Certificate of Conformity

Certificate No. : ECT2019S042131-Y2
Applicant : SC "LED MARKET" SRL
Republica Moldova
Address : mun.Chisinau, sos. Muncesti 801, MD-2029
Cod fiscal: 1004600060124
Manufacturer : SC "LED MARKET" SRL
Republica Moldova
Address : mun.Chisinau, sos. Muncesti 801, MD-2029
Cod fiscal: 1004600060124
Product : LED street light
Trade Name : Leaf Range
Model : FUSION and FUSION-2, sizes SS, S, M, and L
ULTRA 2
Test Standards : EN 60598-1:2015/A1:2018
EN 60598-2-3:2003+A1:2011

The EUT described above has been tested by us with the listed standards and found in compliance with the council **LVD** directive 2014/35/EU. It is possible to use CE marking to demonstrate the compliance with this **LVD** directive.

Digitally signed by Buzdugan Valeria
Date: 2021.06.25 15:16:44 EEST
Reason: MoldSign Signature
Location: Moldova

SHENZHEN ECT TESTING TECHNOLOGY CO., LTD. APPROVED

(Manager)

Date .: May.06 .2019

The results in this report are applicable only to the equipment tested. This report shall not be re-produced except in full without the written approval of Shenzhen ECT Testing Technology Co., Ltd.

Shenzhen ECT Testing Technology Co., Ltd.
Room 1106,Era Innovation Center, Xixiang Gushu Second Road,Baoan District, Shenzhen City, China
Tel: +86-755-23062275 Fax: +86-755-26609102 http://www.ECT-LAB.com

Declarație de conformitate

"LED MARKET" SRL, .cod fiscal 1004600060124
șos. Muncești 801, mun.Chișinău, RM, e-mail info@ledmarket.md tel.(022)496584
(denumirea reprezentantului autorizat al producătorului, date privind înregistrarea întreprinderii, adresa, telefonul, fax)

în persoana Danu Vadim
(prenumele, numele conducătorului)

Declară pe propria răspundere că produsul
Lampi cu doua socluri (tuburi) model 9 W,18W ,24 W ,2700-6500K; Glass,9W, 18W, 2700-6500K, Fabricate in serie conform SF 37525051-05001,00001 :2019. Codul NCM – 8539

Producător: "LED MARKET" SRL, șos. Muncești 801, mun.Chișinău, RM
la care se referă această declarație nu pune în pericol viața, sănătatea consumatorilor, nu produce impact asupra mediului înconjurător și este în conformitate cu următoarele standarde și/sau reglementări tehnice:
SM SR EN 61195:2010 (cap.2.2.2.,3.1,2.4,2.5,2.6)

Declarația este emisă în baza:
Certificatului de conformitate Nr.OC ICC 11 A 5930-19 din 24.05.2019, valabil pînă la 24.05.2022, eliberat de Organismul de certificare a produselor S.R.L. "ICC", str. Sarmizegetusa 92, mun. Chișinău, certificat de acreditare nr. OCpr. – 003 valabil pînă la 28.11.2022; Raportului de incercari Nr 8142/02/19 din 20.05.2019, eliberat de I Î SRL "Certificare", bd.Gagarin 2 ,mun. Chisinau,certificatul de acreditare Nr.LÎ-076 valabil pana la 18.06.2020, Raportului de evaluare a procesului de productie M-8234-19 din 16.05.2019, raportului de identificare si control tehnic al produselor electrotehnice supuse certificarii nr. M-8234-19 din 14.05.2019 si Raportului sumar nr.M-8234-19 din 21.05.2019 , eliberate de OC "ICC"

Informație suplimentară: Fiecare unitate de produs este asigurată cu informația în limba de stat

Declarația dată este inregistrată sub nr. DCLM-06 **din** 24.02.2021

Declarația de conformitate este valabilă pînă la: 25.05.2022

L.S. Danu Vadim
Semnătura prenumele, numele

CERTIFICAT DE CONFORMITATE

OC ICC

Nr. de înregistrare **OC ICC 11 A0005930-19**

MOLDAC REPUBLICA MOLDOVA SM SR EN ISO/CEI 17065 OCpr-003

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecţie-Certificare-Calitate" S.R.L.
MD 2032, mun. Chişinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

Lămpi cu două socluri (tuburi) model 9 W,18 W,24 W,2700-6500K; Glass,9 W,18 W, 2700-6500K. Fabricare în serie conform SF 37525051-05001.00001:2019.

Codul NCM
8539

SÎNT CONFORME CU CERINŢELE OBLIGATORII STABILITE ÎN :

SM SR EN 61195:2010 (cap.2.2, 2..3.1, 2.4, 2.5, 2.6)

PRODUCĂTOR
"LED MARKET", SRL şos.Munceşti 801, mun.Chişinău, RM.

Codul ţării
MD

SOLICITANT
"LED MARKET", SRL şos.Munceşti 801, mun.Chişinău, RM.

Codul IDNO
1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA
Raportului de încercări Nr.8142/02/19 din 20.05.2019, eliberat de LÎ SRL "Certificare", bd. Gagarin 2, mun. Chişinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producţie M-8234-19 din 16.05.2019; Raportului de identificare şi control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 şi Raportului sumar nr.M-8234-19 din 21.05.2019, eliberate de OC "ICC.

INFORMAŢIE SUPLIMENTARĂ:
Schema evaluării conformităţii Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC", conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019. Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informaţie în limba de stat a fiecărei unităţi de produs, conform legislaţiei în vigoare.

CONDUCĂTORUL ORGANISMULUI DE CERTIFICARE Savoi V.

Seria A Nr. 0005930

SOCIETATEA COMERCIALĂ S.R.L. INSPECŢIE CERTIFICARE CALITATE REPUBLICA MOLDOVA mun. CHIŞINĂU IDNO 1004600070069
L.Ş

În atenţia antreprenorilor şi organelor de control !
Copiile certificatelor se legalizează prin specimenul de ştampilă şi semnătura deţinătorului certificatului

CERTIFICAT DE CONFORMITATE

OC ICC

MOLDAC
REPUBLICA MOLDOVA

Nr. de înregistrare **OC ICC 11 A0005931-19**

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecţie-Certificare-Calitate" S.R.L.
MD 2032, mun. Chişinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:

DENUMIREA / DESCRIEREA

Denumirea / descrierea	Codul NCM
Corpuri de iluminat încorporabile, plafoniere model Round, 3-24 W,2700-6500K,IP-54; Square,3-48W,2700-6500K,IP-54. Fabricare în serie conform SF 37525051-05001.00001:2019.	9405

SÎNT CONFORME CU CERINŢELE OBLIGATORII STABILITE ÎN :

SM SR EN 60598-2-2:2014 (cap.2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.14, 2.15)

Producător	Codul ţării
"LED MARKET", SRL şos.Munceşti 801, mun.Chişinău, RM.	MD

Solicitant	Codul IDNO
"LED MARKET", SRL şos.Munceşti 801, mun.Chişinău, RM.	1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA

Raportului de încercări Nr.8143/02/19 din 18.05.2019, eliberat de LÎ SRL "Certificare", bd. Gagarin 2, mun. Chişinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producţie M-8234-19 din 16.05.2019; Raportului de identificare şi control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 şi Raportului sumar nr.M-8234-19 din 21.05.2019, eliberate de OC "ICC.

INFORMAŢIE SUPLIMENTARĂ:

Schema evaluării conformităţii Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC", conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019. Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informaţie în limba de stat a fiecărei unităţi de produs, conform legislaţiei în vigoare.

CONDUCĂTORUL ORGANISMULUI DE CERTIFICARE Savoi V.

SOCIETATEA COMERCIALĂ S.R.L. INSPECŢIE CERTIFICARE CALITATE REPUBLICA MOLDOVA mun. CHIŞINĂU IDNO 1004600070859

L. Ş

Seria A Nr. 0005931

În atenţia antreprenorilor şi organelor de control !
Copiile certificatelor se legalizează prin specimenul de ştampilă şi semnătura deţinătorului certificatului

CERTIFICAT
DE CONFORMITATE

ICC OC

MOLDAC
REPUBLICA MOLDOVA
SM SR EN ISO/CEI 17065
OCpr-003

Nr. de înregistrare **OC ICC 11 A0005933-19**

Data emiterii 24 mai 2019 **Valabil pînă** 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecţie-Certificare-Calitate" S.R.L.
MD 2032, mun. Chişinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

Codul NCM 8543

Lămpi electrice cu LED, model Bulb, candle,3-14 W, 2700-6500 K; Spotlight MR 16, 4-7 W, 2700-6000K, GU 10, 4-7 W, 2700-6000K.
Fabricare în serie conform SF 37525051-05001.00001:2019.

SÎNT CONFORME CU CERINŢELE OBLIGATORII STABILITE ÎN :

SM SR EN 62560:2014 (cap.5, 7, 8, 9, 14)

PRODUCĂTOR
"LED MARKET", SRL şos.Munceşti 801, mun.Chişinău, RM.

Codul ţării MD

SOLICITANT
"LED MARKET", SRL şos.Munceşti 801, mun.Chişinău, RM.

Codul IDNO 1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA
Raportului de încercări Nr.8145/02/19 din 18.05.2019, eliberat de LÎ SRL "Certificare", bd. Gagarin 2, mun. Chişinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producţie M-8234-19 din 16.05.2019; Raportului de identificare şi control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 şi Raportului sumar nr.M-8234-19 din 21.05.2019, eliberate de OC "ICC.

INFORMAŢIE SUPLIMENTARĂ:
Schema evaluării conformităţii Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC", conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019. Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informaţie în limba de stat a fiecărei unităţi de produs, conform legislaţiei în vigoare.

CONDUCĂTORUL ORGANISMULUI DE CERTIFICARE Savoi V.

SOCIETATEA COMERCIALĂ S.R.L. INSPECŢIE-CERTIFICARE-CALITATE CHIŞINĂU REPUBLICA MOLDOVA IDNO 1004600070055

L. Ş.

Seria A Nr. 0005933

În atenţia antreprenorilor şi organelor de control !
Copiile certificatelor se legalizează prin specimenul de ştampilă şi semnătura deţinătorului certificatului

QuayAudit

CERTIFICAT DE INREGISTRARE

Acest certificat confirma faptul că sistemul de management al

"LED MARKET" SRL

MD-2029, şos. Munceşti, nr. 801, mun. Chişinău,
Republica Moldova

a fost auditat şi aprobat de către
Quay Audit UK Ltd pentru următorul standard de management :

BS EN ISO 14001:2015

Sistemul de management aprobat se aplică pentru urmatoarele domenii de activitate:

Producerea şi comercializarea produselor de iluminat de tip LED

Acest certificat se aplica pentru acele domenii de activitate descrise
în Codurile NACE(CAEN) enumerate mai jos, recunoscute internațional:

2740 & 4759

Aprobat initial la	25 Aprilie 2019
Certificare initiala la	25 Aprilie 2019
Certificatul expira la	25 Aprilie 2022
Numarul certificatului	4156667

În numele **Quay Audit UK Limited**

www.ascb.com

www.global-accreditation.org

www.irqao.com

Grove House 8 St. Julian's Friars Shrewsbury Shropshire SY1 1XL | (44)1743 351677 | post@quayaudit.co.uk | www.quayaudit.co.uk

QuayAudit

CERTIFICAT DE INREGISTRARE

Acest certificat confirma faptul că sistemul de management al

"LED MARKET" SRL

MD-2029, şos. Munceşti, nr. 801, mun. Chişinău, Republica Moldova

a fost auditat şi aprobat de către
Quay Audit UK Ltd pentru următorul standard de management

BS EN ISO 45001:2018

Sistemul de management aprobat se aplică pentru urmatoarele domenii de activitate

Producerea şi comercializarea produselor de iluminat de tip LED

Acest certificat se aplica pentru acele domenii de activitate descrise
în Codurile NACE(CAEN) enumerate mai jos, recunoscute internaţional

2740 & 4759

Aprobat initial la	12 Iulie 2019
Certificare initiala la	12 Iulie 2019
Certificatul expira la	12 Iulie 2022
Numarul certificatului	4156714

REGISTERED MANAGEMENT SYSTEMS BS EN ISO 45001:2018

QUAY AUDIT UK LTD

ASCB

În numele **Quay Audit UK Limited**

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[illegible]

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CERTIFICAT DE CONFORMITATE

ICC

MOLDAC
REPUBLICA MOLDOVA
SM SR EN ISO/CEI 17065
OCpr-003

Nr. de înregistrare **OC ICC 11 A0005932-19**

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecție-Certificare-Calitate" S.R.L.
MD 2032, mun. Chişinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

Module (bande) LED , model SMD 2835, 2700-6500 K,RGB; SMD 5050, 2700-6500 K,RGB. Fabricare în serie conform SF 37525051-05001.00001:2019.

Codul NCM: 9405

SÎNT CONFORME CU CERINȚELE OBLIGATORII STABILITE ÎN :

SM SR EN 62031:2012 (cap.6, 7, 10, 11, 12, 16)

PRODUCĂTOR
"LED MARKET", SRL şos.Munceşti 801, mun.Chişinău, RM.

Codul țării: MD

SOLICITANT
"LED MARKET", SRL şos.Munceşti 801, mun.Chişinău, RM.

Codul IDNO: 1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA
Raportului de încercări Nr.8144/02/19 din 20.05.2019, eliberat de LÎ SRL "Certificare", bd. Gagarin 2, mun. Chişinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producție M-8234-19 din 16.05.2019; Raportului de identificare şi control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 şi Raportului sumar nr.M-8234-19 din 21.05.2019, eliberate de OC "ICC.

INFORMAȚIE SUPLIMENTARĂ:
Schema evaluării conformității Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC", conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019. Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informație în limba de stat a fiecărei unități de produs, conform legislației în vigoare.

CONDUCĂTORUL ORGANISMULUI DE CERTIFICARE Savoi V.

Seria A Nr. 0005932

SOCIETATEA COMERCIALĂ S.R.L. INSPECȚIE CERTIFICARE-CALITATE REPUBLICA MOLDOVA mun. Chişinău IDNO 1004600070850 L.Ş

În atenția antreprenorilor şi organelor de control !
Copiile certificatelor se legalizează prin specimenul de ştampilă şi semnătura deținătorului certificatului

QuayAudit

CERTIFICAT DE INREGISTRARE

Acest certificat confirma faptul că sistemul de management al

"LED MARKET" SRL

MD-2029, şos. Munceşti, nr. 801, mun. Chişinău,
Republica Moldova

a fost auditat si aprobat de către
Quay Audit UK Ltd pentru următorul standard de management :

BS EN ISO 9001:2015

Sistemul de management aprobat se aplică pentru urmatoarele domenii de activitate:

Producerea şi comercializarea produselor de iluminat de tip LED

Acest certificat se aplica pentru acele domenii de activitate descrise
în Codurile NACE(CAEN) enumerate mai jos, recunoscute internaţional

2740 & 4759

Aprobat initial la	25 Aprilie 2019
Certificare initiala la	25 Aprilie 2019
Certificatul expira la	25 Aprilie 2022
Numarul certificatului	4156666

REGISTERED MANAGEMENT SYSTEMS BS EN ISO 9001:2015

ASCB Accreditation Services Worldwide

În numele **Quay Audit UK Limited**

www.ascb.com www.global-accreditation.org www.irqao.com

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CERTIFICAT
DE CONFORMITATE

Nr. de înregistrare **OC ICC 11 A0005926-19**

MOLDAC
REPUBLICA MOLDOVA
SM SR EN ISO/CEI 17065
OCpr-003

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecţie-Certificare-Calitate" S.R.L.
MD 2032, mun. Chişinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

Corpuri de iluminat public-felinare stradale, model SMD 20-300 W,2700-6000K,IP-65; COB 20-300 W,2700-6000K,IP-65.
Fabricare în serie conform SF 37525051-05001.00001:2019.

Codul NCM 9405

SÎNT CONFORME CU CERINŢELE OBLIGATORII STABILITE ÎN :

SM SR EN 60598-2-3:2010(cap.3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.13, 3.14)

PRODUCĂTOR
"LED MARKET", SRL şos.Muncești 801, mun.Chişinău, RM.

Codul ţării MD

SOLICITANT
"LED MARKET", SRL şos.Muncești 801, mun.Chişinău, RM.

Codul IDNO 1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA
Raportului de încercări Nr.8138/02/19 din 17.05.2019, eliberat de LÎ SRL "Certificare", bd. Gagarin 2, mun. Chişinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producţie M-8234-19 din 16.05.2019; Raportului de identificare şi control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 şi Raportului sumar nr.M-8234-19 din 21.05.2019, eliberate de OC "ICC".

INFORMAŢIE SUPLIMENTARĂ:
Schema evaluării conformităţii Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC", conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019. Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informaţie în limba de stat a fiecărei unităţi de produs, conform legislaţiei în vigoare.

CONDUCĂTORUL ORGANISMULUI DE CERTIFICARE

L. Ş

Seria A Nr. 0005926

Republica Moldova · Pentru facturi · «LED MARKET» S.R.L. · IDNO 1004600060124 · Societatea cu Răspundere Limitată · mun. Chişinău

În atenţia antreprenorilor şi organelor de control !
Copiile certificatelor se legalizează prin specimenul de ştampilă şi semnătura deţinătorului certificatului

CERTIFICAT
DE CONFORMITATE

ICC

Nr. de înregistrare **OC ICC 11 A0005927-19**

MOLDAC
REPUBLICA MOLDOVA

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecție-Certificare-Calitate" S.R.L.
MD 2032, mun. Chișinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

Corpuri de iluminat-proiectoare. A se vedea anexa.
Fabricare în serie conform SF 37525051-05001.00001:2019

Codul NCM
9405

SÎNT CONFORME CU CERINȚELE OBLIGATORII STABILITE ÎN :

SM EN 60598-2-5:2016 (cap.5.4, 5.5, 5.6, 5.8, 5.9, 5.10, 5.11, 5.13, 5.14)

PRODUCĂTOR
"LED MARKET", SRL șos.Muncești 801, mun.Chișinău, RM

Codul țării
MD

SOLICITANT
"LED MARKET", SRL șos.Muncești 801, mun.Chișinău, RM

Codul IDNO
1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA
Raportului de încercări Nr.8139/02/19 din 17.05.2019, eliberat de LÎ SRL "Certificare", bd. Gagarin 2, mun. Chișinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producție M-8234-19 din 16.05.2019; Raportului de identificare și control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 și Raportului sumar nr.M-8234-19 din 21.05.2019, eliberate de OC "ICC

INFORMAȚIE SUPLIMENTARĂ:
Schema evaluării conformității Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC", conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019. Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informație în limba de stat a fiecărei unități de produs, conform legislației în vigoare.

Seria A Nr. 0005927

CONDUCĂTORUL ORGANISMULUI
DE CERTIFICARE Savoi V.

L. Ș.

«LED MARKET» S.R.L.

În atenția antreprenorilor și organelor de control!
Copiile certificatelor se legalizează prin specimenul de ștampilă și semnătura deținătorului certificatului.

ANEXĂ

Fila 1 | File 1

la certificatul de conformitate

Nr. OC ICC 11 A0005927-19 din 24 mai 2019

Lista produselor concrete asupra carora se extinde actiunea certificatului de conformitate

Nr.	Cod NCM	Denumirea
1	9405	Corpuri de iluminat-proiectoare: - cu lumina orientata, model Track 5-50 W,2700-6500K; Wall mouting 3-80 W,2700-6500 K; Wall mouting 3-80 W,2700-6500 K; Grid light5-120 W,2700-6500 K; Down light SMD, COB 5-50 W,2700-6500 K, - de iluminat fatade, model Linear 6-50 W,2700-6000K,IP-65; Wall Washer 6-50 W,RED BLUE,GREEN,YELLOW,IP-65; - de iluminat industrial, model 150,200,400 W,2700-6000K,IP-65; SMD 10-400 W,2700-6000K,IP-65; Gas Station light, model 20-400 W,2700-6000K; Hibay, model 30-200 W,2700-6000K,IP-65.

CONDUCĂTORUL ORGANISMULUI DE CERTIFICARE Savoi V.

REPUBLICA MOLDOVA MUN. CHIȘINĂU SOCIETATEA CU RĂSPUNDERE LIMITATĂ «LED MARKET» S.R.L.

L.Ș

Seria A Nr. 0002323

CERTIFICAT
DE CONFORMITATE

ICC

MOLDAC
REPUBLICA MOLDOVA
SM SR EN ISO/CEI 17065
OCpr-003

Nr. de înregistrare **OC ICC 11 A0005928-19**

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecție-Certificare-Calitate" S.R.L.
MD 2032, mun. Chișinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pîna la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

Corpuri de iluminat încastrate în sol, model Underground 1-12 W,2700-6000K. Fabricare în serie conform SF 37525051-05001 00001:2019.	Codul NCM 9405

SÎNT CONFORME CU CERINȚELE OBLIGATORII STABILITE ÎN :

SM SR EN 60598-2-13:2010 (cap. 13.4, 13.5, 13.6, 13.9, 13.10, 13.11, 13.14)

PRODUCĂTOR

"LED MARKET", SRL, șos.Muncești 801, mun.Chișinău, RM.	Codul țării MD

SOLICITANT

"LED MARKET", SRL, șos.Muncești 801, mun.Chișinău, RM.	Codul IDNO 1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA

Raportului de încercări Nr.8140/02/19 din 17.05.2019, eliberat de I.Î SRL "Certificare", bd. Gagarin 2, mun. Chișinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producție M-8234-19 din 16.05.2019; Raportului de identificare și control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 și Raportului sumar nr M-8234-19 din 21.05.2019, eliberate de OC "ICC.

INFORMAȚIE SUPLIMENTARĂ:

Schema evaluării conformității Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC", conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019.Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informație în limba de stat a fiecărei unități de produs, conform legislației în vigoare.

Seria A Nr. 0005928

CONDUCĂTORUL ORGANISMULUI DE CERTIFICARE Savor V.

L. Ș

CERTIFICAT
DE CONFORMITATE

ICC

MOLDAC
REPUBLICA MOLDOVA

Nr. de înregistrare **OC ICC 11 A0005929-19**

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecţie-Certificare-Calitate" S.R.L.
MD 2032, mun. Chişinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

Denumirea / descrierea	Codul NCM
Corpuri de iluminat staţionare de uz general: - lustre, model 10-400W,3000K, 4000K, 6000K,RGB, Red,Blue, Green, Yellow, Orange; -de iluminat industrial, model High Bay20-400 W,2700-6000 K; UFO High Bay20-400 W,2700-6000 K; -de iluminat comercial, model Linear light SMD 18-150 W, 2700-6000 K. Fabricare în serie conform SF 37525051-05001,00001:2019.	9405

SÎNT CONFORME CU CERINŢELE OBLIGATORII STABILITE ÎN :

SM SR EN 60598-2-1:2010 (cap.1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.3, 1.14)

PRODUCĂTOR

Producător	Codul ţării
"LED MARKET", SRL, şos.Munceşti 801, mun.Chişinău, RM	MD

SOLICITANT

Solicitant	Codul IDNO
"LED MARKET", SRL, şos.Munceşti 801, mun.Chişinău, RM.	1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA

Raportului de încercări Nr.8141/02/19 din 18.05.2019, eliberat de ÎI SRL "Certificare", bd. Gagarin 2, mun. Chişinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producţie M-8234-19 din 16.05.2019, Raportului de identificare şi control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 şi Raportului sumar nr.M-8234-19 din 21.05.2019, eliberate de OC "ICC.

INFORMAŢIE SUPLIMENTARĂ:

Schema evaluării conformităţii Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC", conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019. Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informaţie în limba de stat a fiecărei unităţi de produs, conform legislaţiei în vigoare.

CONDUCĂTORUL ORGANISMULUI
DE CERTIFICARE Savoi V.

L. Ş

Seria A Nr. 0005929

În atenţia antreprenorilor şi organelor de control !
Copiile certificatelor se legalizează prin specimenul de ştampilă şi semnătura deţinătorului certificatului.

CERTIFICAT
DE CONFORMITATE

Nr. de înregistrare **OC ICC 11 A0005930-19**

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecție-Certificare-Calitate" S.R.L.
MD 2032, mun. Chișinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

DENUMIREA / DESCRIEREA	Codul NCM
Lămpi cu două socluri (tuburi) model 9 W, 18 W, 24 W, 2700-6500K ; Glass, 9 W, 18 W, 2700-6500K. Fabricare în serie conform SF 37525051-05001.00001.2019.	8539

SÎNT CONFORME CU CERINȚELE OBLIGATORII STABILITE ÎN :

SM SR EN 61195:2010 (cap.2.2, 2.3.1, 2.4, 2.5, 2.6)

PRODUCĂTOR	Codul țării
"LED MARKET", SRL, șos. Muncești 801, mun. Chișinău, RM.	MD

SOLICITANT	Codul IDNO
"LED MARKET", SRL, șos. Muncești 801, mun. Chișinău, RM.	1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA
Raportului de încercări Nr.8142/02/19 din 20.05.2019, eliberat de LÎ SRL "Certificare", bd. Gagarin 2, mun. Chișinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producție M-8234-19 din 16.05.2019; Raportului de identificare și control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 și Raportului sumar nr. M-8234-19 din 21.05.2019, eliberate de OC "ICC".

INFORMAȚIE SUPLIMENTARĂ:
Schema evaluării conformității Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC" conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019. Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informație în limba de stat a fiecărei unități de produs, conform legislației în vigoare.

CONDUCĂTORUL ORGANISMULUI
DE CERTIFICARE Savoi V.

Seria A Nr. 0005930

L. Ș.

În atenția antreprenorilor și organelor de control!
Copiile certificatului se legalizează prin specimenul de ștampila și semnătura deținătorului certificatului.

CERTIFICAT DE CONFORMITATE

Nr. de înregistrare **OC ICC 11 A0005931-19**

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecţie-Certificare-Calitate" S.R.L.
MD 2032, mun. Chişinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

	Codul NCM
Corpuri de iluminat încorporabile, plafoniere model Round, 3-24 W,2700-6500K,IP-54, Square,3-48W,2700-6500K,IP-54. Fabricare în serie conform SF 37525051-05001.00001:2019.	9405

SÎNT CONFORME CU CERINŢELE OBLIGATORII STABILITE ÎN :

SM SR EN 60598-2-2:2014 (cap.2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12, 2.14, 2.15)

PRODUCĂTOR

	Codul ţării
"LED MARKET", SRL, şos.Munceşti 801, mun.Chişinău, RM.	MD

SOLICITANT

	Codul IDNO
"LED MARKET", SRL, şos.Munceşti 801, mun.Chişinău, RM.	1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA

Raportului de încercări Nr.8143/02/19 din 18.05.2019, eliberat de LÎ SRL "Certificare", bd. Gagarin 2, mun. Chişinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producţie M-8234-19 din 16.05.2019; Raportului de identificare şi control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 şi Raportului sumar nr.M-8234-19 din 21.05.2019, eliberate de OC "ICC".

INFORMAŢIE SUPLIMENTARĂ:

Schema evaluării conformităţii Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC", conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019. Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informaţie în limba de stat a fiecărei unităţi de produs, conform legislaţiei în vigoare.

CONDUCĂTORUL ORGANISMULUI DE CERTIFICARE Savoi V.

L. Ş.

Seria A Nr. 0005931

CERTIFICAT DE CONFORMITATE

ICC

Nr. de înregistrare **OC ICC 11 A0005932-19**

MOLDAC
SM SR EN ISO/CEI 17065
OCpr-003

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr. - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecţie-Certificare-Calitate" S.R.L.
MD 2032, mun. Chişinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022.

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

Module (bande) LED , model SMD 2835, 2700-6500 K,RGB; SMD 5050, 2700-6500 K,RGB. Fabricare în serie conform SF 37525051-05001.00001.2019.	Codul NCM 9405

SÎNT CONFORME CU CERINŢELE OBLIGATORII STABILITE ÎN :

SM SR EN 62031:2012 (cap.6, 7, 10, 11, 12, 16).

PRODUCĂTOR

"LED MARKET", SRL, şos Munceşti 801, mun.Chişinău, RM	Codul ţării MD

SOLICITANT

"LED MARKET", SRL, şos Munceşti 801, mun.Chişinău, RM.	Codul IDNO 1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA

Raportului de încercări Nr.8144/02/19 din 20.05.2019, eliberat de LÎ SRL "Certificare", bd. Gagarin 2, mun. Chişinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producţie M-8234-19 din 16.05.2019; Raportului de identificare şi control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 şi Raportului sumar nr.M-8234-19 din 21.05.2019, eliberate de OC "ICC".

INFORMAŢIE SUPLIMENTARĂ:

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CONDUCĂTORUL ORGANISMULUI DE CERTIFICARE Savoi V.

Seria A Nr. 0005932

L. Ş

În atenţia antreprenorilor şi organelor de control !
Copiile certificatelor se legalizează prin specimenul de ştampilă şi semnătura deţinătorului certificatului

CERTIFICAT DE CONFORMITATE

ICC

Nr. de înregistrare **OC ICC 11 A0005933-19**

MOLDAC

Data emiterii 24 mai 2019 Valabil pînă 24 mai 2022

ORGANISMUL DE CERTIFICARE OCpr - 003

ORGANISMUL DE CERTIFICARE produse din cadrul SC "Inspecţie-Certificare-Calitate" S.R.L.
MD 2032, mun. Chişinău, str. Sarmizegetusa, 92, tel./fax 022 50-70-75, www.certificare.md
Certificat de acreditare nr. OCpr - 003 valabil pînă la 28.11.2022

PRIN PREZENTUL DOCUMENT SE CONFIRMĂ FAPTUL, CĂ PRODUSELE IDENTIFICATE ASTFEL:
DENUMIREA / DESCRIEREA

Lămpi electrice cu LED, model Bulb, candle, 3-14 W, 2700-6500 K; Spotlight MR 16, 4-7 W, 2700-6000K, GU 10, 4-7 W, 2700-6000K.
Fabricare în serie conform SF 37525051-05001.00001:2019

Codul NCM
8543

SÎNT CONFORME CU CERINŢELE OBLIGATORII STABILITE ÎN :

SM SR EN 62560:2014 (cap.5, 7, 8, 9, 14)

PRODUCĂTOR
"LED MARKET", SRL, şos.Munceşti 801, mun.Chişinău, RM

Codul ţării
MD

SOLICITANT
"LED MARKET", SRL, şos.Munceşti 801, mun.Chişinău, RM

Codul IDNO
1004600060124

CERTIFICATUL ESTE ELIBERAT ÎN BAZA
Raportului de încercări Nr.8145/02/19 din 18.05.2019, eliberat de LÎ SRL "Certificare", bd. Gagarin 2, mun. Chişinău, certificatul de acreditare Nr. LÎ-076 valabil pînă la 18.06.2020; Raportului de evaluare a procesului de producţie M-8234-19 din 16.05.2019; Raportului de identificare şi control tehnic al produselor electrotehnice supuse certificării nr. M-8234-19 din 14.05.2019 şi Raportului sumar nr.M-8234-19 din 21.05.2019, eliberate de OC "ICC".

INFORMAŢIE SUPLIMENTARĂ:
Schema evaluării conformităţii Nr.3. Evaluarea periodică se va efectua o dată pe an de OC "ICC", conform contractului de evaluare periodică Nr.19.22.8234-EPPC din 24.05.2019. Contract de efectuare a încercărilor de laborator periodice nr.1135/19 din 15.05.2019 cu "CERTIFICARE" SRL. Certificatul este valabil doar în cazul asigurării cu informaţie în limba de stat a fiecărei unităţi de produs, conform legislaţiei în vigoare.

CONDUCĂTORUL ORGANISMULUI DE CERTIFICARE Savor V.

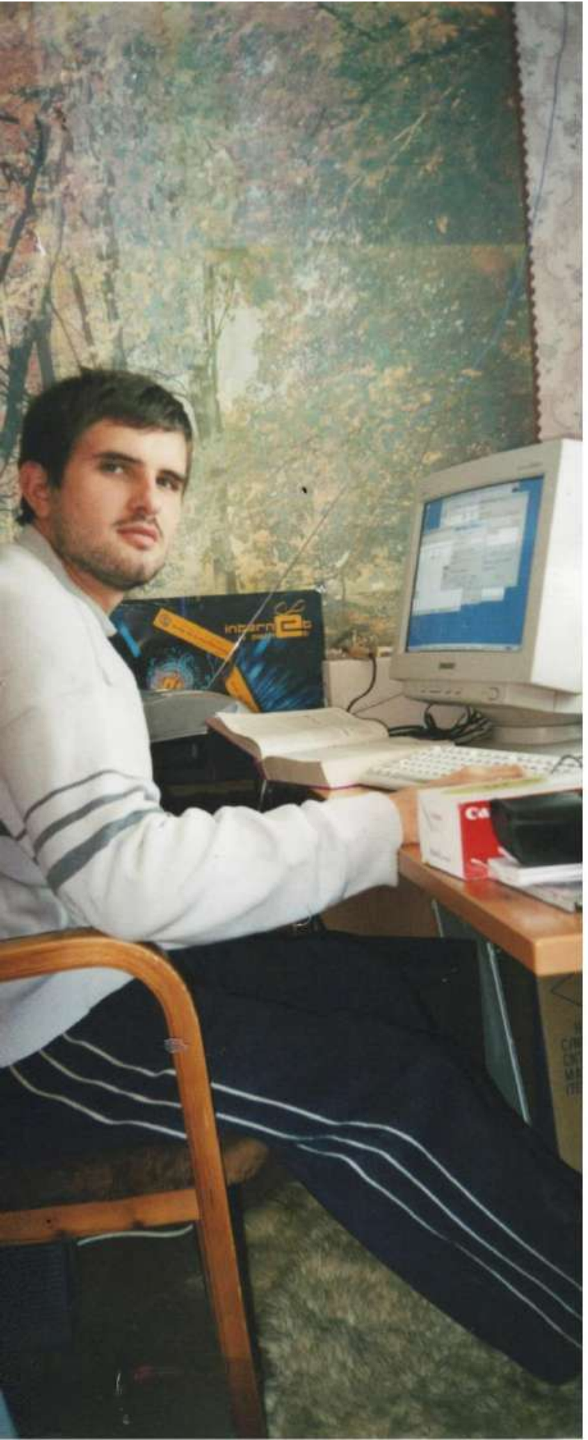
L. Ş

Seria A Nr. 0005933

LED market

Danu Vadim founder and general director
of “LED market” Company

"We focus on ideas to light the environments"



Business Overview

LED market

1. "Led Market" Company was founded on 07.10.2004 and grew simultaneously with the demand for LED lighting technologies on the local market. In the meantime, the company has become a pioneer in this field with a great experience in the elaboration and manufacture of LED lighting products.

2. The company's slogan “Enlighting the future”

3. We produce long life LED luminaires

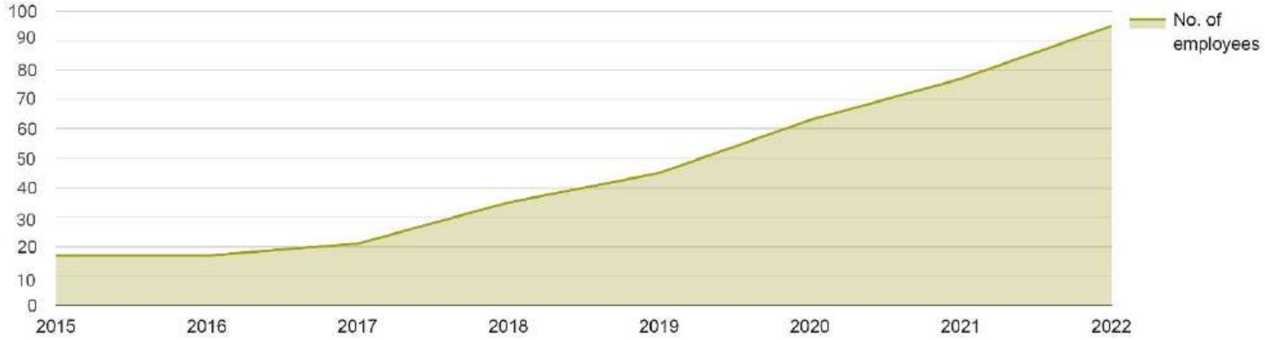
4. We reduce CO2 emissions from gas discharge lamps by replacing them with LED lighting fixtures

5. - Low energy consumption - lower bills
   - Lighting fixtures with long lifespan - Up to 100 000H
   - Qualitative light that is identical to natural light - vivid colors

LED Market ' s Team is devided into 8 departments with 62 employees:

LED market

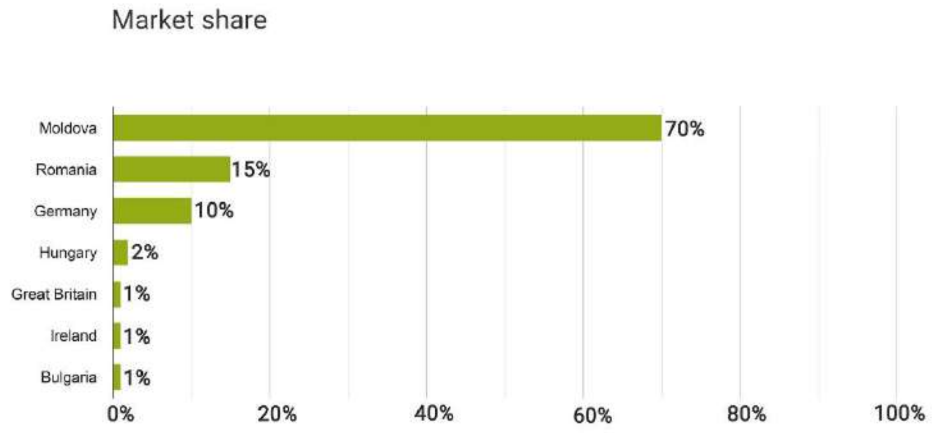
- Commercial department
- Financial & Sales department
- R&D department
- Production department
- Installation department
- Maintenance & upkeep center
- Purchasing & logistic department
- Designer & Graphic department

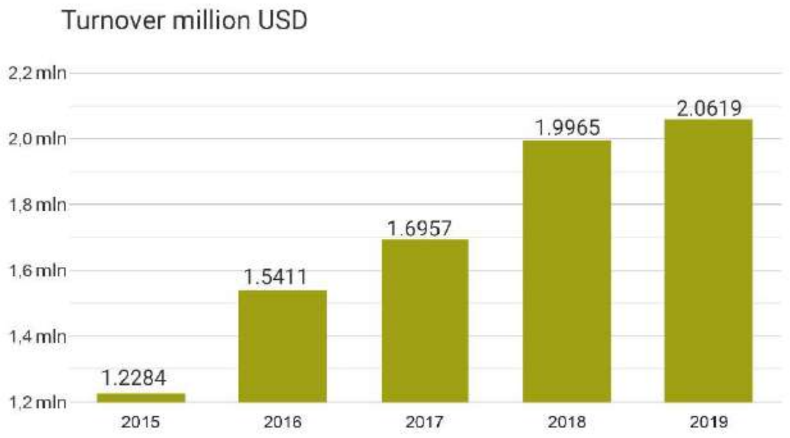


Each department is led by highly qualified specialists in the field of activity, sales managers with more than 10 years experience , engineers with higher education and qualified staff in the production of LED lighting.

Market opportunities

The global LED lighting market estimation was valued at USD 54.00 billion in 2019 and is projected to expand at a compound annual growth rate (CAGR) of 13.4% from 2020 to 2027.





Product & Services

1. Automated stage

- Automatic line
- Semi-automatic line
- SMT line
- Dispensing machine
- Reflow oven machine
- Two wave soldering machine

2. Manual stage

- Conveyor line
- Dedicated workshop
- Manual deep placement

3. Testing stage

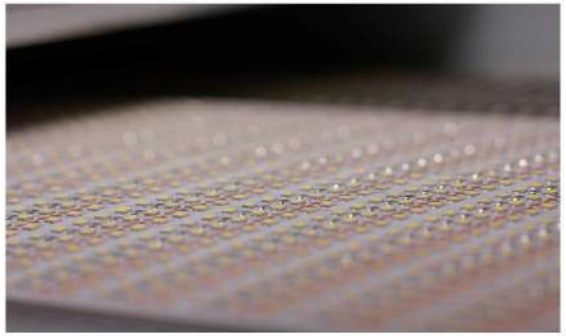
- Ageing test
- IK test
- IP test
- Lighting test
- Thermal test

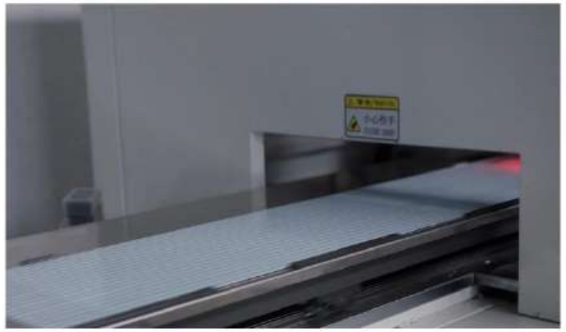
4. R & D

- Foto Goniometric measurements
- Microcontroller programming
- Integrating sphere measurements

Automatic process

LED market



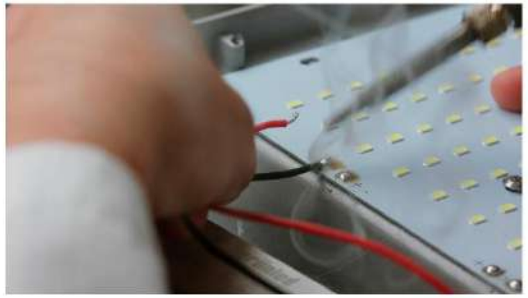


INVEST MOLDOVA

Manual assembling







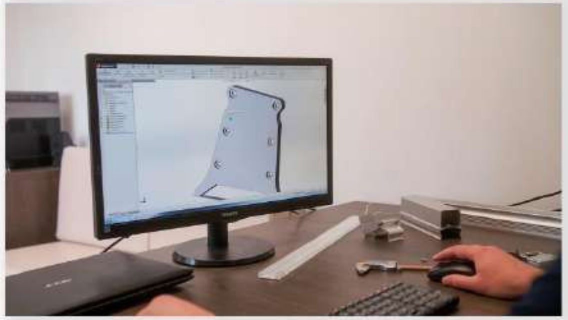


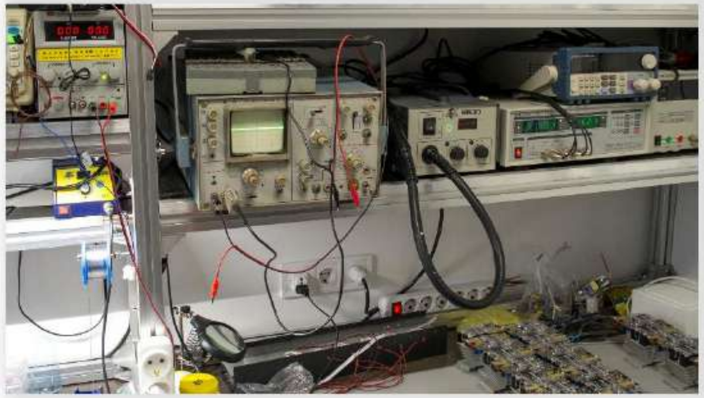


INVEST MOLDOVA

Testing

Research & Development





LED market

Strategic Relations

Partnerships

OSRAM

tuya

TRIDONIC

Customers

enter, darwin, BONUS hypermarket, LEAR Corporation, Nr1, USMF, Starbucks Coffee, JYSK, armacia familiei, Moldcell, LUKOIL Oil Company, PETROM, rompetrol, Tucano Coffee, LAFARGE, orange, SIMPLEX, StarNet, Dulcinella, igenex, Goose & Goose, ELECTROPLUS, UNIC, Vis-a-Vis, OVICO Parfumerie, Vizită, terranova, Jucăria, NL Collection, PUMA, Nivalli, Navali, OLIVA, ARTIZANA, OVICO, pierre cardin

Recent projects:

1. „Easier life during the pandemic"- a project for application in schools and indoor spaces new products as LED UVC disinfect tunnels, boxes and home appliance lamps.
2. "Smart City"- focused on the production of industrial lighting and public lighting suitable for lighting areas at airports, commercial spaces, industrial halls, parking lots, highways etc.
3. "Life is light"- Besides the wide range of products designed for all fields and lighting spaces in this direction, the company focus on Agriculture. Starting from the idea that "Life is light" and that every living thing and plant needs water and energy to grow, "Led market " is working on a project to introduce new lighting products for growing plants.

INVEST MOLDOVA

Business Model

Long-lasting collaborations maintain a healthy business.
We are always interested in offering a reliable long lifespan product reported to an affordable price.
We are looking for a place in the clients subconscious so that he becames loyal to us and recommend us to friends.

B2B

B2C

B2B2C

Inteligent system

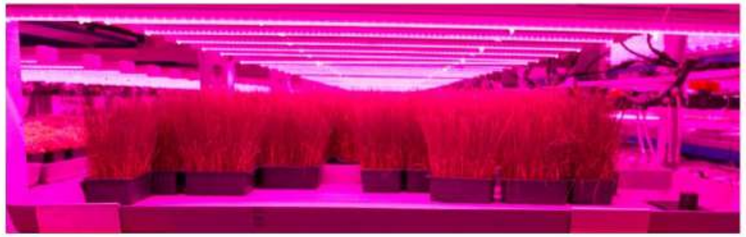
LED market

By 2030, over 60% of the world's population would be city enhabitants – the cities which are touted as smart cities. Smart LED lighting is believed to be one of the key elements of smart cities which can enhance the quality of life, ensure sustainability and transform our daily experiences.The smart lighting infrastructure in cities will offer a greater potential in terms of the state-of-the-art communication points in a city-wide network capable of gathering data, relaying information and delivering certain services to and from the millions of devices used.

Smart home

Smart city

Smart building management



Green farms

INVEST MOLDOVA

Info

CEO Danu Vadim

+373 69 777726

trade@compuvad.com

www.ledmarket.md

CERTIFICATE

TÜVRheinland®

of Conformity
Low Voltage Directive 2006/95/EC

Registration No.: AN 50295128 0001

Report No.: 15076008 001

Holder: WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO.,LTD.
NO.311, LATITUDE FIFTEEN ROAD,
YUEQING ECONOMIC
DEVELOPMENT ZONE,
ZHEJIANG,
P.R. China

Product: Earth Leakage Circuit Breaker
(RCCBs)

Identification:

Type Designation: SGPL (VECAS)
Test Standard : EN 61008-1: 2012 & EN 61008-2-1: 1994+A1
Ratings : Un=240VAC(1P+N);415VAC(3P+N); 50/60Hz;
In=16,20,25,32,40,50,63A; Type A or AC;
IΔn=10mA(only when In=16,20,25A, type AC);
IΔn=30mA,100mA(type A or AC); 300mA,500mA(only for type AC)
Im=IΔm=10In or 500A; IΔc=Inc=6,0kA
Remark : Refer to test report 15076008 001 for details.

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the Licence Holder's disposal. This is to certify that the tested sample is in conformity with all revision of Annex I of Council Directive 2006/95/EC, in its latest amended version, referred to as the Low Voltage Directive. This certificate does not imply assessment of the series-production of the product and does not permit the use of a TÜV Rheinland mark of conformity. The holder of the certificate is authorized to use this certificate in connection with the EC declaration of conformity according to Annex III of the Directive.

TÜV Rheinland LGA Products GmbH Zertifizierungsstelle TÜVRheinland®

Certification Body

Date 30.10.2014

Jie Zhang

TÜV Rheinland LGA Products GmbH - Tillystraße 2 - 90431 Nürnberg

CE The CE marking may be used if all relevant and effective EC Directives are complied with. CE

TÜV Rheinland (China) Ltd.
Member of TÜV Rheinland Group

TÜVRheinland®
Precisely Right.

WENZHOU HUAJIA ELECTRICAL EQUIPMENT
CO.,LTD.
Nancy Chen
-
NO.311, LATITUDE FIFTEEN ROAD,
YUEQING ECONOMIC
DEVELOPMENT ZONE,
ZHEJIANG,
P.R. China

Date : 30.10.2014
Our ref. : ZWC 01
Your ref.: C.J.

Ref : AN Certificate of Conf. Low Voltage D.

Type of Equipment	: RCCBs
Model Designation	: See Certificate
Certificate No.	: AN 50295128 0001
Report No.	: 15076008 001

Dear Nancy Chen,

We herewith confirm that a sample of the above mentioned technical equipment has been tested and was found to be in accordance with the relevant requirements.

Enclosed please find your Certificate of Conformity.

We appreciate your kind support and would like to offer our assistance and continuous services in the future.

With kind regards,

Certification Body

Jie Zhang

CC: WENZHOU HUAJIA ELECTRICAL

Enclosure

证书的详细资料请登陆www.tuvdotcom.com查阅，或拨打我司客服热线800 999 3668 / 400 883 1300咨询

Produkte
Products

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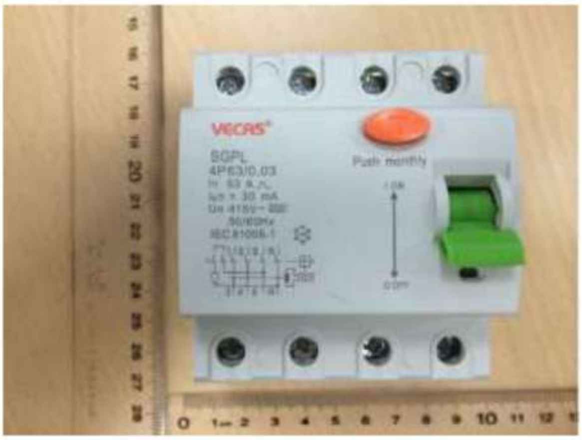
Prüfbericht-Nr.: Test Report No.:	**15076008 001**	**Auftrags-Nr.:** Order No.:	**154051636**	Seite 1 von 1 Page 1 of 1
Kunden-Referenz-Nr.: Client Reference No.:	**N/A**	**Auftragsdatum:** Order date:	**14.03.2014**	
Auftraggeber: Client:	**WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD.** NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, ZHEJIANG, CHINA			
Prüfgegenstand: Test item:	**RCCBs**			
Bezeichnung / Typ-Nr.: Identification / Type No.:	**SGPL**			
Auftrags-Inhalt: Order content:	**Coc of LVD CE**			
Prüfgrundlage: Test specification:	**EN 61008-1: 2012** **EN 61008-2-1: 1994+A11**			

Wareneingangsdatum: Date of receipt:	**02.07.2014**
Prüfmuster-Nr.: Test sample No.:	N/A
Prüfzeitraum: Testing period:	N/A
Ort der Prüfung: Place of testing:	Inspection Center of Products's Quality of Low Voltage Electric Apparatus in Zhejiang Province
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shanghai) Co., Ltd.
Prüfergebnis*: Test result*:	Pass



geprüft von / tested by:

29.10.2014	Wencai Zhang / PE	[signature]
Datum Date	**Name / Stellung** Name / Position	**Unterschrift** Signature

kontrolliert von / reviewed by:

29.10.2014	Ma Rui / Reviewer	[signature]
Datum Date	**Name / Stellung** Name / Position	**Unterschrift** Signature

Sonstiges / Other:

This report is created for type approval based on CB certificate and CB report.

Attachment 1: CB certificates – HU-001398 (1 page)
Attachment 2: CB test report for RCCBs according to IEC 61008-1:2010+A1:2012 and EN 61008-1: 2012 – 1C14525 (361 pages)

Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery: Prüfmuster vollständig und unbeschädigt
Test item complete and undamaged

* Legende:	1 = sehr gut P(ass) = entspricht o.g. Prüfgrundlage(n)	2 = gut	3 = befriedigend F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	4 = ausreichend N/A = nicht anwendbar	5 = mangelhaft N/T = nicht getestet
Legend:	1 = very good P(ass) = passed a.m. test specification(s)	2 = good	3 = satisfactory F(ail) = failed a.m. test specification(s)	4 = sufficient N/A = not applicable	5 = poor N/T = not tested

TÜV Rheinland LGA Products GmbH · Tillystraße 2 · D - 90431 Nürnberg · Tel.: +49 911 655 5225 · Fax: +49 911 655 5226
Mail: service@de.tuv.com · Web: www.tuv.com

Test Report issued under the responsibility of:

TÜVRheinland®

TEST REPORT
IEC 61008-1
Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs)
Part 1: General rules

Report Number. ....:	1C14525
Date of issue ....:	18.Sep.2014
Total number of pages...................:	361
Applicant's name............................:	**WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD.**
Address ....:	NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, ZHEJIANG, CHINA
Test specification:	
Standard ....:	IEC 61008-1:2010 (Third Edition) +A1:2012 used in conjunction with IEC 61008-2-1:1990 (First Edition) ~~or~~ ~~IEC 61008-2-2:1990 (First Edition)~~
Test procedure................................:	CB Scheme
Non-standard test method…………..:	N/A
Test Report Form No......................:	IEC61008_1F
Test Report Form(s) Originator.....:	OVE
Master TRF.....................................:	Dated 2012-12

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 ....:	**RCCBs**
Trade Mark ....:	VECAS®
Manufacturer ....:	WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD.
Model/Type reference.......................:	SGPL
Ratings ....:	Un = 240 V~ 2P(1P+N) 50/60Hz; 415 V~ 4P(3P+N) 50/60Hz In = 16, 20, 25, 32, 40, 50, 63 A; Type A or AC; $I\Delta n$ = 10mA(only when In=16, 20, 25A, type AC); $I\Delta n$ = 30mA, 100mA (type A or type AC); $I\Delta n$ = 300mA, 500mA (only for type AC); Im = $I\Delta m$ = 10In or 500 A; $I\Delta c$ = Inc = 6,0 kA

Testing procedure and testing location:			
☒	CB Testing Laboratory:	The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)	
Testing location/ address.......................... :		No 125 Miaohouwang Road Binjiang District Hangzhou Zhejiang CHINA	
☐	Associated CB Testing Laboratory:		
Testing location/ address.......................... :			
	Tested by (name + signature) .... :	Yuan Kefeng	Yuan Kefeng
	Approved by (name + signature)......... :	Du Liang	Du Liang
☐	Testing procedure: TMP		
Testing location/ address.......................... :			
	Tested by (name + signature) .... :		
	Approved by (name + signature)......... :		
☐	Testing procedure: WMT		
Testing location/ address.......................... :			
	Tested by (name + signature) .... :		
	Witnessed by (name + signature) .... :		
	Approved by (name + signature)......... :		
☐	Testing procedure: SMT		
Testing location/ address.......................... :			
	Tested by (name + signature) .... :		
	Approved by (name + signature)......... :		
	Supervised by (name + signature) ...... :		

List of Attachments (including a total number of pages in each attachment):

Attachment 1: Measuring equipment list (ZTME) – 3 pages

Attachment 2: Photo documentation – 9 pages

Summary of testing:

The model SGPL are family RCCB of the same fundamental design. According to table A.3 of Annex A, following ratings products were subject relevant test accordingly.

Sample allocation and test items according to IEC 61008-1 and EN 61008-1.
So test sequence and samples see table below:

Test sample Rating				Test sequence													
Pole	In	IΔn	Type	A_1	A_2	B	C	D_0+D_1	D_0	D_2	E	F	G_0	G_1	H	I	J
2P(1P+N)	63A	30mA	AC	1	3	3	3	3	-	3	3	3	3	3	-	-	-
2P(1P+N)	63A	100mA	AC	-	-	-	-	-	1	-	-	-	-	-	-	-	-
2P(1P+N)	63A	300mA	AC	-	-	-	-	-	1	-	-	-	-	-	-	-	-
2P(1P+N)	63A	500mA	AC	-	-	-	-	-	1	-	-	-	-	-	-	-	-
2P(1P+N)	25A	10mA	AC	-	-	-	-	1	-	-	3	3	-	-	-	-	-
2P(1P+N)	16A	500mA	AC	-	-	-	-	-	-	-	-	3	3	3	-	-	-
2P(1P+N)	63A	30mA	A	-	-	-	-	1	-	-	-	-	-	-	-	-	-
2P(1P+N)	63A	100mA	A	-	-	-	-	-	1	-	-	-	-	-	-	-	-
4P(3P+N)	63A	30mA	AC	1	3	3	3	3	-	3	3	3	3	3	3	3	3
4P(3P+N)	25A	10mA	AC	-	-	-	-	1	-	-	3	3	-	-	-	-	-
4P(3P+N)	16A	500mA	AC	-	-	-	-	-	-	-	-	3	3	3	-	-	-
4P(3P+N)	63A	30mA	A	-	-	-	-	1	-	-	-	-	-	-	-	-	-

Tests performed (name of test and test clause):		Testing location:
Test sequence A		The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)
2P(1P+N), 63 A, Type AC, 30 mA	page 9	
4P(3P+N), 63 A, Type AC, 30 mA	page 21	
Test sequence B		
2P(1P+N), 63 A, Type AC, 30 mA	page 32	
4P(3P+N), 63 A, Type AC, 30 mA	page 39	
Test sequence C		
2P(1P+N), 63 A, Type AC, 30 mA	page 46	
4P(3P+N), 63 A, Type AC, 30 mA	page 48	
Test sequence D		
2P(1P+N), 63 A, Type AC, 30 mA	page 50	
2P(1P+N), 25 A, Type AC, 10 mA	page 75	
2P(1P+N), 63 A, Type A, 30 mA	page 96	
4P(3P+N), 63 A, Type AC, 30 mA	page 116	
4P(3P+N), 25 A, Type AC, 10 mA	page 141	
4P(3P+N), 63 A, Type A, 30 mA	page 162	
Test sequence D0		
2P(1P+N), 63 A, Type AC, 100 mA	page 182	
2P(1P+N), 63 A, Type AC, 300 mA	page 188	
2P(1P+N), 63 A, Type AC, 500 mA	page 194	
2P(1P+N), 63 A, Type A, 100 mA	page 200	
Test sequence E		
2P(1P+N), 63 A, Type AC, 30 mA	page 207	
2P(1P+N), 25 A, Type AC, 10 mA	page 216	
4P(3P+N), 63 A, Type AC, 30 mA	page 227	
4P(3P+N), 25 A, Type AC, 10 mA	page 236	
Test sequence F		
2P(1P+N), 63 A, Type AC, 30 mA	page 246	
2P(1P+N), 25 A, Type AC, 10 mA	page 255	
2P(1P+N), 16 A, Type AC, 500 mA	page 265	
4P(3P+N), 63 A, Type AC, 30 mA	page 275	
4P(3P+N), 25 A, Type AC, 10 mA	page 284	
4P(3P+N), 16 A, Type AC, 500 mA	page 294	
Test sequence G0		
2P(1P+N), 63 A, Type AC, 30 mA	page 304	
2P(1P+N), 16 A, Type AC, 500 mA	page 304	
4P(3P+N), 63 A, Type AC, 30 mA	page 305	
4P(3P+N), 16 A, Type AC, 500 mA	page 306	
Test sequence H	page 307	
Test sequence I	page 308	
Test sequence J	page 309	

<table>
<tr><td colspan="3">Summary of compliance with National Differences: EN 61008-1 Common modification

List of countries addressed: N/A

☒ The product fulfils the requirements of EN 61008-1: 2012 & EN 61008-2-1: 1994+A11</td></tr>
<tr><td><u>EN 61009-1 Common modifications</u>

Test sequence A-G_0

Test sequence G1
2P(1P+N), 63 A, Type AC, 30 mA
2P(1P+N), 16 A, Type AC, 500 mA
4P(3P+N), 63 A, Type AC, 30 mA
4P(3P+N), 16 A, Type AC, 500 mA</td><td>

page 327

page 342
page 343
page 344
page 345</td><td>Testing location:

The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)</td></tr>
</table>

Copy of marking plate

With sample of marking plate: 2P(1P+N), 16A, 500mA, Type AC

With sample of marking plate: 4P(3P+N), 64A, 30mA, Type A

Test item particulars...:	
Classification of RCCBs functionally dependent on the line voltage ....:	No
Opening automatically in case of failure of the line voltage ....:	No
- reclosing automatically when the line voltage is restored ....:	~~Yes~~ / No
- not reclosing automatically when the line voltage is restored ....:	~~Yes~~ / No
Not opening automatically in case of failure of the line voltage ....:	No
- able to trip in a hazardous situation arising on failure of line voltage ....:	~~Yes~~ / No
- not able to trip in a hazardous situation arising on failure of line voltage ....:	~~Yes~~ / No
Type of RCCB ....:	
- type AC..:	Yes / ~~No~~
- type A ....:	Yes / ~~No~~
- independent of the line voltage..................................:	Yes / ~~No~~
- dependent on the line voltage.....................................:	~~Yes~~ / No
- without time delay ....:	Yes / ~~No~~
- with time delay: type S ....:	~~Yes~~ / No
- enclosed..:	Yes / ~~No~~
- unenclosed..:	~~Yes~~ / No
- IP number ....:	IP20 after installation
- for fixed installation ....:	Yes / ~~No~~
- for mobile installation ....:	~~Yes~~ / No
Number of poles..:	2P(1P+N) or 4P(3P+N)
Ambient air temperature (°C).......................................:	-25 - 40°C
Method of mounting ....:	On DIN Rail
Method of connection..:	Pillar terminal for external cable
Rated residual operating current (A) ....:	∆n = 10mA(only when In=16, 20, 25A, type AC); I∆n = 30mA, 100mA (type A or type AC); I∆n = 300mA, 500mA (only for type AC);
Rated current (A)...:	16, 25, 32, 40, 50, 63 A
Rated voltage (V) ....:	240 V (2P(1P+N)), 415 V (4P(3P+N))
Rated impulse withstand voltage (U_{imp})	4,0 kV
Nature of supply ....:	a.c.
Rated frequency (Hz) ....:	50 / 60 Hz

Rated making and breaking capacity (A) ....:	500A (In=16-40A); 630A (In=50, 63A)
Rated residual making and breaking capacity (A) .....:	500A (In=16-40A); 630A (In=50, 63A)
Rated conditional short-circuit current (A)..................:	6,0 kA
Rated conditional residual short-circuit current (A) ....:	6,0 kA
Type of terminal ....:	Pillar terminal
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..:	02.07.2014
Date (s) of performance of tests ....:	05.07.2014 - 14.08.2014

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) ....:	**WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD./** NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, ZHEJIANG, CHINA

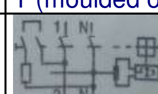
General product information:

Residual current operated circuit-breakers without integral overcurrent protection for household and similar uses (RCCBs)

Un = 240 V~ 2P(1P+N) 50/60Hz; 415 V~ 4P(3P+N) 50/60Hz
In = 16, 20, 25, 32, 40, 50, 63 A; Type A or AC;
IΔn = 10mA(only when In=16, 20, 25A, type AC);
IΔn = 30mA, 100mA (type A or type AC);
IΔn = 300mA, 500mA (only for type AC);
Im = IΔm = 10In or 500 A; IΔc = Inc = 6,0 kA

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE A_1 (1 sample)	**2P(1P+N), 63A, Type AC, 30mA**	

6.	**Marking**		
	a) manufacturer's name or trademark ....:	VECAS®	P
	b) type designation, catalogue number or serial number ....:	2P(1P+N), 63 A, Type AC, 30 mA	P
	c) rated voltage(s) (V) ....:	240 V	P
	d) rated frequency (Hz) ....:	50/60Hz	P
	e) rated current (A) ....:	63 A	P
	f) rated residual operating current (A) ....:	30 mA	P
	h) rated making and breaking capacity (A) ....:	Im = IΔm = 630 A	P
	j) degree of protection ....:	IP20 after installation	P
	k) position of use ....:		N/A
	l) rated residual making and breaking capacity (A) ....:	Im = IΔm = 630 A	P
	m) symbol S for type S	S	N/A
	n) symbol of the method of operation ....:	Not marked	N/A
	o) operating means of test device ....:	T (moulded on button)	P
	p) wiring diagram ....:		P
	q) operating characteristic ....:	~	P
	Marking on the RCCB itself or on nameplate or nameplates attached to the RCCB and located so that for small devices at least e), f), o) and q) (only for type A) are legible when the RCCB is installed :	All markings were visible after installation	N/A
	Joule integral withstand capacity (A^2s) ....:		N/A
	Peak current withstand capacity (A) ....:		N/A
	Time delay when opening in case of failure of the line voltage (s) ....:	Independent on line voltage	N/A
	Open position indicated by "0" and closed position by "I" ....:	O / I	P
	For push-buttons the OFF push-button shall either be red or marked with "0" ....:	no such button	N/A

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict
	If necessary to distinguish between supply and load terminals they shall be clearly marked ....:	line and load immaterial	N/A
	Terminals for neutral conductor marked by "N"		P
	Terminals for protective conductor marked by [symbol IEC 417-5019 a]		N/A
	Marking indelible, easy legible and not on removable parts		P
9.3	Test: 15 s with water, 15 s with hexane		P
	For universal terminals (rigid-solid, rigid-stranded and flexible conductors:		P
	- no markings		P
	For non-universal terminals:		N/A
	- terminals for rigid-solid conductors only, marked by the letters “s” or “sol”		N/A
	- terminals for rigid (solid and stranded) conductors only, marked by the letter “r”		N/A
	marking on the RCCB or if the space available is not sufficient, on the smallest package unit or in technical information		N/A
8.	**Requirements for construction and operation**		
8.1.1	General		
	Residual current detection is located between the incoming and outgoing terminals		P
	Not possible to alter the operating characteristics by means of external interventions other than those specifically intended for changing the setting of the residual operating current	Operating characteristics Type AC could not be changed.	N/A
	Changing from one setting to another shall not be possible without a tool	No adjustable settings.	N/A
	In case of an RCCB having multiple settings of residual operating current the rating refers to the highest setting	No adjustable settings.	N/A
8.1.2	Mechanism		
	Moving contacts of all poles so mechanically coupled that all poles except the switched neutral, make and break substantially together		P

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Switched neutral opens after and closes before other poles		P
	Compliance is checked by inspection and by manual tests, using any appropriate means (e.g.: indicator lights, oscilloscope, etc.)	Checked by indicator lights.	P
	Trip-free mechanism	Compliance to trip free	P
9.15	Test: the RCCB is mounted and wired as in normal use		
	- test circuit according to fig. 4a		P
	- a residual current equal to 1,5 $I_{\Delta n}$ is passed by closing S2, the RCCB having been closed and the operating means being held in the closed position. The RCCB shall trip	1,5 $I_{\Delta n}$: 45 mA. RCCB tripped after closing S2. (U: 240V a.c.)	P
	- test repeated by moving the operating means slowly (1 s) to a position where the current starts to flow. Tripping shall occur without further movement		P
8.1.2	Possible to switch on and off by hand		P
	No intermediate positions of the contacts		P
	In the open position isolation distance in accordance with the requirements necessary to satisfy the isolating function	Suitable for isolating function	P
	Indication of the open and closed position of the main contacts shall be provided by one or both of the following means:		P
	- the position of the actuator (this being preferred)	Could be indicated by actuator	P
	- a separate mechanical indicator		P
	If a separate mechanical indicator is used, this shall show the colour red for the closed position and the colour green for the open position		P
	means of indication of the contact position shall be reliable -checked by inspection and by the tests of 9.15		P
	RCCBs shall be designed so that the actuator, front plate or cover can only be correctly fitted in a manner which ensures correct indication of the contact position -checked by inspection and by the tests of 9.11		P

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Clause	Requirement + Test	Result - Remark	Verdict
	When means are provided or specified by the manufacturer to lock the operating means in the open position: locking only possible when the main contacts are in the open position	No locking parts.	N/A
	If the operating means is used for indication, it shall, when released, automatically take up the position to that of the moving contacts; the operating means shall have two distinct rest positions except that for automatic opening a third distinct position may be provided, when necessary to reset before reclosing	Take up the position of moving contacts.	P
	For RCCBs functionally dependent on line voltage, reclosing automatically when the line voltage is restored after failure, the operating means shall remain in the ON position and the contacts shall reclose automatically unless the operating means has been placed in the OFF position	RCCB functionally independent on line voltage.	N/A
	When an indicator light is used this shall be lit when the RCCB is in the closed position	No indicator light used.	N/A
	The indicator light shall not be the only means to indicate the closed position		N/A
	The action of the mechanism shall not be influenced by the position of enclosures or covers and shall be independent of any removable part.		N/A
	If the cover is used as a guiding means for push-buttons, it shall not be possible to remove the buttons from the outside		N/A
	Operating means securely fixed; not possible to remove them without a tool		P
	For "up-down" operating means the contacts shall be closed by the up movement		P
8.1.4	Screws, current-carrying parts and connections		
8.1.4.1	Connections withstand mechanical stresses occurring in normal use	The head of screw epoxied.	P
	Screws for mounting the RCCB are not of thread-cutting type	DIN- Rail	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.4	Screws and nuts which are operated when mounting and connecting comply with the test of 9.4	Screws operated for connecting.	P
	Torque test:		
	- torque (Nm); 5/10 times; diameter (mm) ....:	2,5 Nm; 5 / ~~10;~~ times; 5,94 mm	P
	- torque (Nm); 5/10 times; diameter (mm) ....:	5 / 10	N/A
	- torque (Nm); 5/10 times; diameter (mm) ....:	5 / 10	N/A
8.1.4.2	Screws with a thread of insulating material operated when mounting the RCCB: correct introduction ensured		N/A
8.1.4.3	Electrical connections: contact pressure not transmitted through insulating material unless there is sufficient resilience in the metallic parts		P
8.1.4.4	Current-carrying parts including parts intended for protective conductors, if any, shall be made of a metal having, under the conditions occurring in the equipment, mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use. Examples below:		P
	- copper		N/A
	- an alloy 58% copper for parts worked cold		P
	- an alloy 50% copper for other parts		N/A
	- other metal		P
	In case of using ferrous alloys or suitably coated ferrous alloys, compliance to resistance to corrosion is checked by a test of resistance to rusting (see 9.25).	Zn plated steel (ferrous alloys). Compliance with clause 9.25	P
	The requirements of this subclause do not apply to: contacts, magnetic circuits, heater elements, bimetals, shunts, parts of electronic devices or to screws, nuts, washers, clamping plates, similar parts of terminals and parts of the test circuit		P
8.1.5	Terminals for external conductors		P
	Compliance is checked by inspection and by the tests as relevant for the type of connection:		P
	9.5 for screw-type terminals		P
	by specific tests for plug-in or bolt-on RCCBs included in the standard		N/A
	by the tests of Annexes J, K or L		N/A
8.1.5.1	Terminals ensure the necessary contact pressure		P
9.5	Torque test:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- torque (Nm); diameter (mm) ....:	2,5 Nm; 5,94 mm	P
	- torque (Nm); diameter (mm) ....:		N/A
	- torque (Nm); diameter (mm) ....:		N/A
	- max. cross-sectional area (mm^2) ....:	25 mm^2	—
9.5.1	Pull test:		P
	Terminal shall be suitable for all types of conductors: rigid (solid or stranded) and flexible, unless otherwise specified by the manufacturer.		—
	Min. cross-section solid / stranded / flexible (mm^2):	1,0 mm^2	—
	Max. cross-section solid / stranded / flexible (mm^2):	25 mm^2	—
	Torque $^2/_3$ (Nm) .... :	1,67 Nm	—
	Pull for 1 min solid / stranded / flexible (N) ... :	50 N for 1,0 mm^2; 100 N for 25 mm^2	P
	During the test no noticeable move of conductor		P
9.5.2	Torque test:		
	- torque (2/3) (Nm) ....:	1,67 Nm	—
	- min. cross-sectional area (mm^2) ....:	1,0 mm^2	—
	- max. cross-sectional area (mm^2) ....:	25 mm^2	—
	The conductor shows no damage		P
	Terminals have not worked loose and no damage		P
9.5.3	Terminals fitted with the largest cross-section area specified in Table 6, for stranded and/or flexible copper conductor.	Stranded conductor: 25 mm^2	—
	Max. cross-section stranded (mm^2) .... :	25 mm^2	—
	Max. cross-section flexible (mm^2) .... :	16 mm^2	—
	Torque $^2/_3$ (Nm) .... :	1,67 Nm	—
	After the test no strand of conductor escaped outside		P
8.1.5.2	RCCBs shall be provided with:		
	- terminals which shall allow the connection of copper conductors having nominal cross-sectional areas as shown in Table 6		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A) / Range of nominal cross sections to be clamped* (mm^2) Rigid (solid or stranded) conductors / Flexible conductors ≤ 13: **1 to 2,5** / 1 to 2,5 > 13 ≤ 16: 1 to 4 / 1 to 4 > 16 ≤ 25: 1,5 to 6 / 1,5 to 6 > 25 ≤ 32: 2,5 to 10 / 2,5 to 6 > 32 ≤ 50: 4 to 16 / 4 to 10 > 50 ≤ 80: **10 to 25** / 10 to 16 > 80 ≤ 100: 16 to 35 / 16 to 25 > 100 ≤ 125: 24 to 50 / 25 to 35	1,0 to 25 mm^2	P
	*It is required that, for current ratings up to and including 50 A, terminals be designed to clamp solid conductors as well as rigid stranded conductors. Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm^2 up to 6 mm^2 be designed to clamp solid conductors only.		N/A
	- or terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors according to Annex L.		N/A
8.1.5.3	Means for clamping the conductors in the terminals do not serve to fix any other component (see tests of 9.5)		P
8.1.5.4	Terminals for In ≤ 32 A allow the connection of conductors without special preparation		P
8.1.5.5	Terminals shall have adequate mechanical strength and metric ISO thread or equivalent (see tests of 9.4 and 9.5.1)		P
8.1.5.6	Clamping of conductor without undue damage to conductor (see tests of 9.5.2)		P
8.1.5.7	Clamping of conductor reliably and between metal surfaces (see tests of 9.4 and 9.5.1)		P
8.1.5.8	Terminals so designed or positioned that no conductor can slip out while the clamping screws or nuts are tightened (see tests of 9.5.3.)		P
8.1.5.9	Terminals so fixed or located that they do not work loose when the clamping screws or nuts are tightened or loosened (see tests of 9.4)	Terminals fix	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.5.10	Clamping screws or nuts of terminals for the protective conductors adequately secured against accidental loosening and not possible to unclamp without a tool		P
8.1.5.11	Screws and nuts of terminals for external conductors shall be in engagement with a metal thread and the screws shall not be of the tapping screw type		P
8.2	Protection against electric shock		
	Live parts not accessible in normal use		P
	For RCCBs other than plug-in type, external parts, other than screws or other means for fixing covers, which are accessible in normal use shall be of insulating material or be lined throughout with insulating material	The cover of RCCBs fixed by screw, sealed by epoxy.	N/A
	Lining reliably fixed		N/A
	Lining has adequate thickness and mechanical strength		N/A
	Inlet openings for cables or conduits shall be of insulating material or be provided with bushings or similar devices of insulating material		N/A
	Such devices shall be reliably fixed		N/A
	Such devices shall have adequate mechanical strength		N/A
	For plug-in RCCBs, external parts, other than screws or other means for fixing covers, which are accessible, shall be of insulating material		N/A
	Metallic operating means insulated from live parts		P
	Metal parts of the mechanism not accessible, insulated from accessible metal parts, from metal frames (for flush-type), from screws or other means for fixing the base and from metal plates		P
	Possible to replace plug-in RCCBs easily without touching live parts		N/A
	Lacquer or enamel not considered to provide adequate insulation		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.6	Test: verify with test finger, 1 min with a force of 75 N		P
	Enclosures or covers not deformed to such an extent that live parts can be touched		P
8.9	Resistance to heat		
	RCCB sufficiently resistant to heat		P
9.13.1	Test: 1 h; test temperature (°C): (100 ± 2) ℃ for not removable covers or (70 ± 2) ℃ for removable covers ......:	100 ℃ / ~~70 ℃~~	P
	No change impairing further use and no flow of sealing compound so that live parts are exposed		P
	No access to live parts even if the test finger is applied with a force not exceeding 5 N		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms)......:	IΔn 30 mA I: 37,5 mA	P
	Marking still legible after test		P
9.13.2	Ball-pressure test for external parts of insulating material (parts retaining live parts in position); test temperature: 125 ℃ ± 2℃ for 1 h; diameter of impression (mm): ≤ 2 mm ......:	Material of cover and base: PA66 125 ℃; 1,02 mm	P
9.13.3	Ball-pressure test for external parts of insulating material (parts not retaining live parts in position); test temperature (°C): (70 ± 2) ℃ or (40 ± 2) °C + max. temperature rise of 9.8; diameter of impression (mm): ≤ 2 mm ......:	Material of cover and base: PA66 70 ℃; 0,9 mm	P
8.1.3	Clearances and creepage distances (internal and external parts)		--
	The minimum required clearances and creepage distances are based on the RCCB being designed for operating in an environment with pollution degree 2		P
	Compliance for item 1 in is checked by measurement and by the test of 9.7.7.4.1 and 9.7.7.4.2. The test is carried out with samples not submitted to the humidity treatment described in 9.7.1.		P
	The clearances of items 2 and 4 may be reduced provided that the measured clearances are not shorter than the minimum allowed in IEC 60664-1 for homogenous field conditions.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	In this case, after the humidity treatment in 9.7.1, compliance for item 2 and 4 and arrangements of 9.7.2 items b), c), d) and e) is checked:		P
	- Tests according to 9.7.2 to 9.7.6 as applicable		P
	- Test according to 9.7.7.2 with test voltages acc. Table 16 with test arrangements of 9.7.2 items b), c), d), e)		P
	If measurement does not show any reduced clearance, test 9.7.7.2 is not applied	Measurement does not show reduced. Test items in 9.7.7.2 performed for reference.	P
	Compliance for item 3, checked by measurement		N/A
	Parts of PCBs connected to the live parts protected against pollution by the use of a type 2 protection according to IEC 60664-3 are exempt from this verification		N/A
	The insulating materials are classified into Material Groups on the basis of their comparative tracking index (CTI) acc. to IEC 60664-1 and measured according to IEC 60112		N/A
	Clearances [mm] U_{imp}		--
	4kV (see table 5) **2,5kV(see table 5)**	☒ ☐	--
	Minimum clearances (see table 5)		--
		minimum clearances [mm]	--
	1. between live parts which are separated when the main contacts are in the open position	4,26 mm 4,0	P
	2. between live parts of different polarity	8,84 mm 3,0	P
	3. between circuits supplied from different sources, one of which being PELV or SELV		N/A
	4. between live parts and:		P
	- accessible surfaces of operating means	21,94 mm 3,0	P
	- screws or other means for fixing covers which have to be removed when mounting the RCCB		N/A
	- surface on which the RCCB is mounted	14,16 mm 3,0	P
	- screws or other means for fixing the RCCB		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts		N/A
	- metal frames supporting flush-type RCCBs		N/A
	Minimum creepage distances (see table 5)		--

