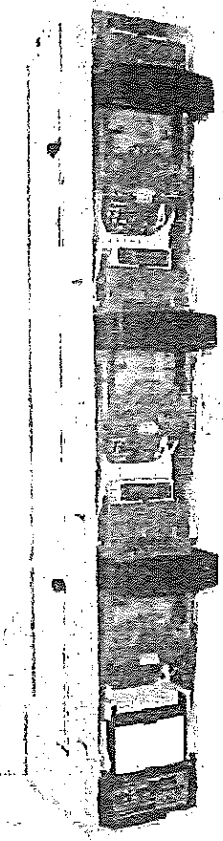
New generation of three pole LV fuse switches type NH

Neue Generation - Pronutec NH Sicherungslastschaltleisten

Triver +



pronutec
gorlan team

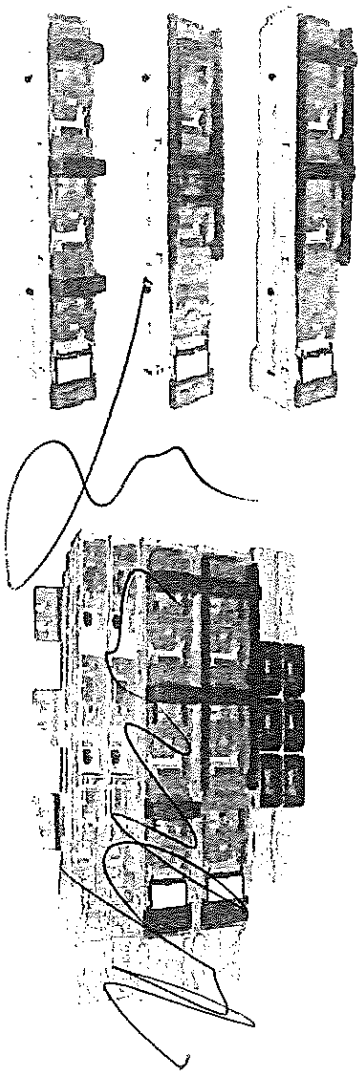
NEW GENERATION OF THREE POLE LV FUSE SWITCHES TYPE NH TRIVER +
NEUE GENERATION - PRONUTEC NH - Sicherungslastschaltleisten TRIVER +

As the market leader in fuse rails and fuse switches and thank to its policy innovation and constant development, Pronutec has designed a new generation of vertical fuse rails and switches NH-1/2/3 TRIVER+.

TRIVER+ is the new range of TRIVER, which aims to meet our customer needs in the recent years; anticipating the needs of the future.

Als Marktführer im Bereich der NH-Sicherungsleisten und NH-Sicherungslastschaltleisten und getreu der Unternehmensphilosophie "stetige Weiterentwicklung und Innovation", präsentiert Pronutec die neue NH-Sicherungslastschaltleisten Generation "TRIVER+" in den Größen NH-1/2/3.

Mit der neue "TRIVER+" Generation kommt Pronutec den sich gewandelten Kundenbedürfnissen nach und erfüllt schon heute zukünftige Bedürfnisse.



Fully compatible - Voll Kompatibel

TRIVER+ is a fuse switch / fuse rail 100% compatible with the current range. It maintains the same external dimensions so they can be installed in any currently installed LV panels in the market (valid fuse switches and fuse rails for front panels of 600mm or 650mm in height).

It has also been designed and tested under the IEC 60947-3 standard and in accordance with major national and international standards of different utilities.

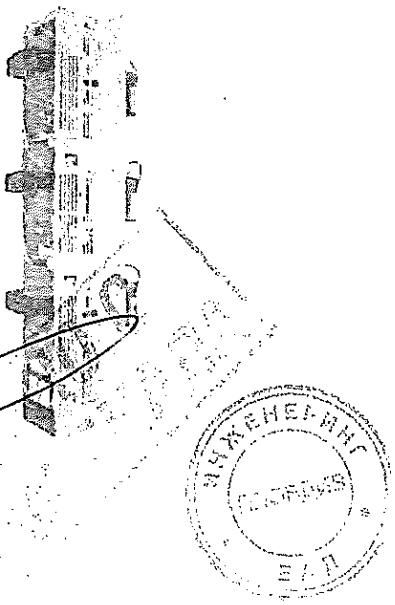
Die neuen "TRIVER+" NH-Sicherungslastschaltleisten sind 100%-ig kompatible zum bestehenden Programm, die äußeren Abmessungen bleiben identisch, so dass keine Änderungen im Bereich der Konstruktion vorgenommen werden müssen.

Die Entwicklung und Prüfung erfolgte gemäß der internationalen Norm IEC 60947-3. Des Weiteren werden die Kundenanforderungen nationaler wie internationaler Energieversorger erfüllt.

Adapted to future - Startklar für die Zukunft

This new generation of three pole switches are prepared to meet the market's needs that will appear in the near future with the implementation of Intelligent Networks (Smart Grids). For such purpose, it incorporates features and accessories for remote control such as integrated or independent metering sets, Fuse Supervision Control, etc...

Die neue Generation der NH-Sicherungslastschaltleisten erfüllt schon heute die Anforderungen für zukünftige intelligente Netzwerke (Smart Grids) z. B. gibt es Zubehörteile zur Fernkontrolle, integrierte oder unabhängige Mess-Sets, Sicherungsüberwachung, usw...



1824

Energy efficiency - Energie-Effizienz

The new TRIVER+, has been designed to achieve greater energy efficiency in real operation conditions. On one hand, it reduces power losses (thanks to the new design of the contact) and second, the heat dissipation of the fuse switch is higher (due to ventilation granted by the new housing of the switching unit).

Mit der neue "TRIVER+" Reihe steigert Pronutec die Energieeffizienz unter realen Bedingungen.
- Reduktion der Verlustleistung durch neu entwickelte Kontakte.
- Bessere Wärmeabfuhr durch einen intelligenten Aufbau des Oberteils.

Fuse switch heat reduction
Reduzierung der Verlustleistung

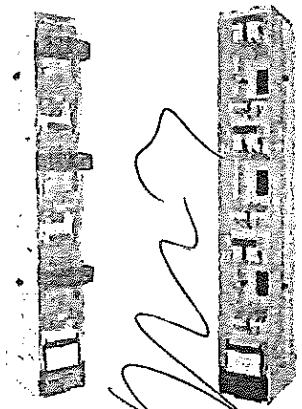
11%

Safety against accidental contacts - Berührungsschutz

Saftey is the main aspect for the development of new products in Pronutec. The new TRIVER+, provides a IP30 protection degree in the closed position and IP20 in the open position, ensuring maximum protection against accidental contacts.

Sicherheit ist der Hauptaspekt für Neuentwicklungen des Hauses Pronutec. Die neue "TRIVER+"-Reihe bietet maximalen Berührungsschutz, so wird ein Schutzgrad von IP30 in der geschlossenen und IP20 in der geöffneten Position erreicht.

Front protection degree
Schutzgrad Frontbedienung



Closed: IP 30
Geschlossen: IP 30

Open: IP 20
Geöffnet: IP 20

Ecodesign - Ecodesign

The reduction of power losses thanks to the new design of the TRIVER+ has a positive effect on the environment by saving energy.

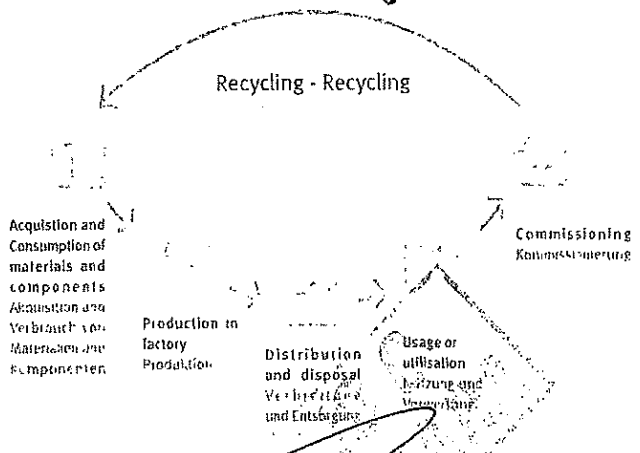
At the same time, with the design of this new TRIVER+, the impact of the product on the environment has been reduced throughout its whole life cycle.

This reflects Pronutec's commitment in terms of sustainable development and respect for the environment.

Neben der Reduktion von Verlustleistungen hat das neue Design "TRIVER+" auch einen positiven Umwelteffekt, da diese durch die Einsparung von Energie entlastet wird.

Gleichzeitig wurde mit der Neuentwicklung "TRIVER+" dafür gesorgt, dass die Belastung der Umwelt während des gesamten Lebenszyklus reduziert wird.

Dieses spiegelt Pronutec's Engagement im Sinne der Nachhaltigkeit wieder.



Ergonomic, Modern and Functional Design - Ergonomisches, Modernes und Funktionales Design

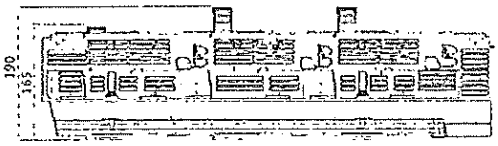
Better maneuverability. Faster to install and handle. More effective. Safer.

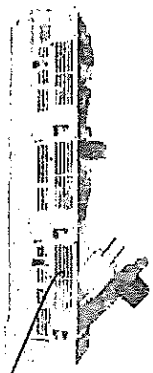
Steigerung der Bedienerfreundlichkeit. Schneller zu installieren. Effizienter. Sicherer.

Applications - Anwendungen

Retractable handle / More compact panels. Depth reduces from 190mm to 165mm. LV panels can be designed with less depth.

Versenkbare Griffe / kompaktere Verteilungen. Reduzierung der Tiefe von 190mm auf 165mm. Verteilungen können mit einer geringeren Tiefe gebaut werden.



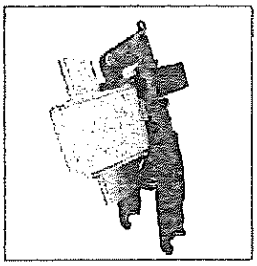


REVERSIBILITY
Connections can be done either in the upper part or lower part, with a simple turn of the base upside down.

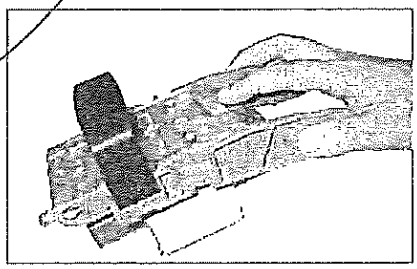
ABGANG OBEN/UNTEN FREI WÄHLBAR
Durch eine einfache Drehung des Unterteils entscheiden Sie selbst ob der Abgang ober- oder unterhalb sein soll.

Safety in its handling - Sicherheit in der Handhabung

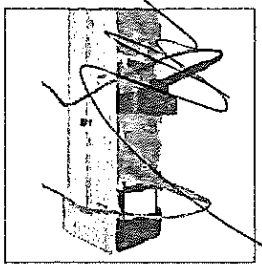
The new TRIVER+ has other elements that make the installation and maintenance operation even safer for people.
Höhere Sicherheit bei den neuen TRIVER+ bei Installation und Wartung.



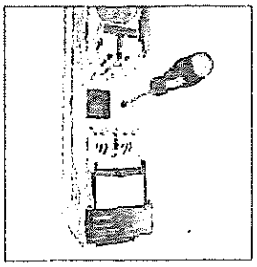
Safety and comfort in the extraction of the fuse.
Sicherheit und Komfort bei der Entnahme des Sicherungseinsatzes.



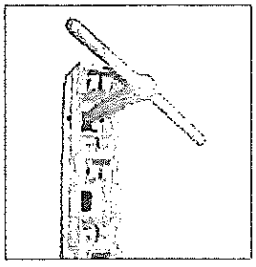
Fuse removed without touching with the use of an external drive.
Berührungslose Entfernung des Sicherungseinsatzes.



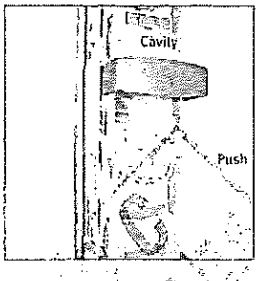
Cover including a device to allow direct access to the blade of the fuse in order to make stress testing.
Oberteil ermöglicht direkte Messung auf den Messern des Sicherungseinsatzes.



Easy to place the switching case.
Einfache Installation des Oberteils.



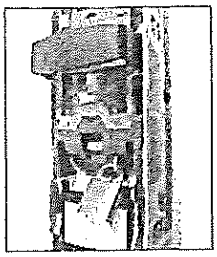
Live work is possible thanks to removable black windows in the switching unit.
Öffnungsfenster im Oberteil ermöglichen die Installation unter Spannung.



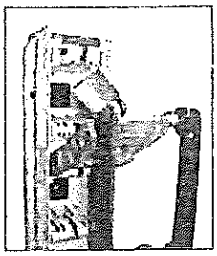
Release of fuse.
More space in the handle.
Entriegelung des Sicherungseinsatzes.
Mehr Komfort beim Schalten durch einen größeren Griffbereich.

Blocking elements - Verriegelung & Blombierbarkeit

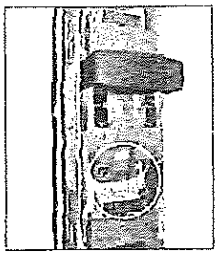
Valid for both, single and three pole switching versions.
Verfügbar in den Versionen 1-und 3-polig schaltbar.



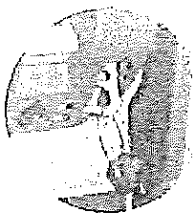
Closed position with padlock in each phase.
Jede Phase in geschlossener Position verriegelbar.



Open position with padlock.
Verriegelung in geöffneter Position.



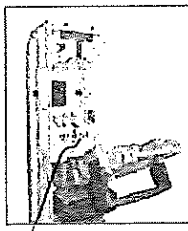
Sealed lock of each phase in its closed position as well as in the cable connection area.
Jede Phase in geschlossener Position plombierbar, zusätzlich kann der Anschlussraum plombiert werden.



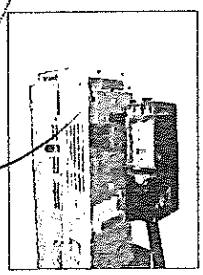
Accessories - Zubehör

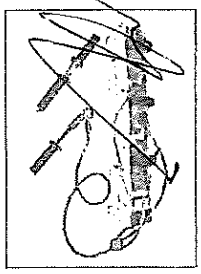
Large range of accessories that provide greater benefits inside the new TRIVER+.
Große Auswahl von Zubehörteilen, die weitere Vorteile der neuen "TRIVER+" Reihe bieten.

Permanent or temporary metering by means of a combined set of fuse - current transformer - ammeter.
Dauerhafte oder temporäre Messungen mittels eines kombinierten Sets von Stromwandlern und Amperemeter.

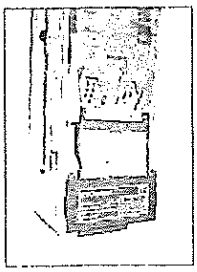


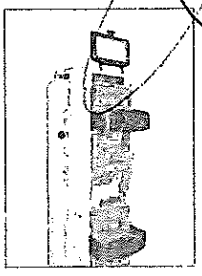
Microswitch which enables electronic open / close indicator.
LED - Integrated blown fuse indicator.
Mikroschalter für Positionsanzeige der NH-Sicherungslastschaltleisten.
LED - Integrierte Zustandsanzeige des Sicherungseinsatzes.





Upper/Lower rating plate.
Obers- und unteres Beschriftungsfeld.





Fuse protected auxiliary supply (up to 160A fuses) used to provide temporary supply with no need for installing an additional fuse rail.
Huckepacksicherung - abgesicherter temporäre Hilfsanschluss (bis 160A) für die vorübergehende Versorgung ohne Installation einer zusätzlichen NH-Sicherungslastschaltleiste.

The blade of the earthing link is housed in the position of the fuse in the base.
The base is grounded by means of a copper braid.
Moglichkeit zur Erdung der angeschlossenen Kabel mit Hilfe unserer isolierten Erdungsgarnitur.

Examples - Beispiele:

00

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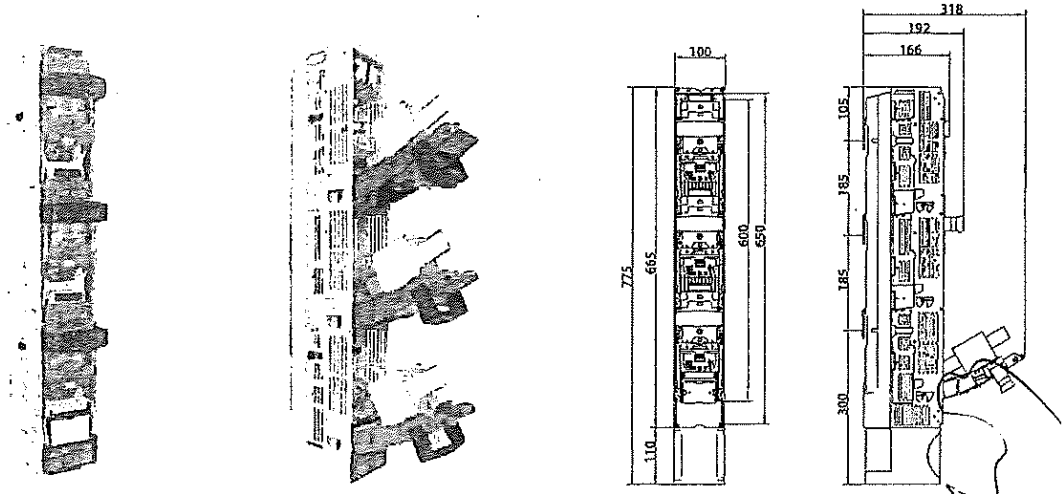
02

06

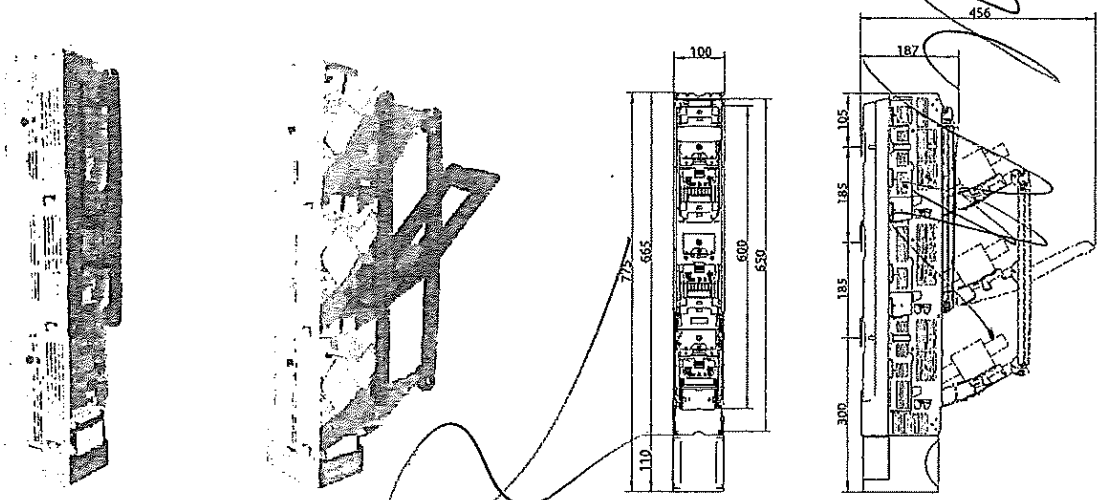
- Large range of terminals adapted to suit several type of cable terminations in international markets.
  Hohe Vielfalt von Anschlussvarianten.

Triver+ - Range - Triver+ - Produktpalette

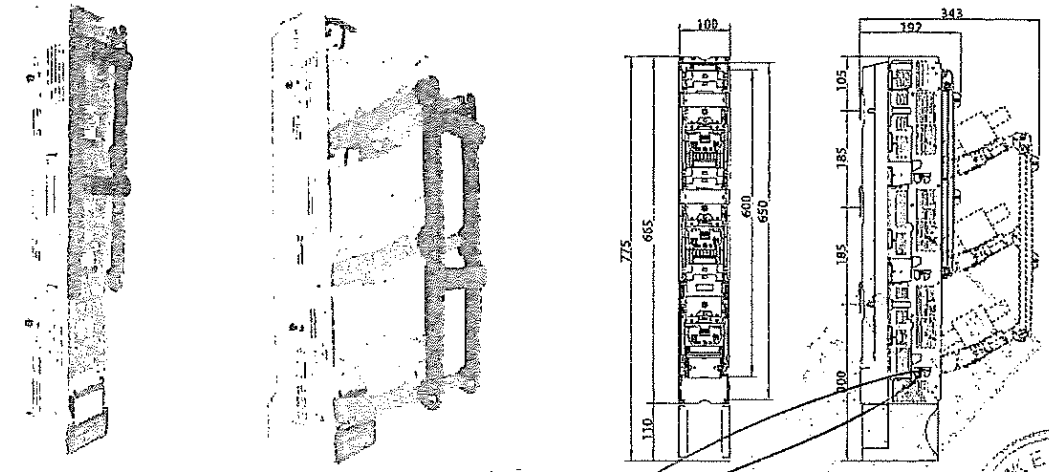
BTVC one pole switching - BTVC 1-polig-schaltbar



BTVC three pole switching - 1 handle - BTVC 3-polig-schaltbar / ein-hand-betrieben



BTVC three pole switching - 2 handles - BTVC 3-polig-schaltbar / zwei-hand-betrieben



1388

Triver+ Range - Triver+ Produktpalette

Description Beschreibung	Fuse Link Sicherungseinsatz	Current Strom	Reference* Artikelnummer*
BTVC-DU	NH-1	250	438.51.10.XX.YY
BTVC-DU	NH-2	400	438.5210.XX.YY
BTVC-DU	NH-3	630	438.53.10.XX.YY
BTVC-DU DOUBLE - BTVC-DU DOPPEL	NH-2	800	438.54.70.XX.YY
BTVC-DU DOUBLE - BTVC-DU DOPPEL	NH-3	1260	438.56.70.XX.YY
BTVC-DT 1 HANDLE - BTVC-DT - EIN-HAND-BETRIEBEN	NH-1	250	438.71.10.XX.YY
BTVC-DT 1 HANDLE - BTVC-DT - EIN-HAND-BETRIEBEN	NH-2	400	438.72.10.XX.YY
BTVC-DT 1 HANDLE - BTVC-DT - EIN-HAND-BETRIEBEN	NH-3	630	438.73.10.XX.YY
BTVC-DT 2 HANDLES - BTVC-DT - ZWEI-HAND-BETRIEBEN	NH-1	250	438.61.10.XX.YY
BTVC-DT 2 HANDLES - BTVC-DT - ZWEI-HAND-BETRIEBEN	NH-2	400	438.62.10.XX.YY
BTVC-DT 2 HANDLES - BTVC-DT - ZWEI-HAND-BETRIEBEN	NH-3	630	438.63.10.XX.YY

*Reference = Article Reference + XX (Terminal code) + YY (Accessories code).
Please, see the terminals and accessories in the Pronutec General Catalogue.
For other options, please consult.

*Artikelnummer = Artikelnummer + XX (Anschlussvariante) + YY (Zubehör).
Die Anschlussvarianten und Zubehörteile entnehmen Sie bitte unserem Hauptkatalog.

Technical data - Technische Daten

Electrical Characteristics Elektrische Eigenschaften	Type Typ	250 A		400 A		630 A	
Rated operation voltage - Bemessungsbetriebsspannung	Ue (V)	AC 500	AC 690	AC 500	AC 690	AC 500	AC 690
Rated operation current - Bemessungsbetriebsstrom	Ie (A)	250	200	400	315	630	500
Conventional free air thermal current with fuses Konventioneller thermischer Strom mit Sicherungen	Ith (A)	250	200	400	315	630	500
Conventional free air thermal current with solid links Konventioneller thermischer Strom mit Trennmessern	Ith(A)	400	400	510	510	800	800
Rated frequency - Bemessungsfrequenz	(Hz)	40-60	40-60	40-60	40-60	40-60	40-60
Rated insulation voltage - Bemessungsisolationsspannung	Ui (V)	AC 1000	AC 1000	AC1000	AC1000	AC1000	AC 1000
Rated conditional short-circuit current - Bedingter Bemessungskurzschlussstrom	(kAeff)	80	80	80	80	80	80
Utilization category - Gebrauchskategorie	-	AC-22B*	AC-22B	AC-22B*	AC-22B	AC-22B	AC-22B
Rated making capacity - Bemessungseinschaltvermoegen	(A)	1200	600	1890	945	1890	750
Rated breaking capacity - Bemessungsausschaltvermoegen	(A)	1200	600	1890	945	1890	750
Rated impulse withstand voltage - Bemessungsstossspannung	Uimp /kV)	20	20	20	20	20	20
Operating cycles with current - Elektrische Lebensdauer(Schaltspiele)	-	200	200	200	200	200	200
Total power loss at Ith Ges. - Verlustleistung bei Ith (ohne NH-SE)	Pv (W)	25	16	52	32	98	62

* AC23B for rated operation voltage AC 400

Characteristics of the materials - Materialeigenschaften

The new TRIVER+ fuse switch maintains one of the most valued aspects by our costumers: high quality materials to ensure product reliability.

- UP-BMC thermostable Polyester reinforced fibreglass socket.
- High-performance self extinguishing technical plastic housing.
- All live parts are made out of SE-CU57 electrolytic copper according to DIN 1787.
- Contacts are sliver plated and conductive parts are tin-plated.
- Stainless steel springs.

Die Nutzung von hochwertigen Materialien stellt die Basis unserer neuen TRIVER+ Produktreihe dar.

- Grundkörper bestehend aus UP-BMC temperaturbeständiges, glasfaserverstärktes Polyester.
- Einsatz von leistungsstarken, selbstverlöschenden Kunststoffen.
- Alle spannungsführende Teile bestehen aus SE-CU57 Elektrolytkupfer gemäß DIN1787,
- Die Kontakte sind versilbert und alle weiteren leitenden Teile verzinnt.
- Kontaktfedern aus nichtrostendem Edelstahl.

1389

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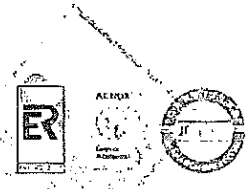
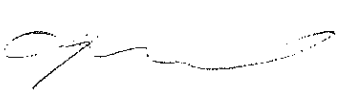
e-mail: 4ex@pronutec.com
www.pronutec.com





1390

Списък на отделните изпитвания на български език

Изследван образец:

Вертикален разединител с предпазители от типа BTVC 400A , триполюсен

Производител:

Pronutec S.A. , Испания

Изпълнени тестове (съгласно IEC/EN 60947-3; IEC 60947-1.Експлоатационни характеристики по комутационна способност .

1) Проверка на оборудването при тестване по комутационна способност при категория на приложение AC 22B/500V

2) Поведение на оборудването при тестване по комутационна способност

3)Състояние на оборудването след тестване по комутационна способност

4) Проверка на диелектричните свойства

5) Проверка на загубите

6) Проверка за ток на утечка

7) Тест за повишаване на температурата –проверка на нагряването

8) Провека на задействащия механизъм за издръжливост

9) Зависими и независими ръчни операции (задействаща сила при отваряне и затваряне)

A PIZ 1

Accredited by BMWA with GZ: 92714/237-IV/9/00 as test- and inspection body
and with BGBl. II Nr. 244//2005 as certification body for personnel

AUSTRIAN INSTITUTE OF TECHNOLOGY

Test Report

Project Designation

PERFORMANCE OF
MAKING AND BREAKING CAPACITY
AT LOW-VOLTAGE
FUSE-SWITCH-DISCONNECTORS
TYPE BTVC 400A
THREE POLE OPERATED
(AC-22B at 500V / 400A)

Client

PRONUTEC S.A.
Parque Empresarial Boroa
Parcela 2c-1
E-48340 Amorebieta - VIZCAYA
SPAIN

Order from / No. 06/2010 / ---

Project Number 2.03.02087.1.0/BTVC400/AC22/500V/400A/3-pole Test Engineer Ing.J.Ainetter

Date of issue	22.11.2010
Total number of issues / No.	1 / 1
Number of pages	10
Annex: Number of pages	---

1891

AUSTRIAN INSTITUTE OF TECHNOLOGY

Test item

Identification:

Low-voltage fuse-switch-disconnectors type BTVC 400A, three pole operated

Trademark:	pronutec
Manufacturer:	PRONUTEC S.A.
Size:	2
Number of poles:	3
Busbar system:	185mm
Rated operational voltage:	400V a.c. up to 690V a.c.
Rated operational current:	400A
Rated frequency:	50Hz

Testing location, Period of testing

Testing location:

Österreichisches Forschungs- und Prüfzentrum Arsenal Ges.m.b.H.
Business Unit Electric Energy Systems
Power Service Center
Giefinggasse 2
1210 Vienna
AUSTRIA

Period of testing:

09/2010

Test(s)

Test(s) performed:

Performance of making and breaking capacity (AC-22B at 500V / 400A)

Test standard(s):

IEC 60947-1:2007 (Edition 5.0) and IEC 60947-3:2008 (Edition 3.0)
EN 60947-1:2007 and EN 60947-3:2009

Test procedure(s):

CB-Scheme and CCA-Scheme

Possible test case verdicts:

P (Pass):	Test object does meet the requirement
F (Fail):	Test object does not meet the requirement
N (Not applicable):	Test case does not apply to the test object

Result

The low-voltage fuse-switch-disconnectors type BTVC 400A, three pole operated, have passed the performance of making and breaking capacity (AC-22B at 500V / 400A) successfully.

Test Engineer

на основание чл. 2 от ЗЗЛД

Ing.J.Ainetter

Project Engineer,

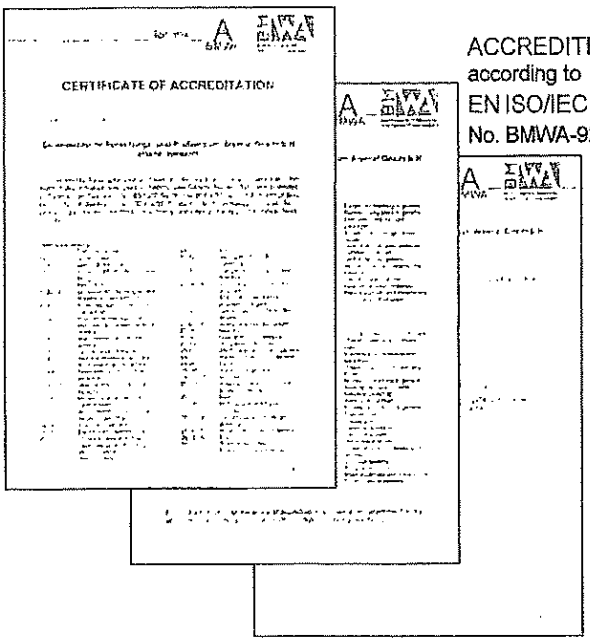
на основание чл. 2 от ЗЗЛД

Ing.K.Farthofer

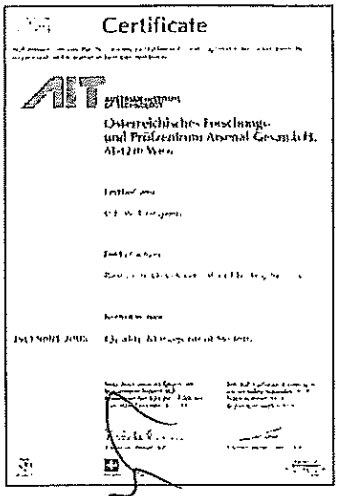
1392

AUSTRIAN INSTITUTE OF TECHNOLOGY

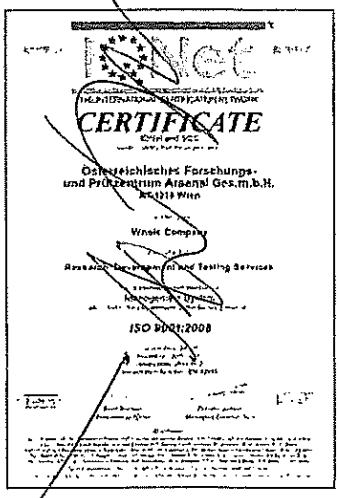
Testing laboratory



ACCREDITED
according to
EN ISO/IEC 17025
No. BMWA-92.714/0504-I/12/2007

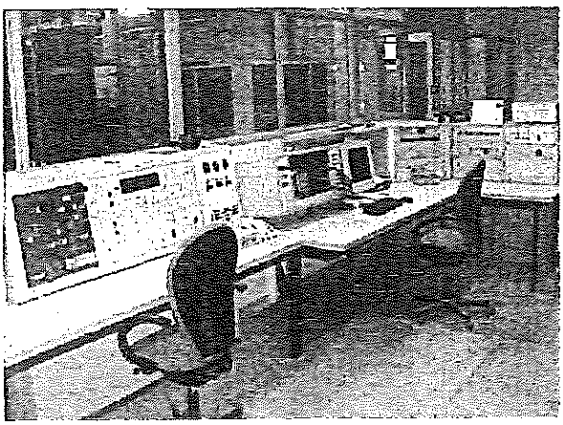


CERTIFICATED
according to
ISO 9001
Reg. No. 12769

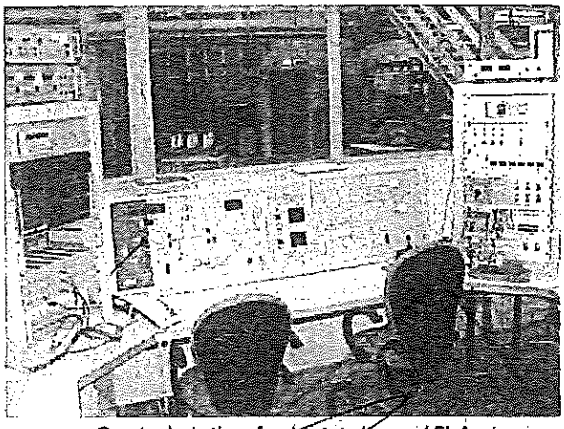


RECOGNIZED
CB TESTING LABORATORY
under the responsibility of OVE
as the National Certification Body

POWER SERVICE CENTER:



Control station for tests up to 15kA



Control station for tests above 15kA

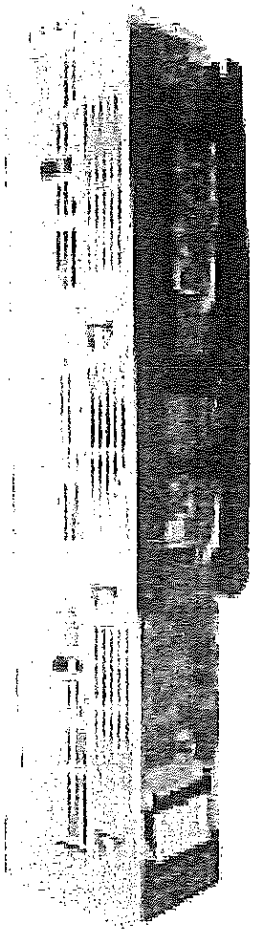
1202

Technical data and description

Test item	Low-voltage fuse-switch-disconnectors
Trademark	pronutec
Model/Type reference	BTVC 400A
Manufacturer	PRONUTEC S.A.
Place of manufacture	Vizcaya, Spain
Type of operation	Three pole operated
Method of operation	Dependent manual operation
Size	2
Busbar system	185mm
Type of terminals	Bolt terminals M12
Switching positions	ON / OFF
Number of poles	3
Nature of supply	AC
Utilization category	AC-22B
Rated operational voltage	400V a.c. up to 690V a.c.
Rated operational current	400A (up to 500V a.c.) 315A (at 690V a.c.)
Rated frequency	50Hz
Conventional free air thermal current	400A (with 500V fuse-links)
Rated insulation voltage	1000V
Rated impulse withstand voltage	12kV
Rated conditional short-circuit current	80kA (up to 500V a.c.) 50kA (at 690V a.c.)
Kind of protective device	Fuse-links NH2
Maximim power dissipation of the protective device	34W
Degree of protection	IP 20

1394

Picture of test item



1295

Test performance / Test values

IEC / EN 60947-3			
Clause	Requirement - Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS		P
8.3.3.3	Making and breaking capacity		P
	- utilization category:	AC-22B	-
	- rated operational voltage Ue (V):	500	-
	- rated operational current Ie (A):	400	-
	Conditions for make operation, AC-23A and AC-23B only:		N
	- test voltage, U = 1,05 Ue (V):	L1: - L2: - L3: -	-
	- test current, I = ... x Ie (A):	L1: - L2: - L3: -	-
	- power factor:	L1: - L2: - L3: -	-
	Conditions for break operation, AC-23A and AC-23B only:		N
	- test voltage, U = 1,05 Ue (V):	L1: - L2: - L3: -	-
	- test current, I = ... x Ie (A):	L1: - L2: - L3: -	-
	- power factor:	L1: - L2: - L3: -	-
	Conditions for make/break operations, other than AC-23A and AC-23B:		P
	- test voltage, U = 1,05 Ue (V):	L1: 526 L2: 528 L3: 526	-
	- test current, I = 3 x Ie (A):	L1: 1217 L2: 1228 L3: 1212	-
	- power factor / ~~time constant (ms)~~:	L1: 0,64 L2: 0,64 L3: 0,64	-
	Number of make/break or make and break operations:	5	P
	- recovery voltage duration ≥ 50 ms (ms):	Permanent	P
	- current duration (ms):	240	-
	- time interval between operations (s):	30	-
	Oscillogram:	1 (5th operation)	

1396

IEC / EN 60947-3			
Clause	Requirement - Test	Result - Remark	Verdict
	Characteristic of transient recovery voltage for AC-22 and AC-23 only:		P
	- oscillatory frequency (kHz) ....:	57,24	-
	- measured oscillatory frequency (kHz) ....:	L1: 57,1 L2: 57,1 L3: 57,1	P
	- factor n ....:	L1: 1,1 L2: 1,1 L3: 1,1	P
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		P
	Test performed without:		-
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8		P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.3.4	Dielectric verification		P
	test voltage 2 Ue with a minimum of 1000V~ (V)...:	1400	-
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage 1,1 Ue (V) ....:	760	-
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole (mA).:	-	N
	Leakage current (other utilization categories) ≤ 2 mA/pole (mA) ....:	< 1	P

1397

IEC / EN 60947-3				
Clause	Requirement - Test	Result - Remark		Verdict
8.3.3.6	Temperature-rise verification			P
	- conductor cross-section (mm²).....:	240		-
	- test current Ie (A).....:	400		-
	Temperature-rise dT of part:	dT (K) measured	dT (K) required	P
	Terminals	≤ 61	80	P
	Manual operating means: non-metallic	5	35	P
	Parts intended to be touched but not hand-held: non-metallic	37	50	P
	Parts which need not be touched during normal operation: non-metallic	45	60	P
8.3.3.7	Strength of actuator mechanism			P
8.2.5	Verification of the strength of actuator mechanism and position indicating device			P
	- actuator type (fig.).....:	1e		-
8.2.5.2.1	Dependent and independent manual operation			P
	- actuating force for opening (N).....:	210		-
	- test force with blocked main contacts (N).....:	400		-
	- used method to keep the contact closed.....:	Fixed by brazing		-
	During and after the test, open position not indicated.....:	No open position indicated		P
	Equipment with locking mean, no locking in the open position while test force is applied .....:	No locking in open position		P
8.2.5.2.2	Dependent power operation			N
	- main contacts fixed together in the closed position .....:	-		N
	- used method to keep the contact closed.....:	-		N
	- 110% of the rated supply voltage applied to the equipment (3 times).....:	-		N
	During and after the test, open position not indicated.....:	-		N
	Equipment show no damage impairing its normal operation .....:	-		N
	Equipment with locking mean, no locking in the open position while test force is applied .....:	-		N

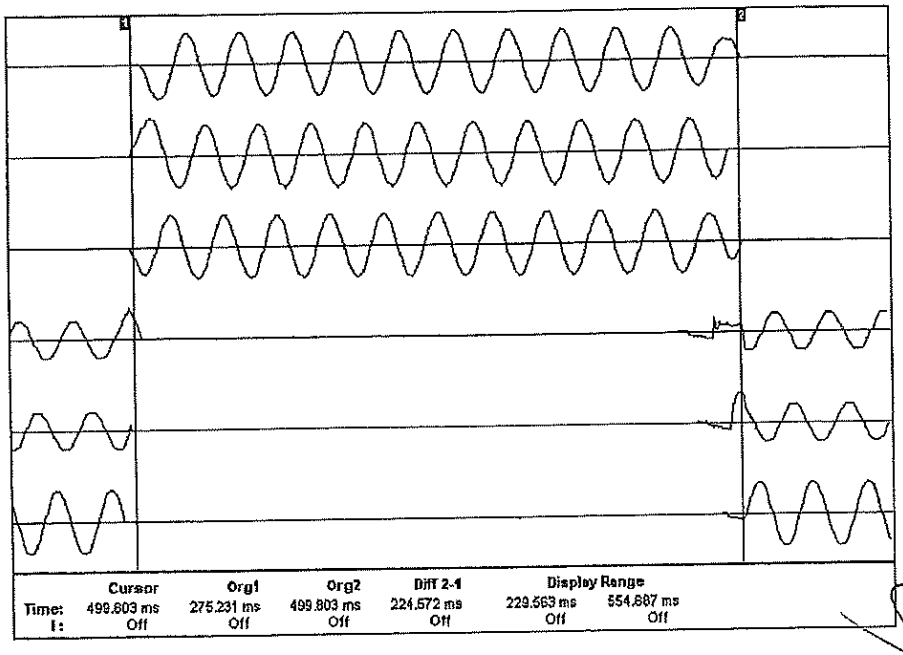
1398

IEC / EN 60947-3			
Clause	Requirement - Test	Result - Remark	Verdict
8.2.5.2.3	Independent power operation		N
	- main contacts fixed together in the closed position .....:	-	N
	- used method to keep the contact closed.....:	-	N
	- stored energy of the power operator released (3 times).....:	-	N
	During and after the test, open position not indicated.....:	-	N
	Equipment show no damage impairing its normal operation .....:	-	N
	Equipment with locking mean, no locking in the open position while test force is applied .....:	-	N

1399

Oscillogram(s)

Oscillogram 1:



bmwf

Federal Ministry of
Economy, Family and Youth

Confirmation of Accreditation

The Federal Ministry of Economics, Family and Youth confirms that

Österreichisches Forschungs- und Prüfzentrum Arsenal Ges.m.b.H

Giefinggasse 2, A-1210 Wien

Identification number: 1

Initial date of Accreditation: December 01, 1993

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

The detailed scope of accreditation is given in the currently valid decree.

The accredited technical fields are published in the list of accredited bodies at www.bmwfj.gv.at/akkreditierung.

Vienna, May 07, 2010

на основание чл. 2 от ЗЗЛД

Dipl.-Ing. Günter P. Friers

Division I/12 - Accreditation Body
Stubenring 1 | 1011 Vienna | Austria | phone: +43 (0)1 711 00 - 8236 | fax: +43 (0)1 711 00 93 - 8256 | DVR 0037257
e-mail: akkreditierung@bmwfj.gv.at | www.bmwfj.gv.at/akkreditierung

169

pronutec gorlan tech	**DECLARACIÓN DE CONFORMIDAD**	DC4381-0 27-Octubre-2010 Pág. 1 de 1

PRONUTEC, S.A.

Parque Empresarial Boroa Parc. 2c-1

48340 Amorebieta – VIZCAYA (SPAIN)

NIF.: ES-A-48/217.962

Declara bajo su responsabilidad que el producto:
Declare under our sole responsibility that the product:
Eigenverantwortliche Erklärung zu unserem Produckt:

Bases tripolares verticales cerradas (BTVC) tamaños 1/2/3, desconexión unipolar y tripolar.
Three poles fuse rails (BTVC) size 1/2/3, one and three pole Switching.
Dreipolige Sicherungslastschaltleisten (BTVC) Größe 1/2/3, ein und dreipolig schaltbar.

Referencias 438xxxxxx fabricados según la Especificación Técnica de Pronutec ET-438.
References 438xxxxxx manufactured according Pronutec's ET-438 Technical Specification.
Die Referenznummem 438xxxxxx sind alle gefertigt gemäß den technischen Spezifikationen der Pronutec ET-438.

Son conformes con las exigencias de la Directiva de Seguridad del material eléctrico destinado a ser utilizado bajo determinados límites de tensión 2006/95/EC.
Are in accordance with the requirements of the Low Voltage Directive 2006/95/EC
Diese sind in Übereinstimmung mit den Anforderungen der Niederspannungsanweisung 2006/95/EC.
Y de la Directiva de Compatibilidad Electromagnética 2004/108/CE.
And with the Electromagnetic Compatibility Directive 2004/108/CE.
Und mit der Elektromagnetischen Verträglichkeitsanweisung 2004/108/CE.

De acuerdo a la siguiente norma armonizada:
According to the following harmonised standard:
Gemäß der folgenden Norm:

UNE - EN 60947-3: 2009

Cualquier montaje, ya sea inicial o posterior que no respete las instrucciones generales de puesta en servicio y uso dadas por Pronutec, anula este documento.
Any initial or subsequent installation that will not observe the general instructions given by Pronutec will cancel this document.
Jegliche Änderungs oder Nachinstallationen, die nicht den generellen Anweisungen der Firma Pronutec entspricht, widerruft diese Erklärung.

