1-pole+N: 400V 2-pole, 3-pole and 3-pole+N: 690V
Rated current	32A
Rated frequency	50Hz
Rated insulation voltage	690V
Rated impulse withstand voltage	4kV
Conventional free air thermal current	32A
Rated short-time withstand current	300A
Rated conditional short-circuit current	100kA at 400V
Degree pf protection	IP20
Material of main contacts	Cu, Ag plated
Material of insulating parts	Enclosure: Polyamid PA6 with 30% GF Fuse carrier(s): Stanyl TE 250 F6
Material of terminals	Fixed part: Cu, Ag plated Body of the clamping unit: Fe, Zn plated

Measuring equipment

Measured quantity	Device	Manufacturer	Code
Voltage (tests up to 10kA)	Voltage transformer GTZ3/S Voltage divider 1:2000 Difference amplifier AM 502 Transient recorder SMR II	Zelisko ÖFPZ Arsenal Tektronix W&W	WU400/1...6 - AM 502/1...4 SMRII32
Current (tests up to 10kA)	Lin. current transformer LGSSO Burden 1Ω Transient recorder SMR II	Ritz ÖFPZ Arsenal W&W	WLIN5000/1...3 - SMRII32
Voltage (tests above 10kA)	3-channel insulating measuring amplifier Transient recorder SMR II	Rohrer W&W	T908D SMRII64/1
Current (tests above 10kA)	Lin. current transformer LGSSO Burden 0,7mΩ Transient recorder SMR II	Ritz ÖFPZ Arsenal W&W	WLIN6000.HVF1...3 - SMRII64/1
Current (tests at reduced voltage)	Current transformer GE 4461 Current transformer AETt10 True-RMS amperemeter KI. 0,5	Goerz Siemens Norma	WI600/1...3 WI4000/1...3 A0,5/1...3
Transient recovery voltage	TRV adjustment equipment Oscilloscope G 801.1	ÖFPZ Arsenal Tektronix	- G801.1
Dielectric properties	High-voltage test device 90-1F with measuring equipment Impulse tester 35 Impulse voltmeter 64M Oscilloscope 9410	Elabo Haefely Haefely Le Croy	HSG5KV G304 G502 G803
Leakage current	Digital multimeter Fluke 185 Digital multimeter Fluke 185	Fluke Fluke	FLUKE185/1 FLUKE185/2
Time	Transient recorder SMR II Stopwatch	W&W Junghans	SMRII32, SMRII64/1 938-2
Temperature	24-channel recorder POLYCOMP SK 30 Temperature meter TESTO 901	H & B Testoterm	SK 30 TESTO
Abnormal heat and fire	Glow-wire test device with measuring equipment	ÖFPZ Arsenal	-
Mechanical strength of terminals	Test equipment	ÖFPZ Arsenal	-
Strength of actuator mechanism	Test equipment	ÖFPZ Arsenal	-
Degree of protection	Test equipment	PTL	-
Clearances and creepage distances	Digital slide gauge CD-20D	Mitutoyo	SCHUB

CB/CCA – TEST REPORT

IEC 60947-3 and EN 60947-3

Low-voltage switchgear and controlgear

Part 3: Switches, disconnectors, switch-disconnectors and fuse-combination units

Report

Reference No.: 2.03.00357.1.0/PCF10/CB/CCA

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

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

Date of issue: 09.09.2004

Contents: 39 pages



Ainetter

Farhofer

Testing laboratory

Name: ÖFPZ Arsenal Ges.m.b.H.

Address: 1030 Wien, Faradaygasse 3, AUSTRIA

Testing location: As above

Client

Name: ETI Elektroelement d.d.

Address: 1411 Izlake, Obrezija 5, SLOVENIA

Test specification

Standard: IEC 60947-1 Ed. 4.0:2004 and EN 60947-1:1999+A1:2000+A2:2001
IEC 60947-3 Ed. 2.1:2001 and EN 60947-3:1999+A1:2001

Test procedure: CB-Scheme and CCA-Scheme

Procedure deviation: N.A.

Non-standard test method.....: N.A.

Test Report Form/blank test report

Test Report Form No.....: IEC60947_3_A/02-12, completed by ÖFPZ Arsenal 2004

TRF originator.....: LCIE

Master TRF.....: Dated 2002-12

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Test item

Description.....: Low-voltage fuse-switch-disconnector for cylindrical fuse-links

Trademark: ETI

Model and/or type reference: PCF10

Manufacturer: ETI Elektroelement d.d.