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Clause	Requirement + Test	Result - Remark	Verdict
	Material group	IIIb ☐ IIIa ☒ II ☐ I ☐	P
		minimum creepage distances [mm]	--
	1. between live parts which are separated when the main contacts are in the open position	6,84 mm 4,0	P
	2. between live parts of different polarity	15,12 mm 3,0	P
	3. between circuits supplied from different sources, one of which being PELV or SELV		N/A
	4. between live parts and:		P
	- accessible surfaces of operating means	21,94 mm 3,0	P
	- screws or other means for fixing covers which have to be removed when mounting the RCCB		N/A
	- surface on which the RCCB is mounted	14,16 mm 3,0	P
	- screws or other means for fixing the RCCB		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts		N/A
	- metal frames supporting flush-type RCCBs		N/A
9.25	Test of resistance to rusting:		--
	- 10 min immersed in a cold chemical degreaser such as methyl-chloroform or refined petrol		P
	- 10 min immersed in a 10% solution of ammonium chloride in water at 20℃±5℃		P
	- 10 min in a box containing air saturated with moisture at 20℃±5℃		P
	- 10 min at 100℃		P
	No sign of rust		P

	TEST SEQUENCE A_2 (3 samples)	

8.10	Resistance to abnormal heat and fire		P
	External parts of insulating material shall not be liable to ignite and to spread fire under fault or overload conditions		P
9.14	Glow wire test		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test performed on a complete RCCB		P
	Glow-wire test: (960 + 15) °C for external parts of insulating material retaining current-carrying parts or parts of the protective circuit in position	Glow-wire test, needle temperature: 960°C	P
	Glow-wire test: (650 + 10) °C for all other external parts insulating material		N/A
	No visible flames, no sustained glowing, or		P
	flames and glowing extinguish within 30 s after removal ....:	Max. height of flame: 6,0 mm 7 s	P
	No ignition of tissue paper or scorching of the pinewood board		P

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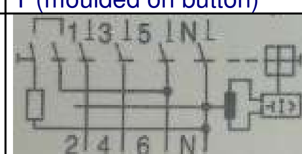
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE A_1 (1 sample)	**4P(3P+N), 63A, Type AC, 30mA**	

6.	**Marking**		
	a) manufacturer's name or trademark ....:	VECAS®	P
	b) type designation, catalogue number or serial number ....:	4P(3P+N), 63 A, Type AC, 30 mA	P
	c) rated voltage(s) (V) ....:	415 V	P
	d) rated frequency (Hz) ....:	50/60Hz	P
	e) rated current (A) ....:	63 A	P
	f) rated residual operating current (A) ....:	30 mA	P
	h) rated making and breaking capacity (A) ....:	Im = IΔm = 630 A	P
	j) degree of protection ....:	IP20 after installation	P
	k) position of use ....:		N/A
	l) rated residual making and breaking capacity (A) ....:	Im = IΔm = 630 A	P
	m) symbol S for type S	S	N/A
	n) symbol of the method of operation ....:	Not marked	N/A
	o) operating means of test device ....:	T (moulded on button)	P
	p) wiring diagram ....:		P
	q) operating characteristic ....:		P
	Marking on the RCCB itself or on nameplate or nameplates attached to the RCCB and located so that for small devices at least e), f), o) and q) (only for type A) are legible when the RCCB is installed :	All markings were visible after installation	N/A
	Joule integral withstand capacity (A^2s) ....:		N/A
	Peak current withstand capacity (A) ....:		N/A
	Time delay when opening in case of failure of the line voltage (s) ....:	Independent on line voltage	N/A
	Open position indicated by "0" and closed position by "I" ....:	O / I	P

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Clause	Requirement + Test	Result - Remark	Verdict
	For push-buttons the OFF push-button shall either be red or marked with "0" ....:	no such button	N/A
	If necessary to distinguish between supply and load terminals they shall be clearly marked ....:	line and load immaterial	N/A
	Terminals for neutral conductor marked by "N"		P
	Terminals for protective conductor marked by [symbol IEC 417-5019 a]		N/A
	Marking indelible, easy legible and not on removable parts		P
9.3	Test: 15 s with water, 15 s with hexane		P
	For universal terminals (rigid-solid, rigid-stranded and flexible conductors:		P
	- no markings		P
	For non-universal terminals:		N/A
	- terminals for rigid-solid conductors only, marked by the letters “s” or “sol”		N/A
	- terminals for rigid (solid and stranded) conductors only, marked by the letter “r”		N/A
	marking on the RCCB or if the space available is not sufficient, on the smallest package unit or in technical information		N/A
8.	**Requirements for construction and operation**		
8.1.1	General		
	Residual current detection is located between the incoming and outgoing terminals		P
	Not possible to alter the operating characteristics by means of external interventions other than those specifically intended for changing the setting of the residual operating current	Operating characteristics Type AC could not be changed.	N/A
	Changing from one setting to another shall not be possible without a tool	No adjustable settings.	N/A
	In case of an RCCB having multiple settings of residual operating current the rating refers to the highest setting	No adjustable settings.	N/A
8.1.2	Mechanism		

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Clause	Requirement + Test	Result - Remark	Verdict
	Moving contacts of all poles so mechanically coupled that all poles except the switched neutral, make and break substantially together		P
	Switched neutral opens after and closes before other poles		P
	Compliance is checked by inspection and by manual tests, using any appropriate means (e.g.: indicator lights, oscilloscope, etc.)	Checked by indicator lights.	P
	Trip-free mechanism	Compliance to trip free	P
9.15	Test: the RCCB is mounted and wired as in normal use		
	- test circuit according to fig. 4a		P
	- a residual current equal to 1,5 $I_{\Delta n}$ is passed by closing S2, the RCCB having been closed and the operating means being held in the closed position. The RCCB shall trip	1,5 $I_{\Delta n}$: 45 mA. RCCB tripped after closing S2. (U: 415V a.c.)	P
	- test repeated by moving the operating means slowly (1 s) to a position where the current starts to flow. Tripping shall occur without further movement		P
8.1.2	Possible to switch on and off by hand		P
	No intermediate positions of the contacts		P
	In the open position isolation distance in accordance with the requirements necessary to satisfy the isolating function	Suitable for isolating function	P
	Indication of the open and closed position of the main contacts shall be provided by one or both of the following means:		P
	- the position of the actuator (this being preferred)	Could be indicated by actuator	P
	- a separate mechanical indicator		P
	If a separate mechanical indicator is used, this shall show the colour red for the closed position and the colour green for the open position		P
	means of indication of the contact position shall be reliable -checked by inspection and by the tests of 9.15		P

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs shall be designed so that the actuator, front plate or cover can only be correctly fitted in a manner which ensures correct indication of the contact position -checked by inspection and by the tests of 9.11		P
	When means are provided or specified by the manufacturer to lock the operating means in the open position: locking only possible when the main contacts are in the open position	No locking parts.	N/A
	If the operating means is used for indication, it shall, when released, automatically take up the position to that of the moving contacts; the operating means shall have two distinct rest positions except that for automatic opening a third distinct position may be provided, when necessary to reset before reclosing	Take up the position of moving contacts.	P
	For RCCBs functionally dependent on line voltage, reclosing automatically when the line voltage is restored after failure, the operating means shall remain in the ON position and the contacts shall reclose automatically unless the operating means has been placed in the OFF position	RCCB functionally independent on line voltage.	N/A
	When an indicator light is used this shall be lit when the RCCB is in the closed position	No indicator light used.	N/A
	The indicator light shall not be the only means to indicate the closed position		N/A
	The action of the mechanism shall not be influenced by the position of enclosures or covers and shall be independent of any removable part.		N/A
	If the cover is used as a guiding means for push-buttons, it shall not be possible to remove the buttons from the outside		N/A
	Operating means securely fixed; not possible to remove them without a tool		P
	For "up-down" operating means the contacts shall be closed by the up movement		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.4	Screws, current-carrying parts and connections		
8.1.4.1	Connections withstand mechanical stresses occurring in normal use	The head of screw epoxied.	P
	Screws for mounting the RCCB are not of thread-cutting type	DIN- Rail	N/A
9.4	Screws and nuts which are operated when mounting and connecting comply with the test of 9.4	Screws operated for connecting.	P
	Torque test:		
	- torque (Nm); 5/10 times; diameter (mm) ....:	2,5 Nm; 5 / ~~10;~~ times; 5,84 mm	P
	- torque (Nm); 5/10 times; diameter (mm) ....:	5 / 10	N/A
	- torque (Nm); 5/10 times; diameter (mm) ....:	5 / 10	N/A
8.1.4.2	Screws with a thread of insulating material operated when mounting the RCCB: correct introduction ensured		N/A
8.1.4.3	Electrical connections: contact pressure not transmitted through insulating material unless there is sufficient resilience in the metallic parts		P
8.1.4.4	Current-carrying parts including parts intended for protective conductors, if any, shall be made of a metal having, under the conditions occurring in the equipment, mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use. Examples below:		P
	- copper		N/A
	- an alloy 58% copper for parts worked cold		P
	- an alloy 50% copper for other parts		N/A
	- other metal		P
	In case of using ferrous alloys or suitably coated ferrous alloys, compliance to resistance to corrosion is checked by a test of resistance to rusting (see 9.25).	Zn plated steel (ferrous alloys). Compliance with clause 9.25	P
	The requirements of this subclause do not apply to: contacts, magnetic circuits, heater elements, bimetals, shunts, parts of electronic devices or to screws, nuts, washers, clamping plates, similar parts of terminals and parts of the test circuit		P
8.1.5	Terminals for external conductors		P
	Compliance is checked by inspection and by the tests as relevant for the type of connection:		P
	9.5 for screw-type terminals		P

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Clause	Requirement + Test	Result - Remark	Verdict
	by specific tests for plug-in or bolt-on RCCBs included in the standard		N/A
	by the tests of Annexes J, K or L		N/A
8.1.5.1	Terminals ensure the necessary contact pressure		P
9.5	Torque test:		P
	- torque (Nm); diameter (mm) ....:	2,5 Nm; 5,94 mm	P
	- torque (Nm); diameter (mm) ....:		N/A
	- torque (Nm); diameter (mm) ....:		N/A
	- max. cross-sectional area (mm^2) ....:	25 mm^2	—
9.5.1	Pull test:		P
	Terminal shall be suitable for all types of conductors: rigid (solid or stranded) and flexible, unless otherwise specified by the manufacturer.		—
	Min. cross-section solid / stranded / flexible (mm^2):	1,0 mm^2	—
	Max. cross-section solid / stranded / flexible (mm^2):	25 mm^2	—
	Torque $^2/_3$ (Nm) .... :	1,67 Nm	—
	Pull for 1 min solid / stranded / flexible (N) ... :	50 N for 1,0 mm^2; 100 N for 25 mm^2	P
	During the test no noticeable move of conductor		P
9.5.2	Torque test:		
	- torque (2/3) (Nm) ....:	1,67 Nm	—
	- min. cross-sectional area (mm^2) ....:	1,0 mm^2	—
	- max. cross-sectional area (mm^2) ....:	25 mm^2	—
	The conductor shows no damage		P
	Terminals have not worked loose and no damage		P
9.5.3	Terminals fitted with the largest cross-section area specified in Table 6, for stranded and/or flexible copper conductor.	Stranded conductor: 25 mm^2	—
	Max. cross-section stranded (mm^2) .... :	25 mm^2	—
	Max. cross-section flexible (mm^2) .... :	16 mm^2	—
	Torque $^2/_3$ (Nm) .... :	1,67 Nm	—
	After the test no strand of conductor escaped outside		P
8.1.5.2	RCCBs shall be provided with:		
	- terminals which shall allow the connection of copper conductors having nominal cross-sectional areas as shown in Table 6		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated current (A) / Range of nominal cross sections to be clamped* (mm²) Rigid (solid or stranded) conductors / Flexible conductors ≤ 13: **1 to 2,5** / 1 to 2,5 > 13 ≤ 16: 1 to 4 / 1 to 4 > 16 ≤ 25: 1,5 to 6 / 1,5 to 6 > 25 ≤ 32: 2,5 to 10 / 2,5 to 6 > 32 ≤ 50: 4 to 16 / 4 to 10 > 50 ≤ 80: **10 to 25** / 10 to 16 > 80 ≤ 100: 16 to 35 / 16 to 25 > 100 ≤ 125: 24 to 50 / 25 to 35	1,0 to 25 mm²	P
	*It is required that, for current ratings up to and including 50 A, terminals be designed to clamp solid conductors as well as rigid stranded conductors. Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm² up to 6 mm² be designed to clamp solid conductors only.		N/A
	- or terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors according to Annex L.		N/A
8.1.5.3	Means for clamping the conductors in the terminals do not serve to fix any other component (see tests of 9.5)		P
8.1.5.4	Terminals for In ≤ 32 A allow the connection of conductors without special preparation		P
8.1.5.5	Terminals shall have adequate mechanical strength and metric ISO thread or equivalent (see tests of 9.4 and 9.5.1)		P
8.1.5.6	Clamping of conductor without undue damage to conductor (see tests of 9.5.2)		P
8.1.5.7	Clamping of conductor reliably and between metal surfaces (see tests of 9.4 and 9.5.1)		P
8.1.5.8	Terminals so designed or positioned that no conductor can slip out while the clamping screws or nuts are tightened (see tests of 9.5.3.)		P
8.1.5.9	Terminals so fixed or located that they do not work loose when the clamping screws or nuts are tightened or loosened (see tests of 9.4)	Terminals fix	P

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.5.10	Clamping screws or nuts of terminals for the protective conductors adequately secured against accidental loosening and not possible to unclamp without a tool		P
8.1.5.11	Screws and nuts of terminals for external conductors shall be in engagement with a metal thread and the screws shall not be of the tapping screw type		P
8.2	Protection against electric shock		
	Live parts not accessible in normal use		P
	For RCCBs other than plug-in type, external parts, other than screws or other means for fixing covers, which are accessible in normal use shall be of insulating material or be lined throughout with insulating material	The cover of RCCBs fixed by screw, sealed by epoxy.	N/A
	Lining reliably fixed		N/A
	Lining has adequate thickness and mechanical strength		N/A
	Inlet openings for cables or conduits shall be of insulating material or be provided with bushings or similar devices of insulating material		N/A
	Such devices shall be reliably fixed		N/A
	Such devices shall have adequate mechanical strength		N/A
	For plug-in RCCBs, external parts, other than screws or other means for fixing covers, which are accessible, shall be of insulating material		N/A
	Metallic operating means insulated from live parts		P
	Metal parts of the mechanism not accessible, insulated from accessible metal parts, from metal frames (for flush-type), from screws or other means for fixing the base and from metal plates		P
	Possible to replace plug-in RCCBs easily without touching live parts		N/A
	Lacquer or enamel not considered to provide adequate insulation		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.6	Test: verify with test finger, 1 min with a force of 75 N		P
	Enclosures or covers not deformed to such an extent that live parts can be touched		P
8.9	Resistance to heat		
	RCCB sufficiently resistant to heat		P
9.13.1	Test: 1 h; test temperature (°C): (100 ± 2) °C for not removable covers or (70 ± 2) °C for removable covers ....:	100 °C / ~~70 °C~~	P
	No change impairing further use and no flow of sealing compound so that live parts are exposed		P
	No access to live parts even if the test finger is applied with a force not exceeding 5 N		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms)..:	IΔn 30 mA I: 37,5 mA	P
	Marking still legible after test		P
9.13.2	Ball-pressure test for external parts of insulating material (parts retaining live parts in position); test temperature: 125 °C ± 2°C for 1 h; diameter of impression (mm): ≤ 2 mm ....:	Material of cover and base: PA66 125 °C; 1,02 mm	P
9.13.3	Ball-pressure test for external parts of insulating material (parts not retaining live parts in position); test temperature (°C): (70 ± 2) °C or (40 ± 2) °C + max. temperature rise of 9.8; diameter of impression (mm): ≤ 2 mm ....:	Material of cover and base: PA66 70 °C; 0,9 mm	P
8.1.3	Clearances and creepage distances (internal and external parts)		--
	The minimum required clearances and creepage distances are based on the RCCB being designed for operating in an environment with pollution degree 2		P
	Compliance for item 1 in is checked by measurement and by the test of 9.7.7.4.1 and 9.7.7.4.2. The test is carried out with samples not submitted to the humidity treatment described in 9.7.1.		P
	The clearances of items 2 and 4 may be reduced provided that the measured clearances are not shorter than the minimum allowed in IEC 60664-1 for homogenous field conditions.		P

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Clause	Requirement + Test	Result - Remark	Verdict
	In this case, after the humidity treatment in 9.7.1, compliance for item 2 and 4 and arrangements of 9.7.2 items b), c), d) and e) is checked:		P
	- Tests according to 9.7.2 to 9.7.6 as applicable		P
	- Test according to 9.7.7.2 with test voltages acc. Table 16 with test arrangements of 9.7.2 items b), c), d), e)		P
	If measurement does not show any reduced clearance, test 9.7.7.2 is not applied	Measurement does not show reduced. Test items in 9.7.7.2 performed for reference.	P
	Compliance for item 3, checked by measurement		N/A
	Parts of PCBs connected to the live parts protected against pollution by the use of a type 2 protection according to IEC 60664-3 are exempt from this verification		N/A
	The insulating materials are classified into Material Groups on the basis of their comparative tracking index (CTI) acc. to IEC 60664-1 and measured according to IEC 60112		N/A
	Clearances [mm] U_{imp}		--
	4kV (see table 5) **2,5kV(see table 5)**	☒ ☐	--
	Minimum clearances (see table 5)		--
		minimum clearances [mm]	--
	1. between live parts which are separated when the main contacts are in the open position	4,26 mm 4,0	P
	2. between live parts of different polarity	8,84 mm 3,0	P
	3. between circuits supplied from different sources, one of which being PELV or SELV		N/A
	4. between live parts and:		P
	- accessible surfaces of operating means	10,70 mm 3,0	P
	- screws or other means for fixing covers which have to be removed when mounting the RCCB		N/A
	- surface on which the RCCB is mounted	24,52 mm 3,0	P
	- screws or other means for fixing the RCCB		N/A
	- metal covers or boxes		N/A
	- other accessible metal parts		N/A
	- metal frames supporting flush-type RCCBs		N/A
	Minimum creepage distances (see table 5)		--

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Clause	Requirement + Test	Result - Remark	Verdict
	Material group	IIIb ☐ IIIa ☒ II ☐ I ☐	P
		minimum creepage distances [mm]	--
	1. between live parts which are separated when the main contacts are in the open position	6,84 mm 4,0	P
	2. between live parts of different polarity	19,04 mm 3,0	P
	3. between circuits supplied from different sources, one of which being PELV or SELV		N/A
	4. between live parts and:		P
	- accessible surfaces of operating means	28,88 mm 4,0	P
	- screws or other means for fixing covers which have to be removed when mounting the RCCB		N/A
	- surface on which the RCCB is mounted	24,52 mm 4,0	P
	- screws or other means for fixing the RCCB	24,52 mm 4,0	P
	- metal covers or boxes		N/A
	- other accessible metal parts		N/A
	- metal frames supporting flush-type RCCBs		N/A
9.25	Test of resistance to rusting:		--
	- 10 min immersed in a cold chemical degreaser such as methyl-chloroform or refined petrol		P
	- 10 min immersed in a 10% solution of ammonium chloride in water at 20℃±5℃		P
	- 10 min in a box containing air saturated with moisture at 20℃±5℃		P
	- 10 min at 100℃		P
	No sign of rust		P

	TEST SEQUENCE A_2 (3 samples)	

8.10	Resistance to abnormal heat and fire		P
	External parts of insulating material shall not be liable to ignite and to spread fire under fault or overload conditions		P

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Clause	Requirement + Test	Result - Remark	Verdict

9.14	Glow wire test		P
	Test performed on a complete RCCB		P
	Glow-wire test: (960 + 15) ℃ for external parts of insulating material retaining current-carrying parts or parts of the protective circuit in position	Glow-wire test, the needle temperature: 960℃	P
	Glow-wire test: (650 + 10) °C for all other external parts insulating material		N/A
	No visible flames, no sustained glowing, or		P
	flames and glowing extinguish within 30 s after removal ....:	Max. height of flame: 6,0 mm 7 s	P
	No ignition of tissue paper or scorching of the pinewood board		P

	TEST SEQUENCE B (3 samples)	4P(3P+N), 63 A, Type AC, 30 mA	

8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		--
8.3	DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY		--
	RCCBs have adequate dielectric properties		P
9.7	TEST OF DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY		--
9.7.7.4	VERIFICATION OF RESISTANCE OF THE INSULATION OF OPEN CONTACT AND BASIC INSULATION AGAINST AN IMPULSE VOLTAGE IN NORMAL CONDITIONS		
	These tests are not preceded by the humidity treatment described in 9.7.1.		P
	The test is carried out on an RCCB fixed on a metal support		P
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2µs, and a time to half-value of 50µs		P
	The shape of the impulses is adjusted with the RCCB under test connected to the impulse generator.		P
	For RCCBs with incorporated surge arresters that cannot be disconnected, the shape of the impulses is adjusted without connection of the RCCB to the impulse generator.		P
	rated impulse withstand voltage [kV]:	4,0 kV	--
	see level of test laboratory [m]	5 m	--
	test voltage (acc. Table 22) [kV]:	4,97 kV	--
9.7.7.4.2	RCCB in open position (contacts in open position)		P
	The impulses are applied between:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	the line terminals connected together and the load terminals connected together	6,32 kV	P
9.7.7.4.3	RCCB in closed position		P
	All components bridging the basic insulation disconnected		P
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any	All terminals – metal support 4,97 kV	P
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the RCCB	Phase – Neutral 4,97 kV	P
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.		P
	no disruptive discharges during the test		P
9.7.7.5	VERIFICATION OF THE BEHAVIOUR OF COMPONENTS BRIDGING THE BASIC INSULATION		--
	A new RCCB sample is tested		N/A
	Test only performed on RCCBs, where components bridging the basic insulation have been disconnected during the impulse voltage test of 9.7.7.4.3		N/A
	test voltage 1200V+U_0		N/A
	The voltage is applied during 5s between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the prospective conductor(s), if any		N/A
	after test, no component bridging the basic insulation should show a visible alteration.		N/A
	Then, the equipment is connected to the mains acc. manufacturer's instruction		N/A
	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$	[ms]	--
			N/A
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1.		N/A
9.7.1	RESISTANCE TO HUMIDITY		P
9.7.1.1	Parts which can be removed without a tool are removed, spring lids kept open, inlet openings are left open and if knock-outs one is opened.		P

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Clause	Requirement + Test	Result - Remark			Verdict
9.7.1.2	Test conditions: 48 h in humidity cabinet RH = 91% to 95% T = 20 to 30℃ ± 1℃	48h RH: 93…94% T: 22,2℃ 101 kPa			--
9.7.1.4	The samples show no damage				P
9.7.2	Insulation resistance of the main circuit measured between 30 and 60 min after this treatment with 500 V DC after 5 s:	B1 [MΩ]	B2 [MΩ]	B3 [MΩ]	--
	a) between the terminals which are electrically connected together when the RCCB is in the closed position ....≥ 2 MΩ	> 500 MΩ	> 500 MΩ	> 500 MΩ	P
	b) between each pole and the others connected together (electronic components, connected between current path being disconnected).......≥ 2 MΩ	> 500 MΩ	> 500 MΩ	> 500 MΩ	P
	c) between all poles connected together and the frame ....≥ 5 MΩ	> 500 MΩ	> 500 MΩ	> 500 MΩ	P
	d) between metal parts of the mechanism and the frame ....≥ 5 MΩ	> 500 MΩ	> 500 MΩ	> 500 MΩ	P
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material...≥ 5 MΩ				N/A
9.7.3	Dielectric strength of the main circuit measured with an AC voltage (45-65Hz) for 1 min:				--
	a) electronic components disconnected........ 2000 V				P
	b) electronic components disconnected........ 2000 V				P
	c) electronic components disconnected........ 2000 V				P
	d) electronic components disconnected........ 2000 V				P
	e) electronic components disconnected........ 2500 V				N/A
	No flashover or breakdown				P
9.7.4	Insulation resistance of auxiliary circuits measured with 500 V DC after 1 min:	B1 [MΩ]	B2 [MΩ]	B3 [MΩ]	--
	1) between all auxiliary circuits and the frame ....≥ 2 MΩ				N/A
	2) between each part of the auxiliary circuits which might be isolated from the other parts and the whole of the other parts connected together..≥ 2 MΩ				N/A
	Dielectric strength of auxiliary circuits measured with an AC voltage at rated frequency for 1 min:				--

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Clause	Requirement + Test	Result - Remark	Verdict
	Rated voltage of auxiliary circuits (a.c. or d.c.) — Test voltage (V) ≤ 30 — 600 > 30 ≤ 50 — 1000 > 50 ≤ 110 — 1500 > 110 ≤ 250 — 2000 > 250 ≤ 500 — 2500	V	--
	1) between all auxiliary circuits and the frame		N/A
	2) between each part of the auxiliary circuits which might be isolated from the other parts and the whole of the other parts connected together		N/A
	No flashover or perforation		N/A
9.7.7.2	Verification of clearances with the impulse withstand voltage		--
	If the measurement of clearances of items 2 and 4 in Table 5 shows a reduction of the required length, this test applies.		--
	The test is carried out on an RCCB fixed on a metal support and being in the closed position		P
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2µs, and a time to half-value of 50µs		P
	The shape of the impulses is adjusted with the RCCB under test connected to the impulse generator.		P
	For RCCBs with incorporated surge arresters that cannot be disconnected, the shape of the impulses is adjusted without connection of the RCCB to the impulse generator.		P
	test performed with:		--
	- surge impedance of the test apparatus ≤500Ω and surge protective devices disconnected before testing or		P
	- hybrid generator with an surge impedance of 2 Ω and surge protective devices not diconnected before testing		N/A
	rated impulse withstand voltage [kV]:	4,0 kV	--
	see level of test laboratory [m]	5	--
	test voltage (acc. Table 16) [kV]:	4,9 kV	--
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any	All terminals – Metal supporting	P

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Clause	Requirement + Test	Result - Remark	Verdict
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the RCCB	Phase - Neutral	P
	A third series of tests is made applying the impulse voltage between (and not tested during the two first sequences described here above):		N/A
	b) between each pole and the others connected together (electronic components, connected between current path being disconnected)		P
	c) between all poles connected together and the frame		P
	d) between metal parts of the mechanism and the frame		P
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material		N/A
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.		P
	no disruptive discharges during the test		P
9.7.5	Secondary circuit of detection transformers		--
	No insulation test, provided that no connection with accessible metal parts or with protective conductor or live parts exists.		N/A
9.7.6	Capability of control circuits connected to the main circuit of withstanding high DC voltages due to insulation measurements		--
	RCCB fixed on metal support in closed position with all control circuits connected as in service.		P
	Open test voltage 600 V +25 / -0 V Maximum ripple 5% Short-circuit current 12 mA +2 / -0 mA Applied for 1 min between each pole and the other poles connected together to the frame.	Obtained: 605V | Obtained: 605V | Obtained: 605V	P

Clause	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							Verdict
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--

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Clause	Requirement + Test						Result - Remark				Verdict
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--

Clause	Requirement + Test	Result - Remark			Verdict
	a) value to be decided by the manufacturer for this test				--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4				--
9.9.2.3	Verification of the correct operation in case of sudden appearance of residual current by closing S_1, (S_2 and RCCB in closed position):				P
	Maximum break times at:	[ms]	[ms]	[ms]	--
	- $I_{\Delta N}$	28	29	27	P
	- 2 $I_{\Delta N}$	21	25	21	P
	- 5 $I_{\Delta N}$ or	20	19	19	P
	- 0,25 A				N/A
	- $I_{\Delta t}$ 500 A	18	20	18	P
	No value exceeds the relevant specified limiting value				P
	Additional test for type S:				--
	Minimum non-actuating time at:	[ms]	[ms]	[ms]	--
	- $I_{\Delta N}$ ....0,13 s				N/A
	- 2 $I_{\Delta N}$ ....0,06 s				N/A
	- 5 $I_{\Delta N}$ ....0,05 s				N/A
	- $I_{\Delta t}$ ....0,04 s				N/A
	The test switch S_1 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_2 for min. non-operating times acc. table 2				N/A
	No tripping during tests				N/A
8.4	Temperature rise				--
	Temperature rises do not exceed the limiting values stated in table 7.				P
	Cross-section (mm²)	16 mm²			--
9.8.1	Ambient air temperature (°C)	23 °C			--
9.8.2	Test current I_N (A) until steady state values are reached.	63 A			--
	Four pole RCCBs:				N/A
	Current passing through				N/A
	- 3 phase poles (1)				N/A
	- neutral and adjacent pole (2)				N/A
	Parts .... Temperature rise K	[K]	[K]	[K]	--

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Clause	Requirement + Test	Result - Remark			Verdict
	Terminals for external connections 65	Max. 45,5	Max. 44,3	Max.44,2	P
	External parts liable to be touched during manual operation of the RCCB, including operating means of insulating material and metallic means for coupling insulated operating means of several poles.. 40	8,5	8,9	8,6	P
	External metallic parts of operating means.......... 25				N/A
	Other external parts, including that face of the RCCB in direct contact with the mounting surface 60	16,6	18,6	18,9	P
8.16	Reliability				--
	RCCBs operate reliably even after long service.				P
9.22.2	Test with 28 cycles at 40 ± 2°C				--
	Cross-section (mm²) .... :	16 mm²			--
	Torque $^{2}/_{3}$ (Nm) .... :	1,67 Nm			--
	Test current I_N (A) .... :	63 A			--
	- with current passing .... 21 h				P
	- without current.. 3 h				P
	For 4 pole RCCBs with 3 overcurrent protected poles only 3 poles loaded				N/A
	At the end of the last period of 21 h with current passing the temperature rise of the terminals shall not exceed 65K	[K] Max. 44,9	[K] Max. 46,3	[K] Max. 44,3	--
	After cool down the RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 2	[ms] 27	[ms] 20	[ms] 23	--
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1.				P
9.23	Verification of ageing of electronic components				--
	168 h at 40 ± 2°C .... :	39,5…39,7 °C, for 168 h			--
	Test current I_N (A) .... :	63 A			--
	Cross-section (mm²) .... :	16 mm²			--
	Electronic parts at 1,1 U_N....................................... :	264 V			--
	After cool down:				P
	- electronic parts show no damage				P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 2	[ms] 25	[ms] 23	[ms] 28	--
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1				P

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE B (3 samples)	4P(3P+N), 63 A, Type AC, 30 mA	

8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		--
8.3	DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY		--
	RCCBs have adequate dielectric properties		P
9.7	TEST OF DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY		--
9.7.7.4	VERIFICATION OF RESISTANCE OF THE INSULATION OF OPEN CONTACT AND BASIC INSULATION AGAINST AN IMPULSE VOLTAGE IN NORMAL CONDITIONS		
	These tests are not preceded by the humidity treatment described in 9.7.1.		P
	The test is carried out on an RCCB fixed on a metal support		P
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2µs, and a time to half-value of 50µs		P
	The shape of the impulses is adjusted with the RCCB under test connected to the impulse generator.		P
	For RCCBs with incorporated surge arresters that cannot be disconnected, the shape of the impulses is adjusted without connection of the RCCB to the impulse generator.		P
	rated impulse withstand voltage [kV]:	4,0 kV	--
	see level of test laboratory [m]	5 m	--
	test voltage (acc. Table 22) [kV]:	4,97 kV	--
9.7.7.4.2	RCCB in open position (contacts in open position)		P
	The impulses are applied between:		P
	the line terminals connected together and the load terminals connected together	6,32 kV	P
9.7.7.4.3	RCCB in closed position		P
	All components bridging the basic insulation disconnected		P
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any	All terminals – metal support 4,97 kV	P
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the RCCB	Phase – Neutral 4,97 kV	P

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Clause	Requirement + Test	Result - Remark			Verdict
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.				P
	no disruptive discharges during the test				P
9.7.7.5	VERIFICATION OF THE BEHAVIOUR OF COMPONENTS BRIDGING THE BASIC INSULATION				--
	A new RCCB sample is tested				N/A
	Test only performed on RCCBs, where components bridging the basic insulation have been disconnected during the impulse voltage test of 9.7.7.4.3				N/A
	test voltage 1200V+U_0				N/A
	The voltage is applied during 5s between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the prospective conductor(s), if any				N/A
	after test, no component bridging the basic insulation should show a visible alteration.				N/A
	Then, the equipment is connected to the mains acc. manufacturer's instruction				N/A
	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$	[ms]			--
					N/A
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1.				N/A
9.7.1	RESISTANCE TO HUMIDITY				P
9.7.1.1	Parts which can be removed without a tool are removed, spring lids kept open, inlet openings are left open and if knock-outs one is opened.				P
9.7.1.2	Test conditions: 48 h in humidity cabinet RH = 91% to 95% T = 20 to 30℃ ± 1℃	48h RH: 93…94% T: 22,2℃ 101 kPa			--
9.7.1.4	The samples show no damage				P
9.7.2	Insulation resistance of the main circuit measured between 30 and 60 min after this treatment with 500 V DC after 5 s:	B1 [MΩ]	B2 [MΩ]	B3 [MΩ]	--
	a) between the terminals which are electrically connected together when the RCCB is in the closed position .... ≥ 2 MΩ	> 500 MΩ	> 500 MΩ	> 500 MΩ	P
	b) between each pole and the others connected together (electronic components, connected between current path being disconnected).......≥ 2 MΩ	> 500 MΩ	> 500 MΩ	> 500 MΩ	P

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Clause	Requirement + Test	Result - Remark			Verdict
	c) between all poles connected together and the frame ....≥ 5 MΩ	> 500 MΩ	> 500 MΩ	> 500 MΩ	P
	d) between metal parts of the mechanism and the frame ....≥ 5 MΩ	> 500 MΩ	> 500 MΩ	> 500 MΩ	P
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material..≥ 5 MΩ				N/A
9.7.3	Dielectric strength of the main circuit measured with an AC voltage (45-65Hz) for 1 min:				--
	a) electronic components disconnected........2000 V				P
	b) electronic components disconnected........2000 V				P
	c) electronic components disconnected........2000 V				P
	d) electronic components disconnected........2000 V				P
	e) electronic components disconnected........2500 V				N/A
	No flashover or breakdown				P
9.7.4	Insulation resistance of auxiliary circuits measured with 500 V DC after 1 min:	B1 [MΩ]	B2 [MΩ]	B3 [MΩ]	--
	1) between all auxiliary circuits and the frame ....≥ 2 MΩ				N/A
	2) between each part of the auxiliary circuits which might be isolated from the other parts and the whole of the other parts connected together..≥ 2 MΩ				N/A
	Dielectric strength of auxiliary circuits measured with an AC voltage at rated frequency for 1 min:				--
	Rated voltage of auxiliary circuits (a.c. or d.c.) — Test voltage (V) ≤ 30 — 600 > 30 ≤ 50 — 1000 > 50 ≤ 110 — 1500 > 110 ≤ 250 — 2000 > 250 ≤ 500 — 2500	V			--
	1) between all auxiliary circuits and the frame				N/A
	2) between each part of the auxiliary circuits which might be isolated from the other parts and the whole of the other parts connected together				N/A
	No flashover or perforation				N/A
9.7.7.2	Verification of clearances with the impulse withstand voltage				--
	If the measurement of clearances of items 2 and 4 in Table 5 shows a reduction of the required length, this test applies.				--

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Clause	Requirement + Test	Result - Remark	Verdict
	The test is carried out on an RCCB fixed on a metal support and being in the closed position		P
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2µs, and a time to half-value of 50µs		P
	The shape of the impulses is adjusted with the RCCB under test connected to the impulse generator.		P
	For RCCBs with incorporated surge arresters that cannot be disconnected, the shape of the impulses is adjusted without connection of the RCCB to the impulse generator.		P
	test performed with:		--
	- surge impedance of the test apparatus ≤500Ω and surge protective devices disconnected before testing or		P
	- hybrid generator with an surge impedance of 2 Ω and surge protective devices not diconnected before testing		N/A
	rated impulse withstand voltage [kV]:	4,0 kV	--
	see level of test laboratory [m]	5	--
	test voltage (acc. Table 16) [kV]:	4,9 kV	--
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any	All terminals – Metal supporting	P
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the RCCB	Phase – Neutral / Phase - Phase	P
	A third series of tests is made applying the impulse voltage between (and not tested during the two first sequences described here above):		N/A
	b) between each pole and the others connected together (electronic components, connected between current path being disconnected)		P
	c) between all poles connected together and the frame		P
	d) between metal parts of the mechanism and the frame		P
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material		N/A

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Clause	**Requirement + Test**	**Result - Remark**			**Verdict**
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.				P
	no disruptive discharges during the test				P
9.7.5	Secondary circuit of detection transformers				--
	No insulation test, provided that no connection with accessible metal parts or with protective conductor or live parts exists.				N/A
9.7.6	Capability of control circuits connected to the main circuit of withstanding high DC voltages due to insulation measurements				--
	RCCB fixed on metal support in closed position with all control circuits connected as in service.				P
	Open test voltage 600 V +25 / -0 V Maximum ripple 5% Short-circuit current 12 mA +2 / -0 mA Applied for 1 min between each pole and the other poles connected together to the frame.	Obtained: 605V	Obtained: 605V	Obtained: 605V	P

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							Verdict
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--

	a) value to be decided by the manufacturer for this test				--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4				--
9.9.2.3	Verification of the correct operation in case of sudden appearance of residual current by closing S_1, (S_2 and RCCB in closed position):				P
	Maximum break times at:	[ms]	[ms]	[ms]	--
	- $I_{\Delta N}$	29	27	30	P
	- 2 $I_{\Delta N}$	26	23	25	P
	- 5 $I_{\Delta N}$ or	19	19	20	P
	- 0,25 A				N/A
	- $I_{\Delta t}$ 500 A	18	17	17	P

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Clause	Requirement + Test	Result - Remark			Verdict
	No value exceeds the relevant specified limiting value				P
	Additional test for type S:				--
	Minimum non-actuating time at:	[ms]	[ms]	[ms]	--
	- $I_{\Delta N}$ ....0,13 s				N/A
	- 2 $I_{\Delta N}$ ....0,06 s				N/A
	- 5 $I_{\Delta N}$ ....0,05 s				N/A
	- $I_{\Delta t}$ ....0,04 s				N/A
	The test switch S_1 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_2 for min. non-operating times acc. table 2				N/A
	No tripping during tests				N/A
8.4	Temperature rise				--
	Temperature rises do not exceed the limiting values stated in table 7.				P
	Cross-section (mm²)	16 mm²			--
9.8.1	Ambient air temperature (°C)	23 °C			--
9.8.2	Test current I_N (A) until steady state values are reached.	63 A			--
	Four pole RCCBs:				P
	Current passing through				P
	- 3 phase poles (1)				P
	- neutral and adjacent pole (2)				P
	Parts .... Temperature rise K	[K]	[K]	[K]	--
	Terminals for external connections..................65(1)	Max. 50,9	Max. 48,3	Max. 48,9	P
	Terminals for external connections..................65(2)	Max. 49,6	Max. 48,2	Max. 47,0	
	External parts liable to be touched during manual operation of the RCCB, including operating means of insulating material and metallic means for coupling insulated operating means of several poles.............................. 40	13,0	12,1	13,6	P
	External metallic parts of operating means.......... 25				N/A
	Other external parts, including that face of the RCCB in direct contact with the mounting surface 60	25,3	24,4	26,5	P
8.16	Reliability				--
	RCCBs operate reliably even after long service.				P
9.22.2	Test with 28 cycles at 40 ± 2°C				--
	Cross-section (mm²) .... :	16 mm²			--
	Torque $^{2}/_{3}$ (Nm) .... :	1,67 Nm			--

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Clause	Requirement + Test	Result - Remark			Verdict
	Test current I_N (A) ....:	63 A			--
	- with current passing .... 21 h				P
	- without current .... 3 h				P
	For 4 pole RCCBs with 3 overcurrent protected poles only 3 poles loaded				N/A
	At the end of the last period of 21 h with current passing the temperature rise of the terminals shall not exceed 65K	[K] Max. 52,0	[K] Max. 49,4	[K] Max. 51,3	--
	After cool down the RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 2	[ms] 20	[ms] 18	[ms] 27	--
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1.				P
9.23	Verification of ageing of electronic components				--
	168 h at 40 ± 2°C ....:	39,5…39,7 °C, for 168 h			--
	Test current I_N (A) ....:	63 A			--
	Cross-section (mm²) ....:	16 mm²			--
	Electronic parts at 1,1 U_N ....:	457 V			--
	After cool down:				P
	- electronic parts show no damage				P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 2	[ms] 20	[ms] 24	[ms] 18	--
	Test switch S_2 and RCCB in the closed position, test voltage established by closing the test switch S_1				P

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE C (3 samples) mA	2P(1P+N), 63 A, Type AC, 30	

8.6	**Mechanical and electrical endurance**		**P**
	RCCBs shall be capable of performing an adequate number of mechanical and electrical operations		P
9.10	Test is made:		P
	- In ≤ 25 A; 2 s on; 13 s off ....:		N/A
	- In > 25 A; 2 s on; 28 s off ....:	In 63 A, 2 s on, 28 s off.	P
	Number of operating cycles: 2000	2000	P
	Test voltage Un (V); test current In (A); cos phi 0,85-0,9 ....:	Utest: 242 V, Itest: 63 A 0,86	—
	Cross-sectional area (mm²) ....:	16 mm^2	—
	RCCBs having $I_{\Delta n}$ > 0,010 A tested at:		
	- 1000 cycles for manual operation ....:	C1 – 1000 C2 – 1000 C3 – 1000	P
	- 500 cycles by using the test device ....:	C1 – 500 C2 – 500 C3 – 500	P
	- 500 cycles at a current of $I_{\Delta n}$ ....:	C1 – 500 C2 – 500 C3 – 500	P
	RCCBs having $I_{\Delta n}$ ≤ 0,010 A tested at:		N/A
	- 500 cycles for manual operation ....:	C1 - C2 - C3 -	N/A
	- 750 cycles by using the test device ....:	C1 - C2 - C3 -	N/A
	- 750 cycles at a current of $I_{\Delta n}$ ....:	C1 - C2 - C3 -	N/A
	Test is made without load using manual operation:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- In ≤ 25 A; 2000 cycles ....:	C1 - C2 - C3 -	N/A
	- In > 25 A; 1000 cycles ....:	C1 – 1000 C2 – 1000 C3 – 1000	P
	After the test:		
	- no undue wear		P
	- no damage		P
	- no loosening of connections		P
	- no seepage of sealing compound		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	C1 – 24 C2 – 25 C3 – 27	P
	Dielectric strength test at a voltage of 900 V a.c. for 1 min:		
	a) ....:	C1 – 900 V, 1 min, 100 mA, OK C2 – 900 V, 1 min, 100 mA, OK C3 – 900 V, 1 min, 100 mA, OK	P
	b) ....:	C1 – 900 V, 1 min, 100 mA, OK C2 – 900 V, 1 min, 100 mA, OK C3 – 900 V, 1 min, 100 mA, OK	P
	c) ....:	C1 – 900 V, 1 min, 100 mA, OK C2 – 900 V, 1 min, 100 mA, OK C3 – 900 V, 1 min, 100 mA, OK	P
	d) ....:	C1 – 900 V, 1 min, 100 mA, OK C2 – 900 V, 1 min, 100 mA, OK C3 – 900 V, 1 min, 100 mA, OK	P
	e) ....:	C1 - C2 - C3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE C (3 samples) 4P(3P+N), 63 A, Type AC, 30 mA		

8.6	**Mechanical and electrical endurance**		**P**
	RCCBs shall be capable of performing an adequate number of mechanical and electrical operations		P
9.10	Test is made:		P
	- In ≤ 25 A; 2 s on; 13 s off ....:		N/A
	- In > 25 A; 2 s on; 28 s off ....:	In 63 A, 2 s on, 28 s off.	P
	Number of operating cycles: 2000	2000	P
	Test voltage Un (V); test current In (A); cos phi 0,85-0,9 ....:	Utest: 423 V, Itest: 63,2 A 0,87	—
	Cross-sectional area (mm²) ....:	16 mm^2	—
	RCCBs having $I_{\Delta n}$ > 0,010 A tested at:		
	- 1000 cycles for manual operation ....:	C1 – 1000 C2 – 1000 C3 – 1000	P
	- 500 cycles by using the test device ....:	C1 – 500 C2 – 500 C3 – 500	P
	- 500 cycles at a current of $I_{\Delta n}$ ....:	C1 – 500 C2 – 500 C3 – 500	P
	RCCBs having $I_{\Delta n}$ ≤ 0,010 A tested at:		N/A
	- 500 cycles for manual operation ....:	C1 - C2 - C3 -	N/A
	- 750 cycles by using the test device ....:	C1 - C2 - C3 -	N/A
	- 750 cycles at a current of $I_{\Delta n}$ ....:	C1 - C2 - C3 -	N/A
	Test is made without load using manual operation:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- In ≤ 25 A; 2000 cycles ....:	C1 - C2 - C3 -	N/A
	- In > 25 A; 1000 cycles ....:	C1 – 1000 C2 – 1000 C3 – 1000	P
	After the test:		
	- no undue wear		P
	- no damage		P
	- no loosening of connections		P
	- no seepage of sealing compound		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	C1 – 25 C2 – 24 C3 – 28	P
	Dielectric strength test at a voltage of 900 V a.c. for 1 min:		
	a) ....:	C1 – 900 V, 1 min, 100 mA, OK C2 – 900 V, 1 min, 100 mA, OK C3 – 900 V, 1 min, 100 mA, OK	P
	b) ....:	C1 – 900 V, 1 min, 100 mA, OK C2 – 900 V, 1 min, 100 mA, OK C3 – 900 V, 1 min, 100 mA, OK	P
	c) ....:	C1 – 900 V, 1 min, 100 mA, OK C2 – 900 V, 1 min, 100 mA, OK C3 – 900 V, 1 min, 100 mA, OK	P
	d) ....:	C1 – 900 V, 1 min, 100 mA, OK C2 – 900 V, 1 min, 100 mA, OK C3 – 900 V, 1 min, 100 mA, OK	P
	e) ....:	C1 - C2 - C3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE D (3 samples) 2P(1P+N), 63 A, Type AC, 30 mA		

	Tests "D0"										
8.5	Operating characteristics										
	For multiple settings of $I_{\Delta n}$ tests are made for each setting										N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4										P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:										N/A
	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							--
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--
	a) value to be decided by the manufacturer for this test										--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4										--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C	21,2 °C									P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:										
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 – 6…30 mA in 30 s D2 – 6…30 mA in 30 s D3 – 6…30 mA in 30 s									P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 – 23,6…23,7 mA D2 – 22,8…23,6 mA D3 – 20,5…21,3 mA									P
9.9.2.2	Verification of the correct operation at closing on residual current										

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Clause	Requirement + Test	Result - Remark	Verdict
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 33 D2 – 28 D3 – 31	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 19 D2 – 39 D3 – 28	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 23 D2 – 21 D3 – 19	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 19 D2 – 15 D3 – 15	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 – D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 21 D2 – 18 D3 – 17	P
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A :		
	The test switch S_1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S_2		
	- maximum break time (ms) at: ___5__A (value 1 between 5A and 200A) ....:	D1 – 18 D2 – 15 D3 – 17	P
	- maximum break time (ms) at: ___10_A (value 2 between 5A and 200A) ....:	D1 – 15 D2 – 18 D3 – 21	P
	- maximum break time (ms) at: ___20_A (value 3 between 5A and 200A) ....:	D1 – 17 D2 – 20 D3 – 15	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: ___50_A (value 4 between 5A and 200A) ....:	D1 – 13 D2 – 13 D3 – 13	P
	- maximum break time (ms) at: __100_A (value 5 between 5A and 200A) ....:	D1 – 15 D2 – 11 D3 – 17	P
	- maximum break time (ms) at: __200_A (value 6 between 5A and 200A) ....:	D1 – 17 D2 – 10 D3 – 11	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.4	a) Tests repeated at a temperature of -5 °C: Obtained value -5,1 °C		
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 32 D2 – 27 D3 – 24	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 20 D2 – 27 D3 – 27	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – 18 D3 – 20	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 18 D2 – 18 D3 – 17	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.3	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): In, until steady state conditions are reached ....:	63 A, at 21,4 °C	—
	- cross-sectional area (mm²) ....:	16 mm²	—
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 37 D2 – 31 D3 – 32	P
	The switch S_1 and the RCCB are in closed position. The residual current is established by closing S_2 :		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 27 D2 – 24 D3 – 27	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 20 D2 – 20 D3 – 24	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 17 D2 – 17 D3 – 17	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 21 D2 – 21 D3 – 17	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.4	b) Tests repeated with the RCCB loaded with rated current:		
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ....:	63 A at 39,6 °C	—
	- cross-sectional area (mm²) ....:	16	—

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Clause	Requirement + Test	Result - Remark	Verdict
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 31 D2 – 27 D3 – 30	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 26 D2 – 18 D3 – 24	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 20 D2 – 18 D3 – 18	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 17 D2 – 18 D3 – 17	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Tests "D1"		
8.12	RCCBs functionally dependent on line voltage		
	RCCBs functionally dependent on the line voltage, shall operate correctly between 0,85 and 1,1 times their rated voltage; voltage (V) ....:		N/A
	Multipole RCCBs shall have all current paths supplied from the phases and neutral, if any		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		N/A
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		N/A
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		N/A
8.14	Behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19	Verification of behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19.1	Current surge test for all RCCBs (0,5μs/100kHz ring wave test)		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	- peak value: 200 A + 10/0%	D1 – 212 A D2 – 210 A D3 – 209 A	P
	- virtual front time: 0,5 μs ± 30%	0,5 μs	P
	- period of the following oscillatory wave: 10 μs ± 20%	10 μs	P
	- each successive reverse peak: about 60% of the preceding peak		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P

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Clause	Requirement + Test	Result - Remark	Verdict
	During the test the RCCB shall not trip ....:	D1 – OK D2 – OK D3 – OK	P
	- break time (ms) at: $I_{\Delta n}$ ....:	D1 – 28 D2 – 24 D3 – 27	P
9.19.2	Verification of behaviour at surge currents up to 3000A (8/20µs surge current)		
9.19.2.1	Test conditions		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	Peak value: 3000A +10/-0%	D1 – 3,04 kA D2 – 3,04 kA D3 – 3,07 kA	P
	Virtual front time: 0,8µs ± 20%	0,8 µs	P
	Virtual time of half value: 20µs ± 20%	20 µs	P
	Peak of reverse current: less than 30 % of peak value		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
9.19.2.2	S-type: During the test the RCCB shall not trip	D1 - D2 - D3 -	N/A
	- break time (ms) at $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
9.19.2.3	General type: During the test the RCCB may trip. After any tripping the RCCB shall be re-closed		P
	- break time (ms) at $I_{\Delta n}$ ....:	D1 – 28 D2 – 30 D3 – 24	P
8.15	Behaviour of RCCBs in case of earth fault currents comprising a d.c. component		
9.21	Verification of the correct operation at residual currents with d.c. components for RCCBs type A		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.21.1	RCCB installed as for normal use, test circuits according to fig. 5 and 6		N/A
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A
9.21.1.1	Verification of the correct operation in case of a continuous rise of the residual pulsating direct current (see Table 20):		
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 90° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 135° (+/-) ....:	D1 – D2 – D3 –	N/A
	No value exceeds the relevant specified limiting values		N/A
9.21.1.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle α = 0°)		
	For RCCBs functionally dependent on line voltage according to 4.1.2.2 a) the residual current is established by closing S1		N/A
	RCCBs with $I_{\Delta n}$ < 0,03 A:		
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,5 A rms (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n}$ = 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 0,35 A rms (+/-) ..:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n}$ > 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 7 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
9.21.1.3	Verification of the correct operation with the pole under test and one other pole loaded with rated current		

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Clause	Requirement + Test	Result - Remark	Verdict
	- test current (A): In ....:		—
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 90° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 135° (+/-) ....:	D1 – D2 – D3 –	N/A
	No value exceeds the relevant specified limiting values		N/A
9.21.1.4	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,006 A:		
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 6 mA) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting values		N/A
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta m}$ ....:	630 A	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	35 mm	—
	Prospective current (A) ....:	630 A	—
	Prospective current obtained (A) ....:	639 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Point of initiation: 45° ± 5°	45 °	P
	Test sequence: O-t-CO-t-CO on each pole in turn excluding the switched neutral pole	O-t-CO-t-CO t = 3 min	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	D1 - < 0,01 mA at 264 V D2 - < 0,01 mA at 264 V D3 - < 0,01 mA at 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		
	a) ....:	D1 – 480 V, 1min, 100 mA, OK D2 – 480 V, 1min, 100 mA, OK D3 – 480 V, 1min, 100 mA, OK	P
	b) ....:	D1 – 480 V, 1min, 100 mA, OK D2 – 480 V, 1min, 100 mA, OK D3 – 480 V, 1min, 100 mA, OK	P
	c) ....:	D1 – 480 V, 1min, 100 mA, OK D2 – 480 V, 1min, 100 mA, OK D3 – 480 V, 1min, 100 mA, OK	P
	d) ....:	D1 - D2 - D3 -	N/A
	e) ....:	D1 - D2 - D3 -	N/A
	No flashover or breakdown ....:	D1 – OK D2 – OK D3 – OK	P
	Making and breaking In at Un ....:	D1 – 63 A at 240 V D2 – 63 A at 240 V D3 – 63 A at 240 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	D1 – 23 D2 – 21 D3 – 25	P
	The polyethylene sheet shows no holes		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
8.11	Test device		
	RCCBs shall be provided with a test device		P
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere-turns produced by $I_{\Delta n}$	Ampere-turns (measured) 42,9mA-turns; 41,9mA-turns; 43,2mA-turns; not exceed 1,66 x 30 mA-1 turn 49,8 mA-turns	P
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		P
9.16	Verification of the operation of the test device at the limits of rated voltage:		
	a) RCCB at 0,85 times the rated voltage, test device actuated 25 times at intervals of 5 s ....:	D1 – 204 V D2 – 204 V D3 – 204 V	P
	b) test a) repeated at 1,1 times the rated voltage :	D1 – 264 V D2 – 264 V D3 – 264 V	P
	c) test b) repeated, but only once, the operating means of the test device being held in the closed position for 30 s ....:	D1 – OK D2 – OK D3 – OK	P
	RCCB operated at each test ....:	D1 – OK D2 – OK D3 – OK	P
	No change impairing further use ....:	D1 – OK D2 – OK D3 – OK	P
8.8	Resistance to mechanical shock and impact		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.12.1.2	Mechanical shock		P
	Mechanical shock: 50 falls of 40 mm on one side; 50 falls on opposite side C turned through 90°; 50 falls on one side; 50 falls on opposite side		P
	No opening of RCCB during the test ....:	D1 – OK D2 – OK D3 – OK	P
9.12.2	Mechanical impact		
9.12.2.1	Impact test (10 blows, height 10 cm): no damage :	D1 – OK D2 – OK D3 – OK	P
9.12.2.2	RCCBs for rail mounting downward vertical force of 50 N for 1 min, upward vertical force of 50 N for 1 min	50 N 1 min	P
	RCCB shall not become loose during test and no damage impairing its further use ....:	D1 – OK D2 – OK D3 – OK	N/A
9.12.2.3	RCCBs of plug-in type (under consideration)		N/A
8.13	Behaviour of RCCBs in case of overcurrents in the main circuit		
	RCCBs shall not operate under specified conditions of overcurrent		N/A
9.18.1	Verification of the limiting value of overcurrent in case of a load through a RCCB with two poles		
	RCCB connected as for normal use with a load equal to (A): 6 In switched on using a two-pole test switch for 1 s ....:	380 A, 1 s	P
	Test repeated three times with an interval of at least 1 min ....:	D1 – OK D2 – OK D3 – OK	P
	The RCCB shall not open ....:	D1 – OK D2 – OK D3 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs functionally dependent on the line voltage at rated voltage (Un) ....:		N/A
9.18.2	Verification of the limiting value of overcurrent in case of a single phase load through a three-pole or four-pole RCCB		
	RCCB connected according to fig. 22		N/A
	Test current (A): 6 In closed by S1 for 1 s ....:		—
	Test repeated three times for each possible combination of current paths with an interval of at least 1 min ....:	D1 - D2 - D3 -	N/A
	The RCCB shall not open ....:	D1 - D2 - D3 -	N/A
	RCCBs functionally dependent on the line voltage at rated voltage		N/A

	Tests "D2"		P
9.11.2.3c)	Verification of suitability in IT system: ....:	IT system	—
	Test circuit according to figure ....:	7	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	35	—
	Test voltage 105% of rated phase to neutral voltage for the pole exclusively for the neutral	240*1,1=264V	
	Test voltage 105% of rated phase to phase voltage for the other poles		
	Prospective current - 500A or - 10 I_n (A) ......:	630	
	Prospective current (A) ....:	630	—
	Prospective current obtained (A) ....:	648	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,96	—
	Point of initiation: 0 ± 5° for the first tested pole, shifted by 30° for the other poles		P
	Test sequence: O-t-CO on each pole in turn excluding the switched neutral pole		P

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Clause	Requirement + Test	Result - Remark	Verdict
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	D1 - < 0,1 mA D2 - < 0,1 mA D3 - < 0,1 mA	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		
	a) ....:	D1 - 2000 D2 - 2000 D3 - 2000	P
	b) ....:	D1 - 2000 D2 - 2000 D3 - 2000	P
	c) ....:	D1 - 2000 D2 - 2000 D3 - 2000	P
	d) ....:	D1 - 2000 D2 - 2000 D3 - 2000	P
	e) ....:	D1 - D2 - D3 -	N/A
	No flashover or breakdown ....:	D1 – OK D2 – OK D3 – OK	P
	Making and breaking In at Un ....:	D1 – OK D2 – OK D3 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	D1 – 21 D2 – 22 D3 – 23	P
	The polyethylene sheet shows no holes		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		

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Clause	Requirement + Test	Result - Remark	Verdict
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A

	TEST SEQUENCE D (1 sample) 2P(1P+N), 25 A, Type AC, 10 mA	

	Tests "D0"		
8.5	Operating characteristics		
	For multiple settings of $I_{\Delta n}$ tests are made for each setting		N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4		P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--

	a) value to be decided by the manufacturer for this test		--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4		--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C	20,3 °C	P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:		
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 – 2…10 mA in 30 s D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 – 7,21…7,65 mA D2 – D3 –	P
9.9.2.2	Verification of the correct operation at closing on residual current		
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 23 D2 – D3 –	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 25 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 – D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 20 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A :		
	The test switch S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		
	- maximum break time (ms) at: ___5__A (value 1 between 5A and 200A) ....:	D1 – 16 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: ___10_A (value 2 between 5A and 200A) ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: ___20_A (value 3 between 5A and 200A) ....:	D1 – 10 D2 – D3 –	P
	- maximum break time (ms) at: ___50_A (value 4 between 5A and 200A) ....:	D1 – 13 D2 – D3 –	P
	- maximum break time (ms) at: __100_A (value 5 between 5A and 200A) ....:	D1 – 11 D2 – D3 –	P
	- maximum break time (ms) at: __200_A (value 6 between 5A and 200A) ....:	D1 – 17 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.4	a) Tests repeated at a temperature of -5 °C: Obtained value -5,1 °C		
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 27 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 16 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 17 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.3	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): In, until steady state conditions are reached ....:	25 A, at 20,1 °C	—
	- cross-sectional area (mm²) ....:	4,0 mm²	—

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Clause	Requirement + Test	Result - Remark	Verdict
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 24 D2 – D3 –	P
	The switch S1 and the RCCB are in closed position. The residual current is established by closing S2 :		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 26 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 21 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 16 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.9.4	b) Tests repeated with the RCCB loaded with rated current:		
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ....:	25 A at 39,6 °C	—
	- cross-sectional area (mm²) ....:	4,0	—
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 25 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 14 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

	Tests "D1"		
8.12	RCCBs functionally dependent on line voltage		
	RCCBs functionally dependent on the line voltage, shall operate correctly between 0,85 and 1,1 times their rated voltage; voltage (V) ....:		N/A
	Multipole RCCBs shall have all current paths supplied from the phases and neutral, if any		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		N/A
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		N/A
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		N/A
8.14	Behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19	Verification of behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19.1	Current surge test for all RCCBs (0,5µs/100kHz ring wave test)		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	- peak value: 200 A + 10/0%	D1 – 212 A D2 – D3 –	P
	- virtual front time: 0,5 µs ± 30%	0,5 µs	P
	- period of the following oscillatory wave: 10 µs ± 20%	10 µs	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- each successive reverse peak: about 60% of the preceding peak		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
	During the test the RCCB shall not trip ....:	D1 – OK D2 – D3 –	P
	- break time (ms) at: $I_{\Delta n}$ ....:	D1 – 25 D2 – D3 –	P
9.19.2	Verification of behaviour at surge currents up to 3000A (8/20μs surge current)		
9.19.2.1	Test conditions		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	Peak value: 3000A +10/-0%	D1 – 3,04 kA D2 – D3 –	P
	Virtual front time: 0,8μs ± 20%	0,8 μs	P
	Virtual time of half value: 20μs ± 20%	20 μs	P
	Peak of reverse current: less than 30 % of peak value		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
9.19.2.2	S-type: During the test the RCCB shall not trip	D1 - D2 - D3 -	N/A
	- break time (ms) at $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
9.19.2.3	General type: During the test the RCCB may trip. After any tripping the RCCB shall be re-closed		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- break time (ms) at $I_{\Delta n}$ ....:	D1 – 25 D2 – D3 –	P
8.15	Behaviour of RCCBs in case of earth fault currents comprising a d.c. component		
9.21	Verification of the correct operation at residual currents with d.c. components for RCCBs type A		N/A
9.21.1	RCCB installed as for normal use, test circuits according to fig. 5 and 6		N/A
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A
9.21.1.1	Verification of the correct operation in case of a continuous rise of the residual pulsating direct current (see Table 20):		
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 90° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 135° (+/-) ....:	D1 – D2 – D3 –	N/A
	No value exceeds the relevant specified limiting values		N/A
9.21.1.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle α = 0°)		
	For RCCBs functionally dependent on line voltage according to 4.1.2.2 a) the residual current is established by closing S1		N/A
	RCCBs with $I_{\Delta n}$ < 0,03 A:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,5 A rms (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n}$ = 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 0,35 A rms (+/-) ..:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n}$ > 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 7 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
9.21.1.3	Verification of the correct operation with the pole under test and one other pole loaded with rated current		
	- test current (A): In ....:		—
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 90° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 135° (+/-) ....:	D1 – D2 – D3 –	N/A
	No value exceeds the relevant specified limiting values		N/A
9.21.1.4	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,006 A:		
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 6 mA) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting values		N/A
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta m}$ ....:	500 A	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	35 mm	—
	Prospective current (A) ....:	500 A	—
	Prospective current obtained (A) ....:	508A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°	45°	P
	Test sequence: O-t-CO-t-CO on each pole in turn excluding the switched neutral pole	O-t-CO-t-CO t = 3 min	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	D1 - < 0,01 mA at 264 V D2 - D3 -	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		
	a) ....:	D1 – 480 V, 1min, 100 mA, OK D2 – D3 –	P
	b) ....:	D1 – 480 V, 1min, 100 mA, OK D2 – D3 –	P
	c) ....:	D1 – 480 V, 1min, 100 mA, OK D2 – D3 –	P
	d) ....:	D1 - D2 - D3 -	N/A
	e) ....:	D1 - D2 - D3 -	N/A
	No flashover or breakdown ....:	D1 – OK D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Making and breaking In at Un ....:	D1 – 25 A at 240 V D2 – D3 –	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	D1 – 23 D2 – D3 –	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
8.11	Test device		
	RCCBs shall be provided with a test device		P
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere-turns produced by $I_{\Delta n}$	Ampere-turns (measured) 48,7mA- 2 turns not exceed 2,5 x 10 mA-2 turn 50 mA-turns	P
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		P
9.16	Verification of the operation of the test device at the limits of rated voltage:		
	a) RCCB at 0,85 times the rated voltage, test device actuated 25 times at intervals of 5 s ....:	D1 – 204 V D2 – D3 –	P
	b) test a) repeated at 1,1 times the rated voltage :	D1 – 264 V D2 – D3 –	P
	c) test b) repeated, but only once, the operating means of the test device being held in the closed position for 30 s ....:	D1 – OK D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB operated at each test ....:	D1 – OK D2 – D3 –	P
	No change impairing further use ....:	D1 – OK D2 – D3 –	P
8.8	Resistance to mechanical shock and impact		
	RCCBs shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.12.1.2	Mechanical shock		P
	Mechanical shock: 50 falls of 40 mm on one side; 50 falls on opposite side C turned through 90°; 50 falls on one side; 50 falls on opposite side		P
	No opening of RCCB during the test ....:	D1 – OK D2 – D3 –	P
9.12.2	Mechanical impact		
9.12.2.1	Impact test (10 blows, height 10 cm): no damage :	D1 – OK D2 – D3 –	P
9.12.2.2	RCCBs for rail mounting downward vertical force of 50 N for 1 min, upward vertical force of 50 N for 1 min	50 N 1 min	P
	RCCB shall not become loose during test and no damage impairing its further use ....:	D1 – OK D2 – D3 –	P
9.12.2.3	RCCBs of plug-in type (under consideration)		N/A
8.13	Behaviour of RCCBs in case of overcurrents in the main circuit		
	RCCBs shall not operate under specified conditions of overcurrent		N/A
9.18.1	Verification of the limiting value of overcurrent in case of a load through a RCCB with two poles		
	RCCB connected as for normal use with a load equal to (A): 6 In switched on using a two-pole test switch for 1 s ....:	60 A, 1 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test repeated three times with an interval of at least 1 min ....:	D1 – OK D2 – D3 –	P
	The RCCB shall not open ....:	D1 – OK D2 – D3 –	P
	RCCBs functionally dependent on the line voltage at rated voltage (Un) ....:		N/A
9.18.2	Verification of the limiting value of overcurrent in case of a single phase load through a three-pole or four-pole RCCB		
	RCCB connected according to fig. 22		N/A
	Test current (A): 6 In closed by S1 for 1 s ....:		—
	Test repeated three times for each possible combination of current paths with an interval of at least 1 min ....:	D1 - D2 - D3 -	N/A
	The RCCB shall not open ....:	D1 - D2 - D3 -	N/A
	RCCBs functionally dependent on the line voltage at rated voltage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	TEST SEQUENCE D (1 sample)	2P(1P+N), 63 A, Type A, 30 mA	
	Tests “D0”		
8.5	Operating characteristics		
	For multiple settings of $I_{\Delta n}$ tests are made for each setting		N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4		P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							Verdict
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--

Clause	Requirement + Test	Result - Remark	Verdict
	a) value to be decided by the manufacturer for this test		--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4		--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C	20,1 °C	P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:		
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 – 6…30 mA in 30 s D2 – D3 –	P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 – 22,3…23,3 mA D2 – D3 –	P
9.9.2.2	Verification of the correct operation at closing on residual current		

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Clause	Requirement + Test	Result - Remark	Verdict
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 34 D2 – D3 –	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 27 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 21 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 – D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 18 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A :		
	The test switch S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		
	- maximum break time (ms) at: ___5__A (value 1 between 5A and 200A) ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: ___10_A (value 2 between 5A and 200A) ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: ___20_A (value 3 between 5A and 200A) ....:	D1 – 16 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: ___50_A (value 4 between 5A and 200A) ....:	D1 – 13 D2 – D3 –	P
	- maximum break time (ms) at: __100_A (value 5 between 5A and 200A) ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: __200_A (value 6 between 5A and 200A) ....:	D1 – 10 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.4	a) Tests repeated at a temperature of -5 °C: Obtained value -5,1 °C		
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 30 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 22 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 18 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.3	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): In, until steady state conditions are reached ....:	63 A, at 21,2 °C	—
	- cross-sectional area (mm²) ....:	16 mm²	—
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 31 D2 – D3 –	P
	The switch S_1 and the RCCB are in closed position. The residual current is established by closing S_2 :		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 27 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 21 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 17 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.4	b) Tests repeated with the RCCB loaded with rated current:		
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ....:	63 A at 39,6 °C	—
	- cross-sectional area (mm²) ....:	16	—

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Clause	Requirement + Test	Result - Remark	Verdict
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 18 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Tests "D1"		
8.12	RCCBs functionally dependent on line voltage		
	RCCBs functionally dependent on the line voltage, shall operate correctly between 0,85 and 1,1 times their rated voltage; voltage (V) ....:		N/A
	Multipole RCCBs shall have all current paths supplied from the phases and neutral, if any		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		N/A
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		N/A
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		N/A
8.14	Behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19	Verification of behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19.1	Current surge test for all RCCBs (0,5µs/100kHz ring wave test)		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	- peak value: 200 A + 10/0%	D1 – 212 A D2 – D3 –	P
	- virtual front time: 0,5 µs ± 30%	0,5 µs	P
	- period of the following oscillatory wave: 10 µs ± 20%	10 µs	P
	- each successive reverse peak: about 60% of the preceding peak		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P

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Clause	Requirement + Test	Result - Remark	Verdict
	During the test the RCCB shall not trip ....:	D1 – OK D2 – D3 –	P
	- break time (ms) at: $I_{\Delta n}$ ....:	D1 –31 D2 – D3 –	P
9.19.2	Verification of behaviour at surge currents up to 3000A (8/20µs surge current)		
9.19.2.1	Test conditions		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	Peak value: 3000A +10/-0%	D1 – 3,04 kA D2 – D3 –	P
	Virtual front time: 0,8µs ± 20%	0,8 µs	P
	Virtual time of half value: 20µs ± 20%	20 µs	P
	Peak of reverse current: less than 30 % of peak value		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
9.19.2.2	S-type: During the test the RCCB shall not trip	D1 - D2 - D3 -	N/A
	- break time (ms) at $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
9.19.2.3	General type: During the test the RCCB may trip. After any tripping the RCCB shall be re-closed		P
	- break time (ms) at $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
8.15	Behaviour of RCCBs in case of earth fault currents comprising a d.c. component		
9.21	Verification of the correct operation at residual currents with d.c. components for RCCBs type A		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.21.1	RCCB installed as for normal use, test circuits according to fig. 5 and 6		P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A
9.21.1.1	Verification of the correct operation in case of a continuous rise of the residual pulsating direct current (see Table 20):		
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		P
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – 25,0-26,3 D2 – D3 –	P
	- angle α = 90° (+/-) ....:	D1 – 20,1-21,8 D2 – D3 –	P
	- angle α = 135° (+/-) ....:	D1 – 21,7-27,8 D2 – D3 –	P
	No value exceeds the relevant specified limiting values		P
9.21.1.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle α = 0°)		
	For RCCBs functionally dependent on line voltage according to 4.1.2.2 a) the residual current is established by closing S1		N/A
	RCCBs with $I_{\Delta n}$ < 0,03 A:		
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,5 A rms (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n}$ = 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 – 25/11 D2 - D3 –	P
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 – 11/22 D2 - D3 –	P
	- maximum break time (ms) at: 0,35 A rms (+/-) ..:	D1 – 9/9 D2 - D3 –	P
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 – 8/11 D2 - D3 -	P
	RCCBs with $I_{\Delta n}$ > 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 7 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
9.21.1.3	Verification of the correct operation with the pole under test and one other pole loaded with rated current		

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Clause	Requirement + Test	Result - Remark	Verdict
	- test current (A): In ....:	63	—
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		P
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – 22,9-32,0 D2 – D3 –	P
	- angle α = 90° (+/-) ....:	D1 – 24,2-30,2 D2 – D3 –	P
	- angle α = 135° (+/-) ....:	D1 – 30,0-33,7 D2 – D3 –	P
	No value exceeds the relevant specified limiting values		P
9.21.1.4	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,006 A:		
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		P
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 6 mA) ....:	D1 – 24,7-25,7 / 25,7-26,4 D2 - D3 -	P
	No value exceeds the relevant specified limiting values		P
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta m}$ ....:	630 A	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	35 mm	—
	Prospective current (A) ....:	630 A	—
	Prospective current obtained (A) ....:	639 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Point of initiation: 45° ± 5°	45°	P
	Test sequence: O-t-CO-t-CO on each pole in turn excluding the switched neutral pole	O-t-CO-t-CO t = 3 min	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	D1 - < 0,01 mA at 264 V D2 - D3 -	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		
	a) ....:	D1 – 480 V, 1min, 100 mA, OK D2 – D3 –	P
	b) ....:	D1 – 480 V, 1min, 100 mA, OK D2 – D3 –	P
	c) ....:	D1 – 480 V, 1min, 100 mA, OK D2 – D3 –	P
	d) ....:	D1 - D2 - D3 -	N/A
	e) ....:	D1 - D2 - D3 -	N/A
	No flashover or breakdown ....:	D1 – OK D2 – OK D3 – OK	P
	Making and breaking In at Un ....:	D1 – 63 A at 240 V D2 – D3 –	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	D1 – 23 D2 – D3 –	P
	The polyethylene sheet shows no holes		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ......:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ......:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ......:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ......:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ......:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ......:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ......:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
8.11	Test device		
	RCCBs shall be provided with a test device		P
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere-turns produced by $I_{\Delta n}$	Ampere-turns (measured) 42,9mA-turns not exceed 1,66 x 30 mA-1 turn 49,8 mA-turns	P
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		P
9.16	Verification of the operation of the test device at the limits of rated voltage:		
	a) RCCB at 0,85 times the rated voltage, test device actuated 25 times at intervals of 5 s ....:	D1 – 204 V D2 – D3 –	P
	b) test a) repeated at 1,1 times the rated voltage :	D1 – 264 V D2 – D3 –	P
	c) test b) repeated, but only once, the operating means of the test device being held in the closed position for 30 s ....:	D1 – OK D2 – D3 –	P
	RCCB operated at each test ....:	D1 – OK D2 – D3 –	P
	No change impairing further use ....:	D1 – OK D2 – D3 –	P
8.8	Resistance to mechanical shock and impact		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.12.1.2	Mechanical shock		P
	Mechanical shock: 50 falls of 40 mm on one side; 50 falls on opposite side C turned through 90°; 50 falls on one side; 50 falls on opposite side		P
	No opening of RCCB during the test ....:	D1 – OK D2 – D3 –	P
9.12.2	Mechanical impact		
9.12.2.1	Impact test (10 blows, height 10 cm): no damage :	D1 – OK D2 – D3 –	P
9.12.2.2	RCCBs for rail mounting downward vertical force of 50 N for 1 min, upward vertical force of 50 N for 1 min	50 N 1 min	P
	RCCB shall not become loose during test and no damage impairing its further use ....:	D1 – OK D2 – D3 –	P
9.12.2.3	RCCBs of plug-in type (under consideration)		N/A
8.13	Behaviour of RCCBs in case of overcurrents in the main circuit		
	RCCBs shall not operate under specified conditions of overcurrent		N/A
9.18.1	Verification of the limiting value of overcurrent in case of a load through a RCCB with two poles		
	RCCB connected as for normal use with a load equal to (A): 6 In switched on using a two-pole test switch for 1 s ....:	380 A, 1 s	P
	Test repeated three times with an interval of at least 1 min ....:	D1 – OK D2 – D3 –	P
	The RCCB shall not open ....:	D1 – OK D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCBs functionally dependent on the line voltage at rated voltage (Un) ....:		N/A
9.18.2	Verification of the limiting value of overcurrent in case of a single phase load through a three-pole or four-pole RCCB		
	RCCB connected according to fig. 22		N/A
	Test current (A): 6 In closed by S1 for 1 s ....:		—
	Test repeated three times for each possible combination of current paths with an interval of at least 1 min ....:	D1 - D2 - D3 -	N/A
	The RCCB shall not open ....:	D1 - D2 - D3 -	N/A
	RCCBs functionally dependent on the line voltage at rated voltage		N/A