En Amorebieta / *In Amorebieta*

Fdo. **Diego Martín Imbert**
Director Técnico
Technical Director / Technischer Direktor

на основание чл. 2 от ЗЗЛД

pronutec
LABORATORIO

ИНЖЕНЕРИНГ ПЛОВДИВ

1402

Декларация за съответствие

Pronutec, S.A.

Parque Empressarial Boroa Parc. 2c-1

48340 Amorebieta-VIZCAYA (SPAIN)

NIF.: ES-A-48/217.962

Декларирам на своя лична отговорност, че продуктите:

Триполюсните основи с предпазители (BTVC) размери 1/2/3, еднополюсните и триполюсни разединители, с референции 438xxxxxx произведени съгласно техническата спецификация на Pronutec *ET-438*

са в съответствие с изискванията на Директива за ниско напрежение *2006/95 / EC*

и с Директива за електромагнитна съвместимост *2004/108 / CE*

в съответствие със следния хармонизиран стандарт: *UNE - EN 60947-3: 2009*

Всяко първоначално или последващо инсталиране, които няма да спазват общите инструкции, дадени от Pronutec ще отмени този документ.

Fdo. Diego Martin Imbert

Технически директор

/подпис не се чете/

En Amorebieta

1403

ДЕКЛАРАЦИЯ

Долуподписаният **Петър Иванов Данчев,** на основание чл. 2 от ЗЗЛД т
МВР на основание чл. 2 от ЗЗЛД на основание чл. 2 от ЗЗЛД
ул. ачеството си на Изпълнителен Директор и представляващ " **ИНЖЕНЕРИНГ" ЕАД**

ДЕКЛАРИРАМ, ЧЕ :

Предлаганите от "Инженеринг" ЕАД триполюсни вертикални разединители за предпазители 400 А - NH2 са изцяло в съответствие с изискванията на техническата спецификация на стандартите за материала , включително на параграфи „Характеристика на материала" и "Съответствие на предложеното изпълнение с нормативно – техническите документи" по процедура с референтен № PPD 18-063.

01.08.2018 г.
гр.Пловдив

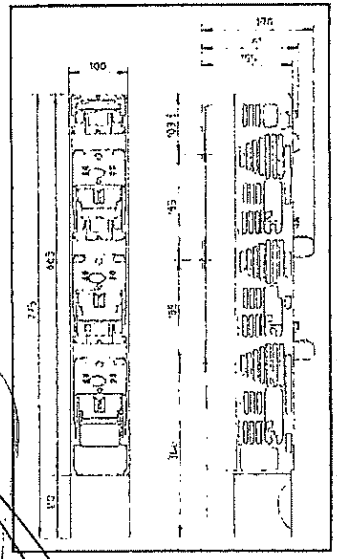
Подпис на основание чл. 2 от ЗЗЛД

ИНЖЕНЕРИНГ ПЛОВДИВ ЕАД

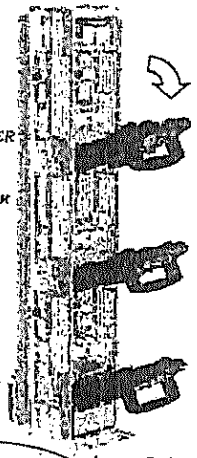
1404

TRIVER +
INSTRUCCIONES DE MONTAJE
ASSEMBLY INSTRUCTIONS / Инструкция за монтаж
BTVC / BTVC-DT / BTVC-DTU NH 1-2-3

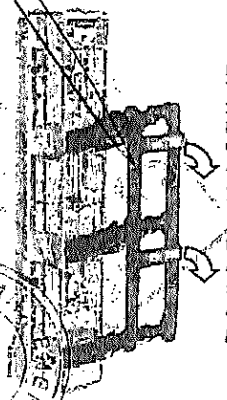
DESCONEXIÓN UNIPOLAR / *ONE POLE SWITCHING* / Превключване еднополюсен
DESCONEXIÓN TRIPOLAR / *THREE POLE SWITCHING* / Превключване ТРЕТА ПОЛЮСЕН



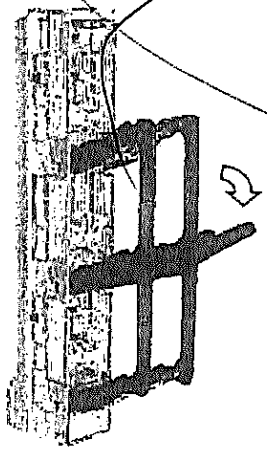
1.
E
EXTRAER LA TAPA DE CONEXIONES
GB
REMOVE CONNECTION COVER
B
Отстанете предпазния капак на клемите



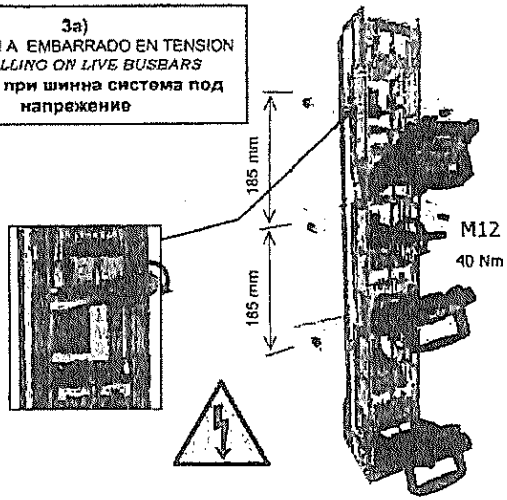
2.
E
TIRAR DE LAS ASAS
GB
PULL THE HANDLES
B
Издърпайте ръкохватките



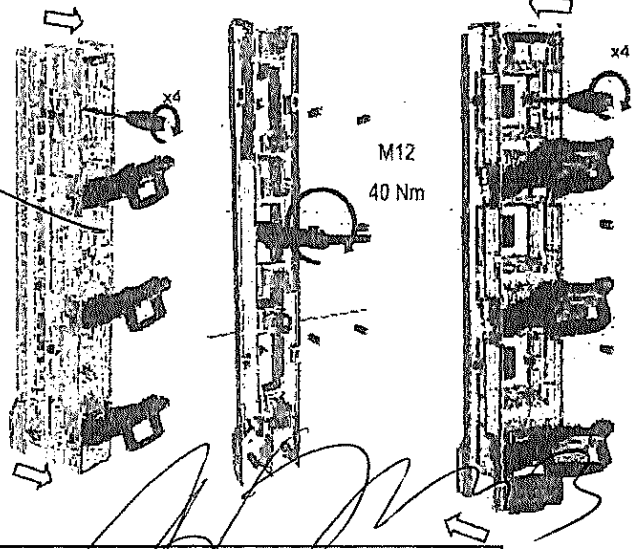
E
TIRAR DE LAS 2 ASAS AL MISMO TIEMPO
GB
PULL BOTH HANDLES AT THE SAME TIME
B
Издърпайте едновременно двете ръкохватки



3a)
CONEXIÓN A EMBARRADO EN TENSION
INSTALLING ON LIVE BUSBARS
Монтаж при шинна система под напрежение

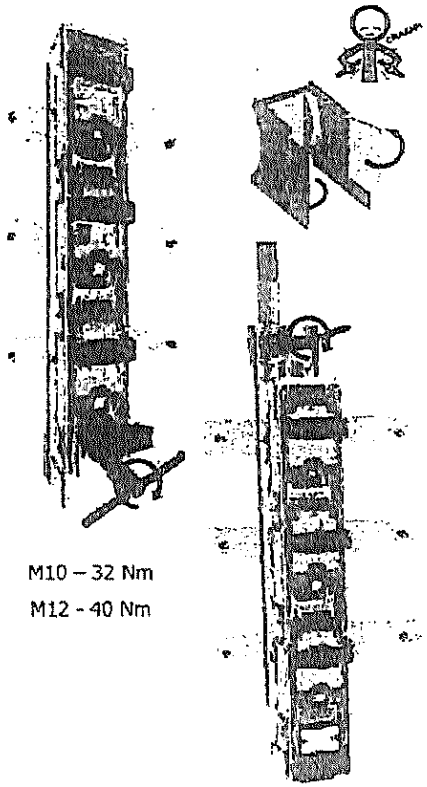


3b) CONEXIÓN A EMBARRADO SIN TENSIÓN
INSTALLING ON CURRENT FREE BUSBARS
Монтаж при шинна система без напрежение



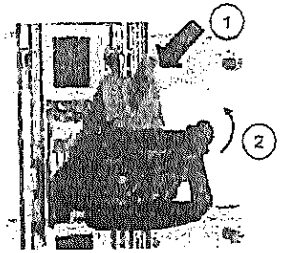
TENER EN CUENTA EL MARCADO DE LAS FASES EN LA ZONA DE CONEXIONES DEL ZOCALO, AL HACER LAS UNIONES ELECTRICAS.
CONSIDER THE PHASES MARKING IN THE TERMINAL ZONE OF THE FUSE RAIL HOLDER, WHEN DOING ELECTRIC UNIONS.
Вземете под внимание маркировката на фазите при осъществяване на електрическия контакт.

4 E CONECTAR LOS CABLES UTILIZANDO HERRAMIENTA AISLADA
GB *FASTEN THE CABLE LUGS BY USING AN ISOLATED TOOL*
В При монтажа кабелите и при останалите монтажни операции използвайте изолирани инструменти и защитни средства

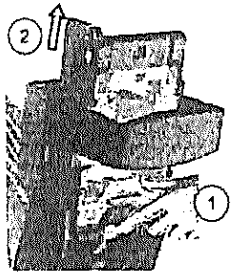


M10 – 32 Nm
M12 - 40 Nm

INTRODUCCIÓN / EXTRACCIÓN DEL FUSIBLE
INSTALLING / REMOVAL OF FUSE
Инсталиране и смяна на предпазител

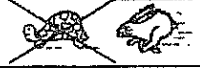


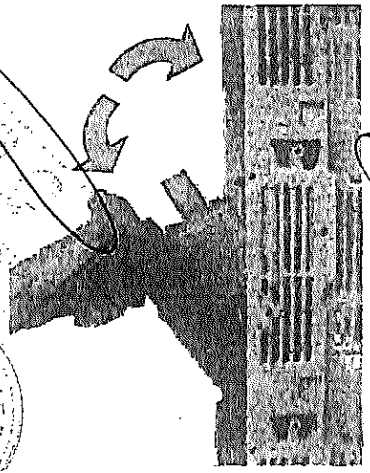
E INSERTAR LOS FUSIBLES Y CERRAR LA TAPA
GB *INSERT THE FUSES AND CLOSE THE COVERS*
В *Поставете предпазителите и затворете капаците*



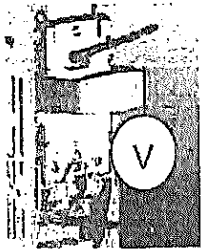
E EXTRACCIÓN DEL FUSIBLE
GB *REMOVAL OF FUSE*
В *Смяна на предпазител*

ON / OFF: MANIOBRAR RAPIDAMENTE !
ON / OFF: MOVE LEVER QUICKLY!
Да се включва и изключва рязко !

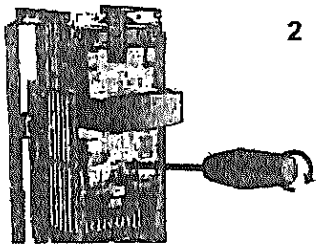


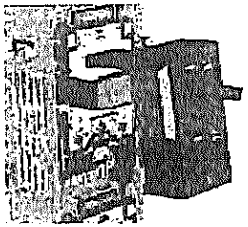


PRESENCIA DE TENSIÓN
VOLTAGE MEASUREMENT
Измерване на напрежение

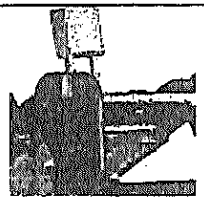


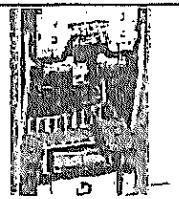
INSTALACIÓN DE SALIDA AUXILIAR PROTEGIDA POR FUSIBLE
INSTALLING A PROTECTED AUXILIAR OUTPUT
Монтаж на спомагателен изолиран изход



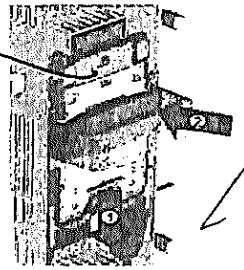


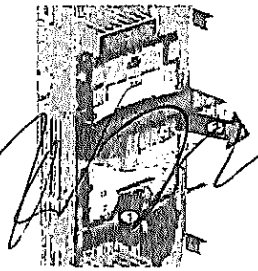
BLOQUEO DE CANDADO *LOCKING DEVICE* **Заключващо устройство**





ASA ESCAMOTEABLE BTVC-E / *RETRACTABLE HANDLE BTVC-E*
Прибираща се ръкохватка за BTVC-E





TRIVER+

CARACTERISTICAS ELECTRICAS/MECANICAS ELECTRICAL/MECHANICAL CHARACTERISTICS **Технически данни и характеристики**	250 A	400 A	630 A
INTENSIDAD NOMINAL Ie (A) RATED OPERATIONAL CURRENT Ie (A) / **Номинален ток Ie (A)**	250	400	630
TENSIÓN NOMINAL Ue (V) RATED OPERATIONAL VOLTAGE Ue (V) / **Номинално напрежение Ue (V)**	690	690	690
TENSIÓN DE AISLAMIENTO UI (V) RATED INSULATION VOLTAGE UI (V) / **Изолационно напрежение UI (V)**	1000	1000	1000
TENSIÓN DE FRECUENCIA INDUSTRIAL TEST VOLTAGE 50 Hz (kV) / **Изпитателно напрежение 50 Hz (kV)** Entre partes activas y masa – 1 min. Between phases and earth - 1 min. **Между фазите и Земята - 1 минута** Entre partes activas – 1 min Between phases - 1 min. / **Между фазите - 1 минута**	 10 3.5	 10 3.5	 10 3.5
TENSIÓN ONDA DE CHOQUE Uimp (kV) RATED IMPULSE WITHSTAND VOLTAGE Uimp (kV) / **Изпитателно импулсно напрежение Uimp (kV)**	20	20	20
RESISTENCIA CORTOCIRCUITO Icm (kA) RATED SHORT-CIRCUIT MAKING CAPACITY Icm (kA) with fuse **Ток на термична устойчивост Icm (kA)**	>50	>50	>50
RESISTENCIA AL AISLAMIENTO (MOhm) INSULATION RESISTANCE / **Съпротивление на изолацията**	>5	>5	>5
ENDURANCIA MECÁNICA MECHANICAL OPERATING CYCLES / **Механична износоустойчивост**	800	800	800
ENDURANCIA ELÉCTRICA ELECTRICAL OPERATING CYCLES **Електрическа износоустойчивост**	200	200	200
CATEGORÍA DE EMPLEO UTILIZATION CATEGORY / **Категория на използване** · Ue = 400 V · Ue = 500 V · Ue = 690 V	 AC-23B AC-22B AC-22B	 AC-23B AC-22B AC-22B	 AC-23B AC-22B AC-22B
GRADO DE PROTECCIÓN PROTECTION DEGREE / **Степен на защита**	IP-30	IP-30	IP-30

IP43801-BLG-B0

ПРИЛОЖЕНИЕ

"ЕЛПРОМ ЕМЗ" ООД град ШАБЛА

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ФИРМЕН ПРОФИЛ
НА " ЕЛПРОМ ЕМЗ " ООД град ШАБЛА

ОБЩА ИНФОРМАЦИЯ ЗА „ ЕЛПРОМ ЕМЗ " ООД град Шабла:

" ЕЛПРОМ ЕМЗ " ООД град Шабла е регистрирано по ф.д. № 481/1991 година при Добрички окръжен съд като правоприемник на ДФ " Елпром София и ДФ " Елпром АВН " град Добрич.

ПРОИЗВОДСТВО : " ЕЛПРОМ ЕМЗ " ООД град Шабла има за свой предмет на дейност :

1.*Производство и реализация на токови измерителни трансформатори* за НН до 1 кV и СрН до 24 кV за вътрешен монтаж с клас на точност 0.2; 0.2S; 0.5; 0.5S и 5P10 и номинална мощност до 50VA в диапазона от номинални токове от 5/5/5A до 3000/5/5A съгласно БДС EN 60044-1:2001 и IEC 60044-1:1999. Произвеждат се следните типове токови измервателни трансформатори:

1. тип СТ-1; тип СТ-2; тип СТ-3; тип СТ-4 са с най-високо работно напрежение до 1 кV
2. тип 7.2СТ-1;тип 7.2СТ-2; тип 7.2СТ-3 са с най-високо работно напрежение до 7.2 кV.
3. тип 7.2СТ-1 PR; тип 7.2СТ-2 PR; тип 7.2СТ-3 PR – трансформатори с външно превключване на първичната намотка с най-високо работно напрежение до 7.2 кV.
4. тип 12СТ-1; тип 12СТ-2; тип 12СТ-3 - са с най-високо работно напрежение до 12 кV.
5. тип 12СТ-1 PR; тип 12СТ-2 PR; тип 12СТ-3 PR – трансформатори с външно превключване на първичната намотка с най-високо работно напрежение до 12 кV.
6. тип 24СТ-1; тип 24СТ-2; тип 24СТ-3 - са с най-високо работно напрежение до 24 кV.
7. тип 24СТ-1 PR; тип 24СТ-2 PR; тип 24СТ-3 PR – трансформатори с външно превключване на първичната намотка с най-високо работно напрежение до 24 кV

"ЕЛПРОМ ЕМЗ" ООД ГРАД ШАБЛА Е ЕДИНСТВЕНИЯТ ПРОИЗВОДИТЕЛ НА ТОКОВИ ИЗМЕРВАТЕЛНИ ТРАНСФОРМАТОРИ В РЕПУБЛИКА БЪЛГАРИЯ

08.2.2012 г.

ЕЛПРОМ ЕМЗ ШАБЛА ООД

1407

2. *През 2002 година започнахме да произвеждаме ТОКОВИ ТРАНСФОРМАТОРИ ТИП " ФЕРАНТИ " за номинално напрежение до 24 KV и честота 50 Hz за вътрешен монтаж на кабели.*

Произвеждаме три типа трансформатори :
Тип FER-1 за монтаж на кабел с диаметър до 30 мм ;
Тип FER-2 за монтаж на кабел с диаметър до 40 мм ;
Тип FER-3 за монтаж на кабел с диаметър до 80 мм.

3. *През 2002 година започнахме да произвеждаме също и БЪРЗОНАСИЩАЩИСЕ ТОКОВИ ТРАНСФОРМАТОРИ ТИП SBP-1 за поминално работна напрежение до 24 KV и честота 50 Hz за вътрешен монтаж използвани в релейните защити.*

4. *"ЕЛПРОМ ЕМЗ " ООД ГРАД ШАБЛА ПРОИЗВЕЖДА ГАМА ЕДНОФАЗНИ МАСЛЕНИ ТРАНСФОРМАТОРИ ЗА СТЪЛБОВ МОНТАЖ* Тип 1TM20/□3/0.23–20Cu и Тип 2TM20/20/0.23-Cu с номинални мощности съответно 0.5 кVA, 1 кVA 2 кVA, 5 кVA, 10 кVA, 16 кVA, 20 кVA, 25 кVA, 40 кVA и 50 кVA , номинално работно напрежение на намотка ВН 20 кV и с номинално работно напрежение на намотка НН 0.23 кV. Предназначен за използване в енергийните системи, като понижаващ трансформатор, за захранване на мрежи НН с общо предназначение

МОНТАЖ НА ТРАНСФОРМАТОРА : Трансформаторите са пригодени за открит стълбов монтаж. Трансформаторът може да бъде монтиран или на предварително подготвена площадка закрепена на метален решетъчен стълб или направо върху бетонният или дървен стълб. Закрепването в този случай към стълба става посредством две метални скоби, предвидено е закрепващите скоби взависимост от диаметъра на стълба да се регулират в рамките на диаметър от 80 до 330 мм.

КЪМ ГАМА МОНОФАЗНИ МАСЛЕНИ ТРАНСФОРМАТОРИ Тип 1TMxx/□3/0.23–20Cu и Тип 2TMxx/20/0.23–Cu при желание на КЛИЕНТА ПРЕДЛАГАМЕ – еднофазен или двуфазен разединител за открит стълбов монтаж от серията РОМ за номинално напрежение 20 кV и номинален ток 200А, окомплектовани с хибридна стойка за високоволтови предпазители за открит монтаж на 20 кV и с катодни отводнители за 20 кV 10кА в комплект с високоволтови предпазители за напрежение 20 кV и РЛЗ.

Имаме разработка на АВТОМАТИЧЕН СТЪПАЛЕН РЕГУЛАТОР НА НАПРЕЖЕНИЕ към ГАМАТА ЕДНОФАЗНИ МАСЛЕНИ ТРАНСФОРМАТОРИ ЗА СТЪЛБОВ МОНТАЖ Тип 2TM20/20/0.23-Cu, който гарантира стабилно изходно напрежение 220 V при колебание на входното напрежение 20кV в границите на –20% до +10%.

5. *"ЕЛПРОМ ЕМЗ"ООД гр. ШАБЛА извършва цялостен или частичен основен ремонт на силови маслени високоволтови трансформатори с мощност от 25 KVA до 1250 KVA включително на 20 KV, 10 KV или 6 KV.*

От 2000 година " ЕЛПРОМ ЕМЗ " ООД град Шабла започна да предлага за продажба на клиенти свои налични заводски рециклирани трифазни силови, маслени, високоволтови трансформатори с мощност от 160 KVA до 1000 KVA на 20 KV, 10 KV и на 6 KV , като дава 12 месеца гаранция на продаваните трансформатори.

През 2003 година " ЕЛПРОМ ЕМЗ " ООД град Шабла започна да поизвежда и да продава НОВИ трифазни, силови, маслени, високоволтови трансформатори с мощност от 25 KVA до 100 KVA на 20 KV, 10 KV или на 6 KV , като дава 18 месеца гаранция на продаваните трансформатори.

Произвеждат се следните мощности /25, 40, 50, 63, 100 KVA/.

1408

6. ***" ЕЛПРОМ ЕМЗ " ООД град Шабла произвежда сухи трансформатори*** **за електрозадвижване с високомоментни постоянно - токови двигатели с номинална мощност от 0.25кVA до 20 кVA отговарящи на изискванията на ОН 0470427-84, те са комплектовъчни изделия в електрозадвижвания с високомоментни постояннотокови двигатели, които се използват в металорежещите машини, робототехниката и други.**

7. ***" ЕЛПРОМ ЕМЗ " ООД град Шабла произвежда монофазни и трифазни дросели с ВЪЗДУШНА МЕЖДИНА*** **и номинална мощност до 400kWAR , които са комплектовъчни изделия в уредбите за компенсиране на cosф. Произвеждат се и дросели с номинална индуктивност до 1.5 Н и номинален ток до 100 А отговарящи на изискванията на ОН 0477415-87, които са комплектовъчни изделия за електрозадвижвания с високомоментни постояннотокови двигатели за задвижване на металорежещи машини, роботи и други.**

8. ***"ЕЛПРОМ ЕМЗ " ООД град Шабла произвежда трансформатори еднофазни и трифазни изпълнени*** **по заявка или по заявка и конструктивна документация на клиента отговарящи на нормативни документи посочени от клиента.**

на основание чл. 2 от ЗЗЛД

УПРАВИТЕЛ
/ ин

1409

Приложение 4.1

" ЕЛПРОМ ЕМЗ " ООД ГРАД ШАБЛА

ГАМА ТОКОВИ ИЗМЕРВАТЕЛНИ ТРАНСФОРМАТОРИ НН ТИП СТ-1; СТ-2, СТ-3 И СТ-4

ТЕЛЕФОНИ ЗА КОНТАКТИ:
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Електроинженер 05743 / 42 - 84
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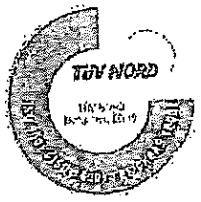
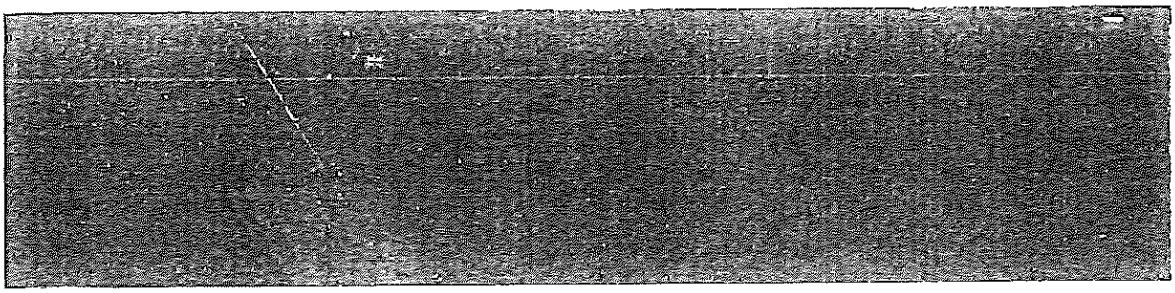
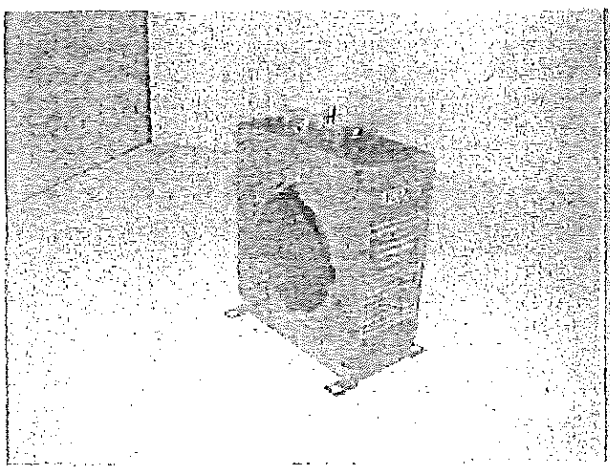


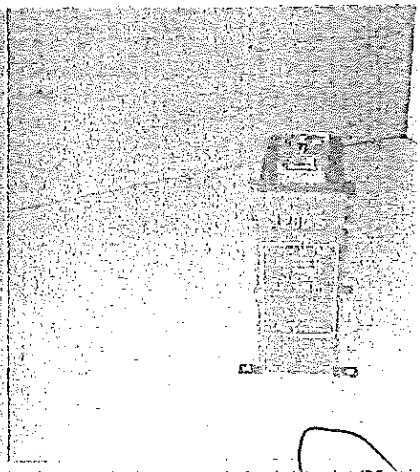
таблица 1.

Тип Type	Преводно отношение Ipn/Isn Ratet current ratio A / A	Най-високо работно напрежение Ratet voltage power network kV	Клас на точност Class of acuuracy %	Номинална мощност Sn Rated power VA	Номинален ток на терм. устойчивост Rated short-time termal stavilty Ith, kA	Номинален ток на дин. устойчивост Rated short-time dinamic stavilty Idyn, kA	Номинален коефициент на безоп. Security factor for apparatus Fs	Заводски шифър Serial number
1	2	3	4	5	6	7	8	9
СТ - 1 първич и вторич	30 / 5	0,72	0,2; 0,5; 0,5S	5 ; 10	60 Ipn	2,5 Ith	5 ; 10	1210302 - XXXX
	50 / 5	0,72	0,2; 0,5; 0,5S	5 ; 10	60 Ipn	2,5 Ith	5 ; 10	1210502 - XXXX
	75 / 5	0,72	0,2; 0,5; 0,5S	5 ; 10	60 Ipn	2,5 Ith	5 ; 10	1210752 - XXXX
	100 / 5	0,72	0,2; 0,5; 0,5S	5 ; 10	60 Ipn	2,5 Ith	5 ; 10	1211002 - XXXX
	150 / 5	0,72	0,2; 0,5; 0,5S	5 ; 10	60 Ipn	2,5 Ith	5 ; 10	1211502 - XXXX
СТ-2 шина 30x10 40x10 кабел ф36	150 / 5	0,72	0,5	5	60 Ipn	2,5 Ith	5 ; 10	1221505 - XXXX
	200 / 5	0,72	0,5	5	60 Ipn	2,5 Ith	5 ; 10	1222005 - XXXX
	250 / 5	0,72	0,5	5	60 Ipn	2,5 Ith	5 ; 10	1222505 - XXXX
	300 / 5	0,72	0,5	5	60 Ipn	2,5 Ith	5 ; 10	1223005 - XXXX
СТ - 3 шина 30x10 40x10 ф36	300 / 5	0,72	0,2; 0,5; 0,5S	5 ; 10	60 Ipn	2,5 Ith	5 ; 10	1233005 - XXXX
	400 / 5	0,72	0,2; 0,5; 0,5S	5 ; 10	60 Ipn	2,5 Ith	5 ; 10	1234005 - XXXX
	500 / 5	0,72	0,2; 0,5; 0,5S	5 ; 10	60 Ipn	2,5 Ith	5 ; 10	1235005 - XXXX
	600 / 5	0,72	0,2; 0,5; 0,5S	5 ; 10	60 Ipn	2,5 Ith	5 ; 10	1236005 - XXXX
СТ - 3 шина 50x10 ф46	500 / 5	0,72	0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	1235005 - XXXX
	600 / 5	0,72	0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	1236005 - XXXX
	750 / 5	0,72	0,2; 0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	1237505 - XXXX
	800 / 5	0,72	0,2; 0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	1238005 - XXXX
СТ-4 за шина 80x10 или кабел ф73	300 / 5	0,72	0,5; 0,5S	5	60 Ipn	2,5 Ith	5 ; 10	1243005 - XXXX
	400 / 5	0,72	0,5; 0,5S	5	60 Ipn	2,5 Ith	5 ; 10	1244005 - XXXX
	500 / 5	0,72	0,5; 0,5S	5	60 Ipn	2,5 Ith	5 ; 10	1245005 - XXXX
	600 / 5	0,72	0,2; 0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	1246005 - XXXX
	750 / 5	0,72	0,2; 0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	1247505 - XXXX
	800 / 5	0,72	0,2; 0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	1248005 - XXXX
	1000 / 5	0,72	0,2; 0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	1249005 - XXXX
	1200 / 5	0,72	0,2; 0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	1250005 - XXXX
	1250 / 5	0,72	0,2; 0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	1251505 - XXXX
	1500 / 5	0,72	0,2; 0,5; 0,5S	5; 10; 15	60 Ipn	2,5 Ith	5 ; 10	





(http://elpromemz.bg/wp-content/uploads/2015/09/DS_22.jpg)



(//elpromemz.bg/wp-content/uploads/2015/09/DS_12.jp

ТИП СТ-4

Категория: НН (http://elpromemz.bg/portfolio-category/hh2/)

ТОКОВИ ИЗМЕРВАТЕЛНИ ТРАНСФОРМАТОРИ НН

Токови измервателни трансформатори за НН тип СТ-4

са проходни трансформатори за вътрешен монтаж с една вторична намотка с клас на точност 0.2 0.5, 0.5S и номинална мощност от 5 VA 10 VA и 15 VA в диапазона на номинални токове от 750/5, 800/5 1000/5, 1200/5 1250/5 и 1500/5 А и максимално работно напрежение 0.72kV.
Отговарят на изискванията на БДС EN 61869-2:2012 БДС EN 60044-1:2001
Одобрени от БИС с удостоверения за одобрен тип средство за измерване №05.04.4547 от 03.04.2006 година

Скрий

Технически характеристики на Тип СТ - 4
обхват 750/5А 800/5А 1000/5А 1200/5А 1250/5А 1500/5А

1 Номинално напрежение – 0.72 KV
2 Честота - 50 Hz
3 Номинален първичен ток Ipn - 750 800, 1000, 1200 1250 1500 А
4 Номинален вторичен ток Isn - 5 А
5 Клас на точност – 0.2, 0.5 0.5S
6. Номинална мощност – 5 10, 15 VA
7 Ток на термична устойчивост – 60 x Ipn
8 Ток на динамична устойчивост - 2.5 x Ith
9 Маса – 0.920 до 1.00 kg
10 Изолация – сухо, клас на топлоустойчивост В

Условия на работа

ИНЖЕНЕРИНГ ПОСРЕДНИК ЕАД

1411

Токовите трансформатори ниско напрежение се монтират не закрито при температура на охолната среда от -35о С до +45о С и височина над морското равнище до 1000м

Стандартизирани документи ; Изделието отговаря на БДС EN 61869-2:2012
БДС EN 60044-1:2001 IEC 60044-1:1999

Габаритни размери (http://elpromemz.bg/wp-content/uploads/2015/12/CT_4_HH_GABARTNI_RAZMER.pdf)

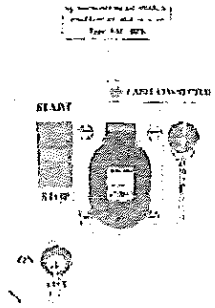
Удостоверения за одобрени типове. Скрий

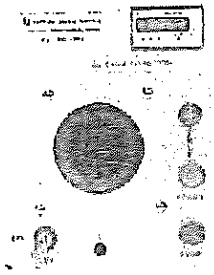
Удостоверение (http://elpromemz.bg/%D1%83%D0%B4%D0%BE%D1%81%D1%82%D0%BE%D0%B2%D0%B5%D1%80%D0%B5%D0%BD%D0%B8%D0%B5-%D0%B7%D0%B0-%D0%BD%D0%BD/)

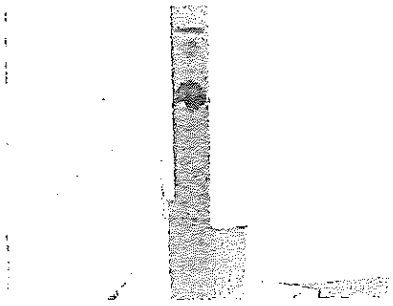
% VIEW PROJECT

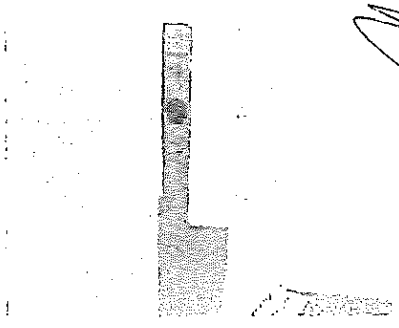
КАТАЛОГ ПРОДУКТИ

нашата продуктува гама









РЕПУБЛИКА БЪЛГАРИЯ
Български институт по метрология

REPUBLIC OF BULGARIA
Bulgarian Institute of Metrology

УДОСТОВЕРЕНИЕ
ЗА ОДОБРЕН ТИП СРЕДСТВО ЗА ИЗМЕРВАНЕ
Measuring Instrument Type-approval Certificate

№ 16.03.5100

Издадено на производител: „ЕЛПРОМ ЕМЗ" ООД, гр. Шабла, ул. Нефтяник № 38
Issued to manufacturer:

На основание на: чл. 32, ал. 1 от Закона за измерванията (ДВ, бр. 46 от 2002 г., изм. бр. 88 от 05 г., изм. и доп. бр. 95 от 2005 г.)
In Accordance with;

Относно: измервателен токов трансформатор тип СТ-х
In Respect of:

Знак за одобрен тип:
Type Approval Mark:

BG 16
5100

Технически и метрологични характеристики: приложение, неразделна част от настоящото удостоверение за одобрен тип средство за измерване
Technical and metrological characteristics:

Срок на валидност: 14.03.2026 г.
Valid until:

Вписва се в регистъра на одобрените за използване типове средства за измерване под №: 5100
Reference №:

Дата на издаване на удостоверението за одобрен тип: 14.03.2016 г.
Date:

на основание чл. 2 от ЗЗЛД

И. Д. ПРЕДСЕДАТЕЛ:
Паун Ил

ПЛОВДИВ
Е А Д

14 43

Приложение към удостоверение за одобрен тип № 16.03.5100

Издадено на производител: „ЕЛПРОМ ЕМЗ" ООД; гр. Шабла, ул. Нефтяник № 38

Относно: измервателен токов трансформатор тип СТ-х

1. Описание на типа:

Измервателните токови трансформатори тип СТ-х се използват за измерване и защита на електрически мрежи с максимално работно напрежение 0,72 kV.

Измервателните токови трансформатори тип СТ-1 се състоят от тороидален магнитопровод с първична и вторична намотки, поместени в кутия от пласмаса. Магнитопровода е направен от силициева ламарина, Mu-метал или пермалой. Върху магнитопровода е намотана вторичната намотка равномерно по целия обем. Това осигурява ефективното магнитно взаимодействие на първичната и вторичната намотки. Броят на навивките на вторичната намотка се определя от отношението между първичния и вторичния номинален ток. Първична и вторична намотки са поместени в кутийка от пластмаса, изработена от пластмаса тип Tecomid NB40 NL E с клас на възпламеняемост съгласно IEC 707-V-0. Началото и края на вторичната намотка са изведени на клеми разположени в горната част на трансформатора и са защитени с прозрачна пластмасова капачка, която е отваряема и има възможност за пломбиране.

Измервателните токови трансформатори тип СТ-2, тип СТ-3 и тип СТ-4 са проходен тип, пригодени за монтаж за шина или за кабел. Състоят се от магнитопровод с вторична намотка и са поместени в пластмасова кутия, изработена от пластмаса тип Tecomid NB40 NL E с клас на възпламеняемост съгласно IEC 707-V-0.

Измервателните токови трансформатори тип СТ-х са предназначени за експлоатация на закрито, при надморска височина до 1000 m, температура на околната среда от минус 35 °C до 45 °C и относителна влажност до 70 %. Изолацията спрямо магнитопровода и намотките е суха, с клас на топлоустойчивост B.

При измервателните токови трансформатори тип СТ-х има възможност да се пломбира кутията на трансформатора с цел предотвратяване на неправомерен достъп до магнитопровода и намотките. Има възможност да се пломбира и капачката, която предпазва клемите на вторичната намотка на трансформатора.

2. Технически и метрологични характеристики:

Характеристики	Тип на трансформатора			
	СТ-1	СТ-2	СТ-3	СТ-4
Максимално работно напрежение, kV	0,72			
Честота, Hz	50			
Номинален първичен ток, A	30; 50; 75; 100; 150	100; 150; 200; 250; 300	400; 500; 600	750; 800; 1000; 1200; 1250; 1500; 1600; 2000; 2500; 3000
Клас на точност	0,2; 0,2S; 0,5; 0,5S	0,5; 0,5S	0,2; 0,2S; 0,5 0,5S	0,2; 0,2S; 0,5; 0,5S
Номинален вторичен ток, A	5			
Мощност, VA	5; 10	5; 10	5; 10; 15	5; 10; 15
Коефициент на сигурност, FS	FS5; FS10			

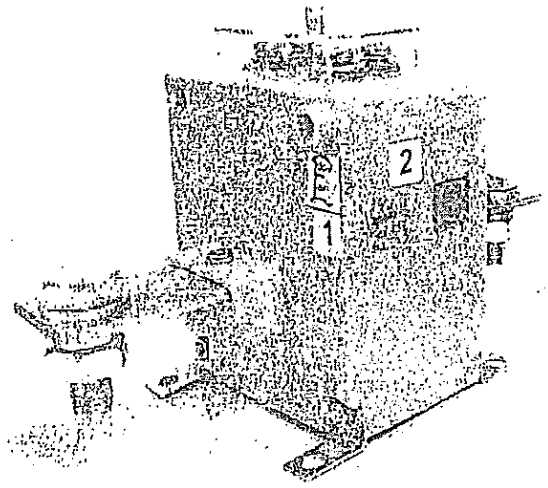
1414

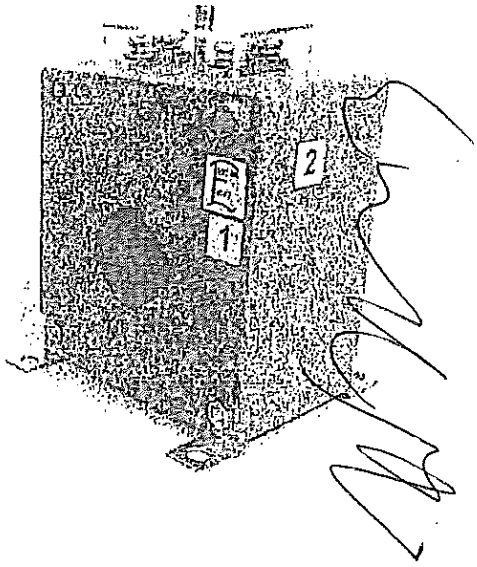
Приложение към удостоверение за одобрен тип № 16.03.5100

3. Типово означение: СТ-х (СТ-1; СТ-2; СТ-3; СТ-4)

4. Описание на местата, предназначени за поставяне на знаци от метрологичен контрол:

- 1 - Знак за одобрен тип;
- 2 - Знак за първоначална проверка (марка за залепване).





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РЕПУБЛИКА БЪЛГАРИЯ
Български институт по метрология

REPUBLIC OF BULGARIA
Bulgarian Institute of Metrology

УДОСТОВЕРЕНИЕ
ЗА ОДОБРЕН ТИП СРЕДСТВО ЗА ИЗМЕРВАНЕ
Measuring Instrument Type-approval Certificate

№ 16.03.5101

Издадено на производител:
Issued to manufacturer:
„ЕЛПРОМ ЕМЗ" ООД, гр. Шабла, ул.. Нефтяник № 38

На основание на:
In Accordance with:
чл. 32, ал. 1 от Закона за измерванията (ДВ, бр. 46 от 2002 г., изм. бр. 88 от 05 г., изм. и доп. бр. 95 от 2005 г.)

Относно:
In Respect of:
измервателен токов трансформатор тип xxCT-x PR

Знак за одобрен тип:
Type Approval Mark:
BG 16
5101

Технически и метрологични характеристики:
Technical and metrological characteristics:
приложение, неразделна част от настоящото удостоверение за одобрен тип средство за измерване

Срок на валидност:
Valid until:
14.03.2026 г.

Вписва се в регистъра на одобрените за използване типове средства за измерване под №:
Reference №:
5101

Дата на издаване на удостоверението за одобрен тип:
Date:
14.03.2016 г.

на основание чл. 2 от ЗЗЛД

И. Д. ПРЕДСЕДАТЕЛ:
Пауи Ивчев

ЕНЕРИНГ ПЛОВДИВ ЕАД

1416

Приложение към удостоверение за одобрен тип № 16.03.5101

Издадено на производител: „ЕЛПРОМ ЕМЗ" ООД; гр. Шабла, ул. Нефтяник № 38

Относно: измервателен токов трансформатор тип ххСТ-х PR

1. Описание на типа:

Измервателните токови трансформатори тип ххСТ-х PR се използват за измерване и защита на електрически мрежи с максимално работно напрежение 7,2 kV; 12 kV и 24 kV.

Измервателните токови трансформатори тип ххСТ-1 са с тороидален магнитопровод с една първична и две вторични намотки, които могат да бъдат за измерване или за защита в произволна комбинация.

Измервателните токови трансформатори тип ххСТ-2 са с тороидален магнитопровод с една първична и една вторична намотка за измерване.

Измервателните токови трансформатори тип ххСТ-3 са с тороидален магнитопровод с една първична и една вторична намотка за защита.

Измервателните токови трансформатори тип ххСТ-4 са с тороидален магнитопровод с една първична и три вторични намотки, които могат да бъдат за измерване или за защита в произволна комбинация.

Измервателните токови трансформатори тип ххСТ-5 са с тороидален магнитопровод с една първична и четири вторични намотки, които могат да бъдат за измерване или за защита в произволна комбинация.

Измервателните токови трансформатори тип ххСТ-хPR са с тороидален магнитопровод с външно превключване на първичната или вторичната намотка.

Изолацията на измервателните токови трансформатори тип ххСТ-х PR между магнитопровода и намотките е суха със силикон.

Измервателните токови трансформатори тип ххСТ-хPR са предназначени за експлоатация на закрито, при надморска височина до 1000 m, температура на околната среда от минус 35 °C до 45 °C.

При измервателните токови трансформатори тип ххСТ-хPR има възможност да се пломбира както кутията на трансформатора, с цел предотвратяване на неправомерен достъп до магнитопровода и намотките, така и пломбиране на капачката, която предпазва клемите на вторичната намотка на трансформатора.