Rating(s).....: See page 2

Copy of marking plate
and/or picture of test item.....: See page 3

Particulars: test item vs. test requirements

- method of mounting..... : Rail mounting
- method of operation : Dependent manual operation
- switching positions : I / O
- number of poles..... : 1-pole, 1-pole+N, 2-pole, 3-pole, 3-pole+N
- type of terminal..... : Pillar terminal
- type of fuse-links : Cylindrical fuse-links 10 x 38
- kind of current..... : AC
- number of phases : 1, 1+N, 2, 3, 3+N
- number of positions of the main contacts : 2
- degree of protection : IP20

Rated and limiting values, main circuit

- rated operational voltage U_e (V) : 400/690 (1-pole)
400 (1-pole+N)
690 (2-pole, 3-pole, 3-pole+N)
- rated insulation voltage U_i (V)..... : 690
- rated impulse withstand voltage U_{imp} (kV)..... : 4
- rated operational current I_e (A) : 32
- conventional free air thermal current I_{th} (A)..... : 32
- conventional enclosed thermal current I_{the} (A) : -
- rated frequency (Hz) : 50
- utilization category..... : AC-22B

Short-circuit characteristic

- rated short-time withstand current I_{cw} (A) : 300
- rated short-circuit making capacity I_{cm} (A)..... : -
- rated conditional short-circuit current (kA) : 100 (at 400V)

Rated and limiting values, auxiliary circuit(s)

- rated operational voltage (V)..... : -
- rated operational current I_e (A) : -
- rated frequency (Hz) : -
- number of circuits..... : -
- number and kind of contact elements : -

Co-ordination of short-circuit protective devices

- kind of protective device..... : Low-voltage cylindrical fuse-links

Test case verdicts

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

Testing

Date of receipt of test item : 05/2004

Date(s) of performance of test(s) : 05...08/2004

General remarks

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 IEC 02.

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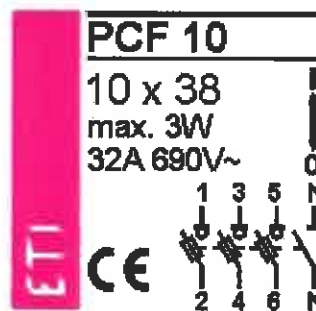
The test results presented in this report relate only to the item tested.

"(see remark #)" refers to a remark appended to the report.

"(see appended table)" refers to a table appended to the report.

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

Copy of marking plate and/or picture of test item



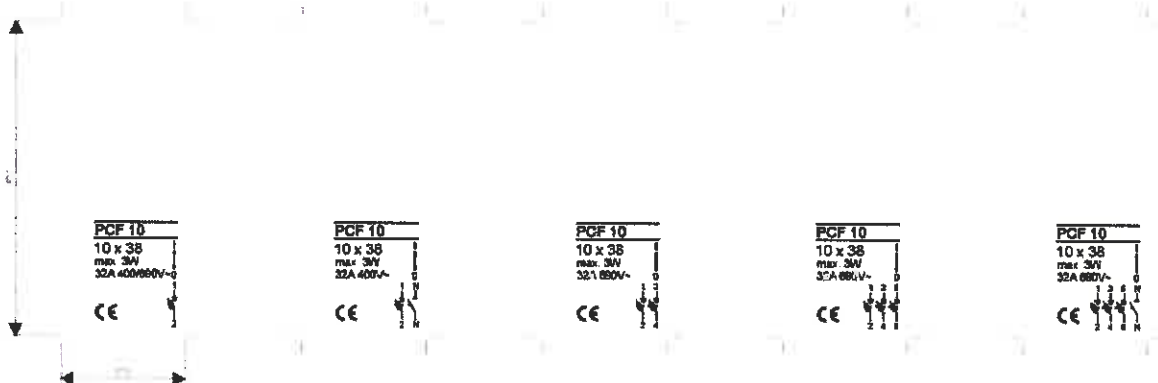
PCF10 1p

PCF10 1p+N

PCF10 2p

PCF10 3p

PCF10 3p+N



Summary of test results

The low-voltage fuse-switch-disconnectors for cylindrical fuse-links type

PCF10

have passed the type test according to

IEC 60947-1 Ed. 4.0:2004 and EN 60947-1:1999+A1:2000+A2:2001

IEC 60947-3 Ed. 2.1:2001 and EN 60947-3:1999+A1:2001

successfully.