	TEST SEQUENCE D (3 samples)	4P(3P+N), 63 A, Type AC, 30 mA	

	Tests "D0"		
8.5	Operating characteristics		
	For multiple settings of $I_{\Delta n}$ tests are made for each setting		N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4		P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--

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Clause	Requirement + Test	Result - Remark	Verdict

				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--

	a) value to be decided by the manufacturer for this test		--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4		--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C	21,2 °C	P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:		
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 – 6…30 mA in 30 s D2 – 6…30 mA in 30 s D3 – 6…30 mA in 30 s	P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 – 20,4…20,8 mA D2 – 24,1…24,7 mA D3 – 21,1…21,6mA	P
9.9.2.2	Verification of the correct operation at closing on residual current		
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 26 D2 – 41 D3 – 30	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 28 D2 – 41 D3 – 32	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 21 D2 – 27 D3 – 21	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 19 D2 – 23 D3 – 18	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 – D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 19 D2 – 19 D3 – 16	P
	No value exceeds the relevant specified limiting value		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A :		
	The test switch S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		
	- maximum break time (ms) at: ___5__A (value 1 between 5A and 200A) ....:	D1 – 13 D2 – 10 D3 – 13	P
	- maximum break time (ms) at: ___10_A (value 2 between 5A and 200A) ....:	D1 – 14 D2 – 13 D3 – 10	P
	- maximum break time (ms) at: ___20_A (value 3 between 5A and 200A) ....:	D1 – 11 D2 – 9 D3 – 9	P
	- maximum break time (ms) at: ___50_A (value 4 between 5A and 200A) ....:	D1 – 10 D2 – 12 D3 – 15	P
	- maximum break time (ms) at: __100_A (value 5 between 5A and 200A) ....:	D1 – 15 D2 – 15 D3 – 12	P
	- maximum break time (ms) at: __200_A (value 6 between 5A and 200A) ....:	D1 – 19 D2 – 13 D3 – 14	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ......:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.4	a) Tests repeated at a temperature of -5 °C: Obtained value -5,1 °C		
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ......:	D1 – 24 D2 – 23 D3 – 26	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ......:	D1 – 21 D2 – 24 D3 – 21	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ......:	D1 – 17 D2 – 17 D3 – 15	P
	- maximum break time (ms) at: 0,25 A (if applicable) ......:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ......:	D1 – 15 D2 – 15 D3 – 17	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ......:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ......:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.3	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): In, until steady state conditions are reached ....:	63 A, at 21,4 °C	—
	- cross-sectional area (mm²) ....:	16 mm²	—
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 24 D2 – 37 D3 – 27	P
	The switch S1 and the RCCB are in closed position. The residual current is established by closing S2 :		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 30 D2 – 27 D3 – 27	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 23 D2 – 21 D3 – 20	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – 15 D3 – 18	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 27 D2 – 15 D3 – 16	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.4	b) Tests repeated with the RCCB loaded with rated current:		
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ....:	63 A at 39,6 °C	—
	- cross-sectional area (mm²) ....:	16	—
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 27 D2 – 31 D3 – 21	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 21 D2 – 18 D3 – 23	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – 15 D3 – 18	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 20 D2 – 15 D3 – 15	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

	Tests "D1"		
8.12	RCCBs functionally dependent on line voltage		
	RCCBs functionally dependent on the line voltage, shall operate correctly between 0,85 and 1,1 times their rated voltage; voltage (V) ....:		N/A
	Multipole RCCBs shall have all current paths supplied from the phases and neutral, if any		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		N/A
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		N/A
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		N/A
8.14	Behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19	Verification of behaviour of RCCBs in case of current surges caused by impulse voltages		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.19.1	Current surge test for all RCCBs (0,5µs/100kHz ring wave test)		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	- peak value: 200 A + 10/0%	D1 – 212 A D2 – 210 A D3 – 209 A	P
	- virtual front time: 0,5 µs ± 30%	0,5 µs	P
	- period of the following oscillatory wave: 10 µs ± 20%	10 µs	P
	- each successive reverse peak: about 60% of the preceding peak		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
	During the test the RCCB shall not trip ....:	D1 – OK D2 – OK D3 – OK	P
	- break time (ms) at: $I_{\Delta n}$ ....:	D1 – 23 D2 – 25 D3 – 27	P
9.19.2	Verification of behaviour at surge currents up to 3000A (8/20µs surge current)		
9.19.2.1	Test conditions		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	Peak value: 3000A +10/-0%	D1 – 3,04 kA D2 – 3,04 kA D3 – 3,07 kA	P
	Virtual front time: 0,8µs ± 20%	0,8 µs	P
	Virtual time of half value: 20µs ± 20%	20 µs	P
	Peak of reverse current: less than 30 % of peak value		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.19.2.2	S-type: During the test the RCCB shall not trip	D1 - D2 - D3 -	N/A
	- break time (ms) at $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
9.19.2.3	General type: During the test the RCCB may trip. After any tripping the RCCB shall be re-closed		P
	- break time (ms) at $I_{\Delta n}$ ....:	D1 – 24 D2 – 26 D3 – 24	P
8.15	Behaviour of RCCBs in case of earth fault currents comprising a d.c. component		
9.21	Verification of the correct operation at residual currents with d.c. components for RCCBs type A		N/A
9.21.1	RCCB installed as for normal use, test circuits according to fig. 5 and 6		N/A
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A
9.21.1.1	Verification of the correct operation in case of a continuous rise of the residual pulsating direct current (see Table 20):		
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 90° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 135° (+/-) ....:	D1 – D2 – D3 –	N/A
	No value exceeds the relevant specified limiting values		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.21.1.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle $\alpha = 0°$)		
	For RCCBs functionally dependent on line voltage according to 4.1.2.2 a) the residual current is established by closing S1		N/A
	RCCBs with $I_{\Delta n} < 0{,}03$ A:		
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,5 A rms (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n} = 0{,}03$ A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 0,35 A rms (+/-) ..:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n} > 0{,}03$ A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 7 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
9.21.1.3	Verification of the correct operation with the pole under test and one other pole loaded with rated current		
	- test current (A): In ....:		—
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 90° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 135° (+/-) ....:	D1 – D2 – D3 –	N/A
	No value exceeds the relevant specified limiting values		N/A
9.21.1.4	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,006 A:		
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- angle α = 0° (+/-) (+/- 6 mA) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting values		N/A
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta m}$ ....:	630 A	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	35 mm	—
	Prospective current (A) ....:	630 A	—
	Prospective current obtained (A) ....:	639 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°	45°	P
	Test sequence: O-t-CO-t-CO on each pole in turn excluding the switched neutral pole	O-t-CO-t-CO t = 3 min	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	D1 - < 0,01 mA at 457 V D2 - < 0,01 mA at 457 V D3 - < 0,01 mA at 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		
	a) ....:	D1 – 830 V, 1min, 100 mA, OK D2 – 830 V, 1min, 100 mA, OK D3 – 830 V, 1min, 100 mA, OK	P
	b) ....:	D1 – 830 V, 1min, 100 mA, OK D2 – 830 V, 1min, 100 mA, OK D3 – 830 V, 1min, 100 mA, OK	P
	c) ....:	D1 – 830 V, 1min, 100 mA, OK D2 – 830 V, 1min, 100 mA, OK D3 – 830 V, 1min, 100 mA, OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) ....:	D1 - D2 - D3 -	N/A
	e) ....:	D1 - D2 - D3 -	N/A
	No flashover or breakdown ....:	D1 – OK D2 – OK D3 – OK	P
	Making and breaking In at Un ....:	D1 – 63 A at 415 V D2 – 63 A at 415 V D3 – 63 A at 415 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	D1 – 24 D2 – 23 D3 – 25	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
8.11	Test device		
	RCCBs shall be provided with a test device		P
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere-turns produced by $I_{\Delta n}$	Ampere-turns (measured) 42,9mA-turns; 41,9mA-turns; 43,2mA-turns; not exceed 1,66 x 30 mA-1 turn 49,8 mA-turns	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		P
9.16	Verification of the operation of the test device at the limits of rated voltage:		
	a) RCCB at 0,85 times the rated voltage, test device actuated 25 times at intervals of 5 s ....:	D1 – 353 V D2 – 353 V D3 – 353 V	P
	b) test a) repeated at 1,1 times the rated voltage :	D1 – 457 V D2 – 457 V D3 – 457 V	P
	c) test b) repeated, but only once, the operating means of the test device being held in the closed position for 30 s ....:	D1 – OK D2 – OK D3 – OK	P
	RCCB operated at each test ....:	D1 – OK D2 – OK D3 – OK	P
	No change impairing further use ....:	D1 – OK D2 – OK D3 – OK	P
8.8	Resistance to mechanical shock and impact		
	RCCBs shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.12.1.2	Mechanical shock		P
	Mechanical shock: 50 falls of 40 mm on one side; 50 falls on opposite side C turned through 90°; 50 falls on one side; 50 falls on opposite side		P
	No opening of RCCB during the test ....:	D1 – OK D2 – OK D3 – OK	P
9.12.2	Mechanical impact		
9.12.2.1	Impact test (10 blows, height 10 cm): no damage :	D1 – OK D2 – OK D3 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
9.12.2.2	RCCBs for rail mounting downward vertical force of 50 N for 1 min, upward vertical force of 50 N for 1 min	50 N 1 min	P
	RCCB shall not become loose during test and no damage impairing its further use ....:	D1 – OK D2 – OK D3 – OK	N/A
9.12.2.3	RCCBs of plug-in type (under consideration)		N/A
8.13	Behaviour of RCCBs in case of overcurrents in the main circuit		
	RCCBs shall not operate under specified conditions of overcurrent		N/A
9.18.1	Verification of the limiting value of overcurrent in case of a load through a RCCB with two poles		
	RCCB connected as for normal use with a load equal to (A): 6 In switched on using a two-pole test switch for 1 s ....:	380 A, 1 s	P
	Test repeated three times with an interval of at least 1 min ....:	D1 – OK D2 – OK D3 – OK	P
	The RCCB shall not open ....:	D1 – OK D2 – OK D3 – OK	P
	RCCBs functionally dependent on the line voltage at rated voltage (Un) ....:		N/A
9.18.2	Verification of the limiting value of overcurrent in case of a single phase load through a three-pole or four-pole RCCB		
	RCCB connected according to fig. 22		N/A
	Test current (A): 6 In closed by S1 for 1 s ....:		—
	Test repeated three times for each possible combination of current paths with an interval of at least 1 min ....:	D1 - D2 - D3 -	N/A
	The RCCB shall not open ....:	D1 - D2 - D3 -	N/A
	RCCBs functionally dependent on the line voltage at rated voltage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Tests "D2"		P
9.11.2.3c)	Verification of suitability in IT system: ....:	IT system	—
	Test circuit according to figure ....:	7	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	35	—
	Test voltage 105% of rated phase to neutral voltage for the pole exclusively for the neutral	240*1,1=264V	
	Test voltage 105% of rated phase to phase voltage for the other poles		
	Prospective current - 500A or - 10 I_n (A) ......:	630	
	Prospective current (A) ....:	630	—
	Prospective current obtained (A) ....:	648	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,96	—
	Point of initiation: 0 ± 5° for the first tested pole, shifted by 30° for the other poles		P
	Test sequence: O-t-CO on each pole in turn excluding the switched neutral pole		P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	D1 - < 0,1 mA D2 - < 0,1 mA D3 - < 0,1 mA	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		
	a) ....:	D1 - 2000 D2 - 2000 D3 - 2000	P
	b) ....:	D1 - 2000 D2 - 2000 D3 - 2000	P
	c) ....:	D1 - 2000 D2 - 2000 D3 - 2000	P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) ....:	D1 - 2000 D2 - 2000 D3 - 2000	P
	e) ....:	D1 - D2 - D3 -	N/A
	No flashover or breakdown ....:	D1 – OK D2 – OK D3 – OK	P
	Making and breaking In at Un ....:	D1 – OK D2 – OK D3 – OK	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	D1 – 16 D2 – 23 D3 – 21	P
	The polyethylene sheet shows no holes		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A

	TEST SEQUENCE D (1 sample) 4P(3P+N), 25 A, Type AC, 10 mA	

	Tests “D0”		
8.5	Operating characteristics		
	For multiple settings of $I_{\Delta n}$ tests are made for each setting		N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4		P

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Clause	Requirement + Test	Result - Remark	Verdict

Clause	Requirement + Test										Result - Remark	Verdict
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:											N/A
	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to								--
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A			--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times		--
			0,03	0,3	0,15	--	0,04	0,04	0,04			--
			>0,03	0,3	0,15	0,04	--	0,04	0,04			--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times		--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times		--
	a) value to be decided by the manufacturer for this test											--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4											--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C										20,3 °C	P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:											
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:										D1 – 2…10 mA in 30 s D2 – D3 –	P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:										D1 – 8,21…8,73 mA D2 – D3 –	P
9.9.2.2	Verification of the correct operation at closing on residual current											
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:										D1 – 24 D2 – D3 –	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1											
	- maximum break time (ms) at: $I_{\Delta n}$ ....:										D1 – 27 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 25 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 19 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 – D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 16 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A :		
	The test switch S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		
	- maximum break time (ms) at: ___5__A (value 1 between 5A and 200A) ....:	D1 – 17 D2 – D3 –	P
	- maximum break time (ms) at: ___10_A (value 2 between 5A and 200A) ....:	D1 – 16 D2 – D3 –	P
	- maximum break time (ms) at: ___20_A (value 3 between 5A and 200A) ....:	D1 – 14 D2 – D3 –	P
	- maximum break time (ms) at: ___50_A (value 4 between 5A and 200A) ....:	D1 – 10 D2 – D3 –	P
	- maximum break time (ms) at: __100_A (value 5 between 5A and 200A) ....:	D1 – 13 D2 – D3 –	P
	- maximum break time (ms) at: __200_A (value 6 between 5A and 200A) ....:	D1 – 15 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.4	a) Tests repeated at a temperature of -5 °C: Obtained value -5,1 °C		
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 27 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 15 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.3	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): In, until steady state conditions are reached ....:	25 A, at 20,1 °C	—
	- cross-sectional area (mm²) ....:	4,0 mm²	—
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 24 D2 – D3 –	P
	The switch S_1 and the RCCB are in closed position. The residual current is established by closing S_2 :		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 26 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 17 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.4	b) Tests repeated with the RCCB loaded with rated current:		
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ....:	25 A at 39,6 °C	—
	- cross-sectional area (mm²) ....:	4,0	—
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 26 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 21 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 15 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

	Tests "D1"		
8.12	RCCBs functionally dependent on line voltage		
	RCCBs functionally dependent on the line voltage, shall operate correctly between 0,85 and 1,1 times their rated voltage; voltage (V) ....:		N/A
	Multipole RCCBs shall have all current paths supplied from the phases and neutral, if any		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		N/A
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		N/A
8.14	Behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19	Verification of behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19.1	Current surge test for all RCCBs (0,5µs/100kHz ring wave test)		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	- peak value: 200 A + 10/0%	D1 – 212 A D2 – D3 –	P
	- virtual front time: 0,5 µs ± 30%	0,5 µs	P
	- period of the following oscillatory wave: 10 µs ± 20%	10 µs	P
	- each successive reverse peak: about 60% of the preceding peak		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
	During the test the RCCB shall not trip ....:	D1 – OK D2 – D3 –	P
	- break time (ms) at: $I_{\Delta n}$ ....:	D1 – 28 D2 – D3 –	P
9.19.2	Verification of behaviour at surge currents up to 3000A (8/20µs surge current)		
9.19.2.1	Test conditions		P

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Clause	Requirement + Test	Result - Remark	Verdict
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	Peak value: 3000A +10/-0%	D1 – 3,04 kA D2 – D3 –	P
	Virtual front time: 0,8µs ± 20%	0,8 µs	P
	Virtual time of half value: 20µs ± 20%	20 µs	P
	Peak of reverse current: less than 30 % of peak value		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
9.19.2.2	S-type: During the test the RCCB shall not trip	D1 - D2 - D3 -	N/A
	- break time (ms) at $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
9.19.2.3	General type: During the test the RCCB may trip. After any tripping the RCCB shall be re-closed		P
	- break time (ms) at $I_{\Delta n}$ ....:	D1 – 25 D2 – D3 –	P
8.15	Behaviour of RCCBs in case of earth fault currents comprising a d.c. component		
9.21	Verification of the correct operation at residual currents with d.c. components for RCCBs type A		N/A
9.21.1	RCCB installed as for normal use, test circuits according to fig. 5 and 6		N/A
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A
9.21.1.1	Verification of the correct operation in case of a continuous rise of the residual pulsating direct current (see Table 20):		
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq 0{,}01$ A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 90° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 135° (+/-) ....:	D1 – D2 – D3 –	N/A
	No value exceeds the relevant specified limiting values		N/A
9.21.1.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle α = 0°)		
	For RCCBs functionally dependent on line voltage according to 4.1.2.2 a) the residual current is established by closing S1		N/A
	RCCBs with $I_{\Delta n}$ < 0,03 A:		
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,5 A rms (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n}$ = 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 –	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 0,35 A rms (+/-) ..:	D1 - D2 - D3 –	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n}$ > 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 7 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
9.21.1.3	Verification of the correct operation with the pole under test and one other pole loaded with rated current		
	- test current (A): In ....:		—
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – D2 – D3 –	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- angle α = 90° (+/-) ....:	D1 – D2 – D3 –	N/A
	- angle α = 135° (+/-) ....:	D1 – D2 – D3 –	N/A
	No value exceeds the relevant specified limiting values		N/A
9.21.1.4	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,006 A:		
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 6 mA) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting values		N/A
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta m}$ ....:	500 A	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	35 mm	—
	Prospective current (A) ....:	500 A	—
	Prospective current obtained (A) ....:	508A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°	45°	P
	Test sequence: O-t-CO-t-CO on each pole in turn excluding the switched neutral pole	O-t-CO-t-CO t = 3 min	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	D1 - < 0,01 mA at 457 V D2 - D3 -	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		
	a) ....:	D1 – 830 V, 1min, 100 mA, OK D2 – D3 –	P
	b) ....:	D1 – 830 V, 1min, 100 mA, OK D2 – D3 –	P
	c) ....:	D1 – 830 V, 1min, 100 mA, OK D2 – D3 –	P
	d) ....:	D1 - D2 - D3 -	N/A
	e) ....:	D1 - D2 - D3 -	N/A
	No flashover or breakdown ....:	D1 – OK D2 – D3 –	P
	Making and breaking In at Un ....:	D1 – 25 A at 415 V D2 – D3 –	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	D1 – 21 D2 – D3 –	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
8.11	Test device		
	RCCBs shall be provided with a test device		P
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere-turns produced by $I_{\Delta n}$	Ampere-turns (measured) 48,7mA- 2 turns not exceed 2,5 x 10 mA-2 turn 50 mA-turns	P
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		P
9.16	Verification of the operation of the test device at the limits of rated voltage:		
	a) RCCB at 0,85 times the rated voltage, test device actuated 25 times at intervals of 5 s ....:	D1 – 332 V D2 – D3 –	P
	b) test a) repeated at 1,1 times the rated voltage :	D1 – 457 V D2 – D3 –	P
	c) test b) repeated, but only once, the operating means of the test device being held in the closed position for 30 s ....:	D1 – OK D2 – D3 –	P
	RCCB operated at each test ....:	D1 – OK D2 – D3 –	P
	No change impairing further use ....:	D1 – OK D2 – D3 –	P
8.8	Resistance to mechanical shock and impact		
	RCCBs shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.12.1.2	Mechanical shock		P
	Mechanical shock: 50 falls of 40 mm on one side; 50 falls on opposite side C turned through 90°; 50 falls on one side; 50 falls on opposite side		P

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Clause	Requirement + Test	Result - Remark	Verdict
	No opening of RCCB during the test ....:	D1 – OK D2 – D3 –	P
9.12.2	Mechanical impact		
9.12.2.1	Impact test (10 blows, height 10 cm): no damage :	D1 – OK D2 – D3 –	P
9.12.2.2	RCCBs for rail mounting downward vertical force of 50 N for 1 min, upward vertical force of 50 N for 1 min	50 N 1 min	P
	RCCB shall not become loose during test and no damage impairing its further use ....:	D1 – OK D2 – D3 –	P
9.12.2.3	RCCBs of plug-in type (under consideration)		N/A
8.13	Behaviour of RCCBs in case of overcurrents in the main circuit		
	RCCBs shall not operate under specified conditions of overcurrent		N/A
9.18.1	Verification of the limiting value of overcurrent in case of a load through a RCCB with two poles		
	RCCB connected as for normal use with a load equal to (A): 6 In switched on using a two-pole test switch for 1 s ....:	150 A, 1 s	P
	Test repeated three times with an interval of at least 1 min ....:	D1 – OK D2 – D3 –	P
	The RCCB shall not open ....:	D1 – OK D2 – D3 –	P
	RCCBs functionally dependent on the line voltage at rated voltage (Un) ....:		N/A
9.18.2	Verification of the limiting value of overcurrent in case of a single phase load through a three-pole or four-pole RCCB		
	RCCB connected according to fig. 22		N/A
	Test current (A): 6 In closed by S1 for 1 s ....:		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Test repeated three times for each possible combination of current paths with an interval of at least 1 min ....:	D1 - D2 - D3 -	N/A
	The RCCB shall not open ....:	D1 - D2 - D3 -	N/A
	RCCBs functionally dependent on the line voltage at rated voltage		N/A

	TEST SEQUENCE D (1 sample)	4P(3P+N), 63 A, Type A, 30 mA	

	Tests "D0"		
8.5	Operating characteristics		
	For multiple settings of $I_{\Delta n}$ tests are made for each setting		N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4		P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A

Clause	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							Verdict
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--

	a) value to be decided by the manufacturer for this test		--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4		--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C	20,1 °C	P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 – 6…30 mA in 30 s D2 – D3 –	P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 – 20,2…21,7 mA D2 – D3 –	P
9.9.2.2	Verification of the correct operation at closing on residual current		
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 32 D2 – D3 –	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 21 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 – D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 17 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A :		
	The test switch S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: ___5__A (value 1 between 5A and 200A) ....:	D1 – 27 D2 – D3 –	P
	- maximum break time (ms) at: ___10_A (value 2 between 5A and 200A) ....:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: ___20_A (value 3 between 5A and 200A) ....:	D1 – 16 D2 – D3 –	P
	- maximum break time (ms) at: ___50_A (value 4 between 5A and 200A) ....:	D1 – 13 D2 – D3 –	P
	- maximum break time (ms) at: __100_A (value 5 between 5A and 200A) ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: __200_A (value 6 between 5A and 200A) ....:	D1 – 10 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.4	a) Tests repeated at a temperature of -5 °C: Obtained value -5,1 °C		

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Clause	Requirement + Test	Result - Remark	Verdict
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 27 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 16 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.3	Tests repeated with the RCCB loaded with rated current:		P

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Clause	Requirement + Test	Result - Remark	Verdict
	- test current (A): In, until steady state conditions are reached ....:	63 A, at 21,2 °C	—
	- cross-sectional area (mm²) ....:	16 mm²	—
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 27 D2 – D3 –	P
	The switch S_1 and the RCCB are in closed position. The residual current is established by closing S_2 :		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 27 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 25 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 15 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ...:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.4	b) Tests repeated with the RCCB loaded with rated current:		
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ...:	63 A at 39,6 °C	—
	- cross-sectional area (mm²) ...:	16	—
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ...:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ...:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ...:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ...:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ...:	D1 – 17 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ...:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

	Tests "D1"		
8.12	RCCBs functionally dependent on line voltage		
	RCCBs functionally dependent on the line voltage, shall operate correctly between 0,85 and 1,1 times their rated voltage; voltage (V) ....:		N/A
	Multipole RCCBs shall have all current paths supplied from the phases and neutral, if any		N/A
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		N/A
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		N/A
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		N/A
8.14	Behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19	Verification of behaviour of RCCBs in case of current surges caused by impulse voltages		P
9.19.1	Current surge test for all RCCBs (0,5µs/100kHz ring wave test)		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	- peak value: 200 A + 10/0%	D1 – 212 A D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- virtual front time: 0,5 µs ± 30%	0,5 µs	P
	- period of the following oscillatory wave: 10 µs ± 20%	10 µs	P
	- each successive reverse peak: about 60% of the preceding peak		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
	During the test the RCCB shall not trip ....:	D1 – OK D2 – D3 –	P
	- break time (ms) at: $I_{\Delta n}$ ....:	D1 –25 D2 – D3 –	P
9.19.2	Verification of behaviour at surge currents up to 3000A (8/20µs surge current)		
9.19.2.1	Test conditions		P
	One pole of the RCCB is submitted to 10 applications of a surge current according to the following requirements:		P
	Peak value: 3000A +10/-0%	D1 – 3,04 kA D2 – D3 –	P
	Virtual front time: 0,8µs ± 20%	0,8 µs	P
	Virtual time of half value: 20µs ± 20%	20 µs	P
	Peak of reverse current: less than 30 % of peak value		P
	The polarity shall be inverted after every two applications		P
	The interval between two consecutive applications shall be about 30 s		P
9.19.2.2	S-type: During the test the RCCB shall not trip	D1 - D2 - D3 -	N/A
	- break time (ms) at $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.19.2.3	General type: During the test the RCCB may trip. After any tripping the RCCB shall be re-closed		P
	- break time (ms) at $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
8.15	Behaviour of RCCBs in case of earth fault currents comprising a d.c. component		
9.21	Verification of the correct operation at residual currents with d.c. components for RCCBs type A		P
9.21.1	RCCB installed as for normal use, test circuits according to fig. 5 and 6		P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A
9.21.1.1	Verification of the correct operation in case of a continuous rise of the residual pulsating direct current (see Table 20):		
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		P
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – 24,7-26,3 / 20,8-22,3 D2 – D3 –	P
	- angle α = 90° (+/-) ....:	D1 – 20,4-22,3 / 20,3-21,6 D2 – D3 –	P
	- angle α = 135° (+/-) ....:	D1 – 21,3-27,5 / 22,4-27,2 D2 – D3 –	P
	No value exceeds the relevant specified limiting values		P
9.21.1.2	Verification of the correct operation in case of suddenly appearing residual pulsating direct currents by closing S2 (angle α = 0°)		
	For RCCBs functionally dependent on line voltage according to 4.1.2.2 a) the residual current is established by closing S1		N/A
	RCCBs with $I_{\Delta n}$ < 0,03 A:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,5 A rms (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	RCCBs with $I_{\Delta n}$ = 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 – 10/20 D2 - D3 –	P
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 – 13/11 D2 - D3 –	P
	- maximum break time (ms) at: 0,35 A rms (+/-) ..:	D1 – 10/12 D2 - D3 –	P
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 – 9/10 D2 - D3 -	P
	RCCBs with $I_{\Delta n}$ > 0,03 A:		
	- maximum break time (ms) at: 1,4 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2,8 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 7 $I_{\Delta n}$ (+/-) ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 350 A rms (+/-) ...:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
9.21.1.3	Verification of the correct operation with the pole under test and one other pole loaded with rated current		
	- test current (A): In ....:	63	—
	- steady increase from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		P
	- steady increase from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) ....:	D1 – 22,7-26,1 / 22,6-26,2 D2 – D3 –	P
	- angle α = 90° (+/-) ....:	D1 – 20,7-23,4 / 20,4-23,5 D2 – D3 –	P
	- angle α = 135° (+/-) ....:	D1 – 22,6-27,6 / 22,8-27,2 D2 – D3 –	P
	No value exceeds the relevant specified limiting values		P
9.21.1.4	Verification of the correct operation in case of residual pulsating d.c. currents with angle α = 0° superimposed by smooth direct current of 0,006 A:		
	- steady increase of pulsating d.c. current from zero to: 1,4 $I_{\Delta n}$ for $I_{\Delta n}$ > 0,01 A with 1,4 $I_{\Delta n}$ /30 A/s (mA)		P
	- steady increase of pulsating d.c. current from zero to: 2 $I_{\Delta n}$ for $I_{\Delta n} \leq$ 0,01 A with 2 $I_{\Delta n}$ /30 A/s (mA)		N/A
	- angle α = 0° (+/-) (+/- 6 mA) ....:	D1 – 22,5-25,6 / 23,2-26,4 D2 - D3 -	P
	No value exceeds the relevant specified limiting values		P
9.11.2.3	Verification of the rated residual making and breaking capacity (A): $I_{\Delta m}$ ....:	630 A	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	35 mm	—
	Prospective current (A) ....:	630 A	—
	Prospective current obtained (A) ....:	639 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°	45°	P
	Test sequence: O-t-CO-t-CO on each pole in turn excluding the switched neutral pole	O-t-CO-t-CO t = 3 min	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	D1 - < 0,01 mA at 457 V D2 - D3 -	P
9.7.3	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		
	a) ....:	D1 – 830 V, 1min, 100 mA, OK D2 – D3 –	P
	b) ....:	D1 – 830 V, 1min, 100 mA, OK D2 – D3 –	P
	c) ....:	D1 – 830 V, 1min, 100 mA, OK D2 – D3 –	P
	d) ....:	D1 - D2 - D3 -	N/A
	e) ....:	D1 - D2 - D3 -	N/A
	No flashover or breakdown ....:	D1 – OK D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Making and breaking In at Un ....:	D1 – 63 A at 415 V D2 – D3 –	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	D1 – 25 D2 – D3 –	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	D1 - D2 - D3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	D1 - D2 - D3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 - D2 - D3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 - D2 - D3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 - D2 - D3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 - D2 - D3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
8.11	Test device		
	RCCBs shall be provided with a test device		P
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere-turns produced by $I_{\Delta n}$	Ampere-turns (measured) 42,9mA-turns not exceed 1,66 x 30 mA-1 turn 49,8 mA-turns	P
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		P
9.16	Verification of the operation of the test device at the limits of rated voltage:		
	a) RCCB at 0,85 times the rated voltage, test device actuated 25 times at intervals of 5 s ....:	D1 – 332 V D2 – D3 –	P
	b) test a) repeated at 1,1 times the rated voltage :	D1 – 457 V D2 – D3 –	P
	c) test b) repeated, but only once, the operating means of the test device being held in the closed position for 30 s ....:	D1 – OK D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB operated at each test ....:	D1 – OK D2 – D3 –	P
	No change impairing further use ....:	D1 – OK D2 – D3 –	P
8.8	Resistance to mechanical shock and impact		
	RCCBs shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.12.1.2	Mechanical shock		P
	Mechanical shock: 50 falls of 40 mm on one side; 50 falls on opposite side C turned through 90°; 50 falls on one side; 50 falls on opposite side		P
	No opening of RCCB during the test ....:	D1 – OK D2 – D3 –	P
9.12.2	Mechanical impact		
9.12.2.1	Impact test (10 blows, height 10 cm): no damage :	D1 – OK D2 – D3 –	P
9.12.2.2	RCCBs for rail mounting downward vertical force of 50 N for 1 min, upward vertical force of 50 N for 1 min	50 N 1 min	P
	RCCB shall not become loose during test and no damage impairing its further use ....:	D1 – OK D2 – D3 –	P
9.12.2.3	RCCBs of plug-in type (under consideration)		N/A
8.13	Behaviour of RCCBs in case of overcurrents in the main circuit		
	RCCBs shall not operate under specified conditions of overcurrent		N/A
9.18.1	Verification of the limiting value of overcurrent in case of a load through a RCCB with two poles		
	RCCB connected as for normal use with a load equal to (A): 6 In switched on using a two-pole test switch for 1 s ....:	380 A, 1 s	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Test repeated three times with an interval of at least 1 min ....:	D1 – OK D2 – D3 –	P
	The RCCB shall not open ....:	D1 – OK D2 – D3 –	P
	RCCBs functionally dependent on the line voltage at rated voltage (Un) ....:		N/A
9.18.2	Verification of the limiting value of overcurrent in case of a single phase load through a three-pole or four-pole RCCB		
	RCCB connected according to fig. 22		N/A
	Test current (A): 6 In closed by S1 for 1 s ....:		—
	Test repeated three times for each possible combination of current paths with an interval of at least 1 min ....:	D1 - D2 - D3 -	N/A
	The RCCB shall not open ....:	D1 - D2 - D3 -	N/A
	RCCBs functionally dependent on the line voltage at rated voltage		N/A

	TEST SEQUENCE D0 (1 sample)	2P(1P+N), 63 A, Type AC, 100 mA	

	Tests “D0”		
8.5	Operating characteristics		
	For multiple settings of $I_{\Delta n}$ tests are made for each setting		N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4		P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--

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Clause	Requirement + Test	Result - Remark	Verdict

	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--

	a) value to be decided by the manufacturer for this test		--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4		--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C	21,2 °C	P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:		
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 – 20…100 mA in 30 s D2 – D3 –	P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 – 66,1…69,3 mA D2 – D3 –	P
9.9.2.2	Verification of the correct operation at closing on residual current		
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 23 D2 – D3 –	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 26 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 19 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 20 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 – D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 19 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A :		
	The test switch S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		
	- maximum break time (ms) at: ___5__A (value 1 between 5A and 200A) ....:	D1 – 17 D2 – D3 –	P
	- maximum break time (ms) at: ___10_A (value 2 between 5A and 200A) ....:	D1 – 14 D2 – D3 –	P
	- maximum break time (ms) at: ___20_A (value 3 between 5A and 200A) ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: ___50_A (value 4 between 5A and 200A) ....:	D1 – 12 D2 – D3 –	P
	- maximum break time (ms) at: __100_A (value 5 between 5A and 200A) ....:	D1 – 11 D2 – D3 –	P
	- maximum break time (ms) at: __200_A (value 6 between 5A and 200A) ....:	D1 – 10 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.4	a) Tests repeated at a temperature of -5 °C: Obtained value -5,1 °C		
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 17 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.3	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): In, until steady state conditions are reached ....:	63 A, at 21,2 °C	—
	- cross-sectional area (mm²) ....:	16 mm²	—
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 27 D2 – D3 –	P
	The switch S1 and the RCCB are in closed position. The residual current is established by closing S2 :		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 27 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 21 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 18 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.4	b) Tests repeated with the RCCB loaded with rated current:		
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ....:	63 A at 39,6 °C	—
	- cross-sectional area (mm²) ....:	16	—
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 25 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 21 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 13 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

	TEST SEQUENCE D0 (1 sample)	2P(1P+N), 63 A, Type AC, 300 mA	

	Tests "D0"		
8.5	Operating characteristics		
	For multiple settings of $I_{\Delta n}$ tests are made for each setting		N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4		P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							
											--
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--

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Clause	Requirement + Test									Result - Remark		Verdict
			>0,03	0,3	0,15	0,04	--	0,04	0,04			--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times		--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times		--
	a) value to be decided by the manufacturer for this test											--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4											--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C									20,6 °C		P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:											
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:									D1 – 60…300 mA in 30 s D2 – D3 –		P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:									D1 – 224…207 mA D2 – D3 –		P
9.9.2.2	Verification of the correct operation at closing on residual current											
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:									D1 – 29 D2 – D3 –		P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1											
	- maximum break time (ms) at: $I_{\Delta n}$ ....:									D1 – 33 D2 – D3 –		P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:									D1 – 13 D2 – D3 –		P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:									D1 – 13 D2 – D3 –		P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:									D1 – D2 - D3 -		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 500 A ....:	D1 – 14 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A :		
	The test switch S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		
	- maximum break time (ms) at: ___5__A (value 1 between 5A and 200A) ....:	D1 – 8 D2 – D3 –	P
	- maximum break time (ms) at: ___10_A (value 2 between 5A and 200A) ....:	D1 – 9 D2 – D3 –	P
	- maximum break time (ms) at: ___20_A (value 3 between 5A and 200A) ....:	D1 – 12 D2 – D3 –	P
	- maximum break time (ms) at: ___50_A (value 4 between 5A and 200A) ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: __100_A (value 5 between 5A and 200A) ....:	D1 – 10 D2 – D3 –	P
	- maximum break time (ms) at: __200_A (value 6 between 5A and 200A) ....:	D1 – 9 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.4	a) Tests repeated at a temperature of -5 °C: Obtained value -5,1 °C		
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 26 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 14 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ...:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ...:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.3	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): In, until steady state conditions are reached ...:	63 A, at 21,2 °C	—
	- cross-sectional area (mm²) ...:	16 mm²	—
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ...:	D1 – 27 D2 – D3 –	P
	The switch S1 and the RCCB are in closed position. The residual current is established by closing S2 :		
	- maximum break time (ms) at: $I_{\Delta n}$ ...:	D1 – 25 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ...:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ...:	D1 – 17 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ...:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ...:	D1 – 14 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.4	b) Tests repeated with the RCCB loaded with rated current:		
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ....:	63 A at 39,6 °C	—
	- cross-sectional area (mm²) ....:	16	—
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 23 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 13 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict

	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

	TEST SEQUENCE D0 (1 sample) 2P(1P+N), 63 A, Type AC, 500 mA		

	Tests "D0"										
8.5	Operating characteristics										
	For multiple settings of $I_{\Delta n}$ tests are made for each setting										N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4										P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:										N/A
	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							--
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--

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Clause	Requirement + Test	Result - Remark	Verdict

	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--

	a) value to be decided by the manufacturer for this test		--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4		--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C	20,6 °C	P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:		
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ...:	D1 – 100…500 mA in 30 s D2 – D3 –	P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 – 380…383 mA D2 – D3 –	P
9.9.2.2	Verification of the correct operation at closing on residual current		
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 30 D2 – D3 –	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 30 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 19 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ...:	D1 – D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 15 D2 – D3 –	P

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Clause	Requirement + Test	Result - Remark	Verdict
	No value exceeds the relevant specified limiting value		P
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A :		
	The test switch S_1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S_2		
	- maximum break time (ms) at: ___5__A (value 1 between 5A and 200A) ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: ___10_A (value 2 between 5A and 200A) ....:	D1 – 13 D2 – D3 –	P
	- maximum break time (ms) at: ___20_A (value 3 between 5A and 200A) ....:	D1 – 11 D2 – D3 –	P
	- maximum break time (ms) at: ___50_A (value 4 between 5A and 200A) ....:	D1 – 12 D2 – D3 –	P
	- maximum break time (ms) at: __100_A (value 5 between 5A and 200A) ....:	D1 – 13 D2 – D3 –	P
	- maximum break time (ms) at: __200_A (value 6 between 5A and 200A) ....:	D1 – 10 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.4	a) Tests repeated at a temperature of -5 °C: Obtained value -5,1 °C		
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 27 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 23 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 12 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.3	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): In, until steady state conditions are reached ....:	63 A, at 21,2 °C	—
	- cross-sectional area (mm²) ....:	16 mm²	—
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 32 D2 – D3 –	P
	The switch S1 and the RCCB are in closed position. The residual current is established by closing S2 :		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 30 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 19 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 13 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.4	b) Tests repeated with the RCCB loaded with rated current:		
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ....:	63 A at 39,6 °C	—
	- cross-sectional area (mm²) ....:	16	—
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 27 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 15 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

	TEST SEQUENCE D0 (1 sample)	2P(1P+N), 63 A, Type A, 100 mA	

	Tests "D0"		
8.5	Operating characteristics		
	For multiple settings of $I_{\Delta n}$ tests are made for each setting		N/A
9.9.1	RCCB installed as for normal use, test circuit according to fig. 4		P
9.9.5	For RCCBs functionally dependent on line voltage, each test is made at 1,1 and 0,85 times the rated line voltage; voltage (V) ....:		N/A

	Type	I_N A	$I_{\Delta N}$ A	Standard values of break time and non-actuating time at a residual current equal to							
											--
				$I_{\Delta N}$	2 $I_{\Delta N}$	5 $I_{\Delta N}$	5 $I_{\Delta N}$ or 0,25A **a)**	5A-200A, **b)**	500A		--
	General	Any value	<0,03	0,3	0,15	--	0,04	0,04	0,04	Max. break times	--
			0,03	0,3	0,15	--	0,04	0,04	0,04		--
			>0,03	0,3	0,15	0,04	--	0,04	0,04		--
	S	≥ 25	>0,03	0,5	0,2	0,15	--	0,15	0,15	Max. break times	--
				0,13	0,06	0,05	--	0,04	0,04	Min. non-actuating times	--

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Clause	Requirement + Test	Result - Remark	Verdict
	a) value to be decided by the manufacturer for this test		--
	b) The test are only made during verification of the correct operation as mentioned in 9.9.2.4		--
9.9.2	Off-load tests made at a temperature of 20 ± 2 °C	20,6 °C	P
9.9.2.1	Verification of the correct operation in case of a steady increase residual current:		
	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	D1 – 20…100 mA in 30 s D2 – D3 –	P
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	D1 – 67,3…68,6 mA D2 – D3 –	P
9.9.2.2	Verification of the correct operation at closing on residual current		
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	D1 – 27 D2 – D3 –	P
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 – D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 17 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P

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Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.4	Verification of the correct operation in case of sudden appearance of residual current of values between 5 $I_{\Delta n}$ and 500A :		
	The test switch S1 and the RCCB being in the closed position, the residual current is suddenly established by closing the test switch S2		
	- maximum break time (ms) at: ___5__A (value 1 between 5A and 200A) ....:	D1 – 17 D2 – D3 –	P
	- maximum break time (ms) at: ___10_A (value 2 between 5A and 200A) ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: ___20_A (value 3 between 5A and 200A) ....:	D1 – 15 D2 – D3 –	P
	- maximum break time (ms) at: ___50_A (value 4 between 5A and 200A) ....:	D1 – 13 D2 – D3 –	P
	- maximum break time (ms) at: __100_A (value 5 between 5A and 200A) ....:	D1 – 11 D2 – D3 –	P
	- maximum break time (ms) at: __200_A (value 6 between 5A and 200A) ....:	D1 – 10 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during tests		N/A
9.9.4	a) Tests repeated at a temperature of -5 °C: Obtained value -5,1 °C		
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 25 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 20 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 21 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 18 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$: 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ......:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.3	Tests repeated with the RCCB loaded with rated current:		P
	- test current (A): In, until steady state conditions are reached ......:	63 A, at 21,2 ℃	—
	- cross-sectional area (mm^2) ......:	16 mm^2	—
	- the RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ......:	D1 – 27 D2 – D3 –	P
	The switch S1 and the RCCB are in closed position. The residual current is established by closing S2 :		
	- maximum break time (ms) at: $I_{\Delta n}$ ......:	D1 – 24 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ......:	D1 – 21 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ......:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ......:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ......:	D1 – 15 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A
9.9.4	b) Tests repeated with the RCCB loaded with rated current:		
	- test current (A): In at a temperature of +40 °C: until steady state conditions are reached ....:	63 A at 39,6 °C	—
	- cross-sectional area (mm²) ....:	16	—
	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		P
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	D1 – 25 D2 – D3 –	P
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	D1 – 21 D2 – D3 –	P
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	D1 – 18 D2 – D3 –	P
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	D1 - D2 - D3 -	N/A
	- maximum break time (ms) at: 500 A ....:	D1 – 15 D2 – D3 –	P
	No value exceeds the relevant specified limiting value		P
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$ for 0,06 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	D1 - D2 - D3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	D1 - D2 - D3 -	N/A
	No tripping during the tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE E (3 samples)	2P(1P+N), 63 A, Type AC, 30 mA	

8.7	**Performance at short-circuit currents**		
9.11.2.4	a) Verification of the coordination between the RCCB and the SCPD		
	Verification of the coordination at the rated conditional short-circuit current (A): Inc ....:	6,0 kA	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	45 mm	—
	Silver wire diameter (mm) or fuse ....:	0,75 mm silver wire diameter	—
	Prospective current (A) ....:	6,0 kA	—
	Prospective current obtained (A) ....:	6,09 kA	—
	Power factor ....:	0,65…0,70	—
	Power factor obtained ....:	0,68	—
	Point of initiation: 45° ± 5°	45 46 46	P
	Verification of I^2t (kA^2s) and Ip (kA) prior to testing ((≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance		P
	Test sequence: O-t-CO		P
	I^2t (kA^2s); Ip (kA) ....:	E1 – 32,2; 3,94 E2 – 31,2 ; 3,84 E3 – 36,7 ; 3,86	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	E1 - < 0,01 mA, Utest: 264 V E2 - < 0,01 mA, Utest: 264 V E3 - < 0,01 mA, Utest: 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P

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Clause	Requirement + Test	Result - Remark	Verdict
	b) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	c) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	d) ....:	E1 - E2 - E3 -	N/A
	e) ....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown ....:	E1 – OK E2 – OK E3 – OK	P
	Making and breaking In at Un ....:	E1 – 240 V E2 – 240 V E3 – 240 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	E1 – 19 E2 – 26 E3 – 21	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E1 - E2 - E3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	E1 - E2 - E3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below Ux ....:	E1 - E2 - E3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	E1 - E2 - E3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	E1 - E2 - E3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
9.11.2.2	Verification of the rated making and breaking capacity (A): Im ....:	630 A	—
	Test circuit according to figure ....:	9	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Residual operating current (A): 10 $I_{\Delta n}$ ....:	630 A	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	35 mm	—
	Prospective current (A) ....:	630 A	—
	Prospective current obtained (A) ....:	639 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°		P
	Test sequence: CO-t-CO-t-CO	CO-t-CO-t-CO	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	E1 - < 0,01 mA, Utest: 264 V E2 - < 0,01 mA, Utest: 264 V E3 - < 0,01 mA, Utest: 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	b) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	c) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	d) ....:	E1 - E2 - E3 -	N/A
	e) ....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown	E1 - E2 - E3 -	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Making and breaking In at Un ....:	E1 – 240 V E2 – 240 V E3 – 240 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	E1 – 21 E2 – 29 E3 – 19	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E1 - E2 - E3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	E1 - E2 - E3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	E1 - E2 - E3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	E1 - E2 - E3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	E1 - E2 - E3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		

	TEST SEQUENCE E (3 samples)	2P(1P+N), 25 A, Type AC, 10 mA	

8.7	**Performance at short-circuit currents**		
9.11.2.4	a) Verification of the coordination between the RCCB and the SCPD		
	Verification of the coordination at the rated conditional short-circuit current (A): Inc ....:	6,0 kA	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	45 mm	—
	Silver wire diameter (mm) or fuse ....:	0,75 mm silver wire diameter	—
	Prospective current (A) ....:	6,0 kA	—
	Prospective current obtained (A) ....:	6,09 kA	—
	Power factor ....:	0,65…0,70	—
	Power factor obtained ....:	0,68	—
	Point of initiation: 45° ± 5°	45 46 46	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Verification of I²t (kA²s) and Ip (kA) prior to testing ((≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance		P
	Test sequence: O-t-CO		P
	I²t (kA²s); Ip (kA) ....:	E1 – 8,34; 1,85 E2 – 6,73; 1,78 E3 – 8,28; 1,79	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	E1 - < 0,01 mA, Utest: 264 V E2 - < 0,01 mA, Utest: 264 V E3 - < 0,01 mA, Utest: 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	b) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	c) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	d) ....:	E1 - E2 - E3 -	N/A
	e) ....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown ....:	E1 – OK E2 – OK E3 – OK	P
	Making and breaking In at Un ....:	E1 – 240 V E2 – 240 V E3 – 240 V	P

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Clause	Requirement + Test	Result - Remark	Verdict
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	E1 – 19 E2 – 25 E3 – 23	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E1 - E2 - E3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	E1 - E2 - E3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	E1 - E2 - E3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	E1 - E2 - E3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	E1 - E2 - E3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
9.11.2.2	Verification of the rated making and breaking capacity (A): Im ....:	500 A	—
	Test circuit according to figure ....:	9	—
	Residual operating current (A): 10 $I_{\Delta n}$ ....:	0,1	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	35 mm	—
	Prospective current (A) ....:	500 A	—
	Prospective current obtained (A) ....:	508 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°		P
	Test sequence: CO-t-CO-t-CO	CO-t-CO-t-CO	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	E1 - < 0,01 mA, Utest: 264 V E2 - < 0,01 mA, Utest: 264 V E3 - < 0,01 mA, Utest: 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		

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Clause	Requirement + Test	Result - Remark	Verdict
	a) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	b) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	c) ....:	E1 – 480 V, 1 min, 100 mA E2 – 480 V, 1 min, 100 mA E3 – 480 V, 1 min, 100 mA	P
	d) ....:	E1 - E2 - E3 -	N/A
	e) ....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown	E1 - E2 - E3 -	P
	Making and breaking In at Un ....:	E1 – 240 V E2 – 240 V E3 – 240 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	E1 – 26 E2 – 17 E3 – 23	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E1 - E2 - E3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	E1 - E2 - E3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	E1 - E2 - E3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	E1 - E2 - E3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	E1 - E2 - E3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		

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Clause	Requirement + Test	Result - Remark	Verdict

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE E (3 samples)	4P(3P+N), 63 A, Type AC, 30 mA	

8.7	**Performance at short-circuit currents**		
9.11.2.4	a) Verification of the coordination between the RCCB and the SCPD		
	Verification of the coordination at the rated conditional short-circuit current (A): Inc ....:	6,0 kA	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	45 mm	—
	Silver wire diameter (mm) or fuse ....:	0,75 mm silver wire diameter	—
	Prospective current (A) ....:	6,0 kA	—
	Prospective current obtained (A) ....:	6,18 kA	—
	Power factor ....:	0,65…0,70	—
	Power factor obtained ....:	0,67	—
	Point of initiation: 45° ± 5°	45 46 46	P
	Verification of I²t (kA²s) and Ip (kA) prior to testing ((≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance		P
	Test sequence: O-t-CO		P
	I²t (kA²s); Ip (kA) ....:	E1 – 44,4 / 3,86 E2 – 44,8 / 3,90 E3 – 39,3 / 3,97	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	E1 - < 0,01 mA, Utest: 457 V E2 - < 0,01 mA, Utest: 457 V E3 - < 0,01 mA, Utest: 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P

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Clause	Requirement + Test	Result - Remark	Verdict
	b) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	c) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	d) ....:	E1 - E2 - E3 -	N/A
	e) ....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown ....:	E1 – OK E2 – OK E3 – OK	P
	Making and breaking In at Un ....:	E1 – 415 V E2 – 415 V E3 – 415 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	E1 – 26 E2 – 23 E3 – 28	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E1 - E2 - E3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	E1 - E2 - E3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below Ux ....:	E1 - E2 - E3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	E1 - E2 - E3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	E1 - E2 - E3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
9.11.2.2	Verification of the rated making and breaking capacity (A): Im ....:	630 A	—
	Test circuit according to figure ....:	9	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Residual operating current (A): 10 $I_{\Delta n}$ ....:	630 A	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	35 mm	—
	Prospective current (A) ....:	630 A	—
	Prospective current obtained (A) ....:	646A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°		P
	Test sequence: CO-t-CO-t-CO	CO-t-CO-t-CO	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	E1 - < 0,01 mA, Utest: 457 V E2 - < 0,01 mA, Utest: 457 V E3 - < 0,01 mA, Utest: 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	b) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	c) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	d) ....:	E1 - E2 - E3 -	N/A
	e) ....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown	E1 - E2 - E3 -	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Making and breaking In at Un ....:	E1 – 415 V E2 – 415 V E3 – 415 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	E1 – 24 E2 – 25 E3 – 17	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E1 - E2 - E3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	E1 - E2 - E3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	E1 - E2 - E3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	E1 - E2 - E3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	E1 - E2 - E3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		

	TEST SEQUENCE E (3 samples) 4P(3P+N), 25 A, Type AC, 10 mA	

8.7	**Performance at short-circuit currents**		
9.11.2.4	a) Verification of the coordination between the RCCB and the SCPD		
	Verification of the coordination at the rated conditional short-circuit current (A): Inc ....:	6,0 kA	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:		—
	Grid distance "a" (mm) ....:	45 mm	—
	Silver wire diameter (mm) or fuse ....:	0,75 mm silver wire diameter	—
	Prospective current (A) ....:	6,0 kA	—
	Prospective current obtained (A) ....:	6,18 kA	—
	Power factor ....:	0,65…0,70	—
	Power factor obtained ....:	0,67	—
	Point of initiation: 45° ± 5°	45 46 46	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Verification of I^2t (kA²s) and Ip (kA) prior to testing ((≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance		P
	Test sequence: O-t-CO		P
	I^2t (kA²s); Ip (kA) ....:	E1 – 5,56 / 2,05 E2 – 7,86 / 2,09 E3 – 7,24 / 2,01	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	E1 - < 0,01 mA, Utest: 457 V E2 - < 0,01 mA, Utest: 457 V E3 - < 0,01 mA, Utest: 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	b) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	c) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	d) ....:	E1 - E2 - E3 -	N/A
	e) ....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown ....:	E1 – OK E2 – OK E3 – OK	P
	Making and breaking In at Un ....:	E1 – 415 V E2 – 415 V E3 – 415 V	P

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Clause	Requirement + Test	Result - Remark	Verdict
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	E1 – 17 E2 – 29 E3 – 23	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E1 - E2 - E3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	E1 - E2 - E3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	E1 - E2 - E3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	E1 - E2 - E3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	E1 - E2 - E3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
9.11.2.2	Verification of the rated making and breaking capacity (A): Im ....:	500 A	—
	Test circuit according to figure ....:	9	—
	Residual operating current (A): 10 $I_{\Delta n}$ ....:	630 A	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	35 mm	—
	Prospective current (A) ....:	500 A	—
	Prospective current obtained (A) ....:	512A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°		P
	Test sequence: CO-t-CO-t-CO	CO-t-CO-t-CO	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	E1 - < 0,01 mA, Utest: 457 V E2 - < 0,01 mA, Utest: 457 V E3 - < 0,01 mA, Utest: 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		

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Clause	Requirement + Test	Result - Remark	Verdict
	a) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	b) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	c) ....:	E1 – 830 V, 1 min, 100 mA E2 – 830 V, 1 min, 100 mA E3 – 830 V, 1 min, 100 mA	P
	d) ....:	E1 - E2 - E3 -	N/A
	e) ....:	E1 - E2 - E3 -	N/A
	No flashover or breakdown	E1 - E2 - E3 -	P
	Making and breaking In at Un ....:	E1 – 415 V E2 – 415 V E3 – 415 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	E1 – 16 E2 – 22 E3 – 25	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	E1 - E2 - E3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	E1 - E2 - E3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	E1 - E2 - E3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	E1 - E2 - E3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	E1 - E2 - E3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	E1 - E2 - E3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	E1 - E2 - E3 -	N/A
	- maximum break time (ms) at: 500 A ....:	E1 - E2 - E3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	E1 - E2 - E3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	E1 - E2 - E3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples)	2P(1P+N), 63 A, Type AC, 30 mA	

8.7	**Performance at short-circuit currents**		
9.11.2.4	Verification of the coordination between the RCCB and the SCPD		
	b) Verification of the coordination at the rated making and breaking capacity (A): Im ....:	630 A	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	35 mm	—
	Silver wire diameter (mm) or fuse ....:	0,75 mm	—
	Prospective current (A) ....:	630 A	—
	Prospective current obtained (A) ....:	639 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°	46 44 46	P
	Test sequence: O-t-CO-t-CO	O-t-CO-t-CO	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 264 V F2 - < 0,01 mA, Utest: 264 V F3 - < 0,01 mA, Utest: 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	b) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	c) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P
	Making and breaking In at Un ....:	F1 – 240 V F2 – 240 V F3 – 240 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 27 F2 – 25 F3 – 19	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): $I\Delta c$ ..:	6,0 kA	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	45 mm	—
	Silver wire diameter (mm) or fuse ....:	0,35	—
	Prospective current (A) ....:	6,0 kA	—
	Prospective current obtained (A) ....:	6,09 kA	—
	Power factor ....:	0,65…0,70	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Power factor obtained ....:	0,68	—
	Point of initiation: 45° ± 5°		P
	Verification of I^2t (kA^2s) and Ip (kA) prior to testing (≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance		P
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA^2s); Ip (kA) ....:	F1 – 34,1; 3,98 F2 – 36,2; 3,74 F3 – 34,6; 3,90	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 264 V F2 - < 0,01 mA, Utest: 264 V F3 - < 0,01 mA, Utest: 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	b) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	c) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Making and breaking In at Un ....:	F1 – 63 A F2 – 63 A F3 – 63 A	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 25 F2 – 20 F3 – 18	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		

	TEST SEQUENCE F (3 samples)	2P(1P+N), 25 A, Type AC, 10 mA	

8.7	**Performance at short-circuit currents**		
9.11.2.4	Verification of the coordination between the RCCB and the SCPD		
	b) Verification of the coordination at the rated making and breaking capacity (A): Im ....:	500 A	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	35 mm	—
	Silver wire diameter (mm) or fuse ....:	0,75 mm	—
	Prospective current (A) ....:	500 A	—
	Prospective current obtained (A) ....:	508 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°	46 45 46	P
	Test sequence: O-t-CO-t-CO	O-t-CO-t-CO	P

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Clause	Requirement + Test	Result - Remark	Verdict
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 264 V F2 - < 0,01 mA, Utest: 264 V F3 - < 0,01 mA, Utest: 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	b) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	c) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P
	Making and breaking In at Un ....:	F1 – 240 V F2 – 240 V F3 – 240 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 25 F2 – 23 F3 – 22	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		

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Clause	Requirement + Test	Result - Remark	Verdict
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ......:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): IΔc ..:	6,0 kA	—
	Test circuit according to figure ......:	9	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ......:	45 mm	—
	Silver wire diameter (mm) or fuse ......:	0,35	—
	Prospective current (A) ......:	6,0 kA	—
	Prospective current obtained (A) ......:	6,09 kA	—
	Power factor ......:	0,65…0,70	—
	Power factor obtained ......:	0,68	—
	Point of initiation: 45° ± 5°		P
	Verification of I²t (kA²s) and Ip (kA) prior to testing (≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance		P
	Test sequence: O-t-CO-t-CO		P
	I²t (kA²s); Ip (kA) ......:	F1 – 4,98; 1,83 F2 – 6,17; 1,85 F3 – 8,01; 1,85	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 264 V F2 - < 0,01 mA, Utest: 264 V F3 - < 0,01 mA, Utest: 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ......:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P

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Clause	Requirement + Test	Result - Remark	Verdict
	b) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	c) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P
	Making and breaking In at Un ....:	F1 – 240V F2 – 240V F3 – 240V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 19 F2 – 23 F3 – 16	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples) 2P(1P+N), 16 A, Type AC, 500 mA		

8.7	**Performance at short-circuit currents**		
9.11.2.4	Verification of the coordination between the RCCB and the SCPD		
	b) Verification of the coordination at the rated making and breaking capacity (A): Im ....:	500 A	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	35 mm	—
	Silver wire diameter (mm) or fuse ....:	0,75 mm	—
	Prospective current (A) ....:	500 A	—
	Prospective current obtained (A) ....:	508 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,95	—
	Point of initiation: 45° ± 5°	46 45 46	P
	Test sequence: O-t-CO-t-CO	O-t-CO-t-CO	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 264 V F2 - < 0,01 mA, Utest: 264 V F3 - < 0,01 mA, Utest: 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	b) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	c) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P
	Making and breaking In at Un ....:	F1 – 240 V F2 – 240 V F3 – 240 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 19 F2 – 23 F3 – 25	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): $I\Delta c$ ..:	6,0 kA	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	45 mm	—
	Silver wire diameter (mm) or fuse ....:	0,35	—
	Prospective current (A) ....:	6,0 kA	—
	Prospective current obtained (A) ....:	6,09 kA	—
	Power factor ....:	0,65…0,70	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Power factor obtained ....:	0,68	—
	Point of initiation: 45° ± 5°		P
	Verification of I^2t (kA^2s) and Ip (kA) prior to testing (≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance		P
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA^2s); Ip (kA) ....:	F1 – 2,36; 1,32 F2 – 2,62; 1,28 F3 – 3,26; 1,37	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 264 V F2 - < 0,01 mA, Utest: 264 V F3 - < 0,01 mA, Utest: 264 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	b) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	c) ....:	F1 – 480 V, 100 mA, 1 min F2 – 480 V, 100 mA, 1 min F3 – 480 V, 100 mA, 1 min	P
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Making and breaking In at Un ....:	F1 – 240V F2 – 240V F3 – 240V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 25 F2 – 23 F3 – 26	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples) 4P(3P+N), 63 A, Type AC, 30 mA		

8.7	**Performance at short-circuit currents**		
9.11.2.4	Verification of the coordination between the RCCB and the SCPD		
	b) Verification of the coordination at the rated making and breaking capacity (A): Im ....:	630 A	—
	Test circuit according to figure ....:	11	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	35 mm	—
	Silver wire diameter (mm) or fuse ....:	0,75 mm	—
	Prospective current (A) ....:	630 A	—
	Prospective current obtained (A) ....:	646 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,96	—
	Point of initiation: 45° ± 5°	46 47 46	P
	Test sequence: O-t-CO-t-CO	O-t-CO-t-CO	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 457 V F2 - < 0,01 mA, Utest: 457 V F3 - < 0,01 mA, Utest: 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	b) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	c) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P
	Making and breaking In at Un ....:	F1 – 415 V F2 – 415 V F3 – 415 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 25 F2 – 23 F3 – 18	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): IΔc ..:	6,0 kA	—
	Test circuit according to figure ....:	11	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	45 mm	—
	Silver wire diameter (mm) or fuse ....:	0,35	—
	Prospective current (A) ....:	6,0 kA	—
	Prospective current obtained (A) ....:	6,09 kA	—
	Power factor ....:	0,65…0,70	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Power factor obtained ....:	0,68	—
	Point of initiation: 45° ± 5°		P
	Verification of I^2t (kA^2s) and Ip (kA) prior to testing (≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance		P
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA^2s); Ip (kA) ....:	F1 – 32,4; 3,93 F2 – 34,1; 3,91 F3 – 34,9; 3,92	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 457 V F2 - < 0,01 mA, Utest: 457 V F3 - < 0,01 mA, Utest: 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	b) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	c) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Making and breaking In at Un ....:	F1 – 415V F2 – 415V F3 – 415V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 31 F2 – 27 F3 – 22	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		

	TEST SEQUENCE F (3 samples)	4P(3P+N), 25 A, Type AC, 10 mA	

8.7	**Performance at short-circuit currents**		
9.11.2.4	Verification of the coordination between the RCCB and the SCPD		
	b) Verification of the coordination at the rated making and breaking capacity (A): Im ....:	500 A	—
	Test circuit according to figure ....:	11	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	35 mm	—
	Silver wire diameter (mm) or fuse ....:	0,75 mm	—
	Prospective current (A) ....:	500 A	—
	Prospective current obtained (A) ....:	512 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,96	—
	Point of initiation: 45° ± 5°	46 46 45	P
	Test sequence: O-t-CO-t-CO	O-t-CO-t-CO	P

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Clause	Requirement + Test	Result - Remark	Verdict
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 457 V F2 - < 0,01 mA, Utest: 457 V F3 - < 0,01 mA, Utest: 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	b) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	c) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P
	Making and breaking In at Un ....:	F1 – 415 V F2 – 415 V F3 – 415 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 21 F2 – 16 F3 – 23	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		

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Clause	Requirement + Test	Result - Remark	Verdict
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: 500 A; 0,04 s ...:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): I∆c ..:	6,0 kA	—
	Test circuit according to figure ...:	9	—
	Point of test circuit which is directly earthed ...:	Neutral	—
	Grid distance "a" (mm) ...:	45 mm	—
	Silver wire diameter (mm) or fuse ...:	0,35	—
	Prospective current (A) ...:	6,0 kA	—
	Prospective current obtained (A) ...:	6,09 kA	—
	Power factor ...:	0,65…0,70	—
	Power factor obtained ...:	0,68	—
	Point of initiation: 45° ± 5°		P
	Verification of I²t (kA²s) and Ip (kA) prior to testing (≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance		P
	Test sequence: O-t-CO-t-CO		P
	I²t (kA²s); Ip (kA) ...:	F1 – 5,67; 1,80 F2 – 6,0; 1,85 F3 – 5,18; 1,91	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 457 V F2 - < 0,01 mA, Utest: 457 V F3 - < 0,01 mA, Utest: 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ...:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P

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Clause	Requirement + Test	Result - Remark	Verdict
	b) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	c) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P
	Making and breaking In at Un ....:	F1 – 415V F2 – 415V F3 – 415V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 19 F2 – 23 F3 – 24	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE F (3 samples) 4P(3P+N), 16 A, Type AC, 500 mA		

8.7	**Performance at short-circuit currents**		
9.11.2.4	Verification of the coordination between the RCCB and the SCPD		
	b) Verification of the coordination at the rated making and breaking capacity (A): Im ....:	500 A	—
	Test circuit according to figure ....:	11	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	35 mm	—
	Silver wire diameter (mm) or fuse ....:	0,75 mm	—
	Prospective current (A) ....:	500 A	—
	Prospective current obtained (A) ....:	512 A	—
	Power factor ....:	0,93…0,98	—
	Power factor obtained ....:	0,96	—
	Point of initiation: 45° ± 5°	46 46 45	P
	Test sequence: O-t-CO-t-CO	O-t-CO-t-CO	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 457 V F2 - < 0,01 mA, Utest: 457 V F3 - < 0,01 mA, Utest: 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	b) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	c) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P

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Clause	Requirement + Test	Result - Remark	Verdict
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P
	Making and breaking In at Un ....:	F1 – 415 V F2 – 415 V F3 – 415 V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 21 F2 – 23 F3 – 17	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): $I\Delta c$ ..:	6,0 kA	—
	Test circuit according to figure ....:	9	—
	Point of test circuit which is directly earthed ....:	Neutral	—
	Grid distance "a" (mm) ....:	45 mm	—
	Silver wire diameter (mm) or fuse ....:	0,35	—
	Prospective current (A) ....:	6,0 kA	—
	Prospective current obtained (A) ....:	6,09 kA	—
	Power factor ....:	0,65…0,70	—

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Clause	Requirement + Test	Result - Remark	Verdict
	Power factor obtained ....:	0,68	—
	Point of initiation: 45° ± 5°		P
	Verification of I^2t (kA^2s) and Ip (kA) prior to testing (≥1x ≤1,1x values of table 15), RCCB replaced by a connection having negligible impedance		P
	Test sequence: O-t-CO-t-CO		P
	I^2t (kA^2s); Ip (kA) ....:	F1 – 3,67; 1,39 F2 – 2,97; 1,34 F3 – 3,16; 1,36	P
	During tests no endangering of operator, no permanent arcing, no flashover and no melting of fuse F		P
	After the tests no damage impairing further use		P
9.7.7.3	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)	F1 - < 0,01 mA, Utest: 457 V F2 - < 0,01 mA, Utest: 457 V F3 - < 0,01 mA, Utest: 457 V	P
9.7.3	Dielectric strength test of the main circuit at test voltage of 2 Un for 1 min:		
	a) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	b) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	c) ....:	F1 – 830 V, 100 mA, 1 min F2 – 830 V, 100 mA, 1 min F3 – 830 V, 100 mA, 1 min	P
	d) ....:	F1 - F2 - F3 -	N/A
	e) ....:	F1 - F2 - F3 -	N/A
	No flashover or breakdown ....:	F1 – OK F2 – OK F3 – OK	P

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Clause	Requirement + Test	Result - Remark	Verdict
	Making and breaking In at Un ....:	F1 – 415V F2 – 415V F3 – 415V	P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	F1 – 25 F2 – 21 F3 – 23	P
	The polyethylene sheet shows no holes		P
9.17	Verification of the behaviour of RCCBs opening automatically in case of failure of the line voltage		
9.17.1	Limiting value of the line voltage (Ux):		
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) .:	F1 - F2 - F3 -	N/A
	- all values less than 0,85 times the rated voltage (V) ....:	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with $I_{\Delta n}$ and operating according to Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux ....:	F1 - F2 - F3 -	N/A
9.17.2	Verification of behaviour in case of failure of the line voltage		
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts ....:	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
9.17.3	Verification of the correct operation, in presence of a residual current, for RCCBs opening with delay in case of failure of the line voltage		

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Clause	Requirement + Test	Result - Remark	Verdict
	RCCB connected according to fig. 4 at the rated voltage (Un) ....:		N/A
	All phases but one switched off by means of S3		N/A
	During the delay: test of 9.9.2:		
9.9.2.1	- steady increase from 0,2 $I_{\Delta n}$ to $I_{\Delta n}$ within 30 s (mA) ....:	F1 - F2 - F3 -	N/A
	- tripping current between $I_{\Delta no}$ and $I_{\Delta n}$ (mA) ....:	F1 - F2 - F3 -	N/A
	The RCCB closes on $I_{\Delta n}$: no value exceeds the specified limiting value of Table 1 (ms) ....:	F1 - F2 - F3 -	N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A
	Additional test for type S:		

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Clause	Requirement + Test	Result - Remark	Verdict
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.4	Verification of the correct operation of RCCBs with 3 or 4 current paths, neutral and one line terminal only being energized in turn:		
	RCCB connected according to fig. 4		N/A
9.9.2.3	The test circuit being successively calibrated at each of the values of residual current specified in Table 1, the test switch S_2 and the RCCB being in the closed position, the test voltage is suddenly established by closing the test switch S_1		
	- maximum break time (ms) at: $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 2 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 5 $I_{\Delta n}$ ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 0,25 A (if applicable) ....:	F1 - F2 - F3 -	N/A
	- maximum break time (ms) at: 500 A ....:	F1 - F2 - F3 -	N/A
	No value exceeds the relevant specified limiting value		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 2 $I_{\Delta n}$; 0,06 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 5 $I_{\Delta n}$; 0,05 s ....:	F1 - F2 - F3 -	N/A
	- minimum non actuating time (ms) at: 500 A; 0,04 s ....:	F1 - F2 - F3 -	N/A
	No tripping during tests		N/A
9.17.5	Verification of the reclosing function of automatically reclosing RCCBs (under consideration)		

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Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE G (3 samples) 2P(1P+N), 63 A, Type AC, 30 mA		

9.22	**Verification of reliability**		
9.22.1	Climatic test based on Clause 4 of IEC 60068-2-3:2000 and IEC 60068-3-4:		
	- number of cycles: 28		P
	- test temperature: upper temperature 55 °C ± 2 °C		P
	Initial verification:		P
9.9.2.3	- maximum break time at $I_{\Delta n}$ (ms) ....:	G1 – 20 / 21 / 25 / 18 / 19 G2 – 18 / 15 / 21 / 19 / 23 G3 – 13 / 18 / 15 / 17 / 16	P
	No value exceeds the specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	G1 - G2 - G3 -	N/A
	No tripping during tests		N/A
	Climatic test: no tripping during 28 cycles test .....:	G1 – OK G2 – OK G3 – OK	P
	Final verification: the RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	G1 – 21 G2 – 18 G3 – 24	P

	TEST SEQUENCE G (3 samples) 2P(1P+N), 16 A, Type AC, 500 mA		

9.22	**Verification of reliability**		
9.22.1	Climatic test based on Clause 4 of IEC 60068-2-3:2000 and IEC 60068-3-4:		
	- number of cycles: 28		P
	- test temperature: upper temperature 55 °C ± 2 °C		P
	Initial verification:		P

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict
9.9.2.3	- maximum break time at $I_{\Delta n}$ (ms) ....:	G1 – 18 / 20 / 21 / 15 / 24 G2 – 15 / 18 / 13 / 27 / 20 G3 – 14 / 17 / 18 / 15 / 21	P
	No value exceeds the specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	G1 - G2 - G3 -	N/A
	No tripping during tests		N/A
	Climatic test: no tripping during 28 cycles test .....:	G1 – OK G2 – OK G3 – OK	P
	Final verification: the RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	G1 – 20 G2 – 18 G3 – 24	P

	TEST SEQUENCE G (3 samples)	4P(3P+N), 63 A, Type AC, 30 mA	

9.22	**Verification of reliability**		
9.22.1	Climatic test based on Clause 4 of IEC 60068-2-3:2000 and IEC 60068-3-4:		
	- number of cycles: 28		P
	- test temperature: upper temperature 55 °C ± 2 °C		P
	Initial verification:		P
9.9.2.3	- maximum break time at $I_{\Delta n}$ (ms) ....:	G1 – 18 / 24 / 21 / 15 / 17 G2 – 20 / 21 / 18 / 15 / 23 G3 – 21 / 18 / 13 / 15 / 20	P
	No value exceeds the specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	G1 - G2 - G3 -	N/A
	No tripping during tests		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Climatic test: no tripping during 28 cycles test .....:	G1 – OK G2 – OK G3 – OK	P
	Final verification: the RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	G1 – 20 G2 – 19 G3 – 17	P

	TEST SEQUENCE G (3 samples)	4P(3P+N), 16 A, Type AC 500 mA	

9.22	**Verification of reliability**		
9.22.1	Climatic test based on Clause 4 of IEC 60068-2-3:2000 and IEC 60068-3-4:		
	- number of cycles: 28		P
	- test temperature: upper temperature 55 °C ± 2 °C		P
	Initial verification:		P
9.9.2.3	- maximum break time at $I_{\Delta n}$ (ms) ....:	G1 – 12 / 18 / 15 / 26 / 11 G2 – 22 / 14 / 10 / 16 / 34 G3 – 17 / 20 / 14 / 21 / 16	P
	No value exceeds the specified limiting value		P
	Additional test for type S:		
	- minimum non actuating time (ms) at: $I_{\Delta n}$; 0,13 s :	G1 - G2 - G3 -	N/A
	No tripping during tests		N/A
	Climatic test: no tripping during 28 cycles test .....:	G1 – OK G2 – OK G3 – OK	P
	Final verification: the RCCB shall trip with a test current of 1,25 $I_{\Delta n}$ (ms) ....:	G1 – 17 G2 – 21 G3 – 20	P

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict

	TEST SEQUENCE H (3 samples) 4P(3P+N), 63 A, Type AC, 30mA		
IEC 61543:			
table4-T1.1	**Harmonics, interharmonics**		P
table4-T1.2	**Signalling voltage**		P
table5-T2.3	**Conducted unidirectional transients of the ms and µs time scale**		P
	Test results of test sequence H:		
	see test report No. :	See below	
	Testing location / address ....:	The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)	

IEC 61543

Table 4-T.1.1	Harmonics, inter harmonics	No requirements1)			N/A
Table 4-T.1.2	Signaling voltages	Under consideration			N/A
Table 5-T.2.3	Voltage surges 1,2/50µs – 4 kV peak (IEC 61000-4-5)				
	Differential mode (generator Z = 2 Ohm) on each possible combination				
	Test:				
	- peak voltage (kV) ....:	4			
	- number of impulse (n.). ....:	6×(10+ and 10-)			
	- polarity of impulse (+/-) ....:	Positive and negative			
	No tripping during the tests	No trip	No trip	No trip	P
	Condition after the tests:	closed			
	RCCB shall trip with a test current of $I_{\Delta n}$ (ms)	Trip	Trip	Trip	P
	Common mode (generator Z = 12 Ohm) between the earthing terminal, the frame of the device and the other terminals connected together				
	Test:				
	- peak voltage (kV) ....:	4			

IEC 61008-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- number of impulse (n.) ....:	6×(10+ and 10-)			
	- polarity of impulse (+/-) ....:	Positive and negative			
	No tripping during the tests	No trip	No trip	No trip	P
	Condition after the tests:	closed			
	RCCB shall trip with a test current of $I_{\Delta n}$ (ms)	Trip	Trip	Trip	P

	TEST SEQUENCE I (3 samples) 4P(3P+N), 63 A, Type AC, 30mA		
IEC 61543:			
table5-T2.1	**Conducted sine-wave voltages or currents**		P
table5-T2.5	**Radiated high-frequency phenomena**		P
table5-T2.2	**Fast transients (burst)**		P
	Test results of test sequence I:		
	see test report No. :	See below	
	Testing location / address ....:	The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)	

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Table 5-T.2.1	Conducted sine-wave form voltages or currents (IEC 61000-4-6)				P
	- frequency range (MHz) ....:	0,150 …80,0			P
	- modulation...:	1 kHz, 80 %; AM			P
	- RF voltage (V/m) ....:	3			P
	- step size ....:	1 %			P
	- dwell time (s) ....:	1			P
	- test current 0,3 × $I_{\Delta n}$ (mA)...................................:	9 mA			P
	No tripping during the tests...................................:	No trip	No trip	No trip	P
	- test current 1,25 × $I_{\Delta n}$ (mA).................................:	37,5 mA			P
	Tripping during the tests	Trip	Trip	Trip	P
Table 5-T.2.5	Radiated radio-frequency disturbances (IEC 61000-4-3)				P

IEC 61008-1					
Clause	Requirement + Test	Result - Remark			Verdict
	- frequency range (MHz) ....:	80,0…1920			P
	- modulation. ....:	1 kHz, 80 %; AM			P
	- RF voltage (V/m) ....:	3			P
	- step size ....:	1 %			P
	- dwell time (s) ....:	1			P
	- test current 0,3 × IΔn (mA) ....:	9 mA			P
	No tripping during the tests...................................:	No trip	No trip	No trip	P
	- test current 1,25 × $I_{\Delta n}$ (mA).................................:	37,5 mA			P
	Tripping during the tests	Trip	Trip	Trip	P
Table 5-T.2.2	Electrical fast transient burst (IEC 61000-4-4)				P
	Common mode level				P
	- applying bursts for a time (min.)	2			P
	- application on each pole of the supply connection peak voltage (kV)..	4			P
	- polarity of impulse (+/-).......................................	Positive and negative			P
	No tripping during the tests....................................	No trip	No trip	No trip	P
	- application on each pole of the output connection peak voltage (kV)..				P
	- polarity of impulses (+/-)	Positive and negative			P
	No tripping during the tests...................................:	No trip	No trip	No trip	P
	Condition after the tests:	closed			
	RCCB shall trip with a test current of $I_{\Delta n}$ (ms)........:	Trip	Trip	Trip	P

	TEST SEQUENCE J (3 samples) 4P(3P+N), 63 A, Type AC, 30mA		
IEC 61543:			
table5-T2.6	**Conducted common mode disturbances in the frequency range lower than 150 kHz**		P
table6-T3.1	**Electrostatic discharges**		P
	Test results of test sequence J:		
	see test report No. :	See below	

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Testing location / address ....:	The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)	

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Clause	Requirement + Test	Result - Remark			Verdict
Table 5-T.2.6	Conducted common mode disturbances in the frequency range lower than 150 kHz				P
	- frequency range (MHz) ....:	1kHz…150kHz			P
	- test current 0,3 × $I_{\Delta n}$ (mA)...................................:	9 mA			P
	No tripping during the tests....................................	No trip	No trip	No trip	P
	- frequency range (MHz) ....:	1: 1, 10, 20, 30 40 kHz 2: 50, 60, 70, 80, 90kHz 3: 100, 110, 120, 130, 150kHz			P
	- test current 1,25 × $I_{\Delta n}$ (mA).................................:	37,5 mA			P
	Tripping during the tests	Trip	Trip	Trip	P
Table 6-T3.1	Electrostatic discharges				P
	Level ....:				P
	10 discharges in air applied on isolating surfaces ...:	Lever, test buttom			P
	- interval between application (s) ....:	1			P
	- peak voltage (kV) ....:	8			P
	- polarity (+/-) ....:	Positive and negative			P
	Tripping during the tests (allowed) ....:	No Trip	No Trip	No Trip	P
	10 discharges applied on conducting surfaces	Mounting rail			P
	- interval between application (s) ....:	1			P
	- peak voltage (kV) ....:	6			P
	- polarity (+/-) ....:	Positive and negative			P
	Tripping during the tests (allowed) ....:	No Trip	No Trip	No Trip	P
	10 discharges applied on coupling plane	Vertical / horizon			P
	- interval between application (s) ....:	1			P
	- peak voltage (kV) ....:	6			P
	- polarity (+/-) ....:	Positive and negative			P
	Tripping during the tests (allowed) ....:	No Trip	No Trip	No Trip	P
	RCCB shall trip with a test current of IΔn (ms) ....:	28	32	31	P

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict

ANNEX A (NORMATIVE)

Test sequence and number of samples to be submitted for certification purposes
Table A.1 - Test sequences

Test sequence		Clause or subclause	Test (or inspection)
A_1		6 8.1.1 8.1.2 9.3 8.1.3 9.15 9.4 9.5 9.6 9.13 8.1.3 9.25	Marking General Mechanism Indelibility of marking Clearance and creepage distances (external parts only) Trip free mechanism Reliability of screws, current-carrying parts and connections Reliability of terminals for external conductors Protection against electric shock Resistance to heat Clearances and creepage distances (internal parts) Resistance to rusting
A_2		9.14	Resistance to abnormal heat and to fire
B		9.7.7.4 9.7.7.5 [b)] 9.7.1 9.7.2 9.7.3 9.7.4 9.7.7.2 9.7.5 9.7.6 9.8 9.22.2 9.23	Resistance of the insulation of open contacts and basic insulation against an impulse voltage in normal conditions Verification of the behaviour of components bridging the basic insulation Resistance to humidity Insulation resistance of the main circuit Dielectric strength of the main circuit Insulation resistance an dielectric strength of auxiliary circuits Verification of clearances with the impulse withstand voltage Secondary circuit of detection transformers Capability of control circuits connected to the main circuits etc. Temperature-rise Reliability at 40℃ Ageing of electronic components
C		9.10	Mechanical and electrical endurance
D	D_0	9.9	Residual operating characteristics
D	D_1	9.17 9.19 9.21 9.11.2.3 a)b) 9.16 9.12 9.18	Behaviour in case of failure of the line voltage Unwanted tripping Behaviour in case of surge currents D.C. components Performance at $I_{\Delta m}$ Test device Resistance to mechanical shock and impact Non-operating current under overcurrent conditions
D_2		9.11.2.3 c)	Verification of the suitability of RCCBs for use in IT-systems
E		9.11.2.4 a)	Coordination at I_{nc}
		9.11.2.2	Performance at I_m
F		9.11.2.4 b)	Coordination at I_m
		9.11.2.4 c)	Coordination at $I_{\Delta c}$
G		9.22.1	Reliability (climatic tests)
H [a)]		IEC 61543 Table 4 -T1.1 IEC 61543 Table 4 -T1.2 IEC 61543 Table 5 -T2.3	Harmonics, interharmonics Signalling voltage Surges
I		IEC 61543 Table 5 -T2.1 IEC 61543 Table 5 -T2.5 IEC 61543 Table 5 -T2.2	Conducted sine-wave voltages or currents Radiated electromagnetic field Fast transients (burst)
J		IEC 61543 Table 5 - T2.6 IEC 61543 Table 6 -T3.1	Conducted common mode disturbances in the frequency range lower than 150 kHz Electrostatic discharges

a) For devices containing a continuously operating oscillator, the test of CISPR 14-1 shall be carried out on the samples prior to the tests of this sequence.
b) This test may be done on separate samples.