2. Технически и метрологични характеристики:

Характеристика	Тип на трансформатора					
	ххСТ-1	ххСТ-2	ххСТ-3	ххСТ-4	ххСТ-5	ххСТ-хPR
Максимално работно напрежение, kV	7,2; 12; 24					
Честота, Hz	50					
Номинален първичен ток, A	от 5 до 3000					
Номинален вторичен ток, A	1; 5					
Клас на точност: - измервателна намотка - защитна намотка	0,2; 0,2S; 0,5; 0,5S; 5P10; 5P20; 10P10; 10P20;	0,2; 0,2S; 0,5; 0,5S	5P10; 5P20; 10P10; 10P20;	0,2; 0,2S; 0,5; 0,5S; 5P10; 5P20; 10P10; 10P20;	0,2; 0,2S; 0,5; 0,5S; 5P10; 5P20; 10P10; 10P20;	0,2; 0,2S; 0,5; 0,5S; 5P10; 5P20; 10P10; 10P20;
Мощност, VA	5; 10; 15; 30; 40; 50					
Коефициент на сигурност, FS	5; 10					

1417

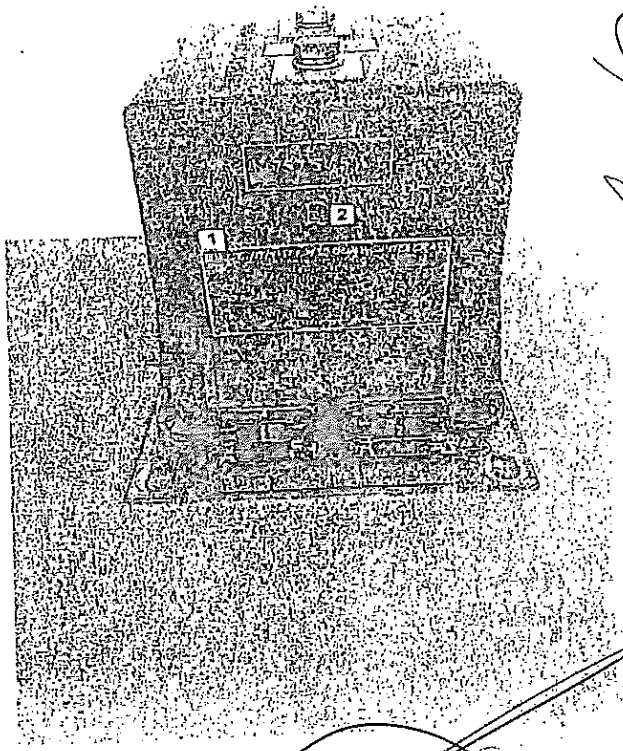
Приложение към удостоверение за одобрен тип № 16.03.5101

3. Типово означение: xxCT-x PR:

xx	CT	x	PR
7,2 kV 12 kV 24 kV	Токов трансформатор	1 - Две вторични намотки за измерване или защита в произволна комбинация; 2 - Една вторична намотка за измерване; 3 – Една вторична намотка за защита; 4 - Три вторични намотки за измерване или защита в произволна комбинация; 5 - Четири вторични намотки за измерване или защита в произволна комбинация.	Трансформатор с външно превключване на първичната или на вторичната намотка

4. Описание на местата, предназначени за поставяне на знаци от метрологичен контрол:

- 1 - Знак за първоначална проверка (марка за залепване);
- 2 - Знак за одобрен тип.



418

ПРИЛОЖЕНИЕ №3

"ЕЛПРОМ ЕМЗ" ООД град ШАБЛА

ТЕЛЕФОНИ ЗА КОНТАКТИ:
Управител 05743 / 45 - 68
Гл.счетоводител 05743 / 42 - 84
Търг. Отдел 05743 / 41 - 84
Факс/тел.секретар 05743 / 50 - 20
E-mail : elpromemz@mbox.infotel.bg

ТЕХНИЧЕСКО ОПИСАНИЕ

ГАМА ТОКОВИ ИЗМЕРВАТЕЛНИ ТРАНСФОРМАТОРИ
тип СТ-1, СТ-2, СТ-3 и СТ-4 за НН до 1000V
ПРОИЗВОДСТВО НА " ЕЛПРОМ ЕМЗ " ООД град ШАБЛА

Токови измервателни трансформатори тип СТ-1; тип СТ-2, тип СТ-3 и тип СТ-4 са за ниско напрежение до 1000V за вътрешен монтаж с клас на точност 0.2; 0.5 или 0.5S и номинална мощност до 50VA в диапазона от номинални токове до 3000А съгласно БДС EN 60044-1:2001 и IEC 60044-1:1999.

- Тип СТ-1 се състои от тороидален магнитопровод с първична и вторична намотки , поместени в кутийка от пластмаса изработена от пластмаса тип Pocan – B4235 с клас на възпламеняемост съгласно IEC 707 – V-0.

  Произвежданите токови трансформатори са в диапазона от 30/5 А до 150/5 А с клас на точност 0.2, 0.5 или 0.5S с мощност 5VA и 10VA.

- Тип СТ-2 Тип, СТ-3 и Тип СТ-4 _ са проходни типове токови измерителни трансформатори пригодени съответно за шина или кабел – състоят се от тороидален магнитопровод с вторична намотка , поместени в кутийка от пластмаса изработена от пластмаса тип Pocan – B4235 с клас на възпламеняемост съгласно IEC 707 – V-0.

  Произвежданите токови трансформатори са в диапазона от 150/5А до 2000/5А с клас на точност 0.5 или 0.5S и мощност 5VA; 10VA и 15VA.

07.2.2012 г.

419

ТЕХНИЧЕСКИ ДАННИ Тип СТ-1, Тип СТ-2,Тип СТ-3 и Тип СТ-4

Условия на работа:Токовите измервателни трансформатори за средно напрежение се монтират на закрито при температура на околната среда от -35С до +45С и височина над морското равнище до 1000м.

1. Номинално напрежение - до 0,75 KV
2. Честота - 50 Hz
3. Номинален първичен ток Ipn - до 2000 A
4. Номинален вторичен ток Isn - 5 A
5. Клас на точност на ядрото за мерене - 0.2, 0.5, 05S
6. Номинална мощност - 5, 10, 15VA
7. Номинален ток на термична устойчивост Ith, кА - 60 Ipn
8. Номинален ток на динамична устойчивост Idyn, кА - 2,5 Ith
9. Номинален коефициент на безопастност Fs - 5 или 10
10. Маса, в кг взависимост от преводното отношение от - 0.485 до 1,070
11. Изолация - суха, клас на топлоустойчивост B

Стандартизирани документи:Изделието отговаря на БДС EN 60044-1:2001 и IEC 60044-1:1999

При всичките произвеждани от " ЕЛПРОМ ЕМЗ " ООД град Шабла токови измервателни трансформатори е предвидена възможност за пломбиране както на кутията на трансформатора с цел предотвратяване на неправомерен достъп до магнитопровода и самите намотки, така и на предпазната капачка, която предпазва клемите на вторичната намотка на трансформатора.

на основание чл. 2 от ЗЗЛД

УПРАВИТЕЛ : ____________

/ инж.Д ... /

ШАБЛА

ИНЖЕНЕРИНГ ПЛОВДИВ ЕАД

1420

Приложение: 4.

БЪЛГАРСКИ ИНСТИТУТ ПО МЕТРОЛОГИЯ
Главна дирекция Мерки и измервателни уреди
отдел "Изследване на типа на средства за измерване"
сектор "Електрични величини"
София, бул. Г.М.Димитров 52 Б, тел. 873-52-98

ПРОТОКОЛ ОТ ИЗПИТВАНЕ

№ 19-ЕВ / 13.07.2006 г.

1. **Обект на изпитването:** Токов измервателен трансформатор тип СТ- Х
2. **Номер и дата на заявката:** АУ-03-654/27.06.2006 г.
3. **Заявител:** " ЕЛПРОМ - ЕМЗ" ООД гр. Шабла
4. **Производител:** " ЕЛПРОМ - ЕМЗ" ООД гр. Шабла
5. **Метод на изпитване:** БДС EN 60044-1 Измервателни трансформатори Част 1: Токови трансформатори.
6. **Период на изпитване:** 07.07.2006 г. до 14.07.2006 г.
7. **Изпитани образци:** ф. № 20218, 33063, 29967, 29477, 34805, 32820
8. **Описание на типа:**

Гамата измервателни токови трансформатори тип СТ-х са за мрежи ниско напрежение.

Токовите трансформатори тип СТ-1 се състоят от тороидален магнитопровод с първична и вторична намотка, а тип СТ-2, тип СТ-3 и тип СТ-4 са проходен тип трансформатори, пригодени за шина или кабел, с вторична намотка.

Резултатите в протокола се отнасят само за изпитваните образци.

на основание чл. 2 от ЗЗЛД

Началник отдел ИТСИ:
/инж/Хр.Соколова/

Протокола може да бъде разпечатван единствено и само с разрешение на началник отдел "Изследване на типа на средствата за измерване"

Вярно с оригинала

14.21

Приложение: 4.

9. **Технически и метрологични характеристики:**

Тип на трансформатора	СТ-1	СТ-2	СТ-3	СТ-4
Номинален първичен ток, А	30, 50, 75, 100,150	200, 250, 300	400, 500, 600	1200, 1250, 1500
Номинален вторичен ток, А	5			
Клас на точност	0,5 S			
Максимално работно напрежение, kV	0,72			
Честота, Hz	50			
Номинална мощност, VA	5, 10	5, 10	5, 10, 15	5, 10, 15

10. Технически средства използвани при изпитването:

10.1. Уредба за проверка на токови трансформатори тип АИТ ф. № 45/1972 с еталонен трансформатор тип TI 50 ф. № 7210453, свидетелство за калибриране № 037- ЕЕИ/ 16.03.2005 год.

10.2. Уредба за изпитване на диелектрична якост тип РЕО 3/50 ф. № 671897308

10.3. Мегаомметър тип Ф 41/2, ф. № 62862.

11. Резултати от изпитванията:

11.1. Проверка на маркировката

11.1.1. Маркировка на изводите – БДС EN 60044-1 т. 10.1.1 и 10.1.2

Протоколи № 01÷ 03 /10.07.2006 г.
Протоколи № 04÷ 06 /11.07.2006 г.
Протокол № 12/12.07.2006 г.

11.1.2 Означение на полярностите – БДС EN 60044-1 т. 10.1.3

Протоколи № 01÷ 03 /10.07.2006 г.
Протоколи № 04÷ 06 /11.07.2006 г.
Протокол № 12/12.07.2006 г.

11.2. Маркировка на табелките с технически данни – БДС EN 60044-1 т. 10.2 и т. 11.7

Протоколи № 01÷ 03 /10.07.2006 г.
Протоколи № 04÷ 06 /11.07.2006 г.
Протокол № 12/12.07.2006 г.

Вярно с оригинала

ЕЛПРОМ-ЕМЗ ШАБЛА ЦОО

1422

Приложение: 4.

11.3. Проверка на диелектричната якост на първичната намотка – /3 kV за 60 s/ — БДС EN 60044-1 т. 5.1.4

Протоколи № 01÷ 03 /10.07.2006 г.
Протоколи № 04÷ 06 /11.07.2006 г.
Протокол № 12/12.07.2006 г.

11.4. Проверка на диелектричната якост на вторичната намотка – /3 kV за 60 s/ — БДС EN 60044-1 т. 5.1.4

Протоколи № 01÷ 03 /10.07.2006 г.
Протоколи № 04÷ 06 /11.07.2006 г.
Протокол № 12/12.07.2006 г.

11.5. Определяне грешките на трансформаторите – — БДС EN 60044-1 т.11.2

Протоколи № 01÷ 03 /10.07.2006 г.
Протоколи № 04÷ 06 /11.07.2006 г.
Протокол № 12/12.07.2006 г.

11.6. Проверка – коефициент на безопасност - — БДС EN 60044-1 т.11.6

Протоколи № 01÷ 03 /10.07.2006 г.
Протоколи № 04÷ 06 /11.07.2006 г.

Присъствали на изпитването:

Младши експерт: .. на основание чл. 2 от ЗЗЛД

/инж. Р. Малинова/

Началник сектор "ЕВ": на основание чл. 2 от ЗЗЛД

/инж.Л. Сотирова/

Вярно с оригинала

ЕЛПРОМ-ЕМЗ-ШАБЛА-ООД

"ЕЛПРОМ ЕМЗ" ООД град Ш.БЛА

ПАСПОРТ - СЕРТИФИКАТ

ИЗПИТАТЕЛЕН ПРОТОКОЛ

За трансформатор токов измерителен ниско напрежение

Тип СТ – 4 обхват 800/5А, 1000/5А, 1200/5А

Заводски № 12410005 - xxxxx

I Условия на работа . Токовите трансформатори ниско напрежение се монтират на закрито при температура на околната среда от –35° С до +45° С и височина над морското равнище до 1000м.

II.Технически характеристики :

1. Номинално напрежение	-	0.72 KV
2. Честота	-	50 Hz
3 Номинален първичен ток Ipn	-	800 : 1000 : 1200 A
4 Номинален вторичен ток Isn	-	5 A
5 Клас на точност	-	0.5
6 Номинална мощност	-	5 VA
7 Ток на термична устойчивост	-	60 x Ipn
8 Ток на динамична устойчивост	-	2.5 x Ith
9 Маса	-	0.9 : 1.0 : 1.1 кг
10. Изолация - суха, клас на топлоустойчивост В		

III Стандартизирани документи . Изделието отговаря на БДС EN 60044-1:2001;
IEC 60044-1:1999.

IV Резултати от приемно-предавателните изпитания
1. Проверка клас на точност : Отговаря на клас на точност - 0.5
2 Изпитване на изолацията между първичната и вторичната намотка с променливо напрежение 3 KV за 1 минута , издържал

V. Сертификат за качество : Настоящият сертификат за качество се дава въз основа на приемно - предавателните заводски изпитания от .. .. .. 2012 година.
НАСТОЯЩИЯ ТИП ТОКОВ ИЗМЕРИТЕЛЕН ТРАНСФОРМАТОР Е ОДОБРЕН ОТ ДАМТН С УДОСТОВЕРЕНИЕ № 4547 от 05.04.2006 година

VI Комплектност на доставката: Запасни части към изделието не се предвиждат

ИНСТРУКЦИЯ ЗА МОНТАЖ И ЕКСПЛОАТАЦИЯ НА ТОКОВИ ИЗМЕРИТЕЛНИ ТРАНСФОРМАТОРИ ТИП СТ – 4

I Място на монтаж : на закрито.
2 Начини на свързване : Първичната намотка на токовите трансформатори се свързва последователно към захранващите проводници на монтажа, в релетата и апаратите – последователно на вторичната намотка

3.Експлоатационни условия на работа : При ползване на токовите трансформатори трябва да се спазват следните условия :

А/ Трансформаторите да се монтират в закрити помещения.

Б/ Съединителните проводници да са свързани добре към източника и консуматора Когато изводите са на винтове, съединителните проводници трябва да се затегнат здраво между две месингови шайби или кабелна обувка.

В/ Токът, който се черпи от трансформатора, по специално мощността на трансформатора, да не е по-голяма от мощността, посочена на табелката. Претоварването на трансформаторите се ограничава от допустимите температури на загряване на изолациите.

Г/ Токовите трансформатори трябва да работят при непрекъснат или периодичен контрол

Д/ При обслужване на токовите трансформатори е задължително да се спазва следното условие

ПРИ ВКЛЮЧЕНА ВЪВ ВЕРИГАТА ПЪРВИЧНА НАМОТКА ВТОРИЧНАТА НАМОТКА НА ТРАНСФОРМАТОРА НЕ ТРЯБВА ДА ОСТАВА ОТВОРЕНА !

Когато се налага прекъсване на вторичната верига, вторичните клеми на трансформаторите трябва да се свързват на късо с проводник със сечение 2,5 кв. мм Във вторичната верига на токов трансформатор предпазители не се поставят.

Е/ При работа на трансформатора единият извод на вторичната намотка се заземява.

4. Безопасност и хигиена на труда : За осигуряване на безопасна работа на обслужващия персонал е необходимо да се спазват следните условия:

А/ Единият извод на вторичната намотка да се заземи

Б/ При включване на първичната намотка във веригата, вторичната намотка да не се остава отворена.

В/ След извършване на монтажа на трансформаторите към таблата и уредите, върху клемите НН на първичната намотка, да се постави предпазна капачка и да се пломбира

Г/ При ревизия на трансформаторите, същите да не са под напрежение.

Д/ При проверка на трансформаторите откъм ниската страна обслужващия персонал да работи с лични предпазни средства.

При добри условия на работа и при периодичен контрол, трансформаторите могат да работят продължително време без повреда.

5 Опаковка, транспорт и съхранение : Трансформаторите се поставят в специални кутии от картон ведлане Транспортират се във всякакъв вид транспортни средства

ПРИ НЕСПАЗВАНЕ НА НАСТАВЛЕНИЯТА, ДАДЕНИ В НАСТОЯЩАТА ИНСТРУКЦИЯ, ЗАВОДЪТ ПРОИЗВОДИТЕЛ НЕ ПРИЕМА РЕКЛАМАЦИИ, НАПРАВЕНИ В ГАРАНЦИОННИЯ СРОК НА ИЗДЕЛИЕТО.

ГАРАНЦИОННА КАРТА

"ЕЛПРОМ ЕМЗ" ООД град Шабла се задължава да замени или ремонтира безвъзмездно токови измерителни трансформатори, които в продължение на 36 месеца от датата на продажбата им от завода, са показали дефекти или потребителят е констатирал несъответствия на трансформатора с изискванията на съответния стандарт.

Замяната или ремонтът се извършва при условие, че са спазени изискванията за транспорт, съхранение, монтаж и експлоатация, дадени от предприятието - производител в прид документация и е запазен оригиналният паспорт - сертификат с гаранционната карта на трансформатор.

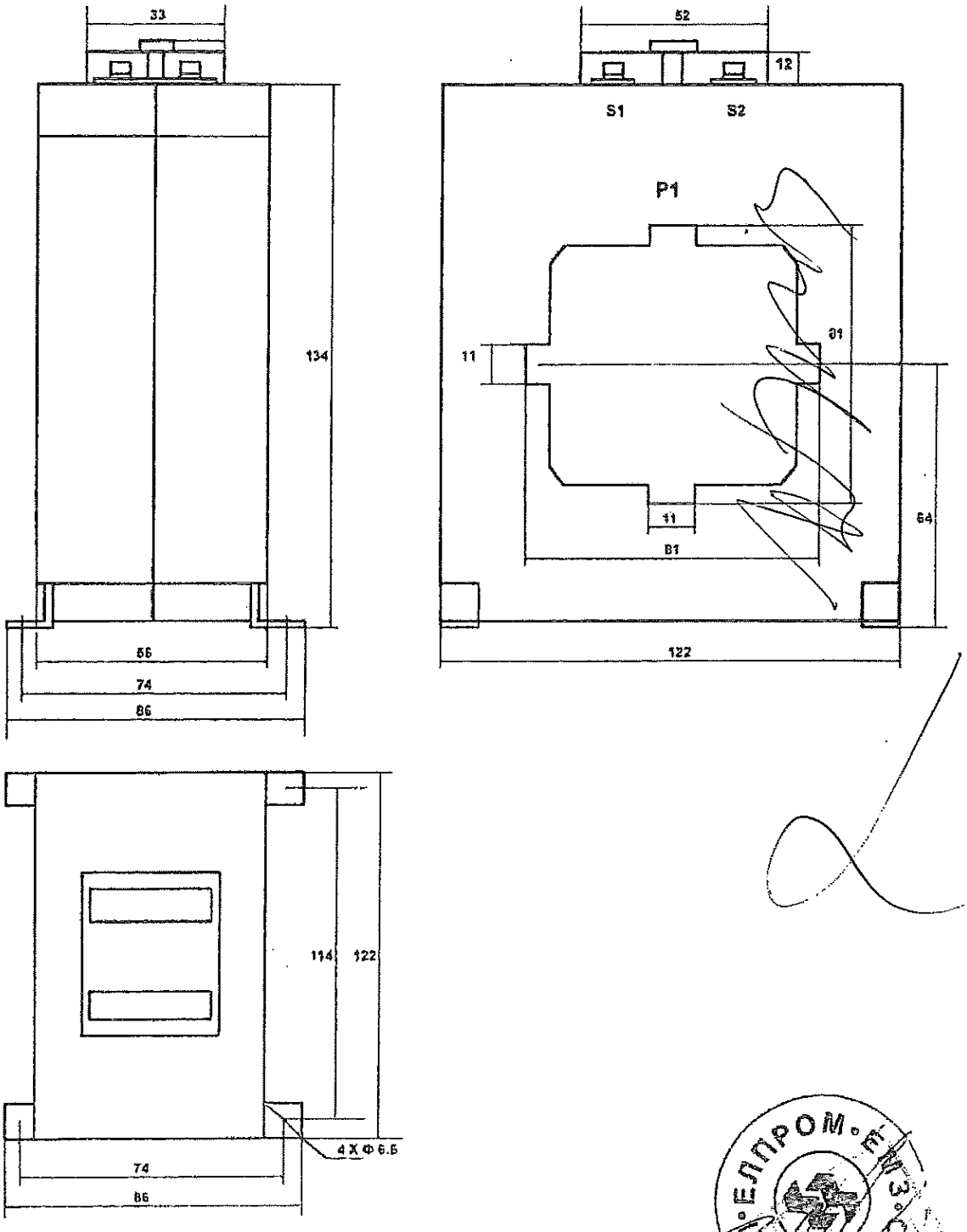
Дата на продажба .....

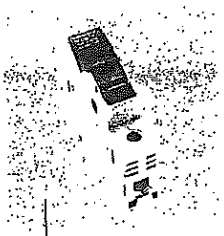
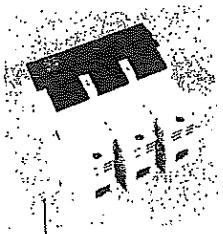
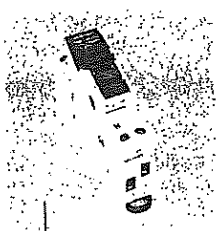
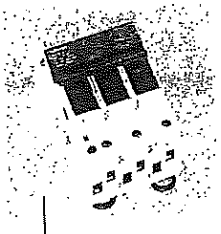
"ЕЛПРОМ ЕМЗ" ООД

ПРИЛОЖЕНИЕ I

ПРИСЪЕДИНИТЕЛНИ РАЗМЕРИ ЗА ТОКОВИ ИЗМЕРВАТЕЛНИ ТРАНСФОРМАТОРИ

тип СТ- 4 включващи преводните отношения 800/5А, 1000/5А, и 1200/5А



31 110		31 123		31 273		31 274	

AMBUS®Panel

IEC-compatible holder for cylindrical fuses
with box terminals, clip-on mounting, contact protection in accordance with DIN 50274

AMBUS®Panel, holder for cylindrical fuses, **standard model, without neutral conductor**

Size	Rated current	Type	Width	Connection	Pack size	Weight kg/100 u.		Part no.	
10x38	32A	1-pole	18	0.75 - 25mm² / AWG 18 - 4	12	5.2		31 110	17
		2-pole	36	0.75 - 25mm² / AWG 18 - 4	6	10.3		31 [illegible]	17
		3-pole	54	0.75 - 25mm² / AWG 18 - 4	4	15.5		31 [illegible]	17
14x51	50A	1-pole	27	1.5 - 35mm² / AWG 14 - 2	6	9.7		31 [illegible]	17
		2-pole	54	1.5 - 35mm² / AWG 14 - 2	3	20.2		31 [illegible]	17
		3-pole	81	1.5 - 35mm² / AWG 14 - 2	2	30.4		31 [illegible]	17
22x58	100A	1-pole	36	4 - 50mm² / AWG 10 - 1/0	6	15.8		31 [illegible]	17
		2-pole	72	4 - 50mm² / AWG 10 - 1/0	3	32.2		31 [illegible]	17
		3-pole	108	4 - 50mm² / AWG 10 - 1/0	2	48.6		31 [illegible]	17

AMBUS®Panel, holder for cylindrical fuses, **standard model, neutral conductor on the right**

10x38	32A	1-pole+N	36	0.75 - 25mm² / AWG 18 - 4	6	11.3		31 [illegible]	17
		3-pole+N	72	0.75 - 25mm² / AWG 18 - 4	3	21.7		31 [illegible]	17
14x51	50A	1-pole+N	54	1.5 - 35mm² / AWG 14 - 2	3	21.8		31 [illegible]	17
		3-pole+N	108	1.5 - 35mm² / AWG 14 - 2	1	42.7		31 [illegible]	17
22x58	100A	1-pole+N	72	4 - 50mm² / AWG 10 - 1/0	3	35.8		31 [illegible]	17
		3-pole+N	144	4 - 50mm² / AWG 10 - 1/0	1	67.5		31 [illegible]	17

AMBUS®Panel, holder for cylindrical fuses, **standard model, neutral conductor on the left**

14x51	50A	3-pole+N	108	1.5 - 35mm² / AWG 14 - 2	1	42.7		[illegible]	17
22x58	100A	3-pole+N	144	4 - 50mm² / AWG 10 - 1/0	1	67.5		[illegible]	17

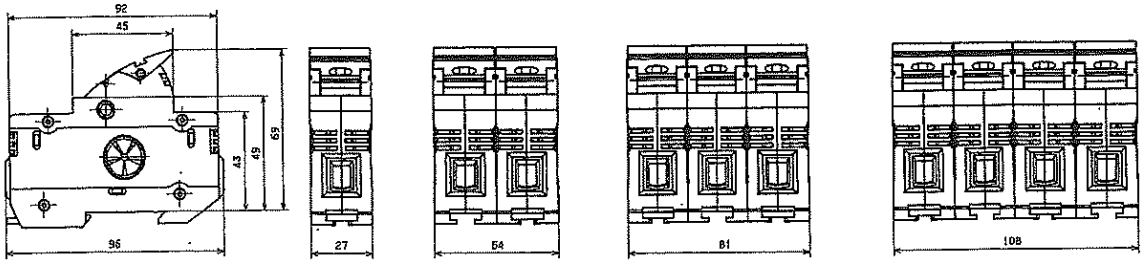
AMBUS®Panel, holder for cylindrical fuses, **N-module**

10x38	32A	N	18	0.75 - 25mm² / AWG 18 - 4	12	6.2		[illegible]	17

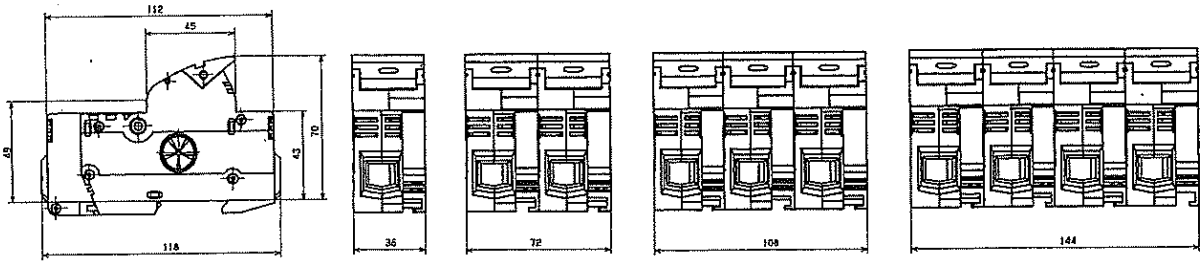
AMBUS®Panel, holder for cylindrical fuses, **standard model, with integrated neutral conductor (on the left)**

10x38	32A	1-pole+N	18	1.5 - 10mm²	12	9.0		31 273	17
		3-pole+N	54	1.5 - 10mm²	4	22.0		31 274	17

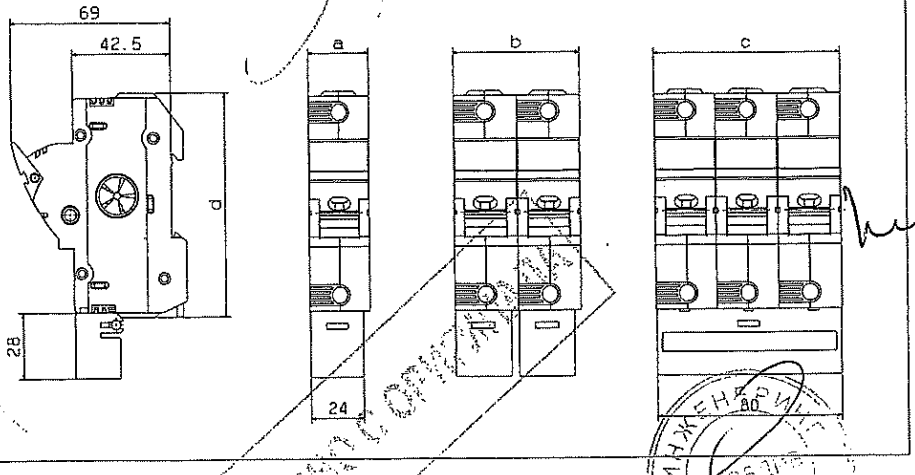
31 115 - 31 119
31 135 - 31 138
31 168
31 278 - 31 280



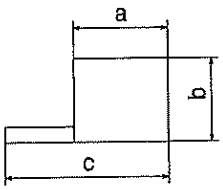
31 120 - 31 124
31 140 - 31 143
31 171
31 281 - 31 283

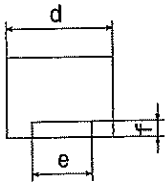


	a	b	c	d
31 940	27			96
31 941			81	96
31 942	36			118
31 943			108	118
31 957		72		118
31 972		54		96

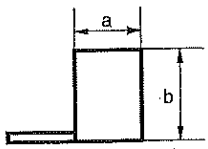


	a	b	c	d	e	f
01 198	42	32	68	23	6.5	4
01 228	42	32	91	23	6.5	4
31 028	17	26	37	20	6	2
31 029	17	26	49	20	6	2
31 039	21	29	42	16	6.5	3
31 085	20	26	53	17	6	2
31 103	13	18	45	17	4	2
31 157	13	17	50	13	4	2
31 550	21	29	60	16	6.5	3

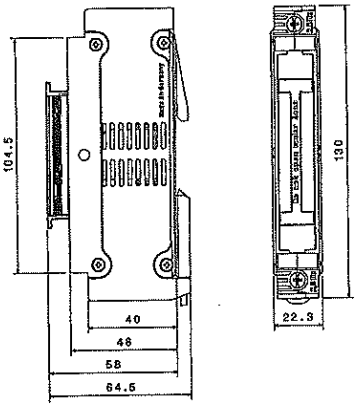




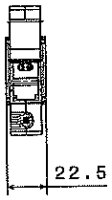
	a	b	Poles	Division
31 012	17	16	3	27
31 014	5	15	1	27
31 024	5	15	1	27
31 056	30	15	3	27
31 057	6	26	1	27
31 101	5	15	1	18
31 102	18	16	3	18
31 309	5	15	1	40
31 310	17	16	3	40
31 311	5	15	1	50
31 312	17	16	3	50
31 548	5	15	1	18
31 549	23	22	3	18
31 561	23	22	2	18

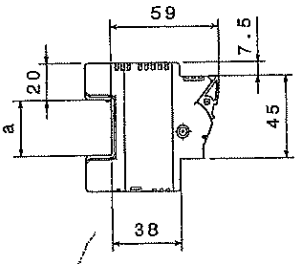


31 555

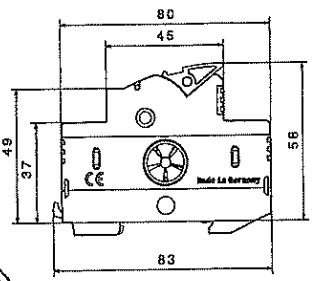


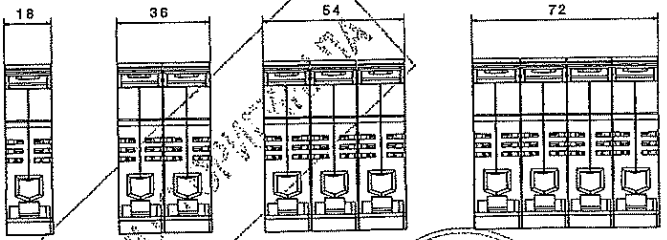
	a
31 570	30
31 572	20





31 110 - 31 114
31 130 - 31 133
31 258
31 273 - 31 277
31 295 - 31 300
31 929 - 31 930
31 971
31 973
31 974





AMBUS®Panel
Holder for cylindrical fuses 10 x 38, 14 x 51, 22 x 58

1, 2- and 3-pole, 1 and 3-pole + N as required
LED: 12 - 72V AC / DC resp. 110 - 690V AC / DC resp. 400 - 1000V DC

Pilot switch:
1 changeover switch 250V AC (5A), 30V DC (4A)
Flat lug 2.8 x 0.5mm (e.g. DIN 46 245)

Clip-on mounting on EN 60715 mounting rail

Conductor terminals:

Size	Conductor terminals according to IEC		Conductor terminals according to IEC UL / CSA	
10x38	1x Cu 0.75 - 25mm²	f, f+AE	1x AWG 18 - AWG 4	str
	2x Cu 0.75 - 10mm²*	f, f+AE	2x AWG 18 - AWG 6 *	str
Integrated N-pole	1x Cu 1.5 - 10mm²	f, f+AE		
14x51	1x Cu 1.5 - 35mm²	f, f+AE	1x AWG 14 - AWG 2	str
22x58	1x Cu 4 - 50mm²	f, f+AE	1x AWG 10 - AWG 1/0	str

* 2 identical conductors next to each other in the contact position

Overall size		10 x 38 PV	10 x 38	14 x 51	22 x 58
According to standard	IEC/EN	IEC 60269-2	IEC 60947-3, EN 60947-3, VDE 0660 part 107		
	UL/CSA	UL 4248-1, 4248-18	UL 4248-1		
Current type		DC	AC (50/60Hz) / DC	AC (50/60Hz) / DC	AC (50/60Hz) / DC
Maximum rated operating voltage (U_e)	IEC/EN	1000V DC	690V AC	690V AC	690V AC
	UL/CSA	1000V DC	600V AC / DC	600V AC / DC	600V AC / DC
Rated insulation voltage (U_i)	IEC/EN	1000V DC	800V	800V	800V
Rated surge withstand capacity (U_{imp})	IEC/EN	6kV	6kV	6kV	6kV
Rated operating current (I_e)	IEC/EN	30A	32A	50A	100A
	UL/CSA	30A	30A	50A / 40A	80A
Application category, version 1P, 1P+N, 2P	IEC/EN	-	AC-22B (400V)	AC-22B (400V)	AC-20B (690V)
	UL/CSA	only applicable as fuse holder			
Application category, version 3P, 3P+N	IEC/EN	-	AC-22B (690V)	AC-21B (690V)	AC-20B (690V)
	UL/CSA	only applicable as fuse holder			
Conditional rated short-circuit current (AC) version 1P, 1P+N, 2P	IEC/EN	20kA**	100kA (500V)*	100kA (400V)*	100kA (500V)*
	UL/CSA	33kA	100kA (600V)	100kA (600V)	100kA (600V)
Conditional rated short-circuit current (AC) version 3P, 3P+N	IEC/EN	-	100kA (500V)*	100kA (400V)*	100kA (500V)*
	UL/CSA	-	100kA (600V)	100kA (600V)	100kA (600V)
Allowable power dissipation for each fuse, standard version		-	3W (gG)	5W (gG)	9.5W (gG)
Allowable power dissipation for each fuse, semi-conductor protection version		4.0W (gPV)	4.3W (aR/gR) (10mm², 25A)	6.5W (aR/gR) (25mm², 40A)	11W (aR/gR) (50mm², 80A)

* Type tested with fuses of characteristic gL/gG (IEC 60269-2)
** Type tested with fuses of characteristic gPV (IEC 60269-6)

wöhner

EC Conformity Declaration

wöhner
Sales/Marketing

Manufacturer:	Wöhner GmbH & Co. KG
Address:	Mönchrödener Str. 10 D - 96472 Rödental
Product designation:	**NH fuse-switch disconnectors** **Switch disconnectors with fuses D0 or 10x38** **Fuse-switch disconnectors for cylindrical fuses**

The designated product(s) conform(s) to the provisions of the following European directive:

Number:	73/23/EWG
Text:	Directive of the Council for Adapting the Legislative Provisions of the member states concerning electric equipment for application within determined voltage limits modified by RL 93/68/EWG

For further information about compliance with this directive, see annex.

Attachment of the CE-marking: 96

Issuer: **Wöhner GmbH & Co. KG**

Place, date: Rödental, 15.05.2003

Legally binding signature:

на основание чл. 2 от ЗЗЛД

Alex Büttner
Managing Director

на основание чл. 2 от ЗЗЛД

Holger Schulte
Marketing & Sales

The annex is part of this declaration.
This declaration certifies the conformance with the mentioned directives, but it does not include any assurances of definite properties.
Please pay special attention to the safety regulations of the delivered product documentation.

Декларация за съответствие

Производител: WÖHNER GmbH и Co KG
Адрес: ул. Mönchrödener 10
D-96472 Rödental

Обозначение на продукта: NH предпазител-разединител
Разединител със предпазители D0 или 10x38
Разединител с цилиндрични предпазители

Конструираният продукт(и) отговаря на разпоредбите на
следната европейска директива:

Номер: 73/23/EWG

Текст: Директива на Съвета за адаптиране на законовите разпоредби на държавите-членки относно електрическото оборудване за прилагане в определени граници на напрежение модифициран от RL 93/68/EWG

За допълнителна информация съгласно тази директива , виж анекс.

Прикрепване на маркировката "CE" 96

Емитент: **WÖHNER GmbH и Co KG**

Място, дата: Rödental, 15.05.2003

Правно обвързващ подпис:

Alex Büttner
Управляващ директор

Holger Schulte
Маркетинг и продажби

ВЕРНО С ОРИГИНАЛА

ИНЖЕНЕРИНГ ЕООД

	Ref. Certif. No.
IEC IECEE CB SCHEME	DE1-49452

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE CERTIFICAT D'ESSAI OC

Product Produit	Fuse-switch-disconnector
Name and address of the applicant Nom et adresse du demandeur	Wöhner GmbH & Co. KG Elektrotechnische Systeme Mönchrödener Straße 10, 96472 Rödental GERMANY
Name and address of the manufacturer Nom et adresse du fabricant	Wöhner GmbH & Co. KG Elektrotechnische Systeme Mönchrödener Straße 10, 96472 Rödental GERMANY
Name and address of the factory Nom et adresse de l'usine Note: *When more than one factory, please report on page 2* Note: *Lorsque il y plus d'une usine, veuillez utiliser la 2ème page*	Wöhner GmbH & Co. KG Elektrotechnische Systeme Mönchrödener Straße 10, 96472 Rödental GERMANY ☐ Additional Information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	Utilization category: AC-21B, AC-22B Rated voltage: 400 V, 500 V, 690 V a.c. Rated current: 10 A, 25 A, 32 A
Trademark (if any) Marque de fabrique (si elle existe)	wöhner
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	
Model / Type Ref. Ref. De type	AES 10x38
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire, peuvent être indiqués sur la 2ème page)	Numbers of poles: 1/2/3-pol. and 1/3-pol.+Neutral ☐ Additional Information on page 2
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	PUBLICATION / EDITION IEC 60947-1(ed.5);am1:2010-12 IEC 60947-3(ed.3)
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	249800-4402-0705/152633

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**

VDE Prüf- und Zertifizierungsinstitut GmbH
VDE *Testing and Certification Institute*
Zertifizierungsstelle / *Certification*

на основание чл. 2 от ЗЗЛД

Date: 2011-12-13

Signature: M. Bausch

Списък на отделните изпитвания на български език

Изследван образец:

Разединител с цилиндрични предпазители н.н. 32А ,10х38 , еднополюсен и триполюсен, тип AES 10х38

Производител:

WÖHNER GmbH, Германия

Изпълнени тестове съгласно IEC/EN 60947-3

1) Маркировка на апаратурата
2) Инструкция за монтаж и есплоатация
3) Материали и конструкция
4) Устойчивост на топлина и огън
5) Минимални разстояния
6) Задвижващо устройство
7) Изолация
8) Посока на задвижване
9) Индикация на позицията на контакта
10) Допълнителни изисквания за безопасност
11) Допълнителни конструктивни изисквания
12) Клеми , проверка за мех. якост
13) Възможност за присъединяване
14) Идентификация и маркировка на клемите

Тест глава I: *Общи експлоатационни характеристики*

1) Покачване на температурата
2) Проверка на диелектричните свойства
3) Включваща и изключваща способност
4) Поведение на апаратурата по време включване и изключване
5) Състояние след теста за включване и изключване
6) Ток на утечка
7) Зависими и независими ръчни операции
8) Сила на задвижващия механизъм

Тест глава II: *Способност за оперативна дейност*

1) Тест –оперативна ефективност

2) Включване и изключване без товар

3) Включване и изключване с товар

4) Поведение на апаратурата по време тест за оперативна ефективност

5) Състояние на апаратурата след теста за включвателна и изключвателна способност.

6) Ток на утечка

7) Проверка ноа диелектричните характеристики

8) Тест -повишаване на температурата

Тест глава III: *Не се използва*
Тест глава IV: *Условен ток на късо съединение*

1) Защита с предпазител от късо съединение

2) Поведение на апарата по време теста

3) Състояние на апарата след тестове на включване и изключване

4) Диелектрични свойства

5) Ток на утечка

6) Проверка на температурата

Test Report issued under the responsibility of:

VDE

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

Report Reference No. ..... :	249800-4402-0705/152633
Date of issue..... :	2011-12-12
Total number of pages ..... :	116
CB Testing Laboratory..... :	**VDE Prüf- und Zertifizierungsinstitut GmbH** VDE Testing and Certification Institute
Address ..... :	Merianstraße 28 · 63069 Offenbach , Germany
Applicant's name..... :	Wöhner GmbH & Co. KG Elektrotechnische Systeme
Address ..... :	Mönchrödener Straße 10, 96472 Rödental, Germany
Test specification:	
Standard..... :	IEC 60947-3: 3rd Edition (2008) in conjunction with IEC 60947-1: 5th Edition (2007)
Test procedure ..... :	CB
Non-standard test method..... :	N/A
Test Report Form No. ..... :	IEC60947_3B
Test Report Form(s) Originator..... :	OVE
Master TRF ..... :	Dated 2009-08

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

Test item description ..... :	Fuse-switch-disconnector
Trade Mark..... :	**wöhner**
Manufacturer ..... :	Wöhner GmbH & Co. KG Elektrotechnische Systeme
Model/Type reference..... :	AES 10x38
Ratings ..... :	See page 6 and 7

Testing procedure and testing location:	
☒ **CB Testing Laboratory:**	**VDE Prüf- und Zertifizierungsinstitut GmbH** **VDE** Testing and Certification Institute
Testing location/ address ..... :	Merianstraße 28 , 63069 Offenbach , Germany
☒ **Associated CB Test Laboratory:**	**IPH Institut** "Prüffeld für elektrische Hochleistungstechnik" GmbH
Testing location/ address ..... :	Landsberger Allee 378 A , 12681 Berlin , Germany
Tested by (name + signature) ..... :	H. Schmidt
Approved by (+ signature) ..... :	T. Kohushölter
☐ Testing procedure: TMP	
Testing location/ address ..... :	
Tested by (name + signature) ..... :	
Approved by (+ signature) ..... :	
☐ Testing procedure: WMT	
Testing location/ address ..... :	
Tested by (name + signature) ..... :	
Witnessed by (+ signature) ..... :	
Approved by (+ signature) ..... :	
☐ Testing procedure: SMT	
Testing location/ address ..... :	
Tested by (name + signature) ..... :	
Approved by (+ signature) ..... :	
Supervised by (+ signature) ..... :	
☐ Testing procedure: RMT	
Testing location/ address ..... :	
Tested by (name + signature) ..... :	
Approved by (+ signature) ..... :	
Supervised by (+ signature) ..... :	

на основание чл. 2 от ЗЗЛД

Summary of testing:

The tests are carried-out according to IEC 60947-1 (ed.5);am1:2010-12 and IEC 60947-3 (ed.3).

Tests performed (name of test and test clause):	**Testing location:**
Clause 7.1 (Construction)	**VDE Testing and Certification Institute**
Test sequence I:	**IPH Institut**
Sample No.1: AC-21B, 500 V, 25 A, 1-pole	see page 16 - 20
Sample No.2: AC-21B, 690 V, 10 A, 1-pole	see page 21 - 25
Sample No.3: AC-22B, 400 V, 32 A, 1-pole	see page 26 - 30
Sample No.4: AC-22B, 400 V, 32 A, 2-pole	see page 31 - 35
Sample No.5: AC-22B, 500 V, 25 A, 2-pole	see page 36 - 40
Sample No.6: AC-22B, 690 V, 10 A, 2-pole	see page 41 - 45
Sample No.7: AC-22B, 690 V, 32 A, 3-pole+N	see page 46 - 50
Test sequence II:	**IPH Institut**
Sample No.8: AC-21B, 500 V, 25 A, 1-pole	see page 51 - 52
Sample No.9: AC-21B, 690 V, 10 A, 1-pole	see page 53 - 54
Sample No.10: AC-22B, 400 V, 32 A, 1-pole	see page 55 - 56
Sample No.11: AC-22B, 400 V, 32 A, 2-pole	see page 57 - 58
Sample No.12: AC-22B, 500 V, 25 A, 2-pole	see page 59 - 60
Sample No.13: AC-22B, 690 V, 10 A, 2-pole	see page 61 - 62
Sample No.14: AC-22B, 690 V, 32 A, 3-pole+N	see page 63 - 64
Test sequence IV:	**IPH Institut**
Sample No.15: 400 V a.c., 100 kA, 1-pole (with fuse-link 32 A / 400 V)	see page 68 - 69
Sample No.16: 400 V a.c., 100 kA, 1-pole+N (with fuse-link 32 A / 400 V)	see page 70 – 71
Sample No.17: 400 V a.c., 100 kA, 2-pole (with fuse-link 32 A / 400 V)	see page 72 - 73
Sample No.18: 400 V a.c., 100 kA, 3-pole+N (with fuse-link 32 A / 400 V)	see page 74 - 75

Summary of testing: (Continuation)

The tests are carried-out according to IEC 60947-1 (ed.5);am1:2010-12 and IEC 60947-3 (ed.3).