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict

Table A.2 - Number of samples for full test procedure			
Test sequence [a]	Number of samples	Minimum number of accepted samples [b]	Maximum number of samples for repeated tests [c]
A_1	1	1	--
A_2	3	2	3
B	3	2	3
C	3	2	3
D	3	2 [d]	3
D_2	3	3	3
E	3	2 [d]	3
F	3	2 [d]	3
G	3	2	3
H [e]	3	2	3
I [e]	3	2	3
J [e]	3	2	3

a) In total a maximum of three test sequences may be repeated.

b) It is assumed that a sample which has not passed a test has not met the requirements due to workmanship or assembly defects which are not representative of the design.

c) In the case of repeated tests, all test results must be acceptable.

d) All samples shall meet the requirements in 9.9.2, 9.9.3, and 9.11.2.3, as appropriate. In addition, permanent arcing or flashover between poles or between poles and frame shall not occur in any sample during tests of 9.11.2.2, 9.11.2.4 a), 9.11.2.4 b) or 9.11.2.4 c).

e) At the manufacturer's request, the same set of samples may be subjected to more than one of these test sequences.

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict

Table A.3 - Number of samples for simplified test procedure			
Test sequence	Number of samples according to the number of poles a) g)		
	2-poles b) c)	3-poles d) f) i)	4-poles e)
A_1	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$
A_2	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
B	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
C	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
$D_0 + D_1$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
D_0	1 for all other ratings of $I_{\Delta N}$		
D_2	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
E	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
F	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$
G	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$
H			3 h) samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$
I			3 h) samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$
J			3 h) samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$

a) If a test is to be repeated according to the minimum performance criteria of clause A.2, a new set of samples is used for the relevant test. In the repeated test all test results must be acceptable.
b) If only 3-pole or 4-pole RCCBs are submitted, this column shall also apply to a set of samples with the smallest number of poles.
c) Also applicable to 1-pole RCCBs with uninterrupted neutral and 2-pole RCCBs with 1 protected pole.
d) Also applicable to 3-pole RCCBs with two protected poles
e) Also applicable to 3-pole RCCBs with uninterrupted neutral and 4-pole RCCBs with 3 protected poles.
f) This column is omitted when 4-pole RCCBs have been tested.
g) If only one value of $I_{\Delta N}$ is submitted, min. rating $I_{\Delta N}$ and max. rating $I_{\Delta N}$ are replaced by $I_{\Delta N}$.
h) Only the highest number of current paths.
i) If a 3-pole RCCB with 4 current paths and a 4-pole RCCB are submitted, then only the 4-pole RCCB is tested, with exception of the test of 9.8 of test sequence B for which both types are submitted to the test.

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Clause	Requirement + Test	Result - Remark	Verdict

Table A.4 - Test sequences for RCCBs of different classification according to 4.6			
Test sequence	Number of samples according to the number of poles [a)]		
	2-pole [b) c)]	3-pole [e)]	4-pole [d)]
$D_0 + D_1$	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$
D_0	1 for all other ratings of $I_{\Delta N}$ with max. $I_{\Delta N}$		

a) If a test is to be repeated according to the minimum performance criteria of clause A.2, a new set of samples is used for the relevant test. In the repeated test all test results must be acceptable.

b) If only 3-pole or 4-pole RCCBs are submitted, this column shall also apply to a set of samples with the smallest number of poles.

c) Also applicable to 1-pole RCCBs with uninterrupted neutral.

d) Also applicable to 3-pole RCCBs with uninterrupted neutral.

e) This column is omitted when 4-pole RCCBs are being tested.

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX B **DETERMINATION OF CLEARANCES AND CREEPAGE DISTANCES**	--
B.1	General	P
	In determining clearances and creepage distances, it is recommended that the following points should be considered.	P
B.2	Orientation and location of a creepage distance	P
	If necessary, the manufacturer shall indicate the intended orientation of the equipment or component in order that creepage distances are not adversely affected by the accumulation of pollution for which they were not designed.	P
B.3	Creepage distances where more than one material is used	P
	A creepage distance may be split in several portions of different materials and/or have different pollution degrees if one of the creepage distances is dimensioned to withstand the total voltage or if the total distance is dimensioned according to the material having the lowest CTI.	P
B.4	Creepage distances split by floating conductive part	P
	A creepage distance may be split into several parts, made with insulation material having the same CTI, including or separated by floating conductors as long as the sum of the distances across each individual part is equal or greater than the creepage distance required if the floating part did not exist. The minimum distance X for each individual part of the creepage distance is given in IEC 60664-1:2007, 6.2 (see also Example 11 in Figure B.1).	P
B.5	Measurement of creepage distances and clearances	P
	In determining creepage distances according to IEC 60664-1, the dimension *X*, specified in the following examples, has a minimum value of 1,0 mm for pollution degree 2.	P
	If the associated clearance is less than 3 mm, the minimum dimension *X* may be reduced to one third of this clearance.	P
	The methods of measuring creepage distances and clearances are indicated in Example 1 to 11. These cases do not differentiate between gaps and grooves or between types of insulation.	P
	The following assumptions are made:	P
	- any recess is assumed to be bridged with an insulating link having a length equal to the specified width *X* and being placed in the most unfavourable position (see Example 3);	P
	- where the distance across a groove is equal to or larger than the specified width *X*, the creepage distance is measured along the contours of the groove (see Example 3);	P
	- creepage distances and clearances measured between parts which can assume different positions in relation to each other, are measured when these parts are in their most unfavourable position.	P

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX C ARRANGEMENT FOR THE DETECTION OF THE EMISSION OF IONIZED GASES DURING SHORT-CIRCUIT TESTS	
	The device under test is mounted as shown in figure C.1, which may require adapting to the specific design of the device, and in accordance with the manufacturer's instructions.	P
	When required (i.e. during "O" operations), a clear polyethylene sheet (0,05 ± 0,01) mm thick, of a size at least 50 mm larger, in each direction, than the overall dimensions of the front face of the device but not less than 200 mm × 200 mm, is fixed and reasonably stretched in a frame, placed at a distance of 10 mm from	P
	– either the maximum projection of the operating means of a device without recess for the operating means;	P
	– or the rim of a recess for the operating means of a device with recess for the operating means.	P
	The sheet should have the following physical properties: Density at 23 °C: 0,92 ± 0,05 g/cm³ Melting-point: 110 °C – 120 °C.	P
	When required, a barrier of insulating material, at least 2 mm thick, is placed, as shown in figure C.1, between the arc vent and the polyethylene sheet to prevent damage of the sheet due to hot particles emitted from the arc vent.	P
	When required, a grid (or grids) according to figure C.2 is (are) placed at a distance of "a" mm from each arc vent side of the device.	P
	The grid circuit (see figure C.3) shall be connected to the points B and C (see figures 7 or 8, as applicable).	P
	The parameters for the grid circuit are as follows:	P
	Resistor R': 1,5 Ω	P
	Copper wire F': length 50 mm, and diameter in accordance with 9.11.2.1 f 1).	P

IEC 61008-1					
Clause	Requirement + Test	Result - Remark			Verdict
	ANNEX D ROUTINE TESTS				--
D.1	General				--
	The tests specified in this standard are intended to reveal, as far as safety is concerned, unacceptable variations in material or manufacture.				N/A
	In general, further tests have to be made to ensure that every RCCB conforms with the samples that withstood the tests of this standard, according to the experience gained by the manufacturer.				N/A
D.2	Tripping test				--
	A residual current is passed through each pole of the RCCB in turn. The RCCB shall not trip at a current less than or equal to 0,5 $I_{\Delta N}$, but it shall trip at $I_{\Delta N}$ within a specified time (see Table 1).	[ms]	[ms]	[ms]	N/A
					N/A
	The test current shall be applied at least five times to each RCCB and shall be applied at least twice to each pole.				N/A
D.3	Electric strength test				--
	A voltage of substantially sine-wave form of 1 500 V having a frequency of 50 Hz/60 Hz is applied for 1 s as follows:				N/A
	a) with the RCCB in the open position, between each pair of terminals which are electrically connected together when the RCCB is in closed position				N/A
	b) for RCCBs not incorporating electronic components, with the RCCB in the closed position, between each pole in turn and the others connected together				N/A
	c) for RCCBs incorporating electronic components, with the RCCB in the open position, either between all incoming terminals of poles in turn or between all outgoing terminals of poles in turn, depending on the position of the electronic components.				N/A
	No flashover or breakdown shall occur				N/A
D.4	Performance of the test device				--
	With the RCCB in the closed position, and connected to a supply at the appropriate voltage, the test device, when operated, shall open the RCCB.				N/A
	Where the test device is intended to operate at more than one value of rated voltage, the test shall be made at the lowest value of rated voltage.				N/A

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Clause	Requirement + Test	Result - Remark	Verdict

J	**ANNEX J Particular requirements for RCCBs with screwless type terminals for external copper conductors**		
J.1	**THIS ANNEX APPLIES TO RCCBS WITHIN THE SCOPE OF CLAUSE 1, EQUIPPED WITH SCREWLESS TERMINALS, FOR CURRENT NOT EXCEEDING 20 A PRIMARILY SUITABLE FOR CONNECTING UNPREPARED (SEE J.3.6) COPPER CONDUCTORS OF CROSS-SECTION UP TO 4 MM^2.**		--
J.6	Marking and other product information		--
	in addition to clause 6:		N/A
	universal terminals:		N/A
	no markings		N/A
	non-universal terminals:		N/A
	terminals for rigid-solid conductors marked by “sol”		N/A
	terminals for rigid (solid and stranded) conductors marked by “r”		N/A
	terminals for flexible conductors marked by “f”		N/A
	Marking on the RCCB or		N/A
	if the space available is not sufficient on the smallest package unit or in technical information		N/A
	Marking indicating the length of insulation to be removed before insertion of the conductor into the terminal shown on the RCBO		N/A
	Manufacturer shall provide information in his literature, on the maximum number of conductors which may be clamped.		N/A
J.8	Standard conditions for operating in service and for installation		--
	clause 8 applies with the following modifications: in 8.1.5, only 8.1.5.1, 8.1.5.2, 8.1.5.3, 8.1.5.6 and 8.1.5.7 apply		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2 of this annex, instead of 9.4 and 9.5.		N/A
J.8.1	Connection or disconnection of conductors		N/A
	The connection or disconnection of conductors shall be made:		N/A
	- by the use of a general purpose tool or by a convenient device integral with the terminal to open it and to assist the insertion or the withdrawal of the conductors (e.g. for universal terminals)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- or, for rigid conductors by simple insertion. For the disconnection of the conductors an operation other than a pull on the conductor shall be necessary (e.g. for push-wire terminals).		N/A
	Universal terminals shall accept rigid (solid or stranded) and flexible unprepared conductors.		N/A
	Non-universal terminals shall accept the types of conductors declared by the manufacturer.		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2.		N/A
J.8.2	Dimensions of connectable conductors		N/A
	The dimensions of connectable conductors are given in Table J.1.		N/A
	The ability to connect these conductors shall be checked by inspection and by the tests of J.9.1 and J.9.2.		N/A
J.8.3	Connectable cross-sectional areas		N/A
	nominal cross-sections to be clamped acc. table J.2		N/A
	compliance checked by inspection and tests of J.9.1 and J.9.2.		N/A
J.8.5	Design and construction of terminals		N/A
	terminals so designed and constructed that:		--
	- each conductor clamped individually		N/A
	- during operation of connection or disconnection the conductors can be connected or disconnected either at the same time or separately		N/A
	- inadequate insertion of the conductor is avoided		N/A
	It shall be possible to clamp securely any number of conductors up to the maximum provided for		N/A
	compliance checked by inspection and tests of J.9.1 and J.9.2.		N/A
J.8.6	Resistance to ageing		N/A
	compliance checked by the test of J.9.3.		N/A
J.9	Tests		--
	Clause 9 applies, by replacing 9.4 and 9.5 by the following tests		N/A
J.9.1	Test of reliability of screwless terminals		--
J.9.1.1	Reliability of screwless system		N/A
	three terminals of poles of new samples, with copper conductors of the rated cross sectional area in accordance with Table J.2, types of conductors in accordance with J.8.1.		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	The connection and subsequent disconnection shall be made five times with:		N/A
	Min. cross-section (mm²) .... :	mm²	N/A
	Max. cross-section (mm²) .... :	mm²	N/A
	new conductors used each time, except for the fifth time, when the conductor used for the fourth insertion is clamped at the same place. Before insertion into the terminal, wires of stranded rigid conductors re-shaped and wires of flexible conductors twisted to consolidate the ends.		N/A
	After each insertion, the conductor being inserted rotated 90 ° along its axis at the level of the clamped section and subsequently disconnected.		N/A
	After tests, the terminal not damaged in such a way as to impair its further use.		N/A
J.9.1.2	Test of reliability of connection		N/A
	three terminals of poles of new samples, with copper conductors of the rated cross sectional area in accordance with Table J.2, types of conductors in accordance with J.8.1.		N/A
	Before insertion into the terminal, wires of stranded rigid conductors and flexible conductors reshaped and wires of flexible conductors twisted to consolidate the ends.		N/A
	possible to fit the conductor into the terminal without undue force in the case of universal terminals and with the force necessary by hand in the case of push-wire terminals.		N/A
	conductor pushed as far as possible into the terminal or inserted so that adequate connection is obvious.		N/A
	Min. cross-section (mm²) .... :	mm²	N/A
	Max. cross-section (mm²) .... :	mm²	N/A
	After the test, no wire of the conductor shall have escaped outside the terminal.		N/A
J.9.2	Tests of reliability of terminals for external conductors: mechanical strength		N/A
	three terminals of poles of new samples fitted with new conductors of the type and of the minimum and maximum cross-sectional areas acc. Table J.2.		N/A
	Min. cross-section (mm²) .... :	mm²	N/A
	Max. cross-section (mm²) .... :	mm²	N/A
	wires of stranded rigid conductors and flexible conductors reshaped and wires of flexible conductors twisted to consolidate the ends.		N/A
	Pull for 1 min, min. cross-section (N)..................... :	N	N/A

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Clause	Requirement + Test	Result - Remark			Verdict
	Pull for 1 min, max. cross-section (N) .... :	N			N/A
	During the test no noticeable move of conductor				N/A
J.9.3	Cycling test				N/A
	Universal, rigid conductors - 3 samples Universal, flexible conductors - 3 samples				N/A
	Non-universal, solid conductors - 3 samples				N/A
	Non-universal, rigid (solid) stranded conductors - 3 samples Non-universal, rigid (stranded) stranded conductors - 3 samples				N/A
	Non-universal, flexible conductors - 3 samples				N/A
	Cross-section (mm²) .... :	mm²			N/A
	Test current I_N (A)...:	A			N/A
	samples subjected to 192 temperature cycles				N/A
	Voltage drop after 192 cycles:				--
	voltage drop, measured at each terminal, at the end of the 192nd cycle, exceeded not the smaller of the two following values:				N/A
	– 22,5 mV				N/A
	– 1,5 times the value measured after the 24th cycle				N/A
		sample 1	sample 2	sample 3	--
		[mV]	[mV]	[mV]	--
	- rigid solid conductors ....:				N/A
	- rigid stranded conductors......................................:				N/A
	- flexible conductors ....:				N/A
	Voltage drop after 24th cycle:				--
		sample 1	sample 2	sample 3	--
		[mV]	[mV]	[mV]	--
	- rigid solid conductors ....:				N/A
	- rigid stranded conductors......................................:				N/A
	- flexible conductors ....:				N/A
	after this test: no changes evidently impairing further use, such as cracks, deformations or the like.				N/A

K	**ANNEX K** **Particular requirements for RCCBs with flat quick-connect terminations**	
K.1	**This annex applies to RCCBs within the scope of Clause 1, equipped with flat quick-connect terminations consisting of a male tab (see K.3.2) with nominal width 6,3 mm and thickness0,8 mm, to be used with a mating female connector for connecting electrical copper conductors according to the manufacturer's instructions, for rated currents up to and including 16 A.**	--

IEC 61008-1			
Clause	Requirement + Test	Result - Remark	Verdict

Clause	Requirement + Test			Result - Remark	Verdict
K.6	Marking and other product information				--
	in addition to clause 6, addition after the lettered item k):				--
	Information regarding the female connector acc. to IEC 61210 and type of conductor to be used shall be given in the manufacturers' instructions:				N/A
	l) manufacturer´s name or trade mark				N/A
	m) type reference				N/A
	n) information on cross-sections of conductors and colour code of insulated female connectors (see Table K.1)				N/A
	o) the use of only silver or tin-plated copper alloys				N/A
K.8	Requirements for construction and operation				--
	Clause 8 applies, with the following exceptions:				N/A
	subclause 8.1.3 applies, the female connectors being fitted to the male tabs of the RCCB				N/A
	replace the contents of 8.1.5 by the following:				N/A
K.8.2	Terminals for external conductors				N/A
K.8.2.1	Male tabs and female connectors shall be of a metal having mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use.				N/A
K.8.2.2	The nominal width of the male tab is 6,3 mm and the thickness 0,8 mm, applicable to rated currents up to and including 16 A. NOTE 1:The use for rated currents up to and including 20 A is accepted in BE, FR, IT, PT, ES and US				N/A
	The dimensions of the male tab shall comply with those specified in Table K.3 and in figures K.2, K.3, K.4 and K.5				N/A
		Dimensions of tabs according Table K.3		Measured in mm	--
		Minimum [mm]	Maximum [mm]		--
A	Dimple	0,7	1,0		N/A
	Hole	0,5	1,0		N/A
B	Dimple	7,8 min			N/A
	Hole	7,8 min			N/A
C	Dimple	0,77	0,84		N/A
	Hole	0,77	0,84		N/A
D	Dimple	6,20	6,40		N/A
	Hole	6,20	6,40		N/A
E	Dimple	3,6	4,1		N/A
	Hole	4,3	4,7		N/A

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Clause	Requirement + Test			Result - Remark		Verdict
F	Dimple	1,6	2,0			N/A
	Hole	1,6	2,0			N/A
J	Dimple	8°	12°			N/A
	Hole	8°	12°			N/A
M	Dimple	2,2	2,5			N/A
	Hole	---	---			---
N	Dimple	1,8	2,0			N/A
	Hole	---	---			---
P	Dimple	0,7	1,8			N/A
	Hole	0,7	1,8			N/A
Q	Dimple	8,9 min	---			N/A
	Hole	8,9 min	---			N/A
	Dimensions of the female connector which may be fitted-on are given in Figure K.6 and in Table K.4.					N/A
				--	request acc. table K.3 / measured value	--
				B_3 max	7,8mm	N/A
				L_2 max	3,5mm	N/A
K.9	Tests					--
	clause 9 applies with the following modifications:					N/A
	replace the contents of 9.5 by the following text:					N/A
K.9.1	Mechanical overload-force					N/A
	Test done on 10 terminals of RCCBs, mounted as in normal use when wiring takes place.					N/A
	Axial push force, and successively the axial pull force gradually applied to the male tab integrated in the RCCB					N/A
	Push 96N					N/A
	Pull 88N					N/A
	No damage occurred to the tab or to the RCCB in which the tab is integrated.					N/A
	addition to 9.8.3:					N/A
	Fine -wire thermocouples shall be placed in such a way as not to influence the contact or the connection area. An example of placement is shown in fig K.1					N/A

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Clause	Requirement + Test	Result - Remark	Verdict

L	**ANNEX L Specific requirements for RCCBs with screw-type terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors**		
L.6	Marking and other product information		--
	In addition to clause 6 the following apply:		N/A
	Terminal marking according table L.1, on the RCCB, near the terminals		N/A
	Conductor types accepted:		N/A
	Copper only	☐ None	N/A
	Aluminium only	☐ “Al”	N/A
	Aluminium and copper	☐ “Al/Cu”	N/A
	Other information concerning the number of conductors, screw torque (if different from table 10) and cross-section shall be indicated on the RCCB	Nm mm^2	N/A
L.7	Standard conditions for operation in service		--
	Clause 7 applies		N/A
L.8	Constructional requirements		--
	Clause 8 applies with the following exceptions:		N/A
8.1.5.2	add the following text at the end of 8.1.5.2:		N/A
	For connection of aluminium conductors, RCCBs shall be provided with screw-type terminals allowing the connection of conductors having nominal cross-sections as shown in table L.2		N/A
	Terminals for the connection of aluminium conductors and terminals of aluminium for the connection of copper or aluminium conductors shall have mechanical strength adequate to withstand the tests of 9.4, with the test conductors tightened with the torque indicated in table 11, or with the torque specified by the manufacturer, which shall never be lower than that specified in table 11.		N/A
	Compliance is checked by inspection, by measurement and by fitting in turn one conductor of the smallest and one of the largest cross-section areas as specified		N/A
8.1.5.4	replace the text of 8.1.5.4 by the following:		N/A
	Terminals shall allow the conductors to be connected without special preparation		N/A
	Compliance is checked by inspection and by the tests of L.9		N/A
L.9	Tests		--
	Clause 9 applies with the following modifications/additions:		N/A

IEC 61008-1				
Clause	Requirement + Test	Result - Remark		Verdict
	For the tests which are influenced by the material of the terminal and the type of conductor that can be connected, the test conditions of table L.3 are applied			N/A
	Additionally the test of L.9.2 is carried out on terminals separated from the RCCB			N/A
L.9.2	Current cycling test			N/A
	This test is carried out on separate terminals			N/A
L.9.2.3	Test arrangement			N/A
	The general arrangement of the samples shall be as shown in figure L.1			N/A
	90 % of torque stated by the manufacturer or selected in table 10 used for the specimens	torque: Nm		N/A
	The test is carried out with conductors according to table L.5. The length of the test conductor from the point of entry to the screw-type terminal specimens to the equalizer shall be as in table L.6	cross-section: mm^2 minimum conductor length: mm		N/A
	Cross section of equalizer not greater than that given in table L.7	max. cross-section: mm^2		N/A
L.9.2.5	Test method and acceptance criteria			N/A
	Test loop subjected to 500 cycles of 1h current-on and 1h current-off, starting at an a.c. current value of 1,12 times the test current value determined in table L.8	test current: A		N/A
	Near the end of each current-on period of the first 24 cycles, the current shall subsequently be adjusted to raise the temperature of the reference conductor to 75℃			N/A
	At the end of the 25th cycle the test current shall be adjusted the last time and the stable temperature shall be recorded as the first measurement. No further adjustment of test current for the remainder of the test			N/A
	Temperatures recorded for at least one cycle of each working day, and after approximately 25, 50, 75, 100, 125, 175, 225, 275, 350, 425 and 500 cycles			N/A
	For each screw-type terminal:			N/A
	- the temperature rise shall not exceed 110 K			N/A
	- the stability factor Sf shall not exceed ± 10 ℃			N/A
	ambient air temperature: ℃			N/A
		max. temperature rise [K]	max. stability factor Sf [℃]	--
	Terminal 1			N/A
	Terminal 2			N/A
	Terminal 3			N/A

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Clause	Requirement + Test	Result - Remark		Verdict
	Terminal 4			N/A
	Terminal 5			N/A
	Terminal 6			N/A
	Terminal 7			N/A
	Terminal 8			N/A

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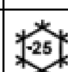
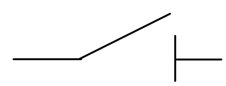
Clause	Requirement - Test	Result - Remark	Verdict

	Annex 1	
	EN 61008-1 **COMMON MODIFICATIONS**	**P**

	GENERAL		**--**
9.11.2	Short circuit tests		--
9.11.2.1 b)	Tolerances and test quantities		--
	voltage (including recovery voltage): 0, -5%		P
9.11.2.1 d)	Value of power frequency recovery voltage shall be equal to 110% of the rated voltage		P

	TEST SEQUENCE "A"		--
6	**MARKING**		--
6.Z1	*The text of clause 6 becomes 6.Z1 with the following modifications* STANDARD MARKING		--
	RCCB MARKED WITH:		--
replace by:	c) Rated voltage(s) (V) with the symbol ~...............	240 V~ and 415 V~	P
replace by:	f) Rated residual operating current ($I_{\Delta N}$) in A or mA	30mA	P
replace by:	g) "DELETED"		N/A
replace by:	h) Rated making and breaking capacity (I_m)...........		N/A
replace by:	l) Rated residual making and breaking capacity ($I_{\Delta m}$), if different from rated making and breaking capacity (I_m)		N/A
replace by:	n) symbol of the method of operating acc. to table Z1 of 4.1 if the RCCB is functionally dependent of the line voltage		N/A
replace by:	p) Wiring diagram unless the correct mode of connection is evident		P
add:	s) RCCBs for use between -25℃ and +40℃ marked with symbol (snowflake enclosing -25)...		P

Clause	Requirement - Test	Result - Remark	Verdict
replace by:	Marking on the RCCB itself or on nameplate or nameplates attached to the RCCB and located so that for small devices at least e), f), m), o) and r) (for type A only) is legible when the RCCB is installed. The information under a), b), c), k), p), r) (for type AC only) and s) may be marked on the side or the back of the device and be visible only before the device is installed. Alternatively, information under p) may be on the inside of any cover which has to be removed in order to connect the supply wires. Information under h) (I_m) and l) ($I_{\Delta m}$) may be put on the side or on the back or in the documentation, but both shall be indicated together. Any remaining information not marked shall be given in the manufacturer's catalogues	a), b), c), e), f), j), o), p), r), s) is legible after installed	P
add:	If a degree of protection higher than IP20 is marked on the device, it shall comply with it, whichever the method of installation. If the higher degree of protection is obtained only by a specific method of installation and/or with the use of specific accessories this shall be specified in the manufacturers literature		P
add:	The suitability for isolation, which is provided by all circuit-breakers of this standard, may be indicated by the symbol on the device		P
add: 6.Z2	ADDITIONAL MARKING		--
	Additional marking to other standards is allowed under the following conditions:		N/A
	- The RCCB shall comply with all the requirements of the additional standard.		N/A
	- The relevant standards to which the additional marking refers shall be indicated adjacent to this marking and shall be clearly differentiated or separated from the standard marking according to 6.Z1.		N/A
	Compliance is checked by inspection and by carrying out all the test sequences required by the relevant standard. Equivalent or less severe test sequences need not be repeated.		N/A
add:6.Z3	Guidance table for marking (see annexed table)		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
8.	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		--
8.1	MECHANICAL DESIGN		--
8.1.2	Mechanism		--
add:	RCCBs shall be designed so that the actuator, front plate or cover can only be correctly fitted in a manner which ensures correct indication of the contact position (Compliance is checked by inspection and by the tests of 9.9 and 9.11.2		P
8.1.3 replace by:	Clearances and creepage distances		--
	The minimum required clearances and creepage distances are based on the RCCB being designed for operating in an environment with pollution degree 2		P
	However, the clearances of item 2 and 4 may be reduced provided that the tests at rated impulse voltage are withstood		P
	The insulating materials are classified into Material Groups on the basis of their comparative tracking index (CTI) acc. to IEC 60664-1 and measured according to IEC 60112		P
add: 8.1.Z1	NON-INTERCHANGEABILITY		--
	For RCCBs intended to be mounted on bases forming a unit therewith (plug-in or screw-in type) it shall not be possible, without the aid of a tool, to replace a RCCB when mounted and wired as in normal use by another of the same make having a higher rated current		N/A
add: 8.1.Z2	Mechanical mounting of plug-in type RCCBs		--
	The mechanical mounting of plug-in type RCCBs shall be reliable and have adequate stability		N/A
add: 8.1.Z2.1	Plug-in type RCCBs, the holding in position of which does not depend solely on their plug-in connection(s)		N/A
	Compliance of the mechanical mounting is checked by the relevant tests of 9.13		N/A
add: 8.1.Z2.2	Plug-in type RCCBs, the holding in position of which depends solely on their plug-in connection(s)		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	Compliance of the mechanical mounting is checked by the relevant tests of 9.13		N/A
9.13.1 replace by:	After the test: The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 1	ms	P
	TEST SEQUENCE "B"		--
9.7 replace by:	*Amend the title to read:* TEST OF DIELECTRIC PROPERTIES AND ISOLATING CAPABILITY		--
9.7.2	Insulation resistance of the main circuit measured between 30 and 60 min after this treatment with 500 V DC after 5 s:		P
replace by:	b) between each pole and the others connected together (electronic components, connected between poles being disconnected).............≥ 2 MΩ	B1 - B2 - B3 -	P
9.7.3 replace by:	Dielectric strength of the main circuit measured with an AC voltage (45-65Hz) for 1 min:		P
	a) .... 2000 V	B1 - B2 - B3 -	P
	b) electronic components disconnected ..... 2000 V	B1 - B2 - B3 -	P
	c)... 2000 V	B1 - B2 - B3 -	P
	d) .... 2000 V	B1 - B2 - B3 -	P
	e) .... 2500 V	B1 - B2 - B3 -	N/A
	No flashover or breakdown		P
9.22.2	TEST WITH TEMPERATURE OF 40°C		P

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Clause	Requirement - Test	Result - Remark	Verdict

replace by:	After cool down the RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 1 (ms)		P
9.23	VERIFICATION OF AGEING *(replace the title by)*		P
replace by:	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 1 (ms)		P

	TEST SEQUENCE "C"		P
9.10	VERIFICATION OF MECHANICAL AND ELECTRICAL ENDURANCE		P
9.10.3	After test:		P
replace by:	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 1 (ms)		P

	TEST SEQUENCE "D"		P
	Tests "D1"		
8.12 replace by:	Multipole RCCBs shall have all current poles supplied from the phases and neutral, if any		N/A
9.17	VERIFICATION OF THE BEHAVIOUR OF RCCBS OPENING AUTOMATICALLY IN CASE OF FAILURE OF THE LINE VOLTAGE		N/A
9.17.1 replace by:	Limiting value of the line voltage (Ux):		N/A
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) . :	D1 - D2 - D3 -	N/A
	- all values less than 0,7 times the rated voltage (V) .... :	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with 1,25 $I_{\Delta N}$ and operating according to Table 1 for $I_{\Delta N}$ (ms) .... :	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A

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Clause	Requirement - Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below Ux .... :	D1 - D2 - D3 -	N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .... :	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	D1 - D2 - D3 -	N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side: No automatically closing		N/A
9.17.5	**DELETE**		P
9.11.2.3	Verification of the rated residual making and breaking capacity (A): IΔm .... :		—
	After the test:		P
9.11.2.1 i) add:	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)		P
9.11.2.1 i) replace by:	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 1 (ms)		P
9.17	Additional tests for RCCBs functionally depending on line voltage if applicable		N/A

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict
9.17.1 replace by:	Limiting value of the line voltage (Ux):		N/A
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) . :	D1 - D2 - D3 -	N/A
	- all values less than 0,7 times the rated voltage (V) .... :	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with 1,25 $I_{\Delta N}$ and operating according to Table 1 for $I_{\Delta N}$ (ms) .... :	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .... :	D1 - D2 - D3 -	N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .... :	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	D1 - D2 - D3 -	N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side: No automatically closing		N/A

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict
9.17.4 *replace by:*	Verification of the correct operation of RCCBs with 3 or 4 current poles, neutral and one line terminal only being energized in turn:		N/A
	RCCB connected according to fig. 4		N/A
8.11 *replace by:*	Test device		P
	RCCBs shall be provided with a test device		P
	-for RCCBs with rated residual current of 30 mA		P
	Ampere-turns produced when operating the test device do not exceed 1,66 times the ampere-turns produced by $I_{\Delta n}$		P
	-for RCCBs with rated residual current other than 30 mA		N/A
	Ampere-turns produced when operating the test device do not exceed 2,5 times the ampere-turns produced by $I_{\Delta n}$		N/A
	Not possible to energize the circuit on the load side by operating the test device when the RCCB is in the open position		P
9.12.2.2 *add:*	Plug-in RCCBs designed for surface mounting are mounted complete with the appropriate means for the plug-in connection but without cables being connected and without any cover plate		N/A
9.12.2.3 *add:*	Plug-in type RCCBs, the holding in position of which depends solely on their connections, are mounted, complete with the appropriated plug-in base but without cables being connected and without any cover-plate, on a vertical rigid wall		N/A
	A force of 20N is applied to the RCCB portion at a point equidistant between the plug-in connections, without jerks for 1min		N/A
	Tests "D2"		P
9.11.2.3c) *replace by:*	Test voltage 110% of rated phase to neutral voltage for the pole exclusively for the neutral	240*1,1=264V	N/A
	Test voltage 110% of rated phase to phase voltage for the other poles		N/A

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict
9.7.3 *replace by:*	Dielectric strength test of the main circuit at test voltage 2 Un for 1 min:		P
	a) .... 2000 V		P
	b) electronic components disconnected ..... 2000 V		P
	c)... 2000 V		P
	d) .... 2000 V		P
	e) .... 2500 V		N/A
	No flashover or breakdown		P
9.17	VERIFICATION OF THE BEHAVIOUR OF RCCBS OPENING AUTOMATICALLY IN CASE OF FAILURE OF THE LINE VOLTAGE		N/A
9.17.1 replace by:	Limiting value of the line voltage (Ux):		N/A
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) . :	D1 - D2 - D3 -	N/A
	- all values less than 0,7 times the rated voltage (V) .... :	D1 - D2 - D3 -	N/A
	- tripping test at test voltage (V) with 1,25 $I_{\Delta N}$ and operating according to Table 1 for $I_{\Delta N}$ (ms) .... :	D1 - D2 - D3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .... :	D1 - D2 - D3 -	N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .... :	D1 - D2 - D3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	D1 - D2 - D3 -	N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side: No automatically closing		N/A

	TEST SEQUENCE "E"		P
9.11.2.4	a) Verification of the coordination between the RCCB and the SCPD		P
	After the test:		P
9.11.2.1 i) add:	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)		P
9.11.2.1 i) replace by:	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 1 (ms)		P
9.17	Additional tests for RCCBs functionally depending on line voltage if applicable		N/A
9.17.1 replace by:	Limiting value of the line voltage (Ux):		N/A
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) . :	E1 - E2 - E3 -	N/A
	- all values less than 0,7 times the rated voltage (V) .... :	E1 - E2 - E3 -	N/A
	- tripping test at test voltage (V) with 1,25 $I_{\Delta N}$ and operating according to Table 1 for $I_{\Delta N}$ (ms) .... :	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below Ux .... :	E1 - E2 - E3 -	N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .... :	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	E1 - E2 - E3 -	N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side: No automatically closing		N/A
9.17.5	**DELETE**		N/A
9.11.2.2	Verification of the rated making and breaking capacity (A): Im .... :		—
	After the test:		P
9.11.2.1 i) add:	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)		P
9.11.2.1 i) replace by:	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 1 (ms)		P
9.17	Additional tests for RCCBs functionally depending on line voltage if applicable		N/A

9.17.1 replace by:	Limiting value of the line voltage (Ux):		N/A
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) . :	E1 - E2 - E3 -	N/A
	- all values less than 0,7 times the rated voltage (V) .... :	E1 - E2 - E3 -	N/A
	- tripping test at test voltage (V) with 1,25 $I_{\Delta N}$ and operating according to Table 1 for $I_{\Delta N}$ (ms) .... :	E1 - E2 - E3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .... :	E1 - E2 - E3 -	N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .... :	E1 - E2 - E3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	E1 - E2 - E3 -	N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side: No automatically closing		N/A
9.17.5	**DELETE**		N/A

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict

	TEST SEQUENCE "F"		P
9.11.2.4	Verification of the coordination between the RCCB and the SCPD		P
	b) Verification of the coordination at the rated making and breaking capacity (A): Im .... :		—
	After the test:		P
9.11.2.1 i) add:	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)		P
9.11.2.1 i) replace by:	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 1 (ms)		P
9.17	Additional tests for RCCBs functionally depending on line voltage if applicable		N/A
9.17.1 replace by:	Limiting value of the line voltage (Ux):		N/A
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) . :	F1 - F2 - F3 -	N/A
	- all values less than 0,7 times the rated voltage (V) .... :	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with 1,25 $I_{\Delta N}$ and operating according to Table 1 for $I_{\Delta N}$ (ms) .... :	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A
	Not possible to close the apparatus by manual operating means below Ux .... :	F1 - F2 - F3 -	N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .... :	F1 - F2 - F3 -	N/A

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	F1 - F2 - F3 -	N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side: No automatically closing		N/A
9.17.5	**DELETE**		
9.11.2.4	c) Verification of the coordination at the rated conditional residual short-circuit current (A): IΔc . :		—
	After the test:		P
9.11.2.1 i) add:	The leakage current flowing across the open contacts is measured at 1,1 Un and shall not exceed 2mA (mA)		P
9.11.2.1 i) replace by:	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 1 (ms)		P
9.17	Additional tests for RCCBs functionally depending on line voltage if applicable		N/A
9.17.1 replace by:	Limiting value of the line voltage (Ux):		N/A
	- rated voltage applied to the line terminals and progressively lowered to attain zero within about 30 s until automatic opening occurs; voltage (V) . :	F1 - F2 - F3 -	N/A
	- all values less than 0,7 times the rated voltage (V) .... :	F1 - F2 - F3 -	N/A
	- tripping test at test voltage (V) with 1,25 $I_{\Delta N}$ and operating according to Table 1 for $I_{\Delta N}$ (ms) .... :	F1 - F2 - F3 -	N/A
	No value exceeds the specified limiting values		N/A

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict
	Not possible to close the apparatus by manual operating means below Ux .... :	F1 - F2 - F3 -	N/A
9.17.2 replace by:	Verification of behaviour in case of failure of the line voltage		N/A
	RCCB supplied with rated voltage, and the line voltage then switched off		N/A
	Time (ms) interval between switching off and opening of the main contacts .... :	F1 - F2 - F3 -	N/A
	a) RCCBs opening without delay: no value exceeds 0,5 s		N/A
	- no tripping shall occur if the voltage is switched off for a time not exceeding 0,03 s	F1 - F2 - F3 -	N/A
	b) RCCBs opening with delay: max. and min. values within the range indicated by the manufacturer		N/A
	RCCBs classified 4.1.2.1b): switch off at U_N		N/A
	Voltage off and on at the line side: No automatically closing		N/A
9.17.5	**DELETE**		N/A

	TEST SEQUENCE "G0"		P
9.22.1	Climatic test		P
9.22.1.5 replace by	Final verification:		P
	The RCCB shall trip with a test current of 1,25 $I_{\Delta N}$ - break time not exceeding the value for $I_{\Delta N}$ in table 1 (ms)		P

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict

	TEST SEQUENCE "G1" ***(add the new test sequence)***	2P(1P+N), 63A, type AC, 30mA	P
8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		P
add: 8.Z1	BEHAVIOUR OF RCCBS AT LOW AMBIENT AIR TEMPERATURE		P
	RCCBs for use between -25℃ and +40℃ operate reliably at low ambient air temperature		P
add: 9.Z1	VERIFICATION OF THE CORRECT OPERATION AT LOW AMBIENT AIR TEMPERATURE FOR RCCBS FOR USE AT TEMPERATURES BETWEEN -25℃ AND +40℃		P
	RCCBs mounted in enclosure with degree of protection IP 55 and connected for normal use		P
	RCCBs in a test chamber at +23℃ ± 2℃ and rH 90% ± 3%		P
	RCCBs in ON-position without load		P
	Five test cycles performed acc. to figure Z6		P
	No tripping during cycles		P
	At the end of last 6 h period at -25℃ an a.c. residual current is passed through one pole (see figure 4a)		P
	- general type:		P
	break time at 1,25 $I_{\Delta N}$ not exceeding the value for $I_{\Delta N}$ in table 1	$G_1$1 – 24 $G_1$2 – 20 $G_1$3 – 21	P
	- S-type:		N/A
	break time at 2,5 $I_{\Delta N}$ not exceeding the value for 2 $I_{\Delta N}$ in table 1	$G_1$1 - $G_1$2 - $G_1$3 -	N/A
	Additionally for RCCBs of type A:		N/A
	Break time with pulsating d.c. residual currents of		N/A
	- 1,25 $I_{\Delta N}$ (general type)		N/A
	- 2,5 $I_{\Delta N}$ (S-type)		N/A
	Multiplied by:		N/A
	1,4 for $I_{\Delta N}$ > 0,01 A	$G_1$1 – $G_1$2 – $G_1$3 –	N/A

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict

	2 for $I_{\Delta N} \leq 0{,}01$ A	$G_1$1 - $G_1$2 - $G_1$3 -	N/A
	at α = 0°el (test circuit figure 4b)		N/A
	After test possible to switch on the RCCB without presence of residual current		N/A

	TEST SEQUENCE "G1" ***(add the new test sequence)***	2P(1P+N), 16A, type AC, 500mA	P
8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		P
add: 8.Z1	BEHAVIOUR OF RCCBS AT LOW AMBIENT AIR TEMPERATURE		P
	RCCBs for use between -25°C and +40°C operate reliably at low ambient air temperature		P
add: 9.Z1	VERIFICATION OF THE CORRECT OPERATION AT LOW AMBIENT AIR TEMPERATURE FOR RCCBS FOR USE AT TEMPERATURES BETWEEN -25°C AND +40°C		P
	RCCBs mounted in enclosure with degree of protection IP 55 and connected for normal use		P
	RCCBs in a test chamber at +23°C ± 2°C and rH 90% ± 3%		P
	RCCBs in ON-position without load		P
	Five test cycles performed acc. to figure Z6		P
	No tripping during cycles		P
	At the end of last 6 h period at -25°C an a.c. residual current is passed through one pole (see figure 4a)		P
	- general type:		N/A
	break time at 1,25 $I_{\Delta N}$ not exceeding the value for $I_{\Delta N}$ in table 1	$G_1$1 – 21 $G_1$2 – 18 $G_1$3 – 22	P
	- S-type:		N/A
	break time at 2,5 $I_{\Delta N}$ not exceeding the value for 2 $I_{\Delta N}$ in table 1	$G_1$1 – $G_1$2 – $G_1$3 –	N/A
	Additionally for RCCBs of type A:		N/A

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict

	Break time with pulsating d.c. residual currents of		N/A
	- 1,25 $I_{\Delta N}$ (general type)		N/A
	- 2,5 $I_{\Delta N}$ (S-type)		N/A
	Multiplied by:		N/A
	1,4 for $I_{\Delta N}$ > 0,01 A	$G_1$1 – $G_1$2 – $G_1$3 –	N/A
	2 for $I_{\Delta N}$ ≤ 0,01 A	$G_1$1 - $G_1$2 - $G_1$3 -	N/A
	at α = 0°el (test circuit figure 4b)		N/A
	After test possible to switch on the RCCB without presence of residual current		N/A

	TEST SEQUENCE "G1" ***(add the new test sequence)***	4P(3P+N), 63A, type AC, 30mA	P
8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		P
add: 8.Z1	BEHAVIOUR OF RCCBS AT LOW AMBIENT AIR TEMPERATURE		P
	RCCBs for use between -25°C and +40°C operate reliably at low ambient air temperature		P
add: 9.Z1	VERIFICATION OF THE CORRECT OPERATION AT LOW AMBIENT AIR TEMPERATURE FOR RCCBS FOR USE AT TEMPERATURES BETWEEN -25°C AND +40°C		P
	RCCBs mounted in enclosure with degree of protection IP 55 and connected for normal use		P
	RCCBs in a test chamber at +23°C ± 2°C and rH 90% ± 3%		P
	RCCBs in ON-position without load		P
	Five test cycles performed acc. to figure Z6		P
	No tripping during cycles		P
	At the end of last 6 h period at -25°C an a.c. residual current is passed through one pole (see figure 4a)		P
	- general type:		P

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict

	break time at 1,25 $I_{\Delta N}$ not exceeding the value for $I_{\Delta N}$ in table 1	$G_1$1 – 20 $G_1$2 – 18 $G_1$3 – 23	P
	- S-type:		N/A
	break time at 2,5 $I_{\Delta N}$ not exceeding the value for 2 $I_{\Delta N}$ in table 1	$G_1$1 - $G_1$2 - $G_1$3 -	N/A
	Additionally for RCCBs of type A:		N/A
	Break time with pulsating d.c. residual currents of		N/A
	- 1,25 $I_{\Delta N}$ (general type)		N/A
	- 2,5 $I_{\Delta N}$ (S-type)		N/A
	Multiplied by:		N/A
	1,4 for $I_{\Delta N}$ > 0,01 A	$G_1$1 – $G_1$2 – $G_1$3 –	N/A
	2 for $I_{\Delta N} \leq 0{,}01$ A	$G_1$1 - $G_1$2 - $G_1$3 -	N/A
	at α = 0°el (test circuit figure 4b)		N/A
	After test possible to switch on the RCCB without presence of residual current		N/A

	TEST SEQUENCE "G1" ***(add the new test sequence)***	4P(3P+N), 16A, type AC, 500mA	P
8	REQUIREMENTS FOR CONSTRUCTION AND OPERATION		P
add: 8.Z1	BEHAVIOUR OF RCCBS AT LOW AMBIENT AIR TEMPERATURE		P
	RCCBs for use between -25°C and +40°C operate reliably at low ambient air temperature		P
add: 9.Z1	VERIFICATION OF THE CORRECT OPERATION AT LOW AMBIENT AIR TEMPERATURE FOR RCCBS FOR USE AT TEMPERATURES BETWEEN -25°C AND +40°C		P
	RCCBs mounted in enclosure with degree of protection IP 55 and connected for normal use		P

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict
	RCCBs in a test chamber at +23℃ ± 2℃ and rH 90% ± 3%		P
	RCCBs in ON-position without load		P
	Five test cycles performed acc. to figure Z6		P
	No tripping during cycles		P
	At the end of last 6 h period at -25℃ an a.c. residual current is passed through one pole (see figure 4a)		P
	- general type:		N/A
	break time at 1,25 $I_{\Delta N}$ not exceeding the value for $I_{\Delta N}$ in table 1	$G_1$1 – 23 $G_1$2 – 20 $G_1$3 – 27	P
	- S-type:		N/A
	break time at 2,5 $I_{\Delta N}$ not exceeding the value for 2 $I_{\Delta N}$ in table 1	$G_1$1 – $G_1$2 – $G_1$3 –	N/A
	Additionally for RCCBs of type A:		N/A
	Break time with pulsating d.c. residual currents of		N/A
	- 1,25 $I_{\Delta N}$ (general type)		N/A
	- 2,5 $I_{\Delta N}$ (S-type)		N/A
	Multiplied by:		N/A
	1,4 for $I_{\Delta N}$ > 0,01 A	$G_1$1 – $G_1$2 – $G_1$3 –	N/A
	2 for $I_{\Delta N} \leq$ 0,01 A	$G_1$1 - $G_1$2 - $G_1$3 -	N/A
	at α = 0°el (test circuit figure 4b)		N/A
	After test possible to switch on the RCCB without presence of residual current		N/A

TABLE ACC. 6.Z3 - GUIDANCE TABLE FOR MARKING

		Marking shall be on the RCCB itself			Marking in the catalogue
6	Marking and other product information Each RCCB shall be marked in a durable manner with all or, for small apparatus, part of the following data: The minimum requirements are indicated by the symbol "X"	Marking visible when the device is installed in case of small devices, where the space avail-able does not allow all the data to be marked.	Marking allowed on the side or on the back of the device, visible before the device is installed.	Alternatively the information may be on the inside of any cover which has to be removed in order to connect the supply wires.	Remaining information to be given in the manufacturer's catalogues if not marked on the device.
a)	The manufacturer's name or trademark		X		
b)	Type designation, catalogue number or serial number		X		
c)	Rated voltage(s) with the symbol ~		X		
d)	Rated frequency, of the RCCB is designed only for one frequency (see 5.3.7)				X
e)	Rated current	X			
f)	Rated residual operating current $I_{\Delta n}$) in A or in mA	X			
h)	Rated making and breaking capacity (I_m)				X *)
j)	The degree of protection (only if different from IP20)				X
k)	The position of use (symbol according to IEC 60051), if necessary		X		
l)	Rated residual making and breaking capacity ($I_{\Delta m}$), if different from rated making and breaking capacity (I_m)				X *)
m)	The symbol S (S in a square) for type S devices	X			
n)	Indication that the RCCB is functionally dependent on line voltage, if applicable		X	X	
o)	Operating means of the test device, by the letter T	X			
q)	Wiring diagram unless the correct mode of operation is evident		X	X	
r)	Operating characteristic in presence of residual currents with d.c. components - RCCBs of type AC with the symbol - RCCBs of type A with the symbol	X (only for RCCBs of type A)	X (only for RCCBs of type AC)		
u)	RCCBs according to 4 Z1 2 marked with the symbol (snowflake enclosing -25)		X		
	Indication of the terminal for the neutral with "N"		X		
	Additional marking of performance to other standards		X		
	Symbol of rated conditional breaking capacity with a fuse	X			

*) $I_{\Delta m}$ and I_m (if different from $I_{\Delta m}$) may be anywhere on the device or in the catalogue but shall be together.
**) Under consideration
NOTE: Specifications on appropriate recommendations to the user to regularly operate the test device are under consideration

replace table A.1 by:

ANNEX A (NORMATIVE)

Test sequence and number of samples to be submitted for certification purposes
Table A.1 - Test sequences

Test sequence		Clause or subclause	Test (or inspection)
A		6 8.1.1 8.1.2 9.3 8.1.3 8.1.6 9.15 9.4 9.5 9.6 9.13 8.1.3 9.14	Marking General Mechanism Indelibility of marking Clearance and creepage distances (external parts only) Non-interchangeability Trip free mechanism Reliability of screws, current-carrying parts and connections Reliability of terminals for external conductors Protection against electric shock Resistance to heat Clearances and creepage distances (internal parts) Resistance to abnormal heat and to fire
B		9.7 9.8 9.20 9.22.2 9.23	Dielectric properties Temperature-rise Resistance of insulation against an impulse voltage Reliability at 40°C Ageing of electronic components
C		9.10	Mechanical and electrical endurance
D	D_0	9.9.1	Operating characteristics under residual current conditions
	D_1	9.17 9.19 9.21 9.11.2.3 a) b) 9.16 9.12 9.18	Behaviour in case of failure of the line voltage Unwanted tripping Behaviour in case of surge currents D.C. components Performance at $I_{\Delta m}$ Test device Resistance to mechanical shock and impact Non operating current under overcurrent conditions
	D_2	9.11.2.3 c)	Verification of the suitability in IT systems
E		9.11.2.4 a)	Coordination at I_{nc}
		9.11.2.2	Performance at I_m
F		9.11.2.4 b)	Coordination at I_m
		9.11.2.4 c)	Coordination at $I_{\Delta c}$
G_0		9.22.1	Reliability (climatic tests)
G_1		9.Z1	Verification of correct operation at low ambient air temperature of RCCBs for use in the range of -25°C to +40°C

replace table A.2 by:			
Table A.2 - Number of samples for full test procedure			
Test sequence [a]	Number of samples	Minimum number of accepted samples [b]	Maximum number of samples for repeated tests [c]
A_1	1+3[f]	1+3[f]	--
A_2	3	2	3
B	3	2	3
C	3	2	3
D	3	2 [d]	3
D_2	3	3	3
E	3	2 [d]	3
F	3	2 [d]	3
G_0	3	2	3
G_1	3	2	3
H [e]	3	2	3
I [e]	3	2	3
J [e]	3	2	3

a) In total a maximum of three test sequences may be repeated.

b) It is assumed that a sample which has not passed a test has not met the requirements due to workmanship or assembly defects which are not representative of the design.

c) In the case of repeated tests, all test results must be acceptable.

d) All samples shall meet the requirements in 9.9.2, 9.9.3, and 9.11.2.3, as appropriate. In addition, permanent arcing or flashover between poles or between poles and frame shall not occur in any sample during tests of 9.11.2.2, 9.11.2.4 a), 9.11.2.4 b) or 9.11.2.4 c).

e) At the manufacturer's request, the same set of samples may be subjected to more than one of these test sequences.

f) Test 9.14 shall be applied to 3 additional new samples.

IEC 61008-1 / EN 61008-1			
Clause	Requirement - Test	Result - Remark	Verdict

replace table A.3 by:

Table A.3 - Number of samples for simplified test procedure

Test sequence	Number of samples according to the number of poles [a) g)]		
	2-poles [b) c)]	3-poles [d) f)]	4-poles [e)]
A_1	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$	1 max. rating I_N min. rating $I_{\Delta N}$
A_2	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
B	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
C	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
$D_0 + D_1$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
D_0	1 for all other ratings of $I_{\Delta N}$		
D_2	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
E	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
F	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$
G_0	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$
G_1	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$	3 max. rating I_N min. rating $I_{\Delta N}$ 3 min. rating I_N max. rating $I_{\Delta N}$
H			3 [h)] samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$
I			3 [h)] samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$
J			3 [h)] samples of the same rating I_N chosen at random min. rating $I_{\Delta N}$

a) If a test is to be repeated according to the minimum performance criteria of clause A.2, a new set of samples is used for the relevant test. In the repeated test all test results must be acceptable.
b) If only 3-pole or 4-pole RCCBs are submitted, this column shall also apply to a set of samples with the smallest number of poles.
c) deleted.
d) deleted.
e) deleted.
f) This column is omitted when 4-pole RCCBs have been tested.
g) If only one value of $I_{\Delta N}$ is submitted, min. rating $I_{\Delta N}$ and max. rating $I_{\Delta N}$ are replaced by $I_{\Delta N}$.
h) Only the highest number of current poles.

Attachment 1

Measuring equipment list (Test location: The Low Voltage Apparatus Laboratory of Zhejiang Testing & Inspection Institute for Mechanical and Electrical Products Quality (ZTME)):

Measuring equipment	Type	Inventory / Serial No.	Next Calibration
Thermometer	/	SB-Ⅰ-C004	2015-03-19
Thermometer	/	SB-Ⅰ-C007	2015-09-11
Digital Thermometer	HC-02	SB-Ⅰ-C015	2015-05-25
Digital Thermometer	HC-02	SB-Ⅰ-C017	2015-05-25
Digital Thermometer	HC-02	SB-Ⅰ-C018	2015-05-25
Digital Timer	DTM-3	SB-Ⅰ-D002	2015-05-25
Digital Timer	JD-2Ⅱ	SB-I-D004	2015-03-10
Digital Timer	CSY-5E	SB-Ⅰ-D007	2015-07-06
Digital Timer	CSY-5E	SB-Ⅰ-D008	2015-07-06
Digital Timer	CSY-5E	SB-Ⅰ-D009	2015-07-06
Caliper	/	SB-Ⅰ-E003	2015-09-11
Amplifying lens	PEAK2016-L	SB-Ⅰ-E004	2015-09-11
Tubular Force meter	LTZ-10	SB-Ⅰ-F005	2014-10-18
Digital push and pull force meter	HG-500	SB-Ⅰ-F006	2015-03-19
Current transformer	HL55	SB-Ⅰ-M004	2015-05-06
Current transformer	HL55	SB-Ⅰ-M005	2015-05-06
Current transformer	HL55	SB-Ⅰ-M006	2015-05-06
Current transformer	HL23-1	SB-Ⅰ-M010	2015-06-23
Current transformer	HL23-1	SB-Ⅰ-M013	2015-06-23
Current transformer	HL1	SB-Ⅰ-M026	2015-03-10
Current transformer	HL1	SB-Ⅰ-M029	2015-03-10
Current transformer	HL23-5	SB-Ⅰ-M040	2015-08-08
Current transformer	HL23-5	SB-Ⅰ-M041	2015-08-08
Insulation resistance meter	VG2679	SB-Ⅰ-N010	2015-06-18
Glow-wire tester	GWH-A	SB-Ⅰ-S010	2015-03-19
Climatic chamber	RS-110A	SB-Ⅰ-S015	2015-03-19
Electrical parameter meter	GDW305B	SB-Ⅰ-S018	2015-09-11
Electrical parameter meter	GDW305B	SB-Ⅰ-S019	2015-09-11
Torque screw driver	NQ-2	SB-Ⅰ-S021	2014-10-18
Torque screw driver	NQ-4	SB-Ⅰ-S022	2014-10-18
DC Dielectric strength tester	ZN-1	SB-Ⅰ-S023	2015-09-11
Impulse voltage tester	GZ-2	SB -I -S024	2015-03-30
Impulse current tester	GZ-3k	SB-Ⅰ-S029	2015-05-04

Measuring equipment	Type	Inventory / Serial No.	Next Calibration
Residual current characteristic tester	IDB-3	SB-Ⅰ-S030	2014-10-18
Equipment for ball pressure test	/	SB-Ⅰ-S031	2015-03-19
Test finger	/	SB-Ⅰ-S033	2014-10-18
Impulse voltage tester	GC-2	SB-Ⅰ-S035	2015-03-19
Digital acquisition / switch unit	34970A	SB-Ⅰ-S040	2015-09-11
Digital acquisition	Genesis	SB-Ⅰ-S041	2014-11-11
Digital acquisition	SATURN-BE12	SB-Ⅰ-S046	2015-08-19
Three phases PWM tester	PF9833	SB-Ⅰ-S057	2015-03-19
Voltage withstand tester	VG2672F	SB-Ⅰ-S058	2015-05-05
High-low temperature chamber	GD-V180M40P60	SB-Ⅰ-S060	2014-11-19
High-low temperature chamber	EL-10KA	SB-Ⅰ-S067	2015-01-14
Temperature-humidity recorder	HC-02	SB-XⅢ-C001	2015-07-21
Temperature-humidity recorder	HC-02	SB-XⅢ-C002	2015-07-21
Electrostatic discharges generator	NSG437	SB-XⅢ-R001	2014-11-13
Radio-frequency disturbances Testing system	NSG3060 （FTM3425-60）	SB-XⅢ-R002	2014-11-13
Radio-frequency disturbances Testing system（Surge）	NSG3060 （CWM3650）	SB-XⅢ-R003	2014-11-13
Three-phase supply coupling network	CDN3063	SB-XⅢ-R005	2014-11-13
Radio-frequency disturbances Testing system	NSG4070-75	SB-XⅢ-R008	2014-11-13
Attenuator	ATN6075	SB-XⅢ-R009	2014-11-13
Current intensity Meter	CIP9136A	SB-XⅢ-R010	2014-11-13
Field intensity Meter	FL7006	SB-XⅢ-R033	2014-11-19
Radio Power Amplify	CBA 1G-250	SB-XⅢ-R036	2014-11-19
Signal generator	SMB 100A	SB-XⅢ-R040	2014.11.14
EMS Antenna	HL046	SB-XⅢ-R042	2014-11-29

Attachment 2

Sample of photo documentation (2P(1P+N), 16A, type AC, 500mA)

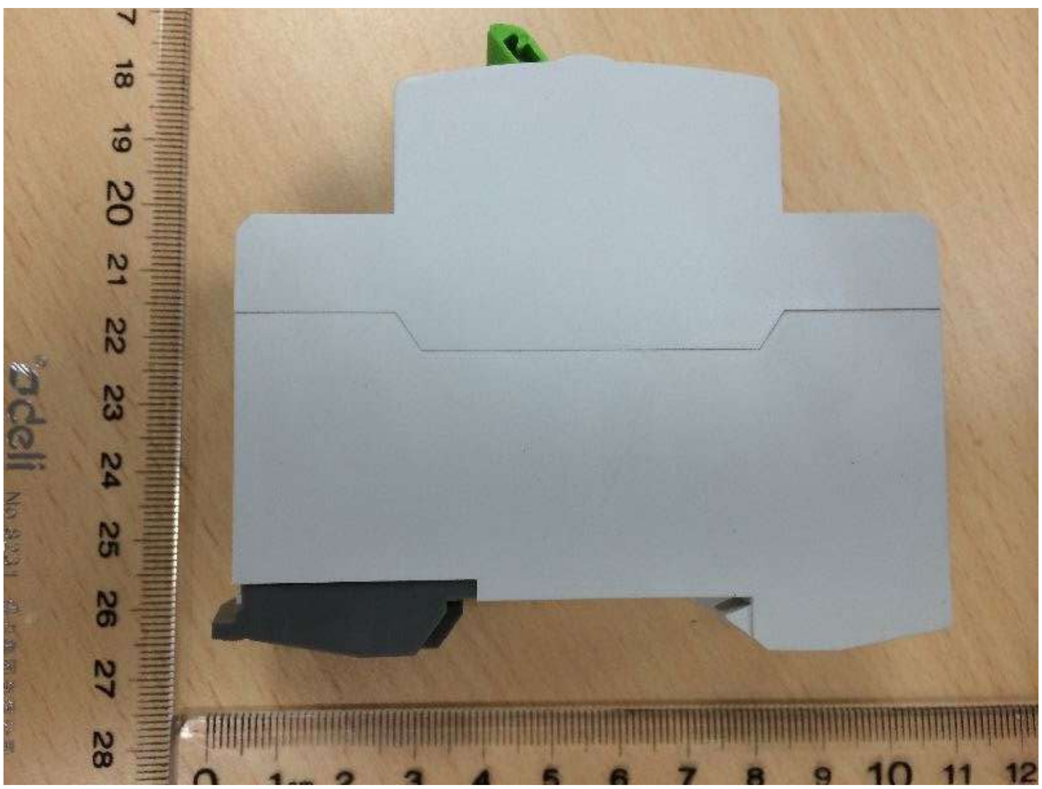


Photo documentation

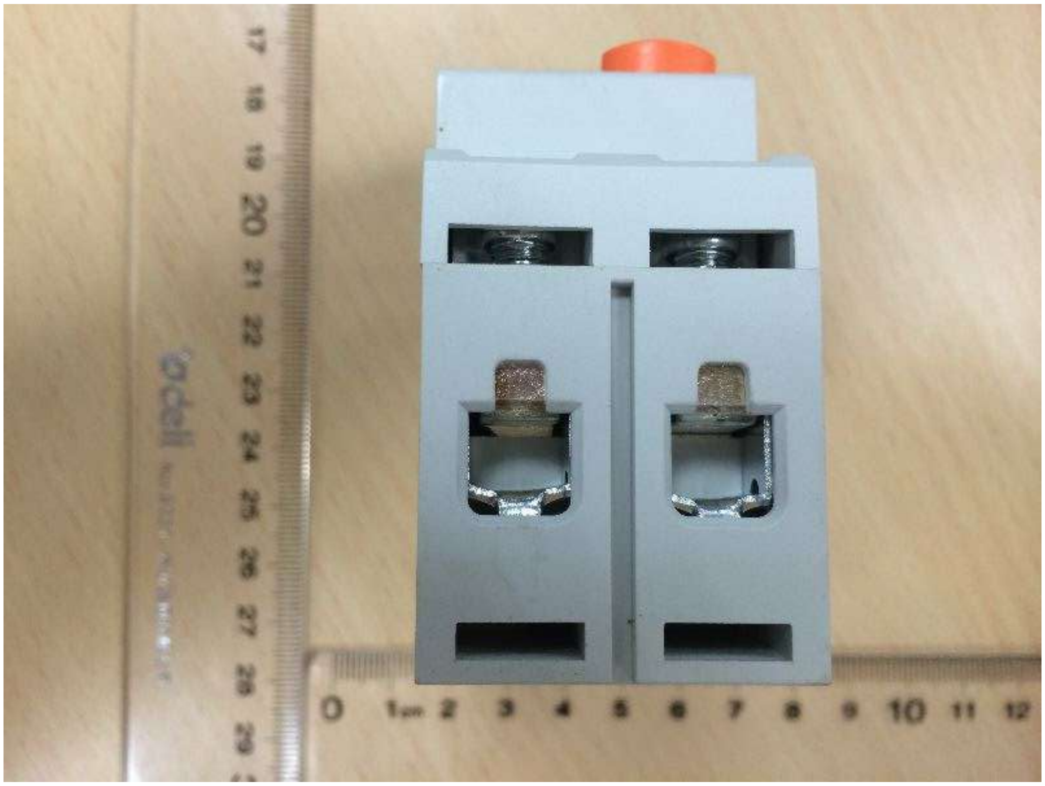
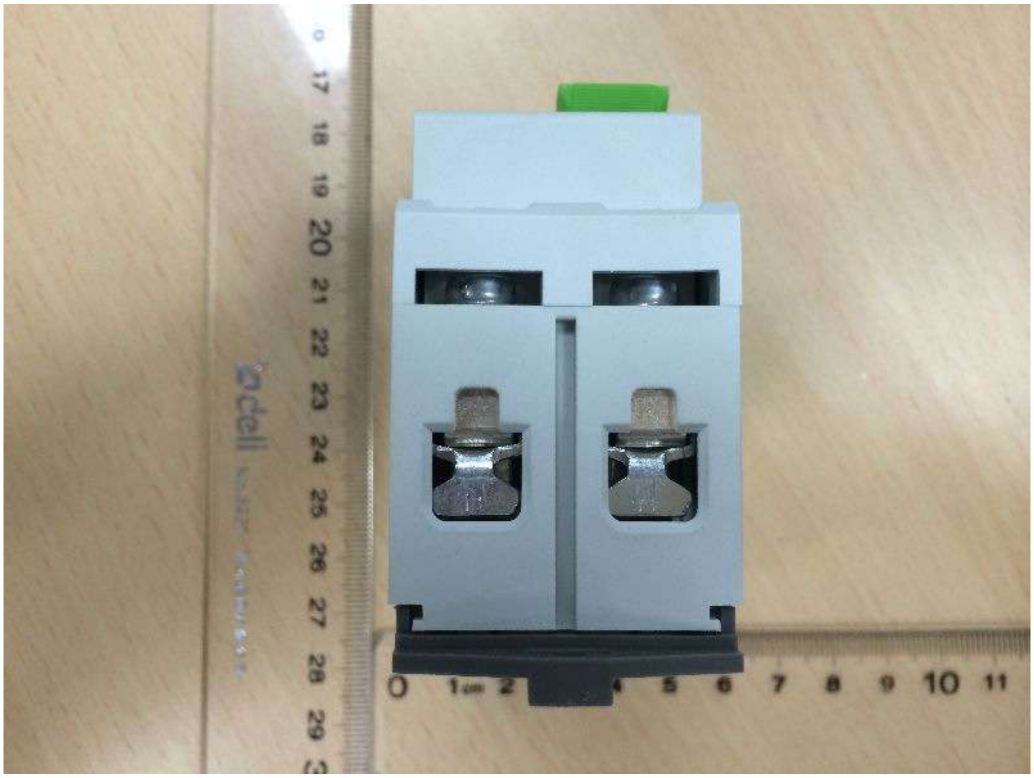


Photo documentation



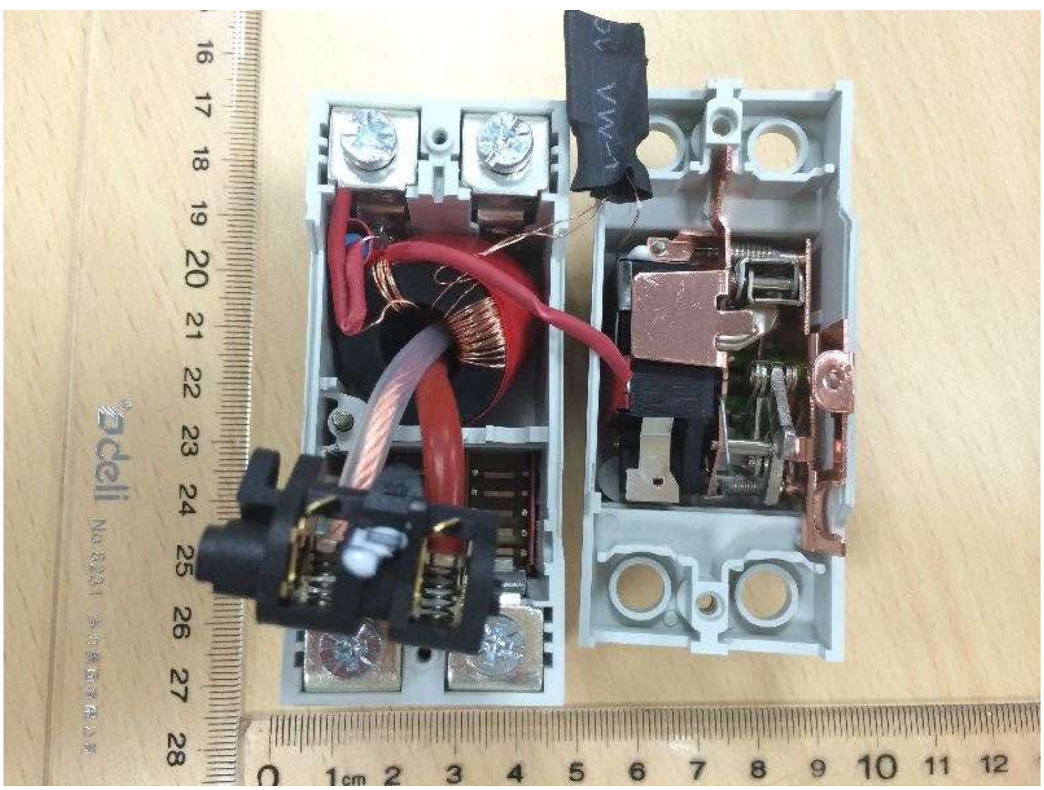
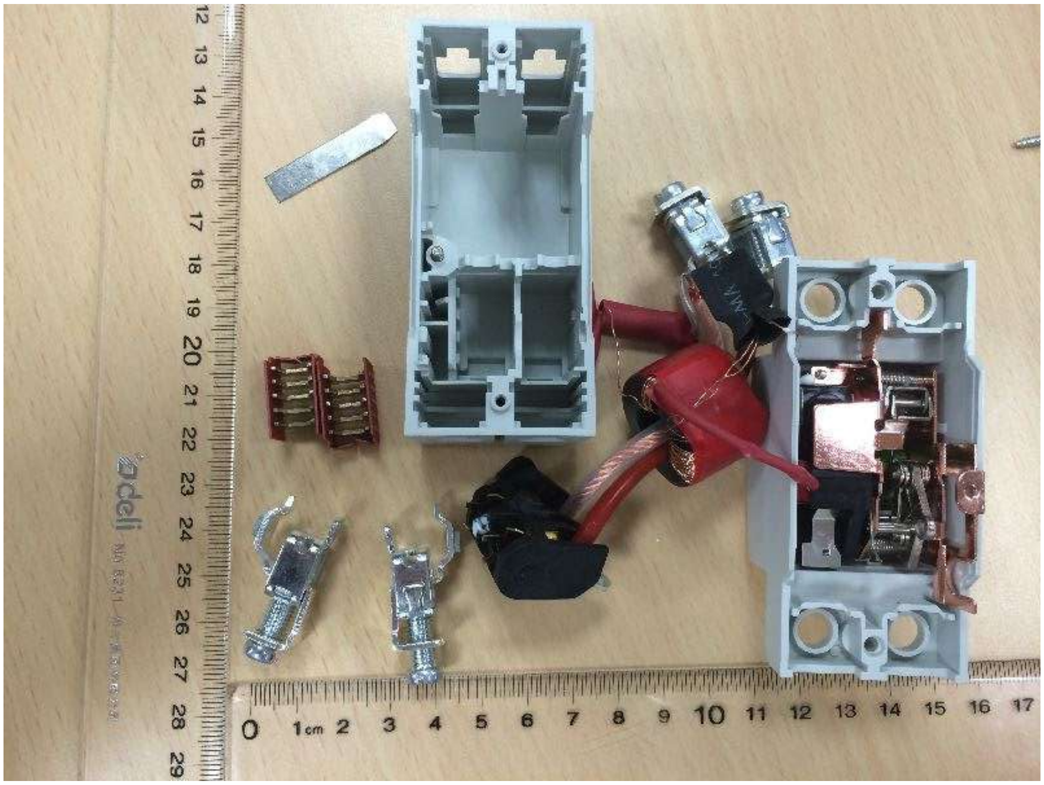
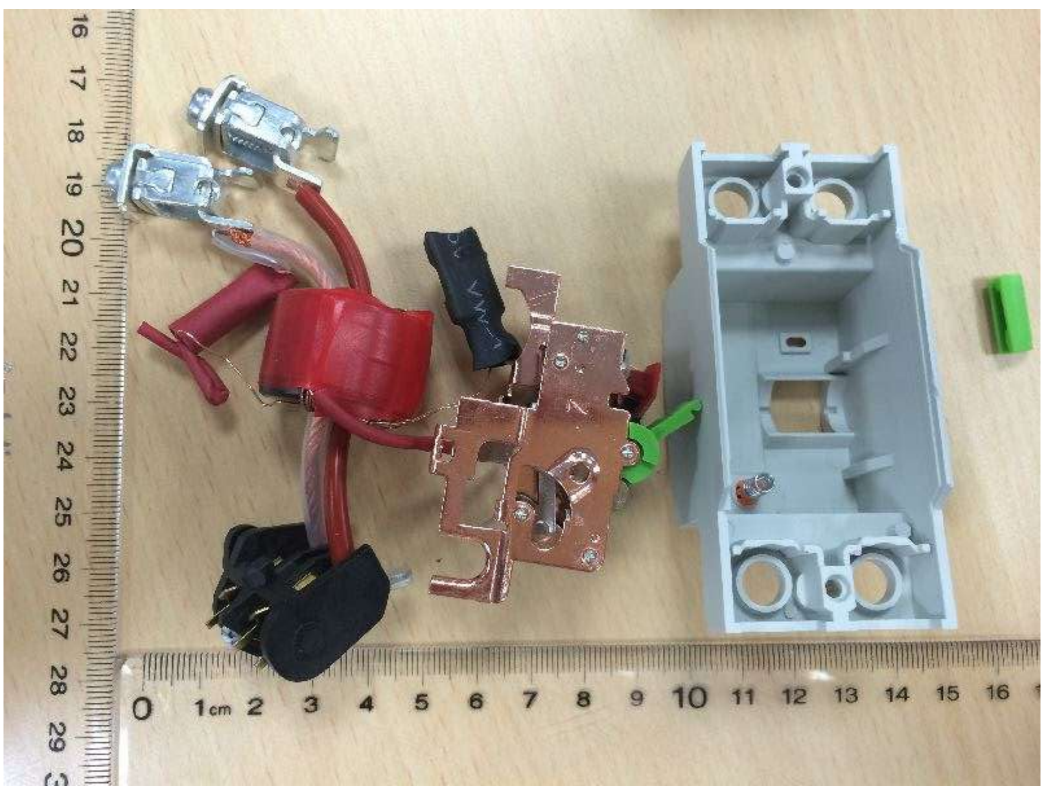
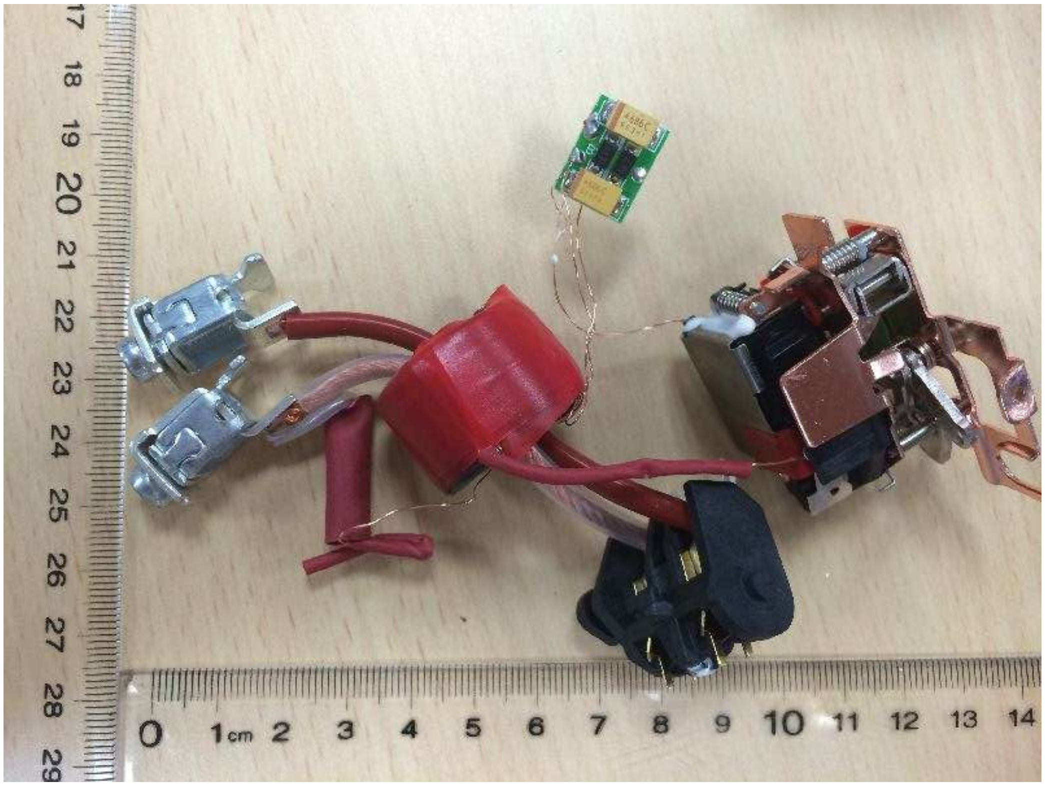


Photo documentation







With sample of 4P(3P+N), 63A, type A, 30mA

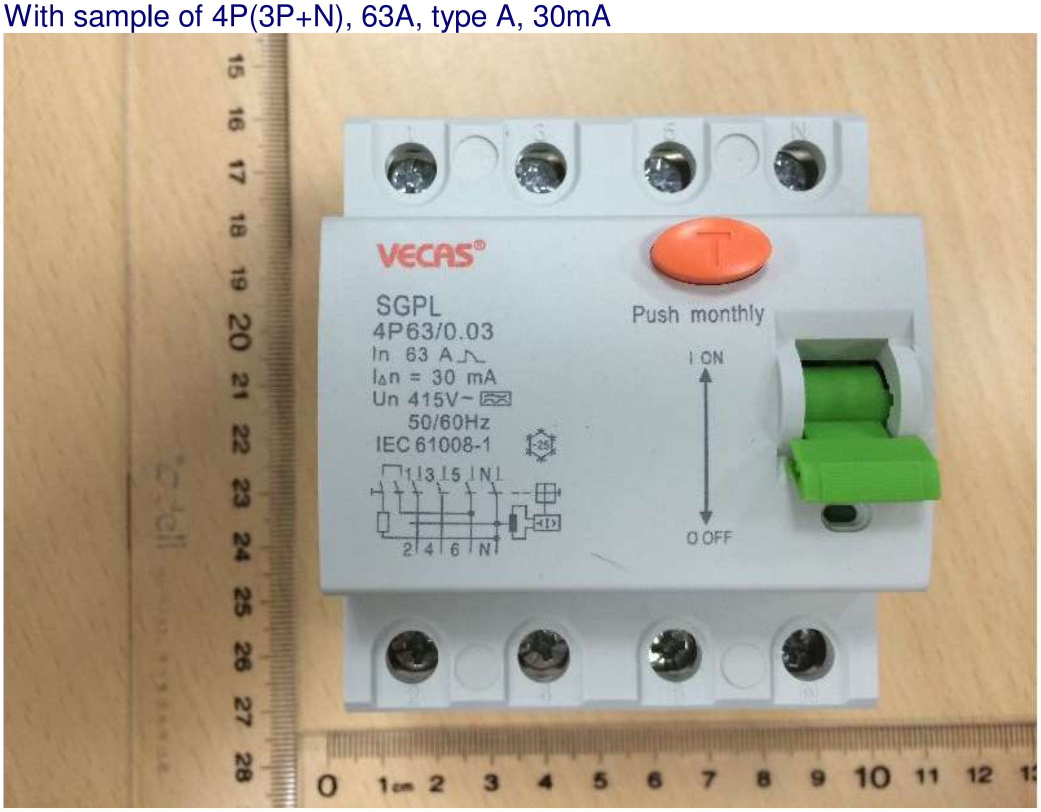
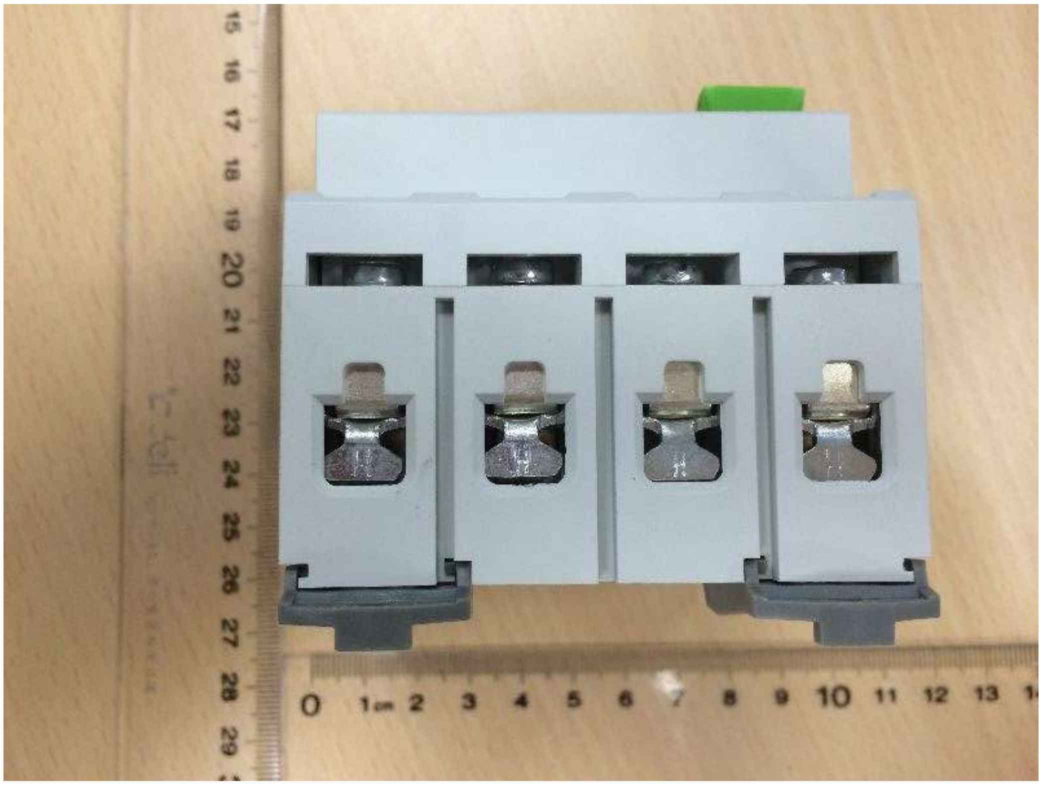
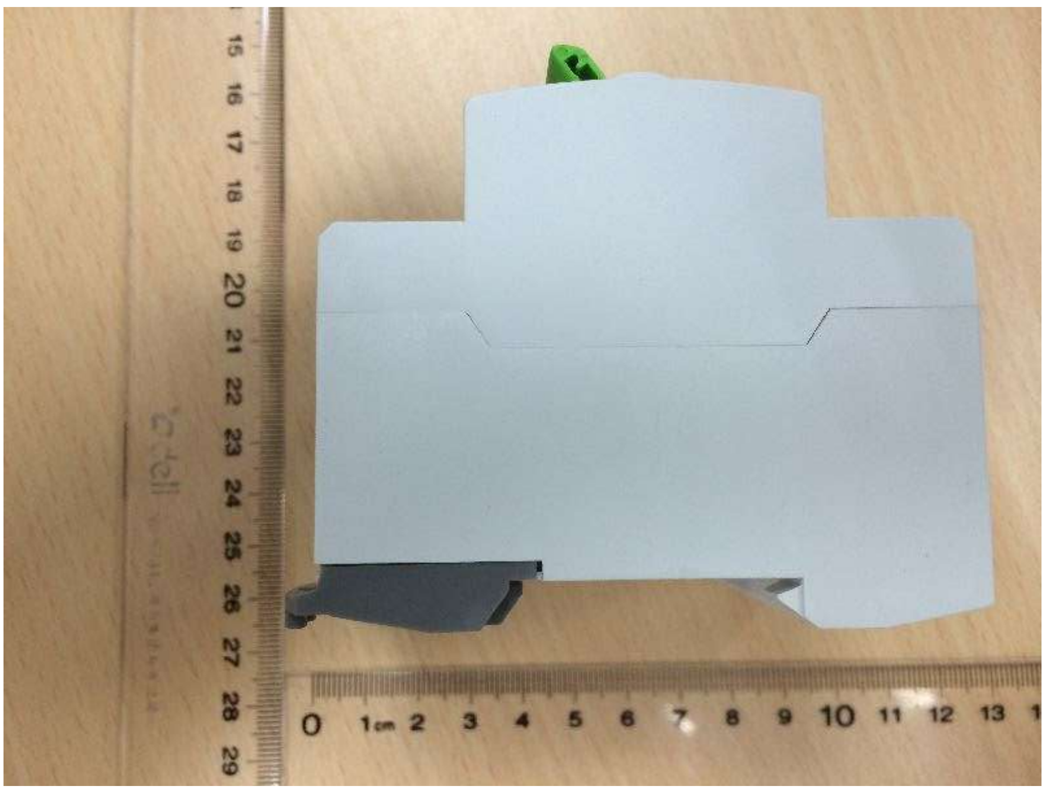


Photo documentation





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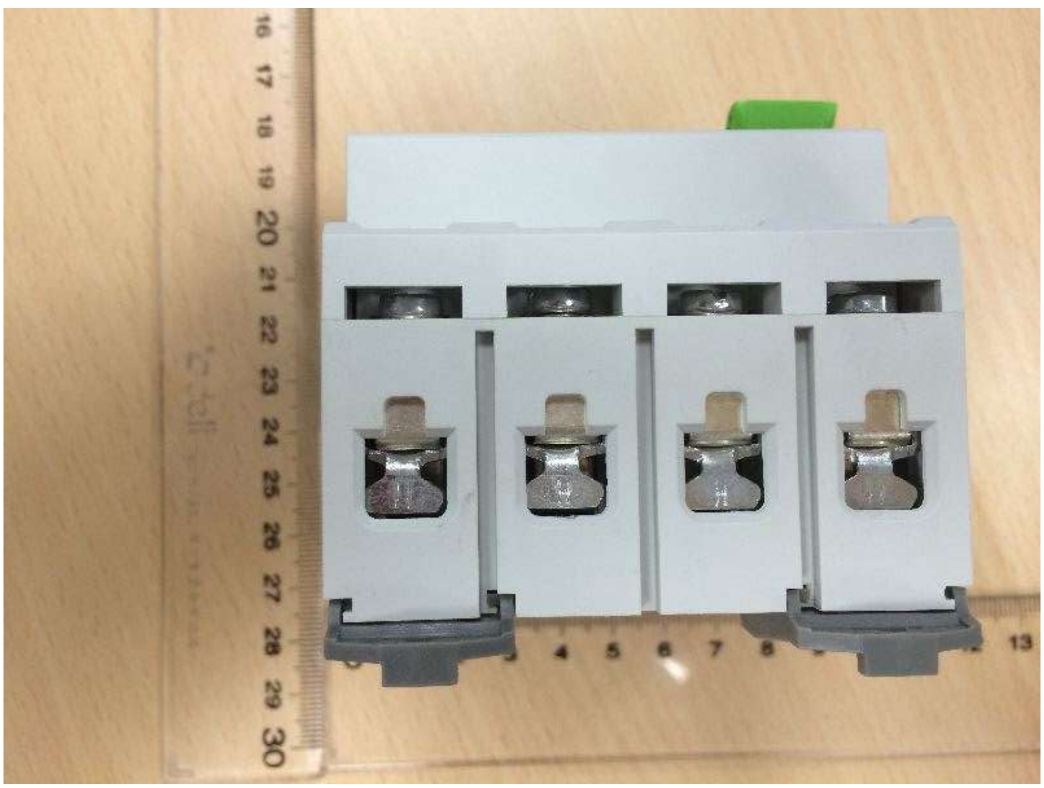

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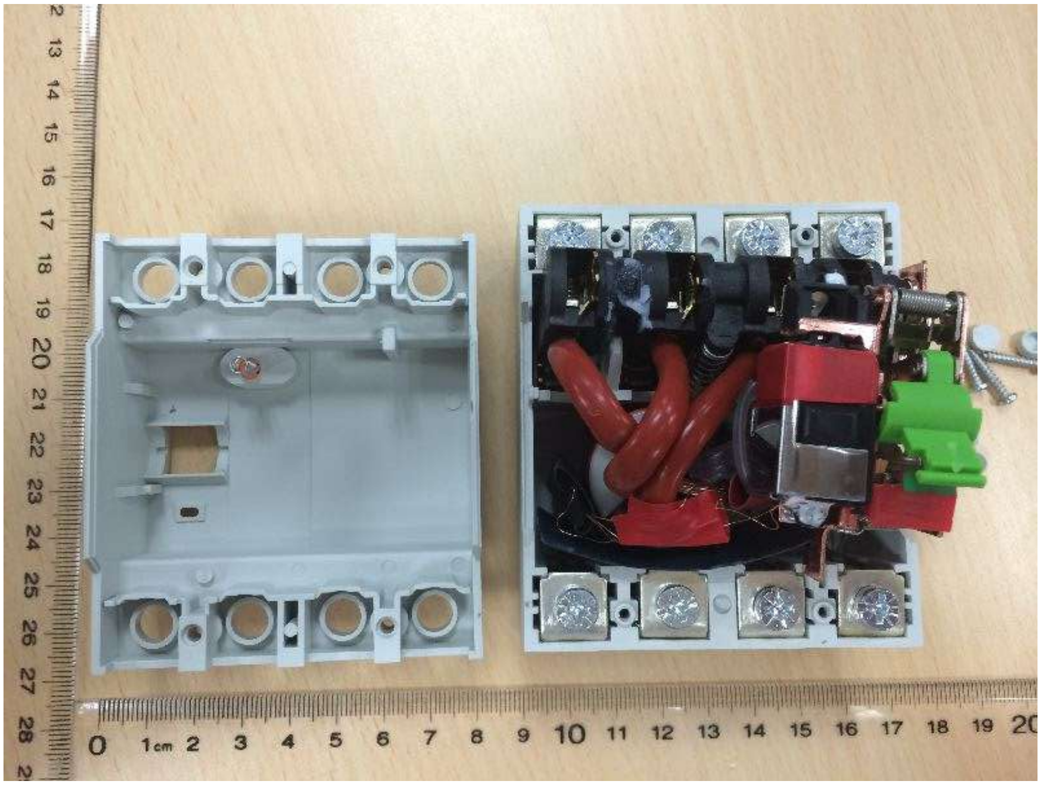

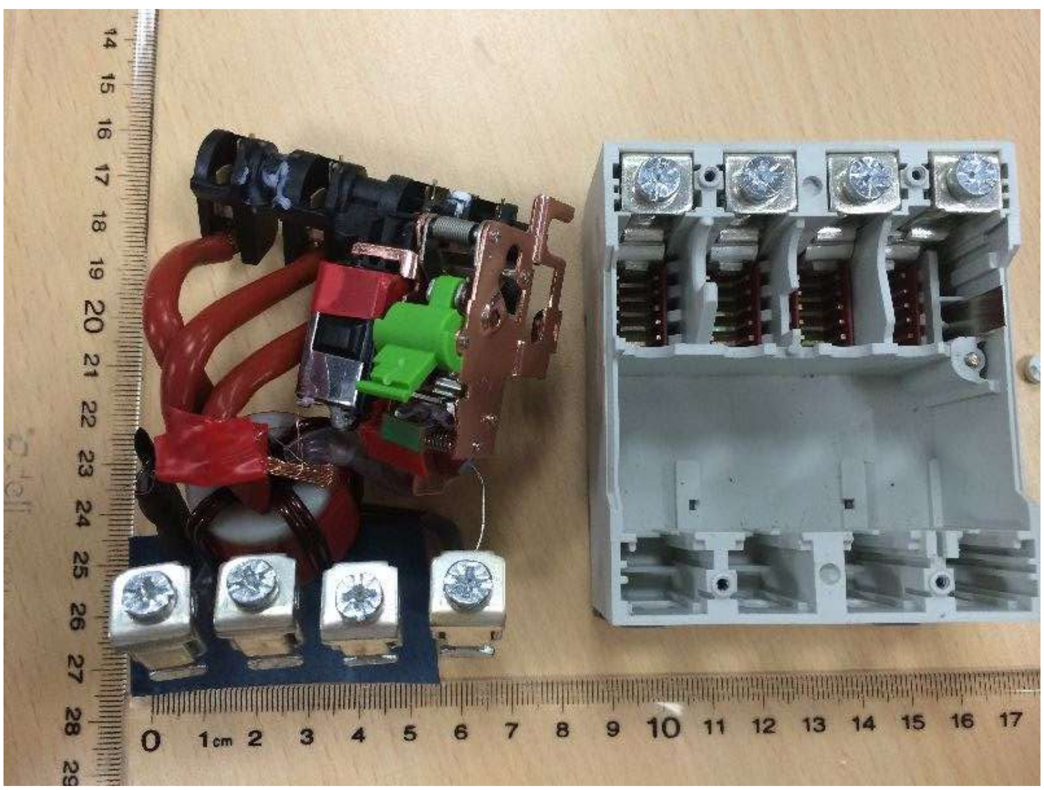

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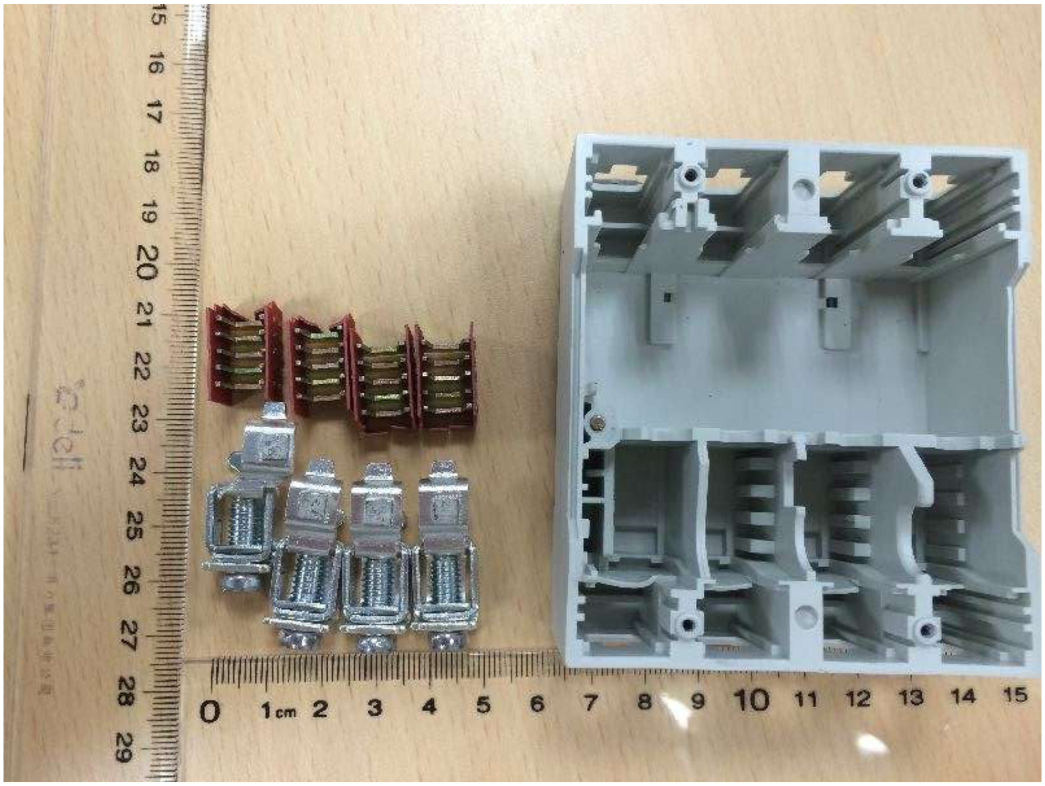

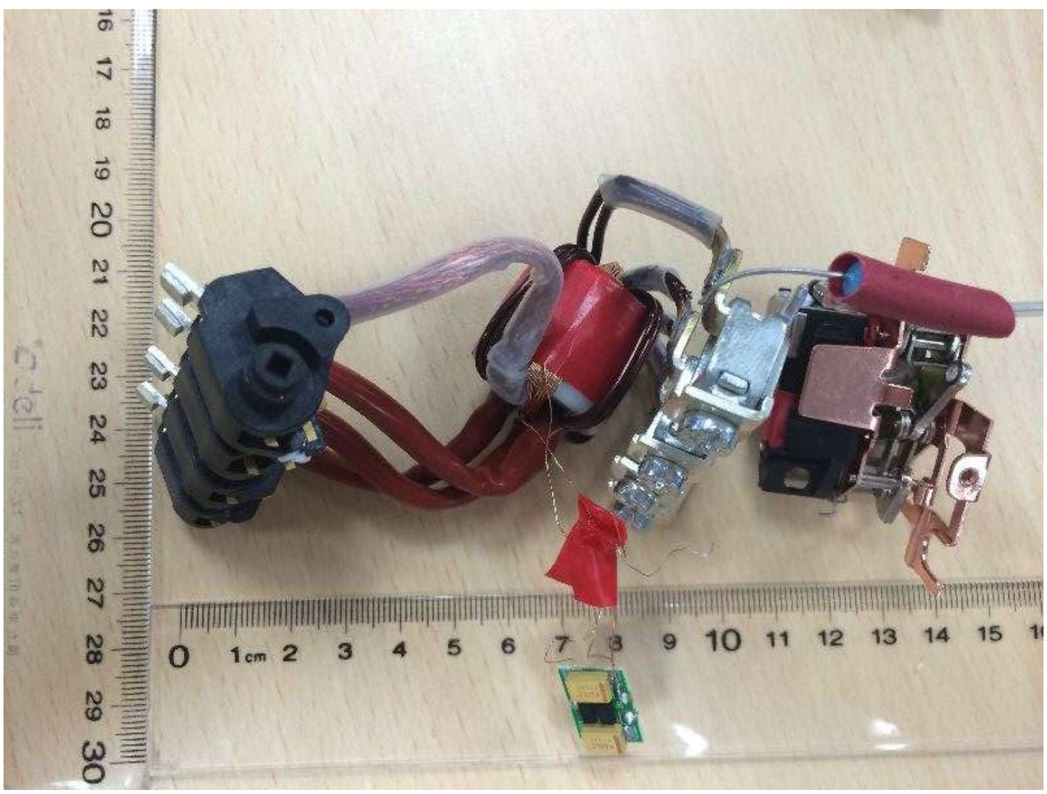

End of test report

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Test Verification of Conformity

Verification Number: 180801235SHA-V1

On the basis of the referenced test report(s), sample(s) tested of the below product have been found to comply with the standards harmonized with the directives listed on this verification at the time the tests were carried out. Other standards and Directives may be relevant to the product. This verification is part of the full test report(s) and should be read in conjunction with it <them>.

Once compliance with all product relevant CE mark directives are verified, including any relevant e.g. risk assessment and production control, the manufacturer may indicate compliance by signing a Declaration of Conformity themselves and applying the mark to products identical to the tested sample(s).

Applicant Name & Address:	**Wenzhou Huajia Electrical Equipment Co., Ltd.** **No. 311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, ZHEJIANG, CHINA.**
Manufacturing site Name & Address:	**Wenzhou Huajia Electrical Equipment Co., Ltd.** **No. 311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, ZHEJIANG, CHINA.**
Product Description:	**Circuit-breakers for over current protection for household and similar installations**
Ratings & Principle Characteristics:	**Ue= 230V/400V~(1P), 400V~(230V~)(2P), 400V~(3P, 4P)** **In= 6, 10, 16, 20, 25, 32, 40, 50, 63A, B- and C- type** **Ics=Icn=6000A, Energy limiting class 3 (6-32A)**
Models/Type References:	**SGP**
Brand Name(s):	***VECAS®***
Standard(s)/Directive(s):	**EN 60898-1:2003 + A1:2004 + A11:2006 + A12:2008 + A13:2012** **Low Voltage Directive 2014/35/EU**
Verification Issuing Office Name & Address:	**Intertek Testing Services Shanghai** **Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China**
Test Report Number(s):	**180801235SHA-001, -002, -003, -004.**

Signature

Name: Oliver Wei
Position: Manager
Date: 26 September 2018

VOV CERTIFICATION & TESTING LABORATORY

VOV

CERTIFICATE OF CONFORMITY

EU – LOW VOLTAGE DIRECTIVE – 2014/35/EU

Registration NO.: VT18120196

Applicant:	WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD
Applicant Address:	NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, YUEQING, ZHEJIANG, CHINA
Product Description:	RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERLOAD PROTECTION
Model / Parameters:	HSL7 230V/240V~2P(1P+N), B&C type, 6A~63A, 50/60Hz, 10mA, 30mA, 100mA, 300mA, TYPE AC, TYPE A, 10KA
TCF / Project NO.:	8609114

Complies with the requirements of the European Community Directive 2014/35/EU. The submitted products have been tested by us with the listed standards and found in compliance with the following European Standards:

EN 61009-1:2012+A12:2015

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the License applicant's disposal. This certificate does not imply assessment of the series-production of the product. The CE markings as shown below can be affixed on the product after preparation of necessary technical documentation.

CE

Authorized by:
Dec 07, 2018

Chief Assessor

VOV CERTIFICATION & TESTING LABORATORY

VOV CERTIFICATION & TESTING LABORATORY LIMITED

THIS CERTIFICATE REFLECTS THE FINDINGS OF THE TIME AND PLACE OF THE AUDIT
THE CERTIFICATION IS ONLY VALID WITH THE TEST REPORT OR TECHNICAL CONSTRUCTION FILE
Internet site: www.vov.org.uk E-mail: vov@vov.org.uk

VOV CERTIFICATION & TESTING LABORATORY

CERTIFICATE OF CONFORMITY

EU – LOW VOLTAGE DIRECTIVE – 2014/35/EU

Registration NO.: VT18120199

Applicant:	WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD
Applicant Address:	NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, YUEQING, ZHEJIANG, CHINA
Product Description:	ISOLATING SWITCH
Model / Parameters:	IS-1P, IS-2P, IS-3P, IS-4P 6A~100A AC230/400V, Icw: 12Ie 1S, 3000A, 0.1S
TCF / Project NO.:	8609117

Complies with the requirements of the European Community Directive 2014/35/EU. The submitted products have been tested by us with the listed standards and found in compliance with the following European Standards:

EN 60947-1:2007+A2:2014 EN 60947-3:2009+A2:2015

This certificate of conformity is based on an evaluation of a sample of the above mentioned product. Technical Report and documentation are at the License applicant's disposal. This certificate does not imply assessment of the series-production of the product. The CE markings as shown below can be affixed on the product after preparation of necessary technical documentation.

Authorized by:
Dec 07, 2018

Chief Assessor

VOV CERTIFICATION & TESTING LABORATORY LIMITED

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CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Wenzhou Huajia Electrical Equipment Co., Ltd.

Registered address: No. 7, Meilin Garden, Liushi Town, Yueqing City, Zhejiang Province, China
Operation address: No.311 Wei 15 Road, Economic Development Zone, Yueqing City, Zhejiang Province, China

has been registered by Intertek as conforming to the requirements of:

ISO 14001:2015

The management system is applicable to:

Manufacturing of Mini Circuit Breaker, Moulded Case Circuit Breaker, Earth Leakage Circuit Breaker (Residual Current Circuit Breaker, Residual Current Circuit Breaker with Overcurrent Protection) , Signal Indicator, Fuse, AC Contactor and Sales of Related Accessories (Export Only).

Unified Social Credit Identifier:
91330300609381229M

Certificate Number:
121906008

Initial Certification Date:
28 August 2019

Date of Certification Decision:
28 August 2019

Issuing Date:
28 August 2019

Valid Until:
27 August 2022

ISO 14001:2015 CERTIFICATION TM
Intertek

UKAS MANAGEMENT SYSTEMS
014

Calin Moldovean
President, Business Assurance

Intertek Certification Limited, 10A Victory Park, Victory Road, Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 014.

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CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Wenzhou Huajia Electrical Equipment Co., Ltd.

Registered address: No. 7, Meilin Garden, Liushi Town, Yueqing City, Zhejiang Province, China
Operation address: No.311 Wei 15 Road, Economic Development Zone, Yueqing City, Zhejiang Province, China

has been registered by Intertek as conforming to the requirements of:

OHSAS 18001:2007

The management system is applicable to:

Manufacturing of Mini Circuit Breaker, Moulded Case Circuit Breaker, Earth Leakage Circuit Breaker (Residual Current Circuit Breaker, Residual Current Circuit Breaker with Overcurrent Protection) , Signal Indicator, Fuse, AC Contactor and Sales of Related Accessories (Export Only).

Unified Social Credit Identifier:
91330300609381229M

Certificate Number:
05131906007

Initial Certification Date:
28 August 2019

Date of Certification Decision:
28 August 2019

Issuing Date:
28 August 2019

Valid Until:
11 March 2021

OHSAS 18001:2007 CERTIFICATION TM
Intertek

UKAS MANAGEMENT SYSTEMS
014

Calin Moldovean
President, Business Assurance

Intertek Certification Limited, 10A Victory Park, Victory Road, Derby DE24 8ZF, United Kingdom

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CERTIFICATE OF REGISTRATION

This is to certify that the management system of:

Wenzhou Huajia Electrical Equipment Co., Ltd.

Registered address: No. 7, Meilin Garden, Liushi Town, Yueqing City, Zhejiang Province, China
Operation address: No.311 Wei 15 Road, Economic Development Zone, Yueqing City, Zhejiang Province, China

has been registered by Intertek as conforming to the requirements of:

ISO 9001:2015

The management system is applicable to:

Manufacturing of Mini Circuit Breaker, Moulded Case Circuit Breaker, Earth Leakage Circuit Breaker (Residual Current Circuit Breaker, Residual Current Circuit Breaker with Overcurrent Protection) , Signal Indicator, Fuse, AC Contactor and Sales of Related Accessories (Export Only).

Unified Social Credit Identifier:
91330300609381229M

Certificate Number:
111906016

Initial Certification Date:
28 August 2019

Date of Certification Decision:
28 August 2019

Issuing Date:
28 August 2019

Valid Until:
27 August 2022

ISO 9001:2015 CERTIFICATION TM
Intertek

UKAS MANAGEMENT SYSTEMS
014

Calin Moldovean
President, Business Assurance

Intertek Certification Limited, 10A Victory Park, Victory Road, Derby DE24 8ZF, United Kingdom

Intertek Certification Limited is a UKAS accredited body under schedule of accreditation no. 014.

DECLARAŢIE DE CONFORMITATE

№ D 104/21 din "4" ianuarie 2021

SRL "POLEV Business", MD -2023, mun. Chişinău, str.A.DOGA , 28/6, of.27
(denumirea producătorului, adresa, telefon, fax)

în persoana: Directorului dna L. Poleacova
(funcţia, numele, prenumele conducătorului)
declară pe propria răspundere că produsul:

1. **Intrerupatoare automate VA47-29/100/SGP 1P, 2P, 3P, 4P 6kA curba B, C VECAS**
2. **Separatoare de sarcina VN32-IS 1P, 2P, 3P, 4P VECAS**
3. **Intrerupatoare automate de forţă VA88/M6, VA88/M6E, VA88/M6RT 25A - 800A VECAS**
4. **Contactoare electromagnetice KM LC1 9A - 95A VECAS**
5. **Contactoare electromagnetice KT1-F 115A -630A VECAS**
6. **Separatoare de sarcină GL 3P 100A - 2500A VECAS**
7. **Separatoare de sarcină basculante GLZ 3P si 6P 100A - 2500A VECAS**
8. **Descarcatoare de impulsuri de supratensiuni TRS 1P, 2P, 3P, 4P B si C VECAS**

(denumirea, tipul, marca , codul produsului, informaţia privind fabricarea în serie sau la un lot de produse

Producător:
„WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO.,LTD " 07 MEILING GARDEN , LIUSHI, YUEQING, ZHEJIANG, China
(numărul şi mărimea lotului, numărul de fabricaţie, denumirea şi numărul documentului,
care însoţeşte produsele/facturii, contractului certificatului de calitate/, denumirea producătorului, ţării etc.)
la care se referă prezenta declaraţie nu pune în pericol viaţa şi sănătatea consumatorilor, nu produce impact asupra mediului înconjurător şi este în conformitate cu următoarele reglementări tehnice sau standarde:

RT „Punerea la dispoziţie pe piaţă a echipamentelor electrice destinate utilizării în cadrul unor anumite limite de tensiune" HG RM nr. 745 din 26.10.2015)

SM EN 60898-1:2003/AC:2016 , SM EN 60947-3:2009/A2:2016
(indicarea reglementărilor tehnice sau standardelor cu specificarea punctelor acestor acte normative, care stabilesc cerinţe pentru produsele respective)

Declaraţia este întocmită în baza:

***CERTIFICATULUI de CONFORMITATE* CE № VT18120199 din 07.12.2018 , eliberat VOV CERTIFICATION & TESTING LABORATORY , UK**
***Declaraţiei de conformitate* № HJ20190117 din 18.01.2019 „WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO.,LTD " , CHINA**
***CERTIFICATULUI SISTEMEI MANAGEMENT* ISO 9001:2015 № CNBJ311911-CN din 22.09.2018 , eliberat de Centru Mondial BUREAU VERITAS CERTIFICATION**
***Rapoartelor de încercări* Test Verification of Conformity** **№ 180801235SHA-V1 din 26 09.2018 la conformitate EN 60898-1:2003+A1:2004+A11:2006+A12:2008+A13:2012 şi Low Voltage Directive 2014/35/EU eliberate de Intertek Testing Services Shanghai Building № 86, 1198 Qinzhou Road (North) , Shanghai China**
***Rapoartelor de încercări* Test Verification of Conformity № VT18120199 din 12 07.2018 la conformitate EN 60898-1:2003+A1:2004+A11:2006+A12:2008+A13:2012 şi Low Voltage Directive 2014/35/EU eliberate VOV CERTIFICATION & TESTING LABORATORY, UK**
Informaţie suplimentară Declaraţia de conformitate este valabilă pînă la: **"3" ianuarie 2022**

SOCIETATEA COMERCIALA "POLEV BUSINESS" IDNO 1007600058371 REPUBLICA MOLDOVA

Director tehnic, POLEV Business SRL Guranda V. **V. Guranda**
(semnătura) (numele, prenumele)

L.Ş.

СЕРТИФИКАТ СООТВЕТСТВИЯ
НАУЧНО – ТЕХНИЧЕСКОЙ ЭКСПЕРТИЗЫ И ИСПЫТАНИЙ

Научный Экспертно-Технический Центр " MOLDTESTENERGO "
МД 2064, г. Кишинев, ул. Крянгэ 49/3 , оф.30 , т. 0694 -26081

Регистрационный номер **CŞET MTE 26 13C 148-21**

Дата выдачи: 25 февраля 2021 Действителен по: 24 февраля 2022

НАСТОЯЩИМ ДОКУМЕНТОМ УДОСТОВЕРЯЕТСЯ, ЧТО ПРОДУКЦИЯ, ИДЕНТИФИЦИРОВАННАЯ КАК:
НАИМЕНОВАНИЕ / ОПИСАНИЕ

Кабели силовые огнестойкие, на номинальное напряжение до 1 кВ включительно , с медными жилами, с изоляцией из сшитой композиции полиэтилена, не содержащей галогенов типа N2XH-J , (N)HXH-JE90/FF180 / аналог ПвПГЭнг(А)-FRHF / торговой марки « Prysmian Group » .

Код NM MD
8544 49 910

Контракты на поставку № 11-2016-1 от 11.01.2016 г. с " Prysmian Cabluri si Sisteme SA ". (România)
№ 2-2017 от 02.01.2017 г. " Prysmian MKMHungarian Cable Works Ltd (Ungaria)

СООТВЕТСТВУЕТ ОБЯЗАТЕЛЬНЫМ ТРЕБОВАНИЯМ, УСТАНОВЛЕННЫМ В:

Безопасности SM IEC 60502-1+A1:2019 - ***Кабели силовые с экструдированной изоляцией и их принадлежности на номинальные напряжения от 1 кV (Um = 1,2 кV) до 30 кV (Um = 36 кV). Часть 1: Кабели на номинальные напряжения 1 кV (Um = 1,2 кV) и 3 кV (Um = 3,6 кV***

ИЗГОТОВИТЕЛЬ:
" Prysmian Cabluri si Sisteme SA ".
" Prysmian MKMHungarian Cable Works Ltd "

Код страны
RO
HU

ЗАЯВИТЕЛЬ:
"S.C.HABSEV GRUP" SRL , str. Uzinelor 90 ,mun. Chişinău, Republica Moldova

Код СUIO
40315050

СЕРТИФИКАТ ВЫДАН НА ОСНОВАНИИ:
Отчета МТЕ об оценке соответствия продукции № 137/021 от 23.02.2021
Протокола испытаний № 8802/02/20 от 09/03/2020, выданный ИЛ " CETIFICARE" SRL
Акта идентификации № 137/021 от 23.02.2021 г.

ДОПОЛНИТЕЛЬНАЯ ИНФОРМАЦИЯ:
Периодическая экспертная оценка продукции будет осуществляться НЭТЦ „Moldtestenergo" один раз в год.

Директор НЭТЦ "MOLDTESTENERGO"
Д.т.н.
м.п.

CENTRUL DE ŞTIINŢĂ ŞI EXPERTIZĂ «MOLDTESTENERGO» S.R.L. MTE IDNO 1003600 REPUBLICA MOLDOVA

М. Гураевский

Test Report issued under the responsibility of:

intertek

Total Quality. Assured.

TEST REPORT
IEC 60898-1
Circuit-breakers for over current protection for household and similar installations
Part 1 - Circuit-breakers for a.c. operation

Report Number. .... :	180801235SHA-001
Date of issue .... :	2018-08-27
Total number of pages	88
Applicant's name .... :	Wenzhou Huajia Electrical Equipment Co., Ltd.
Address .... :	No. 311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, ZHEJIANG, CHINA.
Test specification:	
Standard .... :	IEC 60898-1: 2015
Test procedure .... :	CB scheme
Non-standard test method .... :	N/A
Test Report Form No. .... :	IEC60898_1D
Test Report Form(s) Originator .... :	DEKRA Certification B.V.
Master TRF .... :	Dated 2015-09

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.

General disclaimer:

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 CB Testing Laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test item description .... :	Circuit-breakers with overcurrent protection
Trade Mark .... :	VECAS®
Manufacturer .... :	Wenzhou Huajia Electrical Equipment Co., Ltd. No. 311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, ZHEJIANG, CHINA.
Model/Type reference .... :	SGP
Ratings .... :	U_e= 230/400V~ (1P) I_n=6, 10, 16, 20, 25, 32, 40, 50, 63A

Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):			
☒	**CB Testing Laboratory:**	Intertek Testing Services Shanghai	
Testing location/ address .... :		Building No.86, 1198 Qinzhou Road (North), Shanghai 200233, China	
☒	**Associated CB Testing Laboratory:**	Inspection Center of Products' Quality of Low Voltage Electric Apparatus in Zhejiang Province	
Testing location/ address .... :		No. 400 Guangqiong Rd., Jiaxing, Zhejiang, China	
Tested by (name, function, signature) .... :		Mark He	Mark He
Approved by (name, function, signature) .. :		Quiet Lin	
☐	**Testing procedure: CTF Stage 1:**		
Testing location/ address .... :			
Tested by (name, function, signature) .... :			
Approved by (name, function, signature) .. :			
☐	**Testing procedure: CTF Stage 2:**		
Testing location/ address .... :			
Tested by (name + signature)...................... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature) .. :			
☐	**Testing procedure: CTF Stage 3:**		
☐	**Testing procedure: CTF Stage 4:**		
Testing location/ address .... :			
Tested by (name, function, signature) .... :			
Witnessed by (name, function, signature) . :			
Approved by (name, function, signature) .. :			
Supervised by (name, function, signature) :			

Summary of testing:

The products mentioned in this test report comply with IEC 60 898-1:2015.

Clause	Testing items	Testing location
6	Marking and other product information	CBTL
8.1.1	General	CBTL
8.1.2	Mechanism	CBTL
8.1.3	Clearances and creepage distances	CBTL
8.1.6	Non-interchangeability	CBTL
9.3	Test of Indelibility of marking	CBTL
9.4	Test of reliability of screws, current-carrying parts and connections.	CBTL
9.5	Reliability of terminals for external conductors	CBTL
9.6	Test of protection against electric shock	CBTL
9.7	Test of dielectric properties	
9.7.1	Resistance to humidity	CBTL
9.7.2	Insulation resistance of the main circuit	CBTL
9.7.3~9.7.6	Dielectric strength	CBTL
9.8	Test of temperature-rise	CBTL
9.9	28-days test	ACTL
9.10	Tripping characteristic	ACTL
9.11	Mechanical and electrical endurance	ACTL
9.12	short circuit	ACTL
9.13	Resistance to mechanical shock and impact	CBTL
9.14	Resistance to heat	CBTL
9.15	Resistance to abnormal heat and to fire	CBTL
9.16	Resistance to rust	CBTL

Summary of compliance with National Differences:

☒ **The product fulfils the requirements of EN 60898-1:2003 + A1:2004 + A11:2006 + A12:2008 + A13:2012.**

SEE ATTACHMENT TO TEST REPORT IEC 60898-1 EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES ON PAGE 73.

Copy of marking plate:

REMARKS:

1. Test at service short-circuit capacity (I_{cs}):

   For single-pole circuit-breakers of rated voltage 230/400V or 240/415V, an additional set of three samples is tested in a circuit according to figure 3. During the test the I^2t values need not be measured.

   The test procedure is shown as below:

Operation	Samples		
	1	2	3
1	O	O	O
2	--	CO	O
3	O	--	CO
4	CO	O	--

2. Test at rated short-circuit capacity (I_{cn}):

   For single-pole circuit-breakers of rated voltage 230/400V or 240/415V, an additional set of four samples is tested in a circuit according to figure 3. During the test the I^2t values need not be measured.

   The test procedure is shown as below:

Operation	Samples			
	1	2	3	4
1	O	O	O	--
2	O	CO	--	--
3	--	--	CO	O

Test item particulars	
Type of circuit-breaker ....:	SGP
Number of poles ....:	☒ 1-P ☐ 1-P+N ☐ 2-P ☐ 3-P ☐ 3-P+N ☐ 4-P
Protection against external influences ....:	☐enclosed ☒ unenclosed
Method of mounting ....:	☐surface ☒ flush ☒ panel board
Method of connection ....:	☒.not associated with the mechanical mounting ☐ associated with the mechanical mounting
Type of terminal ....:	☐ screw [a) b)] ☒ pillar [a) b)] ☐ cage [a) b)] ☐ lug ☐ screw less[a)] ☐ flat quick connect [a)] ☐ plug-in ☐ screw-in [a)] copper conductors [b)] aluminium conductors
Instantaneous tripping current ....:	☒B ☒ C ☐ D
I^2t characteristic ....:	Energy limiting class 3 (In≤32A)
Value of rated operational voltage (Ue) ....:	☐ 120 V ☐ 230 V ☐ 240 V ☐ 120/240 V ☒ 230/400 V ☐ 400 V ☐ 240/415 V ☐ 415 V
Value of rated current (In) ....:	6, 10, 16, 20, 25, 32, 40, 50, 63A
Value of rated frequency ....:	☒ 50 Hz ☒ 60 Hz
Ambient air temperature (°C) ....:	☒ 30°C ☐ 40°C ☐ Other ______°C
Rated short-circuit capacity (Icn) ....:	☐ 1,5 kA ☐ 3 kA ☐ 4,5 kA ☒ 6 kA ☐ 10 kA ☐ 15 kA ☐ 20 kA ☐ 25 kA
Rated impulse withstand voltage (Uimp)	☐ 2,5 kV ☒ 4 kV ☐ declared ___kV
Material group and CTI declared by manufacturer…:	☐ Group I, (600 V ≤ CTI) ☐ Group II, (400 V ≤ CTI < 600 V) ☒ Group IIIa, (175 V ≤ CTI < 400 V)
Classification of installation and use	Rail installed
Supply Connection	Cable connected
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	2016-02-23
Date (s) of performance of tests	From 2016-02-25 to 2016-04-12

General remarks:
"(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.** **This test report is valid only being read together with the test reports of 180801235SHA-002, -003, -004.** This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

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) .... :	Wenzhou Huajia Electrical Equipment Co., Ltd. No. 311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, ZHEJIANG, CHINA.

General product information:

U_e= 230/400V~(1P), 400V~(230V~)(2P), 400V~(3P, 4P)

I_n= 6, 10, 16, 20, 25, 32, 40, 50, 63A

I_{cs}= I_{cn}= 6000A, B- and C-type

Energy limiting class 3 (6~32A, B- and C-type)

Number of tests for simplified test procedure, according to table C.3 and C.4

Report ref.No	No. of poles	I_n(A)	Type	Test sequence and number of samples								
				A	B	C_1	C_2	D_0+D_1	D_0	E_1	E_2	E_3 b)
180801235SHA-001	**1P**	**63**	**C**	**x**	**x**	**x**	**x**	**x**	**-**	**x**	**-**	**-**
	1P	**63**	**B**	**-**	**x** d)	**-**	**-**	**-**	**x** a)	**-**	**-**	**-**
	1P	**50**	**B,C**	**-**	**-**	**-**	**-**	**-**	**x** a)	**-**	**-**	**-**
	1P	**40**	**B,C**	**-**	**-**	**-**	**-**	**-**	**x** a)	**-**	**-**	**-**
	1P	**32**	**B,C**	**-**	**-**	**-**	**-**	**-**	**x** a)	**-**	**x**	**-**
	1P	**25**	**B,C**	**-**	**-**	**-**	**-**	**-**	**x** a)	**-**	**-**	**-**
	1P	**20**	**B,C**	**-**	**-**	**-**	**-**	**-**	**x** a)	**-**	**-**	**-**
	1P	**16**	**B,C**	**-**	**-**	**-**	**-**	**-**	**x** a)	**-**	**x**	**-**
	1P	**10**	**B,C**	**-**	**-**	**-**	**-**	**-**	**x** a)	**-**	**-**	**-**
	1P	**6**	**B,C**	**-**	**-**	**-**	**-**	**-**	**x** a)	**x**	**-**	**-**
180801235SHA-002	**2P**	**63**	**C**	**x** e)	**-**	**-**	**x**	**-**	**-**	**x**	**-**	**-**
	2P	**32**	**B,C**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**x**	**-**
	2P	**16**	**B,C**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**x**	**-**
	2P	**6**	**C**	**-**	**-**	**-**	**-**	**-**	**-**	**x**	**-**	**-**
180801235SHA-003 c)	**3P**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
180801235SHA-004	**4P**	**63**	**C**	**x**	**x**	**x**	**x**	**x**	**-**	**x**	**-**	**-**
	4P	**63**	**B**	**-**	**x** d)	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	4P	**32**	**B,C**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**x**	**-**
	4P	**16**	**B,C**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**x**	**-**
	4P	**6**	**C**	**-**	**-**	**-**	**-**	**-**	**-**	**x**	**-**	**-**

Note:

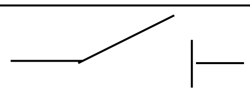
a): For this test sequence only test of clause 9.10.2 (only for B type) is required according to the table C.4.

b): Test sequence in EN 60898-1, due to I_{cn1}=I_{cn}, the test sequence is omitted.

c): The tests of three-pole circuit-breakers are omitted when four-pole circuit-breakers have been tested according to IEC60 898-1 Annex C;

d): For this test sequence only test of clause 9.8 is required according to the table C.4

e): Only 8.11 and 9.15 of test sequence A2 is performed.

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	TESTS „A“ 1 SAMPLE: C63, 1P	**A_1**	
6	**MARKING AND OTHER INFORMATION**		
	Circuit-breaker marked with:		--
	a) Manufacturer’s name or trade mark.................:	VECAS®	P
	b) Type designation, catalogue number or other serial number...:	SGP	P
	c) Rated voltage (V)...:	230/400V~	P
	d) Rated current without symbol "A", preceded by the symbol of instantaneous tripping..............:	C63	P
	e) Rated frequency (Hz) ....:	50/60	N/A
	f) Rated short circuit capacity (A) ....:	6000	P
	g) Wiring diagram		P
	h) Ambient air temperature, if different from 30°C	30°C	P
	i) Degree of protection, if different from IP20		N/A
	j) For D-type circuit-breakers: the maximum instantaneous tripping current, if higher than 20 In see table 2)		N/A
	k) Rated impulse withstand voltage Uimp if it is 2,5 kV	4kV	N/A
	l) Making and breaking capacity on an individual protected pole of multipole circuit-breakers (Icn1), if different from Icn		N/A
	Marking d) shall be readily visible when the CB is installed		P
	If, for small devices, the available space is insufficient, markings a), b), c), e), f), h), j) and l) may be put on the side or on the back of the CB		P
	Marking g) may be on the inside of any cover which has to be removed in order to connect the supply wires but shall not be on a label loosely attached to the CB		N/A
	Any other information not marked shall be given in the manufacturer’s documentation		P
	The suitability for isolation, which is provided by all circuit-breakers of this standard, may be indicated by the symbol on the device		P
	I^2t characteristic (documentation)		N/A
	Symbols on supply and load terminal	‘1’, ‘2’	P
	Terminal for neutral conductor N		N/A
	Earthing terminal if any (IEC 60417-5019)		N/A
	On - off position shall be clearly indicated - 0 I -	I - O	P

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	For push-button CB the off push-button shall either be red or be marked with the symbol ´0´		N/A
	Red not used for other push-button		N/A
	For CB with multiple current ratings, the maximum value is marked, the adjusted value indicated without ambiguity		N/A
	Marking shall be indelible and easily legible (not on removable parts), 15 s with water, 15 s with hexane (see cl. 9.3)		P
8.	**REQUIREMENTS FOR CONSTRUCTION AND OPERATION**		
8.1.1	**General**		
	Circuit-breakers shall be so designed and constructed that, in normal use, their performance is reliable and without danger to the user or surroundings		
8.1.2	**Mechanism**		
	The moving contact shall be mechanically coupled so that all poles make and break together, whether operated manually or automatically, even if an overload occurs on one pole only		N/A
	The switched neutral shall close before and open after the protected pole (s)		N/A
	Neutral pole having adequate making and breaking capacity and CB with independent manual operation: all poles operate together including neutral pole		N/A
	CB shall have a trip free mechanism		P
	It shall be possible to switch the CB on and off by hand		P
	No intermediate position of the contacts		P
	Position of contacts shall be indicated		P
	Indication visible from the outside		P
	If the indication is on the actuating means, it shall, when released, automatically take up or stay in the position corresponding to that of the moving contacts; operating means shall have two different rest positions, except that, for automatic operation, a third distinct rest position may be provided		P
	If a separate mechanical indicator is used to indicate the position of the main contacts, colour red shall be used for the on position and green for the off position.		P
	The action of the mechanism shall not be influenced by the position of enclosures		P
	If the cover is used as a guiding means for push-button, it shall not be possible to remove this button from the outside		N/A

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	Operating means securely fixed, not possible to remove them without a tool		P
	For the up-down operating means the contacts shall be closed by the up movement.		P
8.1.3	**Clearances and creepage distances**		
	The minimum required clearances and creepage distances are based on the CB being designed for operating in an environment with pollution degree 2		P
	Compliance for item 1 in Table 4 is checked by measurement and by the test of 9.7.5.4.1 and 9.7.5.4.2. The test is carried out with samples not submitted to the humidity treatment described in 9.7.1.		P
	The clearances of items 2 and 4 (except accessible surface after installation) may be reduced provided that the measured clearances are not shorter than the minimum allowed in IEC 60664-1 for homogenous field conditions.		P
	In this case, after the humidity treatment in 9.7.1, compliance for item 2 and 4 and arrangements of 9.7.2 items b), c), d) and e) is checked:		P
	-Tests according to 9.7.2 to 9.7.4 as applicable		P
	-Test according to 9.7.5.2 with test voltages acc. Table 13 with test arrangements of 9.7.2 items b), c), d), e)		P
	If measurement does not show any reduced clearance, test 9.7.5.2 is not applied		P
	Compliance for item 3, checked by measurement		N/A
	The insulating materials are classified into Material Groups on the basis of their comparative tracking index (CTI) acc. to IEC 60664-1		P
	Clearances [mm] U_{imp}		--
	4 kV (see table 4) 2,5 kV (see table 4)	☒ ☐	--
	Minimum clearances (see table 4)		
		minimum clearances [mm]	--
	1.between live parts (of the main circuits) which are separated when the CB is in off position ......:	4,5 mm	P
	2.between live parts of different polarity..............:		N/A
	3.between circuits supplied from different sources, one of which being PELV or SELV.......:		N/A
	4. between live parts and		
	- accessible surfaces of operating means...........:	>10,0 mm	P

IEC 60898-1			
Clause	Requirement + Test	Result - Remark	Verdict
	- screws or other means for fixing covers ....:		N/A
	- surface on which the base is mounted..............:	6,0 mm	P
	- screws or other means for fixing the circuit breaker ....:		N/A
	- metal covers or boxes......................................:		N/A
	- other accessible metal parts ....:	>10,0 mm	P
	- metal frames supporting the base (flush-type) .:	6,0 mm to fixing rail	P
	Minimum creepage distances (see table 4)		
	Material group	☐ III_b ☒ III_a ☐ II ☐ I	--
		minimum creepage distances [mm]	--
	1.between live parts (of the main circuits) which are separated when the CB is in off position ......:	>10,0 mm	P
	2.between live parts of different polarity..............:		N/A
	3.between circuits supplied from different sources, one of which being PELV or SELV.......:		N/A
	4. between live parts and		
	- accessible surfaces of operating means...........:	>10,0 mm	P
	- screws or other means for fixing covers ....:		N/A
	- surface on which the base is mounted..............:	6,0 mm	P
	- screws or other means for fixing the circuit breaker ....:		N/A
	- metal covers or boxes......................................:		N/A
	- other accessible metal parts ....:	>10,0 mm	P
	- metal frames supporting the base (flush-type) .:	6,0 mm to fixing rail	P
8.1.4	**Screws, current-carrying parts and connections**		
8.1.4.1	Connections, withstand mechanical stresses occurring in normal use		P
	Screws for mounting of the CB not of the thread-cutting type		N/A
	Test according to cl. 9.4:		
	- 10 times (screw Ø / torque Nm)	Ø___mm___Nm (see table 11) Ø___mm___Nm	N/A
	- 5 times (screw Ø / torque Nm)	Ø_4,8_mm_2_Nm (see table 11) Ø___mm___Nm	P
	Plug in connections tested by plugging in and pulling out five times		N/A
	After test connections have not become loose nor electrical function impaired		P

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.4.2	Screws with a thread of insulating material ensured correct introduction		N/A
8.1.4.3	Electrical connection: contact pressure not transmitted through insulating material, unless there is sufficient resilience in the metallic parts		P
8.1.4.4	Current-carrying parts including parts intended for protective conductors, if any, shall be made of a metal having, under the conditions occurring in the equipment, mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use. Examples below:		
	- copper		N/A
	- alloy 58% copper for worked cold parts		P
	- alloy 50% copper for other parts		N/A
	- other metal		N/A
	In case of using ferrous alloys or suitably coated ferrous alloys, compliance to resistance to corrosion is checked by a test of resistance to rusting (see 9.16).		P
	The requirements of this subclause do not apply to contacts, magnetic circuits, heater elements, bimetals, shunts, parts of electronic devices or to screws, nuts, washers, clamping plates, similar parts of terminals and parts of the test circuit		P
8.1.5	**Terminals for external conductors**		--
	Compliance is checked by inspection and by the tests as relevant for the type of connection:		--
	by tests of clause 9.5 for screw-type terminals		P
	by specific tests for plug-in or bolt-on CBs included in the standard		N/A
	by the tests of Annexes J, K		N/A
8.1.5.1	Terminals ensure the necessary contact pressure		P
9.5	Torque test:		
	- torque (Nm); diameter (mm)...............................:	2,0Nm, Ø4,8 mm	--
	- max. cross-sectional area (mm^2).......................:	25,0	--
9.5.2	Pull test:		
	Terminal shall be suitable for all types of conductors: rigid (solid or stranded) and flexible, unless otherwise specified by the manufacturer.		--
	Min. cross-section solid / stranded / flexible (mm^2)..:	Solid: 1,0 mm^2 Stranded: 1,5 mm^2 Flexible: 1,0 mm^2	--

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Clause	Requirement + Test	Result - Remark	Verdict
	Max. cross-section solid / stranded / flexible (mm^2)......:	Solid: 16,0 mm^2 Stranded: 25,0 mm^2 Flexible: 16,0 mm^2	--
	Torque $^2/_3$ (Nm) ......:	1,33Nm	--
	Pull for 1 min solid / stranded / flexible (N).........:	50N for 1 mm^2 50N for 1,5 mm^2 90N for 16 mm^2 100N for 25 mm^2	P
	During the test no noticeable move of conductor		P
9.5.3	Torque test:		
	- torque $^2/_3$ (Nm)......:	1,33Nm	--
	- min. cross-sectional area (mm^2)......:	Solid: 1,0 mm^2 Stranded: 1,5 mm^2	--
	- max. cross-sectional area (mm^2)......:	Solid: 16,0 mm^2 Stranded: 25,0 mm^2	--
	The conductor shows no damage		P
	Terminals have not worked loose and no damage		P
9.5.4	Terminals fitted with the largest cross-section area specified in Table 5, for stranded copper conductor.		
	Max. cross-section stranded (mm^2)......:	Stranded: 25 mm^2	--
	Torque $^2/_3$ (Nm) ......:	1,33Nm	--
	After the test no strand of conductor escaped outside		P
8.1.5.2	Terminals allow the connection of conductors of the following cross-sectional areas: (table 5)		P
	Rated current (A) Range of nominal cross sections to be clamped* (mm^2) Rigid (solid or stranded) conductors / Flexible conductors **≤ 13 1 to 2,5 1 to 2,5** **> 13 ≤ 16 1 to 4 1 to 4** **> 16 ≤ 25 1,5 to 6 1,5 to 6** **> 25 ≤ 32 2,5 to 10 2,5 to 6** **> 32 ≤ 50 4 to 16 4 to 10** **> 50 ≤ 80 10 to 25 10 to 16** ~~> 80 ≤ 100 16 to 35 16 to 25~~ ~~> 100 ≤ 125 24 to 50 25 to 35~~	Solid conductors: 1,0mm^2 to 16,0mm^2 Stranded conductors: 1,5mm^2 to 25,0mm^2 flexible conductors: 1,0mm^2 to 16,0mm^2	P

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Clause	Requirement + Test	Result - Remark	Verdict
	*It is required that, for current ratings up to and including 50 A, terminals be designed to clamp solid conductors as well as rigid stranded conductors. Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm² up to 6 mm² be designed to clamp solid conductors only.		P
	- or terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors according to Annex L.		N/A
8.1.5.3	Means for clamping the conductors in the terminals not serve to fix any other component (See test sub-clause 9.5)		P
8.1.5.4	Terminals for $I_N \leq 32$ A allow the connection of conductors without special preparation		P
8.1.5.5	Terminals shall have adequate mechanical strength; ISO thread or equivalent (See tests of sub-clause 9.4 and 9.5.2)		P
8.1.5.6	Clamping of conductor without damage to the conductor (See test of sub-clause 9.5.3)		P
8.1.5.7	Clamping of conductor between metal surfaces (See tests of sub-clause 9.4 and 9.5.2)		P
8.1.5.8	Conductor shall not slip-out when the clamping screw or nuts are tightened (See test of sub-clause 9.5.4)		P
8.1.5.9	Terminals shall be properly fixed. No work loose when the clamping screws or nuts are tightened or loosened (See test of sub-clause 9.4)		P
8.1.5.10	Clamping screws or nuts of terminals for protective conductors adequately secured against accidental loosening		N/A
8.1.5.11	Pillar terminals shall allow full insertion and reliable clamping of the conductor		P
8.1.5.12	Screws and nuts of terminals for external conductors shall be in engagement with a metal thread, and the screws shall not be of tapping screw type		P
8.1.6	**Non-interchangeability**		
	For circuit-breakers intended to be mounted on bases forming a unit therewith (plug-in or screw-in type) it shall not be possible, without the aid of a tool, to replace a circuit-breaker when mounted as for normal use by another of the same make having a higher rated current, compliance is checked by inspection		N/A
8.1.7	**Mechanical mounting of plug-in circuit-breakers**		

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Clause	Requirement + Test	Result - Remark	Verdict
8.1.7.1	The mechanical mounting of plug-in circuit-breakers, the holding in position of which does not depend solely on their plug-in connection(s), shall be reliable and have adequate stability		N/A
8.1.7.2	Plug-in type circuit-breakers, the holding in position of which does not depend solely on their plug-in connection(s) Compliance of the mechanical mounting is checked by the relevant test 9.13		N/A
8.1.7.3	Plug-in type circuit-breakers, the holding in position of which does depend solely on their plug-in connection(s) Compliance of the mechanical mounting is checked by the relevant test 9.13		N/A
8.2	**Protection against electric shock**		
	Live parts not accessible in normal use		P
	For CB, other than plug-in type, external parts, other than screws and other means for fixing covers, which are accessible shall be of insulating material		P
	Unless the live parts are within an internal enclosure of insulating material: Lining - reliable fixed, - adequate thickness and - mechanical strength		N/A
	Inlet openings for cables shall be in insulating material or be provided with bushings or similar devices in insulating material Such device - shall be reliable fixed - shall have adequate mechanical strength		N/A
	For plug-in CB, external parts, other than screws and other means for fixing covers, which are accessible shall be in insulating material		N/A
	Metallic operating means insulated from live parts		N/A
	Metal parts of the mechanism not accessible and insulated from accessible metal parts, metal frames (for flush-type), screws or other means for fixing the base		P
	Replacement of plug-in CB possible without touching live parts		N/A
	Lacquer or enamel not considered		N/A
8.1.3	**Creepage distances [mm] (see table 4)**		
	Internal parts only	See above	
9.6	**Test of protection against electric shock**		

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Clause	Requirement + Test	Result - Remark	Verdict
	This verification is applicable to those parts of circuit breakers which are exposed to the operator when mounted as for normal use		P
	Use of test finger so designed that each jointed can be turned through an angle of 90° with respect to the finger		P
	Circuit-breaker with enclosures of thermoplastic material are additional tested at 35 °C for 1 min with a force of 75 N		N/A
8.10	**Resistance to heat**		
	CB sufficiently resistant to heat		P
9.14	**Test of resistance to heat**		
9.14.1	Test:		
	- without removable covers .... 1 h (100 ± 2) °C		P
	- removable covers....................... 1 h (70 ± 2) °C		N/A
	After the test no access to live parts, marking still legible		P
9.14.2	Ball pressure test for external parts of insulating material (parts retaining current-carrying parts and parts of the protective circuit in position) T = 125°C Ø of impression ≤ 2 mm	Impression: 1,5 mm (Enclosure)	P
9.14.3	Ball pressure test for external parts of insulating material (parts not retaining current-carrying parts and parts of the protective circuit in position T = (70 ± 2)°C or T = ___ °C = (40 ± 2)°C + max. temperature rise of sub-clause 9.8 Ø of impression ≤ 2 mm	Impression: 1,0 mm (Handle)	P
8.12	**Resistance to rusting**		
	Ferrous parts adequately protected against rusting		P
9.16	**Test of resistance to rusting:**		
	- 10 min immersed in a cold chemical degreaser such as methyl-chloroform or refined petrol		
	- 10 min immersed in a 10% solution of chloride in water at 20°C		
	- 10 min at 95% humidity at 20°C		
	- 10 min at 100°C		
	No sign of rust		P

	TESTS „A_2“ 3 samples: C63, 1P	**A_{2-1} A_{2-2} A_{2-3}**	

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Clause	Requirement + Test	Result - Remark	Verdict

8.11	**Resistance to abnormal heat and to fire**		
	External parts of insulating material shall not ignite or spread fire under fault or overload conditions		P
9.15	**Resistance to abnormal heat and to fire**		
	Test performed on a complete CB		P
	external parts retaining current-carrying parts and parts of the protective circuit in position .... (960 ± 15)°C	Enclosure	P
	all other external parts .... (650 ± 10)°C	Handle	P
	No visible flames, no sustained glowing, or	Handle	P
	flames and glowing extinguish within 30 s after removal ....:	5,5s Enclosure	P
	No ignition of tissue paper or scorching of the pinewood board		P

	TESTS „B“ 3 samples: C63, 1P	**B_1 B_2 B_3**	
8.3	**Dielectric properties and isolating capability**		
8.3.1	CB shall have adequate dielectric properties and shall ensure isolation:		P
8.3.2	Dielectric strength at power frequency		
	Compliance is checked by the tests 9.7.1, 9.7.2 and 9.7.3 on circuit-breaker in new condition		P
8.3.3	Isolating capability		
	Circuit-breakers shall be suitable for isolation. Compliance is checked by the verification of compliance with the minimum clearances and creepage distances of item 1 of table 4 and by tests of 9.7.5.1 and 9.7.5.3.		P
8.3.4	Dielectric strength at rated impulse withstand voltage (Uimp)		
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.5.2.		P
9.7	**Test of dielectric properties and isolating capability**		
9.7.5.4	Verification of resistance of the insulation of open contact and basic insulation against an impulse voltage in normal conditions		
	These tests are not preceded by the humidity treatment described in 9.7.1.		P
	The test is carried out on an CB fixed on a metal support		P
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2µs, and a time to half-value of 50µs		P

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Clause	Requirement + Test	Result - Remark	Verdict
	The shape of the impulses is adjusted with the CB under test connected to the impulse generator.		P
	rated impulse withstand voltage [kV]:	4kV	--
	sea level of test laboratory [m]:	Sea level	--
	test voltage (acc. Table 15) [kV]:	6,2kV	--
9.7.5.4.2	CB in open position (contacts in open position)		
	The impulses are applied between:		--
	the line terminals connected together and the load terminals connected together		P
9.7.5.4.3	CB in closed position		
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		P
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the CB		N/A
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.		P
	no disruptive discharges during the test		P
9.7.1	Resistance to humidity		
9.7.1.1	Preparation of the circuit-breaker for test		
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened.		N/A
9.7.1.2	Test conditions		
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20 °C and 30 °C	Rf = 93% T = 25°C	P
9.7.1.3	Test procedure.		
	The sample is kept in the cabinet for 48 h.		P
9.7.1.4	Conditions of the circuit breaker after the tests.		
	The sample show no damage within the meaning of this standard and shall withstand the tests of 9.7.2 and 9.7.3, 9.7.4 and 9.7.5.2		P
9.7.2	Insulation resistance of the main circuit		

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Clause	Requirement + Test	Result - Remark	Verdict
9.7.2	After an interval between 30 min and 60 min flowing this treatment, the insulation resistance is measured 5 s after application of a d.c. voltage of approximately 500 V, consecutively as follows:	[MΩ] [MΩ] [MΩ]	
	a) In off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position ≥ 2 MΩ	>500 >500 >500	P
	b) in off-position, between each pole in turn and the others connected together ≥ 2 MΩ		N/A
	c) in on-position, between all poles connected together and the frame ≥ 5 MΩ	>500 >500 >500	P
	d) between metal parts of mechanism and the frame ≥ 5 MΩ		N/A
	e) between the frame and metal foil in contact with the inner surface of the internal enclosure or lining of insulating material ≥ 5 MΩ		N/A
9.7.3	Dielectric strength of the main circuit		
	After the circuit-breakers have passed the tests of 9.7.2 the test voltage specified is applied for 1 min between the parts indicated in 9.7.2		P
	a) 2000 V		P
	b) 2000 V		N/A
	c) 2000 V		P
	d) 2000 V		N/A
	e) 2500 V		N/A
	No flashover or breakdown		P
9.7.4	Insulation resistance and dielectric strength of the auxiliary circuits		
	Insulation resistance of auxiliary circuits measured with 500 V DC after 1 min:		--
	1) between all auxiliary circuits and the frame (MΩ) ≥ 2 MΩ		N/A
	2) between each part of the auxiliary circuits which might be isolated from the other parts and the whole of the other parts connected together (MΩ) ≥ 2 MΩ		N/A
	Dielectric strength of auxiliary circuits measured with an AC voltage at rated frequency for 1 min:		--
	Rated voltage of auxiliary circuits (a.c. or d.c.) — Test voltage (V) ≤ 30 — 600 > 30 ≤ 50 — 1000 > 50 ≤ 110 — 1500 > 110 ≤ 250 — 2000 > 250 ≤ 500 — 2500		--