Tests performed (name of test and test clause):	Testing location:
Test sequence IV:	**IPH Institut**
Sample No.19: 500 V a.c., 100 kA, 1-pole (with fuse-link 25 A / 500 V)	see page 76 - 77
Sample No.20: 500 V a.c., 100 kA, 1-pole+N (with fuse-link 25 A / 500 V)	see page 78 - 79
Sample No.21: 500 V a.c., 100 kA, 2-pole (with fuse-link 25 A / 500 V)	see page 80 - 81
Sample No.22: 500 V a.c., 100 kA, 3-pole+N (with fuse-link 25 A / 500 V)	see page 82 - 83
Sample No.23: 690 V a.c., 50 kA, 1-pole (with fuse-link 10 A / 690 V)	see page 84 - 85
Sample No.24: 690 V a.c., 50 kA, 1-pole+N (with fuse-link 10 A / 690 V)	see page 86 - 87
Sample No.25: 690 V a.c., 50 kA, 2-pole (with fuse-link 10 A / 690 V)	see page 88 - 89
Sample No.26: 690 V a.c., 50 kA, 3-pole+N (with fuse-link 32 A / 400 V)	see page 90 - 91
Test sequence V:	**IPH Institut**
Sample No.27: 690 V, 32 A, 1-pole (with fuse-link 32 A / 400 V)	see page 92 - 93
Sample No.28: 690 V, 32 A, 2-pole (with fuse-link 32 A / 400 V)	see page 94 - 95
Sample No.29: 690 V, 32 A, 3-pole+N (with fuse-link 32 A / 400 V)	see page 96 - 97

Summary of compliance with National Differences:

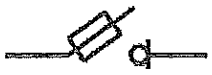
Not applicable

Copy of marking plate

Front printing: (for example a single pole device)

wöhner

AES10x38
32A 10x38
31 110 1P



Side printing:

IEC 60947-3 AC-22B 32A 400V 50/60Hz Ui:AC800V

c US
30A 600V
Do not operate under load

gG	32A	6 □	3.0W
aM	32A	6 □	1.2W
aR/gR	consult		

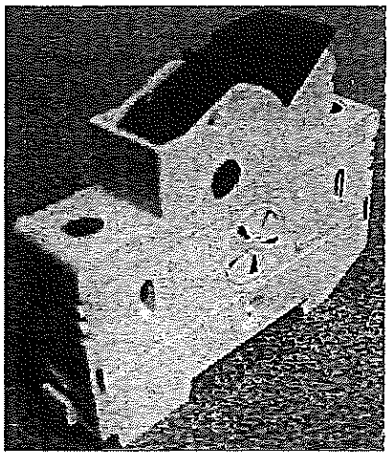
IEC 60269 690V

18..4AWG
0.75..25mm²
Cu only.
75°C wire

PZ2 2,5Nm
22lb-in

When two conductors per terminal are used, only stranded wires of the same size within the range of 18-6AWG, may be used

Picture of the fuse-switch-disconnector: (for example a single pole device)



Test item particulars .....:

- method of operation .....: Dependent manual operation
- suitability for isolation .....: Suitable / ~~not suitable~~
- degree of protection .....: IP20
- number of poles.....: 1; 2; 3; 1+N; 3+N
- kind of current.....: a.c.
- number of positions of the main contacts.....: 2 (open and closed)

Rated and limiting values, main circuit:

- rated operational voltage Ue (V) .....: 400 V a.c.
500 V a.c.
690 V a.c.
- rated insulation voltage Ui (V) .....: 800 V
- rated impulse withstand voltage Uimp (kV) .....: 6 kV
- conventional free air thermal current Ith (A) .....: 32 A
- conventional enclosed thermal current Ithe (A) .....: —
- rated operational current Ie (A) .....: See utilization category
- rated uninterrupted current Iu (A).....: See utilization category
- rated frequency (Hz).....: 50/60 Hz
- utilization category.....:

	Ue [V]	Ie [A]	Number of poles
AC-21B	500	25 **)	1; 1+N
	690	10 *)	1; 1+N
AC-22B	400	32 **)	1; 2; 3; 1+N; 3+N
	500	25 **)	2; 3; 3+N
		32 *)	3; 3+N
	690	10 *)	2
		32 *)	3; 3+N

*) Corresponding short circuit current: 50 kA
**) Corresponding short circuit current: 100 kA

Short-circuit characteristic:

- rated short-time withstand current Icw (kA).....: —
- rated short-time making capacity Icm (kA).....: —
- rated conditional short-circuit current.....: 50 kA; 100 kA (See utilization category)
- Control circuits.....: —
- Auxiliary circuits.....: —
- Relays and releases.....: —

Co-ordination of short-circuit protective devices:	
- kind of protective device.....:	Fuse-links with cylindrical contact caps for fuse system F (size 10,3 x 38) Rated currents: 10 A (gR), 25 A (gG) and 32 A (gG)
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.....:	2011-06
Date (s) of performance of tests.....:	2011-06 up to 2011-11

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.

General product information:

The fuse-switch-disconnectors of type AES10x38 are available for DIN-rail mounting with cable connection on the line and load side.

The cable connection is possible by screw terminals (box terminal connection).
The box terminal connection is suitable for cable cross-sections between 0,75mm² and 25mm².

Upon the tests of the making and breaking capacities and the performance under short-circuit conditions the distances between the metallic screen and the test items were 0 mm to the sides and 0 mm to the top.

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
5.2	MARKING		P
	Marking on equipment itself or on nameplate or nameplates attached to the equipment and legible from the front after mounting		—
	- indication of the open and closed position		P
	- suitability for isolation		P
	- disconnectors AC-20 and DC-20 only: marked "Do not operate under load"		N/A
	Marking on equipment not needed to be visible after mounting:		—
	- manufacturer's name or trademark	wöhner	P
	- type designation or serial number	AES 10x38	P
	- rated operational currents	10 A, 25 A, 32 A	P
	- rated operational voltage	400 V, 500 V, 690 V a.c.	P
	- utilization category	See page 6	P
	- rated frequency	50/60 Hz	P
	- manufacturer's claim for compliance with IEC 60947-3		P
	- degree of protection	IP20	P
	Marking on fuse-combination units:		—
	- fuse type	Fuse System F (size 10,3x38)	P
	- maximum rated current	32 A	P
	- power loss of the fuse-link	< 3 W	P
	Identification of terminals:		—
	- line terminals, unless connection is immaterial	Not labelled, free line and load connection choice	P
	- load terminals, unless connection is immaterial		P
	- neutral pole terminal		N/A
	- protective earth terminal		N/A
	Data in the manufacturer's published information:		—
	- rated insulation voltage	800 V	P
	- rated impulse withstand voltage for equipment suitable for isolation or when determined	6 kV	P
	- pollution degree, if different from 3	3	P
	- rated duty	uninterrupted	P
	- rated short-time withstand current and duration		N/A
	- rated short-circuit making capacity		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- rated conditional short-circuit current	50 kA, 100 kA	P
5.3	Instructions for installation, operation and maintenance		P
6	Normal service, mounting and transport conditions		P
7.1	CONSTRUCTIONAL AND PERFORMANCE REQUIREMENTS		P
7.1.2	Materials		P
7.1.2.2	Resistance to abnormal heat and fire		P
	Test performed on ..... :	- ~~the equipment~~ - sections taken from the equipment - ~~samples of identical material~~	P
	Glow-wire test according to IEC 60695-2-10 and IEC 60695-2-11		—
	Parts made of insulating material necessary to retain current-carrying parts in position: test temperature 960 °C		P
	No visible flame and no sustained glowing		P
	Flames and glowing extinguish within 30 s		P
	No ignition of the tissue paper		P
	Parts of insulating material not necessary to retain current-carrying parts in position, even though in contact with them: test temperature 650 °C		P
	No visible flame and no sustained glowing		P
	Flames and glowing extinguish within 30 s		P
	No ignition of the tissue paper		P
7.1.3 of Part 1	Current-carrying parts and their connection		P
7.1.4	Clearances ..... :	see appended table 7.1.4 on page 103	P
	Creepage distances ..... :	see appended table 7.1.4 on page 103	P
	Pollution degree ..... :	3	—
	Comparative tracking index (V) ..... :	CTI 600 (housing) CTI 575 (actuator)	—
	Material group ..... :	II	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.5 of Part 1	Actuator		P
7.1.5.1	Insulation		—
	Actuator insulated from live parts for		—
	- rated insulation voltage	800 V	P
	- rated impulse withstand voltage	6 kV	P
	Actuator made of metal		—
	- connected to a protective conductor or provided with an additional insulation		P
	Actuator made of or covered by insulating material :		—
	- internal metal parts, which might become accessible in the event of an insulation failure, are also insulated from live parts for the rated insulation voltage		P
7.1.5.2	Direction of movement		P
	The direction of operation for actuators shall where applicable conform to IEC 60447		P
	There is no doubt of the "I" and "O" position and the direction of operation		P
7.1.6 of Part 1	Indication of contact position		P
7.1.6.1	Indicating means		N/A
7.1.6.2	Indication by the actuator		P
7.1.7	Additional safety requirements for equipment suitable for isolation		P
7.1.7.1	Additional constructional requirements		P
	- marking according to 5.2.1b		P
	- indication of the position of the contacts		N/A
	- construction of the actuating mechanism		P
	- minimum clearances across open contacts (see Table 13, Part 1) (mm) .....:	2 mm	—
	- measured clearances (mm) .....:	> 5,5 mm	P
	- test Uimp across gap (kV) .....:	9,8 kV	P

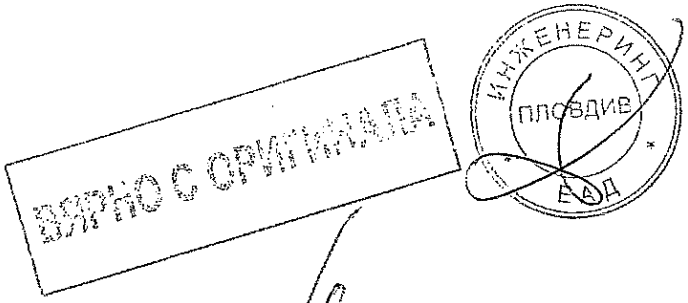
IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.7.2	Supplementary requirements for equipment with provision for electrical interlocking with contactors or circuit-breakers:		N/A
	Auxiliary switch is rated according to IEC 60947-5-1 (unless the equipment is rated AC-23)		N/A
	Time interval between opening of the contacts of the auxiliary contact and the contacts of the main poles: ≥20 ms .....:		—
	Measured time interval (ms) .....:		N/A
	During the closing operation the contacts of the auxiliary switch closes after or simultaneously with the contacts of the main poles		N/A
7.1.7.3	Supplementary requirements for equipment provided with means for padlocking the open position:		N/A
	The locking means is so designed that it cannot be removed with the appropriate padlock(s) installed		N/A
	Test force F applied to the actuator in an attempt to operate to the closed position (N) .....:		—
	Rated impulse withstand voltage (kV) .....:		—
	Test Uimp on open main contacts at the test force		N/A
7.1.8 of Part 1	Terminals		P
7.1.8.1	All parts of terminals which maintain contact and carry current are of metal having adequate mechanical strength	(see 8.2.4 below)	P
	Terminal connections are such that necessary contact pressure is maintained	(see 8.2.4 below)	P
	Terminals are so constructed that the conductor is clamped between suitable surfaces without damage to the conductor and terminal	(see 8.2.4 below)	P
	Terminals do not allow the conductor to be displaced or to be displaced themselves in a manner detrimental to the operator of equipment and the insulation voltage is not reduced below the rated value	(see 8.2.4 below)	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.4	Mechanical properties of terminals (box terminal connection)		P
	Mechanical strength of terminals		P
	Maximum cross-sectional area of conductor (mm²) .....:		—
	Diameter of thread (mm) .....:	Screw M5	—
	Torque (Nm) .....:	2,75 Nm (manufacturer indicates: 2 – 2,5 Nm)	—
	5 times on 2 separate clamping units		P
	Testing for damage to and accidental loosening of conductor (flexion test)		P
	Conductor of the smallest cross-sectional area (mm²) .....:	0,75 mm²	—
	Number of conductor of the smallest cross section :	1	—
	Diameter of bushing hole (mm) .....:	6,5 mm	—
	Height between the equipment and the platen .....:	260 mm	—
	Mass at the conductor(s) (kg) .....:	0,4 kg	—
	135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit		P
	Pull-out test		P
	Force (N), applied for 1 min. .....:	30 N	—
	During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit		P
	Conductor of the largest cross-sectional area (mm²) .....:	25 mm²	—
	Number of conductor of the largest cross section .:	1	—
	Diameter of bushing hole (mm) .....:	13 mm	—
	Height between the equipment and the platen .....:	300 mm	—
	Mass at the conductor(s) (kg) .....:	4,5 kg	—
	135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit		P
	Pull-out test		P
	Force (N), applied for 1 min. .....:	135 N	—
	During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Conductor of the largest and smallest cross-sectional area (mm²) .....:		—
	Number of conductor of the smallest cross section, number of conductor of the largest cross section ..:		—
	Diameter of bushing hole (mm) .....:		—
	Height between the equipment and the platen .....:		—
	Mass at the conductor(s) (kg) .....:		—
	135 continuous revolutions: the conductor neither slips out of the terminal nor breaks near the clamping unit		N/A
	Pull-out test		N/A
	Force (N), applied for 1 min. .....:		—
	During the test, the conductor neither slips out of the terminal nor breaks near the clamping unit		N/A
7.1.8.2	Connection capacity		P
	Type of conductors .....:	Rigid, stranded or flexible	—
	Minimum cross-sectional area of conductor (mm²) :	0,75 mm²	—
	Maximum cross-sectional area of conductor (mm²) .....:	25 mm²	—
	Number of conductors simultaneously connectable to the terminal .....:		—
7.1.8.3	Connection		P
	Terminals for connection to external conductors are readily accessible during installation		P
	Clamping screws and nuts do not serve to fix any other component		P
7.1.8.4	Terminal identification and marking		P
	Terminal intended exclusively for the neutral conductor	Only if applicable	P
	Protective earth terminal		N/A
	Other terminals		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
7.1.9	Additional requirements for equipment provided with a neutral pole		P
	Equipment provided with a pole intended for the connection of neutral, this pole shall be clearly marked by the letter "N"		P
	The switched neutral pole does not break before and does not make after the other poles except		N/A
	- a pole having the appropriate short-circuit breaking and making capacity is used as neutral pole, all poles may operate together	The connection is given by a dummy (piece of copper), which is inside the actuator.	P
	Conventional thermal current of neutral pole	32 A	P
7.1.10	Provisions for protective earthing		N/A
7.1.10.1	The exposed conductive parts are electrically interconnected and connected to a protective earth terminal		N/A
7.1.10.2	Protective earth terminal is readily accessible		N/A
	Protective earth terminal is suitably protected against corrosion		N/A
	Electrical continuity between the exposed conductive parts of the protective earth terminal and the metal sheathing of connecting conductors		N/A
	Protective earth terminal has no other functions		N/A
7.1.10.3	Protective earth terminal marking and identification		N/A
7.1.11	Enclosure for equipment		N/A
7.1.11.1	Design		N/A
	When the enclosure is opened, all parts requiring access for installation and maintenance are readily accessible		N/A
	Sufficient space is provided inside the enclosure		N/A
	The fixed parts of a metal enclosure are electrically connected to the other exposed conductive parts of the equipment and connected to a terminal which enables them to be earthed or connected to a protective conductor		N/A
	Under no circumstances a removable metal part of the enclosure is insulated from the part carrying the earth terminal when the removable part is in place		N/A
	The removable parts of the enclosure are firmly secured to the fixed parts by a device such that they cannot be accidentally loosened or detached owing to the effects of operation of the equipment or vibrations		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	When an enclosure is so designed as to allow the covers to be opened without the use of tools, means is provided to prevent loss of the fastening devices		N/A
	If the enclosure is used for mounting push-buttons, it is not possible to remove the buttons from the outside of the enclosure		N/A
7.1.11.2	Insulation		N/A
	If, in order to prevent accidental contact between a metallic enclosure and live parts, the enclosure is partly or completely lined with insulating material, then this lining is securely fixed to the enclosure		N/A
7.1.12	Degree of protection of enclosed equipment		N/A
	Degree of protection .....:	IP	N/A
7.1.13	Conduit pull-out, torque and bending with metallic conduits		N/A
	Withstand the stress occurring during its installation .....:	IP	N/A



IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 1: AC-21B, 500 V, 25 A, 1-pole)		P
8.3.3.1	Temperature-rise		P
	ambient temperature 10-40 °C .....:	22,7 °C	—
	test enclosure W x H x D (mm x mm x mm) .....:		—
	material of enclosure .....:		—
	Main circuits, test conditions:		—
	- rated operational current Ie (A) .....:	25 A	—
	- cable/busbar cross-section (mm²) / length (mm)..:	4 mm² cables / 1000 mm long	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated current (A) .....:	25A (gG)	—
	- power loss (W) .....:	2,6 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	Measured temperature-rise .....:	see appended table 8.3.3.1 on page 103	P
	Auxiliary circuits, test conditions:		N/A
	- rated operation current (A) .....:		—
	- cable cross-section (mm²).....:		—
	Measured temperature-rise .....:	see appended table 8.3.3.1 on page __	N/A
8.3.3.2	Test of dielectric properties		P
	Rated impulse withstand voltage (kV) .....:	6 kV	—
	- test Uimp main circuits (kV) .....:	7,3 kV	P
	- test Uimp auxiliary circuits (kV) .....:		N/A
	- test Uimp on open main contacts (equipment suitable for isolation) (kV) .....:	9,8 kV	P
	Power-frequency withstand voltage (V) .....:	800 V	—
	- main circuits, test voltage for 5 sec. (V) .....:	2000 V	P
	- control and auxiliary circuits, test voltage for 5 sec. (V) .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Devices, which have been disconnected for the power-frequency withstand voltage test		N/A
	Equipment suitable for isolation, leakage current not exceed 0,5 mA		—
	Test voltage 1,1 Ue (V) ..... :	550 V (tested with 759 V)	—
	Measured leakage current (mA) ..... :	0,001 mA	P
8.3.3.3	Making and breaking capacity		P
	- utilization category ..... :	AC-21B	—
	- rated operational voltage Ue (V) ..... :	500 V	—
	- rated operational current Ie (A) or power (kW) .... :	25 A	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	Bussmann	—
	- manufacturer's model or type reference ..... :	C10G25	—
	- rated current (A) ..... :	25 A (gG)	—
	- power loss (W) ..... :	2,6 W	—
	- rated breaking capacity (kA) ..... :	120 kA	—
	Conditions for make/break operations or make operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—
	Conditions for break operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions for make/break operations, other than AC-23A/B:		P
	- test voltage, U = 1,05 Ue ..... (V):	L1: 525 V L2: — L3: —	—
	- test current, I = ... 1,5 x Ie (A):	L1: 38 A L2: — L3: —	—
	- power factor/ ~~time constant~~ .....:	0,91	—
	Number of make/break or make and break operations .....:	5	P
	- recovery voltage duration (≥ 50 ms)	> 50 ms	P
	- current duration (ms) .....:	70 ms	—
	- time interval between operations .....:	30 s	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		N/A
	- oscillatory frequency (kHz) .....:		—
	- measured oscillatory frequency (kHz) .....:	L1: L2: L3:	N/A
	- factor γ .....:	L1: L2: L3:	N/A
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	13,2 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	550 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories): ≤ 2 mA/pole) .....:	< 2 mA	P
8.3.3.6	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated current (A) .....:	25 A (gG)	—
	- power loss (W) .....:	2,6 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	4 mm²	—
	- test current Ie (A) .....:	25 A	—
	Measured temperature-rise .....:	see appended table 8.3.3.6 on page 103	P
8.3.3.7	Strength of actuator mechanism		P
8.2.5	Verification of the strength of actuator mechanism and position indicating device		
	- actuator type (fig.) .....:	figure 1b (one-finger operated)	—
8.2.5.2.1	Dependent and independent manual operation	dependent manual operation	P
	- actuating force for opening (N) .....:	10,2 N	—
	- test force with blocked main contacts (N) .....:	50 N	—
	- used method to keep the contact closed .....:	Fuse-links were held tight with a piece of wire	—
	During and after the test, open position not indicated .....:		P
	Equipment with locking mean, no locking in the open position while test force is applied .....:		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.5.2.2	Dependent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A
8.2.5.2.3	Independent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- stored energy of the power operator released (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 2: AC-21B, 690 V, 10 A, 1-pole)		P
8.3.3.1	Temperature-rise		P
	ambient temperature 10-40 °C .....:	22,7 °C	—
	test enclosure W x H x D (mm x mm x mm) .....:		—
	material of enclosure .....:		—
	Main circuits, test conditions:		—
	- rated operational current Ie (A) .....:	10 A	—
	- cable/busbar cross-section (mm²) / length (mm)..:	1,5 mm² cables / 1000mm long	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	SIBA	—
	- manufacturer's model or type reference .....:	50 179 06.10	—
	- rated current (A) .....:	10 A (gR)	—
	- power loss (W) .....:	2,3 W	—
	- rated breaking capacity (kA) .....:	200 kA	—
	Measured temperature-rise .....:	see appended table 8.3.3.1 on page 104	P
	Auxiliary circuits, test conditions:		N/A
	- rated operation current (A) .....:		—
	- cable cross-section (mm²).....:		—
	Measured temperature-rise .....:	see appended table 8.3.3.1 on page __	N/A
8.3.3.2	Test of dielectric properties		P
	Rated impulse withstand voltage (kV) .....:	6 kV	—
	- test Uimp main circuits (kV) .....:	7,3 kV	P
	- test Uimp auxiliary circuits (kV) .....:		N/A
	- test Uimp on open main contacts (equipment suitable for isolation) (kV) .....:	9,8 kV	P
	Power-frequency withstand voltage (V) .....:	800 V	—
	- main circuits, test voltage for 5 sec. (V) .....:	2000 V	P
	- control and auxiliary circuits, test voltage for 5 sec. (V) .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Devices, which have been disconnected for the power-frequency withstand voltage test		N/A
	Equipment suitable for isolation, leakage current not exceed 0,5 mA		—
	Test voltage 1,1 Ue (V) ..... :	759 V	—
	Measured leakage current (mA) ..... :	0,001 mA	P
8.3.3.3	Making and breaking capacity		P
	- utilization category ..... :	AC-21B	—
	- rated operational voltage Ue (V) ..... :	690 V	—
	- rated operational current Ie (A) or power (kW) .... :	10 A	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	SIBA	—
	- manufacturer's model or type reference ..... :	50 179 06.10	—
	- rated current (A) ..... :	10 A (gR)	—
	- power loss (W) ..... :	2,3 W	—
	- rated breaking capacity (kA) ..... :	200 kA	—
	Conditions for make/break operations or make operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—
	Conditions for break operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions for make/break operations, other than AC-23A/B:		P
	- test voltage, U = 1,05 Ue ..... (V):	L1: 725 V L2: — L3: —	—
	- test current, I = ... 1,5 x Ie (A):	L1: 15,3 A L2: — L3: —	—
	- power factor/ ~~time constant~~ .....:	0,95	—
	Number of make/break or make and break operations .....:	5	P
	- recovery voltage duration (≥ 50 ms)	> 50 ms	P
	- current duration (ms) .....:	70 ms	—
	- time interval between operations .....:	30 s	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		N/A
	- oscillatory frequency (kHz) .....:		—
	- measured oscillatory frequency (kHz) .....:	L1: L2: L3:	N/A
	- factor γ .....:	L1: L2: L3:	N/A
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	17,6 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories): ≤ 2 mA/pole) .....:	< 2 mA	P
8.3.3.6	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	SIBA	—
	- manufacturer's model or type reference .....:	50 179 06.10	—
	- rated current (A) .....:	10 A (gR)	—
	- power loss (W) .....:	2,3 W	—
	- rated breaking capacity (kA) .....:	200 kA	—
	- conductor cross-section (mm²) .....:	1,5 mm²	—
	- test current Ie (A) .....:	10 A	—
	Measured temperature-rise .....:	see appended table 8.3.3.6 on page 104	P
8.3.3.7	Strength of actuator mechanism		P
8.2.5	Verification of the strength of actuator mechanism and position indicating device		
	- actuator type (fig.) .....:	figure 1b (one-finger operated)	—
8.2.5.2.1	Dependent and independent manual operation	dependent manual operation	P
	- actuating force for opening (N) .....:	11 N	—
	- test force with blocked main contacts (N) .....:	50 N	—
	- used method to keep the contact closed .....:	Fuse-links were held tight with a piece of wire	—
	During and after the test, open position not indicated .....:		P
	Equipment with locking mean, no locking in the open position while test force is applied .....:		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.5.2.2	Dependent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A
8.2.5.2.3	Independent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- stored energy of the power operator released (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 3: AC-22B, 400 V, 32 A, 1-pole)		P
8.3.3.1	Temperature-rise		P
	ambient temperature 10-40 °C .....:	22,7 °C	—
	test enclosure W x H x D (mm x mm x mm) .....:		—
	material of enclosure .....:		—
	Main circuits, test conditions:		—
	- rated operational current Ie (A) .....:	32 A	—
	- cable/busbar cross-section (mm²) / length (mm)..:	6 mm² cables / 1000mm long	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	Measured temperature-rise .....:	see appended table 8.3.3.1 on page 104	P
	Auxiliary circuits, test conditions:		N/A
	- rated operation current (A) .....:		—
	- cable cross-section (mm²).....:		—
	Measured temperature-rise .....:	see appended table 8.3.3.1 on page __	N/A
8.3.3.2	Test of dielectric properties		P
	Rated impulse withstand voltage (kV) .....:	6 kV	—
	- test Uimp main circuits (kV) .....:	7,3 kV	P
	- test Uimp auxiliary circuits (kV) .....:		N/A
	- test Uimp on open main contacts (equipment suitable for isolation) (kV) .....:	9,8 kV	P
	Power-frequency withstand voltage (V) .....:	800 V	—
	- main circuits, test voltage for 5 sec. (V) .....:	2000 V	P
	- control and auxiliary circuits, test voltage for 5 sec. (V) .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Devices, which have been disconnected for the power-frequency withstand voltage test		N/A
	Equipment suitable for isolation, leakage current not exceed 0,5 mA		—
	Test voltage 1,1 Ue (V) ..... :	440 V (tested with 759 V)	—
	Measured leakage current (mA) ..... :	0,001 mA	P
8.3.3.3	Making and breaking capacity		P
	- utilization category ..... :	AC-22B	—
	- rated operational voltage Ue (V) ..... :	400 V	—
	- rated operational current Ie (A) or power (kW) .... :	32 A	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	Bussmann	—
	- manufacturer's model or type reference ..... :	C10G32	—
	- rated current (A) ..... :	32 A (gG)	—
	- power loss (W) ..... :	2,9 W	—
	- rated breaking capacity (kA) ..... :	120 kA	—
	Conditions for make/break operations or make operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—
	Conditions for break operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions for make/break operations, other than AC-23A/B:		P
	- test voltage, U = 1,05 Ue ..... (V):	L1: 420 V L2: — L3: —	—
	- test current, I = ... 3 x Ie (A):	L1: 98 A L2: — L3: —	—
	- power factor/ ~~time constant~~ ..... :	0,66	—
	Number of make/break or make and break operations ..... :	5	P
	- recovery voltage duration (≥ 50 ms)	> 50 ms	P
	- current duration (ms) ..... :	90 ms	—
	- time interval between operations ..... :	30 s	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		P
	- oscillatory frequency (kHz) ..... :	41,29 kHz	—
	- measured oscillatory frequency (kHz) ..... :	L1: 40,5 kHz L2: — L3: —	P
	- factor γ ..... :	L1: 1,1 L2: — L3: —	P
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	8,4 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories): ≤ 2 mA/pole) .....:	< 2 mA	P
8.3.3.6	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.3.6 on page 105	P
8.3.3.7	Strength of actuator mechanism		P
8.2.5	Verification of the strength of actuator mechanism and position indicating device		
	- actuator type (fig.) .....:	figure 1b (one-finger operated)	—
8.2.5.2.1	Dependent and independent manual operation	dependent manual operation	P
	- actuating force for opening (N) .....:	10,4 N	—
	- test force with blocked main contacts (N) .....:	50 N	—
	- used method to keep the contact closed .....:	Fuse-links were held tight with a piece of wire	—
	During and after the test, open position not indicated .....:		P
	Equipment with locking mean, no locking in the open position while test force is applied .....:		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.5.2.2	Dependent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A
8.2.5.2.3	Independent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- stored energy of the power operator released (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 4: AC-22B, 400 V, 32 A, 2-poles)		P
8.3.3.1	Temperature-rise		P
	ambient temperature 10-40 °C ..... :	22,7 °C	—
	test enclosure W x H x D (mm x mm x mm) ..... :		—
	material of enclosure ..... :		—
	Main circuits, test conditions:		—
	- rated operational current Ie (A) ..... :	32 A	—
	- cable/busbar cross-section (mm²) / length (mm) .. :	6 mm² cables / 1000mm long	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	Bussmann	—
	- manufacturer's model or type reference ..... :	C10G32	—
	- rated current (A) ..... :	32 A (gG)	—
	- power loss (W) ..... :	2,9 W	—
	- rated breaking capacity (kA) ..... :	120 kA	—
	Measured temperature-rise ..... :	see appended table 8.3.3.1 on page 105	P
	Auxiliary circuits, test conditions:		N/A
	- rated operation current (A) ..... :		—
	- cable cross-section (mm²) ..... :		—
	Measured temperature-rise ..... :	see appended table 8.3.3.1 on page ___	N/A
8.3.3.2	Test of dielectric properties		P
	Rated impulse withstand voltage (kV) ..... :	6 kV	—
	- test Uimp main circuits (kV) ..... :	7,3 kV	P
	- test Uimp auxiliary circuits (kV) ..... :		N/A
	- test Uimp on open main contacts (equipment suitable for isolation) (kV) ..... :	9,8 kV	P
	Power-frequency withstand voltage (V) ..... :	800 V	—
	- main circuits, test voltage for 5 sec. (V) ..... :	2000 V	P
	- control and auxiliary circuits, test voltage for 5 sec. (V) ..... :		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Devices, which have been disconnected for the power-frequency withstand voltage test		N/A
	Equipment suitable for isolation, leakage current not exceed 0,5 mA		—
	Test voltage 1,1 Ue (V) ..... :	440 V (tested with 759 V)	—
	Measured leakage current (mA) ..... :	0,001 mA	P
8.3.3.3	Making and breaking capacity		P
	- utilization category ..... :	AC-22B	—
	- rated operational voltage Ue (V) ..... :	400 V	—
	- rated operational current Ie (A) or power (kW) .... :	32 A	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	Bussmann	—
	- manufacturer's model or type reference ..... :	C10G32	—
	- rated current (A) ..... :	32 A (gG)	—
	- power loss (W) ..... :	2,9 W	—
	- rated breaking capacity (kA) ..... :	120 kA	—
	Conditions for make/break operations or make operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—
	Conditions for break operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions for make/break operations, other than AC-23A/B:		P
	- test voltage, U = 1,05 Ue ..... (V):	L1: 420 V (242,5 V x √3) L2: 420 V (242,5 V x √3) L3: —	—
	- test current, I = ... 3 x Ie (A):	L1: 98 A L2: 98 A L3: —	—
	- power factor/ ~~time constant~~ ..... :	0,66	—
	Number of make/break or make and break operations ..... :	5	P
	- recovery voltage duration (≥ 50 ms)	> 50 ms	P
	- current duration (ms) ..... :	70 ms	—
	- time interval between operations ..... :	30 s	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		P
	- oscillatory frequency (kHz) ..... :	41,29 kHz	—
	- measured oscillatory frequency (kHz) ..... :	L1: 40,5 kHz L2: 40,5 kHz L3: —	P
	- factor γ ..... :	L1: 1,1 L2: 1,1 L3: —	P
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	17,8 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories): ≤ 2 mA/pole) .....:	< 2 mA	P
8.3.3.6	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.3.6 on page 105	P
8.3.3.7	Strength of actuator mechanism		P
8.2.5	Verification of the strength of actuator mechanism and position indicating device		
	- actuator type (fig.) .....:	figure 1b (one-finger operated)	—
8.2.5.2.1	Dependent and independent manual operation	dependent manual operation	P
	- actuating force for opening (N) .....:	22 N	—
	- test force with blocked main contacts (N) .....:	66 N	—
	- used method to keep the contact closed .....:	Fuse-links were held tight with a piece of wire	—
	During and after the test, open position not indicated .....:		P
	Equipment with locking mean, no locking in the open position while test force is applied .....:		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.5.2.2	Dependent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A
8.2.5.2.3	Independent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- stored energy of the power operator released (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A

ВЕРНО С ОРИГИНАЛА

ИНЖЕНЕРИНГ ПЛОВДИВ ЕАД

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 5: AC-22B, 500 V, 25 A, 2-pole)		P
8.3.3.1	Temperature-rise		P
	ambient temperature 10-40 °C .....:	22,7 °C	—
	test enclosure W x H x D (mm x mm x mm) .....:		—
	material of enclosure .....:		—
	Main circuits, test conditions:		—
	- rated operational current Ie (A) .....:	25 A	—
	- cable/busbar cross-section (mm²) / length (mm)..:	4 mm² cables / 1000 mm long	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated current (A) .....:	25 A (gG)	—
	- power loss (W) .....:	2,6 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	Measured temperature-rise .....:	see appended table 8.3.3.1 on page 106	P
	Auxiliary circuits, test conditions:		N/A
	- rated operation current (A) .....:		—
	- cable cross-section (mm²).....:		—
	Measured temperature-rise .....:	see appended table 8.3.3.1 on page __	N/A
8.3.3.2	Test of dielectric properties		P
	Rated impulse withstand voltage (kV) .....:	6 kV	—
	- test Uimp main circuits (kV) .....:	7,3 kV	P
	- test Uimp auxiliary circuits (kV) .....:		N/A
	- test Uimp on open main contacts (equipment suitable for isolation) (kV) .....:	9,8 kV	P
	Power-frequency withstand voltage (V) .....:	800 V	—
	- main circuits, test voltage for 5 sec. (V) .....:	2000 V	P
	- control and auxiliary circuits, test voltage for 5 sec. (V) .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Devices, which have been disconnected for the power-frequency withstand voltage test		N/A
	Equipment suitable for isolation, leakage current not exceed 0,5 mA		—
	Test voltage 1,1 Ue (V) ..... :	550 V (tested with 759 V)	—
	Measured leakage current (mA) ..... :	0,001 mA	P
8.3.3.3	Making and breaking capacity		P
	- utilization category ..... :	AC-22B	—
	- rated operational voltage Ue (V) ..... :	500 V	—
	- rated operational current Ie (A) or power (kW) .... :	25 A	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	Bussmann	—
	- manufacturer's model or type reference ..... :	C10G25	—
	- rated current (A) ..... :	25 A	—
	- power loss (W) ..... :	2,6 W	—
	- rated breaking capacity (kA) ..... :	120 kA	—
	Conditions for make/break operations or make operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—
	Conditions for break operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions for make/break operations, other than AC-23A/B:		
	- test voltage, U = 1,05 Ue ..... (V):	L1: 525 V (303 V x √3) L2: 525 V (303 V x √3) L3: —	—
	- test current, I = ... 3 x Ie (A):	L1: 78 A L2: 78 A L3: —	—
	- power factor/ ~~time constant~~ ..... :	0,68	—
	Number of make/break or make and break operations ..... :	5	P
	- recovery voltage duration (≥ 50 ms)	> 50 ms	P
	- current duration (ms) ..... :	70 ms	—
	- time interval between operations ..... :	30 s	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		P
	- oscillatory frequency (kHz) ..... :	32,88 kHz	—
	- measured oscillatory frequency (kHz) ..... :	L1: 32,2 kHz L2: 32,2 kHz L3: —	P
	- factor γ ..... :	L1: 1,1 L2: 1,1 L3: —	P
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	20,4 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	550 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories): ≤ 2 mA/pole) .....:	< 2 mA	P
8.3.3.6	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated current (A) .....:	25 A (gG)	—
	- power loss (W) .....:	2,6 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	4 mm²	—
	- test current Ie (A) .....:	25 A	—
	Measured temperature-rise .....:	see appended table 8.3.3.6 on page 106	P
8.3.3.7	Strength of actuator mechanism		P
8.2.5	Verification of the strength of actuator mechanism and position indicating device		
	- actuator type (fig.) .....:	figure 1b (one-finger operated)	—
8.2.5.2.1	Dependent and independent manual operation	dependent manual operation	P
	- actuating force for opening (N) .....:	22,6 N	—
	- test force with blocked main contacts (N) .....:	67,8 N	—
	- used method to keep the contact closed .....:	Fuse-links were held tight with a piece of wire	—
	During and after the test, open position not indicated .....:		P
	Equipment with locking mean, no locking in the open position while test force is applied .....:		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.5.2.2	Dependent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A
8.2.5.2.3	Independent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- stored energy of the power operator released (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A