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Clause	Requirement + Test	Result - Remark	Verdict
	1) between all auxiliary circuits and the frame		N/A
	2) between each part of the auxiliary circuits which might be isolated from the other parts and the whole of the other parts connected together		N/A
	No flashover or perforation		N/A
9.7.5.2	Verification of clearances with the impulse withstand voltage		
	If the measurement of clearances of items 2 and 4 in Table 4 shows a reduction of the required length, this test applies.	Measurement of clearances does not show any reduced clearance, test 9.7.5.2 is not applied.	N/A
	The test is carried out on an CB fixed on a metal support and being in the closed position		N/A
	The impulses are given by a generator producing positive and negative impulses having a front time of 1,2µs, and a time to half-value of 50µs		N/A
	The shape of the impulses is adjusted with the CB under test connected to the impulse generator.		N/A
	test performed with:		--
	-surge impedance of the test apparatus ≤500Ω and surge protective devices disconnected before testing or		N/A
	-hybrid generator with an surge impedance of 2 Ω and surge protective devices not disconnected before testing		N/A
	rated impulse withstand voltage [kV]:	kV	--
	see level of test laboratory [m]:	m	--
	test voltage (acc. Table 14) [kV]:	kV	--
	A first series of tests is made applying the impulse voltage between the phase pole(s) and the neutral pole (or path) connected together and the metal support connected to the terminal(s) intended for the protective conductor(s), if any		N/A
	A second series of tests is made applying the impulse voltage between the phase pole(s), connected together, and the neutral pole (or path) of the CB		N/A
	A third series of tests is made applying the impulse voltage between (and not tested during the two first sequences described here above):		--
	b) between each pole and the others connected together		N/A

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Clause	Requirement + Test	Result - Remark				Verdict
	c) between all poles connected together and the frame					N/A
	d) between metal parts of the mechanism and the frame					N/A
	e) between the frame and a metal foil in contact with the inner surface of the lining of insulating material					N/A
	Five positive impulses and five negative impulses are applied, the interval between consecutive impulses being at least 1 s for impulses of the same polarity and being at least 10 s for impulses of the opposite polarity.					N/A
	no disruptive discharges during the test					N/A
8.4	**Temperature rise**					
	Temperature rise does not exceed the limiting values stated in table 6:	sect. 16,0 mm²				
9.8.2	Test current: I_N= (reach the steady-state value) Four-pole CB's: ☐ 1) Three poles loaded 2) One pole and neutral pole loaded ☐ 1) Four-poles loaded	I_N = 63A				
	Ambient air temperature.....................................:	Tamb= 25°C				
	Parts ....Temperature rise [K]	[K]	[K]	[K]		
	L1	49	54	47		P
	L2	-	-	-		
	L3	-	-	-		
	L4(N)	-	-	-		
	L3	-	-	-		
	N	-	-	-		
	Terminals for external connections ....60 K					P
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles ....40 K	11	11	12		P
	External metallic parts of operating means...25 K	-	-	-		N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface..60 K	25	30	25		P
9.8.5	Measurement of power losses	B_1	B_2	B_3		
	Power loss do not exceed the values stated in table 8					
	Test current: I_N = 63 A (reach the steady state value)	63A				

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Clause	Requirement + Test	Result - Remark			Verdict
	Loaded one pole after the other				
	Max. power loss : 13 W	W	W	W	
	L1 L2 L3 L4(N)	5,20 - - -	7,60 - - -	5,60 - - -	P
	L3 N	- -	- -	- -	N/A
8.5	**Uninterrupted duty**				
	Circuit-breakers operate reliable even after long service				P
9.9	**28 day test**				
	28 cycles - 21 h with current - 3 h without current Cross-sectional area. 16 mm²	I_N = 63A 16,0 mm²			P
	During the test no tripping during the last period, temperature rise shall be measured				P
	Ambient air temperature....................................:	20°C			
	Parts ....Temperature rise [K]	[K]	[K]	[K]	
	Terminals for external connections 75K:	52	55	50	P
	The temperature rise does not exceed the value measured during the temperature rise test (sub-clause 9.8) by more than 15 K				P
	Test current 1,45 I_N =91,4A	91,4 A			P
	- Tripping within				
	- 1h (≤ 63 A)	162s	312s	108s	P
	- 2h (> 63 A)				N/A

	TESTS „B“ 3 samples: B63, 1P	B_4	B_5	B_6	
8.4	**Temperature rise**				
	Temperature rise does not exceed the limiting values stated in table 6:	sect. 16 mm²			
9.8.2	Test current: I_N= (reach the steady-state value) Four-pole CB's: ☐ 1) Three poles loaded 2) One pole and neutral pole loaded ☐ 1) Four-poles loaded	 I_N = 63A			
	Ambient air temperature....................................:	Tamb= 21,3°C			
	Parts ....Temperature rise [K]	[K]	[K]	[K]	
	L1 L2	51 -	50 -	52 -	P

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Clause	Requirement + Test	Result - Remark			Verdict
	L3	-	-	-	
	L4(N)	-	-	-	
	L3	-	-	-	
	N	-	-	-	
	Terminals for external connections ....60 K				P
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles ....40 K	20	18	20	P
	External metallic parts of operating means...25 K	-	-	-	N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface...60 K	50	49	50	P
9.8.5	Measurement of power losses	**B_4**	**B_5**	**B_6**	
	Power loss do not exceed the values stated in table 8				
	Test current: I_N = 63 A (reach the steady state value)	63A			
	Loaded one pole after the other				
	Max. power loss : 13 W	W	W	W	
	L1	6,03	5,93	6,19	P
	L2	-	-	-	
	L3	-	-	-	
	L4(N)	-	-	-	
	L3	-	-	-	
	N	-	-	-	

	TESTS „C“ 3 +3 samples: C63, 1P				
8.7	**Test „C_1“ Mechanical and electrical endurance**	**C_{1-1}**	**C_{1-2}**	**C_{1-3}**	
	Circuit-breaker shall be capable to perform an adequate number of cycles with rated current				
9.11.1	General test conditions				
	Test: Test Voltage ______V (rated voltage) Test Current ______A (rated current) Power factor ________(0,85-0,9) Par. resistor _________ (Ω) Cross sect. area ____mm²	246V 64,0A 0,88 16,0mm²			
9.11.2	Test procedure				

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Clause	Requirement + Test	Result - Remark			Verdict
	The circuit-breaker is submitted to 4000 operating cycles with rated current.	4000 cycles			P
	- $I_N \leq 32$ A: 2 s on - 13 s off				N/A
	- $I_N > 32$ A: 2 s on - 28 s off	I_N=63A			P
	During the test the circuit-breaker shall be operated as in normal use.				P
9.11.3	Conditions of the circuit breaker after the tests.				
	Following the test 9.11.2 the sample shall not show:				
	- undue wear				P
	- discrepancy between the position of the moving contacts and corresponding position of the Indicating device				P
	- damage to the enclosure permitting access to live parts by test finger (see 9.6)				P
	- loosening of electrical or mechanical connections				P
	- seepage of sealing compound				N/A
	Moreover test current ....2,55 I_N_____A	161A			
	Opening time not less 1 s or more than	[s]	[s]	[s]	
	- 60 s (≤ 32 A)	-	-	-	N/A
	- 120 s (> 32 A)	75	72	73	P
	Dielectric strength reduced to 1500 V				P
9.12.11.2	**Test at reduced short-circuit currents**				
9.12.11.2.1	Test on all circuit-breakers				
9.12.11.2.1	Test at reduced short-circuit currents: Fig. 3	Figure 3			
	Test current:	Obtained			--
	- 500 A or 10 In	Itest= 660A			--
	Test voltage 1,05 Un	Utest = 256V			--
	Power factor 0,93-0,98	0,97			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" = 35 mm			P
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: ______x______x_____mm			N/A
	I_{Peak} (A) max. value	840 A			P
	Sequence: 6 x "O" and 3 x "CO"	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq$ ______kA^2s	3,00	3,20	3,40	P

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Clause	Requirement + Test	Result - Remark			Verdict
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12	Verification of the circuit-breaker after short-circuit tests				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit –breaker is in the open position	**C_{1-1}** [µA]	**C_{1-2}** [µA]	**C_{1-3}** [µA]	
	The leakage current shall not exceed 2 mA L1	0,90	0,90	0,90	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 1500 V (see 9.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A

9.12.11.2.2	**Test „C_2“ Short-circuit test on circuit-breakers for use in IT systems**				
		C_{2-1}	**C_{2-2}**	**C_{2-3}**	
	Short-circuit test on circuit-breakers for use in IT systems: Fig. 4	Figure 4			--
	Test current:	Obtained			
	- 500 A or 1,2 times the upper limit of the standard range of instantaneous tripping (see table 2) whichever is the higher, but < 2500 A. When tripping exceed 20 In the current adjusted at 1,2 times the upper limit even when higher 2500 A	Itest= 762A			--
	Test voltage 1,05 Un	U test = 438V			--
	Power factor 0,93-0,98	0,95			--

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Clause	Requirement + Test	Result - Remark			Verdict
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" = 35 mm			P
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: ______x______x_____mm			N/A
	I_{Peak} (A) max. value	$1{,}08X10^3A$			P
	Sequence: "O" + "CO" on each protected pole	[kA^2s]	[kA^2s]	[kA^2s]	--
	Shifted point 30 ° on the other protected pole	**C_{2-1}**	**C_{2-2}**	**C_{2-3}**	--
	Max. $I^2t \leq$ ______kA^2s L1 L2 L3 L4 (N)	5,40 _ _ _	4,30 _ _ _	5,10 _ _ _	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				--
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit – breaker is in the open position	**C_{2-1}** [µA]	**C_{2-2}** [µA]	**C_{2-3}** [µA]	--
	The leakage current shall not exceed 2 mA L1	14,4	17,9	18,0	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 1500 V (see 9.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e) 2000 V				N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 3 samples: C63, 1P		
8.6	**Automatic operation**		
8.6.1	Standard time-current zone		
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.		
9.10	**Tests „D_0“**	**D_{1-1} D_{1-2} D_{1-3}**	
	I_N (A)	63A	--
	Sect. (mm²)	16mm²	--
	Instantaneous tripping current	☐ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	71,2A	
	- 1 h ($I_N \leq 63$ A)	>1h >1h >1h	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	91,4A	
	- Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	3,3 2,5 4,0	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	161 A	
	opening time not less than 1 s or more than	[S] [S] [S]	
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	50,7 46,4 31,9	P
9.10.3	Test of instantaneous tripping and of correct opening of the contacts		
9.10.3.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage.		
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.		
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		P
9.10.3.2	☐ For circuit-breakers of the B – Type		
	Test current 3I_N (A), starting from cold	__________A	--
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s		N/A
	Test current 5 I_N (A), starting from cold	__________A	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Tripping less than 0,1 s		N/A
9.10.3.3	☒ For circuit-breakers of the C – Type		
	Test current 5I_N (A), starting from cold	315A	
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s	7,6 3,8 7,3	P
	Test current 10 I_N (A), starting from cold	632A	P
	Tripping less than 0,1 s	9,79ms 10,1ms 9,86ms	P
9.10.3.4	☐ For circuit-breakers of the D – Type		
	Test current 10I_N (A), starting from cold		
	Opening time:	[s] [s] [s]	--
	≥ 0,1 s		N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold		
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		
	Test current 1,1 It (A), (two pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C	
	Test current 1,13 I_N (A)	71,2A	
	- Passed for 1h	>1h >1h >1h	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	120A	
	Tripping within	[min] [min] [mini]	--
	- 1h (≤ 63 A)	0,9 0,8 1,0	P
	- 2h (> 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	T = +40°C	
	Test current I_N (A)	63,0A	
	No tripping within		--
	- 1h (≤ 63 A)	>1h >1h >1h	P
	- 2h (> 63 A)		N/A

	Tests „D_1"	**D_{1-1} D_{1-2} D_{1-3}**	
8.9	**Resistance to mechanical shock and impact**		
	CB shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.13.1	Mechanical shock		
	- 50 falls on two sides of vertical board C		
	- Vertical board turned 90°		
	- 50 falls on two sides of vertical board C		
	During the test the circuit-breakers shall not open		P
9.13.2	Mechanical impact		
9.13.2.2	All types:		
	- Impact test: 10 blows-height 10 cm, no damage		P
9.13.2.3	Screw-in types:		
	- Torque 2,5 Nm for 1 min, no damage		N/A
9.13.2.4	CB intended to be mounted on a rail		
	- downward vertical 50 N for 1 min		P
	- upward vertical 50 N for 1 min, no damage		P
9.13.2.5	Plug-in types		
	The circuit-breaker are mounted in their normal position, complete with plug-in base but without cables and any cover plate		
	A force of 20 N applied for 1min to the circuit-breaker (see fig 16).		
	During this test the circuit-breaker part shall not become loose from the base and shall not show damage impairing further use.		N/A
9.12.11.3	**Test at 1500 A:**		
	Prospective current of 1500 A - power factor 0,93 to 0,98		
	Prospective current obtained (A)	$1,54 \times 10^3$A for 6-O, 2-CO $1,52 \times 10^3$A for last O	--

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Clause	Requirement + Test	Result - Remark			Verdict
	Power factor	0,95 for 6-O, 2-CO 0,96 for last O			--
	Test voltage 1,05 Un	Utest = 256V for 6-O, 2-CO Utest = 444V for last O			--
	Test circuit: figure	Figure 3			--
	T (min)	3min			--
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" = 35 mm			P
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: ______x______x_____mm			N/A
	Sequence	6-O, 2-CO, 1-O			--
	I_{Peak} (A) max. value	2,37A x10^3A			--
	$I^2t \leq$ ______ kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	--
	Max. $I^2t \leq$ ______kA^2s L1 L2 L3 L4(N)	25,9 _ _ _	24,9 _ _ _	23,8 _ _ _	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= 457V. The circuit – breaker is in the open position	**D_{1-1}** [μA]	**D_{1-2}** [μA]	**D_{1-3}** [μA]	--
	The leakage current shall not exceed 2 mA L1	6,21	5,84	6,34	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 1500 V (see 9.7.2)				
	a)				P
	b)				N/A
	c)				P

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Clause	Requirement + Test	Result - Remark	Verdict

	d)				N/A
	e) 2000 V				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	61A			
	- Passed for 1h	>1h	>1h	>1h	P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	101A			
		D_{1-1} [min]	**D_{1-2}** [min]	**D_{1-3}** [min]	--
	Tripping within ☒ 1 hour / ☐ 2 hour	1,2	0,9	1,6	P

	TESTS „D" 2 samples: B6 AND C6, 1P			
8.6	**Automatic operation**			
8.6.1	Standard time-current zone			
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.			
9.10	**Tests „D_0"**	**D_{0-1}**	**D_{0-2}**	
	I_N (A)	6		
	Sect. (mm²)	1,0		
	Instantaneous tripping current	☒ B ☒ C ☐ D		--
9.10.2	Test of time-current characteristic			
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	6,8		--
	- 1 h ($I_N \leq 63$ A)		>1h	P
	- 2 h ($I_N > 63$ A)			N/A
	No tripping			P
	Then steadily increased within 5 s to 1,45 I_N (A)	8,7		--
	- Tripping within	[min]	[min]	--
	- 1h (≤ 63 A)		4,8	P
	- 2h (> 63 A)			N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	15,3		--
	opening time not less than 1 s or more than	[s]	[s]	
	- 60 s (≤ 32 A)		12	P
	- 120 s (> 32 A)			N/A
9.10.3	Test of instantaneous tripping and of correct opening of the contacts			
9.10.3.1	General test conditions			
	For the lower values of the test current the test is made once, at any convenient voltage.			

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Clause	Requirement + Test	Result - Remark	Verdict
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.		
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		P
9.10.3.2	☒ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	18,1	--
	Opening time:	[s]	--
	≥ 0,1 s	7,7	P
	Test current 5 I_N (A), starting from cold	30,2	--
	Tripping less than 0,1 s	7,62ms	P
9.10.3.3	☒ For circuit-breakers of the C – Type		
	Test current $5I_N$ (A), starting from cold	30,0	--
	Opening time:	[s]	--
	≥ 0,1 s	1,7	P
	Test current 10 I_N (A), starting from cold	60,2	--
	Tripping less than 0,1 s	7,96ms	P
9.10.3.4	☐ For circuit-breakers of the D – Type		
	Test current $10I_N$ (A), starting from cold		--
	Opening time:	[s]	--
	≥ 0,1 s		N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold		--
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		
	Test current 1,1 It (A), (two pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
9.10.5	Test of effect of ambient temperature on the tripping characteristics		
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C	
	Test current 1,13 I_N (A)	6,8	--
	- Passed for 1h	>1h	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	11,4	--
	Tripping within	[min] [min]	--
	- 1h (≤ 63 A)	0,6	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	T = +40°C	
	Test current I_N (A)	6,0	--
	No tripping within		--
	- 1h (≤ 63 A)	>1h	P
	- 2h (> 63 A)		N/A

	TESTS „D“ 2 samples: B10 AND C10, 1P		
8.6	**Automatic operation**		
8.6.1	Standard time-current zone		
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.		
9.10	**Tests „D_0“**	**D_{0-3}** **D_{0-4}**	
	I_N (A)	10	
	Sect. (mm²)	1,5	
	Instantaneous tripping current	☒ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	11,3	--
	- 1 h (I_N ≤ 63 A)	>1h	P
	- 2 h (I_N > 63 A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	14,5	--
	- Tripping within	[min] [min]	--
	- 1h (≤ 63 A)	3,3	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	25,5	--

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Clause	Requirement + Test	Result - Remark	Verdict
	opening time not less than 1 s or more than	[s] [s]	
	- 60 s (≤ 32 A)	11,3	P
	- 120 s (> 32 A)		N/A
9.10.3	Test of instantaneous tripping and of correct opening of the contacts		
9.10.3.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage.		
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.		
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		P
9.10.3.2	☒ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	30,0	--
	Opening time:	[s]	--
	≥ 0,1 s	8,3	P
	Test current 5 I_N (A), starting from cold	50,1	--
	Tripping less than 0,1 s	7,18ms	P
9.10.3.3	☒ For circuit-breakers of the C – Type		
	Test current $5I_N$ (A), starting from cold	50,0	--
	Opening time:	[s]	--
	≥ 0,1 s	2,7	P
	Test current 10 I_N (A), starting from cold	101	--
	Tripping less than 0,1 s	8,11ms	P
9.10.3.4	☐ For circuit-breakers of the D – Type		
	Test current $10I_N$ (A), starting from cold		--
	Opening time:	[s]	--
	≥ 0,1 s		N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold		--
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		
	Test current 1,1 It (A), (two pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C	
	Test current 1,13 I_N (A)	11,3	--
	- Passed for 1h	>1h	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	19,0	--
	Tripping within	[min] [min]	--
	- 1h (≤ 63 A)	0,7	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	T = +40°C	
	Test current I_N (A)	10,0	--
	No tripping within		--
	- 1h (≤ 63 A)	>1h	P
	- 2h (> 63 A)		N/A

	TESTS „D“ 2 samples: B16 AND C16, 1P		
8.6	**Automatic operation**		
8.6.1	Standard time-current zone		
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.		
9.10	**Tests „D_0“**	**D_{0-5}** **D_{0-6}**	
	I_N (A)	16	
	Sect. (mm²)	2,5	
	Instantaneous tripping current	☒ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	18,1	--
	- 1 h (I_N ≤ 63 A)	>1h	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- 2 h (I_N > 63 A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	23,2	--
	- Tripping within	[min] [min]	--
	- 1h (≤ 63 A)	5,5	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	41,0	--
	opening time not less than 1 s or more than	[s] [s]	
	- 60 s (≤ 32 A)	10,7	P
	- 120 s (> 32 A)		N/A
9.10.3	Test of instantaneous tripping and of correct opening of the contacts		
9.10.3.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage.		
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.		
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		P
9.10.3.2	☒ For circuit-breakers of the B – Type		
	Test current 3I_N (A), starting from cold	48,0	--
	Opening time:	[s]	--
	≥ 0,1 s	8,2	P
	Test current 5 I_N (A), starting from cold	80,6	--
	Tripping less than 0,1 s	7,92ms	P
9.10.3.3	☒ For circuit-breakers of the C – Type		
	Test current 5I_N (A), starting from cold	80,0	--
	Opening time:	[s]	--
	≥ 0,1 s	2,1	P
	Test current 10 I_N (A), starting from cold	164	--
	Tripping less than 0,1 s	8,32ms	P
9.10.3.4	☐ For circuit-breakers of the D – Type		
	Test current 10I_N (A), starting from cold		--
	Opening time:	[s]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	≥ 0,1 s		N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold		--
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		
	Test current 1,1 It (A), (two pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C	
	Test current 1,13 I_N (A)	18,1	--
	- Passed for 1h	>1h	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	30,4	--
	Tripping within	[min] [min]	--
	- 1h (≤ 63 A)	0,5	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	T = +40°C	
	Test current I_N (A)	16,0	--
	No tripping within		--
	- 1h (≤ 63 A)	>1h	P
	- 2h (> 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 2 samples: B20 AND C20, 1P			
8.6	**Automatic operation**			
8.6.1	Standard time-current zone			
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.			
9.10	**Tests „D_0“**	**D_{0-7}**	**D_{0-8}**	
	I_N (A)	20		
	Sect. (mm²)	2,5		
	Instantaneous tripping current	☒ B ☒ C ☐ D		--
9.10.2	Test of time-current characteristic			
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	22,6		--
	- 1 h ($I_N \leq 63$ A)		>1h	P
	- 2 h ($I_N > 63$ A)			N/A
	No tripping			P
	Then steadily increased within 5 s to 1,45 I_N (A)	29,0		--
	- Tripping within	[min]	[min]	--
	- 1h (≤ 63 A)		4,0	P
	- 2h (> 63 A)			N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	51,0		--
	opening time not less than 1 s or more than	[s]	[s]	
	- 60 s (≤ 32 A)		10,0	P
	- 120 s (> 32 A)			N/A
9.10.3	Test of instantaneous tripping and of correct opening of the contacts			
9.10.3.1	General test conditions			
	For the lower values of the test current the test is made once, at any convenient voltage.			
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.			
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min			
	The tripping time of the O operation is measured			
	After each operation the indicating means shall show the open position of the contacts			P
9.10.3.2	☒ For circuit-breakers of the B – Type			
	Test current 3I_N (A), starting from cold	60,0		--
	Opening time:	[s]		--

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Clause	Requirement + Test	Result - Remark	Verdict
	≥ 0,1 s	8,6	P
	Test current 5 I_N (A), starting from cold	101	--
	Tripping less than 0,1 s	8,11ms	P
9.10.3.3	☒ For circuit-breakers of the C – Type		
	Test current 5I_N (A), starting from cold	100	--
	Opening time:	[s]	--
	≥ 0,1 s	2,3	P
	Test current 10 I_N (A), starting from cold	202	--
	Tripping less than 0,1 s	8,09ms	P
9.10.3.4	☐ For circuit-breakers of the D – Type		
	Test current 10I_N (A), starting from cold		--
	Opening time:	[s]	--
	≥ 0,1 s		N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold		--
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		
	Test current 1,1 It (A), (two pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C	
	Test current 1,13 I_N (A)	20,6	--
	- Passed for 1h	>1h	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	38,0	--
	Tripping within	[min] [min]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- 1h (≤ 63 A)	37	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	T = +40°C	
	Test current I_N (A)	20,0	--
	No tripping within		--
	- 1h (≤ 63 A)	>1h	P
	- 2h (> 63 A)		N/A

	TESTS „D“ 2 samples: B25 AND C25, 1P		
8.6	**Automatic operation**		
8.6.1	Standard time-current zone		
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.		
9.10	**Tests „D_0“**	**D_{0-9}** **D_{0-10}**	
	I_N (A)	25	
	Sect. (mm²)	4,0	
	Instantaneous tripping current	☒ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	28,3	--
	- 1 h (I_N ≤ 63 A)	>1h	P
	- 2 h (I_N > 63 A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	36,3	--
	- Tripping within	[min] [min]	--
	- 1h (≤ 63 A)	2,6	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	63,8	--
	opening time not less than 1 s or more than	[s] [s]	
	- 60 s (≤ 32 A)	12,1	P
	- 120 s (> 32 A)		N/A
9.10.3	Test of instantaneous tripping and of correct opening of the contacts		
9.10.3.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage.		
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.		

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Clause	Requirement + Test	Result - Remark	Verdict
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		P
9.10.3.2	☒ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	75,0	--
	Opening time:	[s]	--
	≥ 0,1 s	8,1	P
	Test current 5 I_N (A), starting from cold	127	--
	Tripping less than 0,1 s	8,07ms	P
9.10.3.3	☒ For circuit-breakers of the C – Type		
	Test current $5I_N$ (A), starting from cold	125	--
	Opening time:	[s]	--
	≥ 0,1 s	2,0	P
	Test current 10 I_N (A), starting from cold	252	--
	Tripping less than 0,1 s	8,96ms	P
9.10.3.4	☐ For circuit-breakers of the D – Type		
	Test current $10I_N$ (A), starting from cold		--
	Opening time:	[s]	--
	≥ 0,1 s		N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold		--
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		
	Test current 1,1 It (A), (two pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		

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Clause	Requirement + Test	Result - Remark		Verdict
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C		
	Test current 1,13 I_N (A)	28,3		--
	- Passed for 1h		>1h	P
	- Passed for 2h			N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	47,5		--
	Tripping within	[min]	[min]	--
	- 1h (≤ 63 A)		0,5	P
	- 2h (> 63 A)			N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	T = +40°C		
	Test current I_N (A)	25,0		--
	No tripping within			--
	- 1h (≤ 63 A)		>1h	P
	- 2h (> 63 A)			N/A

	TESTS „D“ 2 samples: B32 AND C32, 1P			
8.6	**Automatic operation**			
8.6.1	Standard time-current zone			
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.			
9.10	**Tests „D_0“**	**D_{0-11}**	**D_{0-12}**	
	I_N (A)	32		
	Sect. (mm²)	6,0		
	Instantaneous tripping current	☒ B ☒ C ☐ D		--
9.10.2	Test of time-current characteristic			
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	36,2		--
	- 1 h (I_N ≤ 63 A)		>1h	P
	- 2 h (I_N > 63 A)			N/A
	No tripping			P
	Then steadily increased within 5 s to 1,45 I_N (A)	46,4		--
	- Tripping within	[min]	[min]	--
	- 1h (≤ 63 A)		2,2	P
	- 2h (> 63 A)			N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	81,6		--
	opening time not less than 1 s or more than	[s]	[s]	

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Clause	Requirement + Test	Result - Remark	Verdict
	- 60 s (≤ 32 A)	15,2	P
	- 120 s (> 32 A)		N/A
9.10.3	Test of instantaneous tripping and of correct opening of the contacts		
9.10.3.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage.		
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.		
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		P
9.10.3.2	☒ For circuit-breakers of the B – Type		
	Test current 3I_N (A), starting from cold	96,0	--
	Opening time:	[s]	--
	≥ 0,1 s	10,3	P
	Test current 5 I_N (A), starting from cold	164	--
	Tripping less than 0,1 s	8,32ms	P
9.10.3.3	☒ For circuit-breakers of the C – Type		
	Test current 5I_N (A), starting from cold	160	--
	Opening time:	[s]	--
	≥ 0,1 s	2,0	P
	Test current 10 I_N (A), starting from cold	323	--
	Tripping less than 0,1 s	8,75ms	P
9.10.3.4	☐ For circuit-breakers of the D – Type		
	Test current 10I_N (A), starting from cold		--
	Opening time:	[s]	--
	≥ 0,1 s		N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold		--
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		
	Test current 1,1 It (A), (two pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C	
	Test current 1,13 I_N (A)	36,2	--
	- Passed for 1h	>1h	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	61,0	--
	Tripping within	[min] [min]	--
	- 1h (≤ 63 A)	0,5	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	T = +40°C	
	Test current I_N (A)	32,0	--
	No tripping within		--
	- 1h (≤ 63 A)	>1h	P
	- 2h (> 63 A)		N/A

	TESTS „D“ 2 samples: B40 AND C40, 1P		
8.6	**Automatic operation**		
8.6.1	Standard time-current zone		
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.		
9.10	**Tests „D_0“**	**D_{0-13}** **D_{0-14}**	
	I_N (A)	40	
	Sect. (mm²)	10,0	
	Instantaneous tripping current	☒ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	45,2	--
	- 1 h (I_N ≤ 63 A)	>1h	P
	- 2 h (I_N > 63 A)		N/A

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Clause	Requirement + Test	Result - Remark		Verdict
	No tripping			P
	Then steadily increased within 5 s to 1,45 I_N (A)	58,0		--
	- Tripping within	[min]	[min]	--
	- 1h (≤ 63 A)		1,8	P
	- 2h (> 63 A)			N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	102		--
	opening time not less than 1 s or more than	[s]	[s]	
	- 60 s (≤ 32 A)			N/A
	- 120 s (> 32 A)		31,9	P
9.10.3	Test of instantaneous tripping and of correct opening of the contacts			
9.10.3.1	General test conditions			
	For the lower values of the test current the test is made once, at any convenient voltage.			
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.			
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min			
	The tripping time of the O operation is measured			
	After each operation the indicating means shall show the open position of the contacts			P
9.10.3.2	☒ For circuit-breakers of the B – Type			
	Test current 3I_N (A), starting from cold	120		--
	Opening time:	[s]		--
	≥ 0,1 s	10,6		P
	Test current 5 I_N (A), starting from cold	202		--
	Tripping less than 0,1 s	8,60ms		P
9.10.3.3	☒ For circuit-breakers of the C – Type			
	Test current 5I_N (A), starting from cold	200		--
	Opening time:	[s]		--
	≥ 0,1 s	3,0		P
	Test current 10 I_N (A), starting from cold	408		--
	Tripping less than 0,1 s	9,10ms		P
9.10.3.4	☐ For circuit-breakers of the D – Type			
	Test current 10I_N (A), starting from cold			--
	Opening time:	[s]		--

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Clause	Requirement + Test	Result - Remark	Verdict
	≥ 0,1 s		N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold		--
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		
	Test current 1,1 It (A), (two pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C	
	Test current 1,13 I_N (A)	45,2	--
	- Passed for 1h	>1h	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	76,0	--
	Tripping within	[min] [min]	--
	- 1h (≤ 63 A)	0,7	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	T = +40°C	
	Test current I_N (A)	40,0	--
	No tripping within		--
	- 1h (≤ 63 A)	>1h >1h	P
	- 2h (> 63 A)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 2 samples: B50 AND C50, 1P		
8.6	**Automatic operation**		
8.6.1	Standard time-current zone		
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.		
9.10	**Tests „D_0“**	**D_{0-15}** **D_{0-16}**	
	I_N (A)	50	
	Sect. (mm²)	10,0	
	Instantaneous tripping current	☒ B ☒ C ☐ D	--
9.10.2	Test of time-current characteristic		
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:	56,5	--
	- 1 h ($I_N \leq 63$ A)	>1h	P
	- 2 h ($I_N > 63$ A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_N (A)	72,5	--
	- Tripping within	[min] [min]	--
	- 1h (≤ 63 A)	2,2	P
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:	127,5	--
	opening time not less than 1 s or more than	[s] [s]	
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	59,2	P
9.10.3	Test of instantaneous tripping and of correct opening of the contacts		
9.10.3.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage.		
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.		
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		P
9.10.3.2	☒ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	150	--
	Opening time:	[s]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	≥ 0,1 s	11,3	P
	Test current 5 I_N (A), starting from cold	252	--
	Tripping less than 0,1 s	8,87ms	P
9.10.3.3	☒ For circuit-breakers of the C – Type		
	Test current 5I_N (A), starting from cold	250	--
	Opening time:	[s]	--
	≥ 0,1 s	6,6	P
	Test current 10 I_N (A), starting from cold	509	--
	Tripping less than 0,1 s	9,56ms	P
9.10.3.4	☐ For circuit-breakers of the D – Type		
	Test current 10I_N (A), starting from cold		--
	Opening time:	[s]	--
	≥ 0,1 s		N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold		--
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		
	Test current 1,1 It (A), (two pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		
	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C	
	Test current 1,13 I_N (A)	56,5	--
	- Passed for 1h	>1h	P
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s	95,0	--
	Tripping within	[min] [min]	--

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Clause	Requirement + Test	Result - Remark	Verdict
	- 1h (≤ 63 A)	0,6	P
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	T = +40°C	
	Test current I_N (A)	50,0	--
	No tripping within		--
	- 1h (≤ 63 A)	>1h	P
	- 2h (> 63 A)		N/A

	TESTS „D“ 1 samples: B63, 1P		
8.6	**Automatic operation**		
8.6.1	Standard time-current zone		
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.		
9.10	**Tests „D_0“**	**D_{0-17}**	
	I_N (A)	63	
	Sect. (mm²)	16,0	
	Instantaneous tripping current	☒ B ☐ C ☐ D	--
9.10.2	Test of time-current characteristic		
9.10.2.1	Test current 1,13 I_N (A) starting from cold for:		--
	- 1 h (I_N ≤ 63 A)		N/A
	- 2 h (I_N > 63 A)		N/A
	No tripping		N/A
	Then steadily increased within 5 s to 1,45 I_N (A)		--
	- Tripping within	[min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.2.2	Test current 2,55 I_N (A) starting from cold for:		--
	opening time not less than 1 s or more than	[s]	
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)		N/A
9.10.3	Test of instantaneous tripping and of correct opening of the contacts		
9.10.3.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage.		
	For the upper values of the test current the test is made at rated voltage Un(phase to neutral) with a power factor between 0,95 and 1.		

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Clause	Requirement + Test	Result - Remark	Verdict
	The sequence of operation is : O-CO-CO-CO Interval time: > 3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		P
9.10.3.2	☒ For circuit-breakers of the B – Type		
	Test current 3I_N (A), starting from cold	189	--
	Opening time:	[s]	--
	≥ 0,1 s	9,8	P
	Test current 5 I_N (A), starting from cold	323	--
	Tripping less than 0,1 s	9,01ms	P
9.10.3.3	☐ For circuit-breakers of the C – Type		
	Test current 5I_N (A), starting from cold		--
	Opening time:	[s]	--
	≥ 0,1 s		N/A
	Test current 10 I_N (A), starting from cold		--
	Tripping less than 0,1 s		N/A
9.10.3.4	☐ For circuit-breakers of the D – Type		
	Test current 10I_N (A), starting from cold		--
	Opening time:	[s]	--
	≥ 0,1 s		N/A
	Test current 20 I_N (A) or to the maximum instantaneous tripping current(see cl. 6, item j), starting from cold		--
	Tripping less than 0,1 s		N/A
9.10.4	Test of effect of single pole loading on the tripping characteristic of multi-pole circuit-breakers:		
	Test current 1,1 It (A), (two pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	Test current 1,2 It (A), (three pole or four pole) starting from cold	__________A	
	Tripping within	[min] [min] [min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
9.10.5	Test of effect of ambient temperature on the tripping characteristics		

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Clause	Requirement + Test	Result - Remark	Verdict

	a) Ambient temperature of (35 ± 2) K below the ambient air reference temperature	T = -5°C	
	Test current 1,13 I_N (A)		--
	- Passed for 1h		N/A
	- Passed for 2h		N/A
	Current is then steadily increased to 1,9 I_N (A) within 5s		--
	Tripping within	[min]	--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A
	b) Ambient temperature of (10 ± 2) K above the ambient air reference temperature	T = +40°C	
	Test current I_N (A)		--
	No tripping within		--
	- 1h (≤ 63 A)		N/A
	- 2h (> 63 A)		N/A

	TESTS „E_1“ 3 + 3 samples: C63, 1P				
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-1}**	**E_{1-2}**	**E_{1-3}**	
	Service short-circuit capacity (Ics) ....:	6000A			
	Test circuit: figure ....:	Figure 3			
	Test voltage 1,05 Un	256V			
	Prospective current ....:	6,00x10^3 A			
	Prospective current obtained ....:	6,07x10^3 A			
	Power factor ....:	0,65~0,70			
	Power factor obtained ....:	0,68			
	Sequence ....:	O-O-CO			
	T (min) ....:	3min			
9.12.9.2	Test in free air copper wire F’: ☐ 0,12 mm / ☒ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” = 45 mm			P
9.12.9.3	Test in enclosures copper wire F’: ☐ 0,12 mm / ☐ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: ______x______x_____mm			N/A
	I_{Peak} (A) max. value...:	4,82x10^{3}A			
	I^2t ≤ _______ kA^{2}s	[KA^{2}S]	[KA^{2}S]	[KA^{2}S]	

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Clause	Requirement + Test	Result - Remark			Verdict
	Max. $I^2t \leq$ _______kA²s L1 L2 L3 L4(N)	80,0 – – –	86,9 – – –	70,5 – – –	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit – breaker is in the open position	**E_{1-1}** [µA]	**E_{1-2}** [µA]	**E_{1-3}** [µA]	--
	The leakage current shall not exceed 2 mA L1	5,71	4,21	4,83	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 1500 V (see 9.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e)				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	61,0A			
	- Passed for 1h	>1h	>1h	>1h	P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	101A			
		E_{1-1} [min]	**E_{1-2}** [min]	**E_{1-3}** [min]	
	Tripping within ☒ 1 hour / ☐ 2 hour	2,3	0,9	1,3	P

9.12.11.4.2	**Test „E_1“(Test at service short-circuit capacity) three phase tests for single circuit-breakers**	**E_{1-4}**	**E_{1-5}**	**E_{1-6}**	
	Service short-circuit capacity (Ics) ....:	6000A			

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Clause	Requirement + Test	Result - Remark			Verdict
	Test circuit: figure ....:	Figure 3			
	Test voltage 1,05 Un	444V			
	Prospective current ....:	6,00x10³ A			
	Prospective current obtained..........:	6,07x10³ A			
	Power factor ....:	0,65~0,70			
	Power factor obtained ....:	0,68			
	Sequence ....:	See remark			
	T (min) ....:	3 min			
9.12.9.2	Test in free air copper wire F’: ☐ 0,12 mm / ☒ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” = 45 mm			P
9.12.9.3	Test in enclosures copper wire F’: ☐ 0,12 mm / ☐ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: ______x______x_____mm			N/A
	I_{Peak} (A) max. value..........:	4,05x10³A			--
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= <u>457</u> V. The circuit – breaker is in the open position	**E_{1-4}** [µA]	**E_{1-5}** [µA]	**E_{1-6}** [µA]	--
	The leakage current shall not exceed 2 mA L1	8,40	7,00	7,20	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 1500 V (see 9.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e)				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	60,5A			
	- Passed for 1h	>1h	>1h	>1h	P

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Clause	Requirement + Test	Result - Remark			Verdict
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	100A			
		E_{1-4} [min]	**E_{1-5}** [min]	**E_{1-6}** [min]	
	Tripping within ☒ 1 hour / ☐ 2 hour	0,4	0,7	0,3	P
	TESTS „E_1" 3 + 3 samples: C6, 1P				
9.12.11.4.2	**Test E_1: Test at service short-circuit capacity**	**E_{1-7}**	**E_{1-8}**	**E_{1-9}**	
	Service short-circuit capacity (Ics) ....:	6000A			
	Test circuit: figure ....:	Figure 3			
	Test voltage 1,05 Un	256V			
	Prospective current ....:	6,00x10³A			
	Prospective current obtained ....:	6,13x10³ A			
	Power factor ....:	0,65~0,70			
	Power factor obtained ....:	0,68			
	Sequence ....:	O-O-CO			
	T (min) ....:	3min			
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" = 45mm			P
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: ______x______x_____mm			N/A
	I_{Peak} (A) max. value...:	1,72x10³A			
	I²t ≤ ______ kA²s	[KA²S]	[KA²S]	[KA²S]	
	Max. I²t ≤ ______kA²s L1 L2 L3 L4(N)	27,7 – – –	27,4 – – –	0,90 – – –	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				

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Clause	Requirement + Test	Result - Remark			Verdict
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit – breaker is in the open position	**E_{1-7}** [µA]	**E_{1-8}** [µA]	**E_{1-9}** [µA]	--
	The leakage current shall not exceed 2 mA L1	4,90	4,70	5,00	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 1500 V (see 9.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e)				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	5,80A			
	- Passed for 1h	>1h	>1h	>1h	P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	9,60A			
		E_{1-7} [min]	**E_{1-8}** [min]	**E_{1-9}** [min]	
	Tripping within ☒ 1 hour / ☐ 2 hour	3,7	3,5	3,7	P

9.12.11.4.2	**Test „E_1“(Test at service short-circuit capacity) three phase tests for single circuit-breakers**	**E_{1-10}**	**E_{1-11}**	**E_{1-12}**	
	Service short-circuit capacity (Ics) ....:	6000A			
	Test circuit: figure ....:	Figure 3			
	Test voltage 1,05 Un	444V			
	Prospective current ....:	$6{,}00 \times 10^3$A			
	Prospective current obtained...............................:	$6{,}17 \times 10^3$ A			
	Power factor ....:	0,65~0,70			
	Power factor obtained ....:	0,68			
	Sequence ....:	See remark			
	T (min) ....:	3 min			
9.12.9.2	Test in free air copper wire F’: ☐ 0,12 mm / ☒ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” = 45 mm			P

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Clause	Requirement + Test	Result - Remark			Verdict
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: ______x______x_____mm			N/A
	I_{Peak} (A) max. value...:	$2{,}85x10^3A$			--
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit –breaker is in the open position	**E_{1-10}** [µA]	**E_{1-11}** [µA]	**E_{1-12}** [µA]	--
	The leakage current shall not exceed 2 mA L1	4,70	5,00	4,70	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 1500 V (see 9.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e)				N/A
	Test current 0.85x non-tripping current (1,13 I_N)	5,80A			
	- Passed for 1h	>1h	>1h	>1h	P
	- Passed for 2h				N/A
	Current is then steadily increased to 1,1 x tripping current (1,45 I_N) within 5s	9,60A			
		E_{1-10} [min]	**E_{1-11}** [min]	**E_{1-12}** [min]	
	Tripping within ☒ 1 hour / ☐ 2 hour	3,5	3,2	3,5	P

	TESTS „E_2“ 3 samples: C32, 1P				
9.12.11.4.3	**Test: E2 (Test at rated short-circuit capacity)**	**E_{2-1}**	**E_{2-2}**	**E_{2-3}**	
	Rated short-circuit capacity (Icn)..........................:	6000A			--

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Clause	Requirement + Test	Result - Remark			Verdict
	Test circuit: figure ......:	Figure 3			--
	Test voltage 1,05 Un	256V			--
	Prospective current ......:	6,00x10^3 A			
	Prospective current obtained ......:	6,07x10^3 A			
	Power factor ......:	0,65~0,70			
	Power factor obtained ......:	0,68			
	Sequence ......:	O-CO			
	T (min) ......:	3min			
9.12.9.2	Test in free air copper wire F’: ☐ 0,12 mm / ☒ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” = 45 mm			P
9.12.9.3	Test in enclosures copper wire F’: ☐ 0,12 mm / ☐ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: _____x_____x_____mm			N/A
	I_{Peak} (A) max. value ......:	3,09X10^{3}A			--
	$I^2t \leq$ 52 kA2s	[KA^{2}S]	[KA^{2}S]	[KA^{2}S]	--
	Max. $I^2t \leq$ 52 kA^{2}s L1 L2 L3 L4(N)	34,2 ___ ___ ___	29,8 ___ ___ ___	29,3 ___ ___ ___	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.2	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit –breaker is in the open position	**E_{2-1}** [µA]	**E_{2-2}** [µA]	**E_{2-3}** [µA]	--
	The leakage current shall not exceed 2 mA L1	8,20	9,03	11,3	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 900 V (see 9.7.3)				
	a)				P
	b)				N/A

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Clause	Requirement + Test	Result - Remark			Verdict
	c)				P
	d)				N/A
	e)				N/A
	Test current 2,8 I_N	89,6A			
	Tripping within > 0,1 s up to	[S]	[S]	[S]	
	- 60 s	4	5	4	N/A
	- 120 s	-	-	-	P

	TESTS „E_2“ 3 samples: C16, 1P				
9.12.11.4.3	**Test: E2 (Test at rated short-circuit capacity)**	**E_{2-4}**	**E_{2-5}**	**E_{2-6}**	
	Rated short-circuit capacity (Icn)........................:	6000A			--
	Test circuit: figure ....:	Figure 3			--
	Test voltage 1,05 Un	256V			--
	Prospective current ....:	6,00x10³ A			
	Prospective current obtained ....:	6,13x10³ A			
	Power factor ....:	0,65~0,70			
	Power factor obtained ....:	0,68			
	Sequence ....:	O-CO			
	T (min) ....:	3min			
9.12.9.2	Test in free air copper wire F’: ☐ 0,12 mm / ☒ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” = 45 mm			P
9.12.9.3	Test in enclosures copper wire F’: ☐ 0,12 mm / ☐ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: ______x______x_____mm			N/A
	I_{Peak} (A) max. value...:	3,15x10³ A			--
	I²t ≤ 40 kA²s	[KA²S]	[KA²S]	[KA²S]	--
	Max. I²t ≤ 40 kA²s L1 L2 L3 L4(N)	11,1 ___ ___ ___	34,8 ___ ___ ___	13,1 ___ ___ ___	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--

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Clause	Requirement + Test	Result - Remark	Verdict

9.12.12.2	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit –breaker is in the open position	**E_{2-4}** [µA]	**E_{2-5}** [µA]	**E_{2-6}** [µA]	--
	The leakage current shall not exceed 2 mA L1	12,4	11,3	11,2	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 900 V (see 9.7.3)				
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e)				N/A
	Test current 2,8 I_N	44,8A			
	Tripping within > 0,1 s up to	[S]	[S]	[S]	
	- 60 s	16	14	11	P
	- 120 s	-	-	-	N/A

	TESTS „E_2“ 3 samples: B32, 1P				
9.12.11.4.3	**Test: E2 (Test at rated short-circuit capacity)**	**E_{2-7}**	**E_{2-8}**	**E_{2-9}**	
	Rated short-circuit capacity (Icn).........................:	6000A			--
	Test circuit: figure ....:	Figure 3			--
	Test voltage 1,05 Un	256V			--
	Prospective current ....:	6,00x10³ A			
	Prospective current obtained ....:	6,13x10³ A			
	Power factor ....:	0,65~0,70			
	Power factor obtained ....:	0,67			
	Sequence ....:	O-CO			
	T (min) ....:	3min			
9.12.9.2	Test in free air copper wire F’: ☐ 0,12 mm / ☒ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☒ 1,5 Ohm	“a” = 45 mm			P

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Clause	Requirement + Test	Result - Remark			Verdict
9.12.9.3	Test in enclosures copper wire F’: ☐ 0,12 mm / ☐ 0,16 mm resistor R’ : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: ______x______x_____mm			N/A
	I_{Peak} (A) max. value ....:	3,86X10^{3}A			--
	I²t ≤ _45_ kA2s	[KA²S]	[KA²S]	[KA²S]	--
	Max. I²t ≤ _45_ kA²s L1 L2 L3 L4(N)	30,4 ___ ___ ___	23,3 ___ ___ ___	20,1 ___ ___ ___	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.2	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit –breaker is in the open position	**E_{2-7}** [µA]	**E_{2-8}** [µA]	**E_{2-9}** [µA]	--
	The leakage current shall not exceed 2 mA L1	7,40	8,80	7,60	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 900 V (see 9.7.3)				
	a)				P
	b)				N/A
	c)				P
	d)				N/A
	e)				N/A
	Test current 2,8 I_N	89,6A			
	Tripping within > 0,1 s up to	[S]	[S]	[S]	
	- 60 s	13	8	17	N/A
	- 120 s	-	-	-	P

	TESTS „E_2“ 3 samples: B16, 1P				
9.12.11.4.3	**Test: E2 (Test at rated short-circuit capacity)**	**E_{2-10}**	**E_{2-11}**	**E_{2-12}**	

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Clause	Requirement + Test	Result - Remark			Verdict
	Rated short-circuit capacity (Icn)......................:	6000A			--
	Test circuit: figure ....:	Figure 3			--
	Test voltage 1,05 Un	256V			--
	Prospective current ....:	$6,00x10^3$ A			
	Prospective current obtained ....:	$6,13x10^3$ A			
	Power factor ....:	0,65~0,70			
	Power factor obtained ....:	0,67			
	Sequence ....:	O-CO			
	T (min) ....:	3min			
9.12.9.2	Test in free air copper wire F': ☐ 0,12 mm / ☒ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☒ 1,5 Ohm	"a" = 45 mm			P
9.12.9.3	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimensions of enclosure: ______x______x_____mm			N/A
	I_{Peak} (A) max. value...:	$2,60x10^3$ A			--
	$I^2t \leq$ 35 kA^2s	[KA^2S]	[KA^2S]	[KA^2S]	--
	Max. $I^2t \leq$ 35 kA^2s L1 L2 L3 L4(N)	7,70 ___ ___ ___	27,3 ___ ___ ___	7,40 ___ ___ ___	P
	- No permanent arcing				P
	- No flash-over between poles or between poles and frame				P
	- No blowing of the fuses F and F′				P
	- Polyethylene foil shows no holes				P
	After the test:				--
9.12.12.2	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.5.3, each pole is supplied at a voltage 1,1 times Un.= 457 V. The circuit – breaker is in the open position	**E_{2-4}** [µA]	**E_{2-5}** [µA]	**E_{2-6}** [µA]	--
	The leakage current shall not exceed 2 mA L1	7,70	8,20	7,90	P
	L2	-	-	-	N/A
	L3	-	-	-	N/A
	L4(N)	-	-	-	N/A
	Electric strength test:				
	Test voltage 900 V (see 9.7.3)				
	a)				P

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Clause	Requirement + Test	Result - Remark			Verdict
	b)				N/A
	c)				P
	d)				N/A
	e)				N/A
	Test current 2,8 I_N	44,8A			
	Tripping within > 0,1 s up to	[S]	[S]	[S]	
	- 60 s	8	9	20	P
	- 120 s	-	-	-	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Annex E		
	Special requirements for auxiliary circuits for safety extra-low voltage		
8.1.3	**Clearances and creepage distances**		
	Additional note to table 4 NOTE 4 live parts in auxiliary circuits intended to be connected to safety extra low voltages shall be separated from circuits with higher voltages in accordance with the requirements of 411.1.3.3 of IEC 60364-4-41		--
	Compliance is checked by inspection		N/A
9.7.4	**Dielectric strength of the auxiliary circuits**		
	Note: A test for circuits intended for connection to safety extra-low voltage is under consideration		N/A

	Annex J		
	Particular requirements for circuit-breakers with screw less type terminals for external copper conductors (In not exceeding 20 A, cross-sectional area up to 4 mm^2		
J.6	**Marking**		
	Universal terminals		--
	- no marking		N/A
	Non-universal		--
	- declared for rigid-solid conductors	marked with: “sol”	N/A
	- declared for rigid(solid and stranded) ....:	marked with: “r”	N/A
	- declared for flexible conductors ....:	Marked with: “f”	N/A
	The markings should appear on the circuit-breaker or, if available space is not sufficient, on smallest package unit or in technical information ....:		N/A
	Indication of length of insulation to be removed on the circuit-breaker...:	______mm	N/A
J.7	**Standard conditions for operation in service**		
	Clause 7 applies		N/A
J.8	**Constructional requirements**		
	Clause 8 applies with the follow modifications:		N/A
	In clause 8.1.5 only –5.1, -5.2. –5.3, - 5.6 and -5.7 apply		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.1	**Connection or disconnection of conductors**		

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Clause	Requirement + Test	Result - Remark	Verdict
	The connection or disconnection shall be made by:		N/A
	A general purpose tool or by a convenient device integral with the terminal or		N/A
	for rigid conductors by simple insertion		N/A
	For disconnection an operation other than a pull shall be necessary (push-wire terminals)		N/A
	Universal terminals shall accept rigid (solid or stranded and flexible unprepared conductors		N/A
	Non-universal terminals shall accept conductors declared by the manufacturer		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.2	**Dimensions of connectable conductors**		
	The dimensions of connectable conductors are given in table J.1		N/A
	The ability to connect these conductors shall be checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.3	**Connectable cross-sectional areas**		
	The nominal cross-sections to be clamped are given in table J.2		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.4	**Insertion and connection of conductors**		
	The insertion and disconnection of the conductors shall be made in accordance with the manufacturer's instructions		N/A
J.8.5	**Design and construction of terminals**		
	Terminals shall be designed and constructed that:		N/A
	- each conductor is clamped individually		N/A
	- connection or disconnection connectors connected or disconnected separate or same		N/A
	- inadequate insertion of the conductor is avoided		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.6	**The terminals shall be resistant to ageing**		
	Compliance is checked by the tests of J.9.3		N/A
J.9	**Tests**		--
	Clause 9 applies, by replacing 9.4 and 9.5 by the follow		N/A
J.9.1	**Test of reliability of screw less terminals**		

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Clause	Requirement + Test	Result - Remark	Verdict
J.9.1.1	**Reliability of screw less system**		
	5 times connection and disconnection		N/A
	3 rigid conductors min. cross-section max. cross-section	_____mm² _____mm²	N/A
	3 flexible conductors min. cross-section max. cross-section	_____mm² _____mm²	N/A
	After tests, the terminal shall not be damage in such a way as to impair its further use		N/A
J.9.1.2	**Test of reliability of connection**		
	3 terminals of poles of new sample are fitted with new copper conductors according table J.2		N/A
	rigid conductors min. cross-section max. cross-section	_____mm² _____mm²	N/A
	flexible conductors min. cross-section max. cross-section	_____mm² _____mm²	N/A
	Each conductor is either pushed as far as possible into the terminal or shall be inserted so that adequate connection is obvious		N/A
	After tests, no wire of the conductor shall have escaped outside the terminals		N/A
J.9.2	**Tests of reliability of terminals for external conductors: Mechanical strength**		
	Three terminals of new samples are fitted with new conductors of the type and of the minimum and maximum cross sectional area according table J.2.		N/A
	Each conductor is subjected to a pull force of value shown in table J.3. for 1 min		N/A
	Terminal screw torque : $^2/_3$ of table 11	_____ Nm	N/A
	rigid conductors min. cross-section max. cross-section	______ mm² / ______N ______ mm² / ______N	N/A
	flexible conductors min. cross-section max. cross-section	______ mm² / ______N ______ mm² / ______N	N/A
	During the test the conductor shall not slip out of the terminal		N/A
J.9.3	**Cycling test**		
	The test is carried out with new copper conductors having a cross sectional area according table 10	_______ mm ²	N/A
	The test is carried out on new samples(a sample is one pole, the number of which is defined below, according the type of terminal		N/A
	- universal terminals for rigid (solid and stranded) and flexible conductors	3 + 3 samples	N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- non-universal terminals for solid conductors only	3 samples	N/A
	-- non- universal terminals for rigid (solid and stranded) conductors	3 + 3 samples	N/A
	- non-universal terminals for flexible conductors only	3 samples	N/A
	The conductors are connected in series as in normal use to each of the three samples as defined on fig. J.1.		N/A
	The sample is provided with a hole or equivalent in order to measure the voltage drop on the terminal		N/A
	The test arrangement is placed in a heating cabinet which is initially on 20°C		N/A
	Except the cooling period the test current (rated current) is applied to the circuit	I test _______ A	N/A
	The samples shall be subjected to 192 temperature cycles, each cycle having a duration of $^{+}/_{-}$ 1 hour		N/A
	Description of the temperature cycle: In 20 min raised to 40°C, maintained for 10 min, then cool down in 20 min to 30 °C, maintained for 10 min. For measurement of the voltage drop it is allowed to cool down to 20 °C		N/A
	The maximum voltage drop, measured on each terminal, at the end of the 192nd cycle, with Inom. shall not exceed the smaller of the two following values - either 22,5 mV - or 1,5 times the value measured after the 24 cycle	Uv max. __________ mV	N/A
	Sample after 24 cycles: rigid conductors (mV) flexible conductors (mV)	J_1 | J_2 | J_3 _____ | _____ | _____ _____ | _____ | _____	N/A
	Sample after 192 cycles: rigid conductors (mV) flexible conductors (mV)	J_1 | J_2 | J_3 _____ | _____ | _____ _____ | _____ | _____	N/A
	After this test the samples shall show no changes evidently impairing further use, such as cracks, deformations or like		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Annex K		
	Particular requirements for circuit-breakers with flat quick-connect terminations		--
K.6	**Marking**		
	The whole of clause 6 applies		
	Addition after the lettered item k		--
	The following information regarding the female connector according to IEC 61210 and the type of conductor to be used shall be given in the manufacturer's instructions		N/A
	a) manufacturers name or trade mark		N/A
	b) type reference		N/A
	c) information on cross-sections of conductors and colour code of insulating female connectors (see table K.1)		N/A
	d) the use of only silver or tin-plated copper alloys		N/A
K.7	**Standard conditions for operation in service**		
	Clause 7 applies		N/A
K.8	**Constructional requirements**		
	Clause 8 applies with the follow modifications:		N/A
	replacement of 8.1.3 by:		N/A
K.8.1	**Clearances and creepage distances (see annex B)**		
	Subclause 8.1.3 applies, the female connectors being fitted to the male tabs of the circuit-breaker		N/A
	Replacement of 8.1.5 by:		N/A
K.8.2	**Terminals for external conductors**		
K.8.2.1	Male tabs and female connectors shall be of a metal having mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use		N/A
K.8.2.2	The nominal width of male tab is 6,3 mm and the thickness 0,8 mm, applicable to rated currents up to and including 16 A NOTE 1:The use for rated currents up to and including 20 A is accepted in BE, FR, IT, PT, ES and US		N/A
	The dimensions of the male tab shall comply with those specified in table K.3 and in figures K.2, K3, K4, K5, where the dimensions A, B, C, D, E, F, J, M, N and Q are mandatory		N/A
	The dimensions of the female connector which may be fitted-on are given in figure K.6 and in table K.4		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	Compliance is checked by inspection and by measurement	See table on page ________	N/A
K.8.2.3	**Male tabs shall be securely retained**		
	Compliance is checked by the mechanical overload test of K.9.1		N/A
K.9	**Tests**		
	Clause 9 applies, with follow modifications:		N/A
	Replacement of 9.5 by:		N/A
K.9.1	**Mechanical overload-force**		
	10 terminals of circuit-breakers, mounted as normal use are subjected to a axial push force and successively the axial pull force specified in table K2 applied to male tab once	push force 96 N pull force 88 N	N/A
	No damage which could impair further use shall occur to the tab or to the circuit-breaker in which the tab is integrated		N/A
	Addition to 9.8.3:		
	Fine –wire thermocouples shall be placed in such a way as not to influence the contact or the connection area. An example of placement is shown in fig K.1		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

		Dimensions of tabs according Table K.3		Measured in mm	Verdict
		Minimum	Maximum		
A	Dimple	0,7	1,0	________	N/A
	Hole	0,5	1,0	________	N/A
B	Dimple	7,8 min		________	N/A
	Hole	7,8 min		________	N/A
C	Dimple	0,77	0,84	________	N/A
	Hole	0,77	0,84	________	N/A
D	Dimple	6,20	6,40	________	N/A
	Hole	6,20	6,40	________	N/A
E	Dimple	3,6	4,1	________	N/A
	Hole	4,3	4,7	________	N/A
F	Dimple	1,6	2,0	________	N/A
	Hole	1,6	2,0	________	N/A
J	Dimple	8°	12°	________	N/A
	Hole	8°	12°	________	N/A
M	Dimple	2,2	2,5	________	N/A
	Hole	---	---	---	N/A
N	Dimple	1,8	2,0	________	N/A
	Hole	---	---	---	N/A
P	Dimple	0,7	1,8	________	N/A
	Hole	0,7	1,8	________	N/A
Q	Dimple	8,9 min	---	________	N/A
	Hole	8,9 min	---	________	N/A
B3			7,8 max	________	N/A
L2			3,5 max	________	N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Annex L		
	Specific requirements for circuit-breakers with screw-type terminals for external untreated aluminium conductors and with aluminium screw-type terminals for use with copper or with aluminium conductors		
L.6	**Marking**		
	In addition to clause 6 the following apply:		
	Terminal marking according table L.1, on the circuit breaker, near the terminals		--
	Conductor types accepted: Copper only Aluminium only Aluminium and copper	 ☐ None ☐ “Al” ☐ “Al/Cu”	N/A N/A N/A N/A
	Other information concerning the number of conductors, screw torque (if different from table 11) and cross-section shall be indicated on the circuit-breaker	________ Nm ________ mm²	N/A
L.7	**Standard conditions for operation in service**		
	Clause 7 applies		N/A
L.8	**Constructional requirements**		
	Clause 8 applies with the following exceptions:		N/A
8.1.5.2	is completed by:		
	For connection of aluminium conductors, circuit-breakers shall be provided with screw-type terminals allowing the connection of conductors having nominal cross-sections as shown in table L.2		N/A
	Terminals for the connection of aluminium conductors and terminals of aluminium for the connection of copper or aluminium conductors shall have mechanical strength adequate to withstand the tests of 9.4, with the test conductors tightened with the torque indicated in table 11, or with the torque specified by the manufacturer, which shall never be lower than that specified in table 11.		N/A
	Compliance is checked by inspection, by measurement and by fitting in turn one conductor of the smallest and one of the largest cross-section areas as specified		N/A
8.1.5.4	Terminals shall allow the conductors to be connected without special preparation		N/A
	Compliance is checked by inspection and by the tests of L.9		N/A
L.9	**Tests**		

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Clause	Requirement + Test	Result - Remark		Verdict
	Clause 9 applies with the following modifications/additions:			N/A
	For the tests which are influenced by the material of the terminal and the type of conductor that can be connected, the test conditions of table L.3 are applied			N/A
	Additionally the test of L.9.2 is carried out on terminals separated from the circuit-breaker			N/A
L.9.2	**Current cycling test**			
	This test is carried out on separate terminals			N/A
	The general arrangement of the samples shall be as shown in figure L.1			N/A
	90 % of torque stated by the manufacturer or selected in table 11 used for the specimens	torque:________Nm		N/A
	The test is carried out with conductors according to table L.5. The length of the test conductor from the point of entry to the screw-type terminal specimens to the equalizer shall be as in table L.6	cross-section:_______mm^2 minimum conductor length:______mm		N/A
	Cross section of equalizer not greater than that given in table L.7	max. crosssection______mm^2		N/A
L.9.2.5	Test method and acceptance criteria			
	Test loop subjected to 500 cycles of 1h current-on and 1h current-off, starting at an a.c. current value of 1,12 times the test current value determined in table L.8	test current:_______A		
	Near the end of each current-on period of the first 24 cycles, the current shall subsequently be adjusted to raise the temperature of the reference conductor to 75°C			
	At the end of the 25th cycle the test current shall be adjusted the last time and the stable temperature shall be recorded as the first measurement. No further adjustment of test current for the remainder of the test			
	Temperatures recorded for at least one cycle of each working day, and after approximately 25, 50, 75, 100, 125, 175, 225, 350, 425 and 500 cycles			
	For each screw-type terminal			
	- the temperature rise shall not exceed 110 K			N/A
	- the stability factor Sf shall not exceed ± 10 °C			N/A
	ambient air temperature: _______°C	max. temperature rise [K]	max. stability factor Sf [°C]	N/A
	Terminal 1			N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	Terminal 2			N/A
	Terminal 3			N/A
	Terminal 4			N/A
	Terminal 5			N/A
	Terminal 6			N/A
	Terminal 7			N/A
	Terminal 8			N/A

IEC60898_1C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

ATTACHMENT TO TEST REPORT IEC 60898-1
EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES
Circuit-breakers for over current protection for household and similar installations

Part 1 - Circuit-breakers for a.c. operation

Differences according to	EN 60898-1:2003+A1:2004+A11:2006+A12:2008+A13:2012
Attachment Form No.	EU_GD_IEC60898_1C
Attachment Originator	DEKRA
Master Attachment	2014-03

	CENELEC COMMON MODIFICATIONS (EN)	

Test item particulars	
Type of circuit-breaker ....:	SGP
Energy limiting class ....:	☐ Class 1 ☒ Class 3 (In≤32A)
Value of rated operational voltage (Ue)..........:	☐ 230 V ☐ 240 V ☒ 230/400 V ☐ 400 V ☐ 240/415 V ☐ 415 V
Rated impulse withstand voltage (Uimp) ....:	4 kV

	Requirements for construction and operation		
9.6	**Test of protection against electric shock**		--
	In case of knock-outs the test finger is applied with a force of 10 N		P

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

	TESTS „A“ 1 sample: C63, 1P		
6	**MARKING AND OTHER INFORMATION**		**--**
6.1	***Standard marking:***		--
	f) Rated short circuit capacity in A within a rectangle, without symbol “A” ....:	6000 within a rectangle	P
	h) calibration temperature, if different from 30°C		N/A

IEC60898_1C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	j) Energy limiting class in a square in accordance with annex ZA.	Energy limiting class 3 (In≤32A)	P
	k) Making and breaking capacity on an individual protected pole of multipole circuit-breakers (Icn1), if different from Icn		N/A
6.2	***Additional marking***		
	Additional marking to other standards (EN or IEC or other) is allowed under the follow conditions:		--
	- the circuit-breaker shall comply with all the requirements of the additional standard;		--
	- the relevant standard to which the additional marking refers shall be indicated adjacent to this marking and shall be clearly differentiated or separated from the standard marking according to cl. 6.1		-
	Compliance is checked by inspection and by carrying out all the test sequences required by the relevant standard. Equivalent or less severe test sequences need not be repeated.		P
6.3	**Guidance table for marking**		
	Each MCB shall be marked in a durable manner with all or, for small apparatus, according table for marking		P

	TESTS „C“ 3 samples: C63, 1P	**C_1 C_2 C_3**	
9.11.3	Dielectric strength reduced to 900 V		P

9.12.11.2.2	**Test C_2 : Short-circuit test on circuit-breakers for use in IT systems 3 samples: C63, 1P**		--
	Test voltage 105 % of 400 V	438V	P

	TESTS „D“ 3 samples: C63, 1P		
9.10	***Tests: D_O***	**D_{1-1} D_{1-2} D_{1-3}**	
	If the tests are made in a test chamber, it shall be made in still air; the volume of the chamber shall not affect the test results.		
9.10.2.2	☐ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	____________ A	
	Opening time:	[S] [S] [S]	
	- 0,1s ≤ t ≤ 45s (≤ 32A)		N/A
	- 0,1s ≤ t ≤ 90s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	____________ A	
	opening time not less than 1 s or more than	[S] [S] [S]	

IEC60898_1C - ATTACHMENT					
Clause	Requirement + Test	Result - Remark			Verdict
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)				N/A
9.10.2.3	☒ For circuit-breakers of the C – Type				
	Test current 5I_N (A), starting from cold	315			
	Opening time:	[S]	[S]	[S]	
	- 0,1s ≤ t ≤ 15 s (≤ 32A)				N/A
	- 0,1s ≤ t ≤ 30 s (> 32A)	7,6	3,8	7,3	P
	Moreover the CB shall perform following test:				
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	161			
	opening time not less than 1 s or more than	[s]	[s]	[s]	
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)	43	47	39	P
9.10.2.4	☐ For circuit-breakers of the D – Type				
	Test current 10I_N (A), starting from cold				
	Opening time:	[S]	[S]	[S]	
	- 0,1s ≤ t ≤ 4s (10 A < In ≤ 32 A)				N/A
	- 0,1s ≤ t ≤ 8s (10 A ≤ In or In > 32A)				N/A
	Test current 20 I_N (A) starting from cold				N/A
	Tripping less than 0,1 s				N/A
	Moreover the CB shall perform following test:				
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:				
	opening time not less than 1 s or more than	[s]	[s]	[s]	
	- 60 s (≤ 32 A)				N/A
	- 120 s (> 32 A)				N/A

	TESTS „D“ 2 samples: C6 and B6, 1P		
9.10	***Tests: D_O***	**D_{0-1} D_{0-2}**	
	If the tests are made in a test chamber, it shall be made in still air; the volume of the chamber shall not affect the test results.		
9.10.2.2	☒ For circuit-breakers of the B – Type		
	Test current 3I_N (A), starting from cold	18,1A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 45s (≤ 32A)	7,7	P
	- 0,1s ≤ t ≤ 90s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	15,3 A	
	opening time not less than 1 s or more than	[S]	

IEC60898_1C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	- 60 s (≤ 32 A)	11,3	P
	- 120 s (> 32 A)		N/A
9.10.2.3	☒ For circuit-breakers of the C – Type		
	Test current 5I_N (A), starting from cold	30,0A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 15 s (≤ 32A)	1,7	P
	- 0,1s ≤ t ≤ 30 s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	15,3 A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	14	P
	- 120 s (> 32 A)		N/A

	TESTS „D“ 2 samples: C10 and B10, 1P		
9.10	***Tests: D_O***	**D_{0-3}** **D_{0-4}**	
	If the tests are made in a test chamber, it shall be made in still air; the volume of the chamber shall not affect the test results.		
9.10.2.2	☒ For circuit-breakers of the B – Type		
	Test current 3I_N (A), starting from cold	30,0A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 45s (≤ 32A)	8,3	P
	- 0,1s ≤ t ≤ 90s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	25,5 A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	12,4	P
	- 120 s (> 32 A)		N/A
9.10.2.3	☒ For circuit-breakers of the C – Type		
	Test current 5I_N (A), starting from cold	50,0A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 15 s (≤ 32A)	2,7	P
	- 0,1s ≤ t ≤ 30 s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	25,5 A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	16	P
	- 120 s (> 32 A)		N/A

IEC60898_1C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

	TESTS „D“ 2 samples: C16 and B16, 1P		
9.10	***Tests: D_O***	**$D_{0\text{-}5}$** **$D_{0\text{-}6}$**	
	If the tests are made in a test chamber, it shall be made in still air; the volume of the chamber shall not affect the test results.		
9.10.2.2	☒ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	48,0A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 45s (≤ 32A)	8,2	P
	- 0,1s ≤ t ≤ 90s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	40,8 A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	10,5	P
	- 120 s (> 32 A)		N/A
9.10.2.3	☒ For circuit-breakers of the C – Type		
	Test current $5I_N$ (A), starting from cold	80,0A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 15 s (≤ 32A)	2,1	P
	- 0,1s ≤ t ≤ 30 s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	41,0 A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	9,7	P
	- 120 s (> 32 A)		N/A

	TESTS „D“ 2 samples: C20 and B20, 1P		
9.10	***Tests: D_O***	**$D_{0\text{-}7}$** **$D_{0\text{-}8}$**	
	If the tests are made in a test chamber, it shall be made in still air; the volume of the chamber shall not affect the test results.		
9.10.2.2	☒ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	60,0A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 45s (≤ 32A)	8,6	P
	- 0,1s ≤ t ≤ 90s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	51,0 A	

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Clause	Requirement + Test	Result - Remark	Verdict
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	11,2	P
	- 120 s (> 32 A)		N/A
9.10.2.3	☒ For circuit-breakers of the C – Type		
	Test current 5I_N (A), starting from cold	100A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 15 s (≤ 32A)	2,3	P
	- 0,1s ≤ t ≤ 30 s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	51,0A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	12	P
	- 120 s (> 32 A)		N/A

	TESTS „D" 2 samples: C25 and B25, 1P		
9.10	***Tests: D_O***	**D_{0-9}** **D_{0-10}**	
	If the tests are made in a test chamber, it shall be made in still air; the volume of the chamber shall not affect the test results.		
9.10.2.2	☒ For circuit-breakers of the B – Type		
	Test current 3I_N (A), starting from cold	75,0A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 45s (≤ 32A)	8,1	P
	- 0,1s ≤ t ≤ 90s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	64,0 A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	14,1	P
	- 120 s (> 32 A)		N/A
9.10.2.3	☒ For circuit-breakers of the C – Type		
	Test current 5I_N (A), starting from cold	125A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 15 s (≤ 32A)	2,0	P
	- 0,1s ≤ t ≤ 30 s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	64,0A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	14	P

IEC60898_1C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	- 120 s (> 32 A)		N/A

	TESTS „D“ 2 samples: C32 and B32, 1P		
9.10	***Tests: D_O***	**D_{0-11}** **D_{0-12}**	
	If the tests are made in a test chamber, it shall be made in still air; the volume of the chamber shall not affect the test results.		
9.10.2.2	☒ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	96,0A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 45s (≤ 32A)	10,3	P
	- 0,1s ≤ t ≤ 90s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	18,6 A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	13,2	P
	- 120 s (> 32 A)		N/A
9.10.2.3	☒ For circuit-breakers of the C – Type		
	Test current $5I_N$ (A), starting from cold	160A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 15 s (≤ 32A)	2,0	P
	- 0,1s ≤ t ≤ 30 s (> 32A)		N/A
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	18,6A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)	11	P
	- 120 s (> 32 A)		N/A

	TESTS „D“ 2 samples: C40 and B40, 1P		
9.10	***Tests: D_O***	**D_{0-13}** **D_{0-14}**	
	If the tests are made in a test chamber, it shall be made in still air; the volume of the chamber shall not affect the test results.		
9.10.2.2	☒ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	120A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 45s (≤ 32A)		N/A
	- 0,1s ≤ t ≤ 90s (> 32A)	10,6	P
	Moreover the CB shall perform following test:		

IEC60898_1C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	102 A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	10,8	P
9.10.2.3	☒ For circuit-breakers of the C – Type		
	Test current $5I_N$ (A), starting from cold	200A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 15 s (≤ 32A)		N/A
	- 0,1s ≤ t ≤ 30 s (> 32A)	3,0	P
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	102A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	21	P

	TESTS „D" 2 samples: C50 and B50, 1P		
9.10	***Tests: D_O***	**D_{0-15} D_{0-16}**	
	If the tests are made in a test chamber, it shall be made in still air; the volume of the chamber shall not affect the test results.		
9.10.2.2	☒ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	150A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 45s (≤ 32A)		N/A
	- 0,1s ≤ t ≤ 90s (> 32A)	11,3	P
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	128A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	14,5	P
9.10.2.3	☒ For circuit-breakers of the C – Type		
	Test current $5I_N$ (A), starting from cold	250A	
	Opening time:	[S]	
	- 0,1s ≤ t ≤ 15 s (≤ 32A)		N/A
	- 0,1s ≤ t ≤ 30 s (> 32A)	6,6	P
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	128A	
	opening time not less than 1 s or more than	[S]	

IEC60898_1C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	19	P

	TESTS „D“ 1 sample: B63, 1P		
9.10	***Tests: D_O***	**$D_{0\text{-}17}$**	
	If the tests are made in a test chamber, it shall be made in still air; the volume of the chamber shall not affect the test results.		
9.10.2.2	☒ For circuit-breakers of the B – Type		
	Test current $3I_N$ (A), starting from cold	189A	
	Opening time:	[s]	
	- 0,1s ≤ t ≤ 45s (≤ 32A)		N/A
	- 0,1s ≤ t ≤ 90s (> 32A)	9,8	P
	Moreover the CB shall perform following test:		
9.10.1.2	Test current 2,55 I_N (A) starting from cold for:	161A	
	opening time not less than 1 s or more than	[S]	
	- 60 s (≤ 32 A)		N/A
	- 120 s (> 32 A)	19,3	P

	TESTS „E_3“				
9.12.11.4.4	***Test: E_3 (Test at making and breaking capacity on an individual pole (Icn1)***	**$E_{3\text{-}1}$**	**$E_{3\text{-}2}$**	**$E_{3\text{-}3}$**	
	Service short-circuit capacity...............................:	_____________ A			--
	Test circuit: figure ....:	*(Simplification of the figures for short circuit tests in IEC 60898-1:2015)*			--
	Test voltage..:	V			
	Prospective current...:	_____________ A			--
	Prospective current obtained...............................:	_____________ A			--
	Power factor..:	______________			--
	Power factor obtained...:	______________			--
	Sequence..:	O – t –CO 15° 45° 75°			--
	T (min) ....:	___________ min			--
9.12.9.1	Test in free air copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	“a” = ______ mm			
9.12.9.2	Test in enclosures copper wire F': ☐ 0,12 mm / ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm / ☐ 1,5 Ohm	dimension of enclosure: ______x______x_____mm			

IEC60898_1C - ATTACHMENT					
Clause	Requirement + Test	Result - Remark			Verdict
	I_{Peak} (A) max. value ....:	____________ A			--
	$I^2t \leq$ ______ kA^2s	$[KA^2S]$	$[KA^2S]$	$[KA^2S]$	--
	Max. $I^2t \leq$ ______kA^2s L1 L2 L3				N/A
	- No permanent arcing				N/A
	- No flash-over between poles or between poles and frame				N/A
	- No blowing of the fuses F and F′				N/A
	- Polyethylene foil shows no holes				N/A
	After the test:				--
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un.= _____ V. The circuit –breaker is in the open position The leakage current shall not exceed 2 mm	**E_{3-1}** [µA]	**E_{3-2}** [µA]	**E_{3-3}** [µA]	
	L1				N/A
	L2				N/A
	L3				N/A
	L4(N)				N/A
	Electric strength test:				
	Test voltage 900 V (see 9.7.3)				
	a)				N/A
	b)				N/A
	c)				N/A
	d)				N/A
	e) 2000 V				N/A
	Test current 2,8 I_N	____________ A			
	Tripping within > 0,1 s up to	[S]	[S]	[S]	
	- 60 s				N/A
	- 120 s				N/A

IEC60898_1C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict

Annex ZA
EN 60898-1:2003/A13:2012
(normative)

EN 60898-1

Classification of circuit-breakers into energy limiting classes

Clause	Requirement + Test	Verdict
	Circuit-breakers of B-type and C-type, when classified into energy limiting classes 1, 2, 3 in accordance with tables ZA1 or ZA2, as applicable, shall be marked with the number of the energy limiting class in a square adjoining the symbol given in f) of clause 6.	P
	Tables ZA.1 and ZA.2 (below)	P

Table ZA.1 – Permissible I^2t (let-through) values for circuit-breakers type B with rated current up to and including 63 A

Rated shortcircuit capacity A	Type B				
	Class 1	Class 3			
	≤ 63 A	≤ 16 A	20 A, 25 A, 32 A	40 A	50 A, 63 A
3 000	No limits specified	15 000	18 000	21 600	**28 000**
4 500		25 000	32 000	38 400	**48 000**
6 000		35 000	45 000	54 000	**65 000**
10 000		70 000	90 000	108 000	**135 000**

Table ZA.2 – Permissible I^2t (let-through) values for circuit breakers type C with rated current up to and including 63 A

Rated shortcircuit capacity A	Type C				
	Class 1	Class 3			
	≤ 63 A	≤ 16 A	20 A, 25 A, 32 A	40 A	50 A, 63 A
3 000	No limits specified	**17 000**	**20 000**	**24 000**	**30 000**
4 500		**28 000**	**37 000**	**45 000**	**55 000**
6 000		**40 000**	**52 000**	**63 000**	**75 000**
10 000		**80 000**	**100 000**	**120 000**	**145 000**

Clause	Requirement + Test	Verdict
	The maximum I^2t values measured during the test of I cn (test sequence E_1 or E_2 as applicable) in accordance with 9.12.11.4 serve as reference values for the classification.	P

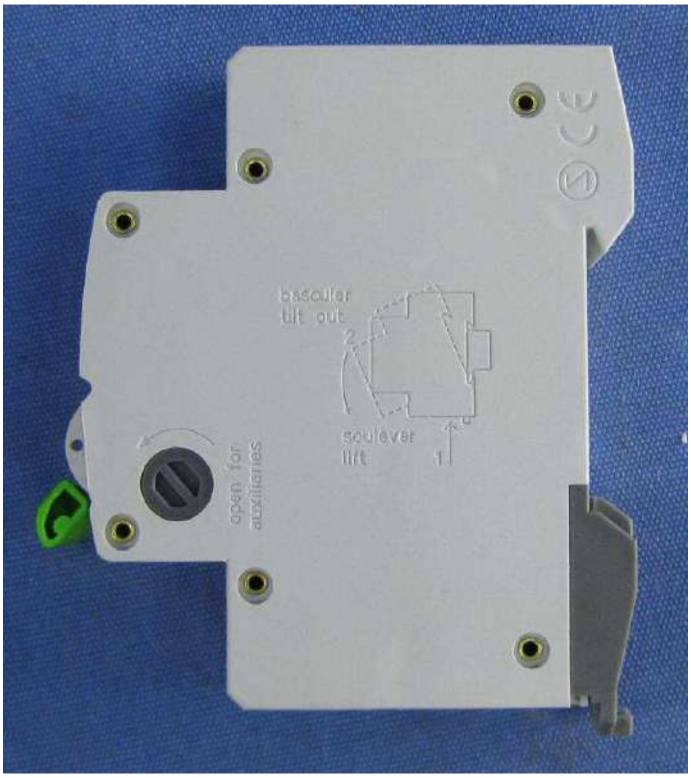
IEC60898_1C - ATTACHMENT			
Clause	Requirement + Test	Result - Remark	Verdict
	Compliance with the requirements of Tables ZA.1 and ZA.2 is checked on the circuit-breakers with the highest rated current available within the range covered by each of these tables.		P
	If these current ratings are not included in the samples submitted to test sequence E_1 or E_2 of Annex C, the appropriate number of samples of these ratings shall be additionally submitted to that test sequence. None of the values measured shall exceed the permissible I^2t value of the proposed energy limiting class in accordance with Tables ZA.1 and ZA.2.		P
	If circuit-breakers rated 40 A are submitted with the range of circuit-breakers with rating exceeding 16 A and their measured I^2t values are lower than those indicated in Table ZA.1 or Table ZA.2 for rating 32 A, no relevant test is necessary for the circuit-breakers rated 32 A.		N/A
	If circuit-breakers rated 50 A or 63 A are submitted with the range of circuit-breakers with rating exceeding 32 A and their measured I^2t values are lower than those indicated in Table ZA.1 or Table ZA.2 for rating 40 A, no relevant test is necessary for the circuit-breakers rated 40 A.		N/A

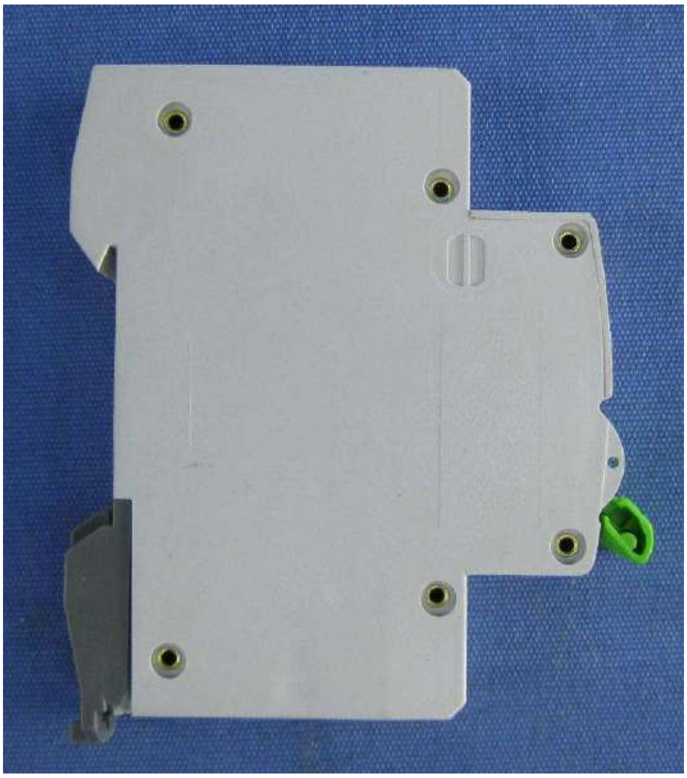
	Annex ZC (Informative)	
	EN 60898-1 **Special national conditions**	
	For the countries in which the relevant special national conditions apply these provisions are normative, for other countries they are informative.	
J.1	**Austria, Czech Republic, Denmark, Netherlands, Norway and Switzerland**	
	The upper limit of current for use of screw less terminals is 16 A	
J.3.3	**Austria, Belgium, Denmark, France, Germany, Italy, Portugal, Spain, Sweden, Switzerland, and United Kingdom**	
	Only universal screwless type terminals are accepted.	
K1	**Belgium, France, Italy, Portugal, Spain, and United Kingdom**	
	The use of circuit-breakers with flat quick-connect terminations for rated currents up to and including 20 A is accepted.	
K.8.2.2	**Belgium, France, Italy, Portugal, Spain, and United Kingdom**	
	The use for rated currents up to and including 20 A	

	Annex ZD **EN 60898-1:2003/A13:2012** (normative)	
	Based on EN 60898-1:2003, A1:2004, A11:2005 and A12:2008, the following tests and/or requirements have been technically modified and may require retesting or inspection as applicable: - **6.3 Guidance table for marking, line j) of the table (including the comparison of already measured i^2t values with new Tables ZA.1 and ZA.2**	

Photos of samples:

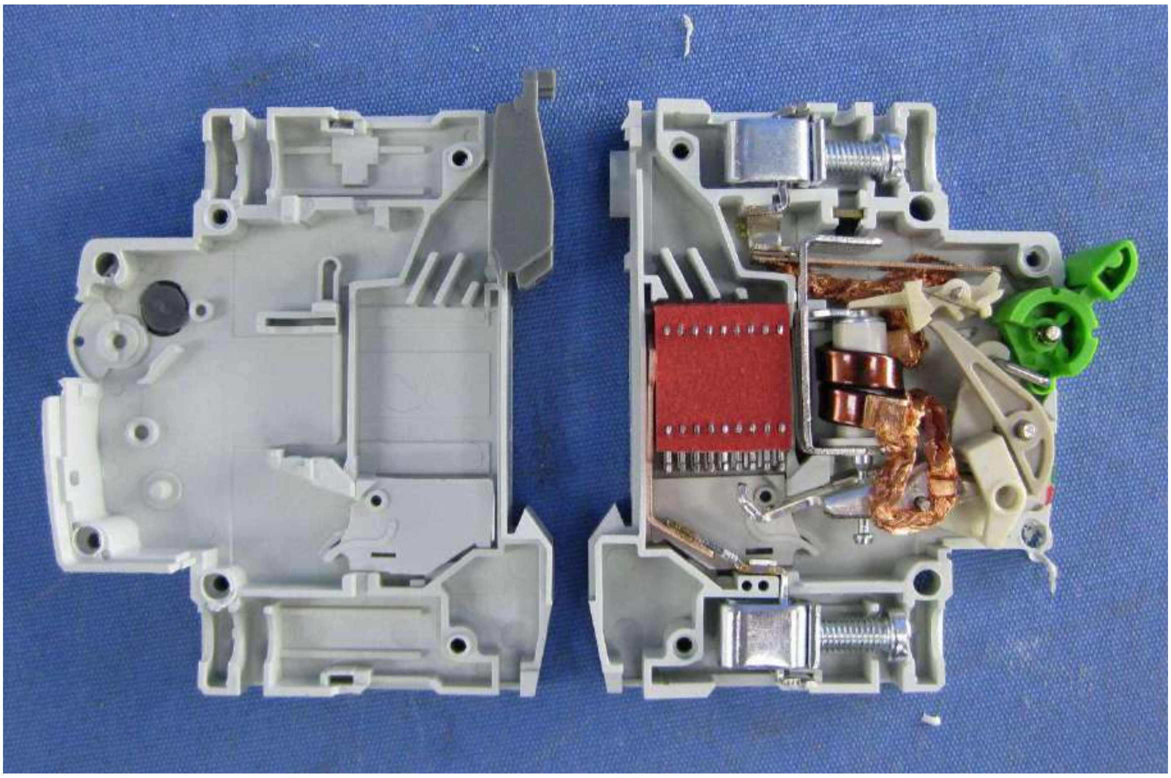
Photos of samples:





Photos of samples:

Photos of samples:



TECHNICAL CONSTRUCTION FILE (TCF)

EU LOW VOLTAGE DIRECTIVE 2014/35/EU

PROJECT NO.: 8609114
Registration NO.: VT18120196

EN 61009-1:2012+A12:2015

WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD

RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERLOAD PROTECTION

Date of Report: 2018-12-07

VOV Certification & Testing Laboratory Limited

Web: www.vov.org.uk E-mail: vov@vov.org.uk

Testing laboratory

Location

VOV CERTIFICATION & TESTING LABORATORY LIMITED
Web: www.vov.org.uk E-mail: vov@vov.org.uk

Details of applicant

Name : **WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD**
ADD : **NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, YUEQING, ZHEJIANG, CHINA**

Details of manufacturer

Name : **WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD**
ADD : **NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, YUEQING, ZHEJIANG, CHINA**

Test item

Description of test item : **RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERLOAD PROTECTION**
Type identification : **HSL7 230V/240V~2P(1P+N), B&C TYPE, 6A~63A, 50/60HZ, 10MA, 30MA, 100MA, 300MA, TYPE AC, TYPE A, 10KA**
Specification : **/**

Testing Standards

EN 61009-1:2012+A12:2015

AUDIT INFORMATION:		
Description of Test	Standard No.	EN 61009-1:2012+A12:2015
Test Engineer by	Dcorrb.Pen	Signature
Reviewer by	Gaither	Signature
VOV CERTIFICATION & TESTING LABORATORY LIMITED		

VOV CERTIFICATION & TESTING LABORATORY
PRODUCT SERVICE

Test item particulars -- RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERLOAD PROTECTION

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(Fall)

Testing Date:

Date of receipt of test item : 2018-11-19
Date(s) of performance of tests : 2018-11-19～2018-12-07

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.

Test product information:

Type identification : **HSL7**
Specification : **230V/240V~2P(1P+N), B&C TYPE, 6A~63A, 50/60HZ, 10MA, 30MA, 100MA, 300MA, TYPE AC, TYPE A, 10KA**

Test Result:

Pass

FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGES

1- GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The ***WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD*** Model **HSL7 230V/240V~2P(1P+N), B&C TYPE, 6A~63A, 50/60HZ, 10MA, 30MA, 100MA, 300MA, TYPE AC, TYPE A, 10KA** in this report is the ***RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERLOAD PROTECTION.*** Product's details are presented Appendix.

Note : The test data was only good for the test sample. It may have deviation from other sample.

1.2 Objective

The following Declaration of Conformity report of the ***RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERLOAD PROTECTION*** equipment is prepared on behalf of ***WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD***, In accordance with ***EN 61009-1:2012+A12:2015.***

2. Test equipment utilized

ID-Nr.	Test-Equipment	Type	Manufacturer
V001	Protective wire and insulation tester	PI 6001 D	SPS electronic
V002	Test pin for protective wire	PE 15-i	SPS electronic
V003	Power supply	MX-9300	MAXCOM
V004	Frequency counter	MX-9300	MAXCOM
V005	Function generator	MX-9300	MAXCOM
V006	Digital multimeter	MX-9300	MAXCOM
V007	Spectrum analyzer	PSA 65A	AVCOM
V008	Climatic chamber	HC 4033	Heraeus Votsch
V009	Programmable power supply	TOE 8815	Toellner
V010	Power supply	DF 1730	WJG
V011	Regeltrafo		TPW/RFT
V012	High Voltage Generator		
V013	Digital oscilloscope (2Gs/s)	TDS 640A	Tektronix
V014	High Voltage probe	P 6015	Tektronix
V015	Wheatstone bridge	J 573	RFT
V016	Function generator	MX 2020	MAXCOM
V017	Sweep function generator	7202	Dagatron
V018	Audio generator	7101	Dagatron
V019	Vibration table		Sandox
V020	LCR Meter	SR 720	Rhode & Schwarz
V021	Digital multimeter	PMM 208	Dagatron
V022	Thermo hygro recorder	C 042801	Amarell
V023	Digital thermometer	AK-688	KD
V024	Digital thermometer		PRIMA
V025	Digital thermometer	ad 170th	ama-digit
V026	Digital thermometer	ad 31th	ama-digit

V027	Digital thermometer/humidity meter	ad 90th	ama-digit
V028	Digital thermometer/humidity meter	37950-10	Cole Parmer
V029	Digital thermometer	ad 15th	ama-digit
V030	Digital thermometer	Type K	Amarell
V031	Digital thermometer	ad 20th	ama-digit
V032	High voltage test generator	HA 3300 D	SPS electronic
V033	High voltage test accessories	HVGZ 312	SPS electronic
V034	Socket-Outlet Torque Balance	F 37.13	PTL
V035	Force Indicator 50N	P 10.31	PTL
V036	Unjointed Finger Probe	P 10.05	PTL
V037	Flexible Finger Probe	P 10.01	PTL
V038	Spring Operated Impact Hammer var.	F 22.50	PTL
V039	Metallic Ball	F 53.32	PTL
V040	Hazardous Live Probe	P 10.06	PTL
V041	Hazardous Live Probe	P 10.11	PTL
V042	Ball Pressure Test Apparatus	T 10.02	PTL
V043	Glow Wire Tester	T 03.14	PTL
V044	8-Channel Digital Thermometer	ADAM-4018M	Advantech
V045	8-Channel Digital Thermometer	ADAM-4018M	Advantech
V046	Laser test system	LM-ULTIMA	Coherent
V047	Optical comparator	8x	Hensoldt-Wetzlar
V048	Optical comparator	20x	Hensoldt-Wetzlar
V049	Optical comparator	40x	Hensoldt-Wetzlar
V050	Digital Calliper	10-871-2	ED&D
V051	Feeler Gauges	set	LGA

3. **EN 61009-1:2012+A12:2015 Test Report**

EN 61009-1			
Cl.	Requirement - Test	Result	Verdict
	TESTS „A"-1 sample: 63A, 1 pole, D type		
6	**MARKING AND OTHER INFORMATION**		
	Circuit- breaker marked with:		
	a) Manufacturer's name or trade mark………:		P
	b) Type designation, catalogue number or other identification number…………………………:	**HSL7**	P
	c) Rated voltage(V)…………………………………………………:	230/400	P
	d) Rated current(A)…………………………………………………:	6-63A	P
	e) Rated frequency(Hz)…………………………………………:		N/A
	f) Rated short circuit capacity(A)…………:	10KA	P
	g) Wiring diagram		N/A
	h) Ambient air temperature, if different from 30℃		N/A
	i) Degree of protection, if different from IP20		N/A
	j) For D-type circuit-breakers: the maximum instantaneous tripping current, if higher than 20 ln(see table 2)		N/A
	k) Rated impulse withstand voltage Uimp if is 2,5kV		N/A
	Symbol for instantaneous tripping current	C	P
	Symbol for nature of supply	~	P
	Marking for rated current and for instantaneous tripping shall be readily visible when CBO is installed		P
	Other marking shall be easily discernible		P
	The suitability for isolation, which is provided by all circuit-breakers of this standard, may be indicated by the symbol on the device		N/A
	Energy limiting class		N/A
	l^2t characteristic(documentation)		N/A
	Symbols on supply and load terminal		N/A
	Terminal for neutral conductor **N**		N/A
	Earthing terminal if any (IEC 60417-5019)		N/A
	On-off position shall be clearly indicated-01-	0and 1	P
	For push-button CBO the off push-button shall either be red or be marked with the symbol '0'		N/A
	Red not used for other push-button		N/A
	This symbol shall be easily discernible		N/A
	For CBO with multiple current ratings, the maximum value is marked, the adjusted value indicated without ambiguity		N/A

EN 61009-1			
Cl.	Requirement - Test	Result	Verdict
	Marking shall be indelible and easily legible(not on removable parts), 15 s with hexane (see cl.8.3)		P
8.	**REQUIREMENTS FOR CONSTRUCTION AND OPERATION**		
8.1.1	**General**		
8.1.2	**Mechanism**		
	The moving contact shall be mechanically coupled so that all poles make and break together, whether operated manually or automatically, even if an overload occurs on one pole only		N/A
	The switched neutral shall close before and open after the protected pole (s)		N/A
	Neutral pole having adequate making and breaking capacity and CBO with independent manual operation: all poles operate together including neutral pole		N/A
	CBO shall have a trip free mechanism		P
	It shall be possible to switch the CB on and off by hand		P
	No intermediate position of the contacts		P
	Position of contacts shall be indicated		P
	Indication visible from the outside		P
	If the indication is on the actuating means, it shall, when released, automatically take up or stay in the position corresponding to that of the moving contacts; operating means shall have two different rest positions, except that, for automatic operation, a third distinct rest position may be provided		P
	If a separate mechanical indicator is used to indicate the position of the main contacts, colour red shall be used for the on position and green for the off position.		N/A
	The action of the mechanism shall not be influenced by the position of enclosures		N/A
	If the cover is used as a guiding means for push-button, it shall not be possible to remove this button from the outside		N/A
	Operating means securely fixed, not possible to remove them without a tool		P
	For the up-down operating means the contacts shall be closed by the up movement		N/A

EN 61009-1			
Cl.	Requirement - Test	Result	Verdict
8.1.3	**Clearances and creepage distances**		
8.1.3	**Clearances [mm] see table 4**		
	1.between live parts (of the main circuits) which are separated when the CB is in off position……:	5,5mm	P
	2.between live parts of different polarity		N/A
	3.between circuits supplied from different sources, one of which being PELV or SELV:		N/A
	4.between live parts and		
	- accessible surfaces of operating means:	＞10 mm	P
	- screws or other means for fixing covers:		N/A
	- surface on which the base is mounted…:		N/A
	- screws or other means for fixing the PROTECTION……:	＞5 mm to fixing rail	P
	- metal covers or boxes……:		N/A
	- other accessible metal parts……:		N/A
	- metal frames supporting the base (flush-type)……:		N/A
	5.between metal parts of mechanism and:		N/A
	- accessible metal parts……:		N/A
	- screws or other means for fixing the PROTECTION……:		N/A
	- metal frames supporting the base (flush type)……:		N/A
8.1.3	Creepage distances [mm] (see table 4)		
	Material group	llla	P
	1.between live parts (of the main circuits) which are separated when the CB is in off position……:	＞5,5 mm	P
	2.between live parts of different polarity		N/A
	3.between circuits supplied from different sources, one of which being PELV or SELV:		N/A
	4.between live parts and		
	- accessible surfaces of operating means:	＞5 mm	P
	- screws or other means for fixing covers:		N/A
	- surface on which the base is mounted…:		N/A
	- screws or other means for fixing the PROTECTION……:	＞5 mm to fixing rail	P
	- metal covers or boxes……:		N/A
	- other accessible metal parts……:		N/A
	- metal frames supporting the base (flush-type)……:		N/A
	5.between metal parts of mechanism and:		N/A
	- accessible metal parts……:		N/A
	- screws or other means for fixing the PROTECTION……:		N/A

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Cl.	Requirement - Test	Result	Verdict
x	- metal frames supporting the base (flush type)........:		N/A
8.1.4	**Screws, current-carrying parts and connections**		
8.1.4.1	Connections, withstand mechanical stresses occurring in normal use		P
	Screws for mounting of the CB not of the thread-cutting type		N/A
	Test according to cl.9.4:		P
	- 10 times (screw ø/ torque Nm)	Ø___mm___Nm (see table 10) Ø___mm___Nm	N/A
	- 5 times (screw ø/ torque Nm)	Ø 5 mm 2 Nm (see table 10) Ø___mm___Nm	P
	Plug in connections tested by plugging in and pulling out five times		N/A
	After test connections have not become loose nor electrical function impaired		P
8.1.4.2	Screws with a thread of insulating material ensured correct introduction		N/A
8.1.4.3	Electrical connection: Contact pressure not transmitted through insulating material, unless there is sufficient resilience in the metallic parts		P
	- copper		N/A
	- alloy 58% copper for worked cold parts		P
	- alloy 50% copper for other parts		N/A
	- other metal		N/A
8.1.5	**Terminals for external conductors**		
8.1.5.1	Terminals ensure correct connection of conductors (Test acc.to cl.9.5 or annex J or K)		P
9.5	Torque Ø 5 mm 2 Nm Ø___mm___Nm Ø___mm___Nm max. sect. 25mm^2		P
9.5.1	Pull test: min sect. 1,0 mm^2, Pull 50N max sect. 25mm^2, Pull 100N Pull N for 1 min During the test conductor does not move noticeably		P
9.5.2	min sect. 1,0 mm^2 Torque (2/3)= 1,33 Nm max sect. 25 mm^2 The conductor shows no damage		P

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Cl.	Requirement - Test	Result	Verdict
9.5.3	Nominal cross-section from 1,0 to 25 mm^2 No of wires 7 Ø of wires 2,14 mm Torque (2/3)=1,33 Nm After the test on wire escaped outside		P
8.1.5.2	Terminals allow the connection of of the following cross-sectional areas: (table 5)		P
	Rated current (A) — Range of nominal cross sections to be clamped (mm^2) ⩽ 13 — 1 to 2,5 > 13⩽16 — 1 to 4 > 16⩽25 — 1, 5to 6 > 25⩽32 — 1, 5to 10 > 32⩽50 — 4 to 16 > 50⩽80 — 10 to 25 >80 ⩽100 — 16 to 35 >100 ⩽125 — 25 to 50		 P P P P P P N/A N/A
	It is required that, for current ratings up to and including 50 A terminals are designed to clamp solid conductors as well as rigid stranded conductors; the use of flexible conductors is permitted		P
	Nevertheless, it is permitted that terminals for conductors having cross-sections from 1 mm^2 up to 6 mm^2 are designed to clamp solid conductors only.	_____To ____mm^2	N/A
8.1.5.3	Means for clamping the conductors in the terminals not serve to fix any other component (See test sub-clause 9.5)		P
8.1.5.4	Terminals for 1_n⩽32 A allow the connection of conductors without special preparation		P
8.1.5.5	Terminals shall have adequate mechanical strength; ISO thread or equivalent (See tests of sub-clause 9.4 and 9.5.1)		P
8.1.5.6	Clamping of conductor without damage to the conductor (See test of sub-clause 9.5.2)		P
8.1.5.7	Clamping of conductor between metal surfaces (See tests of sub-clause 9.4 and 9.5.1)		P
8.1.5.8	Conductor shall not slip-out when the clamping screw or nuts are tightened (See test of sub-clause 9.5.3)		P
8.1.5.9	Terminals shall be properly fixed. No work loose when the clamping screws or nuts are tightened or loosened (See test of sub-clause 9.4)		P

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

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Cl.	Requirement - Test	Result	Verdict
	Metallic operating means insulated from live parts		N/A
	Metal parts of the mechanism not accessible and insulated from accessible metal parts, metal frames (for flush-type), screws or other means for fixing the base		P
	Replacement of plug-in CB possible without touching live parts		N/A
	Lacquer or enamel not considered		N/A
9.6	**Test of protection against electric shock**		
	Use of test finger so designed that each jointed can be turned through an angle of 90℃ with respect to the finger		P
	Circuit-breaker with enclosures of thermoplastic material are additional tested at 35℃ for 1 min with a force of 75 N		N/A
7.10	Resistance to heat		
	CB sufficiently resistant to heat		P
9.14	**Test of resistance to heat**		
9.14.1	Test:		
	- without removable covers………. 1 h (100±2) ℃		P
	- removable covers……………………………. 1 h (70±2) ℃		N/A
	After the test no access to live parts, marking still legible		P
9.14.2	Ball pressure test for external parts of insulating material (parts retaining current-carrying parts and parts of the protective circuit in position) T = 125℃ Ø of impression ≤ 2 mm		P
9.14.3	Ball pressure test for external parts of insulating material (parts retaining current-carrying parts and parts of the protective circuit in position) T = (70±2) ℃ or T = ___℃ = (40±2) ℃ + max. temperature rise of sub-clause 8.8 Ø of impression ≤ 2 mm		N/A
8.11	Resistance to abnormal heat and to fire		
	External parts of insulating material shall not ignite or spread fire under fault or overload conditions		P
9.15	**Resistance to abnormal heat and to fire**		
	Glow wire test: No visible flame, no sustained glowing or flames and glowing extinguish within 30 s		P
	external parts retaining current-carrying parts and parts of the protective circuit in position……………………………………………………(960±15) ℃		P

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Cl.	Requirement - Test	Result	Verdict
	all other external parts.......................... (650±10) ℃		P
8.12	Resistance to rusting		
	Ferrous parts adequately protected against rusting		P
9.16	Test of resistance to rusting:		
	- 10 min immersed in a cold chemical degreaser such as methyl-chloroform or refined petrol		
	- 10 min immersed in a 10% solution of ammoniur chloride in water at 20℃		
	- 10 min at 95% humidity at 20℃		
	- 10 min at 100℃		
	No sign of rust		P
	TESTS „B" – 3 samples: 63A, 1 pole, D type	**B1 B2 B3**	
8.3	**Dielectric properties and isolating capability**		
	CB shall have adequate dielectric properties and shall ensure isolation:		P
8.3.1	Dielectric strength at power frequency		
	Compliance is checked by the tests 9.7.1, 9.7.2 and 9.7.2 on circuit-breaker in new condition		P
9.3.2	Isolating capability		
	Circuit-breakers shall be suitable for isolation. Compliance is checked by the verification of compliance with the minimum clearances and creepage distances of item 1 of table 4 and by tests of 9.7.6.1 and 9.7.6.3.		P
8.3.3	Dielectric strength at rated impulse withstand voltage (U_{imp}) 2,5 kV		
	Circuit-breakers shall adequately withstand impulse voltages. Compliance is checked by the tests of 9.7.6.2		P
9.7	**Test of dielectric properties and isolating capability**		
9.7.1	Resistance to humidity		P
9.7.1.1	Preparation of the circuit-breaker for test		P
	Inlet openings, if any, are left open; if knock-outs are provided, one of them is opened		N/A
9.7.1.2	Test conditions		
	The humidity treatment is carried out in humidity cabinet 91% to 95% and the temperature of the air between 20℃and 30℃	Rf = 93% T = 30℃	P
9.7.1.3	Test procedure:		
	The sample is kept in the cabinet for 48 h.		P
9.7.1.4	Condition of the circuit-breaker after the test		

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Cl.	Requirement - Test	Result	Verdict
	After this treat, the sample show no damage within the meaning of this standard and shall withstand the tests of 9.7.2 and 9.7.3		P
9.7.2	Insulation resistance of the main circuit		
9.7.2	After an interval between 30 min and 60 min flowing this treatment, the insulation resistance is measured 5 s after application of a d.c. voltage of approximately 500 V, consecutively as follows:		P
	a) in off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position ⩾ 2 MΩ	> 100 MΩ	P
	b) in off-position, between the terminals which are electrically connected together when the circuit-breaker is in the closed position ⩾ 2 MΩ		N/A
	c) in on-position, between all poles connected together and the frame ⩾ 5 MΩ	> 100 MΩ	P
	d) between metal parts of mechanism and the frame ⩾ 5 MΩ	> 100 MΩ	P
	e) between the frame and metal foil in contact with the inner surface of the internal enclosure or lining of insulating material ⩾ 5 MΩ		N/A
9.7.3	Dielectric strength of the main circuit		
	After the circuit-breakers have passed the tests of 9.7.2 the test voltage specified in 9.7.5 is applied for 1 min between the parts indicated in 9.7.2		P
	a) 2000 V		P
	b) 2000 V		N/A
	c) 2000 V		P
	d) 2000 V		P
	e) 2000 V		N/A
9.7.4	Dielectric strength of the auxiliary and control circuits		N/A
	For these tests, the main circuit shall be connected to the frame. The test voltage specified in 9.7.5 shall be applied for 1 min as follows:		N/A
	1) Between all the auxiliary or control circuits and the frame U = V	U = ______V	N/A
	2)Between each part of the auxiliary or control circuits which may be isolated from the other parts of the auxiliary or control circuits and these other parts connected together U=[1000 V if $U_i \leqslant 60$ V or $2U_i$ + 1000 V if $U_i > 60$ V]	U = ______V	N/A
9.7.6	Verification of the impulse withstand voltage (across clearances and across solid insulation) and leakage current across open contacts		
9.7.6.1	Verification of the impulse withstand voltage across open contacts (suitability for isolation)		

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Cl.	Requirement - Test	Result	Verdict
	The 1,2/50μs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum		
	-rated impulse withstand voltage (kV):	6 kV	
	-sea level of the laboratory:	Sea level	P
	-test Uimp on open main contacts (equipment suitable for isolating) (see table 13)	U_{test} = 6 kV	P
	-no unintentional disruptive discharge during the test's		P
9.7.6.2	Verification of impulse withstand voltage for the parts not test in 9.7.6.1		
	The 1,2/50μs impulse voltage shall be applied three times for each polarity at intervals of 1s minimum		
	-rated impulse withstand voltage (kV):	6 kV	
	-sea level of the laboratory:	Sea level	
	-test U_{imp} main circuits (see table 14):	U_{test} = 6 kV	
	Application of test voltage		
	i)Between all the phase pole(s) connected together and to the neutral pole (or path) of the circuit-breaker		
	ii)Between all the phase pole(s) and the neutral pole(or path) connected together and the metal support connected to the terminals intended for the protective conductor(s)		
	-no unintentional disruptive discharge during the test's		P
9.7.6.3	Verification of leakage currents across open contacts (suitability for isolation)		
	For circuit-breakers suitable for isolation, the leakage current shall be measured. Each pole having been submitted to the test of 9.12.11.2, or9.12.11.3, or 9.12.11.4.2 or 9.12.11.4.3 is supplied at a test voltage of 1,1 times its rated operational voltage, the circuit-breaker being in the open position		
	The leakage current flowing across the open contacts is measured and shall not exceed 2 mA		P
8.4	**Temperature rise**		
	Temperature rise does not exceed the limiting values stated in table V:	Sect. 16 mm^2	
9.8.2	Test current: l_n= (reach the steady-state value) Four-pole CB's: 1) three poles loaded 2) one pole and neutral pole loaded	l_n = 63 A	
	Ambient air temperature……………………………………:	T_{amb}=22℃	
	Terminals for external connections………60	[K] [K] [K]	
	Measured value (K) L1	31 33 33	P
	L2	— — —	N/A

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Cl.	Requirement - Test	Result			Verdict
	L3	—	—	—	N/A
	L4 (N)	—	—	—	N/A
	L3	—	—	—	N/A
	N	—	—	—	N/A
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles……… 40	9	10	7	P
	External metallic parts of operating means……… 25				N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface……… 60	12	15	15	P
9.8.5	**Measurement of power losses**				
	Power loss do not exceed the values stated in table 15				
	Test current: I_n =63 A (reach the steady state value)				
	Loaded one pole after the other	W	W	W	
		Max power loss:13W			
	Measured value (W) L1	5,2	4,9	5,3	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	L3	—	—	—	N/A
	N	—	—	—	N/A
8.5	Uninterrupted duty				
	Circuit-breakers operate reliable even after long service				P
9.9	**28 day test**				
	28 cycles -21 h with current -3 h without current cross sectional area. 16 mm^2	I_n = 63 A			
	During the test no tripping during the last period, temperature rise shall be measured				P
	Ambient air temperature………:				
	Parts………temperature rise [K]	[K]	[K]	[K]	
	Terminals for external connections………60	45	42	46	P
	The temperature rise does not exceed the value measured during the temperature rise test (subclause 8.8) by more than 15 K				P
	Test current 1,45 I_n=91,5A				P
	-Tripping within				P

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Cl.	Requirement - Test	Result			Verdict
	-1h (≤63 A)	12,7	10,5	8,9	P
	-2h (≤63 A)				N/A
	TESTS„B‟-3 samples: 63A, 1 pole, C type	**B_4**	**B_5**	**B_6**	
8.4	**Temperature rise**				
	Temperature rise does not exceed the limiting values stated in table V:	Sect. 16 mm^2			
9.8.2	Test current: l_n= (reach the steady-state value) Four-pole CB's: 1) three poles loaded 2) one pole and neutral pole loaded	l_n = 63 A			
	Ambient air temperature……………………………………………:	T_{amb}=22℃			
	Terminals for external connections……………60	[K]	[K]	[K]	
	Measured value (K) L1	35	41	38	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	L3	—	—	—	N/A
	N	—	—	—	N/A
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles……………………………………………………………………………………40	8	9	9	P
	External metallic parts of operating means……………………………………………………………………………………25				N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface………………………………………60	13	16	15	P
9.8.5	**Measurement of power losses**				
	Power loss do not exceed the values stated in table 15				
	Test current: l_n =63A (reach the steady state value)				
	Loaded one pole after the other	W	W	W	
		Max power loss:13W			
	Measured value (W) L1	4,3	5,1	5,1	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	L3	—	—	—	N/A
	N	—	—	—	N/A

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Cl.	Requirement - Test	Result			Verdict
	TESTS„B ‟-3 samples: 63A, 1 pole, C type	**B_7**	**B_8**	**B_9**	
8.4	**Temperature rise**				
	Temperature rise does not exceed the limiting values stated in table V:	Sect. 16 mm^2			
9.8.2	Test current: l_n= (reach the steady-state value) Four-pole CB's: 1) three poles loaded 2) one pole and neutral pole loaded	l_n = 63 A			
	Ambient air temperature……………………………………:	T_{amb}=22℃			
	Terminals for external connections…………60	[K]	[K]	[K]	
	Measured value (K) L1	35	33	33	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	L3	—	—	—	N/A
	N	—	—	—	N/A
	External parts liable to be touched during manual operation of the circuit-breaker, including operating means of insulating material and metallic means for coupling of insulating operating means of several poles………………………………………………………………………40	8	9	9	P
	External metallic parts of operating means………………………………………………………………………25				N/A
	Other external parts, including that face of the circuit-breaker is in direct contact with the mounting surface…………………………60	14	14	14	P
9.8.5	**Measurement of power losses**				
	Power loss do not exceed the values stated in table 15				
	Test current: l_n =63A (reach the steady state value)				
	Loaded one pole after the other	W	W	W	
		Max power loss:13W			
	Measured value (W) L1	4,2	4,1	4,2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	L3	—	—	—	N/A
	N	—	—	—	N/A
	TESTS„C_1 ‟-3 samples: 63A, 1 pole, C type	**$C_1$1**	**$C_1$2**	**$C_1$3**	
8.7	Mechanical and electrical endurance				

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Cl.	Requirement - Test	Result			Verdict
	Circuit-breaker shall be capable to perform an adequate number of cycles with rated current				
9.11.1	General test conditions				
	Test: Test Voltage 230 V (rated voltage) Test Current 63 A (rated current) Power factor 0,85 Par. resistor ______Ohm Cross sect. area 16 mm^2	234V 63,5A 0,85			P
9.11.2	**Test procedure**				
	The circuit-breaker is submitted to 4000 operating cycles with rated current.				
	-$l_n \leqslant 32$ A: 2s on- 13 s off				
	-$l_n \leqslant 32$ A: 2s on- 28 s off	63A			
	During the test the circuit-breaker shall be operated as in normal use.				P
9.11.3	**Condition of the circuit-breaker after the test**				
	Following the test 9.11.2 the sample shall not show:				
	-undue wear				P
	-discrepancy between the position of the moving contacts and corresponding position of the indicating device				P
	-damage to the enclosure permitting access to live parts by test finger (see 9.6				P
	-loosening of electrical or mechanical connections				P
	-seepage of electrical or compound				N/A
	Moreover test current……………2,55 l_n=161 A				
	Opening time not less 1 s or more than	[S]	[S]	[S]	
	-60 s ($\leqslant$32 A)				N/A
	-120 s (>32 A)	42	37	56	P
	Dielectric strength reduced to 900V (1500 V acc. IEC 60898)				P
9.12.11.2	**Test at reduced short-circuit currents**				
9.12.11.2.1	Test on all circuit-breakers				
9.12.11.2.1	Test at reduced short-circuit currents: fig. 3				
	Test current:	Obtained			
	- 500 A or 10 l_n 6-O and 3CO	I_{test}=656 A			P
	Test voltage 1,05 U_n	U_{test}=256 V			P
	Power factor 0,93-0,98	0,95			P

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Cl.	Requirement - Test	Result			Verdict
9.12.9.1	Test in free air copper wire F': ☐ 0,12 mm/ ⏭ 0,16 mm resistor R' : ☐ 0,75 Ohm/ ⏭ 1,5 Ohm	"a"=35 mm			P
9.12.9.2	Test in enclosures Copper wire F': ☐ 0,12 mm/ ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×__×__mm			N/A
	I_{peak} (A) max. value	980			P
	Sequence: 6× "O" and 3× "CO"	[kA^2s]	[kA^2s]	[kA^2s]	
	Max. I2t≤_______kA^2s	3,4	10,3	3,8	P
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F'				P
	-Polyethylene foil shows no holes				P
	After the test:				P
9.12.12	Verification of the circuit-breaker after short-circuit tests				
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A
9.12.11.2.2	Short-circuit test on circuit-breakers rated 230V, or 240V or 230/400 V for verifying for use in IT systems -3 samples: 63A, 1 pole, D type				
	Test current:	Obtained			
	-500 A or 1,2 times the upper limit of the standard range of instantaneous tripping (see table 2) whichever is the higher, but< 2500A. When l tripping exceed 20 l_n the current adjusted at 1,2 times the upper limit even when higher 2500 A	I_{test}= 1520A			P

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Cl.	Requirement - Test	Result			Verdict
	Test voltage 1,05 U_n	U_n=252V			P
	Power factor 0,93-0,98	0,98			P
9.12.9.1	Test in free air copper wire F': ☐ 0,12 mm/ ⏭ 0,16 mm resistor R' : ☐ 0,75 Ohm/ ⏭ 1,5 Ohm	"a"=35 mm			P
9.12.9.2	Test in enclosures Copper wire F': ☐ 0,12 mm/ ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×___×___mm			N/A
	I_{peak} (A) max. value	1660			P
	Sequence: "O" + "CO" on each protected pole	[kA^2s]	[kA^2s]	[kA^2s]	
	Shifted point 30° on the other protected pole	C_2-1	C_2-2	C_2-3	
	Max. I2t≤_______kA^2s L1	21,6	15,3	18,2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F'				P
	-Polyethylene foil shows no holes				P
	After the test:				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A

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Cl.	Requirement - Test	Result			Verdict
	TESTS„D "-3 samples: 63A, 1 pole, C type	**D1**	**D2**	**D3**	
8.6	**Automatic operation**				
8.6.1	Standard time-current zone				
	Tripping characteristic of CB ensures adequate protection of the circuit, without premature operation.				
9.10	**Tests: D_0**				
	l_n (A)	63	63	63	
	Sect. (mm^2)	16	16	16	
	Instantaneous tripping current	☐ B	⏭C	☐ D	
9.10.1	Test of time-current characteristic				
9.10.1.1	Test current 1,13 l_n(A) starting from cold for:	71,2 A			
	-1 h (l_n≤63A)	>1h	>1h	>1h	P
	-2 h (l_n>63A)				N/A
	No tripping				P
	Then steadily increased within 5 s to 1,45 l_n(A)	91,5A			
	-Tripping within	[min]	[min]	[min]	
	-1 h (l_n≤63A)	16,4	18,1	9,2	P
	-2 h (l_n>63A)				N/A
9.10.1.2	Test current 2,55 l_n(A) starting from cold for:	16A			
	Opening time not less than 1 s or more than	[S]	[S]	[S]	
	-60 s (l_n≤32A)				N/A
	-120 s (l_n>32A)	73	84	85	P
9.10.2	Teast of instantaneous tripping and or correct opening of the contacts				
9.10.2.1	General test conditions				
	For the lower values of the test current the test is made once, at any convenient voltage				
	For the upper values of the test current the test is made at rated voltage U_n(phase to neutral) with a power factor between 0,95 and 1				
	The sequence of operation is: O-CO-CO-CO interval time:>3 min				
	The tripping time of the O operation is measured				
	After each operation the indicating means shall show the open position of the contacts				P
9.10.2.2	☐ For circuit-breakers of the B- Type				
	Test current 3 l_n(A), starting form cold	________			
	Opening time:	[S]	[S]	[S]	
	-0,1s ≤t≤45s(≤32A)				N/A
	-0,1s ≤t≤90s(>32A)				N/A

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Cl.	Requirement - Test	Result	Verdict
	Test current 5 I_n(A), starting from cold	________	
	Tripping less than 0,1 s		N/A
9.10.2.3	☐ For circuit-breakers of the C- Type		
	Test current 5 I_n(A), starting from cold	________	
	Opening time:	[S] [S] [S]	
	-0,1s ≤t≤15s(≤32A)		N/A
	-0,1s ≤t≤30s(>32A)		N/A
	Test current 10 I_n(A), starting from cold	________	
	Tripping less than 0,1 s		N/A
9.10.2.4	⏭ For circuit-breakers of the **D- Type**		
	Test current 10 I_n(A), starting from cold	630V	
	Opening time:	[S] [S] [S]	
	-0,1s ≤t≤4s(≤32A)		N/A
	-0,1s ≤t≤8s(>32A)	1,1 3,2 2,2	P
	Test current 10 I_n(A) or to the maximum instantaneous tripping current(see cl.6,itemj), starting from cold	1,26×10^3A	
	Tripping less than 0,1 s	7 ms 6ms 7ms	P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers		
	Test current 1,1 I_t(A), (two pole) starting from cold	________	
	Tripping within	[min] [min] [min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
	Test current 1,2 I_t(A), (three pole or four pole) starting from cold	________	
	Tripping within	[min] [min] [min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		
	a)Ambient temperature of (-5±2)℃		
	Test current 1,13 I_t(A)	71,2A	
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
	Current is then steadily increased to 1,9 I_n(A) within 5s	120A	
	-Tripping within	[min] [min] [min]	

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Cl.	Requirement - Test	Result	Verdict
	-1 h (≤63A)	11,2 5,3 10,1	P
	-2 h (>63A)		N/A
	b)Ambient temperature of (40±2)℃		
	Test current l_n(A)	63,0A	
	No tripping within		
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
	Test: D_1		
8.9	**Resistance to mechanical shock and impact**		
	CB shall have adequate mechanical behaviour so as to withstand the stresses imposed during installation and use		P
9.13.1	**Mechanical shock**		
	-50 falls on two sides of vertical board C		
	-Vertical board turned 90°		
	-50 falls on two sides of vertical board C		
	During the test the circuit-breakers shall not open		P
9.13.2	Mechanical impact		
9.13.2.1	All types:		
	-Impact test: 10 blows-height 10 cm, no damage		P
9.13.2.2	Screw-in types:		
	-Torque 2,5 Nm for 1 min, no damage		N/A
9.13.2.3	CB intended to be mounted on a rail		
	-downward vertical 50 N for 1 min, no damage		P
	-upward vertical 50 N for 1 min, no damage		P
9.13.2.4	Plug-in types		
	The circuit-breaker are mounted in there normal position, complete with plug-in base but without cables and any cover plate		
	A force of 20 N applied for 1min to the circuit-breaker (see fig 17).		
	During this test the circuit-breaker part shall not become loose from the base and shall not show damage impairing further use.		N/A
9.12.11.3	**Test at 1500 V:**		
	Prospective current of 1500 A- power factor 0,93 to 0,98		
	Prospective current obtained (A)	1520	
	Power factor	0,95	

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Cl.	Requirement - Test	Result			Verdict
	Test voltage 1,05 U_n	256V			
	Test circuit: figure 3/5	Figure 3/5			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F': ☒ 0,12 mm/ ☐0,16 mm resistor R' : ☐ 0,75 Ohm/ ☒ 1,5 Ohm	"a"=25 mm			
9.12.9.2	Test in enclosures Copper wire F': ☐ 0,12 mm/ ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×___×___mm			
	Sequence	6-O,2-CO,1-O			
	I_{peak}(A) max. value	1140A			
	$I^2t \leqslant$_______kA^2s	[kA^2s]	[kA^2s]	[kA^2s]	
	Max. $I^2t \leqslant$___kA^2s L1 L2 L3 L4(N)	5,9 — — —	5,3 — — —	10,2 — — —	P
	After the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F'				P
	-Polyethylene foil shows no holes				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				
	a)leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A

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Cl.	Requirement - Test	Result			Verdict
	Test current 0.85× non tripping Current (1,13 I_n)	60,5 A			
	-Passed for 1h	>1h	>1h	>1h	P
	-Passed for 2h				N/A
	Current is then steadily increased to 1,1 ×tripping current(1,45 I_n) within 5s	100,5A			
		min	min	min	
	Tripping within ⏭ 1 hour / ☐ 2 hour	7,8	24,1	10,6	P
9.10	**TESTS:** **D_0**-3 samples: 63A, 1 pole, B,C,D type	**D_0-1**	**D_0-2**	**D_0-3**	
	I_n (A)	6A			
	Sect. (mm^2)	1 mm^2			
	Instantaneous tripping current	⏭**B**	⏭**C**	⏭**D**	
9.10.1	Test of time-current characteristic				
9.10.1.1	Test current 1,13I_n(A) starting from cold for:	6,78A			
	-1 h (I_n≤63A)				P
	-2 h (I_n>63A)				N/A
	No tripping				P
	Then steadily increased within 5 s to 1,45 I_n(A)	8,70 A			
	-Tripping within	[min]			
	-1 h (I_n≤63A)	2,7			P
	-2 h (I_n>63A)				N/A
9.10.1.2	Test current 2,55I_n(A) starting from cold for:	15,3A			
	Opening time not less than 1 s or more than	[S]			
	-60 s (I_n≤32A)	26			P
	-120 s (I_n>32A)				N/A
9.10.2	Test of instantaneous tripping and or correct opening of the contacts				
9.10.2.1	General test conditions				
	For the lower values of the test current the test is made once, at any convenient voltage				
	For the upper values of the test current the test is made at rated voltage U_n(phase to neutral) with a power factor between 0,95 and 1				
	The sequence of operation is: O-CO-CO-CO interval time:>3 min				
	The tripping time of the O operation is measured				
	After each operation the indicating means shall show the open position of the contacts				
9.10.2.2	⏭ For circuit-breakers of the **B- Type**				
	Test current 3I_n(A), starting form cold	18,0A			
	Opening time:	[S]			

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Cl.	Requirement - Test	Result	Verdict
	-0,1s ≤t≤45s(≤32A)	3,2	P
	-0,1s ≤t≤90s(>32A)		N/A
	Test current $5I_n$(A), starting from cold	30,0A	
	Tripping less than 0,1 s	6 ms	P
9.10.2.3	⏭For circuit-breakers of the **C- Type**		
	Test current $5I_n$(A), starting from cold	30,0A	
	Opening time:	[S]	
	-0,1s ≤t≤15s(≤32A)	3,4	P
	-0,1s ≤t≤30s(>32A)		N/A
	Test current $10I_n$(A), starting from cold	60,0A	
	Tripping less than 0,1 s	10 ms	P
9.10.2.4	⏭ For circuit-breakers of the **D- Type**		
	Test current $10I_n$(A), starting from cold	60,0A	
	Opening time:	[S]	
	-0,1s ≤t≤4s(≤32A)	2,7	P
	-0,1s ≤t≤8s(>32A)		N/A
	Test current $20I_n$(A) or to the maximum instantaneous tripping current(see cl.6,itemj), starting from cold	120A	
	Tripping less than 0,1 s	8ms	P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers		
	Test current $1,1I_t$(A), (two pole) starting from cold	————	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
	Test current $1,2I_t$(A), (three pole or four pole) starting from cold	————	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		
	a)Ambient temperature of (-5±2)℃		
	Test current $1,13I_n$(A)	6,78A	
	-1 h (≤63A)		P
	-2 h (>63A)		N/A

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Cl.	Requirement - Test	Result	Verdict
	Current is then steadily increased to 1,9 I_n(A) within 5s	11,4A	
	-Tripping within	[min]	
	-1 h (⩽63A)	2,0	P
	-2 h (>63A)		N/A
	b)Ambient temperature of (40±2)℃		
	Test current I_n(A)	6,0A	
	No tripping within		
	-1 h (⩽63A)		P
	-2 h (>63A)		N/A
9.10	**TESTS: D_0**-3 samples: 10A, 1 pole, B,C,D type	**D_0-4 D_0-5 D_0-6**	
	I_n(A)	10A	
	Sect. (mm^2)	1,5 mm^2	
	Instantaneous tripping current	**⏭B ⏭C ⏭D**	
9.10.1	Test of time-current characteristic		
9.10.1.1	Test current 1,13I_n(A) starting from cold for:	11,3A	
	-1 h (I_n⩽63A)		P
	-2 h (I_n>63A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_n(A)	14,5 A	
	-Tripping within	[min]	
	-1 h (I_n⩽63A)	3,5	P
	-2 h (I_n>63A)		N/A
9.10.1.2	Test current 2,55I_n(A) starting from cold for:	25,5A	
	Opening time not less than 1 s or more than	[S]	
	-60 s (I_n⩽32A)	34	P
	-120 s (I_n>32A)		N/A
9.10.2	Test of instantaneous tripping and or correct opening of the contacts		
9.10.2.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage		
	For the upper values of the test current the test is made at rated voltage U_n(phase to neutral) with a power factor between 0,95 and 1		
	The sequence of operation is: O-CO-CO-CO interval time:>3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		

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Cl.	Requirement - Test	Result	Verdict
9.10.2.2	⏭For circuit-breakers of the **B- Type**		
	Test current $3I_n$(A), starting from cold	30,0A	
	Opening time:	[S]	
	-0,1s ≤t≤45s(≤32A)	1,2	P
	-0,1s ≤t≤90s(>32A)		N/A
	Test current $5I_n$(A), starting from cold	50,0A	
	Tripping less than 0,1 s	7 ms	P
9.10.2.3	⏭For circuit-breakers of the **C- Type**		
	Test current $5I_n$(A), starting from cold	50,0A	
	Opening time:	[S]	
	-0,1s ≤t≤15s(≤32A)	2,3	P
	-0,1s ≤t≤30s(>32A)		N/A
	Test current $10I_n$(A), starting from cold	100A	
	Tripping less than 0,1 s	6 ms	P
9.10.2.4	⏭ For circuit-breakers of the **D- Type**		
	Test current $10I_n$(A), starting from cold	100A	
	Opening time:	[S]	
	-0,1s ≤t≤4s(≤32A)	2,9	P
	-0,1s ≤t≤8s(>32A)		N/A
	Test current $20I_n$(A) or to the maximum instantaneous tripping current(see cl.6,itemj), starting from cold	200A	
	Tripping less than 0,1 s	11ms	P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers		
	Test current $1,1I_t$(A), (two pole) starting from cold	————	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
	Test current $1,2I_t$(A), (three pole or four pole) starting from cold	————	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		
	a)Ambient temperature of (-5±2)℃		
	Test current $1,13I_n$(A)	11,3A	

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Cl.	Requirement - Test	Result	Verdict
	-1 h (⩽63A)		P
	-2 h (>63A)		N/A
	Current is then steadily increased to 1,9 l_n(A) within 5s	19,0A	
	-Tripping within	[min]	
	-1 h (⩽63A)	3,5	P
	-2 h (>63A)		N/A
	b)Ambient temperature of (40±2)℃		
	Test current l_n(A)	10,0A	
	No tripping within		
	-1 h (⩽63A)		P
	-2 h (>63A)		N/A
9.10	**TESTS:** **D_0**-3 samples: 16A, 1 pole, B,C,D type	**D_0-7** **D_0-8** **D_0-9**	
	l_n(A)	26A	
	Sect. (mm^2)	2,5 mm^2	
	Instantaneous tripping current	⏭B ⏭C ⏭D	
9.10.1	Test of time-current characteristic		
9.10.1.1	Test current 1,13l_n(A) starting from cold for:	18,1A	
	-1 h (l_n⩽63A)		P
	-2 h (l_n>63A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 l_n(A)	23,2 A	
	-Tripping within	[min]	
	-1 h (l_n⩽63A)	2,0	P
	-2 h (l_n>63A)		N/A
9.10.1.2	Test current 2,55l_n(A) starting from cold for:	40,8A	
	Opening time not less than 1 s or more than	[S]	
	-60 s (l_n⩽32A)	44	P
	-120 s (l_n>32A)		N/A
9.10.2	Test of instantaneous tripping and or correct opening of the contacts		
9.10.2.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage		
	For the upper values of the test current the test is made at rated voltage U_n(phase to neutral) with a power factor between 0,95 and 1		
	The sequence of operation is: O-CO-CO-CO interval time:>3 min		

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Cl.	Requirement - Test	Result	Verdict
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		
9.10.2.2	⏭For circuit-breakers of the **B- Type**		
	Test current $3I_n$(A), starting from cold	48,0A	
	Opening time:	[S]	
	-0,1s ⩽t⩽45s(⩽32A)	1,6	P
	-0,1s ⩽t⩽90s(>32A)		N/A
	Test current $5I_n$(A), starting from cold	80,0A	
	Tripping less than 0,1 s	8 ms	P
9.10.2.3	⏭For circuit-breakers of the **C- Type**		
	Test current $5I_n$(A), starting from cold	80,0A	
	Opening time:	[S]	
	-0,1s ⩽t⩽15s(⩽32A)	1,8	P
	-0,1s ⩽t⩽30s(>32A)		N/A
	Test current $10I_n$(A), starting from cold	160A	
	Tripping less than 0,1 s	22 ms	P
9.10.2.4	⏭ For circuit-breakers of the **D- Type**		
	Test current $10I_n$(A), starting from cold	160A	
	Opening time:	[S]	
	-0,1s ⩽t⩽4s(⩽32A)	2,3	P
	-0,1s ⩽t⩽8s(>32A)		N/A
	Test current $20I_n$(A) or to the maximum instantaneous tripping current(see cl.6,itemj), starting from cold	320A	
	Tripping less than 0,1 s	12ms	P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers		
	Test current $1,1I_t$(A), (two pole) starting from cold	———	
	Tripping within	[min]	
	-1 h (⩽63A)		N/A
	-2 h (>63A)		N/A
	Test current $1,2I_t$(A), (three pole or four pole) starting from cold	———	
	Tripping within	[min]	
	-1 h (⩽63A)		N/A
	-2 h (>63A)		N/A

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Cl.	Requirement - Test	Result	Verdict
9.10.4	Test of effect of ambient temperature on the tripping characteristics		
	a) Ambient temperature of (-5±2)℃		
	Test current 1,13I_n(A)	18,1A	
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
	Current is then steadily increased to 1,9 I_n(A) within 5s	30,4A	
	-Tripping within	[min]	
	-1 h (≤63A)	2,4	P
	-2 h (>63A)		N/A
	b) Ambient temperature of (40±2)℃		
	Test current I_n(A)	16,0A	
	No tripping within		
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
9.10	**TESTS: D_0**-3 samples: 20A, 1 pole, B,C,D type	**D_0-10 D_0-11 D_0-12**	
	I_n(A)	20A	
	Sect. (mm^2)	2,5 mm^2	
	Instantaneous tripping current	⏭B ⏭C ⏭D	
9.10.1	Test of time-current characteristic		
9.10.1.1	Test current 1,13I_n(A) starting from cold for:	22,6A	
	-1 h (I_n≤63A)		P
	-2 h (I_n>63A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_n(A)	29,0 A	
	-Tripping within	[min]	
	-1 h (I_n≤63A)	4,5	P
	-2 h (I_n>63A)		N/A
9.10.1.2	Test current 2,55I_n(A) starting from cold for:	51,0A	
	Opening time not less than 1 s or more than	[S]	
	-60 s (I_n≤32A)	21	P
	-120 s (I_n>32A)		N/A
9.10.2	Test of instantaneous tripping and or correct opening of the contacts		
9.10.2.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage		

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Cl.	Requirement - Test	Result	Verdict
	For the upper values of the test current the test is made at rated voltage U_n(phase to neutral) with a power factor between 0,95 and 1		
	The sequence of operation is: O-CO-CO-CO interval time:>3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		
9.10.2.2	⏭For circuit-breakers of the **B- Type**		
	Test current $3I_n$(A), starting from cold	60,0A	
	Opening time:	[S]	
	-0,1s ⩽t⩽45s(⩽32A)	2,5	P
	-0,1s ⩽t⩽90s(>32A)		N/A
	Test current $5I_n$(A), starting from cold	100A	
	Tripping less than 0,1 s	18 ms	P
9.10.2.3	⏭For circuit-breakers of the **C- Type**		
	Test current $5I_n$(A), starting from cold	100A	
	Opening time:	[S]	
	-0,1s ⩽t⩽15s(⩽32A)	1,8	P
	-0,1s ⩽t⩽30s(>32A)		N/A
	Test current $10I_n$(A), starting from cold	200A	
	Tripping less than 0,1 s	8 ms	P
9.10.2.4	⏭ For circuit-breakers of the **D- Type**		
	Test current $10I_n$(A), starting from cold	200A	
	Opening time:	[S]	
	-0,1s ⩽t⩽4s(⩽32A)	1,6	P
	-0,1s ⩽t⩽8s(>32A)		N/A
	Test current $20I_n$(A) or to the maximum instantaneous tripping current(see cl.6,itemj), starting from cold	400A	
	Tripping less than 0,1 s	9 ms	P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers		
	Test current $1,1I_t$(A), (two pole) starting from cold	________	
	Tripping within	[min]	
	-1 h (⩽63A)		N/A
	-2 h (>63A)		N/A
	Test current $1,2I_t$(A), (three pole or four pole) starting from cold	________	

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Cl.	Requirement - Test	Result	Verdict
	Tripping within	[min]	
	-1 h (⩽63A)		N/A
	-2 h (>63A)		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		
	a) Ambient temperature of (-5±2)℃		
	Test current 1,13l_n(A)	22,6A	
	-1 h (⩽63A)		P
	-2 h (>63A)		N/A
	Current is then steadily increased to 1,9 l_n(A) within 5s	38,0A	
	-Tripping within	[min]	
	-1 h (⩽63A)	2,7	P
	-2 h (>63A)		N/A
	b) Ambient temperature of (40±2)℃		
	Test current l_n(A)	20,0A	
	No tripping within		
	-1 h (⩽63A)		P
	-2 h (>63A)		N/A
9.10	TESTS: D_0-3 samples: 25A, 1 pole, B,C,D type	D_0-13 D_0-14 D_0-15	
	l_n(A)	25A	
	Sect. (mm^2)	4 mm^2	
	Instantaneous tripping current	⏭B ⏭C ⏭D	
9.10.1	Test of time-current characteristic		
9.10.1.1	Test current 1,13l_n(A) starting from cold for:	28,3A	
	-1 h (l_n⩽63A)		P
	-2 h (l_n>63A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 l_n(A)	36,3 A	
	-Tripping within	[min]	
	-1 h (l_n⩽63A)	4,2	P
	-2 h (l_n>63A)		N/A
9.10.1.2	Test current 2,55l_n(A) starting from cold for:	63,8A	
	Opening time not less than 1 s or more than	[S]	
	-60 s (l_n⩽32A)	23	P
	-120 s (l_n>32A)		N/A

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Cl.	Requirement - Test	Result	Verdict
9.10.2	Test of instantaneous tripping and or correct opening of the contacts		
9.10.2.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage		
	For the upper values of the test current the test is made at rated voltage U_n(phase to neutral) with a power factor between 0,95 and 1		
	The sequence of operation is: O-CO-CO-CO interval time:>3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		
9.10.2.2	⏭For circuit-breakers of the **B- Type**		
	Test current $3I_n$(A), starting from cold	75,0A	
	Opening time:	[S]	
	-0,1s ≤t≤45s(≤32A)	2,1	P
	-0,1s ≤t≤90s(>32A)		N/A
	Test current $5I_n$(A), starting from cold	125A	
	Tripping less than 0,1 s	7 ms	P
9.10.2.3	⏭For circuit-breakers of the **C- Type**		
	Test current $5I_n$(A), starting from cold	125A	
	Opening time:	[S]	
	-0,1s ≤t≤15s(≤32A)	2,8	P
	-0,1s ≤t≤30s(>32A)		N/A
	Test current $10I_n$(A), starting from cold	250A	
	Tripping less than 0,1 s	12 ms	P
9.10.2.4	⏭ For circuit-breakers of the **D- Type**		
	Test current $10I_n$(A), starting from cold	250A	
	Opening time:	[S]	
	-0,1s ≤t≤4s(≤32A)	3,1	P
	-0,1s ≤t≤8s(>32A)		N/A
	Test current $20I_n$(A) or to the maximum instantaneous tripping current(see cl.6,itemj), starting from cold	500A	
	Tripping less than 0,1 s	16 ms	P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers		
	Test current $1,1I_t$(A), (two pole) starting from cold	————	
	Tripping within	[min]	

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Cl.	Requirement - Test	Result	Verdict
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
	Test current 1,2I_t(A), (three pole or four pole) starting from cold	――――――	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		
	a)Ambient temperature of (-5±2)℃		
	Test current 1,13I_n(A)	28,3A	
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
	Current is then steadily increased to 1,9 I_n(A) within 5s	47,5A	
	-Tripping within	[min]	
	-1 h (≤63A)	1,5	P
	-2 h (>63A)		N/A
	b)Ambient temperature of (40±2)℃		
	Test current I_n(A)	25,0A	
	No tripping within		
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
9.10	TESTS: D_0-3 samples: 32A, 1 pole, B,C,D type	D_0-16 D_0-17 D_0-18	
	I_n(A)	32A	
	Sect. (mm^2)	6 mm^2	
	Instantaneous tripping current	⏭B ⏭C ⏭D	
9.10.1	Test of time-current characteristic		
9.10.1.1	Test current 1,13I_n(A) starting from cold for:	36,2A	
	-1 h (I_n≤63A)		P
	-2 h (I_n>63A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_n(A)	46,4 A	
	-Tripping within	[min]	
	-1 h (I_n≤63A)	3,2	P
	-2 h (I_n>63A)		N/A
9.10.1.2	Test current 2,55I_n(A) starting from cold for:	81,6A	
	Opening time not less than 1 s or more than	[S]	

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Cl.	Requirement - Test	Result	Verdict
	-60 s (I_n≤32A)	20	P
	-120 s (I_n>32A)		N/A
9.10.2	Test of instantaneous tripping and or correct opening of the contacts		
9.10.2.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage		
	For the upper values of the test current the test is made at rated voltage U_n(phase to neutral) with a power factor between 0,95 and 1		
	The sequence of operation is: O-CO-CO-CO interval time:>3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		
9.10.2.2	⏭For circuit-breakers of the **B- Type**		
	Test current 3I_n(A), starting from cold	96,0A	
	Opening time:	[S]	
	-0,1s ≤t≤45s(≤32A)	2,7	P
	-0,1s ≤t≤90s(>32A)		N/A
	Test current 5I_n(A), starting from cold	160A	
	Tripping less than 0,1 s	14 ms	P
9.10.2.3	⏭For circuit-breakers of the **C- Type**		
	Test current 5I_n(A), starting from cold	160A	
	Opening time:	[S]	
	-0,1s ≤t≤15s(≤32A)	2,4	P
	-0,1s ≤t≤30s(>32A)		N/A
	Test current 10I_n(A), starting from cold	320A	
	Tripping less than 0,1 s	10 ms	P
9.10.2.4	⏭ For circuit-breakers of the **D- Type**		
	Test current 10I_n(A), starting from cold	320A	
	Opening time:	[S]	
	-0,1s ≤t≤4s(≤32A)	2,7	P
	-0,1s ≤t≤8s(>32A)		N/A
	Test current 20I_n(A) or to the maximum instantaneous tripping current(see cl.6,itemj), starting from cold	640A	
	Tripping less than 0,1 s	16 ms	P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers		

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Cl.	Requirement - Test	Result	Verdict
	Test current 1,1I_t(A), (two pole) starting from cold	————	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
	Test current 1,2I_t(A), (three pole or four pole) starting from cold	————	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		
	a)Ambient temperature of (-5±2)℃		
	Test current 1,13I_n(A)	36,2A	
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
	Current is then steadily increased to 1,9 I_n(A) within 5s	60,8A	
	-Tripping within	[min]	
	-1 h (≤63A)	2,6	P
	-2 h (>63A)		N/A
	b)Ambient temperature of (40±2)℃		
	Test current I_n(A)	32,0A	
	No tripping within		
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
9.10	TESTS: D_0-3 samples: 40A, 1 pole, B,C,D type	D_0-19 D_0-20 D_0-21	
	I_n(A)	40A	
	Sect. (mm^2)	10 mm^2	
	Instantaneous tripping current	⏭B ⏭C ⏭D	
9.10.1	Test of time-current characteristic		
9.10.1.1	Test current 1,13I_n(A) starting from cold for:	45,2A	
	-1 h (I_n≤63A)		P
	-2 h (I_n>63A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 I_n(A)	58,0 A	
	-Tripping within	[min]	
	-1 h (I_n≤63A)	4,7	P

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Cl.	Requirement - Test	Result	Verdict
	-2 h (I_n>63A)		N/A
9.10.1.2	Test current 2,55I_n(A) starting from cold for:	102A	
	Opening time not less than 1 s or more than	[S]	
	-60 s (I_n≤32A)		N/A
	-120 s (I_n>32A)	28	P
9.10.2	Test of instantaneous tripping and or correct opening of the contacts		
9.10.2.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage		
	For the upper values of the test current the test is made at rated voltage U_n(phase to neutral) with a power factor between 0,95 and 1		
	The sequence of operation is: O-CO-CO-CO interval time:>3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		
9.10.2.2	⏭For circuit-breakers of the **B- Type**		
	Test current 3I_n(A), starting from cold	120A	
	Opening time:	[S]	
	-0,1s ≤t≤45s(≤32A)		N/A
	-0,1s ≤t≤90s(>32A)	3,6	P
	Test current 5I_n(A), starting from cold	200A	
	Tripping less than 0,1 s	7 ms	P
9.10.2.3	⏭For circuit-breakers of the **C- Type**		
	Test current 5I_n(A), starting from cold	200A	
	Opening time:	[S]	
	-0,1s ≤t≤15s(≤32A)		N/A
	-0,1s ≤t≤30s(>32A)	3,1	P
	Test current 10I_n(A), starting from cold	400A	
	Tripping less than 0,1 s	10 ms	P
9.10.2.4	⏭ For circuit-breakers of the **D- Type**		
	Test current 10I_n(A), starting from cold	400A	
	Opening time:	[S]	
	-0,1s ≤t≤4s(≤32A)		N/A
	-0,1s ≤t≤8s(>32A)	3,6	P
	Test current 20I_n(A) or to the maximum instantaneous tripping current(see cl.6,itemj), starting from cold	800A	
	Tripping less than 0,1 s	15 ms	P

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Cl.	Requirement - Test	Result	Verdict
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers		
	Test current 1,1l$_t$(A), (two pole) starting from cold	————	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
	Test current 1,2l$_t$(A), (three pole or four pole) starting from cold	————	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		
	a)Ambient temperature of (-5±2)℃		
	Test current 1,13l$_n$(A)	45,2A	
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
	Current is then steadily increased to 1,9 l$_n$(A) within 5s	76,0A	
	-Tripping within	[min]	
	-1 h (≤63A)	2,6	P
	-2 h (>63A)		N/A
	b)Ambient temperature of (40±2)℃		
	Test current l$_n$(A)	40,0A	
	No tripping within		
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
9.10	TESTS: D$_0$-3 samples: 50A, 1 pole, B,C,D type	D$_0$-22 D$_0$-23 D$_0$-24	
	l$_n$(A)	50A	
	Sect. (mm^2)	10 mm^2	
	Instantaneous tripping current	⏭B ⏭C ⏭D	
9.10.1	Test of time-current characteristic		
9.10.1.1	Test current 1,13l$_n$(A) starting from cold for:	56,5A	
	-1 h (l$_n$≤63A)		P
	-2 h (l$_n$>63A)		N/A
	No tripping		P
	Then steadily increased within 5 s to 1,45 l$_n$(A)	72,5A	

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Cl.	Requirement - Test	Result	Verdict
	-Tripping within	[min]	
	-1 h ($l_n \leqslant 63A$)	6,7	P
	-2 h ($l_n > 63A$)		N/A
9.10.1.2	Test current 2,55l_n(A) starting from cold for:	128A	
	Opening time not less than 1 s or more than	[S]	
	-60 s ($l_n \leqslant 32A$)		N/A
	-120 s ($l_n > 32A$)	56	P
9.10.2	Test of instantaneous tripping and or correct opening of the contacts		
9.10.2.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage		
	For the upper values of the test current the test is made at rated voltage U_n(phase to neutral) with a power factor between 0,95 and 1		
	The sequence of operation is: O-CO-CO-CO interval time:>3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		
9.10.2.2	⏭For circuit-breakers of the **B- Type**		
	Test current 3l_n(A), starting from cold	150A	
	Opening time:	[S]	
	-0,1s ≤t≤45s(≤32A)		N/A
	-0,1s ≤t≤90s(>32A)	3,0	P
	Test current 5l_n(A), starting from cold	250A	
	Tripping less than 0,1 s	8 ms	P
9.10.2.3	⏭For circuit-breakers of the **C- Type**		
	Test current 5l_n(A), starting from cold	250A	
	Opening time:	[S]	
	-0,1s ≤t≤15s(≤32A)		N/A
	-0,1s ≤t≤30s(>32A)	3,2	P
	Test current 10l_n(A), starting from cold	500A	
	Tripping less than 0,1 s	8 ms	P
9.10.2.4	⏭ For circuit-breakers of the **D- Type**		
	Test current 10l_n(A), starting from cold	500A	
	Opening time:	[S]	
	-0,1s ≤t≤4s(≤32A)		N/A
	-0,1s ≤t≤8s(>32A)	4,2	P

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Cl.	Requirement - Test	Result	Verdict
	Test current $20I_n$(A) or to the maximum instantaneous tripping current(see cl.6,itemj), starting from cold	1000A	
	Tripping less than 0,1 s	10 ms	P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers		
	Test current $1,1I_t$(A), (two pole) starting from cold	————	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
	Test current $1,2I_t$(A), (three pole or four pole) starting from cold	————	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		
	a)Ambient temperature of (-5±2)℃		
	Test current $1,13I_n$(A)	56,5A	
	-1 h (≤63A)		P
	-2 h (>63A)		N/A
	Current is then steadily increased to 1,9 I_n(A) within 5s	95,0A	
	-Tripping within	[min]	
	-1 h (≤63A)	4,7	P
	-2 h (>63A)		N/A
	b)Ambient temperature of (40±2)℃		
	Test current I_n(A)	50,0A	
	No tripping within		
	-1 h (≤63A)		P
	-2 h (>63A)		N/A

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Cl.	Requirement - Test	Result	Verdict
9.10	**TESTS:** D_0-2 samples: 63A, 1 pole, B,C, type	**D_0-25 D_0-26**	
	I_n(A)	63A	
	Sect. (mm^2)	16 mm^2	
	Instantaneous tripping current	⏭B ⏭C ☐D	
9.10.1	Test of time-current characteristic		
9.10.1.1	Test current $1,13I_n$(A) starting from cold for:		
	-1 h ($I_n \leqslant$63A)		N/A
	-2 h (I_n>63A)		N/A
	No tripping		N/A
	Then steadily increased within 5 s to 1,45 I_n(A)		
	-Tripping within	[min]	
	-1 h ($I_n \leqslant$63A)		N/A
	-2 h (I_n>63A)		N/A
9.10.1.2	Test current $2,55I_n$(A) starting from cold for:		
	Opening time not less than 1 s or more than	[S]	
	-60 s ($I_n \leqslant$32A)		N/A
	-120 s (I_n>32A)		N/A
9.10.2	Test of instantaneous tripping and or correct opening of the contacts		
9.10.2.1	General test conditions		
	For the lower values of the test current the test is made once, at any convenient voltage		
	For the upper values of the test current the test is made at rated voltage U_n(phase to neutral) with a power factor between 0,95 and 1		
	The sequence of operation is: O-CO-CO-CO interval time:>3 min		
	The tripping time of the O operation is measured		
	After each operation the indicating means shall show the open position of the contacts		
9.10.2.2	⏭For circuit-breakers of the **B- Type**		
	Test current $3I_n$(A), starting from cold	189A	
	Opening time:	[S]	
	-0,1s $\leqslant$t$\leqslant$45s($\leqslant$32A)		N/A
	-0,1s $\leqslant$t$\leqslant$90s(>32A)	2,9	P
	Test current $5I_n$(A), starting from cold	315A	
	Tripping less than 0,1 s	8 ms	P
9.10.2.3	⏭For circuit-breakers of the **C- Type**		
	Test current $5I_n$(A), starting from cold	315A	
	Opening time:	[S]	

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Cl.	Requirement - Test	Result	Verdict
	-0,1s ≤t≤15s(≤32A)		N/A
	-0,1s ≤t≤30s(>32A)	2,8	P
	Test current 10I_n(A), starting from cold	630A	
	Tripping less than 0,1 s	16 ms	P
9.10.2.4	☐For circuit-breakers of the **D- Type**		
	Test current 10I_n(A), starting from cold		
	Opening time:	[S]	
	-0,1s ≤t≤4s(≤32A)		N/A
	-0,1s ≤t≤8s(>32A)		P
	Test current 20I_n(A) or to the maximum instantaneous tripping current(see cl.6,itemj), starting from cold		
	Tripping less than 0,1 s		P
9.10.3	Test of effect of single pole loading on the tripping characteristic of multipole circuit-breakers		
	Test current 1,1I_t(A), (two pole) starting from cold	――――――	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
	Test current 1,2I_t(A), (three pole or four pole) starting from cold	――――――	
	Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
9.10.4	Test of effect of ambient temperature on the tripping characteristics		
	a)Ambient temperature of (-5±2)℃		
	Test current 1,13I_n(A)		
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
	Current is then steadily increased to 1,9 I_n(A) within 5s		
	-Tripping within	[min]	
	-1 h (≤63A)		N/A
	-2 h (>63A)		N/A
	b)Ambient temperature of (40±2)℃		
	Test current I_n(A)		
	No tripping within		