ВЕРНО С ОРИГИНАЛА

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 6: AC-22B, 690 V, 10 A, 2-pole)		P
8.3.3.1	Temperature-rise		P
	ambient temperature 10-40 °C ..... :	22,7 °C	—
	test enclosure W x H x D (mm x mm x mm) ..... :		—
	material of enclosure ..... :		—
	Main circuits, test conditions:		—
	- rated operational current Ie (A) ..... :	10 A	—
	- cable/busbar cross-section (mm²) / length (mm)... :	1,5 mm² cables / 1000mm long	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	SIBA	—
	- manufacturer's model or type reference ..... :	50 179 06.10	—
	- rated current (A) ..... :	10 A (gR)	—
	- power loss (W) ..... :	2,3 W	—
	- rated breaking capacity (kA) ..... :	200 kA	—
	Measured temperature-rise ..... :	see appended table 8.3.3.1 on page 106	P
	Auxiliary circuits, test conditions:		N/A
	- rated operation current (A) ..... :		—
	- cable cross-section (mm²) ..... :		—
	Measured temperature-rise ..... :	see appended table 8.3.3.1 on page __	N/A
8.3.3.2	Test of dielectric properties		P
	Rated impulse withstand voltage (kV) ..... :	6 kV	—
	- test Uimp main circuits (kV) ..... :	7,3 kV	P
	- test Uimp auxiliary circuits (kV) ..... :		N/A
	- test Uimp on open main contacts (equipment suitable for isolation) (kV) ..... :	9,8 kV	P
	Power-frequency withstand voltage (V) ..... :	800 V	—
	- main circuits, test voltage for 5 sec. (V) ..... :	2000 V	P
	- control and auxiliary circuits, test voltage for 5 sec. (V) ..... :		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Devices, which have been disconnected for the power-frequency withstand voltage test		N/A
	Equipment suitable for isolation, leakage current not exceed 0,5 mA		—
	Test voltage 1,1 Ue (V) ..... :	759 V	—
	Measured leakage current (mA) ..... :	0,001 mA	P
8.3.3.3	Making and breaking capacity		P
	- utilization category ..... :	AC-22B	—
	- rated operational voltage Ue (V) ..... :	690 V	—
	- rated operational current Ie (A) or power (kW) .... :	10 A	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	SIBA	—
	- manufacturer's model or type reference ..... :	50 179 06.10	—
	- rated current (A) ..... :	10 A (gR)	—
	- power loss (W) ..... :	2,3 W	—
	- rated breaking capacity (kA) ..... :	200 kA	—
	Conditions for make/break operations or make operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—
	Conditions for break operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions for make/break operations, other than AC-23A/B:		
	- test voltage, U = 1,05 Ue ..... (V):	L1: 725 V (418,5 V x √3) L2: 725 V (418,5 V x √3) L3: —	—
	- test current, I = ... 3x Ie (A):	L1: 31 A L2: 31 A L3: —	—
	- power factor/ ~~time constant~~ .....:	0,65	—
	Number of make/break or make and break operations .....:	5	P
	- recovery voltage duration (≥ 50 ms)	> 50 ms	P
	- current duration (ms) .....:	80 ms	—
	- time interval between operations .....:	30 s	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		P
	- oscillatory frequency (kHz) .....:	21,15 kHz	—
	- measured oscillatory frequency (kHz) .....:	L1: 21,0 kHz L2: 21,0 kHz L3:	P
	- factor γ .....:	L1: 1,1 L2: 1,1 L3:	P
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	22,5 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories): ≤ 2 mA/pole) .....:	< 2 mA	P
8.3.3.6	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	SIBA	—
	- manufacturer's model or type reference .....:	50 179 06.10	—
	- rated current (A) .....:	10 A (gR)	—
	- power loss (W) .....:	2,3 W	—
	- rated breaking capacity (kA) .....:	200 kA	—
	- conductor cross-section (mm²) .....:	1,5 mm²	—
	- test current Ie (A) .....:	10 A	—
	Measured temperature-rise .....:	see appended table 8.3.3.6 on page 107	P
8.3.3.7	Strength of actuator mechanism		P
8.2.5	Verification of the strength of actuator mechanism and position indicating device		
	- actuator type (fig.) .....:	figure 1b (one-finger operated)	—
8.2.5.2.1	Dependent and independent manual operation	dependent manual operation	P
	- actuating force for opening (N) .....:	24,4 N	—
	- test force with blocked main contacts (N) .....:	73,2 N	—
	- used method to keep the contact closed .....:	Fuse-links were held tight with a piece of wire	—
	During and after the test, open position not indicated .....:		P
	Equipment with locking mean, no locking in the open position while test force is applied .....:		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.5.2.2	Dependent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A
8.2.5.2.3	Independent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- stored energy of the power operator released (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3	TEST SEQUENCE I: GENERAL PERFORMANCE CHARACTERISTICS (Sample No. 7: AC-22B, 690 V, 32 A, 3-pole+N)		P
8.3.3.1	Temperature-rise		P
	ambient temperature 10-40 °C .....:	22,7 °C	—
	test enclosure W x H x D (mm x mm x mm) .....:		—
	material of enclosure .....:		—
	Main circuits, test conditions:		—
	- rated operational current Ie (A) .....:	32 A	—
	- cable/busbar cross-section (mm²) / length (mm)..:	6 mm² cables / 1000mm long	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	Measured temperature-rise .....:	see appended table 8.3.3.1 on page 107	P
	Auxiliary circuits, test conditions:		N/A
	- rated operation current (A) .....:		—
	- cable cross-section (mm²).....:		—
	Measured temperature-rise .....:	see appended table 8.3.3.1 on page __	N/A
8.3.3.2	Test of dielectric properties		P
	Rated impulse withstand voltage (kV) .....:	6 kV	—
	- test Uimp main circuits (kV) .....:	7,3 kV	P
	- test Uimp auxiliary circuits (kV) .....:		N/A
	- test Uimp on open main contacts (equipment suitable for isolation) (kV) .....:	9,8 kV	P
	Power-frequency withstand voltage (V) .....:	800 V	—
	- main circuits, test voltage for 5 sec. (V) .....:	2000 V	P
	- control and auxiliary circuits, test voltage for 5 sec. (V) .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Devices, which have been disconnected for the power-frequency withstand voltage test		N/A
	Equipment suitable for isolation, leakage current not exceed 0,5 mA		—
	Test voltage 1,1 Ue (V) ..... :	759 V	—
	Measured leakage current (mA) ..... :	0,001 mA	P
8.3.3.3	Making and breaking capacity		P
	- utilization category ..... :	AC-22B	—
	- rated operational voltage Ue (V) ..... :	690 V	—
	- rated operational current Ie (A) or power (kW) .... :	32 A	—
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	Bussmann	—
	- manufacturer's model or type reference ..... :	C10G32	—
	- rated current (A) ..... :	32 A (gG)	—
	- power loss (W) ..... :	2,9 W	—
	- rated breaking capacity (kA) ..... :	120 kA	—
	Conditions for make/break operations or make operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—
	Conditions for break operation, AC-23A and AC-23B only:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor ..... :	L1: L2: L3:	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Conditions for make/break operations, other than AC-23A/B:		
	- test voltage, U = 1,05 Ue ..... (V):	L1: 725 V (418,5 V x √3) L2: 725 V (418,5 V x √3) L3: 725 V (418,5 V x √3)	—
	- test current, I = ... 3 x Ie (A):	L1: 99 A L2: 98 A L3: 100 A	—
	- power factor/ ~~time constant~~ ..... :	0,63	—
	Number of make/break or make and break operations ..... :	5	P
	- recovery voltage duration (≥ 50 ms)	> 50 ms	P
	- current duration (ms) ..... :	70 ms	—
	- time interval between operations ..... :	30 s	P
	Characteristic of transient recovery voltage for AC-22 and AC-23 only		P
	- oscillatory frequency (kHz) ..... :	26,69 kHz	—
	- measured oscillatory frequency (kHz) ..... :	L1: 27,5 kHz L2: 27,5 kHz L3: 27,5 kHz	P
	- factor γ ..... :	L1: 1,1 L2: 1,1 L3: 1,1	P
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	46,2 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.4	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ ..... :	1380 V	—
	No flashover or breakdown		P
8.3.3.5	Leakage current		P
	test voltage (1,1 Ue) (V) ..... :	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole ..... :		N/A
	Leakage current (other utilization categories): ≤ 2 mA/pole) ..... :	< 2 mA	P
8.3.3.6	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	Bussmann	—
	- manufacturer's model or type reference ..... :	C10G32	—
	- rated current (A) ..... :	32 A (gG)	—
	- power loss (W) ..... :	2,9 W	—
	- rated breaking capacity (kA) ..... :	120 kA	—
	- conductor cross-section (mm²) ..... :	6 mm²	—
	- test current Ie (A) ..... :	32 A	—
	Measured temperature-rise ..... :	see appended table 8.3.3.6 on page 107	P
8.3.3.7	Strength of actuator mechanism		P
8.2.5	Verification of the strength of actuator mechanism and position indicating device		
	- actuator type (fig.) ..... :	figure 1b (one-finger operated)	—
8.2.5.2.1	Dependent and independent manual operation	dependent manual operation	P
	- actuating force for opening (N) ..... :	41,2 N	—
	- test force with blocked main contacts (N) ..... :	123,6 N	—
	- used method to keep the contact closed ..... :	Fuse-links were held tight with a piece of wire	—
	During and after the test, open position not indicated ..... :		P
	Equipment with locking mean, no locking in the open position while test force is applied ..... :		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.2.5.2.2	Dependent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- 110% of the rated supply voltage applied to the equipment (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A
8.2.5.2.3	Independent power operation		N/A
	- main contacts fixed together in the closed position:		N/A
	- used method to keep the contact closed .....:		N/A
	- stored energy of the power operator released (3 times) .....:		N/A
	During and after the test, open position not indicated .....:		N/A
	Equipment show no damage impairing its normal operation .....:		N/A
	Equipment with locking mean, no locking in the open position while test force is applied .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 8: AC-21B, 500 V, 25 A, 1-pole)		P
8.3.4.1	Operational performance test		P
	- utilization category .....:	AC-21B	—
	- rated operational voltage (V) .....:	500 V	—
	- rated operational current (A) .....:	25 A	—
	Test conditions for electrical operation cycles:		
	- test voltage (V) .....:	L1: 506 V L2: — L3: —	—
	- test current (A) .....:	L1: 25,6 A L2: — L3: —	—
	- power factor/~~time constant~~ .....:	L1: 0,95 L2: — L3: —	—
	Number of cycles with current .....:	300	P
	Number of cycles without current .....:	1700	P
	First test sequence (with/without current) .....:	Without current	—
	Second test sequence (with/without current) .....:	With current	—
	- time interval between first and second test sequence .....:	515 minutes	—
8.3.4.1.5	Behaviour of the equipment during the operational performance test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.1.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	11,2 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.4.2	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	550 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA/pole .....:	< 2 mA	P
8.3.4.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated current (A) .....:	25 A (gG)	—
	- power loss (W) .....:	2,6 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	4 mm²	—
	- test current Ie (A) .....:	25 A	—
	Measured temperature-rise .....:	see appended table 8.3.4.4 on page 108	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 9: AC-21B, 690 V, 10 A, 1-pole)		P
8.3.4.1	Operational performance test		P
	- utilization category .....:	AC-21B	—
	- rated operational voltage (V) .....:	690 V	—
	- rated operational current (A) .....:	10 A	—
	Test conditions for electrical operation cycles:		
	- test voltage (V) .....:	L1: 690 V L2: — L3: —	—
	- test current (A) .....:	L1: 10,2 A L2: — L3: —	—
	- power factor/~~time constant~~ .....:	L1: 0,95 L2: — L3: —	—
	Number of cycles with current .....:	300	P
	Number of cycles without current .....:	1700	P
	First test sequence (with/without current) .....:	Without current	—
	Second test sequence (with/without current) .....:	With current	—
	- time interval between first and second test sequence .....:	1125 minutes	—
8.3.4.1.5	Behaviour of the equipment during the operational performance test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.1.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	8,0 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.4.2	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA/pole .....:	0,005 mA	P
8.3.4.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	SIBA	—
	- manufacturer's model or type reference .....:	50 179 06.10	—
	- rated current (A) .....:	10 A (gR)	—
	- power loss (W) .....:	2,3 W	—
	- rated breaking capacity (kA) .....:	200 kA	—
	- conductor cross-section (mm²) .....:	1,5 mm²	—
	- test current Ie (A) .....:	10 A	—
	Measured temperature-rise .....:	see appended table 8.3.4.4 on page 108	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 10: AC-22B, 400 V, 32 A, 1-pole)		P
8.3.4.1	Operational performance test		P
	- utilization category .....:	AC-22B	—
	- rated operational voltage (V) .....:	400 V	—
	- rated operational current (A) .....:	32 A	—
	Test conditions for electrical operation cycles:		
	- test voltage (V) .....:	L1: 414 V L2: L3: —	—
	- test current (A) .....:	L1: 32,1 A L2: L3: —	—
	- power factor/~~time constant~~ .....:	L1: 0,79 L2: L3: —	—
	Number of cycles with current .....:	300	P
	Number of cycles without current .....:	1700	P
	First test sequence (with/without current) .....:	Without current	—
	Second test sequence (with/without current) .....:	With current	—
	- time interval between first and second test sequence .....:	315 minutes	—
8.3.4.1.5	Behaviour of the equipment during the operational performance test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.1.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	11,4 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.4.2	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA/pole .....:	0,006 mA	P
8.3.4.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.4.4 on page 108	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 11: AC-22B, 400 V, 32 A, 2-poles)		P
8.3.4.1	Operational performance test		P
	- utilization category .....:	AC-22B	—
	- rated operational voltage (V) .....:	400 V	—
	- rated operational current (A) .....:	32 A	—
	Test conditions for electrical operation cycles:		
	- test voltage (V) .....:	L1: 414 V (239 V x √3) L2: 414 V (239 V x √3) L3: —	—
	- test current (A) .....:	L1: 32,2 A L2: 32,2 A L3: —	—
	- power factor/~~time constant~~ .....:	L1: 0,8 L2: 0,8 L3: —	—
	Number of cycles with current .....:	300	P
	Number of cycles without current .....:	1700	P
	First test sequence (with/without current) .....:	Without current	—
	Second test sequence (with/without current) .....:	With current	—
	- time interval between first and second test sequence .....:	315 minutes	—
8.3.4.1.5	Behaviour of the equipment during the operational performance test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.1.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	21,4 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.4.2	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA/pole .....:	0,006 mA	P
8.3.4.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.4.4 on page 109	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 12: AC-22B, 500 V, 25 A, 2-poles)		P
8.3.4.1	Operational performance test		P
	- utilization category .....:	AC-22B	—
	- rated operational voltage (V) .....:	500 V	—
	- rated operational current (A) .....:	25 A	—
	Test conditions for electrical operation cycles:		
	- test voltage (V) .....:	L1: 510 V (294,4 V x √3) L2: 510 V (294,4 V x √3) L3:—	—
	- test current (A) .....:	L1: 24,9 A L2: 24,9 A L3: —	—
	- power factor/~~time constant~~ .....:	L1: 0,78 L2: 0,78 L3: —	—
	Number of cycles with current .....:	300	P
	Number of cycles without current .....:	1700	P
	First test sequence (with/without current) .....:	Without current	—
	Second test sequence (with/without current) .....:	With current	—
	- time interval between first and second test sequence .....:	315 minutes	—
8.3.4.1.5	Behaviour of the equipment during the operational performance test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.1.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	21,6 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.4.2	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	550 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA/pole .....:	< 2 mA	P
8.3.4.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated current (A) .....:	25 A (gG)	—
	- power loss (W) .....:	2,6 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	4 mm²	—
	- test current Ie (A) .....:	25 A	—
	Measured temperature-rise .....:	see appended table 8.3.4.4 on page 109	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 13: AC-22B, 690 V, 10 A, 2-poles)		P
8.3.4.1	Operational performance test		P
	- utilization category .....:	AC-22B	—
	- rated operational voltage (V) .....:	690 V	—
	- rated operational current (A) .....:	10 A	—
	Test conditions for electrical operation cycles:		
	- test voltage (V) .....:	L1: 690 V (398,4 V x √3) L2: 690 V (398,4 V x √3) L3:—	—
	- test current (A) .....:	L1: 10 A L2: 10 A L3: —	—
	- power factor/~~time constant~~ .....:	L1: 0,78 L2: 0,78 L3: —	—
	Number of cycles with current .....:	300	P
	Number of cycles without current .....:	1700	P
	First test sequence (with/without current) .....:	Without current	—
	Second test sequence (with/without current) .....:	With current	—
	- time interval between first and second test sequence .....:	315 minutes	—
8.3.4.1.5	Behaviour of the equipment during the operational performance test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.1.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	21,8 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.4.2	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA/pole .....:	0,008 mA	P
8.3.4.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	SIBA	—
	- manufacturer's model or type reference .....:	50 179 06.10	—
	- rated current (A) .....:	10 A (gR)	—
	- power loss (W) .....:	2,3 W	—
	- rated breaking capacity (kA) .....:	200 kA	—
	- conductor cross-section (mm²) .....:	1,5 mm²	—
	- test current Ie (A) .....:	10 A	—
	Measured temperature-rise .....:	see appended table 8.3.4.4 on page 109	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4	TEST SEQUENCE II: OPERATIONAL PERFORMANCE CAPABILITY (Sample No. 14: AC-22B, 690 V, 32 A, 3-poles+N)		P
8.3.4.1	Operational performance test		P
	- utilization category .....:	AC-22B	—
	- rated operational voltage (V) .....:	690 V	—
	- rated operational current (A) .....:	32 A	—
	Test conditions for electrical operation cycles:		
	- test voltage (V) .....:	L1: 690 V (398,4 V x √3) L2: 690 V (398,4 V x √3) L3: 690 V (398,4 V x √3)	—
	- test current (A) .....:	L1: 33 A L2: 33 A L3: 33 A	—
	- power factor/~~time constant~~ .....:	L1: 0,8 L2: 0,8 L3: 0,8	—
	Number of cycles with current .....:	300	P
	Number of cycles without current .....:	1700	P
	First test sequence (with/without current) .....:	Without current	—
	Second test sequence (with/without current) .....:	With current	—
	- time interval between first and second test sequence .....:	315 minutes	—
8.3.4.1.5	Behaviour of the equipment during the operational performance test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.4.1.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	44,6 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.4.2	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No breakdown or flashover		P
8.3.4.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA/pole .....:	0,01 mA	P
8.3.4.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.4.4 on page 110	P

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

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.2	Short-circuit making capacity		N/A
	Rated short-circuit making capacity Icm (A) .....:		N/A
	test voltage (1.05xUe) ..... (V):	L1: L2: L3:	—
	r.m.s. test current (A) .....:	L1: L2: L3:	—
	maximum peak test current (factor n)		N/A
	power factor/time constant .....:	L1: L2: L3:	N/A
	current duration (s) .....:		—
	Time interval between the cycles		—
8.3.5.2.5	Behaviour of the equipment during the test		N/A
	Test performed without:		—
	- endanger to the operator		N/A
	-cause damage to adjacent equipment		N/A
	No permanent arcing		N/A
	No flash over between poles and poles and frame		N/A
	No melting of the fuse in the detection circuit		N/A
8.3.5.2.6	Condition of the equipment after making and breaking capacity tests		N/A
	Immediately after the test equipment must work satisfactorily		N/A
	- required opening force not greater than the test force of 8.2.5.2 and table 8		N/A
	- equipment is able to carry its rated current after normal closing operation		N/A
8.3.5.3	Dielectric verification		N/A
	test voltage: 2*Ue with a minimum of 1000V~ .....:		—
	No flashover or breakdown		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.5.4	Leakage current		N/A
	test voltage (1,1 Ue) (V) .....:		—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:		N/A
8.3.5.5	Temperature-rise verification		N/A
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:		—
	- manufacturer's model or type reference .....:		—
	- rated current (A) .....:		—
	- power loss (W) .....:		—
	- rated breaking capacity (kA) .....:		—
	- conductor cross-section (mm²) .....:		—
	- test current Ie (A) .....:		—
	Measured temperature-rise .....:	see appended table 8.3.5.5 on page __	N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 15: 400 V, 32 A, 1-pole)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated voltage (V) .....:	400 V	—
	- rated current (A) .....:	32 A (gG)	—
	- rated breaking capacity (kA) .....:	120 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) .....:	L1: 420 V L2: — L3: —	—
	test current (kA) .....:	L1: 101 kA L2: — L3: —	—
	rated frequency (Hz) .....:	50 Hz	—
	power factor .....:	0,19	—
	Time constant (ms) .....:	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) .....:	L1: 6,5 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 7000 A^2s L2: — L3: —	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	1,6 m/s	—
	- point at which the measurement is made .....:	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	1,5 m/s	—
	- max. let-through current (kA) .....:	L1: 4,94 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 5000 A^2s L2: — L3: —	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	8,7 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V ..... :	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) ..... :	440 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole ..... :		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole ..... :	0,008 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark ..... :	Bussmann	—
	- manufacturer's model or type reference ..... :	C10G32	—
	- rated current (A) ..... :	32 A (gG)	—
	- power loss (W) ..... :	2,9 W	—
	- rated breaking capacity (kA) ..... :	120 kA	—
	- conductor cross-section (mm²) ..... :	6 mm²	—
	- test current Ie (A) ..... :	32 A	—
	Measured temperature-rise ..... :	see appended table 8.3.6.5 on page 110	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 16: 400 V, 32 A, 1-pole+N)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated voltage (V) .....:	400 V	—
	- rated current (A) .....:	32 A (gG)	—
	- rated breaking capacity (kA) .....:	120 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) .....:	L1: 420 V L2: — L3: —	—
	test current (kA) .....:	L1: 101 kA L2: — L3: —	—
	rated frequency (Hz) .....:	50 Hz	—
	power factor .....:	0,19	—
	Time constant (ms) .....:	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) .....:	L1: 6,54 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 7000 A^2s L2: — L3: —	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	1,6 m/s	—
	- point at which the measurement is made .....:	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	1,5 m/s	—
	- max. let-through current (kA) .....:	L1: 3,7 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 4000 A^2s L2: — L3: —	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	24,8 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,002 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 111	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 17: 400 V, 32 A, 2-poles)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated voltage (V) .....:	400 V	—
	- rated current (A) .....:	32 A (gG)	—
	- rated breaking capacity (kA) .....:	120 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) .....:	L1: 420 V (242,5 V x √3) L2: 420 V (242,5 V x √3) L3: —	—
	test current (kA) .....:	L1: 101 kA L2: 101 kA L3: —	—
	rated frequency (Hz) .....:	50 Hz	—
	power factor .....:	0,19	—
	Time constant (ms).....:	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) .....:	L1: 6,35 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 5000 A^2s L2: — L3: —	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	1,6 m/s	—
	- point at which the measurement is made .....:	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	1,5 m/s	—
	- max. let-through current (kA) .....:	L1: 6,15 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 5000 A^2s L2: — L3: —	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test-force of 8.2.5.2 and table 8	22 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,001 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 111	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 18: 400 V, 32 A, 3-poles+N)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated voltage (V) .....:	400 V	—
	- rated current (A) .....:	32 A (gG)	—
	- rated breaking capacity (kA) .....:	120 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) .....:	L1: 420 V (242,5 V x √3) L2: 420 V (242,5 V x √3) L3: 420 V (242,5 V x √3)	—
	test current (kA) .....:	L1: 103 kA L2: 100 kA L3: 101 kA	—
	rated frequency (Hz) .....:	50 Hz	—
	power factor .....:	0,19	—
	Time constant (ms).....:	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) .....:	L1: 0,4 kA L2: 4,8 kA L3: 4,8 kA	—
	- Joule integral I^2dt (A^2s) .....:	L1: 0 A^2s L2: 4000 A^2s L3: 4000 A^2s	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	1,6 m/s	—
	- point at which the measurement is made .....:	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	1,5 m/s	—
	- max. let-through current (kA) .....:	L1: 1,6 kA L2: 4,2 kA L3: 4,4 kA	—
	- Joule integral I^2dt (A^2s) .....:	L1: 0 A^2s L2: 4000 A^2s L3: 4000 A^2s	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	49,1 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	440 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,001 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 111	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 19: 500 V, 25 A, 1-pole)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark ..... :	Bussmann	—
	- manufacturer's model or type reference ..... :	C10G25	—
	- rated voltage (V) ..... :	500 V	—
	- rated current (A) ..... :	25 A (gG)	—
	- rated breaking capacity (kA) ..... :	120 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) ..... :	L1: 537 V L2: — L3: —	—
	test current (kA) ..... :	L1: 107 kA L2: — L3: —	—
	rated frequency (Hz) ..... :	50 Hz	—
	power factor ..... :	0,2	—
	Time constant (ms) ..... :	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) ..... :	L1: 2,59 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) ..... :	L1: 1000 A^2s L2: — L3: —	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) ..... :	1,6 m/s	—
	- point at which the measurement is made ..... :	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) ..... :	1,5 m/s	—
	- max. let-through current (kA) ..... :	L1: 3,56 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) ..... :	L1: 2000 A^2s L2: — L3: —	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	11,4 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	550 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,001 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated current (A) .....:	25 A (gG)	—
	- power loss (W) .....:	2,6 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	4 mm²	—
	- test current Ie (A) .....:	25 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 112	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 20: 500 V, 25 A, 1-pole+N)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated voltage (V) .....:	500 V	—
	- rated current (A) .....:	25 A (gG)	—
	- rated breaking capacity (kA) .....:	120 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) .....:	L1: 537 V L2: — L3: —	—
	test current (kA) .....:	L1: 107 kA L2: — L3: —	—
	rated frequency (Hz) .....:	50 Hz	—
	power factor .....:	0,2	—
	Time constant (ms) .....:	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) .....:	L1: 3,8 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 2000 A^2s L2: — L3: —	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	1,6 m/s	—
	- point at which the measurement is made .....:	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	1,5 m/s	—
	- max. let-through current (kA) .....:	L1: 2,22 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 1000 A^2s L2: — L3: —	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	20,6 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	550 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,001 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated current (A) .....:	25 A (gG)	—
	- power loss (W) .....:	2,6 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	4 mm²	—
	- test current Ie (A) .....:	25 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 112	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 21: 500 V, 25 A, 2-poles)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated voltage (V) .....:	500 V	—
	- rated current (A) .....:	25 A (gG)	—
	- rated breaking capacity (kA) .....:	120 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) .....:	L1: 537 V (310 V x √3) L2: 537 V (310 V x √3) L3: —	—
	test current (kA) .....:	L1: 107 kA L2: 107 kA L3: —	—
	rated frequency (Hz) .....:	50 Hz	—
	power factor .....:	0,2	—
	Time constant (ms).....:	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) .....:	L1: 3,71 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 1000 A^2s L2: — L3: —	—
	Fuse protected short-circuit making		P
	; mean velocity of 15 manually under no-load conditions operations (m/s) .....:	1,6 m/s	—
	- point at which the measurement is made .....:	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	1,5 m/s	—
	- max. let-through current (kA) .....:	L1: 3,64 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 1000 A^2s L2: — L3: —	—

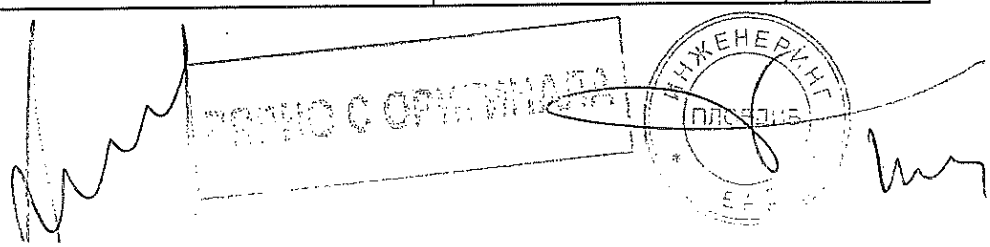
IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	31,2 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	550 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,005 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated current (A) .....:	25 A (gG)	—
	- power loss (W) .....:	2,6 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	4 mm²	—
	- test current Ie (A) .....:	25 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 112	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 22: 500 V, 25 A, 3-poles+N)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated voltage (V) .....:	500 V	—
	- rated current (A) .....:	25 A (gG)	—
	- rated breaking capacity (kA) .....:	120 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) .....:	L1: 730 V (421,5 V x √3) L2: 730 V (421,5 V x √3) L3: 730 V (421,5 V x √3)	—
	test current (kA) .....:	L1: 102 kA L2: 102 kA L3: 101 kA	—
	rated frequency (Hz) .....:	50 Hz	—
	power factor .....:	0,2	—
	Time constant (ms).....:	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) .....:	L1: 1,9 kA L2: 3,8 kA L3: 2,0 kA	—
	- Joule integral I^2dt (A^2s) .....:	L1: 1000 A^2s L2: 2000 A^2s L3: 1000 A^2s	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	1,6 m/s	—
	- point at which the measurement is made .....:	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	1,4 m/s	—
	- max. let-through current (kA) .....:	L1: 0 kA L2: 3,16 kA L3: 3,16 kA	—
	- Joule integral I^2dt (A^2s) .....:	L1: 0 A^2s L2: 1000 A^2s L3: 1000 A^2s	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	46,4 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1000 V (tested with 1380 V)	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	550 V (tested with 759 V)	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,002 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G25	—
	- rated current (A) .....:	25 A (gG)	—
	- power loss (W) .....:	2,6 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	4 mm²	—
	- test current Ie (A) .....:	25 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 113	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 23: 690 V, 10 A, 1-pole)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark ..... :	SIBA	—
	- manufacturer's model or type reference ..... :	50 179 06.10	—
	- rated voltage (V) ..... :	690 V	—
	- rated current (A) ..... :	10 A (gR)	—
	- rated breaking capacity (kA) ..... :	200 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) ..... :	L1: 725 V L2: — L3: —	—
	test current (kA) ..... :	L1: 52,7 kA L2: — L3: —	—
	rated frequency (Hz) ..... :	50 Hz	—
	power factor ..... :	0,13	—
	Time constant (ms) ..... :	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) ..... :	L1: 2,0 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) ..... :	L1: 0 A^2s L2: — L3: —	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) ..... :	1,6 m/s	—
	- point at which the measurement is made ..... :	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) ..... :	1,5 m/s	—
	- max. let-through current (kA) ..... :	L1: 0,77 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) ..... :	L1: 0 A^2s L2: — L3: —	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	18,8 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,002 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	SIBA	—
	- manufacturer's model or type reference .....:	50 179 06.10	—
	- rated current (A) .....:	10 A (gR)	—
	- power loss (W) .....:	2,3 W	—
	- rated breaking capacity (kA) .....:	200 kA	—
	- conductor cross-section (mm²) .....:	1,5 mm²	—
	- test current Ie (A) .....:	10 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 113	P



IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 24: 690 V, 10 A, 1-pole+N)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	SIBA	—
	- manufacturer's model or type reference .....:	50 179 06.10	—
	- rated voltage (V) .....:	690 V	—
	- rated current (A) .....:	10 A (gR)	—
	- rated breaking capacity (kA) .....:	200 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) .....:	L1: 726 V L2: — L3: —	—
	test current (kA) .....:	L1: 52,7 kA L2: — L3: —	—
	rated frequency (Hz) .....:	50 Hz	—
	power factor .....:	0,13	—
	Time constant (ms) .....:	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) .....:	L1: 1,02 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 0 A^2s L2: — L3: —	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	1,6 m/s	—
	- point at which the measurement is made .....:	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	1,5 m/s	—
	- max. let-through current (kA) .....:	L1: 0,78 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 0 A^2s L2: — L3: —	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	25,4 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,001 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	SIBA	—
	- manufacturer's model or type reference .....:	50 179 06.10	—
	- rated current (A) .....:	10 A (gR)	—
	- power loss (W) .....:	2,3 W	—
	- rated breaking capacity (kA) .....:	200 kA	—
	- conductor cross-section (mm²) .....:	1,5 mm²	—
	- test current Ie (A) .....:	10 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 113	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 25: 690 V, 10 A, 2-poles)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark .....:	SIBA	—
	- manufacturer's model or type reference .....:	50 179 06.10	—
	- rated voltage (V) .....:	690 V	—
	- rated current (A) .....:	10 A (gR)	—
	- rated breaking capacity (kA) .....:	200 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) .....:	L1: 726 V (419,16 V x √3) L2: 726 V (419,16 V x √3) L3: —	—
	test current (kA) .....:	L1: 52,7 kA L2: 52,7 kA L3: —	—
	rated frequency (Hz) .....:	50 Hz	—
	power factor .....:	0,13	—
	Time constant (ms).....:	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		
	- max. let-through current (kA) .....:	L1: 0,61 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 0 A^2s L2: — L3: —	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) .....:	1,6 m/s	—
	- point at which the measurement is made .....:	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) .....:	1,5 m/s	—
	- max. let-through current (kA) .....:	L1: 0,55 kA L2: — L3: —	—
	- Joule integral I^2dt (A^2s) .....:	L1: 0 A^2s L2: — L3: —	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	34,2 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,003 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	SIBA	—
	- manufacturer's model or type reference .....:	50 179 06.10	—
	- rated current (A) .....:	10 A (gR)	—
	- power loss (W) .....:	2,3 W	—
	- rated breaking capacity (kA) .....:	200 kA	—
	- conductor cross-section (mm²) .....:	1,5 mm²	—
	- test current Ie (A) .....:	10 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 114	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6	TEST SEQUENCE IV: CONDITIONAL SHORT-CIRCUIT CURRENT (Sample No. 26: 690 V, 32 A, 3-poles+N)		P
	Protective device details:		P
	- manufacturer's name, trademark or identification mark ..... :	Bussmann	—
	- manufacturer's model or type reference ..... :	C10G32	—
	- rated voltage (V) ..... :	400 V	—
	- rated current (A) ..... :	32 A (gG)	—
	- rated breaking capacity (kA) ..... :	120 kA	—
8.3.6.2	Fuse protected short-circuit withstand		P
	test voltage (1,05 Ue) (V) ..... :	L1: 726 V (419,16 V x √3) L2: 726 V (419,16 V x √3) L3: 726 V (419,16 V x √3)	—
	test current (kA) ..... :	L1: 50,9 kA L2: 52,2 kA L3: 51,0 kA	—
	rated frequency (Hz) ..... :	50 Hz	—
	power factor ..... :	0,23	—
	Time constant (ms) ..... :	—	—
	Fuse protected short-circuit withstand (equipment in closed position)		—
	- max. let-through current (kA) ..... :	L1: 0,9 kA L2: 5,6 kA L3: 5,6 kA	—
	- Joule integral I^2dt (A^2s) ..... :	L1: 2000 A^2s L2: 8000 A^2s L3: 6000 A^2s	—
	Fuse protected short-circuit making		P
	- mean velocity of 15 manually under no-load conditions operations (m/s) ..... :	1,6 m/s	—
	- point at which the measurement is made ..... :	point of rotation	—
	- test speed during the fuse protected short-circuit making (m/s) ..... :	1,4 m/s	—
	- max. let-through current (kA) ..... :	L1: 5,3 kA L2: 5,3 kA L3: 0 kA	—
	- Joule integral I^2dt (A^2s) ..... :	L1: 5000 A^2s L2: 5000 A^2s L3: 0 A^2s	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.6.2.5	Behaviour of the equipment during the test		P
	Test performed without:		—
	- endanger to the operator		P
	- cause damage to adjacent equipment		P
	No permanent arcing		P
	No flash over between poles and poles and frame		P
	No melting of the fuse in the detection circuit		P
8.3.6.2.6	Condition of the equipment after making and breaking capacity tests		P
	Immediately after the test equipment must work satisfactorily		P
	- required opening force not greater than the test force of 8.2.5.2 and table 8	51,6 N (required opening force) 150 N (test force acc. tab. 8)	P
	- equipment is able to carry its rated current after normal closing operation		P
8.3.6.3	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No flashover or breakdown		P
8.3.6.4	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2,0 mA/pole .....:	0,002 mA	P
8.3.6.5	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.6.5 on page 114	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.7	TEST SEQUENCE V: OVERLOAD PERFORMANCE CAPABILITY (Sample No. 27: 690 V, 32 A, 1-pole)		P
8.3.7.1	Overload test		P
	ambient temperature 10-40 °C .....:	25,6 °C	—
	test enclosure W x H x D (mm x mm x mm) .....:	—	—
	material of enclosure .....:	—	—
	test current 1,6xIthe or 1,6xIth (A) .....:	52	—
	cable/busbar cross-section (mm²) / length (mm) ...:	6 mm² cable / 1000 mm long	—
	Fuse-link details:		P
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- time duration of the overload test (s) .....:	824 s	—
	Within 3 to 5 min after the fuse(s) has(have) operated (or 1 h), the equipment has been operated once, i.e. opened and closed		P
	Required opening force not greater than the test force of 8.2.5.2 and table 8	14 N (required opening force) 150 N (test force acc. tab. 8)	P
	The equipment has not undergone any impairment hindering such operation		P
8.3.7.2	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No flashover or breakdown		P
8.3.7.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA)/pole .....:	0,002 mA	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.7.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	Fuse links aged during the overload test are replaced by new fuse-links .....:		P
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.7.4 on page 114	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.7	TEST SEQUENCE V: OVERLOAD PERFORMANCE CAPABILITY (Sample No. 28: 690 V, 32 A, 2-poles)		P
8.3.7.1	Overload test		P
	ambient temperature 10-40 °C .....:	23,6 °C	—
	test enclosure W x H x D (mm x mm x mm) .....:	—	—
	material of enclosure .....:	—	—
	test current 1,6xIthe or 1,6xIth (A) .....:	52	—
	cable/busbar cross-section (mm²) / length (mm) ...:	6 mm² cable / 1000 mm long	—
	Fuse-link details:		P
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- time duration of the overload test (s) .....:	573 s	—
	Within 3 to 5 min after the fuse(s) has(have) operated (or 1 h), the equipment has been operated once, i.e. opened and closed		P
	Required opening force not greater than the test force of 8.2.5.2 and table 8	17,2 N (required opening force) 150 N (test force acc. tab. 8)	P
	The equipment has not undergone any impairment hindering such operation		P
8.3.7.2	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No flashover or breakdown		P
8.3.7.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA)/pole .....:	0,001 mA	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.7.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	Fuse links aged during the overload test are replaced by new fuse-links .....:		P
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.7.4 on page 115	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.7	TEST SEQUENCE V: OVERLOAD PERFORMANCE CAPABILITY (Sample No. 29: 690 V, 32 A, 3-poles+N)		P
8.3.7.1	Overload test		P
	ambient temperature 10-40 °C .....:	23,6 °C	—
	test enclosure W x H x D (mm x mm x mm) .....:	—	—
	material of enclosure .....:	—	—
	test current 1,6xIthe or 1,6xIth (A) .....:	52	—
	cable/busbar cross-section (mm²) / length (mm) ...:	6 mm² cable / 1000 mm long	—
	Fuse-link details:		P
	- manufacturer's name, trademark or identification mark	Bussmann	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	- time duration of the overload test (s) .....:	540 s	—
	Within 3 to 5 min after the fuse(s) has(have) operated (or 1 h), the equipment has been operated once, i.e. opened and closed		P
	Required opening force not greater than the test force of 8.2.5.2 and table 8	35,2 N (required opening force) 150 N (test force acc. tab. 8)	P
	The equipment has not undergone any impairment hindering such operation		P
8.3.7.2	Dielectric verification		P
	test voltage: 2*Ue with a minimum of 1000V~ .....:	1380 V	—
	No flashover or breakdown		P
8.3.7.3	Leakage current		P
	test voltage (1,1 Ue) (V) .....:	759 V	—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA)/pole .....:	0,001 mA	P

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.7.4	Temperature-rise verification		P
	Fuse-link details (fuse-combination units only):		—
	- manufacturer's name, trademark or identification mark .....:	Bussmann	—
	- manufacturer's model or type reference .....:	C10G32	—
	- rated current (A) .....:	32 A (gG)	—
	- power loss (W) .....:	2,9 W	—
	- rated breaking capacity (kA) .....:	120 kA	—
	Fuse links aged during the overload test are replaced by new fuse-links .....:		P
	- conductor cross-section (mm²) .....:	6 mm²	—
	- test current Ie (A) .....:	32 A	—
	Measured temperature-rise .....:	see appended table 8.3.7.4 on page 115	P

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

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	Annex A (normative)		N/A
A	Equipment for direct switching of a single motor		N/A
A.1	Additional rated duties.....:		N/A
A.1.1	- intermittent periodic duty		N/A
	- intermittent duty		N/A
A.1.1.1	Classes of intermittent duty .....:		N/A
	-class 1: up to 1 operating cycle per hour		N/A
	-class 3: up to 3 operating cycle per hour		N/A
	-class 12: up to 12 operating cycles per hour		N/A
	-class 30: up to 30 operating cycles per hour		N/A
	-class 120: up to 120 operating cycles per hour		N/A
A.1.2	Temporary duty.....:		N/A
A.5	Mechanical durability:		N/A
	Equipment mounted according to manufacturer's instruction		N/A
	Preferred number of no-load operating cycles expressed in millions.....:		N/A
	0,001 – 0,003 – 0,01 – 0,03 – 0,1 – 0,3 - 1		N/A
	If no mechanical endurance is stated by the manufacturer, a minimum mechanical endurance according to the class of intermittent duty shall be tested.	Class of intermittent duty:	N/A
	Number of no-load operating cycles performed.....:	_____	N/A
A.6	Electrical durability:		N/A
	- test according to manufacturer's instruction		N/A
A.7	Verification of making and breaking capacities:		N/A
	- utilization category .....:		—
	- rated operational voltage Ue (V) .....:		—
	- rated operational current Ie (A) or power (kW) ....:		—
	Conditions for make/break operations or make operations:		—
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ...x Ie (A):	L1: L2: L3:	—

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	- power factor .....:	L1: L2: L3:	—
	Conditions for make/break operations:		N/A
	- test voltage, U = 1,05 Ue ..... (V):	L1: L2: L3:	—
	- test current, I = ... x Ie (A):	L1: L2: L3:	—
	- power factor/ time constant .....:	L1: L2: L3:	—
	Number of make/break or make and break operations .....:		N/A
	- recovery voltage duration (≥ 50 ms)		N/A
	- current duration (ms) .....:		—
	- time interval between operations .....:		N/A
	Characteristic of transient recovery voltage if necessary:		N/A
	- oscillatory frequency (kHz) .....:		—
	- measured oscillatory frequency (kHz) .....:	L1: L2: L3:	N/A
	- factor γ .....:	L1: L2: L3:	N/A
8.3.3.3.5	Behaviour of the equipment during making and breaking capacity tests		N/A
	Test performed without:		—
	- endanger to the operator		N/A
	- cause damage to adjacent equipment		N/A
	No permanent arcing		N/A
	No flash over between poles and poles and frame		N/A
	No melting of the fuse in the detection circuit		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
8.3.3.3.6	Condition of the equipment after making and breaking capacity tests		N/A
	Immediately after the test equipment must work satisfactorily		N/A
	- required opening force not greater than the test force of 8.2.5.2 and table 8		N/A
	- equipment is able to carry its rated current after normal closing operation		N/A
8.3.3.4	Dielectric verification		N/A
	test voltage: 2*Ue with a minimum of 1000V~ .....:		—
	No flashover or breakdown		N/A
8.3.3.5	Leakage current		N/A
	test voltage (1,1 Ue) (V) .....:		—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B): ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories): ≤ 2 mA/pole) .....:		N/A
8.3.3.6	Temperature-rise verification		N/A
	- conductor cross-section (mm²) .....:		—
	- test current Ie (A) .....:		—
	Measured temperature-rise .....:	see __	N/A
A.8	Operational performance test:		N/A
	- utilization category .....:		—
	- rated operational voltage (V) .....:		—
	- rated operational current (A) .....:		—
	Test conditions for electrical operation cycles:		N/A
	- test voltage (V) .....:	L1: L2: L3:	—
	- test current (A) .....:	L1: L2: L3:	—
	- power factor/time constant .....:	L1: L2: L3:	—
	Number of cycles with current .....:		N/A
	Number of cycles without current .....:		N/A

IEC 60947-3			
Clause	Requirement + Test	Result - Remark	Verdict
	First test sequence (with/without current) .....:		—
	Second test sequence (with/without current) .....:		—
	- time interval between first and second test sequence .....:		—
8.3.4.1.5	Behaviour of the equipment during the operational performance test		N/A
	Test performed without:		—
	- endanger to the operator		N/A
	-cause damage to adjacent equipment		N/A
	No permanent arcing		N/A
	No flash over between poles and poles and frame		N/A
	No melting of the fuse in the detection circuit		N/A
8.3.4.1.6	Condition of the equipment after making and breaking capacity tests		N/A
	Immediately after the test equipment must work satisfactorily		N/A
	- required opening force not greater than the test force of 8.2.5.2 and table 8		N/A
	- equipment is able to carry its rated current after normal closing operation		N/A
8.3.4.2	Dielectric verification		N/A
	test voltage: 2*Ue with a minimum of 1000V~ .....:		—
	No breakdown or flashover		N/A
8.3.4.3	Leakage current		N/A
	test voltage (1,1 Ue) (V) .....:		—
	Leakage current (utilization categories AC-20A, AC-20B, DC-20A and DC-20B) ≤ 0,5 mA/pole .....:		N/A
	Leakage current (other utilization categories) ≤ 2 mA/pole .....:		N/A
8.3.4.4	Temperature-rise verification		N/A
	- conductor cross-section (mm²) .....:		—
	- test current Ie (A) .....:		—
	Measured temperature-rise .....:	see __	N/A
A.9	Special tests:	see __	N/A

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

Annex C (normative)			N/A
C	Single pole operated three pole switches		N/A
C.1	Three pole operated switches of fundamentally the same design, already successfully tested are deemed to satisfy the requirements of individually operated three pole devices.		N/A
C.2	Additional-tests to be performed on single pole operated three pole switches		N/A
	Test "8.3.3.3 Making and breaking capacities" according to test sequence I with following modifications		N/A
	L1 and L2 are closed, L3 is subjected to the required make-break operation cycle.....:		N/A
	L2 closed and L3 opened, L1 is subjected to the required make-break operation cycle.....:		N/A
	Test performed in a three phase circuit		N/A
	Test "8.3.4.1 Operational performance" according to test sequence II with following modifications		N/A
	L1 and L2 are closed, L3 is subjected to the required make-break operation cycle.....:		N/A
	L2 closed and L3 opened, L1 is subjected to the required make-break operation cycle.....:		N/A
	Test performed in a three phase circuit		N/A
	Test "8.3.6.2 Fuse protected short circuit test" according to test sequence IV with following modifications		N/A
	For the making test L1 shall be open and L2 closed, L3 is subjected to the required make operation cycle.....:		N/A
	L2 closed and L3 opened, L1 is subjected to the required make-break operation cycle.....:		N/A
	Test performed in a three phase circuit		N/A
C.5	Instruction for use		N/A
	The product literature includes following statement :		N/A
	These devices are intended for power distribution systems where switching and/or isolating of an individual phase may be necessary and shall not be used for the switching of the primary circuit of three-phase equipment.		N/A

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

7.1.4	TABLE: Clearance and creepage distance measurements					
clearance cl and creepage distance dcr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	cl (mm)	required dcr (mm)	dcr (mm)
Between active parts and parts intended to be touched	7300	800	2	>5,5	11	>11
Between active parts and enclosure	7300	800	2	>5,5	11	>11
Between active parts and fuse-link with the contacts in open position	9800	800	2	>5,5	11	>11
supplementary information:						

8.3.3.1	TABLE: Temperature-rise (measurements) (Sample No. 1: I_e = 25 A)		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Above terminals (cable connection)		39,3	70
Below terminals (cable connection)		35,3	70
Manual operating means: ~~metallic~~ / non-metallic		4,3	25
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		8,5	40
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		12,8	50
supplementary information:	Ambient temperature:	22,7 °C	

8.3.3.6	TABLE: Temperature-rise (measurements) (Sample No. 1: I_e = 25 A)		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		37,2	80
Manual operating means: ~~metallic~~ / non-metallic		4,6	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		6,1	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		17,0	60
supplementary information:	Ambient temperature:	22,9 °C	

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

8.3.3.1	**TABLE: Temperature-rise (measurements) (Sample No. 2: I_e = 10 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Above terminals (cable connection)		31,7	70
Below terminals (cable connection)		29,8	70
Manual operating means: ~~metallic~~ / non-metallic		5,0	25
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		8,8	40
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		15,3	50
supplementary information:	Ambient temperature:	22,7 °C	

8.3.3.6	**TABLE: Temperature-rise (measurements) (Sample No. 2: I_e = 10 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		32,9	80
Manual operating means: ~~metallic~~ / non-metallic		3,7	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		5,4	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		19,4	60
supplementary information:	Ambient temperature:	23,8 °C	

8.3.3.1	**TABLE: Temperature-rise (measurements) (Sample No. 3: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Above terminals (cable connection)		45,0	70
Below terminals (cable connection)		37,5	70
Manual operating means: ~~metallic~~ / non-metallic		5,5	25
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		13,8	40
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		12,0	50
supplementary information:	Ambient temperature:	22,7 °C	

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

8.3.3.6	**TABLE: Temperature-rise (measurements) (Sample No. 3: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		39,0	80
Manual operating means: ~~metallic~~ / non-metallic		4,8	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		5,4	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		21,1	60
supplementary information:	Ambient temperature:	24,3 °C	

8.3.3.1	**TABLE: Temperature-rise (measurements) (Sample No. 4: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Above terminals (cable connection)		48,5	70
Below terminals (cable connection)		47,3	70
Manual operating means: ~~metallic~~ / non-metallic		7,8	25
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		21,8	40
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		14,5	50
supplementary information:	Ambient temperature:	22,7 °C	

8.3.3.6	**TABLE: Temperature-rise (measurements) (Sample No. 4: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		49,0	80
Manual operating means: ~~metallic~~ / non-metallic		8,8	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		12,9	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		26,9	60
supplementary information:	Ambient temperature:	24,4 °C	

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

8.3.3.1	**TABLE: Temperature-rise (measurements) (Sample No. 5: I_e = 25 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Above terminals (cable connection)		44,3	70
Below terminals (cable connection)		42,9	70
Manual operating means: ~~metallic~~ / non-metallic		10,6	25
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		13,3	40
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		15,2	50
supplementary information:	Ambient temperature:	22,7 °C	

8.3.3.6	**TABLE: Temperature-rise (measurements) (Sample No. 5: I_e = 25 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		47,5	80
Manual operating means: ~~metallic~~ / non-metallic		8,9	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		16,2	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		22,8	60
supplementary information:	Ambient temperature:	22,9 °C	

8.3.3.1	**TABLE: Temperature-rise (measurements) (Sample No. 6: I_e = 10 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Above terminals (cable connection)		44,5	70
Below terminals (cable connection)		40,8	70
Manual operating means: ~~metallic~~ / non-metallic		9,3	25
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		19,5	40
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		14,8	50
supplementary information:	Ambient temperature:	22,7 °C	

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

8.3.3.6	**TABLE: Temperature-rise (measurements) (Sample No. 6: I_e = 10 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		50,4	80
Manual operating means: ~~metallic~~ / non-metallic		6,3	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		13,8	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		27,0	60
supplementary information:	Ambient temperature:	23,8 °C	

8.3.3.1	**TABLE: Temperature-rise (measurements) (Sample No. 7: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Above terminals (cable connection)		63,8	70
Below terminals (cable connection)		63,9	70
Manual operating means: ~~metallic~~ / non-metallic		16,9	25
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		32,8	40
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		22,3	50
supplementary information:	Ambient temperature:	22,7 °C	

8.3.3.6	**TABLE: Temperature-rise (measurements) (Sample No. 7: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		59,9	80
Manual operating means: ~~metallic~~ / non-metallic		11,2	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		23,7	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		27,6	60
supplementary information:	Ambient temperature:	24,4 °C	

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

8.3.4.4	**TABLE: Temperature-rise (measurements) (Sample No. 8: I_e = 25 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		39,6	80
Manual operating means: ~~metallic~~ / non-metallic		5,5	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		17,6	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		25,9	60
supplementary information:	Ambient temperature:	25,3 °C	

8.3.4.4	**TABLE: Temperature-rise (measurements) (Sample No. 9: I_e = 10 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		43,1	80
Manual operating means: ~~metallic~~ / non-metallic		3,3	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		14,0	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		20,3	60
supplementary information:	Ambient temperature:	25,3 °C	

8.3.4.4	**TABLE: Temperature-rise (measurements) (Sample No. 10: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		47,5	80
Manual operating means: ~~metallic~~ / non-metallic		10,8	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		24,4	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		26,1	60
supplementary information:	Ambient temperature:	25,3 °C	

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

8.3.4.4	**TABLE: Temperature-rise (measurements) (Sample No. 11: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		42,5	80
Manual operating means: ~~metallic~~ / non-metallic		9,2	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		22,1	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		22,5	60
supplementary information:	Ambient temperature:	25,3 °C	

8.3.4.4	**TABLE: Temperature-rise (measurements) (Sample No. 12: I_e = 25 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		48,9	80
Manual operating means: ~~metallic~~ / non-metallic		8,4	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		28,8	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		30,4	60
supplementary information:	Ambient temperature:	25,3 °C	

8.3.4.4	**TABLE: Temperature-rise (measurements) (Sample No. 13: I_e = 10 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		43,8	80
Manual operating means: ~~metallic~~ / non-metallic		9,3	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		28,5	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		28,7	60
supplementary information:	Ambient temperature:	25,3 °C	

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

8.3.4.4	**TABLE: Temperature-rise (measurements) (Sample No. 14: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		44,1	80
Manual operating means: ~~metallic~~ / non-metallic		14,5	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		34,0	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		23,3	60
supplementary information:	Ambient temperature:	25,3 °C	

8.3.5.5	**TABLE: Temperature-rise (measurements)**		N/A
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals			
Manual operating means: metallic / non-metallic			
Parts intended to be touched but not hand-held: metallic / non-metallic			
Parts which need not be touched during normal operation: metallic / non-metallic			
supplementary information:			

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 15: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		53,5	80
Manual operating means: ~~metallic~~ / non-metallic		6,0	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		16,8	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		26,3	60
supplementary information:	Ambient temperature:	23,5 °C	

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

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 16: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		58,5	80
Manual operating means: ~~metallic~~ / non-metallic		10,2	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		21,8	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		40,5	60
supplementary information:	Ambient temperature:	24,9 °C	

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 17: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		65,9	80
Manual operating means: ~~metallic~~ / non-metallic		14,1	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		28,4	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		44,7	60
supplementary information:	Ambient temperature:	24,6 °C	

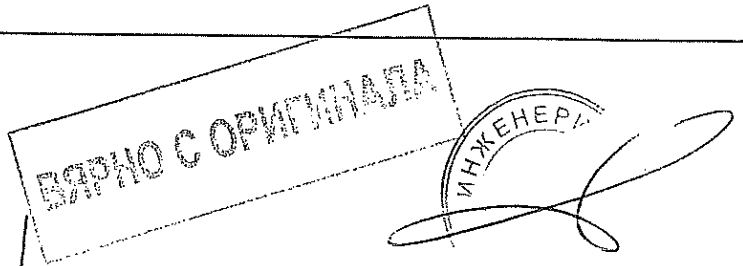
8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 18: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		60,3	80
Manual operating means: ~~metallic~~ / non-metallic		16,6	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		35,0	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		33,5	60
supplementary information:	Ambient temperature:	24,2 °C	

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

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 19: I_e = 25 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		35,6	80
Manual operating means: ~~metallic~~ / non-metallic		6,5	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		15,7	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		22,0	60
supplementary information:	Ambient temperature:	24,6 °C	

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 20: I_e = 25 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		42,1	80
Manual operating means: ~~metallic~~ / non-metallic		8,6	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		19,1	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		24,3	60
supplementary information:	Ambient temperature:	24,6 °C	

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 21: I_e = 25 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		46,6	80
Manual operating means: ~~metallic~~ / non-metallic		12,9	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		26,5	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		28,2	60
supplementary information:	Ambient temperature:	24,6 °C	



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

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 22: I_e = 25 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		57,7	80
Manual operating means: ~~metallic~~ / non-metallic		16,8	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		33,8	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		30,6	60
supplementary information:	Ambient temperature:	24,6 °C	

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 23: I_e = 10 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		33,5	80
Manual operating means: ~~metallic~~ / non-metallic		3,5	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		13,0	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		19,0	60
supplementary information:	Ambient temperature:	23,3 °C	

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 24: I_e = 10 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		31,9	80
Manual operating means: ~~metallic~~ / non-metallic		6,1	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		17,1	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		19,3	60
supplementary information:	Ambient temperature:	23,3 °C	

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

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 25: I_e = 10 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		45,7	80
Manual operating means: ~~metallic~~ / non-metallic		8,4	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		24,1	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		25,3	60
supplementary information:	Ambient temperature:	23,3 °C	

8.3.6.5	**TABLE: Temperature-rise (measurements) (Sample No. 26: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		56,8	80
Manual operating means: ~~metallic~~ / non-metallic		13,5	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		33,0	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		30,8	60
supplementary information:	Ambient temperature:	24,6 °C	

8.3.7.4	**TABLE: Temperature-rise (measurements) (Sample No. 27: I_e = 32 A)**		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		42,5	80
Manual operating means: ~~metallic~~ / non-metallic		2,8	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		14,0	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		21,6	60
supplementary information:	Ambient temperature:	22,6 °C	

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

8.3.7.4	TABLE: Temperature-rise (measurements) (Sample No. 28: I_e = 32 A)		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		46,8	80
Manual operating means: ~~metallic~~ / non-metallic		11,7	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		31,8	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		35,4	60
supplementary information:	Ambient temperature:	23,4 °C	

8.3.7.4	TABLE: Temperature-rise (measurements) (Sample No. 29: I_e = 32 A)		P
Temperature rise dT of part:		dT (K) measured	dT (K) required
Terminals		53,6	80
Manual operating means: ~~metallic~~ / non-metallic		17,5	35
Parts intended to be touched but not hand-held: ~~metallic~~ / non-metallic		33,4	50
Parts which need not be touched during normal operation: ~~metallic~~ / non-metallic		41,5	60
supplementary information:	Ambient temperature:	23,8 °C	

List of test equipment used:
(Note: This is an example of the required attachment. Other forms with a different layout but containing similar information are also acceptable.)