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Cl.	Requirement - Test	Result			Verdict
	-1 h (⩽63A)				N/A
	-2 h (>63A)				N/A
	TESTS„E ‶-3 samples:63A,1 pole, D type(Test in single-phase circuit)				
9.12.11.4.2	Test: E_1(Test at service short-circuit capacity)	E_1-1	E_1-2	E_1-3	
	Service short-circuit capacity..........:	4500A			
	Test circuit: figure.......................................:	3			
	Prospective current...:	4500A			
	Prospective current obtained................:	4520 A			
	Power factor..:	0,75～0,80			
	Power factor obtained.......................................:	0,77			
	Sequence...:	O-O -CO			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F’: ☐0,12 mm/ ⏭0,16 mm resistor R’ : ☐ 0,75 Ohm/ ⏭ 1,5 Ohm	“a”=45 mm			P
9.12.9.2	Test in enclosures Copper wire F’: ☐ 0,12 mm/ ☐ 0,16 mm resistor R’ : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×___×___mm			N/A
	I_{peak}(A) max. value	4470A			
	$I^2t \leqslant$ _______ kA^2s				N/A
	Max. $I^2t \leqslant$ ___ kA^2s L1 L2 L3 L4(N)	89,1 — — —	97,8 — — —	86,7 — — —	P N/A N/A N/A
	During and after the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F’				P
	-Polyethylene foil shows no holes				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a)leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A

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Cl.	Requirement - Test	Result			Verdict
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A
	Test current 0.85× non tripping Current (1,13l_n)	60,5 A			
	-Passed for 1h	>1h			P
	-Passed for 2h				N/A
	Current is then steadily increased to 1,1×tripping current(1,45l_n) within 5s	100,5A			
		min	min	min	
	Tripping within ⏭ 1 hour / ☐ 2 hour	31,1	21,3	14,4	P
	TESTS„E ‶-3 samples:63A,1 pole, D type(Test in single-phase circuit)				
9.12.11.4.2	Test: E_1(Test at service short-circuit capacity)	E_1-4	E_1-5	E_1-5	
	Service short-circuit capacity………..:	4500A			
	Test circuit: figure……………………………….:	5			
	Prospective current………………………………:	4500A			
	Prospective current obtained……………..:	4610 A			
	Power factor…………………………………………………..:	0,75～0,80			
	Power factor obtained…………………………….:	0,77			
	Sequence…………………………………………………………….:	O-O -CO			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F’: ☐0,12 mm/ ⏭0,16 mm resistor R’ : ☐ 0,75 Ohm/ ⏭ 1,5 Ohm	“a”=45 mm			P
9.12.9.2	Test in enclosures Copper wire F’: ☐ 0,12 mm/ ☐ 0,16 mm resistor R’ : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×___×___mm			N/A
	I_{peak}(A) max. value	4430A			
	I^2t≤_______kA^2s				N/A
	Max. I^2t≤___kA^2s L1	—	—	—	N/A
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
	During and after the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F'				P
	-Polyethylene foil shows no holes				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A
	Test current 0.85× non tripping Current (1,13I_n)	60,5 A			
	-Passed for 1h	>1h			P
	-Passed for 2h				N/A
	Current is then steadily increased to 1,1 ×tripping current(1,45I_n) within 5s	100,5A			
		min	min	min	
	Tripping within ⏭ 1 hour / ☐ 2 hour	28,1	24,6	9,3	P
	TESTS„E‶-3 samples:32A,1 pole, D type(Test in single-phase circuit)				
9.12.11.4.2	**Test: E_1(Test at service short-circuit capacity)**	**E_1-7**	**E_1-8**	**E_1-9**	
	Service short-circuit capacity………:	6000A			
	Test circuit: figure………:	3			
	Prospective current………:	6000A			
	Prospective current obtained………:	6130 A			
	Power factor………:	0,65~0,70			

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
	Power factor obtained……………………………:	0,67			
	Sequence…………………………………………………………:	O-O -CO			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F′: □0,12 mm/ ⏭0,16 mm resistor R′ : □ 0,75 Ohm/ ⏭ 1,5 Ohm	"a"=45 mm			P
9.12.9.2	Test in enclosures Copper wire F′: □ 0,12 mm/ □ 0,16 mm resistor R′ : □ 0,75 Ohm/ □1,5 Ohm	Dimension of enclosure: × × mm			N/A
	I_{peak}(A) max. value	5600A			
	$I^2t\leqslant$______kA^2s				N/A
	Max. $I^2t\leqslant$___kA^2s L1	67,9	86,9	68,9	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	During and after the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F′				P
	-Polyethylene foil shows no holes				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A
	Test current 0.85× non tripping Current ($1,13I_n$)	30,7 A			

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
	-Passed for 1h	>1h			P
	-Passed for 2h				N/A
	Current is then steadily increased to 1,1 ×tripping current (1,45I_n) within 5s	51,0A			
		min	min	min	
	Tripping within ⏭ 1 hour / ☐ 2 hour	5,4	1,4	2,6	P
	TESTS„E ‶-3 samples:32A,1 pole, D type(Test in single-phase circuit)				
9.12.11.4.2	Test: E_1(Test at service short-circuit capacity)	E_1-10	E_1-11	E_1-12	
	Service short-circuit capacity............:	6000A			
	Test circuit: figure...:	3			
	Prospective current...:	6000A			
	Prospective current obtained.................:	6170 A			
	Power factor...:	0,65～0,70			
	Power factor obtained......................................:	0,67			
	Sequence..:	O-O -CO			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F’: ☐0,12 mm/ ⏭0,16 mm resistor R’ : ☐ 0,75 Ohm/ ⏭ 1,5 Ohm	“a”=45 mm			P
9.12.9.2	Test in enclosures Copper wire F’: ☐ 0,12 mm/ ☐ 0,16 mm resistor R’ : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×___×___mm			N/A
	I_{peak}(A) max. value	3830A			
	$I^2t \leqslant$________kA^2s				N/A
	Max. $I^2t \leqslant$____kA^2s L1	—	—	—	N/A
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	During and after the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F’				P
	-Polyethylene foil shows no holes				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4 (N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A
	Test current 0.85× non tripping Current ($1,13I_n$)	30,7 A			
	-Passed for 1h	>1h			P
	-Passed for 2h				N/A
	Current is then steadily increased to 1,1 ×tripping current ($1,45I_n$) within 5s	51,0A			
		min	min	min	
	Tripping within ⏭ 1 hour / ☐ 2 hour	4,3	10,2	15,7	P
	TESTS„E ‶-3 samples:6A,1 pole, D type(Test in single-phase circuit)				
9.12.11.4.2	Test: E_1 (Test at service short-circuit capacity)	E_1-13	E_1-14	E_1-15	
	Service short-circuit capacity..........:	6000A			
	Test circuit: figure..........:	3			
	Prospective current..........:	6000A			
	Prospective current obtained..........:	6130 A			
	Power factor..........:	0,65～0,70			
	Power factor obtained..........:	0,67			
	Sequence..........:	O-O -CO			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F': ☐0,12 mm/ ⏭0,16 mm resistor R' : ☐ 0,75 Ohm/ ⏭ 1,5 Ohm	"a"=45 mm			P
9.12.9.2	Test in enclosures Copper wire F': ☐ 0,12 mm/ ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×___×___mm			N/A

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
	I_{peak}(A) max. value……………………………………………:	393A			
	$I^2t \leqslant$ _______ kA^2s				N/A
	Max. $I^2t \leqslant$ ___ kA^2s L1	43,2	50,4	42,3	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	During and after the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F'				P
	-Polyethylene foil shows no holes				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A
	Test current 0.85× non tripping Current ($1,13I_n$)	5,8 A			
	-Passed for 1h	>1h			P
	-Passed for 2h				N/A
	Current is then steadily increased to 1,1 ×tripping current($1,45I_n$) within 5s	9,6A			
		min	min	min	
	Tripping within ☒ 1 hour / ☐ 2 hour	4,3	10,2	15,7	P
	TESTS"E"-3 samples:6A,1 pole, D type(Test in single-phase circuit)				

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
9.12.11.4.2	Test: E_1(Test at service short-circuit capacity)	E_1-16	E_1-17	E_1-18	
	Service short-circuit capacity............:	6000A			
	Test circuit: figure..:	5			
	Prospective current...:	6000A			
	Prospective current obtained.................:	6170 A			
	Power factor...:	0,65～0,70			
	Power factor obtained.......................................:	0,67			
	Sequence..:	O-O -CO			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F’: ☐0,12 mm/ ☒0,16 mm resistor R’ : ☐ 0,75 Ohm/ ☒ 1,5 Ohm	“a”=45 mm			P
9.12.9.2	Test in enclosures Copper wire F’: ☐ 0,12 mm/ ☐ 0,16 mm resistor R’ : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×___×___mm			N/A
	I_{peak}(A) max. value...:	2650A			
	$I^2t \leqslant$________kA^2s				N/A
	Max. $I^2t \leqslant$____kA^2s L1	—	—	—	N/A
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	During and after the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F’				P
	-Polyethylene foil shows no holes				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a)leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P

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Cl.	Requirement - Test	Result			Verdict
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A
	Test current 0.85× non tripping Current ($1,13l_n$)	5,8 A			
	-Passed for 1h	>1h			P
	-Passed for 2h				N/A
	Current is then steadily increased to 1,1 ×tripping current($1,45l_n$) within 5s	9,6A			
		min	min	min	
	Tripping within ☒ 1 hour / ☐ 2 hour	8,5	24,2	18,0	P
	TESTS„E 〝-3 samples:32A,1 pole, D type(Test in single-phase circuit)				
9.12.11.4.2	Test: E_2(Test at service short-circuit capacity)	E_2-1	E_2-2	E_2-3	
	Service short-circuit capacity............:	6000A			
	Test circuit: figure..:	3			
	Prospective current...:	6000A			
	Prospective current obtained.................:	6130 A			
	Power factor...:	0,65～0,70			
	Power factor obtained.....................................:	0,67			
	Sequence..:	O-O -CO			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F’: ☐0,12 mm/ ☒0,16 mm resistor R’ : ☐ 0,75 Ohm/ ☒ 1,5 Ohm	“a”=45 mm			P
9.12.9.2	Test in enclosures Copper wire F’: ☐ 0,12 mm/ ☐ 0,16 mm resistor R’ : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×___×___mm			N/A
	I_{peak}(A) max. value..:	3960A			
	$I^2t \leqslant$ __55__ kA^2s				P
	Max. $I^2t \leqslant$____kA^2s L1	24,2	49,6	35,9	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	During and after the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F’				P
	-Polyethylene foil shows no holes				P

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A
	Test current 2,8I_n	90,0A			
	Tripping within:	(s)	(s)	(s)	
	0,1s <t<60 s(⩽32A)	47	28	41	P
	0,1s <t<120 s(>32A)				N/A
	TESTS„E "-3 samples:16A,1 pole, D type(Test in single-phase circuit)				
9.12.11.4.2	Test: E_2(Test at service short-circuit capacity)	E_2-4	E_2-5	E_2-6	
	Service short-circuit capacity...........:	6000A			
	Test circuit: figure.......................................:	3			
	Prospective current..:	6000A			
	Prospective current obtained.................:	6130 A			
	Power factor..:	0,65~0,70			
	Power factor obtained.....................................:	0,67			
	Sequence...:	O-O -CO			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F': ☐0,12 mm/ ⏭0,16 mm resistor R' : ☐ 0,75 Ohm/ ⏭ 1,5 Ohm	"a"=45 mm			P
9.12.9.2	Test in enclosures Copper wire F': ☐ 0,12 mm/ ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×___×___mm			N/A

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
	I_{peak}(A) max. value……………………………………………:	4050A			
	$I^2t \leqslant$ 42 kA^2s				P
	Max. $I^2t \leqslant$ ___ kA^2s L1	40,7	39,7	33,6	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	During and after the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F’				P
	-Polyethylene foil shows no holes				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A
	Test current 2,8I_n	45,0A			
	Tripping within:	(s)	(s)	(s)	
	0,1s <t<60 s(⩽32A)	29	34	53	P
	0,1s <t<120 s(>32A)				N/A
	TESTS„E ‶-3 samples:32A,1 pole, D type(Test in single-phase circuit)				
9.12.11.4.2	Test: E_2(Test at service short-circuit capacity)	E_2-7	E_2-8	E_2-9	
	Service short-circuit capacity…………:	6000A			
	Test circuit: figure……………………………………:	3			

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
	Prospective current.......................................:	6000A			
	Prospective current obtained...............:	6130 A			
	Power factor..:	0,65~0,70			
	Power factor obtained..................................:	0,67			
	Sequence...:	O-O -CO			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F': ☐0,12 mm/ ⏭0,16 mm resistor R' : ☐ 0,75 Ohm/ ⏭ 1,5 Ohm	"a"=45 mm			P
9.12.9.2	Test in enclosures Copper wire F': ☐ 0,12 mm/ ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×__×__mm			N/A
	I_{peak}(A) max. value...:	3810A			
	$I^2t\leqslant$ 45 kA^2s				P
	Max. $I^2t\leqslant$___kA^2s L1	37,3	11,6	37,5	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	During and after the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F'				P
	-Polyethylene foil shows no holes				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P
	a)leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
	e) 2000 V				N/A
	Test current 2,8I$_n$	90,0A			
	Tripping within:	(s)	(s)	(s)	
	0,1s <t<60 s(⩽32A)	35	56	28	P
	0,1s <t<120 s(>32A)				N/A
	TESTS~E〝-3 samples:16A,1 pole, D type(Test in single-phase circuit)				
9.12.11.4.2	Test: E$_2$(Test at service short-circuit capacity)	E$_2$-10	E$_2$-11	E$_2$-12	
	Service short-circuit capacity……….:	6000A			
	Test circuit: figure………………………………:	3			
	Prospective current………………………………:	6000A			
	Prospective current obtained……………:	6130 A			
	Power factor…………………………………………………:	0,65~0,70			
	Power factor obtained…………………………:	0,67			
	Sequence…………………………………………………………:	O-O -CO			
	t(min)	3 min			
9.12.9.1	Test in free air copper wire F': ☐0,12 mm/ ⏭0,16 mm resistor R' : ☐ 0,75 Ohm/ ⏭ 1,5 Ohm	"a"=45 mm			P
9.12.9.2	Test in enclosures Copper wire F': ☐ 0,12 mm/ ☐ 0,16 mm resistor R' : ☐ 0,75 Ohm/ ☐1,5 Ohm	Dimension of enclosure: ×___×___mm			N/A
	I $_{peak}$(A) max. value………………………………………:	3850A			
	$I^2t⩽$ 35 kA^2s				P
	Max. $I^2t⩽$___kA^2s L1	33,4	31,8	32,2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	During and after the test:				
	-No permanent arcing				P
	-No flash-over between poles or between poles and frame				P
	-No blowing of the fuses F and F'				P
	-Polyethylene foil shows no holes				P
9.12.12.1	The circuit-breakers shall show no damage impairing their further use and shall maintenance, withstand the following tests.				P

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
	a) leakage current across open contacts, according to 9.7.6.3, each pole is supplied at a voltage 1,1 times Un=264V. The circuit-breaker is in the open position	(mA)	(mA)	(mA)	
	The leakage current shall not exceed 2 mA L1	<2	<2	<2	P
	L2	—	—	—	N/A
	L3	—	—	—	N/A
	L4(N)	—	—	—	N/A
	Electric strength test:				
	Test voltage 1500 V (see 8.7.2)				
	a)				P
	b)				N/A
	c)				P
	d)				P
	e) 2000 V				N/A
	Test current 2,8I_n	45,0A			
	Tripping within:	(s)	(s)	(s)	
	0,1s <t<60 s(⩽32A)	52	37	39	P
	0,1s <t<120 s(>32A)				N/A
	Annex J				
	Particular requirements for circuit-breakers with screw less type terminals for external copper conductors (in not exceeding 20 A, cross-sectional up to 4 mm^2)				N/A
J.6	**Marking**				N/A
	Universal terminals				N/A
	-no marking				N/A
	Non-universal				N/A
	-declared for riged-soled conductors:	marked with: "sol"			N/A
	-declared for riged(solid and stranded):	marked with: "r"			N/A
	-declared for flexible conductors :	marked with: "f"			N/A
	The markings should appear on the circuit -breaker or, if available space is not sufficient, on smallest package unit or in technical information:				N/A
	Indication of length of insulation to be removed on the circuit-breaker………………:	______ mm			N/A
J.7	**Standard conditions for operation in service**				N/A
	Clause 7 applies				N/A
J.8	**Constructional requirements**				N/A

EN 61009-1			
Cl.	Requirement - Test	Result	Verdict
	Clause 8 applies with the follow modifications:		N/A
	In clause 8.1.5 only,-5,1 -5,2 -5,3 -5,6 and -5,7 apply		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.1	**Connection or disconnection of conductors**		N/A
	The connection or disconnection shall be made by:		N/A
	A general purpose tool or by a convenient device integral with the terminal or		N/A
	for rigid conductors by simple insertion		N/A
	For disconnection an operation other than a pull shall be necessary(push-wire terminals)		N/A
	Universal terminals shall accept (solid or stranded and flexible unprepared conductors)		N/A
	Non-universal terminals shall accept conductors declared by the manufacturer		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.8.2	**Dimensions of connectable conductors**		N/A
	The dimensions of connectable conductors are given in table J.1		N/A
	The ability to connect these conductors shall be checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.3	**Connectable cross-sectional areas**		N/A
	The dimensions of connectable conductors are given in table J.2		N/A
	The ability to connect these conductors shall be checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.4	**Insertion and connection of conductors**		N/A
	The insertion and disconnection of the conductors shall be made in accordance with the manufacturer's instructions		N/A
J.8.5	**Design and construction of conductors**		N/A
	Terminals shall be designed and constructed that:		N/A
	-each conductor is clamped individually		N/A
	-connection or disconnection connectors connected or disconnected separate or same		N/A
	-inadequate insertion of the conductor is avoided		N/A
	Compliance is checked by inspection and by the tests of J.9.1 and J.9.2		N/A
J.8.6	**The terminals shall be resistant to ageing**		N/A

EN 61009-1			
Cl.	Requirement - Test	Result	Verdict
	Compliance is checked by the tests of J.9.3		N/A
J.9	**Tests**		N/A
	Clause 9 applies, by replacing 9.4 and 9.5 by the follow		N/A
J.9.1	**Test of reliability of screw less terminals**		N/A
J.9.1.1	**Reliability of screw less system**		N/A
	5 times connection and disconnection		N/A
	3 rigid conductors min. cross-section max. cross-section	________ Mm^2 ________ Mm^2	N/A
	3 flexible conductors min. cross-section max. cross-section	________ Mm^2 ________ Mm^2	N/A
	After tests, the terminal shall not be damage in such a way as to impair its further use		N/A
J.9.1.2	**Test of reliability of connection**		N/A
	3 terminals of poles of new sample are fitted with new copper conductors according table J.2		N/A
	rigid conductors min. cross-section max. cross-section	________ Mm^2 ________ Mm^2	N/A
	flexible conductors min. cross-section max. cross-section	________ Mm^2 ________ Mm^2	N/A
	Each conductor is either pushed as far as possible into the terminal or shall be inserted so that adequate connection is obvious		N/A
	After tests, no wire of the conductor shall have escaped outside the terminals		N/A
J.9.2	**Tests of reliability of terminals for external conductors: Mechanical strength**		N/A
	Three terminals of new samples are fitted with new conductors of the type and of the minimum and maximum cross sectional area according table J.2		N/A
	Each conductor is subjected to a pull force of value shown in table J.3. for min		N/A
	Terminal screw torque: $^2/_3$ of table 10	_____ Nm	N/A
	rigid conductors min. cross-section max. cross-section	___ Mm^2/___N ___ Mm^2/___N	N/A
	flexible conductors min. cross-section max. cross-section	___ Mm^2/___N ___ Mm^2/___N	N/A
	During the test the conductor shall not slip out of the terminal		N/A
J.9.3	**Cycling test**		N/A
	The test is carried out with new copper conductors having a cross sectional area according table 9	________ Mm^2	N/A

EN 61009-1					
Cl.	Requirement - Test	Result			Verdict
	The test is carried out on new samples (a sample is one pole, the number of which is defined below, according the type of terminal				N/A
	-universal terminals for rigid (solid and stranded and flexible conductors)	3+3 samples			N/A
	-non-universal terminals for soled conductors only	3 samples			N/A
	-non -universal terminals for rigid (solid and stranded and flexible conductors)	3+3 samples			N/A
	-non-universal terminals for flexible conductors only	3 samples			N/A
	The conductors is connected in series as in normal use to each of the three samples as defined on fig.J.1.				N/A
	The sample is provided with a hole or equivalent in order to measured the voltage drop on the terminal				N/A
	The test arrangement is placed in a heating cabinet which is initially on 20℃				N/A
	Except the cooling period the test current (rated current) is applied to the circuit	I test ___A			N/A
	The samples shall be subjected to 192 temperature cycles, each cycle having a duration of $^{+}/_{-}$ 1 hour				N/A
	Description of the temperature cycle: In 20 min raised to 40℃, maintained for 10 min, then cool down in 20 min to 30℃, maintained for 10 min. For measurement of the voltage drop it is allowed to cool down to 20℃				N/A
	The maximum voltage drop, measured on each terminal, at the end of the 192nd cycle, with lnom. Shall not exceed the smaller of the two following values - either 22,5 mV - or 1,5 times the value measured after the 24 cycle	Uv max. ___mV			N/A
	Sample after 24 cycles: rigid conductors (mV) flexible conductors (mV)	J1 ___ ___	J2 ___ ___	J3 ___ ___	N/A
	Sample after 192 cycles: rigid conductors (mV) flexible conductors (mV)				N/A
	After this test the samples shall shown no changes evidently impairing further use, such as cracks, deformations or like				N/A

EN 61009-1			
Cl.	Requirement - Test	Result	Verdict
	Annex K		
	Particular requirements for circuit-breakers with flat quick-connect terminations		N/A
K.6	**Marking**		N/A
	The whole of clause 6 applies		N/A
	Addition after the lettered item k		N/A
	The following information regarding the female connector according to IEC 61210 and the type of conductor to be used shall be given in the manufacturers instructions		N/A
	l) manufactures name or trade mark		N/A
	m) type reference		N/A
	n) information on cross-sections of conductors and colour code of insulating female connectors (see table K.1)		N/A
	o) the use of only silver or tin-plated copper alloys		N/A
K.7	**Standard conditions for operation in service**		N/A
	Clause 7 applies		N/A
K.8	**Constructional requirements**		N/A
	Clause 8 applies with the follow modifications:		N/A
	Replacement of 8.1.3 by:		N/A
K.8.1	**Clearances and creepage distances (see annex B)**		N/A
	Subclause 8.1.3 applies, the female connectors being fitted to the male tabs of the circuit-breaker		N/A
	Replacement of 8.1.5 by:		N/A
K.8.2	Terminals for external conductors		N/A
K.8.2.1	Male tabs and female connectors shall be of a metal having mechanical strength, electrical conductivity and resistance to corrosion adequate for their intended use		N/A
K.8.2.2	The nominal width of male tab is 6,3 mm and the thickness 0,8 mm, applicable to rated currents up to and including 16 A NOTE 1 The use for rated currents up to and including 20 A is accepted in BE, ER, IT, PT, ES and US		N/A
	The dimensions of the male tab shall comply with those specified in table K.3 and in figures K.2, K3,K4,K5, where the dimensions A,B,C,D,E,F,J,M, N and Q are mandatory		N/A
	The dimensions of the female connector which may be fitted-on are given in figure K.6 and in table K.4		N/A
	Compliance is checked by inspection and by measurement	See table on page__	N/A
K.8.2.3	**Male tabs shall be securely retained**		N/A

EN 61009-1			
Cl.	Requirement - Test	Result	Verdict
	Compliance is checked by the mechanical overload test of K.9.1		N/A
K.9	**Tests**		N/A
	Clause 9 applies, with follow modifications:		N/A
	Replacement of 9.5		N/A
K.8.1	**Mechanical overload-force**		N/A
	10 terminals of circuit-breakers, mounted as normal use are subjected to a axial push force and successively the axial pull force specified in table K2 applied to male tab once	Push force 96N Pull force 88N	N/A
	No damage which could impair further use shall occur to the tab or to the circuit-breaker in which the tab is integrated		N/A
	Addition to 9.8.3		N/A
K.8.2	Fine-wire thermocouples shall be placed in such a way as not to influence the contact or the connection area. An example of placement is shown in fig K.1		N/A

EN 61009-1					
Cl.		Requirement - Test		Result	Verdict
		Dimensions of tabs according Table K.3		Measured in mm	Verdict
		Minimum	Maximum	———	N/A
A	Dimple	0,7	1,0	———	N/A
	Hole	0,5	1,0	———	N/A
B	Dimple	7,8 min		———	N/A
	Hole	7,8 min		———	N/A
C	Dimple	0,77	0,84	———	N/A
	Hole	0,77	0,84	———	N/A
D	Dimple	6,20	6,40	———	N/A
	Hole	6,20	6,40	———	N/A
E	Dimple	3,6	4,1	———	N/A
	Hole	4,3	4,7	———	N/A
F	Dimple	1,6	2,0	———	N/A
	Hole	1,6	2,0	———	N/A
J	Dimple	8°	12°	———	N/A
	Hole	8°	12°	———	N/A
M	Dimple	2,2	2,5	———	N/A
	Hole	--	--	--	N/A
N	Dimple	1,8	2,0	———	N/A
	Hole	--	--	--	N/A
P	Dimple	0,7	1,8	———	N/A
	Hole	0,7	1,8	———	N/A
Q	Dimple	8,9 min	--	———	N/A
	Hole	8,9 min	--	———	N/A
B3			7,8 max	———	N/A
L2			3,5 max	———	N/A

Test sequence		Clause or Sub-clause	Test (or inspection)
A		6 8.1.1 8.1.2 9.3 8.1.3 8.1.6 9.4 9.5 9.6 8.1.3 9.14 9.15 9.16	Marking General Mechanism Indelibility of marking Clearances and creepage distances (external parts only) Non-interchangeability Reliability of screws, current-carrying parts and connections Reliability of terminals for external conductor Protection against electric shock Clearances and creepage distances (internal parts only) Resistance to heat Resistance to abnormal heat and to fire Resistance to rusting
B		9.7 9.8 9.9	Dielectric properties Temperature rise 28-day test
C	C_1	9.11 9.12.11.2 9.12.12	Mechanical and electrical endurance Performance at reduced short-circuit currents Verification of circuit-breaker after short-circuit tests
	C_2	9.12.11.2.2 9.12.12	Short-circuit test for verifying the suitability of circuit-breakers for use in IT systems Verification of the circuit-breaker after short-circuit test
D	D_1	9.10	Tripping characteristic
	D_2	9.13 9.12.11.3 and 9.12.12	Resistance to mechanical shock and impact Short-circuit performance at 1500 A Verification of circuit-breaker after short-circuit tests
E	E_1	9.12.11.4.2 and 9.12.12.1	Service short-circuit capacity (lcs) Verification of circuit-breaker after short-circuit tests
	E_2	9.12.11.4.3 and 9.12.12.2	Performance at rated short-circuit capacity (lcn) Verification of circuit-breaker after short-circuit tests
NOTE: With the agreement of the manufacturer the same samples may be used for than one test sequence.			

<table>
<tr><th colspan="2">Test sequence</th><th>Number of samples</th><th>Minimum number of samples which shall pass the tests [a)b)]</th><th>Number of samples for repeated tests [c)]</th></tr>
<tr><td colspan="2">A</td><td>1</td><td>1</td><td>-</td></tr>
<tr><td colspan="2">B</td><td>3</td><td>2</td><td>3</td></tr>
<tr><td rowspan="2">C</td><td>C_1</td><td>3</td><td>2[e)]</td><td>3</td></tr>
<tr><td>C_2[f)]</td><td>3</td><td>2[e)]</td><td>3</td></tr>
<tr><td colspan="2">D</td><td>3</td><td>2[e)]</td><td>3</td></tr>
<tr><td colspan="2">E_1</td><td>3+3[d)]</td><td>2[e)]+2[d)e)]</td><td>3+3[d)]</td></tr>
<tr><td colspan="2">E_2</td><td>3+4[d)]</td><td>2[e)]+3[d)e)]</td><td>3+4[d)]</td></tr>
</table>

a) In total, a maximum of two test sequences may be repeated.

b) It is assumed that a sample which has not passed a test has not met the requirements due to workmanship or assembly defects which are not representative of the design.

c) In the case of repeated tests, all results shall be acceptable.

d) Supplementary samples in case of single-pole circuit-breakers rated 230/400V(see table 1).

e) All samples shall meet the test requirement of 9.12.10, 9.12.11.2, 9.12.11.3 and 9.12.11.4, as appropriate.

f) For this sequence read "number of protected poles" instead of "number of samples"

Test sequence		Number of samples depending on number of poles a)			
		1 pole b)	2 pole c)	3 pole d)	4 pole e)
A		1 maximum rated current 1 maximum rated current	1 maximum rated current g) l)	1 maximum rated current l)	1 maximum rated current l)
B		3 maximum rated current	3 maximum rated current g)	3 maximum rated current	3 maximum rated current
C	C^1	3 maximum rated current	3 maximum rated current g)	3 maximum rated current	3 maximum rated current
	C^2	3 maximum rated current	2 maximum rated current for 2 protected poles, or 3 maximum rated current for one protected pole	1 maximum rated current	1 maximum rated current
D_0+D_1		3 maximum rated current	3 maximum rated current h)	3 maximum rated current	3 maximum rated current
D_0		1 of all other rated currents			
E_1		3+3 f) maximum rated current 3+3 f) maximum rated current	3 maximum rated current 3 maximum rated current	3 maximum rated current 3 maximum rated current	3 maximum rated current 3 maximum rated current
E_2		3+4 f) maximum rated current 3+4 f) maximum rated current	3 maximum rated current 3 maximum rated current	3 maximum rated current 3 maximum rated current	3 maximum rated current 3 maximum rated current

a) If a test is to be repeated according to the according to the acceptance criteria of C.2, a new set of samples is used for the relevant test sequence. In repeated tests all results shall be satisfactory.
b) If only multipole circuit-breakers are submitted, this column applies to the set of samples having the smallest number of poles (instead of the relevant column).
c) Applicable to two-pole circuit-breakers whether with two protected poles or with one protected pole.
d) This series is omitted when four-pole circuit-breaker are also tested.
e) Also applicable to circuit-breakers with three protected poles and a neutral pole.
f) Supplementary samples in case of single-pole circuit-breakers of 6.3.1.4
g) This test sequence is omitted when three-pole or four-pole circuit-breakers have been tested.
h) This test sequence shall be omitted for two-pole circuit-breakers with two protected poles, when three-pole or four-pole circuit-breaker have been tested.
i) When multipole circuit-breakers are submitted, a maximum of four screw-type terminals for external conductors are subjected to the tests of 9.5, i.e. two supply and two load terminals.

Circuit-breaker type-tested first	Subsequent test sequences of circuit-breakers of		
	B- type	C- type	D- type
B- type	--	$(D_0+D_1)+E$	$(D_0+D_1)+E$
C- type	$D_0{}^a+B^a$	--	$(D_0+D_1)+E$
D- type	$D_0{}^a+B^a$	$D_0{}^a+B^{ab}$	--

a For these test sequence only the tests of 9.8 and 9.10.2 are required.

b When certification is requested at the same time for B-type, C-type and D-type circuit-breakers having the same rated short-circuit capacity, only test sequence D_0 is required if B-type and D-type samples have been tested.

PRODUCT LABELING

CE Mark Label Specification

Specifications: Text is Black or white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT.

EUT PHOTOGRAPHS (EUT FRONT VIEW)

Manufacturer/Approval holder Declaration

The following identical model(s):

HSL7 230V/240V~2P(1P+N), B&C type, 6A~63A, 50/60Hz, 10mA, 30mA, 100mA, 300mA, TYPE AC, TYPE A, 10KA

Belong to the tested device:

Product description: **RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERLOAD PROTECTION**

Model name: **HSL7**

No additional models were tested.

EC DECLARATION OF CONFORMITY

Council Directive 2014/35/EU on LVD Directive

WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD
NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, YUEQING, ZHEJIANG, CHINA

DESCRIPTION OF TEST ITEM

RESIDUAL CURRENT CIRCUIT BREAKER WITH OVERLOAD PROTECTION

TYPE IDENTIFICATION

HSL7 230V/240V~2P(1P+N), B&C type, 6A~63A, 50/60Hz, 10mA, 30mA, 100mA, 300mA, TYPE AC, TYPE A, 10KA

THE PRODUCT HAS BEEN ASSESSED BY THE APPLICATION ON THE FOLLOWING DIRECTIVES：

EN 61009-1:2012+A12:2015

(Place & Date of issue)

Company stamp and
Signature of Authorized Personnel

Test Report No.: 8609114

TECHNICAL CONSTRUCTION FILE (TCF)

EU LOW VOLTAGE DIRECTIVE 2014/35/EU

PROJECT NO.: 8609117
Registration NO.: VT18120199

EN 60947-1:2007+A2:2014 EN 60947-3:2009+A2:2015

WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD

ISOLATING SWITCH

Date of Report: 2018-12-07

VOV Certification & Testing Laboratory Limited

Web: www.vov.org.uk E-mail: vov@vov.org.uk

VOV CERTIFICATION & TESTING LABORATORY

TESTING LABORATORY

Location

VOV CERTIFICATION & TESTING LABORATORY LIMITED
Web: www.vov.org.uk E-mail: vov@vov.org.uk

Details of applicant

Name	:	**WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD**
ADD	:	**NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, YUEQING, ZHEJIANG, CHINA**

Details of manufacturer

Name	:	**WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD**
ADD	:	**NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, YUEQING, ZHEJIANG, CHINA**

Test item

Description of test item	:	**ISOLATING SWITCH**
Type identification	:	**IS-1P, IS-2P, IS-3P, IS-4P**
Specification	:	**6A~100A AC230/400V, Icw: 12Ie 1S, 3000A, 0.1S**

Test Standards

EN 60947-1:2007+A2:2014 EN 60947-3:2009+A2:2015

AUDIT INFORMATION:			
Description of Test	Standard No.	EN 60947-1:2007+A2:2014 EN 60947-3:2009+A2:2015	
Test Engineer by	Gaither	Signature	
Reviewer by	Randy Tan	Signature	
VOV CERTIFICATION & TESTING LABORATORY LIMITED			

Test item particulars -- LOAD ISOLATION SWITCH

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(Fall)

Testing Date:

Date of receipt of test item : 2018-11-19
Date(s) of performance of tests : 2018-11-19～2018-12-07

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.

Test product information:

Type identification : **IS-1P, IS-2P, IS-3P, IS-4P**
Specification : **6A~100A AC230/400V, Icw: 12Ie 1S, 3000A, 0.1S**

Test Result:

Pass

FOR FURTHER DETAILS, PLEASE REFER TO THE FOLLOWING PAGES

1- GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The ***WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD*** Model ***IS-1P, IS-2P, IS-3P, IS-4P 6A~100A AC230/400V, ICW: 12IE 1S, 3000A, 0.1S*** in this report is the ***LOAD ISOLATION SWITCH***. Product's details are presented Appendix.

Note : The test data was only good for the test sample. It may have deviation from other sample.

1.2 Objective

The following Declaration of Conformity report of the ***LOAD ISOLATION SWITCH*** equipment is prepared on behalf of ***WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD***, In accordance with ***EN 60947-1:2007+A2:2014 EN 60947-3:2009+A2:2015.***

2、Test equipment utilized

ID-Nr.	Test-Equipment	Type	Manufacturer
V001	Protective wire and insulation tester	PI 6001 D	SPS electronic
V002	Test pin for protective wire	PE 15-i	SPS electronic
V003	Power supply	MX-9300	MAXCOM
V004	Frequency counter	MX-9300	MAXCOM
V005	Function generator	MX-9300	MAXCOM
V006	Digital multimeter	MX-9300	MAXCOM
V007	Spectrum analyzer	PSA 65A	AVCOM
V008	Climatic chamber	HC 4033	Heraeus Votsch
V009	Programmable power supply	TOE 8815	Toellner
V010	Power supply	DF 1730	WJG
V011	Regeltrafo		TPW/RFT
V012	High Voltage Generator		
V013	Digital oscilloscope (2Gs/s)	TDS 640A	Tektronix
V014	High Voltage probe	P 6015	Tektronix
V015	Wheatstone bridge	J 573	RFT
V016	Function generator	MX 2020	MAXCOM
V017	Sweep function generator	7202	Dagatron
V018	Audio generator	7101	Dagatron
V019	Vibration table		Sandox
V020	LCR Meter	SR 720	Rhode & Schwarz
V021	Digital multimeter	PMM 208	Dagatron
V022	Thermo hygro recorder	C 042801	Amarell
V023	Digital thermometer	AK-688	KD
V024	Digital thermometer		PRIMA
V025	Digital thermometer	ad 170th	ama-digit
V026	Digital thermometer	ad 31th	ama-digit

V027	Digital thermometer/humidity meter	ad 90th	ama-digit
V028	Digital thermometer/humidity meter	37950-10	Cole Parmer
V029	Digital thermometer	ad 15th	ama-digit
V030	Digital thermometer	Type K	Amarell
V031	Digital thermometer	ad 20th	ama-digit
V032	High voltage test generator	HA 3300 D	SPS electronic
V033	High voltage test accessories	HVGZ 312	SPS electronic
V034	Socket-Outlet Torque Balance	F 37.13	PTL
V035	Force Indicator 50N	P 10.31	PTL
V036	Unjointed Finger Probe	P 10.05	PTL
V037	Flexible Finger Probe	P 10.01	PTL
V038	Spring Operated Impact Hammer var.	F 22.50	PTL
V039	Metallic Ball	F 53.32	PTL
V040	Hazardous Live Probe	P 10.06	PTL
V041	Hazardous Live Probe	P 10.11	PTL
V042	Ball Pressure Test Apparatus	T 10.02	PTL
V043	Glow Wire Tester	T 03.14	PTL
V044	8-Channel Digital Thermometer	ADAM-4018M	Advantech
V045	8-Channel Digital Thermometer	ADAM-4018M	Advantech
V046	Laser test system	LM-ULTIMA	Coherent
V047	Optical comparator	8x	Hensoldt-Wetzlar
V048	Optical comparator	20x	Hensoldt-Wetzlar
V049	Optical comparator	40x	Hensoldt-Wetzlar
V050	Digital Calliper	10-871-2	ED&D
V051	Feeler Gauges	set	LGA

3、EN 60947-1:2007+A2:2014 EN 60947-3:2009+A2:2015 Test Report

Clause	Requirement - Test	Result - Remark	Verdict
3	Classification		-
	Circuit-breakers may be classified:		-
3.1	According to the utilization category	Category: A	P
3.2	According to the method of operation of manually operated equipment – dependent manual operation (see 2.13); – independent manual operation (see 2.14); – semi-independent manual operation (see 2.15).	dependent manual operation	P
3.3	According to suitability for isolation – suitable for isolation (see 7.1.7 of IEC 60947-1 and 7.1.7.1); – not suitable for isolation.	isolation	P
3.4	According to the degree of protection provided	See 7.1.12 of IEC 60947-1.	P
4	Characteristics		-
4.1	Summary of characteristics	IS-1P, IS-2P, IS-3P, IS-4P 6A~100A AC230/400V, ICW: 12IE 1S, 3000A, 0.1S	-
	The characteristics of the equipment shall be stated in terms of the following as applicable: – type of equipment (see 4.2); – rated and limiting values for the main circuit (see 4.3); – utilization category (see 4.4); – control circuits (see 4.5); auxiliary circuits (see 4.6);		P
4.2	Type of equipment		-
	The following shall be stated.		P
4.2.1	Number of poles		-
4.2.2	Kind of current	3000A	P

Clause	Requirement - Test	Result - Remark	Verdict
	Kind of current (a.c. or d.c.) and, in the case of a.c., number of phases and rated frequency.	3000A	P
4.2.3	Number of positions of the main contacts (if more than two)	IS-1P, IS-2P, IS-3P, IS-4P	P
4.3	Rated and limiting values for the main circuit Rated values are assigned by the manufacturer. They shall be stated in accordance with 4.3.1 to 4.3.6.4 but it may not be necessary to establish all the rated values listed.		P
4.3.1	Rated voltages An equipment is defined by the following rated voltages.	3000A	P
4.3.1.1	Rated operational voltage (Ue) Subclause 4.3.1.1 of IEC 60947-1 applies.	3000A	P
4.3.1.2	Rated insulation voltage (Ui) Subclause 4.3.1.2 of IEC 60947-1 applies.	3000A	P
4.3.1.3	Rated impulse withstand voltage (Uimp) Subclause 4.3.1.3 of IEC 60947-1 applies.	3000A	P
4.3.2	Currents An equipment is defined by the following currents.	3000A	P
4.3.2.1	Conventional free air thermal current (Ith) Subclause 4.3.2.1 of IEC 60947-1 applies.		P
4.3.2.2	Conventional enclosed thermal current (Ithe) Subclause 4.3.2.2 of IEC 60947-1 applies.		-
4.3.2.3	Rated operational currents (Ie) (or rated operational powers) Subclause 4.3.2.3 of IEC 60947-1 applies.		-
4.3.2.4	Rated uninterrupted current (Iu) Subclause 4.3.2.4 of IEC 60947-1 applies.		-
4.3.3	Rated frequency Subclause 4.3.3 of IEC 60947-1 applies.		-
4.3.4	Rated duty The rated duties considered as normal are as follows.		-
4.3.4.1	Eight-hour duty Subclause 4.3.4.1 of IEC 60947-1 applies.		-

Clause	Requirement - Test	Result - Remark	Verdict
4.3.4.2	Uninterrupted duty Subclause 4.3.4.2 of IEC 60947-1 applies.		-
4.3.5	Normal load and overload characteristics		-
4.3.5.1	Ability to withstand motor switching overload currents See Annex A.		-
4.3.5.2	Rated making capacity Subclause 4.3.5.2 of IEC 60947-1 applies with the following additions.	Not applicable to DC-20 equipment.	-
4.3.5.3	Rated breaking capacity Subclause 4.3.5.3 of IEC 60947-1 applies with the following additions.		-
4.3.6	Short-circuit characteristics		-
4.3.6.1	Rated short-time withstand current (Icw)		-
	The rated short-time withstand current of a switch, a disconnector or a switch-disconnector is the value of short-time withstand current, assigned by the manufacturer, that the equipment can carry without any damage under the test conditions of 8.3.5.1.		P
4.3.6.2	Rated short-circuit making capacity (Icm)		-
4.3.6.3	Vacant		-
4.3.6.4	Rated conditional short-circuit current	Sub clause 4.3.6.4 of IEC 60947-1 applies.	P
4.4	Utilization category		-
	Utilization categories with suffix B are appropriate for devices which, due to design or application, are only intended for infrequent operation. This could apply, for example, to disconnections normally only operated to provide isolation for maintenance work or switching devices where the fuse-link blade forms the moving contact.	DC	P

Clause	Requirement - Test	Result - Remark	Verdict
4.5	Control circuits Subclause 4.5 of IEC 60947-1 applies.	3000A	P
4.6	Auxiliary circuits Subclause 4.6 of IEC 60947-1 applies.		-
4.7	Relays and releases Subclause 4.7 of IEC 60947-1 applies.		P
5	Product information		-
5.1	Nature of information		-
	Subclause 5.1 of IEC 60947-1 applies as appropriate for a particular design.		-
5.2	Marking		-
5.2.1	Each equipment shall be marked in a durable and legible manner with the following data.		P
	The markings for a), b) and c) below shall be on the equipment itself or on a name-plate or name-plates attached to the equipment, and shall be located at a place such that they are legible from the front after mounting the equipment in accordance with the manufacturer's instructions. a) Indication of the open and closed position. The open and closed position shall be respectively indicated by the graphical symbols 60417-IEC-5007 and 60417-IEC-5008 of IEC 60417-2 (see 7.1.6.1 of IEC 60947-1). b) Suitability for isolation. The appropriate symbols of Table 1 shall be used. c) Additional marking for disconnectors.		P
5.2.2	The following data shall also be marked on the equipment but need not be visible from the front when the equipment is mounted: a) manufacturer's name or trade mark; b) type designation or serial number; c) rated operational currents (or rated powers) at the rated operational voltage and utilization category (see 4.3.1, 4.3.2 and 4.4);		P

Clause	Requirement - Test	Result - Remark	Verdict
	d) value (or range) of the rated frequency or the indication "d.c." (or the symbol); e) for fuse-combination units, the fuse type and maximum rated current and the power loss of the fuse-link; f) IEC 60947-3, if the manufacturer claims compliance with this part; g) degree of protection of enclosed equipment (see Annex C of IEC 60947-1).		P
5.2.3	The following terminals shall be identified: a) line and load terminals unless the connection is immaterial (see 8.3.3.3.1); b) neutral pole terminal, if applicable, by the letter "N" (see 7.1.8.4 of IEC 60947-1); c) protective earth terminal (see 7.1.10.3 of IEC 60947-1).		P
5.2.4	The following data shall be made available in the manufacturer's published information: a) rated insulation voltage; b) rated impulse withstand voltage for equipment suitable for isolation or when determined; c) pollution degree, if different from 3; d) rated duty; e) rated short-time withstand current and duration, where applicable; f) rated short-circuit making capacity, where applicable; g) rated conditional short-circuit current, where applicable.		P
5.3	Instructions for installation, operation and maintenance Sub clause 5.3 of IEC 60947-1 applies.		P
6	Normal service, mounting and transport conditions		-
	Clause 6 of IEC 60947-1 applies with the following addition. Pollution degree (see 6.1.3.2 of IEC 60947-1). Unless otherwise stated by the manufacturer, the equipment is intended for installation under environmental conditions of pollution degree 3.		P

Clause	Requirement - Test	Result - Remark	Verdict
7	Constructional and performance requirements		-
7.1	Constructional requirements Subclause 7.1 of IEC 60947-1 applies, with the following additions.		-
7.1.2	Materials		-
	The suitability of materials used shall be verified with respect to resistance to abnormal heat and fire by conducting tests a) on the equipment; or b) on sections taken from the equipment; or c) on samples of identical material having a representative cross-section. If an identical material having a representative cross-section has already satisfied the requirements, then those tests need not be repeated.		P
7.1.2.2	Glow wire testing		-
	Subclause 7.1.2.2 of IEC 60947-1 applies with the following additions. Parts of insulating material necessary to retain current-carrying parts in position shall conform to the glow-wire tests of 8.2.1.1.1 of IEC 60947-1 at a test temperature of 960 °C.		P
7.1.4	Clearances and creepage distances Subclause 7.1.4 of IEC 60947-1 applies with the following addition. Guidance on the measurement of clearances and creepage distances is given in Annex G of IEC 60947-1.		P
7.1.7	Additional requirements for equipment suitable for isolation Subclause 7.1.7 of IEC 60947-1 applies with the following additions.		P
7.1.7.1	Additional constructional requirements The equipment shall be marked according to 5.2.1 b).		P
7.1.7.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers		P

Clause	Requirement - Test	Result - Remark	Verdict
7.1.7.3	Supplementary requirements for equipment provided with means for padlocking the open position		-
	The locking means shall be designed in such a way that it cannot be removed with the appropriate padlock(s) installed. When the equipment is locked by even a single padlock, it shall not be possible by operating the actuator, to reduce the clearance between open contacts to the extent that it no longer complies with the requirements of 7.2.3.1 b) of IEC 60947-1.		P
	Alternatively, the design may provide padlockable means to prevent access to the actuator.		-
7.1.9	Additional requirements for equipment provided with a neutral pole		-
	Subclause 7.1.9 of IEC 60947-1 applies except for the note referring to an over-current release.		P
7.1.12	Degrees of protection of enclosed equipment Degrees of protection of enclosed equipment and relevant tests are given in Annex C of IEC 60947-1.		-
7.2	Performance requirements		-
7.2.1	Operating conditions		-
7.2.1.1	General		-
	Subclause 7.2.1.1 of IEC 60947-1 applies with the following additions. The following requirements apply to fuse-switches, fuse-disconnectors and fuse-switch disconnectors with a rated short-circuit making capacity exceeding 10 kA and for which the closing operation is by direct manual operation without an interposing mechanism (dependent and semi-independent manual operation see 2.13 and 2.15).		P
	The test speed for the making operations specified in 8.3.6.2 shall be determined as follows.		-

Clause	Requirement - Test	Result - Remark	Verdict
	a) The equipment shall be operated 15 times manually under no-load conditions in accordance with the manufacturer's instructions, 5 times by each of three persons. The velocity of the hand actuator at the instant of contact closure of the last closing contact shall be determined by oscillographic or other appropriate means at any convenient part of the device. The point at which the measurement is made and the velocity at the measurement point shall be stated in the test report. The mean velocity shall be determined after deleting the highest and lowest values. b) The test apparatus shall ensure that the equipment under test fully closes and that there is no impediment to the free closing movement of the device. The actual test speed shall not exceed the mean velocity determined according to a).		P
7.2.2	Temperature rise		-
	Subclause 7.2.2 of IEC 60947-1 applies with the following addition. For fuse-combination units, the temperature rise of the fuse-link contacts during the test according to 8.3.3.1 shall not cause any damage of a nature which impairs the subsequent performance of the equipment in test sequence I.		P
7.2.3	Dielectric properties Subclause 7.2.3 of IEC 60947-1 applies with the following additions.		-
7.2.3.1	Impulse withstand voltage Subclause 7.2.3.1 of IEC 60947-1 applies with the following addition.		-
	Clearances across the open contacts of a device not suitable for isolation shall withstand the test voltage given in Table 12 of IEC 60947-1 appropriate to the rated impulse withstand voltage.		P
7.2.3.2	Power-frequency withstand voltage of the main, auxiliary and control circuits Subclause 7.2.3.2 c) of IEC 60947-1 applies with the following addition.		P

Clause	Requirement - Test	Result - Remark	Verdict
7.2.4	Ability to make and break under no-load, normal load and overload conditions		-
7.2.4.1	Making and breaking capacities		-
	The rated making and breaking capacities are stated by reference to the rated operational voltage and rated operational current and to the utilization category according to Table 3.	The test conditions are specified in 8.3.3.3.1.	P
7.2.4.2	Operational performance		-
	Tests concerning the verification of the operational performance of an equipment are intended to verify that the equipment is capable of making and breaking without failure the currents flowing in its main circuit for the intended use. The number of operating cycles and the test circuit parameters for the operational performance test for the various utilization categories are given in Tables 4 and 5.		P
7.2.4.3	Mechanical durability Subclause 7.2.4.3.1 of IEC 60947-1 applies. Test conditions are specified in 8.5.1.	120 Number of operating cycles per hour	P
7.2.4.4	Electrical durability Subclause 7.2.4.3.2 of IEC 60947-1 applies. Test conditions are specified in 8.5.2.		P
7.2.5	Ability to make, break or withstand short-circuit currents		-
	The equipment shall be so constructed as to be capable of withstanding, under the conditions specified in this part, the thermal, dynamic and electrical stresses resulting from short-circuit currents. Short-circuit currents may be encountered during current making, current carrying in the closed position and current interruption. a) Rated short-time withstand current (see 4.3.6.1). b) Rated short-circuit making capacity (see 4.3.6.2). c) Rated conditional short-circuit current (see 4.3.6.4).		P

Clause	Requirement - Test	Result - Remark	Verdict
7.2.6	Vacant		-
7.2.7	Additional performance requirements for equipment suitable for isolation		-
	These requirements only apply to equipment with rated operational voltage greater than 50 V. With the equipment in new condition and the contacts in the open position the equipment shall withstand the dielectric test of 8.3.3.2.		P
7.2.8	Vacant		-
7.2.9	Overload requirements for equipment incorporating fuses		-
	The main circuit of an equipment shall be capable of carrying an overload current according to 8.3.7.1 and shall not cause any damage of a nature which impairs the subsequent performance of the equipment in test sequence V.		P
7.3	Electromagnetic compatibility		-
7.3.1	Vacant		-
7.3.2	Immunity		-
7.3.2.1	Equipment not incorporating electronic circuits		-
	Equipment within the scope of this part standard not incorporating electronic circuits are not sensitive to electromagnetic disturbances in normal service conditions and therefore no immunity tests are required.		P
7.3.2.2	Equipment incorporating electronic circuits		-
	Equipment incorporating electronic circuits (e.g. an electronic fuse-blowing indicator) shall have a satisfactory immunity to electromagnetic disturbances (see 8.4.1.2).		P

Clause	Requirement - Test	Result - Remark	Verdict
7.3.3	Emission		-
7.3.3.1	Equipment not incorporating electronic circuits		-
	For equipment not incorporating electronic circuits, electromagnetic disturbances can only be generated during occasional switching operations. The duration of disturbances is in the order of milliseconds.		P
	The frequency, level and consequences of these emissions are considered as a part of the normal electromagnetic environment of low-voltage installations.		P
7.3.3.2	Equipment incorporating electronic circuits		-
	Equipment incorporating electronic circuits (e.g. an electronic fuse-blowing indicator) may generate continuous electromagnetic disturbances.		P
	These limits are given for mechanical switching devices which are used exclusively in an industrial environment. When there exists a likelihood of use outside the industrial environment, the following notice shall be included in the manufacturer's published information.	Caution This is a class A product. In a domestic environment, this product may cause radio interference in which case the user may be required to take adequate measures.	P
8	Tests		-
8.1	Kind of tests		-
8.1.1	General Subclause 8.1.1 of IEC 60947-1 applies.		-
8.1.2	Type tests		-
	Subclause 8.1.2 of IEC 60947-1 applies. Type tests are given in Table 9 of this part.		-

Clause	Requirement - Test	Result - Remark	Verdict
8.1.3	Routine tests		-
	Subclause 8.1.3 of lEC 60947-1 applies with the following additions.		-
8.1.3.1	General		-
	The following tests apply: – mechanical operation test (see 8.1.3.2) operation of the switch, disconnector, switch-disconnector or fuse-combination unit during manufacture and/or other routine test may take the place of the tests listed above, provided the same conditions apply and the number of operations is not less than that specified; – dielectric test (see 8.1.3.3) if, by the control of materials and manufacturing processes, the integrity of the dielectric properties has been proven, these tests may be replaced by sampling tests according to a recognized sampling plan (see IEC 60410).		P
8.1.3.2	Mechanical operation test A test shall be made to verify the correct mechanical operation of the equipment by 5 closing and opening operations.		P
	8.1.3.3 Dielectric test The test conditions shall be in accordance with 8.3.3.4.2 of IEC 60947-1. As an alternative, the combined test according to 8.3.3.4.2, item 3), of IEC 60947-1 is allowed. The value of the test voltage shall be in accordance with that given in Table 12A of IEC 60947-1. The duration of the test shall not be less than 1 s and the test voltage shall be applied as follows: – with the equipment in the open position, between each pair of terminals which are electrically connected together when the equipment is closed; – with the equipment in the closed position, between each pole and the adjacent pole(s) and between each pole and the frame;		P

Clause	Requirement - Test	Result - Remark	Verdict
	– for equipment incorporating electronic circuits connected to the main poles, with the equipment in the open position, between each pole and the adjacent pole(s) and between each pole and the frame, either on the incoming side or the outgoing side depending on the position of the electronic components.		P
8.1.5	Special tests Special tests (see 2.6.4 of IEC 60947-1) are specified in 8.5.		-
8.2	Type tests for constructional requirements Subclause 8.2 of IEC 60947-1 applies with the following additions.		P
8.2.4	Mechanical properties of terminals Subclause 8.2.4 of IEC 60947-1 applies with the following addition. Where equipment is designed to be provided with different designs of terminals, the tests shall be conducted on every design.		P
8.2.5	Verification of the effectiveness of indication of the main contacts position of equipment suitable for isolation Subclause 8.2.5 of IEC 60947-1 applies with the following additions.		P
8.2.5.1	Condition of equipment for tests The test of the actuator mechanism and position indicating device shall be conducted as part of test sequence I (see 8.3.3 and Table 11).		P
8.2.5.2	Method of test		-
8.2.5.2.1	Dependent and independent manual operation		-
	The force necessary to operate the device to the open position shall be measured at the extremity of the actuator. The measured force F shall be equal to the average value of maximum force obtained from 3 consecutive operations, with the device in a clean and new condition. This force F shall then be used for the establishment of the test force in Table 8.		P
8.2.5.2.2	Dependent power operation	Verification shall be made according to 8.2.5.3.2.	-

Clause	Requirement - Test	Result - Remark	Verdict
8.2.5.2.3	Independent power operation		-
	With the equipment in the closed position, the fixed and moving contacts of the pole for which the test is deemed to be the most severe shall be fixed together, for example by welding. Where the device has more than one contact system in series, each contact system shall be held in the closed position.		P
8.2.5.3	Condition of equipment during and after test		-
8.2.5.3.1	Dependent and independent manual operation		-
	After the test and when the test force is no longer applied to the actuator with the actuator being left free, the indication of the open position shall not be wrongly given.		-
8.2.5.3.2	Dependent and independent power operation		-
	During and after the test, the open position shall not be indicated by any of the means provided and the equipment shall not show any damage such as to impair its normal operation.		P
8.3	Performance		-
	Performance type tests to which equipment may be submitted according to its kind are listed in Table.		P
8.3.1	Test sequences Type tests are grouped together in a number of sequences as shown in Table 10.		-
	For each sequence, tests shall be made in the order listed in accordance with the requirements of the appropriate subclause, apart from the temperature-rise test (simplified testing only) and dielectric properties test of test sequence I, which may be conducted on a separate sample.		P
8.3.2	General test conditions		-

Clause	Requirement - Test	Result - Remark	Verdict
8.3.2.1	General requirements		-
	Subclause 8.3.2.1 of IEC 60947-1 applies to all type tests as applicable. The equipment at the start of any test sequence shall be in new and clean condition.		P
8.3.2.1.1	Simplified test for equipment having the same fundamental design		-
	When submitting simultaneously a range of switches, disconnectors, switch-disconnectors or fuse combination units of the same fundamental design, the following variations are permitted provided the equipment complies in all other respects.		-
8.3.2.1.2	Requirements for equipment having the same fundamental design		-
	Switches, disconnectors, switch-disconnectors or fuse combination units shall be evaluated with respect to the following criteria during the determination of acceptance as the same fundamental design: a) the material, finish and dimensions of the current-carrying parts are identical, except for variation in design of terminals and means of fuse attachment; b) the contact size, material, configuration and method of attachment are identical; c) the operating mechanism is of the same fundamental design, materials and physical characteristics are identical; d) the closing and opening speeds of contacts are substantially the same; e) moulding and insulating materials are identical; f) method, materials and construction of any arc extinction device are identical.		P
8.3.2.1.3	Simplified test procedure		-

Clause	Requirement - Test	Result - Remark	Verdict
8.3.2.2	Test quantities		-
	Subclause 8.3.2.2 of IEC 60947-1 applies.		-
8.3.2.3	Evaluation of test results		-
	The behaviour of the equipment during the tests and its condition after the tests are specified in the appropriate test clause.		P
8.3.2.4	Test report Subclause 8.3.2.4 of IEC 60947-1 applies.	See report	-
8.3.3	Test sequence I: general performance characteristics		-
	This test sequence applies to the types of equipment listed in Table 11 and comprises the tests according to the table.		P
8.3.3.1	Temperature-rise Sub clause 8.3.3.3 of IEC 60947-1 applies with the following additions.	Terminals for external connections 80K Manual operating means: - metallic 25K - non-metallic 35K Parts intended to be touched but not hand-held: - metallic 40K - non-metallic 50K Parts which need not be touched for normal operation: - metallic 50K - non-metallic 60K	P
8.3.3.2	Test of dielectric properties Subclause 8.3.3.4.1, items 1), 2), 3), 7) and, if applicable, 8) of IEC 60947-1 applies with the following addition.		-
8.3.3.3	Making and breaking capacities		-
8.3.3.3.1	Test values and conditions		-
8.3.3.3.2	Test circuit Subclause 8.3.3.5.2 of IEC 60947-1 applies.		-

Clause	Requirement - Test	Result - Remark	Verdict
8.3.3.3.3	Transient recovery voltage Sub clause 8.3.3.5.3 of IEC 60947-1 applies only to utilization categories AC-22 and AC-23. For tests for utilization categories DC-22 and DC-23 the test circuit load may be replaced by a motor producing the specified current and time constant value if agreed between manufacturer and user.		-
8.3.3.3.4	Vacant		-
8.3.3.3.5	Behaviour of equipment during making and breaking capacity tests		-
	The equipment shall perform during the above tests in such a manner as not to endanger an operator or cause damage to adjacent equipment.		-
8.3.3.3.6	Condition of equipment after the making and breaking capacity tests		-
	It shall be demonstrated immediately after the test that the equipment will close and open satisfactorily during a no-load close/open operation.		P
8.3.3.4	Dielectric verification		-
	After the test according to 8.3.3.3, a test shall be made according to 8.3.3.4.1 4) of IEC 60947-1.		P
8.3.3.5	Leakage current		-
	This test is made only on equipment suitable for isolation of rated operational voltage Ue greater than 50 V. The leakage current shall be checked across each contact gap and from each terminal to the frame.		P
	The value of leakage current, with a test voltage equal to 1,1 times the rated operational voltage of equipment shall not exceed – 0,5 mA per pole for equipment of utilization category AC-20A, AC-20B, DC-20A or DC-20B; – 2 mA per pole for equipment of all other utilization categories.		P
8.3.3.6	Temperature-rise verification		-

Clause	Requirement - Test	Result - Remark	Verdict
8.3.3.7	Strength of actuator mechanism		-
	Subclause 8.2.5 applies to equipment suitable for isolation.		-
8.3.4	Test sequence II: operational performance capability		-
8.3.4.1	Operational performance test		-
8.3.4.1.1	Test values and conditions		-
	The test values are stated in Tables 4 and 5, according to the utilization category.		-
8.3.4.1.2	Test circuit		-
	Subclause 8.3.3.5.2 of IEC 60947-1 applies.		-
8.3.4.1.3	Transient recovery voltage		-
	It is not necessary to adjust the transient recovery voltage.		-
8.3.4.1.4	Switching overvoltage		-
8.3.4.1.5	Behaviour of the equipment during the operational performance test		-
8.3.4.1.6	Condition of the equipment after the operational performance test		-
	It shall be demonstrated immediately after the test that the equipment will close and open satisfactorily during a no-load close/open operation.		-
8.3.4.2	Dielectric verification Subclause 8.3.3.4 applies.		-
8.3.4.3	Leakage current Subclause 8.3.3.5 applies.		-
8.3.4.4	Temperature-rise verification Subclause 8.3.3.6 applies.		-

Clause	Requirement - Test	Result - Remark	Verdict
8.3.5	Test sequence III: short-circuit performance capability This test sequence applies to the types of equipment listed in Table 14 and comprises the tests according to this table.		-
	This test sequence is not mandatory if a value of rated short-circuit making capacity is not stated by the manufacturer (see 8.3.5.2.1) and test sequence IV (see 8.3.6) is carried out.		-
8.3.5.1	Short-time withstand current test		-
8.3.5.1.1	Test values and conditions The test conditions of 8.3.4.3 of IEC 60947-1 apply. The test current shall be the rated short-time withstand current stated according to 4.3.6.1.	3000A	P
8.3.5.1.2	Test circuit Subclause 8.3.4.1.2 of IEC 60947-1 applies. For a.c., the power-factor of the test circuit shall be in accordance with 8.3.4.1.3 of IEC 60947-1. For d.c., the time-constant of the test circuit shall be in accordance with 8.3.4.1.4 of IEC 60947-1.	3000A	P
8.3.5.1.3	Test circuit calibration The calibration of the test circuit is carried out by placing temporary connections B of negligible impedance as close as reasonably possible to the terminals provided for connecting the equipment under test.		P
8.3.5.1.4	Test procedure The temporary connections B are replaced by the equipment under test and the test current is applied for the specified time with the equipment in the closed position.		P
8.3.5.1.5	Behaviour of the equipment during the test		-
8.3.5.1.6	Conditions of the equipment after the test It shall be demonstrated immediately after the test that the equipment will close and open satisfactorily during a no-load close/open operation.		P

Clause	Requirement - Test	Result - Remark	Verdict
8.3.5.2	Short-circuit making capacity test		-
8.3.5.2.1	Test values and conditions The test shall be made on the same equipment as for the test of 8.3.5.1 without any maintenance.	The test current shall be that assigned by the manufacturer as stated in 4.3.6.2.	-
8.3.5.2.2	Test circuit Subclause 8.3.5.1.2 applies.		-
8.3.5.2.3	Test circuit calibration The calibration of the test circuit is carried out by placing temporary connections B of negligible impedance as close as reasonably possible to the terminals provided for connecting the equipment under test.		-
	The current shall be applied for the specified time and its mean value, determined from the record, shall be at least equal to the specified value. If the testing station is unable to make these tests on d.c., they may, if agreed between manufacturer and user, be made on a.c., provided suitable precautions are taken, for instance, the peak value of current shall not exceed the permissible current.		P
8.3.5.2.4	Test procedure		-
	The temporary connections B are replaced by the equipment under test and the equipment shall be closed twice with an interval of approximately 3 min between these operations on a prospective peak current not less than the rated short-circuit making capacity of the equipment. The current shall be maintained for at least 0,05 s.		P
8.3.5.2.5	Behaviour of the equipment during the test The equipment shall perform during the above tests in such a manner as not to endanger an operator or cause damage to adjacent equipment.		P
8.3.5.2.6	Condition of the equipment after the test It shall be demonstrated immediately after the test that the equipment will open and close satisfactorily during a no-load open/close operation.		P

Clause	Requirement - Test	Result - Remark	Verdict
8.3.5.3	Dielectric verification Subclause 8.3.3.4 applies.		P
8.3.5.4	Leakage current Subclause 8.3.3.5 applies, except that the maximum value of leakage current shall not exceed 2 mA per pole for all utilization categories.		P
8.3.5.5	Temperature-rise verification Subclause 8.3.3.6 applies.		P
8.3.6	Test sequence IV: conditional short-circuit current This test sequence applies to the types of equipment listed in Table 15 and comprises the tests according to the table.		P
8.3.6.1	Circuit-breaker protected short-circuit withstand		-
8.3.6.2	Fuse protected short-circuit withstand		-
8.3.6.2.1	Test values and conditions The fuse-links shall be of the rated maximum current and rated breaking capacity deemed suitable by the manufacturer for use with the equipment.		P
	The test shall be made as follows. a) Withstand test A prospective current corresponding to the rated conditional short-circuit current stated by the manufacturer shall be applied with the equipment in the closed position. b) Making test After the withstand test of item a), all equipment according to Table 15 shall be fitted with new fuse-links and closed on to the rated conditional short-circuit current.		P
8.3.6.2.2	Test circuit Subclause 8.3.5.1.2 applies.		-
8.3.6.2.3	Test circuit calibration Subclause 8.3.5.2.3 applies.		-
8.3.6.2.4	Test procedure For fuse-switches, fuse-disconnectors and fuse-switch-disconnectors, the closing mechanism shall be operated according to 7.2.1.1.		-

Clause	Requirement - Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test Subclause 8.3.5.2.5 applies.		P
8.3.6.2.6	Condition of the equipment after the test Subclause 8.3.5.2.6 applies.		P
8.3.6.3	Dielectric verification Subclause 8.3.3.4 applies.		P
8.3.6.4	Leakage current Subclause 8.3.5.4 applies.		P
8.3.6.5	Temperature-rise verification Subclause 8.3.3.6 applies.		P
8.3.7	Test sequence V: overload performance capability This test sequence applies to the types of equipment listed in Table 16 and comprises the tests according to the table.		P
8.3.7.1	Overload test The equipment shall first be temperature conditioned at room temperature. The test current is 1,6 Ithe or 1,6 Ith for a period of 1 h, or until one or more of the fuses blow. If the time is less than 1 h, the time shall be recorded in the test report.		P
	The equipment manufacturer shall supply the fuse-links (see IEC 60269 series) to be used for the test. Details of the fuse-links used shall be recorded in the test report.		P
8.3.7.2	Dielectric verification Subclause 8.3.3.4 applies.		P
8.3.7.3	Leakage current Subclause 8.3.3.5 applies.		P
8.3.7.4	Temperature-rise verification Subclause 8.3.3.6 applies with the addition of the following.		P
8.4	Electromagnetic compatibility tests Subclause 8.4 of IEC 60947-1 applies with the following addition. During tests, the following performance criterion applies: – unintentional separation or closing of contacts shall not occur.		-
8.4.1	Immunity 8.4.1.1 Equipment not incorporating electronic circuits		-

Clause	Requirement - Test	Result - Remark	Verdict
8.4.1.2	Equipment incorporating electronic circuits The requirements of 7.3.2.2 apply. To verify compliance with these requirements, the tests contained in Table 6 shall be conducted.		P
8.4.2	Emission		-
8.4.2.1	Equipment not incorporating electronic circuits No tests are necessary (see 7.3.3.1).		-
8.4.2.2	Equipment incorporating electronic circuits The requirements of 7.3.3.2 apply. The limits contained in Table 7 shall be verified by tests.		-
8.5	Special tests Resistance to mechanical and/or electrical wear is demonstrated by the operational performance test detailed in 8.3.4.1.		-
8.5.1	Mechanical durability The mechanical durability test (see 7.2.4.3 and 8.1.5), where required, is made in accordance with the appropriate requirements of 8.3.4.1, except that for equipment suitable for isolation, the maximum value of leakage current shall not exceed 6 mA per pole for all utilization categories.		P
8.5.2	Electrical durability The electrical durability test (see 7.2.4.4 and 8.1.5), where required, is made in accordance with the appropriate requirements of 8.3.4.1, except that for equipment suitable for isolation, the maximum value of leakage current shall not exceed 6 mA per pole for utilization categories AC-21, AC-22, AC-23, DC-21, DC-22 and DC-23.	DC	P
	Equipment of utilization categories AC-20A, AC-20B, DC-20A and DC-20B is not submitted to this test. The total number of operating cycles shall be as declared by the manufacturer.		-
Annex A	Equipment for direct switching of a single motor		-

Clause	Requirement - Test	Result - Remark	Verdict
A.1 General	Switches, switch-disconnectors and fuse-combination units normally intended for direct switching of individual motors shall comply with the additional requirements of this annex. These requirements are essentially the same as the appropriate subclauses of IEC 60947-4-1 and equipment complying with this annex may state on the nameplate the appropriate utilization category according to Table A.1.		P
A.2	Rated duty Additional rated duties considered as standard are as follows.		-
A.2.1	Intermittent periodic duty or intermittent duty Subclause 4.3.4.3 of IEC 60947-1 applies with the following additions.		-
A.2.2	Temporary duty Subclause 4.3.4.4 of IEC 60947-1 applies.		-
A.3	Making and breaking capacities An equipment is defined by its making and breaking capacities, in accordance with utilization categories as specified in Table A.2 (see A.4).		-
	A.4 Utilization category The utilization categories as given in A.2 are considered standard in this annex. Any other type of utilization category shall be based on agreement between manufacturer and user but information given in the manufacturer's catalogue or tender may take the place of such an agreement.		P
A.5	Operational performance Subclause 7.2.4.2 of IEC 60947-1 applies with the following additions.		P
A.6	Mechanical durability Subclause 7.2.4.3.1 of IEC 60947-1 applies with the following addition.		P
A.7	Electrical durability Subclause 7.2.4.3.2 of IEC 60947-1 applies with the following addition. The total number of on-load operating cycles shall be as declared by the manufacturer.		P
A.8	Verification of making and breaking capacities See 8.3.3.3 except that the test values shall be in accordance with Tables A.2 and A.3.		P

Clause	Requirement - Test	Result - Remark	Verdict
A.9	Operational performance test See 8.3.4.1 except that the test conditions shall be in accordance with Table A.4. With the agreement of the manufacturer, the tests of A.8 and A.9 may be conducted on the same sample.		P
A.10	Special tests Resistance to mechanical and/or electrical wear is demonstrated by the operational performance test detailed in A.9.		P
A.10.1	Mechanical durability test		-
A.10.1.1	Condition of the equipment for tests The equipment shall be installed as for normal service; in particular, the conductors shall be connected in the same manner as for normal use. During the test there shall be no voltage or current in the main circuit. The equipment may be lubricated before the test if lubrication is prescribed in normal service.		P
A.10.1.2	Operating conditions The equipment shall be operated as in normal service.		-
	A.10.1.3 Test procedure a) The tests are carried out at the frequency of operations corresponding to the class of intermittent duty. However, if the manufacturer considers that the equipment can satisfy the required conditions when using a higher frequency of operations, he may do so. b) The number of operating cycles to be carried out shall be not less than the number of no-load operating cycles stated by the manufacturer. c) After each tenth of the total number of operations has been carried out, it is permissible before carrying on with the test – to clean the whole equipment without dismantling; – to lubricate parts for which lubrication is prescribed by the manufacturer for normal service; – to adjust the travel and the pressure of the contacts if the design of the equipment enables this to be done. d) This maintenance work shall not include any replacement of parts.		P

Clause	Requirement - Test	Result - Remark	Verdict
A.10.1.4	Results to be obtained Following the tests of mechanical durability, the equipment shall still be capable of complying with the normal operating conditions at room temperature. There shall be no loosening of the parts used for connecting the conductors.		P
A.10.2	Electrical durability test With respect to its resistance to electrical wear, an equipment is, by convention, characterized by the number of on-load operating cycles, corresponding to the different utilization categories given in Table A.5 which can be made without repair or replacement.		P
Annex B	Items subject to agreement between manufacturer and user		-
	Annex J of IEC 60947-1 applies with regard to clauses and subclauses of this part, with the following additions.		P
Annex C	Single pole operated three pole switches		-
C.1	General All requirements of this part apply except where modified by the following. The test requirements according to this part for verification of making and breaking capacities, operational performance and conditional short-circuit withstand, apply to devices with poles operated simultaneously. They are therefore not suitable for three-phase switches operated pole by pole.		P
C.2	Tests When testing single pole operated three pole switches, the relevant test sequences of Table 10 shall be applied with the following identified tests, modified in accordance with Clause C.3: – 8.3.3.3 Making and breaking capacities of test sequence I; – 8.3.4.1 Operational performance of test sequence II; – 8.3.6.2 Fuse protected short-circuit withstand. b) Making of test sequence IV.		P
C.3	Test set-up and sequence		-

Clause	Requirement - Test	Result - Remark	Verdict
C.3.1	Making and breaking capacities (8.3.3.3) and operational performance (8.3.4.1)		P
C.3.2	Fuse protected short-circuit test (8.3.6.2) For the making test of the fuse-switch, the following test shall be applied. With L1 open and L2 closed, L3 is subjected to the required make operation cycle. The test shall be performed in a three-phase test circuit according to Figure 11 of IEC 60947-1.		P
C.4	Condition of equipment after tests The equipment shall comply with the relevant clauses of 8.3.3.3.6, 8.3.4.1.6 and 8.3.5.2.6.		P
C.5	Instructions for use The manufacturer shall include within the product literature the following statement. These devices are intended for power distribution systems where switching and/or isolation of an individual phase may be necessary and shall not be used for the switching of the primary circuit of three-phase equipment.		P

PRODUCT LABELING

CE Mark Label Specification

Specifications: Text is Black or white in color and is left justified. Labels are printed in indelible ink on permanent adhesive backing or silk-screened onto the EUT or shall be affixed at a conspicuous location on the EUT.

EUT PHOTOGRAPHS (EUT FRONT VIEW)

Manufacturer/Approval Holder Declaration

The following identical model(s):

IS-1P, IS-2P, IS-3P, IS-4P 6A~100A AC230/400V, ICW: 12IE 1S, 3000A, 0.1S

Belong to the tested device:

Product description: **LOAD ISOLATION SWITCH**

No additional models were tested.

EC DECLARATION OF CONFORMITY

Council Directive 2014/35/EU on LVD Directive

WENZHOU HUAJIA ELECTRICAL EQUIPMENT CO., LTD
NO.311, LATITUDE FIFTEEN ROAD, YUEQING ECONOMIC DEVELOPMENT ZONE, YUEQING, ZHEJIANG, CHINA

DESCRIPTION OF TEST ITEM

LOAD ISOLATION SWITCH

TYPE IDENTIFICATION

IS-1P, IS-2P, IS-3P, IS-4P 6A~100A AC230/400V, ICW: 12IE 1S, 3000A, 0.1S

THE PRODUCT HAS BEEN ASSESSED BY THE APPLICATION ON THE FOLLOWING DIRECTIVES:

EN 60947-1:2007+A2:2014 EN 60947-3:2009+A2:2015

(Place & Date of issue)

Company stamp and
Signature of Authorized Personnel

Test Report No.: 8609117