Clause	Measurement / testing	Testing / measuring equipment / material used	Range used	Calibration date
		Not applicable,		
		only required for the MT programs		

DAkkS
Deutsche
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Entrusted according to Section 8 subsection1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV
Signatory to the Multilateral Agreements of
EA, ILAC and IAF for Mutual Recognition

Accreditation

The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

IPH Institut "Prüffeld für elektrische Hochleistungstechnik" GmbH
Landsberger Allee 378 A, 12681 Berlin

is competent under the terms of DIN EN ISO/IEC 17025:2005 to carry out tests in the following fields:

High-voltage equipment and components
Low-voltage equipment and components
Installation, switching, control and protective equipment
High-voltage, medium-voltage and low-voltage cables and their accessories

The accreditation certificate shall only apply in connection with the notice of accreditation of 2015-11-11 with the accreditation number D-PL-12107-01 and is valid until 2020-11-10. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 42 pages.

Registration number of the certificate: **D-PL-12107-01-00**

ВЯРНО С ОРИГИНАЛА

ИНЖЕНЕРИНГ ПЛОВДИВ ЕАД

Frankfurt, 2015-11-11

Dipl.-Ing. (FH) Ralf Egner
Head of Division

This document is a translation. The definitive version is the original German accreditation certificate.

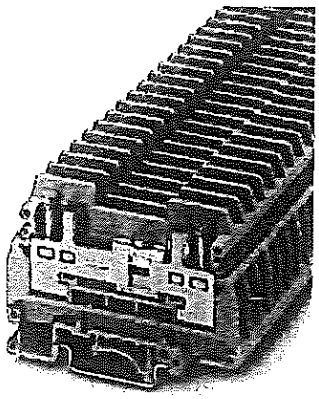
See notes overleaf.

PHOENIX CONTACT

Extract from the online catalog

URTK/S

Order No.: 0311087



http://eshop.phoenixcontact.net/phoenix/treeViewClick.do?UID=0311087

Test disconnect terminal block, Connection method: Screw connection, Cross section: 0.5 mm² - 10 mm² , AWG: 20 - 10, Width: 8.2 mm, Mounting type: NS 35/7.5, NS 35/15, NS 32, Color: gray

Commercial data

EAN	4 017918 001292
Pack	50 pcs.
Customs tariff	85369010
Gross weight in pieces	0.035996 KG
Net weight per piece (exclusive packing)	0.03581 KG
Catalog page information	Page 463 (CL1-2011)

Product notes

WEEE/RoHS-compliant since: 01/01/2003

http://www.download.phoenixcontact.com
Please note that the data given here has been taken from the online catalog. For comprehensive information and data, please refer to the user documentation. The General Terms and Conditions of Use apply to Internet downloads.

Technical data

General

Number of levels	1
Number of connections	2
Color	gray

Insulating material	PA
Inflammability class according to UL 94	V0

Dimensions

Length	72 mm
Width	8.2 mm
Height NS 35/7,5	51.5 mm
Height NS 35/15	59 mm
Height NS 32	56 mm

Technical data

Rated surge voltage	6 kV
Pollution degree	3
Surge voltage category	III
Insulating material group	I
Connection in acc. with standard	IEC 60947-7-1
Nominal current I_N	41 A
Nominal voltage U_N	400 V
Open side panel	ja
Shock protection test specification	DIN EN 50274 (VDE 0660-514):2002-11
Back of the hand protection	guaranteed
Surge voltage test setpoint	7.3 kV
Result of surge voltage test	Test passed
Power frequency withstand voltage setpoint	1.89 kV
Result of power-frequency withstand voltage test	Test passed
Checking the mechanical stability of terminal points (5 x conductor connection)	Test passed
Bending test rotation speed	10 rpm
Bending test turns	135
Bending test conductor cross section/weight	0.5 mm² / 0.3 kg
	6 mm² / 1.4 kg
	10 mm² / 2 kg
Result of bending test	Test passed
Conductor cross section tensile test	0.5 mm²
Tractive force setpoint	20 N
Conductor cross section tensile test	6 mm²
Tractive force setpoint	80 N

441

Conductor cross section tensile test	10 mm²
Tractive force setpoint	90 N
Tensile test result	Test passed
Tight fit on carrier	NS 32/NS 35
Setpoint	5 N
Result of tight fit test	Test passed
Result of voltage drop test	Test passed
Temperature-rise test	Test passed
Conductor cross section short circuit testing	6 mm²
Short-time current	0.72 kA
Conductor cross section short circuit testing	10 mm²
Short-time current	1.2 kA
Short circuit stability result	Test passed
Proof of thermal characteristics (needle flame) effective duration	30 s
Result of thermal test	Test passed
Temperature index, insulating material (DIN EN 60216-1 (VDE 0304-21))	130 °C
Static insulating material application in cold	-60 °C

Connection data

Conductor cross section solid min.	0.5 mm²
Conductor cross section solid max.	10 mm²
Conductor cross section stranded min.	0.5 mm²
Conductor cross section stranded max.	6 mm²
Conductor cross section AWG/kcmil min.	20
Conductor cross section AWG/kcmil max	8
Conductor cross section stranded, with ferrule without plastic sleeve min.	0.5 mm²
Conductor cross section stranded, with ferrule without plastic sleeve max.	6 mm²
Conductor cross section stranded, with ferrule with plastic sleeve min.	0.5 mm²
Conductor cross section stranded, with ferrule with plastic sleeve max.	4 mm²
2 conductors with same cross section, solid min.	0.5 mm²
2 conductors with same cross section, solid max.	2.5 mm²
2 conductors with same cross section, stranded min.	0.5 mm²

2 conductors with same cross section, stranded max.	6 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, min.	0.5 mm²
2 conductors with same cross section, stranded, ferrules without plastic sleeve, max.	4 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, min.	0.5 mm²
2 conductors with same cross section, stranded, TWIN ferrules with plastic sleeve, max.	4 mm²
Connection method	Screw connection
Stripping length	13 mm
Internal cylindrical gage	A5
Screw thread	M4
Tightening torque, min	1.2 Nm
Tightening torque max	1.5 Nm

Certificates / Approvals

Certification	CSA, cULus Recognized, GOST, KEMA-KEUR, DNV, LR, PRS, RS, CCA
Certifications applied for:	
Certification Ex:	

Accessories

Item	Designation	Description
Assembly		
3034361	AP-ME METER	Cover profile, for covering terminal strips, snapped onto APT-ME cover profile carrier or APH-ME end bracket. A cover profile carrier should be positioned at the ends and at intervals of around 40 cm. Length supplied: 1 m
3034374	APH-ME	Cover profile carrier for mounting on NS 35/7.5 DIN rail for attaching the cover profile AP-ME
3034358	APT-ME	Cover profile carrier for mounting on NS 35/7.5 DIN rail for attaching the cover profile AP-ME

1443

0310224	ATS-RTK	Partition plate, Length: 72 mm, Width: 0.8 mm, Height: 51.5 mm, Color: gray
3022218	CLIPFIX 35	Snap-on end bracket, for 35 mm NS 35/7.5 or NS 35/15 DIN rail, can be fitted with Zack strip ZB 8 and ZB 8/27, terminal strip marker KLM 2 and KLM, width: 9.5 mm, color: gray
3022276	CLIPFIX 35-5	Quick mounting end clamp for NS 35/7,5 DIN rail or NS 35/15 DIN rail, can be fitted with ZB 5 and ZBF 5 zack marker strip, KLM 2, KLM3, and KML3L terminal strip marker, parking option for FBS...5, FBS...6, KSS 5, KSS 6, width: 5.15 mm, color: gray
0310020	D-URTK	End cover, Length: 72 mm, Width: 2.2 mm, Height: 41.5 mm, Color: gray
1201442	E/UK	End clamp, for assembly on NS 32 or NS 35/7.5 DIN rail
1201413	E/UK 1	End clamps, for supporting the ends of double-level and three-level terminal blocks, width: 10 mm, color: gray
1201002	NS 32 PERF 2000MM	G-profile DIN rail, material: Steel, perforated, height 15 mm, width 32 mm, length 2 m
1201015	NS 32 UNPERF 2000MM	G-profile DIN rail, material: Steel, unperforated, height 15 mm, width 32 mm, length 2 m
0801704	NS 35/ 7,5 AL UNPERF 2000MM	DIN rail, material: Aluminum, unperforated, height 7.5 mm, width 35 mm, length: 2 m
1206560	NS 35/ 7,5 CAP	DIN rail end piece, for DIN rail NS 35/7,5
0801762	NS 35/ 7,5 CU UNPERF 2000MM	DIN rail, material: Copper, unperforated, height 7.5 mm, width 35 mm, length: 2 m
0801733	NS 35/ 7,5 PERF 2000MM	DIN rail, material: steel galvanized and passivated with a thick layer, perforated, height 7.5 mm, width 35 mm, length: 2000 mm
0801681	NS 35/ 7,5 UNPERF 2000MM	DIN rail, material: Steel, unperforated, height 7.5 mm, width 35 mm, length: 2 m
1204119	NS 35/ 7,5 WH PERF 2000MM	DIN rail 35 mm (NS 35)
1204122	NS 35/ 7,5 WH UNPERF 2000MM	DIN rail 35 mm (NS 35)
1206421	NS 35/ 7,5 ZN PERF 2000MM	DIN rail, material: Galvanized, perforated, height 7.5 mm, width 35 mm, length: 2 m
1206434	NS 35/ 7,5 ZN UNPERF 2000MM	DIN rail, material: Galvanized, unperforated, height 7.5 mm, width 35 mm, length: 2 m
1201756	NS 35/15 AL UNPERF 2000MM	DIN rail, deep drawn, high profile, unperforated, 1.5 mm thick, material: aluminum, height 15 mm, width 35 mm, length 2000 mm
1206573	NS 35/15 CAP	DIN rail end piece, for DIN rail NS 35/15
1201895	NS 35/15 CU UNPERF 2000MM	DIN rail, material: Copper, unperforated, 1.5 mm thick, height 15 mm, width 35 mm, length: 2 m
1201730	NS 35/15 PERF 2000MM	DIN rail, material: steel galvanized and passivated with a thick layer, perforated, height 15 mm, width 35 mm, length: 2000 mm
1201714	NS 35/15 UNPERF 2000MM	DIN rail, material: Steel, unperforated, height 15 mm, width 35 mm, length: 2 m

0806602	NS 35/15 WH PERF 2000MM	DIN rail 35 mm (NS 35)
1204135	NS 35/15 WH UNPERF 2000MM	DIN rail 35 mm (NS 35)
1206599	NS 35/15 ZN PERF 2000MM	DIN rail, material: Galvanized, perforated, height 15 mm, width 35 mm, length: 2 m
1206586	NS 35/15 ZN UNPERF 2000MM	DIN rail, material: Galvanized, unperforated, height 15 mm, width 35 mm, length: 2 m
1201798	NS 35/15-2,3 UNPERF 2000MM	DIN rail, material: Steel, unperforated, 2.3 mm thick, height 15 mm, width 35 mm, length: 2 m
0310211	TS-RTK	Separating plate, Length: 72 mm, Width: 0.8 mm, Color: gray

Bridges

0311281	ASB 2-RTK/S	Switching jumper, Number of positions: 2, Color: silver
0202154	EB 2- 8	Insertion bridge, Number of positions: 2, Color: gray
0202141	EB 3- 8	Insertion bridge, Number of positions: 3, Color: gray
0202142	EB 4- 8	Insertion bridge, Number of positions: 4, Color: gray
0202138	EB 10- 8	Insertion bridge, Number of positions: 10, Color: gray
0311171	FB 10- RTK/S	Fixed bridge, Number of positions: 10, Color: silver
0308359	S	Switching lock, Length: 12 mm, Width: 8.2 mm, Color: white
0311236	SB 2-RTK/S	Switching jumper, Number of positions: 2, Color: silver
0311265	SB 4-RTK/S	Switching jumper, Number of positions: 4, Color: silver
0311278	USB 2-RTK/S	Switching jumper, Number of positions: 2, Color: silver

General

0800886	E/NS 35 N	End clamp, width: 9.5 mm, color: gray

Marking

1007235	SBS 8:UNBEDRUCKT	Marker cards, Card, white, Unlabeled, Can be labeled with: Plotter, Mounting type: Snap into tall marker groove, Snap into flat marker groove, For terminal block width: 8.2 mm, Lettering field: 6 x 8.1 mm
0818072	UC-TM 8	Marker for terminal blocks, Sheet, white, Unlabeled, Can be labeled with: BLUEMARK CLED, Bluemark, Plotter, Mounting type: Snap into tall marker groove, For terminal block width: 8.2 mm, Lettering field: 7.6 x 10.5 mm
0824597	UC-TM 8 CUS	Marker for terminal blocks, Can be ordered: By sheet, white, Labeled according to customer specifications, Mounting type: Snap into tall marker groove, For terminal block width: 8.2 mm, Lettering field: 7.6 x 10.5 mm
0828740	UCT-TM 8	Marker for terminal blocks, Sheet, white, Unlabeled, Can be labeled with: Thermomark C+, Thermomark C, BLUEMARK CLED, Bluemark, Mounting type: Snap into tall marker groove, For terminal block width: 8.2 mm, Lettering field: 7.6 x 10.5 mm

0829616	UCT-TM 8 CUS	Marker for terminal blocks, Can be ordered: By sheet, white, Labeled according to customer specifications, Mounting type: Snap into tall marker groove, For terminal block width: 8.2 mm, Lettering field: 7.6 x 10.5 mm
0825011	ZB 8 CUS	Zack marker strip, Can be ordered: Strip, white, Labeled according to customer specifications, Mounting type: Snap into tall marker groove, For terminal block width: 8.2 mm, Lettering field: 10.5 x 8.15 mm
1052002	ZB 8:UNBEDRUCKT	Zack marker strip, Strip, white, Unlabeled, Can be labeled with: Plotter, Mounting type: Snap into tall marker groove, For terminal block width: 8.2 mm, Lettering field: 10.5 x 8.15 mm

Plug/Adapter

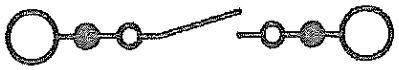
0311728	PSBJ-URTK/S BK	Female test connector, Color: black
0311757	PSBJ-URTK/S BU	Female test connector, Color: blue
0311760	PSBJ-URTK/S GN	Female test connector, Color: green
0311744	PSBJ-URTK/S RD	Female test connector, Color: red
0311773	PSBJ-URTK/S VT	Female test connector, Color: violet
0311731	PSBJ-URTK/S YE	Female test connector, Color: yellow

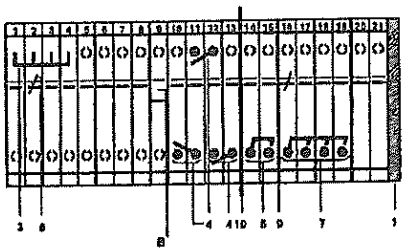
Tools

1205066	SZS 1,0X4,0 VDE	Screwdriver, bladed, VDE insulated, size: 1.0 x 4.0 x 100 mm, 2-component grip, with non-slip grip

Diagrams/Drawings

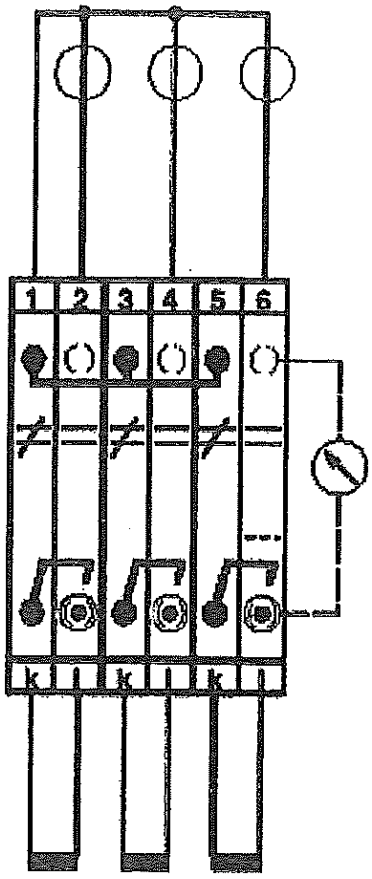
Circuit diagram



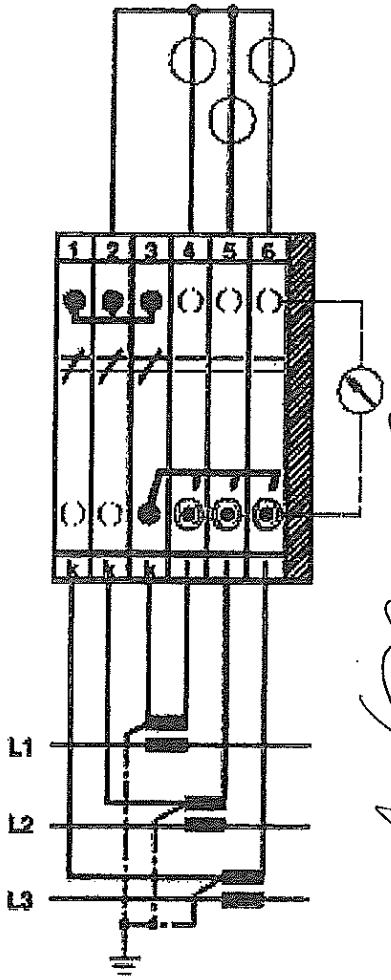


a = open
1 = cover
3 = fixed bridge
4 = switch bar, for 2 terminal blocks, useable on both sides of the disconnect point, inward switching motion
5 = switch bar, for 2 terminal blocks, useable on both sides of the disconnect point, outward switching motion
7 = switch bar, for 3-phasige short-circuiting of linked current transformer sets, only on the right
8 = switching lock, prevents disconnect slide from being actuated
9 = separating plate, for electrical separation of neighboring bridges in terminal center
10 = partition plate

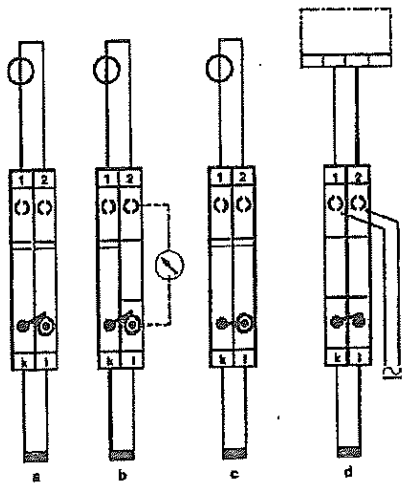
Schematic diagram



Three-phase transducer test set



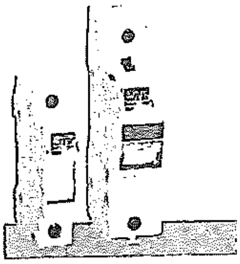
Three-phase linked transducer test set



Simple current transformer test circuit
a = normal operation
b = measured value testing
c = transformer short-circuit
d = relay testing

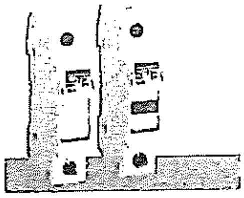
Address

PHOENIX CONTACT GmbH & Co. KG
Flachsmarktstr. 8
32825 Blomberg,Germany
Phone +49 5235 3 00
Fax +49 5235 3 41200
http://www.phoenixcontact.com



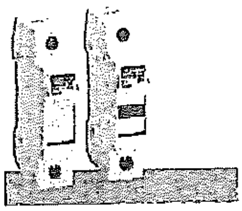
Page 12-2

AC FUSE HOLDERS
- Version without indicator: 1P, 1P+N, 2P, 3P, 3P+N
- Version with indicator: 1P
- For fuses 10x38, 14x51 and 22x58mm IEC class gG or aM.
- Rated current: 32A, 50A, 125A
- Rated voltage: 690VAC.



Page 12-2

AC FUSE HOLDERS CLASS CC FOR NORTH AMERICAN MARKET
- Version without indicator: 1P, 2P, 3P
- Version with indicator: 1P
- For 10x38mm UL/CSA class CC fuses
- Rated current: 30A
- Rated voltage: 600VAC.



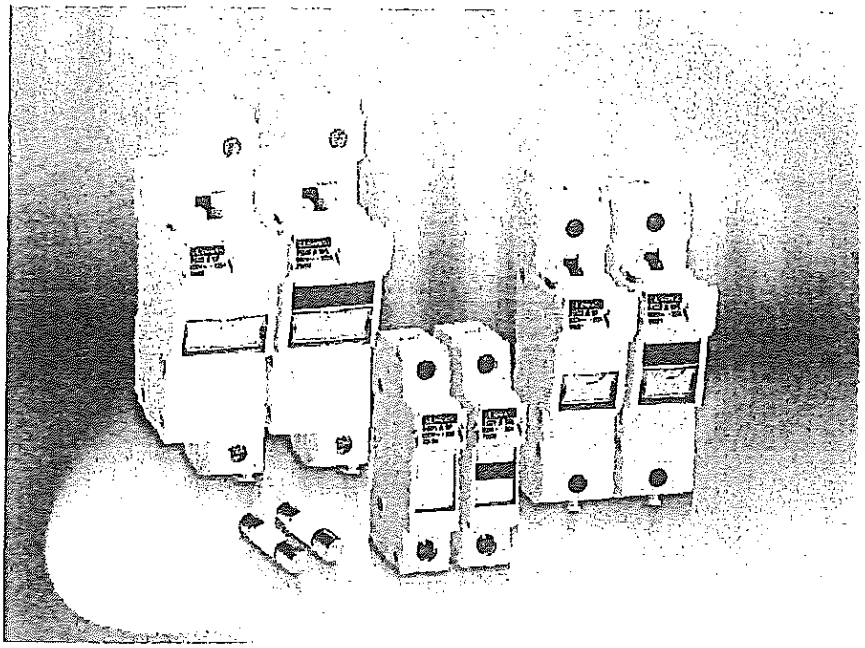
Page 12-3

DC FUSE HOLDERS FOR PHOTOVOLTAIC APPLICATIONS
- Version without indicator: 1P, 2P
- Version with indicator: 1P, 2P
- For 10x38mm IEC class gPV fuses
- Rated current: 32A
- Rated voltage: 1000VDC
- IEC utilisation category: DC20B.

Page 12-3

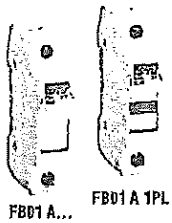
DC FUSES FOR PHOTOVOLTAIC APPLICATIONS
- 10x38mm, IEC class gPV
- Rated current: 20A
- Rated voltage: 1000VDC.

Fuse holders

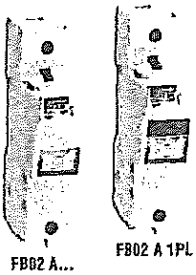


- Modular size for 10x38, 14x51 and 22x58mm fuses
- Finger safe - IP20 IEC degree of protection against accidental contact with live parts and with sealable cover for operators' safety
- Version with status indicator to quickly determine if the fuse is still operative or needs to be replaced
- UL and CSA certified versions.

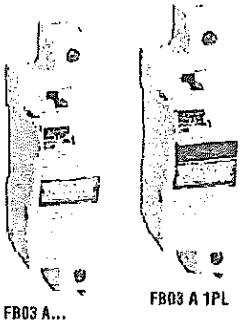
Fuse holders UL Recognized and CSA certified


FB01 A...

FB01 A 1PL


FB02 A...

FB02 A 1PL


FB03 A...

FB03 A 1PL

Order code	Pole arrangement	Status indicator	DIN size	Qty per pkg	Wt
			n°	n°	[kg]
For 10x38mm fuses. 32A rated current at 690VAC.					
FB01 A 1P	1P	—	1	12	0.066
FB01 A 1PL	1P	YES	1	12	0.065
FB01 A 1M❶	1P+N	—	1	12	0.062
FB01 A 1N	1P+N	—	2	6	0.134
FB01 A 2P	2P	—	2	6	0.132
FB01 A 3P	3P	—	3	4	0.188
FB01 A 3N	3P+N	—	4	3	0.260
For 14x51mm fuses. 50A rated current at 690VAC.					
FB02 A 1P	1P	—	1	12	0.113
FB02 A 1PL	1P	YES	1	12	0.114
FB02 A 1N	1P+N	—	2	6	0.237
FB02 A 2P	2P	—	2	6	0.224
FB02 A 3P	3P	—	3	4	0.335
FB02 A 3N	3P+N	—	4	3	0.460
For 22x58mm fuses. 125A rated current at 690VAC.					
FB03 A 1P	1P	—	1	12	0.167
FB03 A 1PL	1P	YES	1	12	0.167
FB03 A 1N	1P+N	—	2	6	0.354
FB03 A 2P	2P	—	2	6	0.334
FB03 A 3P	3P	—	3	4	0.500
FB03 A 3N	3P+N	—	4	3	0.720

❶ Not certified.

Operational characteristics
- IEC rated voltage Ue:
  - 690VAC (FB01 A 1M excluded)
  - 400VAC (FB01 A 1M only)
- IEC rated current Ie:
  - FB01 A: 32A
  - FB02 A: 50A
  - FB03 A: 125A
- IEC utilisation category:
  - FB01 A: AC22B 500V, AC21B 690V (except FB01 A 1M: AC22B 400V)
  - FB02 A: AC22B 500V, AC21B 690V
  - FB03 A: AC21B 690V
- Suitable for IEC fuse class: gG and aM
- IEC degree of protection: IP20.

Certifications and compliance
Certifications obtained:

Type	UL Recognized for USA (File E343395)	CSA certified (File 252040 class 6255)	UL Recognized for USA and Canada (File E343395)
FB01 A 1P, FB01 A 1PL, FB01 A 1N	●	●	—
FB02 A...	—	—	●
FB03 A...	—	—	●

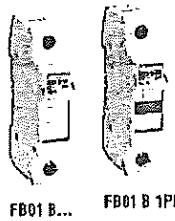
● Certification obtained.

"UL Recognized": Products having this type of marking are intended for use as components of complete workshop-assembled equipment.

Compliant with standards: IEC/EN 60269-1, IEC/EN 60269-2, IEC/EN 60947-1, IEC/EN 60947-3, UL 4248-1, UL 4248-4, CSA C22.2 n°4248.1, CSA C22.2 n°4248.4.

12

Fuse holders


FB01 B...

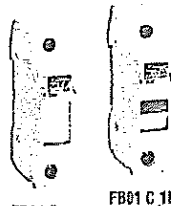
FB01 B 1PL

Order code	Pole arrangement	Status indicator	DIN size	Qty per pkg	Wt
			n°	n°	[kg]
For 10x38mm fuses. 32A rated current at 690VAC.					
FB01 B 1P	1P	—	1	12	0.062
FB01 B 1PL	1P	YES	1	12	0.064
FB01 B 1N	1P+N	—	2	6	0.127
FB01 B 2P	2P	—	2	6	0.128
FB01 B 3P	3P	—	3	4	0.185
FB01 B 3N	3P+N	—	4	3	0.247

Operational characteristics
- IEC rated voltage Ue: 690VAC
- IEC rated current Ie: 32A
- IEC utilisation category: AC22B 500V, AC21B 690V
- Suitable for IEC fuse class: gG and aM
- IEC degree of protection IP20.

Reference standards
Compliant with standards: IEC/EN 60947-1, IEC/EN 60947-3, IEC/EN 60269-1, IEC/EN 60269-2.

Fuse holders UL Listed and CSA certified for class CC fuses for North American market


FB01 C...

FB01 C 1PL

Order code	Pole arrangement	Status indicator	DIN size	Qty per pkg	Wt
			n°	n°	[kg]
For 10x38mm fuses. 30A rated current at 600VAC.					
FB01 C 1P	1P	—	1	12	0.070
FB01 C 1PL	1P	YES	1	12	0.072
FB01 C 2P	2P	—	2	6	0.140
FB01 C 3P	3P	—	3	4	0.210

NOTE: UL Listed and CSA certified as "Fuseholders, Cartridge Fuse" for use with Class CC fuses. Interrupting rating 200,000 Amps rms symmetrical. Voltage rating 600V. Current rating 30A.

Operational characteristics
- IEC rated voltage Ue: 600VAC
- IEC rated current Ie: 30A
- IEC utilisation category: AC22B 500V, AC21B 690V
- Suitable for UL/CSA fuse class: CC
- IEC degree of protection IP20.

Certifications and compliance
Certifications obtained: UL Listed (File E343395) and CSA certified (File 252040 class 6225).
Compliant with standards: IEC/EN 60269-1, IEC/EN 60269-2, IEC/EN 60947-1, IEC/EN 60947-3, UL 4248-1, UL 4248-4, CSA C22.2 n°4248.1, CSA C22.2 n°4248.4.

1453

Fuse holders for photovoltaic applications


FB01 D...


FB01 D 1PL

Order code	Pole arrangement	Status indicator	DIN size	Qty per pkg	Wt
			n°	n°	[kg]
For 10x38mm fuses. 32A rated current at 1000VDC.					
FB01 D 1P	1P	—	1	12	0.064
FB01 D 1PL	1P	YES	1	12	0.065
FB01 D 2P	2P	—	2	6	0.127
FB01 D 2PL	2P	YES	2	6	0.130

Operational characteristics
- IEC rated voltage Ue: 1000VDC
- IEC rated current Ie: 32A
- IEC utilisation category: DC20B 1000VDC
- Suitable for IEC fuse class: gPV
- IEC degree of protection: IP20.

Reference standards
Compliant with standards: IEC/EN 60269-1, IEC/EN 60269-2, IEC/EN 60947-1, IEC/EN 60947-3.

Fuses for photovoltaic applications


FE01 D...

Order code	Rated current In	Qty per pkg	Wt
	[A]	n°	[kg]
For 10x38mm fuses. 30kA breaking capacity at 1000VDC.			
FE01 D 00200	2	10	0.008
FE01 D 00400	4	10	0.008
FE01 D 00600	6	10	0.008
FE01 D 00800	8	10	0.008
FE01 D 01000	10	10	0.008
FE01 D 01200	12	10	0.008
FE01 D 01600	16	10	0.008
FE01 D 02000	20	10	0.008

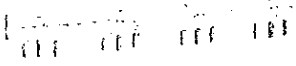
Operational characteristics
- IEC rated voltage Ue: 1000VDC
- IEC rated current Ie: 2-20A
- IEC fuse class: gPV.

Reference standards
Compliant with standards: IEC/EN 60269-6.

Accessories


FBX 00


FBX 01
FBX 02


FBX 05


FBX 07


FBX 08


FBX 11

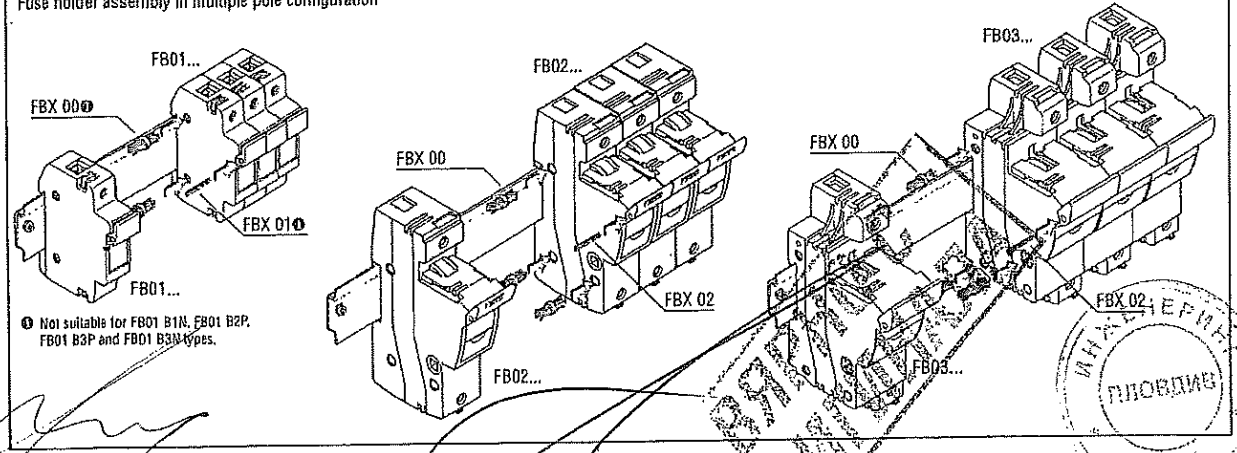
Order code	Description	Qty per pkg	Wt
	[A]	n°	[kg]
FBX 00❶	Coupling clip for 10x38, 14x51 and 22x58mm sizes❶	100	0.003
FBX 01❶	Coupling pin for 10x38mm size❶	100	0.005
FBX 02	Coupling pin for 14x51 and 22x58mm sizes	100	0.008
For FB01 A... and FB01 B... types.			
FBX 05	Three-phase connection busbar, for 57 modules in total, 1m/3.3ft long	10	0.465
FBX 07	One-pole terminal for 25mm² max conductor	25	0.010
FBX 08	One-pole terminal for 50mm² max conductor	25	0.020
FBX 11	End cap for FBX05 busbar	50	0.001

❶ Not suitable for FB01 B1N, FB01 B2P, FB01 B3P and FB01 B3N types.

General and operational characteristics
THREE-PHASE BUSBAR
- Central point of power supply: 130A max
- Side point of power supply: 80A max
- Pitch: 18mm/0.7in
- Busbar section: 10mm²
- Number of modules/poles: 57
- For paralleling connection
- Length (standard supplied): 1m/3.3ft which can be cut in shorter sections.

12

Fuse holder assembly in multiple pole configuration

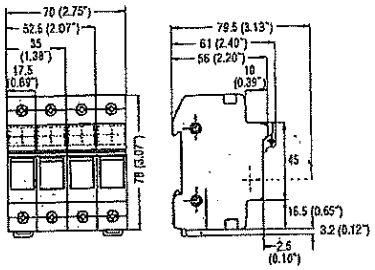


❶ Not suitable for FB01 B1N, FB01 B2P, FB01 B3P and FB01 B3N types.

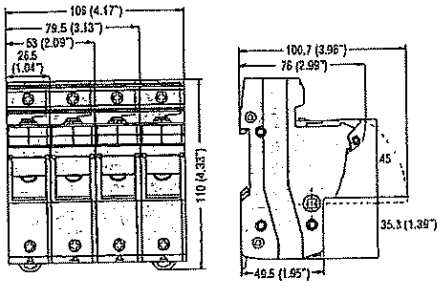
Fuse holders
Dimensions [mm (in)]

FUSE HOLDERS

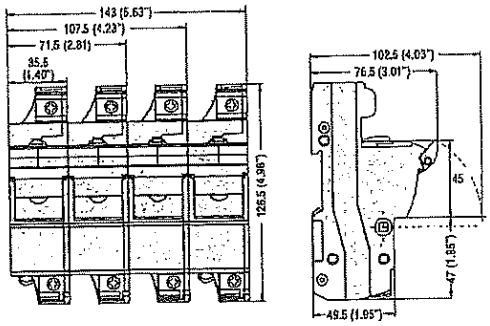
FB01 A... FB01 B... FB01 C... FB01 D...



FB02 A...

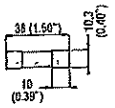


FB03 A...

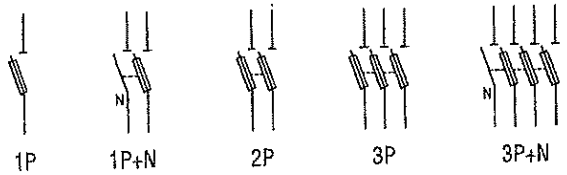


FUSES

FE01 D 0...



Wiring diagrams



1P 1P+N 2P 3P 3P+N

Fuse holders
Technical characteristics

TYPE		FB01 A...	FB01 B...	FB02 A...	FB03 A...	FB01 C...	FB01 D...
Range		AC				Class CC (AC)	DC
IEC maximum rated current In		32A		50A	125A	30A	32A
IEC maximum rated voltage In		690VAC; 400VAC ❶	690VAC			600VAC	1000VDC
IEC utilisation category		AC22B 500V; AC21B 690V; AC22B 400V ❶			AC21B 690V	AC22B 500V; AC21B 690V	DC20B 1000VDC
Maximum power dissipation		3W		5W	9.5W	3W	4W
Derating factor of current In for different ambient temperatures	20°C	1					
	30°C	0.95					
	40°C	0.9					
	50°C	0.8					
	60°C	0.7					
	70°C	0.5					
Derating factor of current In for side-by-side fuse holders - n° poles	1-4	1					
	5-6	0.8					
	7-9	0.7					
	≥10	0.6					
Voltage for status indicator		120...690VAC		230...690VAC		120...600VAC	350...1000VDC

CONNECTIONS						
Maximum tightening torque		2.5Nm; 2Nm ❶ / 22lbin	3Nm / 26lbin	4Nm / 35lbin	2.5Nm / 22lbin	
Maximum conductor cross section	flexible/stranded	1x16mm²; 1-16mm² ❶ / 8AWG	1x25mm² / 6AWG	1x35mm² / 2AWG	1x16mm² / 8AWG	1x16mm² / 6AWG
	rigid/solid	1x25mm²; 1-10mm² ❶ / 8AWG	1x35mm² / 8AWG	1x50mm² / 1AWG	1x25mm² / 10AWG	1x25mm² / 4AWG

AMBIENT CONDITIONS	
Operating temperature	-20...+70°C
Storage temperature	-40...+80°C
Maximum altitude	3,000m
Operation position	Any
Fixing	On 35mm DIN rail (IEC/EN 60715)

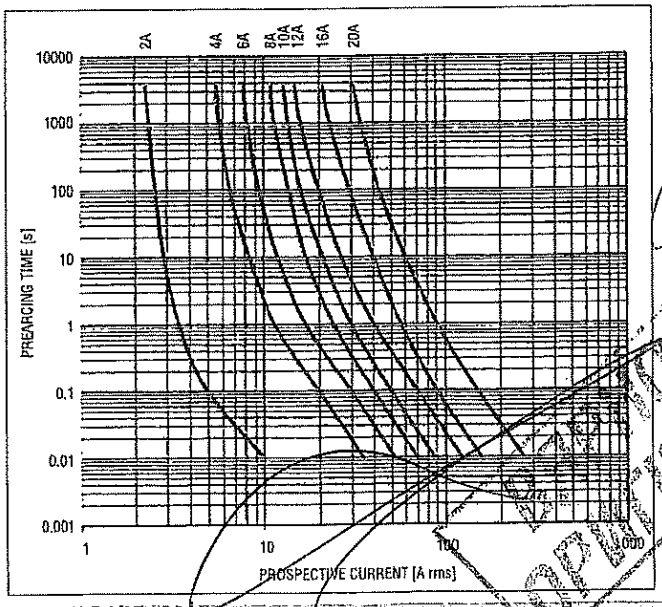
❶ Values valid only for FB01 A 1M type.

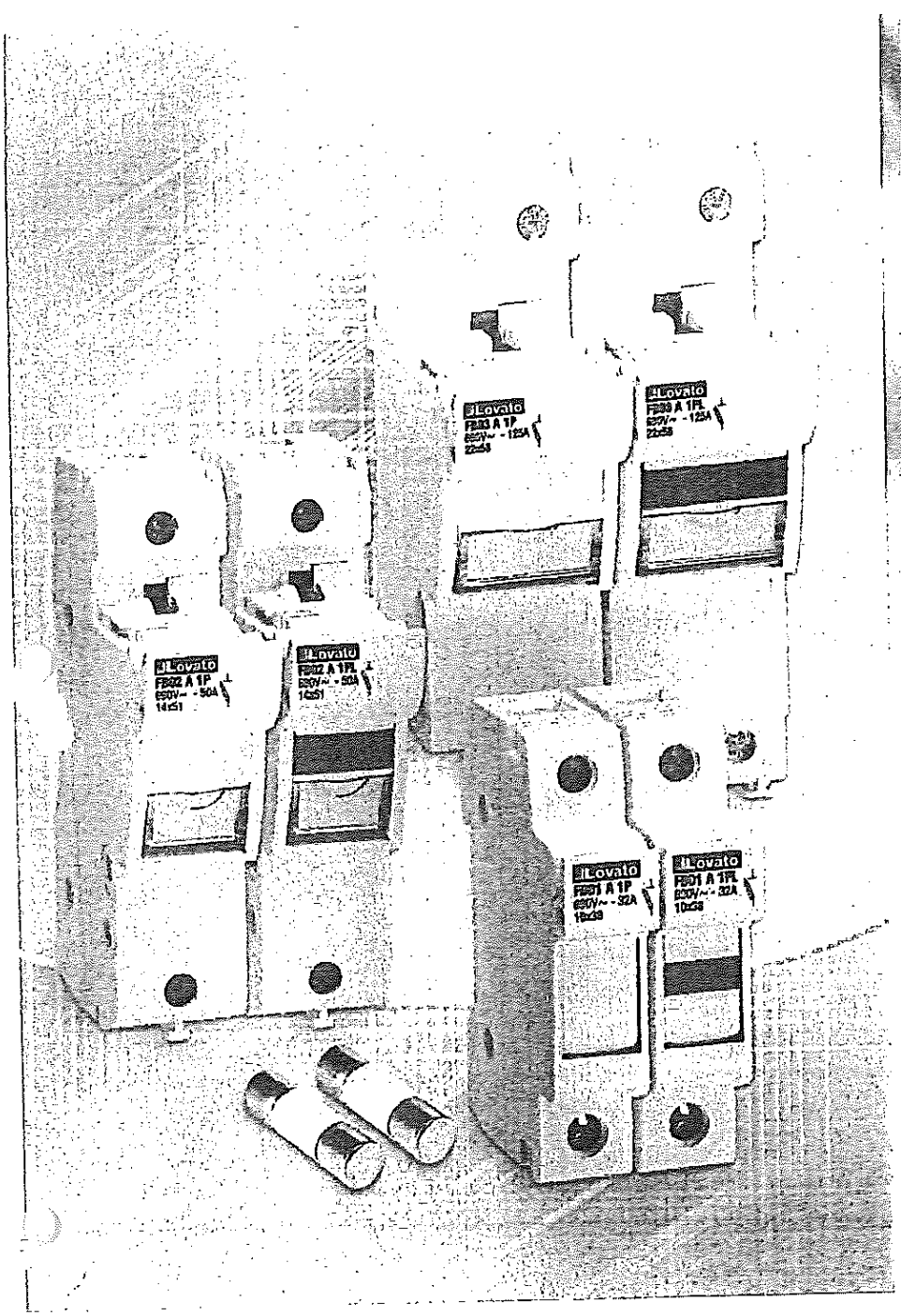
12

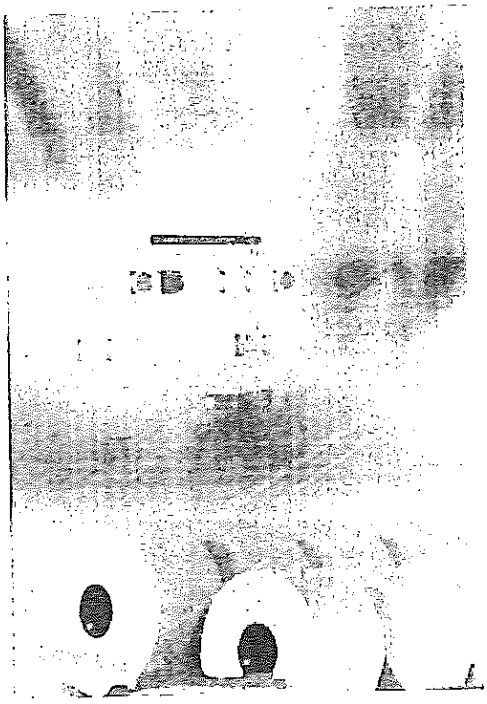
TECHNICAL CHARACTERISTICS FOR FE01 D... FUSES

TYPE	Rated current [A]	Power consumption at 0.7 In [W]	Power consumption at In [W]	Prearcing I²t [A²s]	Total I²t at 1000VDC [A²s]
FE01 D 00200	2	0.62	1.54	1.78	6.5
FE01 D 00400	4	0.73	1.84	3	11
FE01 D 00600	6	0.96	2.4	8.5	32
FE01 D 00800	8	1.02	2.55	25	93
FE01 D 01000	10	1.03	2.58	11	52
FE01 D 01200	12	1.04	2.6	25	116
FE01 D 01600	16	1.08	2.7	33	152
FE01 D 02000	20	1.16	2.9	85	390

TIME-CURRENT CHARACTERISTICS FOR FE01 D... FUSES







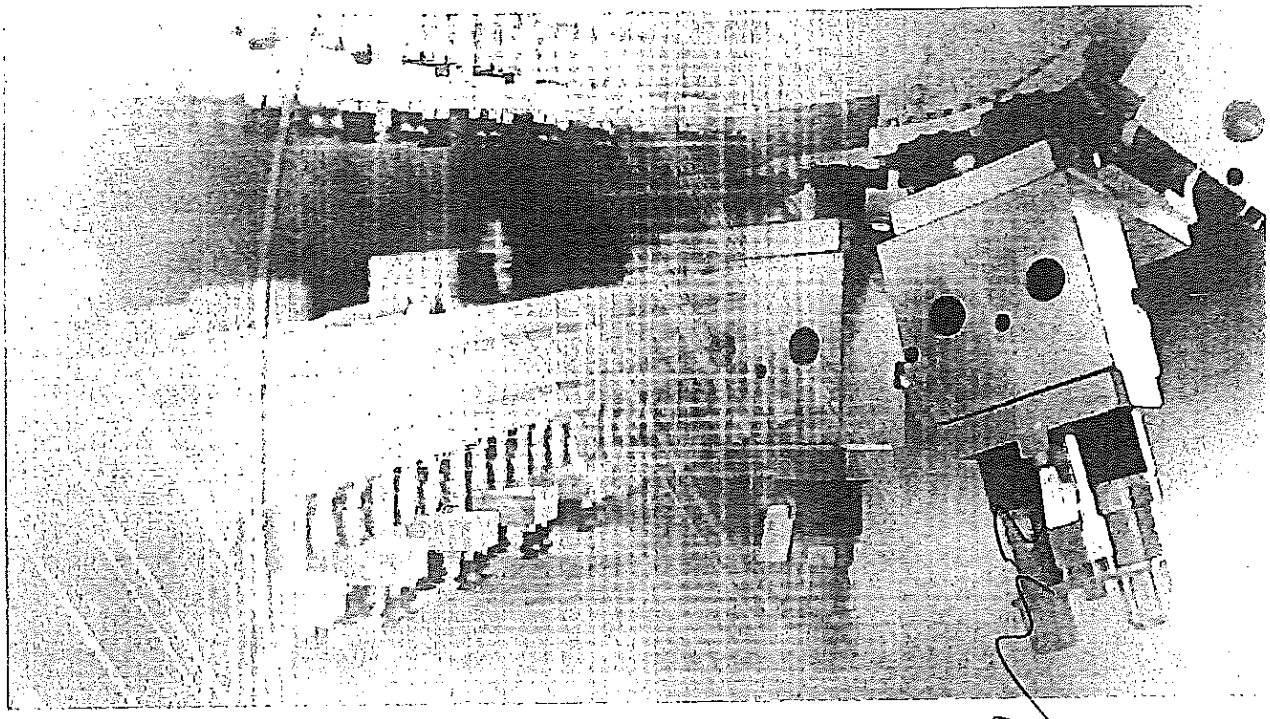
Fuse holders and fuses

Lovato electric

100% electricity

1457

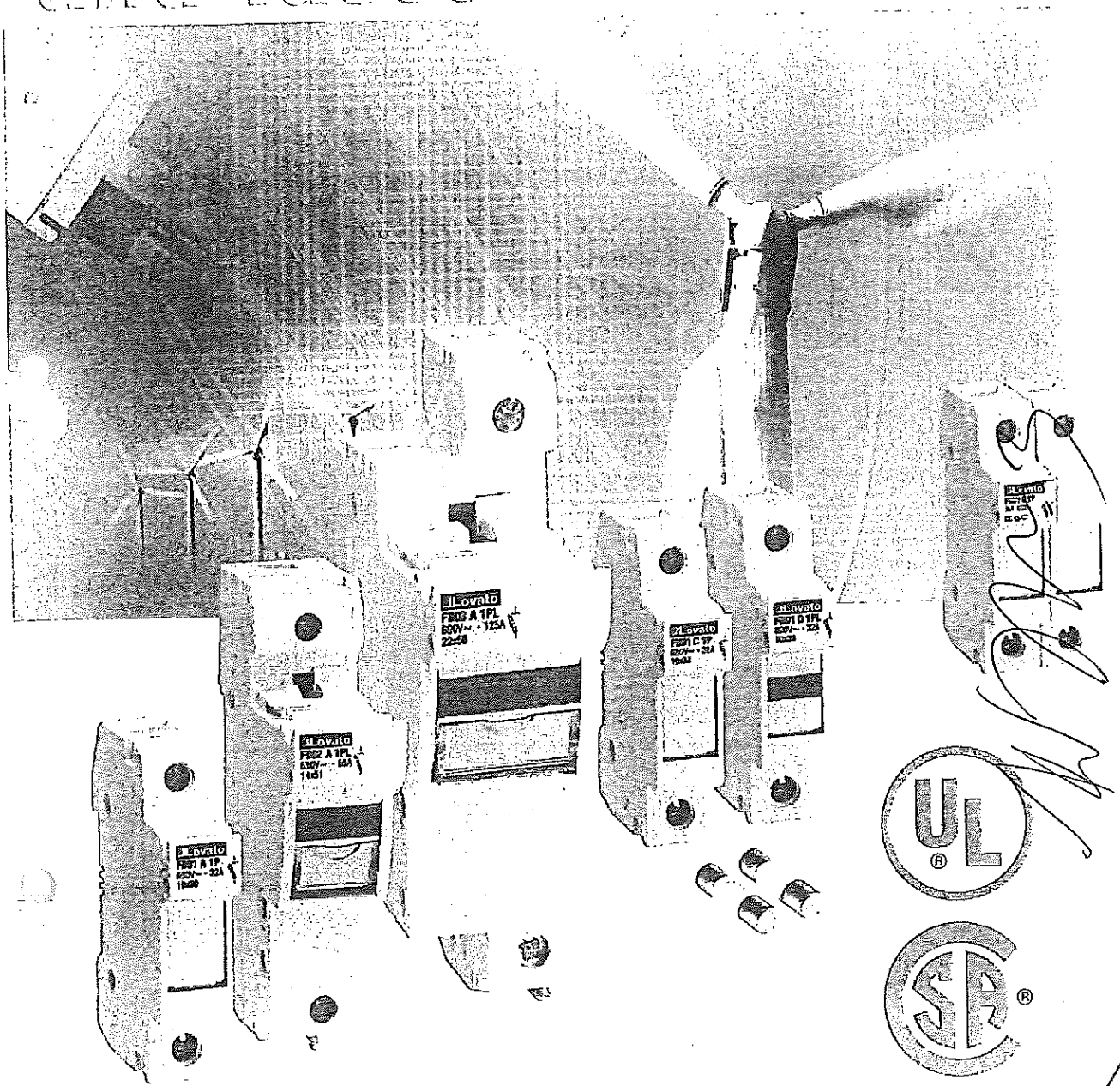
Fuse holders



- Modular concept for quick assembly of different versions based on various requirements.
- Compact size compliant with standards for electrical equipment.
- DIN rail mounting and removal ease.
- IP20 protection degree, finger safe.
- Sealable cover in open or closed position to increase user's safety.
- Version with status indicator to quickly determine if the fuse is still operative or needs to be replaced.
- Ergonomic grip for easy cover opening.
- Dedicated cylindrical 10x38 DC fuses for photovoltaic systems.
- UL and CSA certified versions.

Range	AC			DC	DC FUSES	CLASS CC
Fuse size	10x38	14x51	22x58	10x38	10x38	10x38
Type	gG or aM			gPV	gPV	Class CC
Rated voltage	690VAC			1000VDC / 690VAC	1000VDC	600VAC
Rated current	32A	50A	125A	32A	20A	30A
Utilisation category	AC-22B 500V AC-21B 690V		–	DC-20B 1000VDC AC-21B 690V	DC-20B 1000VDC	AC-22B 500V AC-21B 690V

and fuses

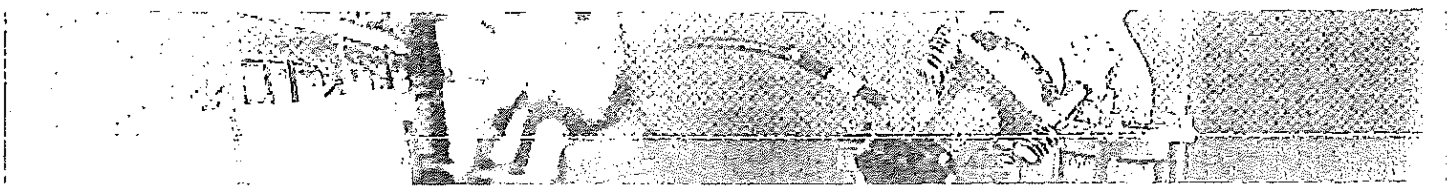


LOVATO Electric fuse holders can be used to protect against overloads and short circuits of electric lines, for motor protection and control and for the protection of electric installations.

This equipment can assure the disconnect function but is not suitable for isolation so cannot be used as switch disconnector.

The range is available in two versions: with or without fuse status indicator. If the fuse fitted on the holder blows, the failure status is shown by the indicator on the fuse-holder front.

All the fuse holders are certified for the North-American market (UL Listed, UL Recognized and CSA). Furthermore, there is a non-certified version in 10x38mm size available too.

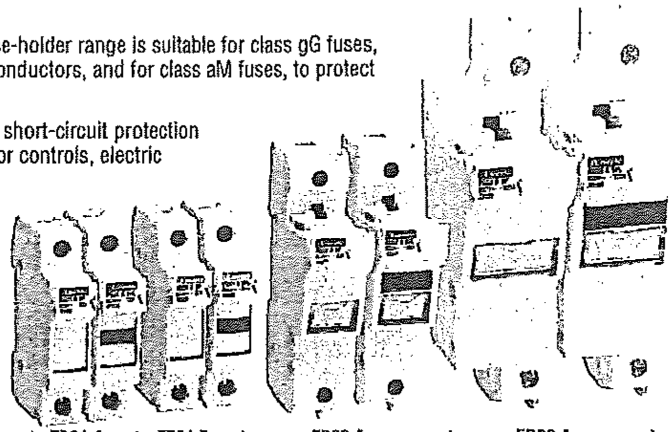


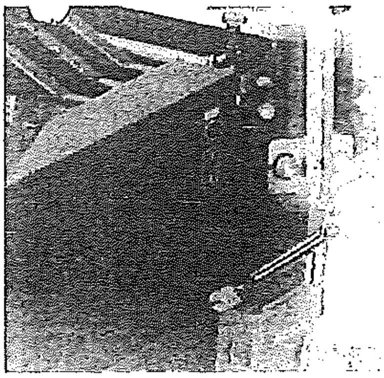
Fuse holders AC RANGE

LOVATO Electric AC fuse-holder range is suitable for class gG fuses, to protect cables and conductors, and for class aM fuses, to protect motor starting.

Function: Overload and short-circuit protection of control circuits, motor controls, electric installations.

Usage: Service industry, electric panels onboard machinery, electric installations in general.

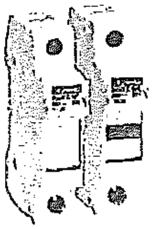




	FB01 A...	FB01 B...	FB02 A...	FB03 A...
Fuse size	10x38		14x51	22x58
Version without indicator	1P, 1P+N, 2P, 3P, 3P+N			
Version with indicator	1P			
Main characteristics				
- Rated voltage	690VAC			
- Rated current	32A		50A	125A
- Utilisation category	AC-22B 500V, AC-21B 690V		AC-22B 500V, AC-21B 690V	AC-21B 690V
- Suitable for fuses	10x38 gG or aM		14x51 gG or aM	22x58 gG or aM
- Maximum conductor cross section	16mm² flexible/stranded; 25mm² rigid/solid		25mm² flexible/stranded; 35mm² rigid/solid	35mm² flexible/stranded; 50mm² rigid/solid
Certifications obtained	UR, CSA	–	cURus	cURus
Compliant with standards	IEC/EN 60947-1, IEC/EN 60947-3, RoHS directive, UL512, CSA C22.2 n°39			

UR: UL Recognized; cURus: UL Recognized for USA and Canada.

CLASS CC Fuse holders RANGE

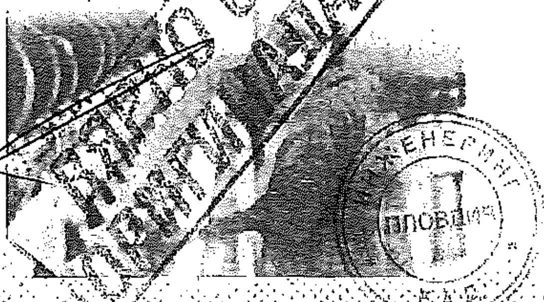


FB01 C...

LOVATO Electric fuse holders for class CC fuses are used to protect branch circuits, consisting of conductors and components following the last overcurrent protective device protecting a load, in industrial applications which require high breaking capacity.
Suitable only and exclusively for fitting fuses defined as "class CC", quite common on the North American market.

Usage: Service industry, electric panels onboard machinery, electric installations in general.

Fuse size	Class CC
Version without indicator	1P, 2P, 3P
Version with indicator	1P
Main characteristics	
- Rated voltage	600VAC
- Rated current	30A
- Utilisation category	AC-22B 500V, AC-21B 690V
- Suitable for fuses	10x38 class CC
- Maximum conductor cross section	16mm² flexible/stranded; 25mm² rigid/solid
Certifications obtained	UL, CSA
Compliant with standards	IEC/EN 60947-1, IEC/EN 60947-3UL512, RoHS directives, CSA 22.2 n° 39



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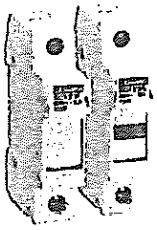
1462

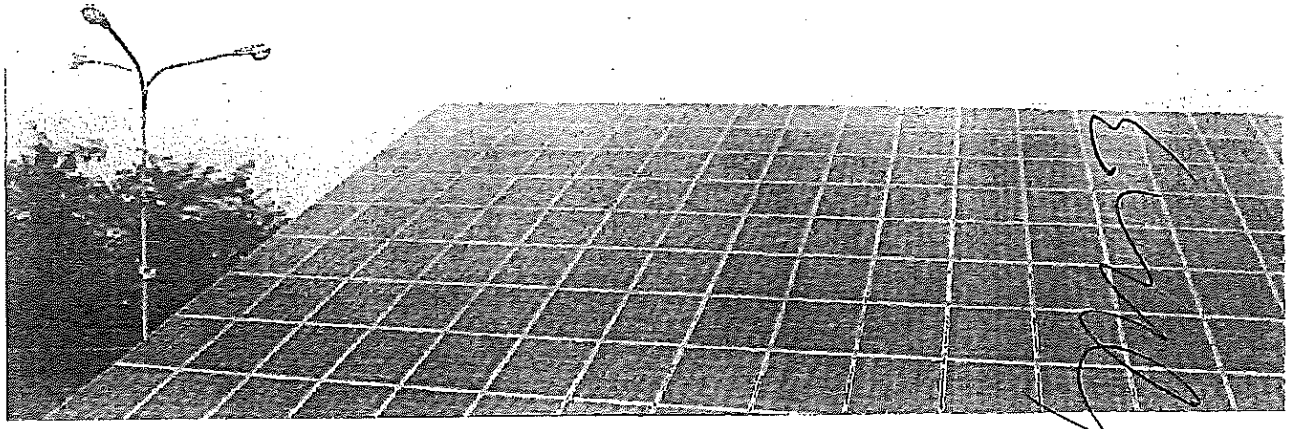
Fuse holders DC



FB01 D...

LOVATO Electric DC fuse holder range is suitable for 1000VDC rated voltage and gPV class.
Used for overload and short-circuit protection of photovoltaic modules (strings) and the relative connecting cables.

Fuse size	10x38
Version without indicator	1P, 2P
Version with indicator	1P
Main characteristics	
- Rated voltage	1000VDC / 690VAC
- Rated current	32A
- Utilisation category	DC-20B 1000VDC, AC-21B 690V
- Suitable for fuses	10x38 gPV
- Maximum conductor cross section	16mm² flexible/stranded, 25mm² rigid/solid
Compliant with standards	IEC/EN 60947-1, IEC/EN 60947-3, RoHS directive



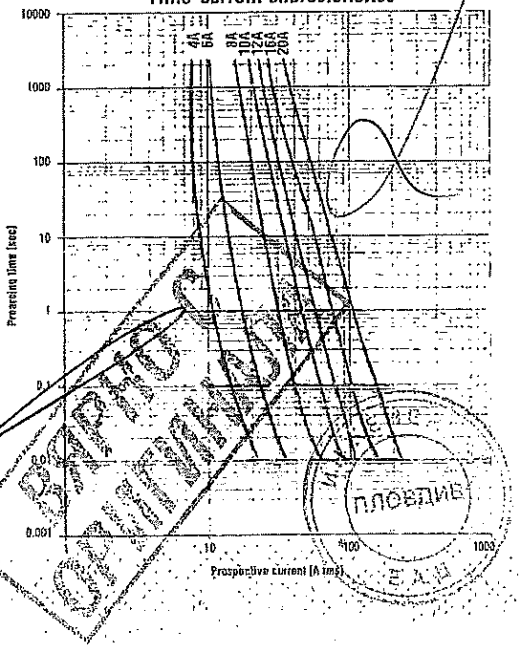
Fuses DC

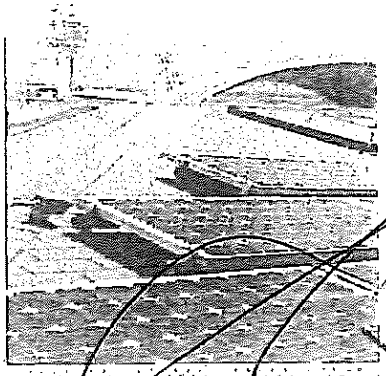
FE01 D 0...

LOVATO Electric offers a range of cylindrical 10x38 fuses dedicated to photovoltaic duty and designed for 1000VDC maximum use.
Contrary to AC type fuses that blow for high overcurrent values, this type of DC fuse is designed to blow with low-intensity overcurrent values, created on photovoltaic cells and panels.

Fuses for photovoltaic application	
Breaking capacity	30kA
Mains characteristics	
- Rated voltage	1000VDC
- Rated current	2...20A

Time-current characteristics





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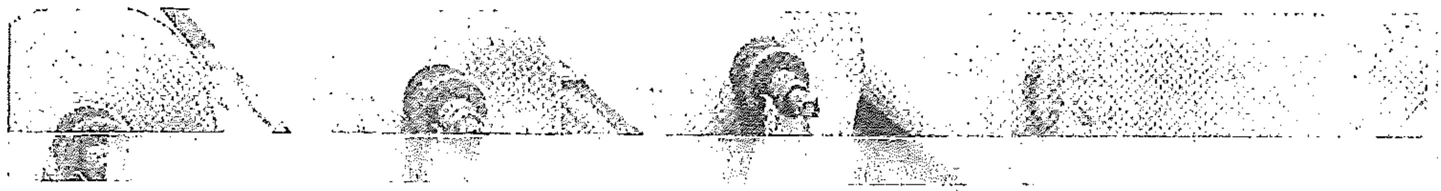
1461

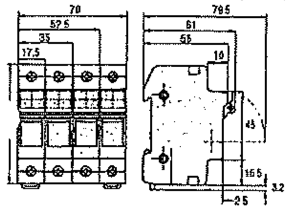


TECHNICAL CHARACTERISTICS

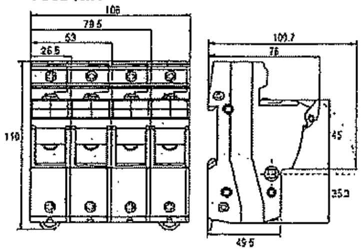
Type		FB01 A...	FB01 B...	FB02 A...	FB03 A...	FB01 C...	FB01 D...
Range		**AC**	**AC**	**AC**	**AC**	**Class CC (AC)**	**DC**
Certifications obtained		UR, CSA	–	cURus	cURus	UL, CSA	–
Maximum power dissipation		3W	3W	5W	9.5W	3W	4W
Derating factor of current Ie for different ambient temperatures	20°C	1	1	1	1	1	1
	30°C	0.95	0.95	0.95	0.95	0.95	0.95
	40°C	0.9	0.9	0.9	0.9	0.9	0.9
	50°C	0.8	0.8	0.8	0.8	0.8	0.8
	60°C	0.7	0.7	0.7	0.7	0.7	0.7
	70°C	0.5	0.5	0.5	0.5	0.5	0.5
Derating factor of current Ie for sid-by-side fuse holders - n° poles	1-3	1	1	1	1	1	1
	4-6	0.8	0.8	0.8	0.8	0.8	0.8
	7-9	0.7	0.7	0.7	0.7	0.7	0.7
	>10	0.6	0.6	0.6	0.6	0.6	0.6
Voltage for status indicator		120...690VAC	120...690VAC	230...690VAC	230...690VAC	120...600VAC	350...1000VDC
CONNECTIONS							
Maximum tightening torque		2.5Nm/22lbin	2.5Nm/22lbin	3Nm/26lbin	4Nm/35lbin	2.5Nm/22lbin	2.5Nm/22lbin
Maximum conductor cross section	flexible/stranded	1-16mm²/8 AWG	1-16mm²/6 AWG	1-25mm²/4 AWG	1-35mm²/2 AWG	1-16mm²/8 AWG	1-16mm²/6 AWG
	rigid/solid	1-25mm²/8 AWG	1-25mm²/4 AWG	1-35mm²/2 AWG	1-50mm²/1 AWG	1-25mm²/10 AWG	1-25mm²/4 AWG
AMBIENT CONDITIONS							
Operating temperature		-20...+70°C	-20...+70°C	-20...+70°C	-20...+70°C	-20...+70°C	-20...+70°C
Storage temperature		-40...+80°C	-40...+80°C	-40...+80°C	-40...+80°C	-40...+80°C	-40...+80°C
HOUSING							
Din rail mount version		Yes	Yes	Yes	Yes	Yes	Yes
Degree of protection		IP20	IP20	IP20	IP20	IP20	IP20

DIMENSIONS

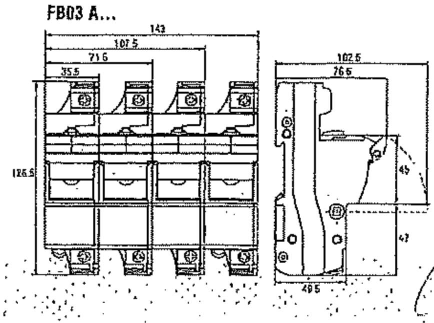
FB01 A... FB01 B... FB01 C... FB01 D...



FB02 A...

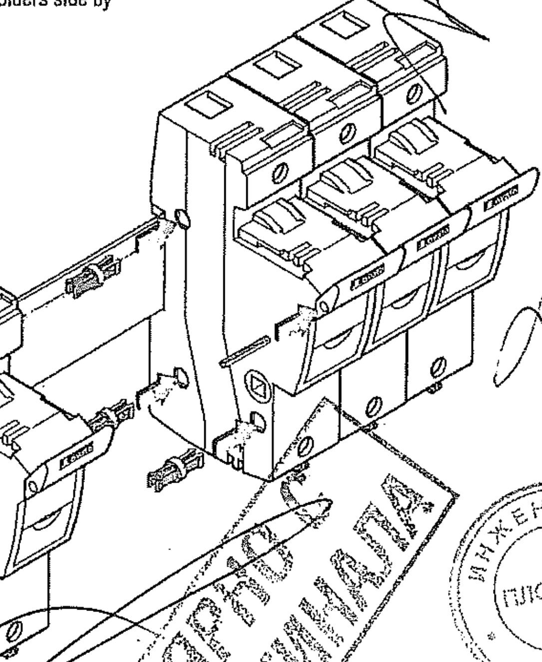


FB03 A...



ASSEMBLY

Accessories: Coupling elements (clips and pins) to mount and fix fuse holders side by side



ВЯРНО С ОРИГИНАЛА

ИНЖЕНЕРИНГ ПЛОВДИВ ЕАД

Lovato electric

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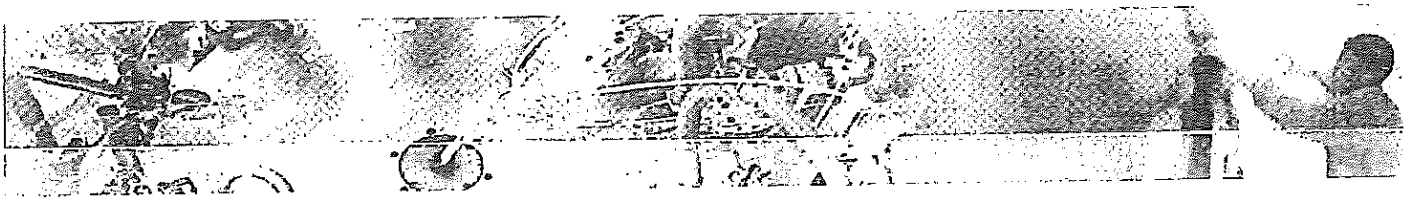
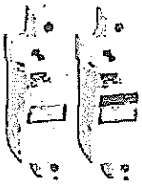


HOW TO ORDER



FUSE HOLDERS

Order code	Pole arrangement	DIN modules	Status indicator	Rated voltage Ue	Rated nominale Ie	Qty per pkg	Weight
		n°		[V]	[A]	n°	[kg]
Fuse holder (fuse disconnector), 10x38, certified by UR and CSA.							
FB01 A 1P	1 pole	1	–	690VAC	32	12	0.750
FB01 A 1PL	1 pole	1	Yes	690VAC	32	12	0.750
FB01 A 1N	1 pole + N	2	–	690VAC	32	6	0.750
FB01 A 2P	2 poles	2	–	690VAC	32	6	0.750
FB01 A 3P	3 poles	3	–	690VAC	32	4	0.750
FB01 A 3N	3 poles + N	4	–	690VAC	32	3	0.750
Fuse holder (fuse disconnector), 14x51, certified by cURus.							
FB02 A 1P	1 pole	1.5	–	690VAC	50	6	1.000
FB02 A 1PL	1 pole	1.5	Yes	690VAC	50	6	1.000
FB02 A 1N	1 pole + N	3	–	690VAC	50	3	1.000
FB02 A 2P	2 poles	3	–	690VAC	50	3	1.000
FB02 A 3P	3 poles	4.5	–	690VAC	50	2	1.000
FB02 A 3N	3 poles + N	6	–	690VAC	50	1	0.650
Fuse holder (fuse disconnector), 22x58, certified byt cURus.							
FB03 A 1P	1 pole	2	–	690VAC	125	6	1.050
FB03 A 1PL	1 pole	2	Yes	690VAC	125	6	1.050
FB03 A 1N	1 pole + N	4	–	690VAC	125	3	1.050
FB03 A 2P	2 poles	4	–	690VAC	125	3	1.050
FB03 A 3P	3 poles	6	–	690VAC	125	2	1.050
FB03 A 3N	3 poles + N	8	–	690VAC	125	1	0.70c
Fuse holder (fuse disconnector), class CC, certified by UL and CSA.							
FB01 C 1P	1 pole	1	–	600VAC	30	12	0.750
FB01 C 1PL	1 pole	1	Yes	600VAC	30	12	0.750
FB01 C 2P	2 poles	2	–	600VAC	30	6	0.750
FB01 C 3P	3 poles	3	–	600VAC	30	4	0.750
Fuse holder (fuse disconnector), 10x38.							
FB01 B 1P	1 pole	1	–	690VAC	32	12	0.750
FB01 B 1PL	1 pole	1	Yes	690VAC	32	12	0.750
FB01 B 1N	1 pole + N	2	–	690VAC	32	6	0.750
FB01 B 2P	2 poles	2	–	690VAC	32	6	0.750
FB01 B 3P	3 poles	3	–	690VAC	32	4	0.750
FB01 B 3N	3 poles + N	4	–	690VAC	32	3	0.750
Fuse holder (fuse disconnector), 10x38, for photovoltaic applications.							
FB01 D 1P	1 pole	1	–	1000VDC	32	12	0.750
FB01 D 1PL	1 pole	1	Yes	1000VDC	32	12	0.750
FB01 D 2P	2 poles	2	–	1000VDC	32	6	0.750

FUSES FOR PHOTOVOLTAIC APPLICATIONS

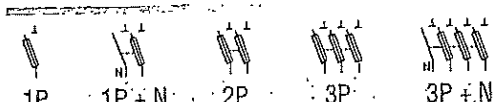
Order code	Rated breaking capacity	Rated voltage Ue	Rated current Ie	Qty per pkg	Weight
	[kA]	[V]	[A]	n°	[kg]
FE01 D 00200	30	1000VDC	2	10	0.130
FE01 D 00400	30	1000VDC	4	10	0.130
FE01 D 00600	30	1000VDC	6	10	0.130
FE01 D 00800	30	1000VDC	8	10	0.130
FE01 D 01000	30	1000VDC	10	10	0.130
FE01 D 01200	30	1000VDC	12	10	0.130
FE01 D 01600	30	1000VDC	16	10	0.130
FE01 D 02000	30	1000VDC	20	10	0.130

ACCESSORIES

Order code	Description	Qty per pkg	Weight
		n°	[kg]
FBX 00	Coupling clip for 10x38, 14x51 and 22x58 sizes	100	0.050
FBX 01	Coupling pin for 10x38 size	100	0.130
FBX 02	Coupling pin for 14x51 and 22x58 sizes	100	0.150

N.B. Two clips FBX 00 and one pin FBX 01 are needed to couple two fuse holders B01... types.
Three clips FBX 00 and one pin FBX 02 are needed to couple two fuse holder FB02... and FB03... types.

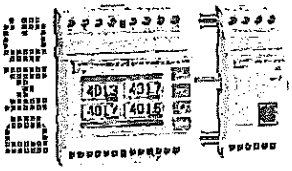
WIRING DIAGRAMS



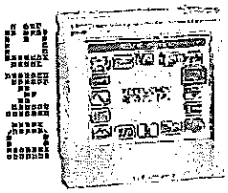
new

2011

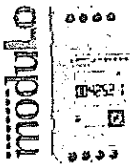
Switch disconnectors
16 to 1600A



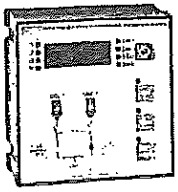
Modular digital multimeters



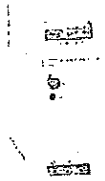
Flush-mount digital multimeters
and power analyzers



Energy meters



Automatic transfer switch
controllers

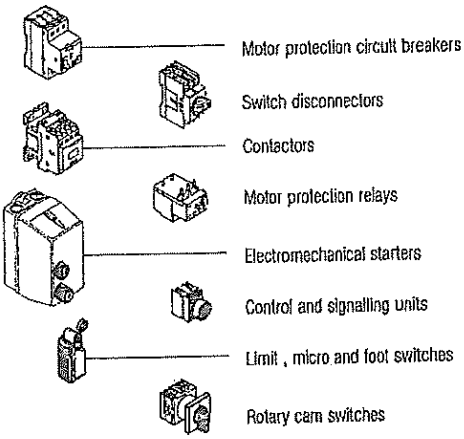


Switching power supplies

Lovato electric

100% electricity

Switch



Motor protection circuit breakers

Switch disconnectors

Contactors

Motor protection relays

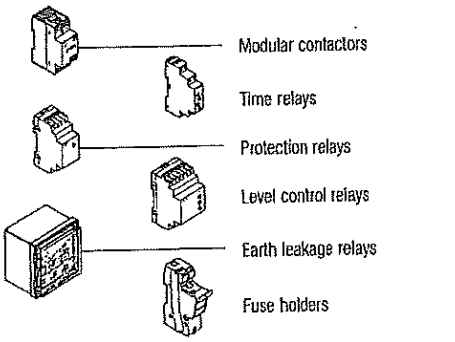
Electromechanical starters

Control and signalling units

Limit , micro and foot switches

Rotary cam switches

DIN



Modular contactors

Time relays

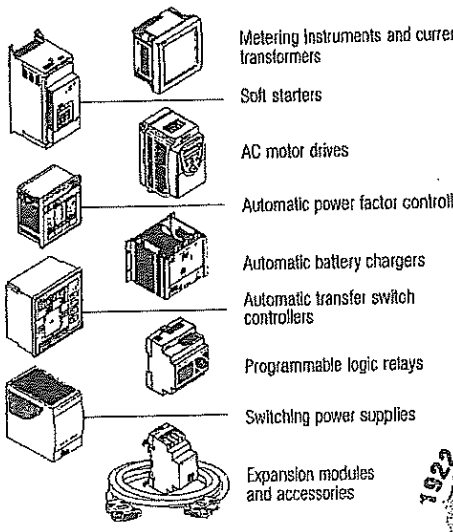
Protection relays

Level control relays

Earth leakage relays

Fuse holders

Logic



Metering instruments and current transformers

Soft starters

AC motor drives

Automatic power factor controllers

Automatic battery chargers

Automatic transfer switch controllers

Programmable logic relays

Switching power supplies

Expansion modules and accessories

ClaroEmporioCreativo@gmail.com

1922 - 2011

www.LovatoElectric.com

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PD67 GB 01 11

1664

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София 1505, П.К. 59
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Факс: (+359 2) 958 2270
E-mail: v.v@techno-link.com
http://www.viv-isomatic.com

Банкова сметка 1004521117, БулБанк София 62186214

ТЕХНИЧЕСКИ ХАРАКТЕРИСТИКИ

Предлаганите клеми са производство на фирма Phoenix Contact – Германия. Фирмата е сертифицирана по ISO 9001. Клемите са тествани и са в съответствие с IEC 60 947-7-1, IEC 60947-1, IEC 60695-2-2, EN 50019, а също така притежават и други сертификати, които са дадени за всяка клема в каталога.

Клемите на Phoenix Contact са с универсална основа за закрепване както към симетрична шина NS 35/7,5, NS 35/15, така и към несиметрична - NS 32. Кабелните входове на клемата са затворени фунии, което улеснява въвеждането на проводника. Всички клеми имат гнезда за индивидуално и рационално маркиране.

Предлаганите клеми, производство на Phoenix Contact притежават следните по-важни качества:

- **всички метални части са устойчиви на електролитна корозия и ръжда**

Всички метални елементи на клемите са изработени от медна сплав, с високо съдържание на мед, като напълно се избягва използването на стомана. Това елиминира две възможни причини за корозия: Едната е електролитна корозия, която възниква между медния проводник и стоманата, при наличие на влага. Втората е ръждата и последиците от нея – ненадежден електрически контакт, блокирани винтчета. Използването само на медна сплав има и допълнителни предимства като: 1) ниско температурно повишение, поради високата електрическа проводимост и 2) по-малко вероятно е разхлабване на винтчетата, тъй като практически няма относително термично разширение между проводника и притискащата част.

Повърхността на металните части е защитена с калаено или никелово галванично покритие.

- **блокиране на винтчетата срещу саморазвиване**

Phoenix Contact притежава патент, наречен "Reakdyn principle" за предпазване на винтчетата от саморазвиване. Конструкцията на притискащата част е на приципа на движеща се клетка. При завъртане на винта, той натиска тоководещата част и издърпва проводника в клетката към тоководещата част. Поради високата притискаща сила проводника се интегрира в мекото калаено покритие на тоководещата част. Така се постига контактно съпротивление което превишава изискванията на IEC 60 947-7-1, като за клема 4 mm^2 то е 0,3mΩ.

Поради специалната си форма при затягане на винтчето горната част на клетката се деформира еластично и предизвиква нарастваща триеща сила в главата на винтчето, която не му позволява да се саморазвие.

- **надежна механична и електрическа връзка, съгласно IEC 60 947-7-1**

Конструкцията на притискащата част на клемата не само удовлетворява тези изсквания, но дори ги надвишава, поради следните качества: 1) Равната основа на притискащата част гарантира, че дори и най тънкия проводник ще бъде стегнат както трябва., 2) напречните жлебове на тоководещата част гарантират нарушаване оксидацията по проводника, без да го извиват и така осигуряват добър контакт. 3) стабилната конструкция на притискащите части, заедно с високата точност при изработка, осигуряват връзка, недопускаща проникването на газ, както и голяма

1465

сила на притискане. Това означава, че условията за контакт могат да се поддържат стабилни за дълъг период от време, дори в агресивна атмосфера.

- **качества на изолационния материал**

Изолационния материал на клемите, които са предмет на настоящия търг е Полиамид 6.6. Този материал е одобрен от всички оторизирани лаборатории като CSA, NEMKO, KEMA, VDE и др. Той има отлични електрически, механични, химически и други качества, дори при високи температури. Позволени са кратковременно температури до 200° С. Полиамида абсорбира вода до 2,8%, но тази влага не е във формата на кристализирана вода в пластмасата, а е химически свързана в молекулната структура. Това прави пластмасата гъвкава и нечуплива, дори при ниски температури от -40° С. Полиамида има клас на негоримост V0, съгласно UL 94.

Максималния допустим ток на клемите зависи от максимално допустимото сечение на проводника и е в съответствие с IEC 60947-7-1.

Съответствие на техническите изисквания

Съгласно горното, предлаганите клеми притежават следните характеристики в съответствие с техническите изисквания:

1. Проводниците се присъединяват към клемите чрез винтова връзка, осигуряваща необслабваща електическа връка при вибрации и стареене;
2. Проводимите и притискащи части са устойчиви срещу електролитна корозия и ръжда. Гарантиран клас на негоримост – V0 съгласно UL 94;
3. Повишена механична устойчивост;
4. Изолационният материал не абсорбира влага;
5. Клемите са с гнезда за поставяне на етикети от двете страни;
6. Клемите се монтират върху универсална монтажна рейка. Възможен е монтаж както както към симетрична шина NS 35/7,5, NS 35/15, така и към несиметрична - NS 32
7. Токови клеми:
   - Пофазно шунтиране на токовите вериги към ТТ с подвижни (фиксирани към клемата) или преносими изолирани мостове, съгласно приложената схема;
   - Видимо разкъсване на токовите вериги след шунтиране;
   - Включване на товарно устройство за тестване – монтирана или с възможност за монтаж на тест букса с диаметър 4mm;
   - Видимо разделяне на токовите вериги по предназначение (ядра);
8. Напреженови вериги:
   - Видимо разкъсване ;
   - Включване на товарно устройство за тестване – монтирана или с възможност за монтаж на тест букса с диаметър 4mm;
   - Възможност за видимо разделяне на напреженовите вериги по фази и предназначение;
   - Възможност за включване на измервателни уреди от двете страни на клемата;

ВЯРНО С ОРИГИНАЛА

1466

Кратко описание на предложените клеми и аксесоари към тях

1. **URTK/S**

Клеми с винтова връзка за присъединяване на кръгъл твърд проводник до 10mm^2 или гъвкав проводник с/без накрайник до 6mm^2 . Клемата е с възможност за фиксирано разкъсване на връзката, с гнезда за присъединяване на тестови проводници или за поставяне на шунтиращи мостчета от двете страни на клемата - щифт 4mm. Тази клема е универсална и удовлетворява всички изисквания за яснота на веригата, удобства за превключване. Клемата предлага няколко типа на замостване: чрез конектори с изолирана ръкохватка (2, 4 поз.), превключващи мостове (2, 4 поз.) за окъсяване на трансформаторни вериги, фиксиран мост – 10 позиционен, делим, окомплектован с винтове. Гнездата за тестови проводник или шунтиращ конектор всяка страна са независими от винта за присъдиняване на проводника.

2. **URTK/SP**

Клеми с винтова връзка за присъединяване на кръгъл твърд проводник до 10mm^2 или гъвкав проводник с/без накрайник до 6mm^2 . Клемата е с възможност за фиксирано разкъсване на връзката, с гнезда за присъединяване на тестови проводници или за поставяне на шунтиращи мостчета от двете страни на клемата - щифт 4mm. Тази клема е универсална и удовлетворява всички изисквания за яснота на веригата, удобства за превключване и защита от допир до тоководещи части. Клемата предлага няколко типа на замостване: чрез изолирани превключващи мостове (2, 3, 4, 10 поз.), неизолиран фиксиран мост, конектори с изолирана ръкохватка (2, 4 поз.) Гнездата за тестови проводник или шунтиращ конектор са напълно изолирани.

3. **D-URTK**

Крайна капачка за клема URTK/S.

4. **Разделителна пластина ATP-URTK/SP.**

Секционна разделителна пластина за визуално и електрическо разделяне на клемни групи за директен монтаж на DIN шина. Дебелина: 2 мм.

Подходяща за използване с всички токови и напреженови клеми.

5. **Шунтиращ мост SB 2-RTK/S.**

Двупозиционен подвижен, шунтиращ мост за клеми URTK/S.

6. **Шунтиращ мост SB 2-URTK/SP.**

Двупозиционен изолиран, подвижен, шунтиращ мост за клеми URTK/SP.

7. **Фиксатор за клемен пакет CLIPFIX 35.**

Фиксатор със защипване за симетрични шини 35/7,5 мм, 35/15 мм.
Ширина: 9,5 мм. Материал: полиамид.
Клас на запалимост: V0. Цвят: сив.
Може да се маркира със стантартни клемни маркировки ZB, маркировки: KLM, KLM 2.

Съставил:

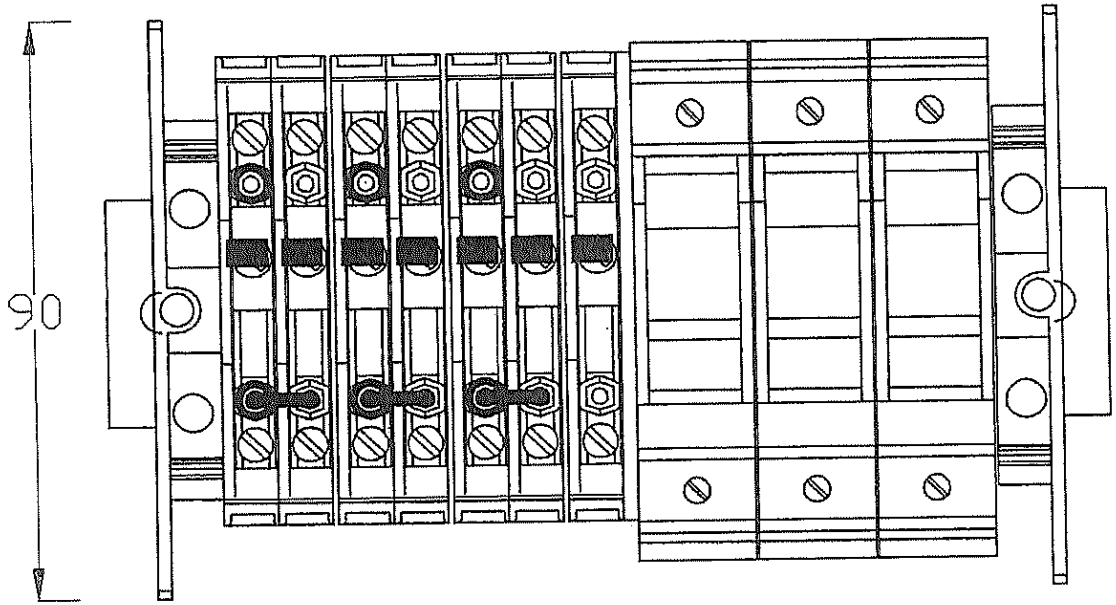
Инж

"Ви

на основание чл. 2 от ЗЗЛД

ПЛОВДИВ

1472



ВиВ Изоматик ООД
1680 София, ул. "Пирин" No40A
тел. 02 958 63 48, 958 63 44, 958 31 11, факс 958 22 70

ОБЕКТ:Измервателен клеморед ЧЕЗ

СЪГЛАСУВАЛИ:

част:	лист No: 1/ 1
фаза: РП	мащаб: –

ВЪЗЛОЖИТЕЛ:

Чертал:

Р-л фирма: инж. Вл. Лазаров

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32825 Blomberg, Germany
Telefon: +49 5235 300
Telefax: +49 5235 3-41200
Internet: http://www.phoenixcontact.com
USt-Id-Nr.: DE124613250
WEEE-Reg.-Nr.: DE50738265

PHOENIX CONTACT GmbH & Co. KG · 32823 Blomberg

TO WHOM IT MAY CONCERN

Development Quality Laboratory
Business Unit
Industrial Connection Technology

Phone: ++49 / (0) 52 35/34 20 71
Fax: ++49 / (0) 52 35/341 2 06

04st of Decembre 2009

Confirmation

Dear Sir or Madam,

We hereby confirm that the universal test disconnect terminal block URTK/S (0311087) is applicable at the rated insulation voltage up to 500 V in accordance to IEC 60947-7-1:2002-07 (partly)

Yours sincerely

PHOENIX CONTACT GmbH & Co. KG

PHOENIX CONTACT GmbH & Co. KG
Flachsmarktstraße 8
32825 Blomberg, Germany
Development Quality Laboratory
Business Unit
Industrial Connection Technology

на основание чл. 2 от ЗЗЛД

i.V. Dipl.-Phys. Ing. Alessandro Alberani
Head of Development
Quality Laboratory
Business Unit ICT

i.V. Dipl.-Phys. Ing. Alessandro Alberani

479

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Internet: http://www.phoenixcontact.com
USt-Id-Nr.: DE124613250

PHOENIX CONTACT GmbH & Co. KG · 32823 Blomberg

TO WHOM IT MAY CONCERN

Development Quality Laboratory
Business Unit
Industrial Connection Technology

Telefon: ++49 / (0) 52 35/34 20 71
++49 / (0) 52 35/34 10 97
Telefax: ++49 / (0) 52 35/34 12 06

04st of Decembre 2009

Certification regarding the static use of modular terminal blocks in the temperature range from -60°C to +120°C

Dear Sir or Madam,

Based on the available documentation of our plastic suppliers, we herewith certify for the non-reinforced polyamide plastics used in the area of CLIPLINE (Industrial Connection Technology) as follows:

Considering self-heating, articles made of the above materials can be used in static operation from -60°C to +120°C.

Best regards

PHOENIX CONTACT GmbH & Co. KG

на основание чл. 2 от ЗЗЛД

i.V. Dipl.-Phys. Ing. Alessandro Alberani
Head of Development
Quality Laboratory
Business Unit ICT

на основание чл. 2 от ЗЗЛД

i.A. Dipl.-Chem. Ing. J. Jacke

KEMA
REGISTERED QUALITY

KEMA KEUR

CERTIFICATE

KEMA no.: [illegible]

Issued to:
Applicant:
Phoenix Contact GmbH & Co.
Flachsmarktstrasse 8-28
BLOMBERG, Germany

Manufacturer/licensee:
Phoenix Contact GmbH & Co.
Flachsmarktstrasse 8-28
BLOMBERG, Germany

Product : Terminal Blocks

Trade name : PHOENIX CONTACT
Types/models : URTK/S-BEN BU, URTK/S-BEN, URTK/S, URTK/SP, USLKG 10, USLKG 6N

The product and any acceptable variation thereto is specified in the Annex to this certificate and the documents therein referred to.

KEMA hereby declares that the above-mentioned product has been certified on the basis of:
- a type test according to the standard EN 60947-7-1:1991, EN 60947-7-2:1995
- an inspection of the production location according to CCA Group Operational Document CCA-204
- a certification agreement with the number 900469

KEMA hereby grants the right to use the KEMA certification mark

KEMA KEUR

The KEMA-KEUR certification mark may be applied to the product as specified in this certificate for the duration of the KEMA-KEUR certification agreement and under the conditions of the KEMA-KEUR certification agreement.

This certificate is issued on: August 6, 1999

на основание чл. 2 от ЗЗЛД
[redacted]

C.M. Boschloo
Certification Manager

® Integral publication of this certificate is allowed

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ACCREDITED BY
THE DUTCH COUNCIL
FOR ACCREDITATION

1481

KEMA

ANNEX TO KEMA-KEUR CERTIFICATE 97.4117.13

SPECIFICATION OF THE CERTIFIED PRODUCT

Product data

product	:	terminal blocks
trade name	:	PHOENIX CONTACT
types	:	URTK/S-BEN BU, URTK/S-BEN, URTK/S, URTK/SP, USLKG 10, USLKG 6N
material	:	thermoplastic material
mounting	:	top hat rail 35 mm (EN 50022) and G-profile rail 32 mm (EN 50035)

Additional Information

Markings

Trademark, type designation, rated connection capacity and rated insulation voltage are indented in the insulation material.

Product data – type USLKG 6N

rated connection capacity	:	6 mm²
connectable conductors	:	one conductor 0,2 - 10 mm² solid 0,2 - 6 mm² flexible without ferrule 0,25 - 6 mm² flexible with ferrule two conductors 0,2 - 2,5 mm² solid 0,2 - 2,5 mm² flexible without ferrule 0,25 - 1,5 mm² flexible with ferrule
description	:	protective conductor terminal block with 2 screw-type clamping units, 1-pole

Product data – type URTK/S

rated voltage	:	400 V
rated connection capacity	:	6 mm²
connectable conductors	:	one conductor 0,5 - 10 mm² solid 0,5 - 6 mm² flexible without ferrule 0,5 - 10 mm² flexible with ferrule two conductors 0,5 - 2,5 mm² solid 0,5 - 6 mm² flexible without ferrule 0,5 - 4 mm² flexible with ferrule
rated impulse withstand voltage	:	6 kV
description	:	disconnect terminal block with 2 screw-type clamping units, 1-pole

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1482

Product data – type USLKG 10

rated connection capacity	:	6 mm²
connectable conductors	:	one conductor 0,5 - 10 mm² solid 0,5 - 6 mm² flexible without ferrule 0,5 - 6 mm² flexible with ferrule two conductors 0,5 - 2,5 mm² solid 0,5 - 2,5 mm² flexible without ferrule 0,5 - 2,5 mm² flexible with ferrule
description	:	protective conductor terminal block with 2 screw-type clamping units, 1-pole

Product data – type URTK/S-BEN

rated voltage	:	500 V
rated connection capacity	:	6 mm²
connectable conductors	:	one conductor 0,5 - 10 mm² solid 0,5 - 6 mm² flexible without ferrule 0,5 - 10 mm² flexible with ferrule two conductors 0,5 - 2,5 mm² solid 0,5 - 6 mm² flexible without ferrule 0,5 - 4 mm² flexible with ferrule
rated impulse withstand voltage	:	6 kV
description	:	disconnect terminal block with 2 screw-type clamping units, 1-pole

Product data – type URTK/S-BEN BU

rated voltage	:	500 V
rated connection capacity	:	6 mm²
connectable conductors	:	one conductor 0,5 - 10 mm² solid 0,5 - 6 mm² flexible without ferrule 0,5 - 10 mm² flexible with ferrule two conductors 0,5 - 2,5 mm² solid 0,5 - 6 mm² flexible without ferrule 0,5 - 4 mm² flexible with ferrule
rated impulse withstand voltage	:	6 kV
description	:	disconnect terminal block with 2 screw-type clamping units, 1-pole

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1483

Product data – type URTK/SP

rated voltage	:	500 V
rated connection capacity	:	6 mm²
connectable conductors	:	one conductor 0,5 - 10 mm² solid 0,5 - 6 mm² flexible without ferrule 0,5 - 6 mm² flexible with ferrule two conductors 0,5 - 2,5 mm² solid 0,5 - 4 mm² flexible without ferrule 0,5 - 2,5 mm² flexible with ferrule
rated impulse withstand voltage	:	6 kV
description	:	disconnect terminal block with 2 screw-type clamping units, 1-pole

TESTS

Test requirements

EN 60947-7-1:1991 + C:1997-06 + A11:1997
EN 60947-7-2:1995 + C:1996-01

Test results
The test results are laid down in KEMA test file 97.4117.13.

Conclusion
The examination proved that all test requirements were met.

Tested by : H.L. Schendstok

Checked by : L.J.W. van Mege

на основание чл. 2 от ЗЗЛД

FACTORY-LOCATION(S)

Phoenix Contact GmbH & Co.
Flachsmarktstrasse 8-28, BLOMBERG, Germany

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ИНЖЕНЕРИНГ ПЛОВДИВ ЕАД

1484

DEVICE UNDER TEST ..... **Fuse holder *FB01B types***

MANUFACTURER ..... Lovato Electric S.p.A.

TYPE OF TEST ..... **Temperature rise test on FB01B fuse holders**

DATE OF DEVICE RECEIPT 27/04/2011

START / END TESTING ..... 29/04/2011 – 13/05/2011

SAMPLES STORING ..... ☒ Ellminated / returned to customer ☐ Storage :

INDEX .....

ISSUE 16/05/2011

COMPILED ..... STAFF LPR

APPROVED ..... RESP. LPR

1485

1. PURPOPSE OF TESTING

Requested test (according to the customer specification):
Temperature rise at 690V – 32A on FB01B fuse holders

Test purpose:
"Verify the good function of FB01B fuse holders ."

Test target:
Pass the test.

2. TEST SAMPLES

N. 1 FB01B1P fuse holder - 32A (10 x 38 mm), batch production number ...[1]
N. 1 FB01B2P fuse holder - 32A (10 x 38 mm), batch production number ...[1]
N. 1 FB01B3P fuse holder - 32A (10 X 38 mm), batch production number ...[1]

3. TEST METHOD

IEC 60947-3 (2008-08) Ed. 3.0 + IEC 60947-1 Ed. 5.1 (2011-03)
Temperature rise (§ 8.3.3.1)

4. TEST PROCEDURES

Temperature rise..... Test instruction LPR 051-1, rev. 4, dated 11/10/2010.

[1] not available
[1] not available
[1] not available

14 86

5. TEST RESULTS

5.1 TEMPERATURE RISE

5.1.1 WITH LEGRAND FUSE 32 A gG 400 V

Sample under test.....N. 1 FB01B1P - 32A
N. 1 FB01B2P - 32A
N. 1 FB01B3P - 32A

Test conditions

Ambient temperature.....21 °C
Relative humidity.....46 %
Installation.....in vertical way, on DIN RAIL 35mm

Data sheet fusible used:
- Supplier.....Legrand
- Code.....cod. 133 32

Test parameters

Wiring of the main circuit
- cables section / length.....6,0 mm^2 / 1,0 m
- screws tightening nominal torque.....2,0 ÷ 2,5 N.m
- screws applied tightening torque.....2,0 N·m

Supply of the main circuit
- rated current.....Ith = 25 - 32 A
- test current.....I = 32 A
- supply frequency.....50 Hz

Test results

See next page.

1487

Temperature rise main circuit

	[K]			Standard limit EN60947-1 tab. 2
	One pole fuse holder FB01B1P	2 pole fuse holder FB01B2P	3 pole fuse holder FB01B3P	
Terminal L1	43	54	57	65
Terminal T1	39	51	52	65
Terminal L2	-	55	61	65
Terminal T2	-	49	58	65
Terminal L3	-	-	57	65
Terminal T3	-	-	50	65
Note .....:	Silver plated-brass terminal			

Temperature rise for accessibile parts

	[K]			Standard limit EN60947-1 tab. 3
	One pole fuse holder FB01B1P	2 pole fuse holder FB01B2P	3 pole fuse holder FB01B3P	
Line side	14	24	29	40
Load side	10	19	21	40
Left side	24	30	32	40
Right side	22	30	31	40
On front	18	24	29	40
Lever	9	16	17	40

1488

6. TEST EQUIPMENT AND INSTRUMENTS

6.1. TEST EQUIPMENT

Description	Used for	Full scale	Code
Current supply station	Power supply main circuit	20V – 50A	LPRA 065

6.2. MEASURING INSTRUMENTS

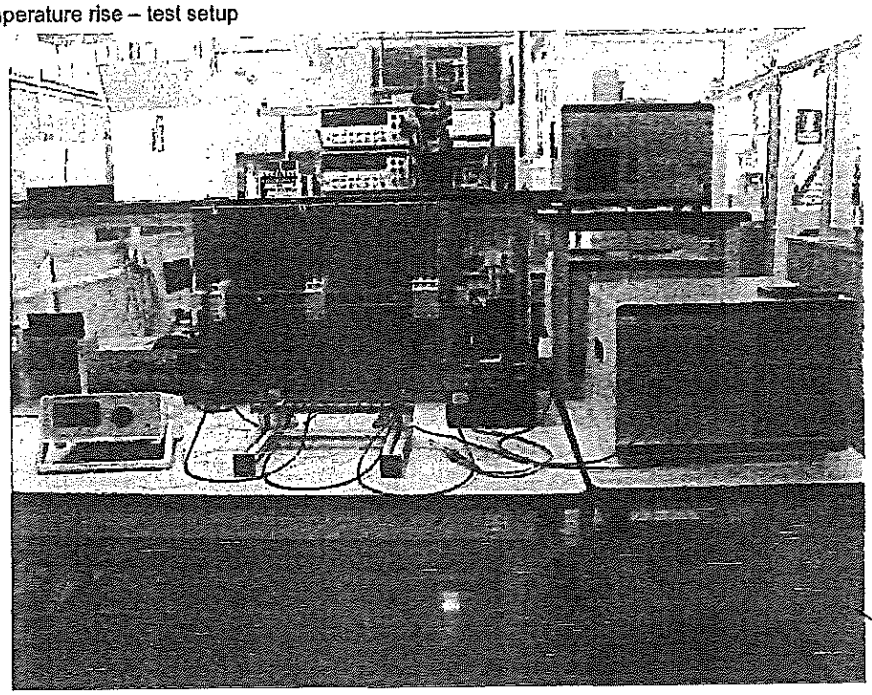
Description	Used to measure	Full scale	Code	Calibration expiration date
Thermohygrometer	Ambient temperature	-5 ÷ 50 °C	LPR 1 65	27/10/2011
Thermohygrometer	Relative humidity	10 ÷ 90%	LPR 165	27/10/2011
Termometric instrument	Temperature rise	-30 ÷ +200 °C	LPR 201	10/01/2012
Termocouple T type	Temperature rise	-30 ÷ +200 °C	L PR 201	10/01/2012
Termocouple T type	Temperature rise	-30 ÷ +200 °C	L PR 201.13	10/01/2012
Current transformer	Main circuit current	1.004/50 A	LPR 155	11/05/2012
Digital multimeter	Main circuit current	10 A	LPR 55	11/05/2012
Digital multimeter	Drop voltage	mV - Autom.	LPR 125	11/05/2012
Dynamometric screw driver	Main terminal screw tightening	6,0 Nm	LPR 231	07/01/2012

7. REMARKS & ANALYS

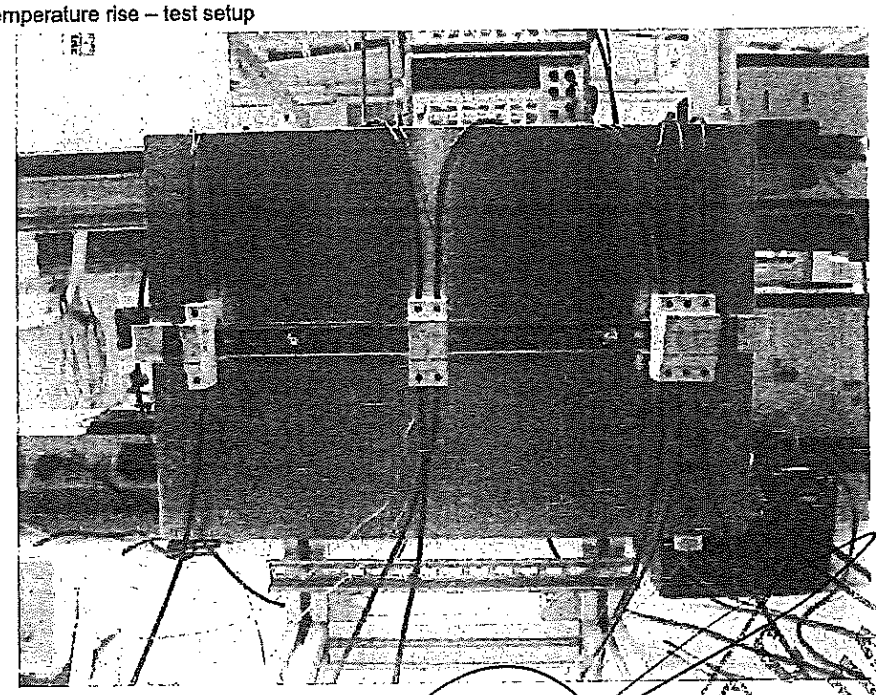
Temperature rise test 690V – 32A: test passed

8. ANNEX

Picture 1: Temperature rise – test setup



Picture 1a: Temperature rise – test setup

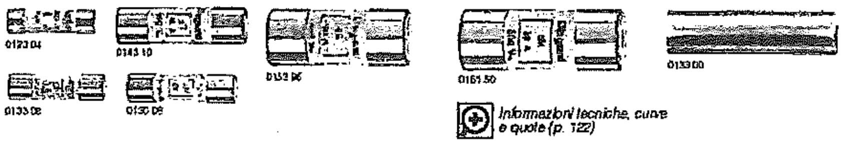


1490

Picture 2: Catalogue Legrand fuses

legrand

fusibili cilindrici



Informazioni tecniche, curve e quote (p. 122)

Tipo "gG"

B.C.R. (Bassa Capacità di Rottura)
Rispondenti alle norme CEI 32-1, CEI 32-5 - EN 60 269-1, EN 60 269-3

Imballo	Articoli Senza segnalatore	Articoli Con segnalatore	I nominale (A)	Tensione (V~)	Potere interruzione (KA)
	8,5 x 23 mm				
10	(1) 0113 02	0114 02 (1)	2	250	6
10	(1) 0113 04	0114 04 (1)	4		
10	(1) 0113 06	0114 06 (1)	6		
100	0113 10	0114 10	10		
	8,5 x 31,5 mm				
10	0123 01		1	400	20
10	0123 02	0124 02	2		
10	0123 04	0124 04	4		
10	0123 06	0124 06	6		
10	0123 08		8		
10	0123 10	0124 10	10		
10	0123 12		12		
100	0123 16	0124 16	16		
100	0123 20	0124 20	20		
	10,3 x 38 mm				
10/10	0133 32	0134 32	32	500	20

A.C.R. (Alta Capacità di Rottura)
Conformi alle norme CEI 32-1 e 32-4 - IEC 60 269.1,2 e 2,1 - EN 60 269.1
Approvazioni Bureau Veritas

Imballo	Articoli Senza segnalatore / Senza percussore	Articoli Con segnalatore / Con percussore	I nominale (A)	Tensione (V~)	Potere interruzione (KA)
	10,3 x 38 mm				
10	0133 94		0,5	500	100
10	0133 01		1		
10	0133 02	0134 02	2		
10	0133 04	0134 04	4		
10	0133 06	0134 06	6		
10	0133 08	0134 08	8		
10	0133 10	0134 10	10		
10	0133 12	0134 12	12		
10	0133 16	0134 16	16		
10	0133 20	0134 20	20		
10	0133 25	0134 25	25		
	14 x 51 mm				
10	0143 02		2	500	100
10	0143 04	0145 04	4		
10	0143 06	0145 06	6		
10	0143 10	0145 10	10		
10	0143 16	0145 16	16		
10	0143 20	0145 20	20		
10	0143 25	0145 25	25		
10	0143 32	0145 32	32		
10	0143 40	0145 40	40		
10	0143 50	0145 50	50	400	
	22 x 58 mm				
10	0153 10	0155 10	10	500	100
10	0153 16	0155 16	16		
10	0153 20	0155 20	20		
10	0153 25	0155 25	25		
10	0153 32	0155 32	32		
10	0153 40	0155 40	40		
10	0153 50	0155 50	50		
10	0153 63	0155 63	63		
10	0153 80	0155 80	80		
10	0153 96	0155 96	100		
10	0153 97	0155 97	125	400	

(1) Tipo g

Tipo "aM"

Rispondenti alle norma IEC EN 60269-1
Approvazione Bureau Veritas

Imballo	Articoli Senza percussore	Articoli Con percussore	I nominale (A)	Tensione (V~)	Potere interruzione (KA)
	8,5 x 31,5 mm				
10	0120 01		1	400	20
10	0120 02		2		
10	0120 04		4		
10	0120 06		6		
10	0120 08		8		
10	0120 10		10		

A.C.R. (Alta Capacità di Rottura)
Conformi alle norma IEC 60269-1,2 e 2-1; EN 60269-1; CEI 32.1 e 32.4
Approvazioni Bureau Veritas

Imballo	Articoli Senza percussore	Articoli Con percussore	I nominale (A)	Tensione (V~)	Potere interruzione (KA)
	10,3 x 38 mm				
10	0130 92		0,25	500	100
10	0130 95		0,50		
10	0130 01		1		
10	0130 02		2		
10	0130 04		4		
10	0130 06		6		
10	0130 08		8		
10	(1) 0130 10		10		
10	(1) 0130 12		12		
10	0130 16		16		
10	0130 20		20	400	
10	0130 25		25	400	
	14 x 51 mm				
10	0140 02	0141 02	2	500	100
10	0140 04	0141 04	4		
10	0140 06	0141 06	6		
10	0140 08	0141 08	8		
10	0140 10	0141 10	10		
10	0140 12	0141 12	12		
10	0140 16	0141 16	16		
10	0140 20	0141 20	20		
10	0140 25	0141 25	25		
10	0140 32	0141 32	32		
10	0140 40	0141 40	40		
10	0140 45	0141 45	45		
10	0140 50		50	400	
	22 x 58 mm				
10	0150 16	0151 16	16	500	100
10	0150 20	0151 20	20		
10	0150 25	0151 25	25		
10	0150 32	0151 32	32		
10	0150 40	0151 40	40		
10	0150 50	0151 50	50		
10	0150 63	0151 63	63		
10	0150 80	0151 80	80		
10	0150 98	0151 95	100		
10	0150 97	0151 97	125	400	

Neutri

Imballo	Articoli	Dimensioni
10	0123 00	8,5 x 31,5
10	0133 00	10,3 x 38
10	0143 00	14. x 51
10	0153 00	22 x 58

(1) cal bro non norma-zzato

115

ВЯРНО С ОРИГИНАЛА

149

Annex to ISO/IEC 17025 declaration of accreditation
for registration number: **K 006**

of **KEMA Nederland B.V.**
Calibration & Metering
Arnhem

This annex is valid from: **30-03-2010** to **01-03-2014** Replaces annex dated: **30-06-2009**

Premises: **n.a.**

HCS code	Measured quantity, Range	Frequency	Best measurement capabilities (k=2)	Remarks
LF 0 0	DC/LF Quantities			
LF 1 0	DC Voltage			
	Standard cells		3 µV	
	Up to 1 mV		0,4 µV	
	1 mV to 10 mV		$3 \cdot 10^{-4} \cdot U$	
	10 mV to 100 mV		$3 \cdot 10^{-5} \cdot U$	
	100 mV to 10 V		$5 \cdot 10^{-6} \cdot U$	
	10 V to 100 V		$1 \cdot 10^{-5} \cdot U$	
	100 V to 1100 V		$2 \cdot 10^{-6} \cdot U$	
	Zener Reference Standards			
	1 V and 1,018 V		3 µV	
	10 V		20 µV	
	High Voltage			Measuring
	1 kV to 6 kV		$2 \cdot 10^{-3} \cdot U$	
LF 2 0	DC Current			
	10 µA to 3 A		$2 \cdot 10^{-5} \cdot I$	
	3 A to 10 A		$2{,}5 \cdot 10^{-5} \cdot I$	
	10 A to 20 A		$6 \cdot 10^{-5} \cdot I$	

This annex has been approved by:

Ir. J.C. van der Poel
Chief Executive

Annex to ISO/IEC 17025 declaration of accreditation
for registration number: **K 006**

of **KEMA Nederland B.V.**
Calibration & Metering
Arnhem

This annex is valid from: **30-03-2010** to **01-03-2014** Replaces annex dated: **30-06-2009**

HCS code	Measured quantity, Range	Frequency	Best measurement capabilities (k=2)	Remarks
	20 A to 100 A		$1 \cdot 10^{-4} \cdot I$	
LF 3 1	AC Voltage			
	60 mV to 1000 V	40 Hz to 20 kHz	$2 \cdot 10^{-4} \cdot U$	
	60 mV to 1000 V	20 kHz to 50 kHz	$3 \cdot 10^{-4} \cdot U$	
	60 mV to 220 V	20 kHz to 50 kHz 50 kHz to 100 kHz	$4 \cdot 10^{-4} \cdot U$	
	220 V to 1000 V	50 kHz to 100 kHz	$4 \cdot 10^{-4} \cdot U$	
	220 V to 1000 V	50 kHz to 100 kHz	$2 \cdot 10^{-3} \cdot U$	
	High Voltage			Measuring
	1 kV tot 6 kV	50 Hz	$2 \cdot 10^{-3} \cdot U$	
LF 3 2	AC Voltage Ratio			
	(instrument transformers)			
	Primary: (10-600)V Secondary: (0,1-240)V	50 Hz and 60 Hz	$3 \cdot 10^{-5} \cdot U_{ult}/U_{In}$ and 90 µrad	
LF 3 3	AC Current			
	0,1 mA to 300 mA	40 Hz to 5 kHz	$3 \cdot 10^{-4} \cdot I$	
	300 mA to 20 A	40 Hz to 1 kHz	$3 \cdot 10^{-4} \cdot I$	
	20 A to 50 A	40 Hz to 1 kHz	$6 \cdot 10^{-4} \cdot I$	
LF 4 2	AC Current Ratio			ambient temp. (23 ± 2) °C
	(instrument transformers)	50 Hz and 60 Hz	$3 \cdot 10^{-5} \cdot I_{ult}/I_{In}$ and 90 µrad	Measuring

493

Annex to ISO/IEC 17025 declaration of accreditation
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HCS code	Measured quantity, Range	Frequency	Best measurement capabilities (k=2)	Remarks
	Primary: 5 A to 6000 A Secondary: 1A or 5A			
LF 4 3	High Current 10 A to 6000 A	50 Hz, 60 Hz	$3 \cdot 10^{-4} \cdot I$	
LF 5 0	Power and Energy			10 mV to 1100 V 10 µA to 100 A
	Power 0,1 µW to 1 µW		$1 \cdot 10^{-4} \cdot P$	
	1 µW to 1 kW		$5 \cdot 10^{-5} \cdot P$	
	1 kW tot 10 kW		$1 \cdot 10^{-4} \cdot P$	
	10 kW tot 110 kW		$2 \cdot 10^{-4} \cdot P$	
	3 W to 57,6 kW	50 Hz and 60 Hz	$\frac{3 \cdot 10^{-4}}{\cos\varphi} \cdot P$	on site to be performed at ambient temperature; voltage and current as mentioned above
	3 W to 2,9 MW	50 Hz and 60 Hz	$\frac{2 \cdot 10^{-4}}{\cos\varphi} \cdot P$	measuring 20 V to 1100 V 100 mA to 6000A cos φ = 0 to 1
	Reactive Power (P_r) 6 var to 1,8 Mvar	50 Hz and 60 Hz	$\frac{5 \cdot 10^{-4}}{\sin\varphi} \cdot P_r$	60 V to 300 V 100 mA to 6000 A
	Electrical (reactive-) energy			see (reactive-) power and time
LF 5 1	Power Factor cos φ : 0 to 1	40 Hz to 100 Hz	$\frac{2 \cdot 10^{-3}}{\cos\varphi} \cdot PF$	

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HCS code	Measured quantity, Range	Frequency	Best measurement capabilities (k=2)	Remarks
LF 6	Impedance (DC/LF)			
LF 6 2	DC Resistance			Non-decadic values
	20 µΩ to 50 µΩ		$3 \cdot 10^{-4} \cdot R$	
	50 µΩ to 100 µΩ		$1 \cdot 10^{-4} \cdot R$	
	100 µΩ to 20 kΩ		$1{,}2 \cdot 10^{-5} \cdot R$	
	1 mΩ to 10 mΩ		$6\ 5 \cdot 10^{-6} \cdot R$	
	10 mΩ to 1000 mΩ		$7 \cdot 10^{-6} \cdot R$	
	1 Ω to 10 kΩ		$5 \cdot 10^{-6} \cdot R$	
	10 kΩ to 1 MΩ		$1 \cdot 10^{-5} \cdot R$	
	1 MΩ to 10 MΩ		$1{,}2 \cdot 10^{-5} \cdot R$	
	10 MΩ to 100 MΩ		$3 \cdot 10^{-5} \cdot R$	
	100 µΩ to 10 kΩ		$6 \cdot 10^{-6} \cdot R$	Decadic Values
LF 6 4	Capacitance			
	LF Capacitance			accuracy depends on dissipation factor at 1 kHz
	10 pF to 100 pF	100 Hz, 1 kHz, 10 kHz	$1 \cdot 10^{-3} \cdot C$	
	1 µF	50 Hz, 200 Hz, 1 kHz	$1 \cdot 10^{-3} \cdot C$	
LF 6 7	Inductance			
	1 mH to 10 mH	1 kHz, (400-1692)Hz	$1 \cdot 10^{-3} \cdot L$	
	100 mH	100 Hz, 1 kHz 1,592 kHz	$1 \cdot 10^{-3} \cdot L$	
	1 H	100 Hz, 200 Hz, 400 Hz and 1 kHz	$1 \cdot 10^{-3} \cdot L$	
RF 0 0	RF Quantities			
RF 3 0	RF Power			
	- 9 dBm to +30 dBm	0,1 MHz to 4200 MHz	0,5 dB	Measuring:
	+30 dBm to +57 dBm	0,1 MHz to 500 MHz	0,6 dB	50 ohm coaxial VSWR
	-60 dBm to –10 dBm	10 MHz to 10000 MHz	0,5 dB	

1495

Annex to ISO/IEC 17025 declaration of accreditation
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This annex is valid from: **30-03-2010** to **01-03-2014** Replaces annex dated: **30-06-2009**

HCS code	Measured quantity, Range	Frequency	Best measurement capabilities (k=2)	Remarks
	-80 dBm to –10 dBm	0,1 MHz to 2700 MHz	1,1 dB	source < 2 Generating: (0,09 - 3200) MHz
RF 5 0	Rise time (10% to 90%) 1 ns to 1 ms		$2 \cdot 10^{-2} \cdot \tau$ +200 ps	10 mV/div to 1 kV/div
TF 0 0	TIME and FREQUENCY			
TF2 1	Frequency	1 Hz to 1,2 GHz	$5 \cdot 10^{-10} \cdot f$	
TF 2 2	Time interval	1 µs to ∞	$5 \cdot 10^{-10} \cdot t$ + 100 ns	
TF 3 2	Harmonic Distortion			(1)
	< 0,1 %	20 Hz to 2,5 kHz	$3 \cdot 10^{-4}$	
	0,1 % to 1 %	20 Hz to 2,5 kHz	$1 \cdot 10^{-3}$	
	1 % to 10 %	20 Hz to 2,5 kHz	$3 \cdot 10^{-3}$	
	10 % to 30 %	20 Hz to 2,5 kHz	$1 \cdot 10^{-2}$	
	30 % to 100 %	20 Hz to 2,5 kHz	$3 \cdot 10^{-2}$	

Part II, Mechanical quantities and Temperature

Measured quantity, Instrument, Gauge		Range	Best measurement capabilities (k=2)	Remarks
PV 1 0	Pressure			(2)
	Relative Pressure	(-10 to 10) kPa	$3 \cdot 10^{-4} \cdot p_e$ + 4 Pa	medium: air
		(-98 to 100) kPa	$3 \cdot 10^{-4} \cdot p_e$ + 5 Pa	medium: nitrogen
		100 kPa to 10 MPa	$3 \cdot 10^{-4} \cdot p_e$	medium: nitrogen
		(10 to 70) MPa	$3 \cdot 10^{-4} \cdot p_e$	medium: oil

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This annex is valid from: **30-03-2010** to **01-03-2014** Replaces annex dated: **30-06-2009**

HCS code	Measured quantity, Range	Frequency	Best measurement capabilities (k=2)	Remarks
	Absolute Pressure	(80 to 110) kPa	$3 \cdot 10^{-4} \cdot p$	medium: air
		(2 to 200) kPa	$3 \cdot 10^{-4} \cdot p$ + 5 Pa	medium: nitrogen
		200 kPa to 10 MPa	$3 \cdot 10^{-4} \cdot p$	medium: nitrogen
		(10 to 70) MPa	$3 \cdot 10^{-4} \cdot p$	medium: oil
TE 0 0	TEMPERATURE, HUMIDITY AND THERMOPHYSICAL PROPERTIES			
TE 1 0	Resistance thermometers	-50 °C to 20 °C	0,02 K	
		20 °C to 50 °C	0,05 K	
		50 °C to 300 °C	0,05 K	
		300 °C to 550 °C	0,16 K	
		550 °C to 650 °C	0,50 K	
TE 3 0	Thermocouples	-50 °C to 20 °C	0,16 K	Including C.J. references
		20 °C to 50 °C	0,16 K	
		50 °C to 300 °C	0,16 K	
		300 °C to 550 °C	0,21 K	
		550 °C to 650 °C	0,6 K	
		650 °C to 1000 °C	1,6 K	
TE 4 0	Liquid-in-glass thermometers	-50 °C to 50 °C	0,02 K	
		20 °C to 50 °C	0,04 K	
		50 °C to 300 °C	0,02 K	
	Differential Temperature	-50 °C to 200 °C	0,05 K	t_{min} = -50 °C t_{max} = 200 °C
TE 4 1	Self indicating thermometers			

Annex to ISO/IEC 17025 declaration of accreditation
for registration number: **K 006**

of **KEMA Nederland B.V.**
Calibration & Metering
Arnhem

This annex is valid from: **30-03-2010** to **01-03-2014** Replaces annex dated: **30-06-2009**

HCS code	Measured quantity, Range	Frequency	Best measurement capabilities (k=2)	Remarks
	Dry Block Calibrators	-20 °C to 650 °C	$(8 \cdot 10^{-4} \cdot t_{90} + 0{,}06)$ K	
	Writing thermometers	15 °C to 50 °C	0,5 K	
	Digital thermometers	-50 °C to 20 °C	0,02 K	including C.J. references
		20 °C to 50 °C	0,05 K	resolution 1 digit
		50 °C to 300 °C	0,05 K	
		300 °C to 550 °C	0,16 K	
		550 °C to 630 °C	0,50 K	
		630 °C to 1000 °C	1,5 K	

Remarks:

The ambient temperature during calibration is, unless specified otherwise, for:
LF measurements @ (23 ± 1)°C
TF measurements @ (23 ± 1)°C
Pressure measurements @ (23 ± 2)°C
Temperature measurements @ (23 ± 2)°C

(1) The stated best measurement capabilities are based on the fundamental frequency of the input signal.
If desired the distortion can be specified as a rang number of the harmonics.

(2) $p_e = p - p_{amb}$; p_e is the relative pressure, p_{amb} is the local air pressure, p is the absolute pressure.

The best measurement capability is the highest achievable accuracy for a given measuring value or measuring range, expressed as the total positive and negative measurement uncertainty.

The uncertainty is calculated according to EA-4/02 "Expression of the Uncertainty of Measurement in Calibration".

Calibrations are performed inside the laboratory, unless specified otherwise.

NÁRODNÍ AKREDITAČNÍ ORGÁN

EA MLA Signatory
Český institut pro akreditaci, o.p.s.
Olšanská 54/3, 130 00 Praha 3

issues

according to section 16 of Act No. 22/1997 Coll., on technical requirements for products, as amended

CERTIFICATE OF ACCREDITATION

No. 421 / 2016

Zkušebnictví, a.s.
with registered office Podnikatelská 547, 190 11 Praha 9 - Běchovice, Company Registration No. 45274355

to the Testing Laboratory No. **1035**
KEMA Laboratories Prague

Scope of accreditation:

Testing of making and breaking capacity, testing of short-circuit resistance, testing of electric arc resistance, temperature-rise tests by continuous flow of electric current, dielectric tests, determination of degree of protection, verification of equipment design and routine tests of heavy current equipment to the extent as specified in the appendix to this Certificate.

This Certificate of Accreditation is a proof of Accreditation issued on the basis of assessment of fulfillment of the accreditation criteria in accordance with

ČSN EN ISO/IEC 17025:2005

In its activities performed within the scope and for the period of validity of this Certificate, the Body is entitled to refer to this Certificate, provided that the accreditation is not suspended and the Body meets the specified accreditation requirements in accordance with the relevant regulations applicable to the activity of an accredited Conformity Assessment Body.

This Certificate of Accreditation replaces, to the full extent, Certificate No.: 743/2015 of 02 November 2015, or any administrative acts building upon it.

The Certificate of Accreditation is valid until: **15 July 2021**

Prague: 15 July 2016

на основание чл. 2 от ЗЗЛД

Jiří Růžička
Director
Czech Accreditation Institute
Public Service Company

1499

ViV Изоматик ООД
София 1404, ул."Деян Белишки" 58
София 1505, П.К. 59
Телефон: (+359 2) 958 3111, 958 6344, 958 6340
Факс: (+359 2) 958 2270
E-mail: v.v@techno-link.com
http://www.viv-isomatic.com

Банкова сметка 1004521117, Булбанк София 62196214

Инструкция за транспорт, съхранение, монтаж и експлоатация на клемореди за вторични вериги за измервателни групи на ниво средно напрежение

1. Транспорт

Клеморедите трябва да се транспортират опаковани в оригиналната опаковка.

Няма специфични изисквания към начина на транспорт.

2. Съхранение

Клемите и аксесоарите към тях трябва да се съхраняват в сухи, закрити помещения опаковани в оригиналната опаковка.

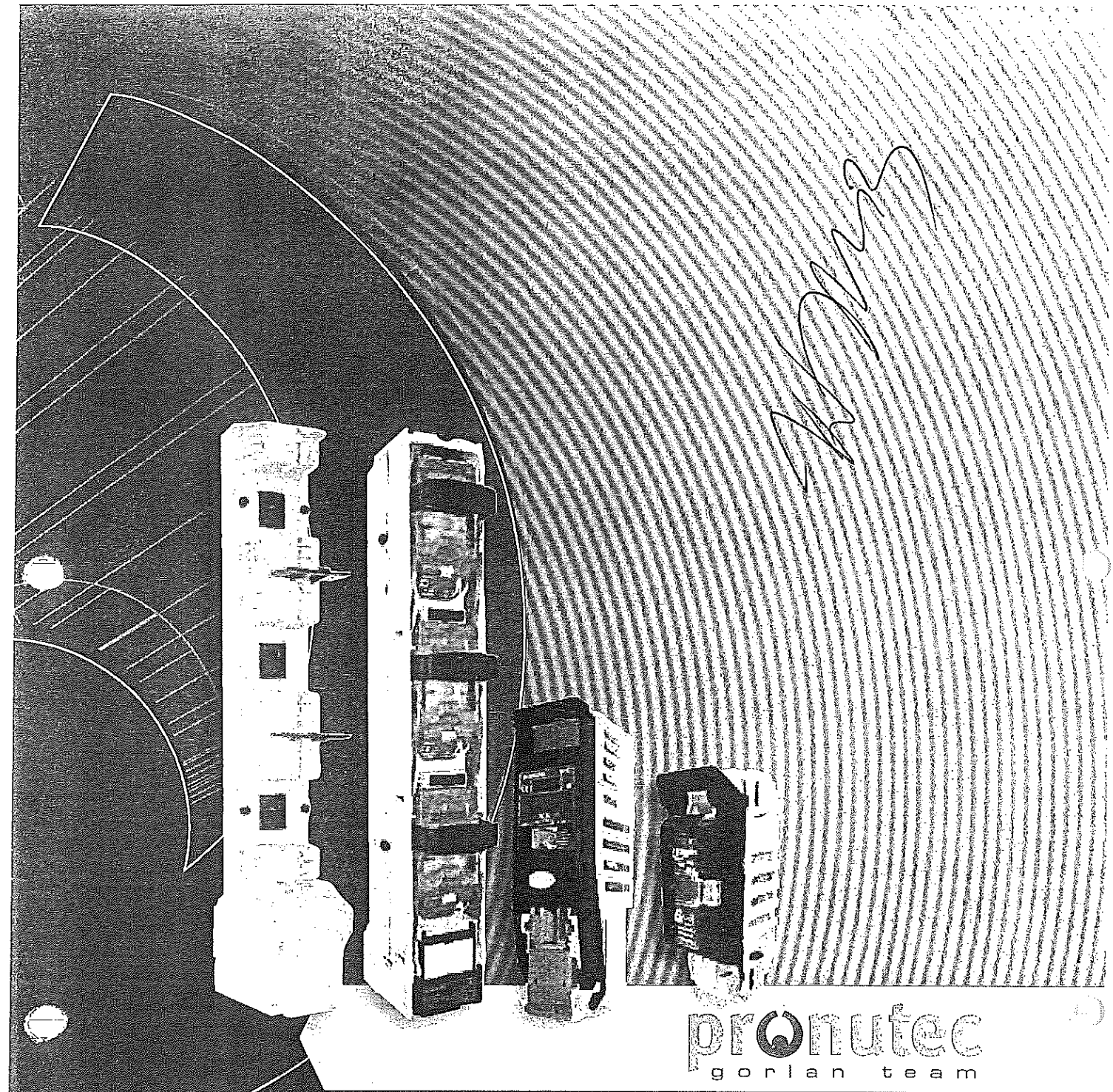
Температура на съхранение: от -25 до +55 °C.

Няма специфични изисквания към начина на съхранение.

3. Монтаж и експлоатация

Монтажа и експлоатационната поддръжка на клемореда е необходимо да се извърва от правоспособен ел.монтьор с минимум III та квалификационна група.
Необходимо е да се спазват следните изисквания.
Да се използва изолирана отверка от т.н тип Philips с дебелина 1мм и широчина 4мм
Да не се прави опит да се монтира проводник, ако клемата не е отворена достатъчно
Да не се прави опит да се монрира проводник с по-голямо сечение от 6мм2, същия трябва да бъде с отстранена изолация 13мм
Да не се прилагат ток и напрежение по-големи от указаните.
Да се спазват въртящите моменти за затягане на жилата от минимум 1,2Nm и максимум 1,5Nm.
Периодично (веднъж месечно) да се прави проверка за замърсяване и ако е необходимо, клемореда да се почисти, като се спазват инструкциите за безопасна работа.
Клемореда да не се мокри или подлага на атака от химически реагенти.
Да не се прилагат механични удари

1502



pronutec
gorlan team

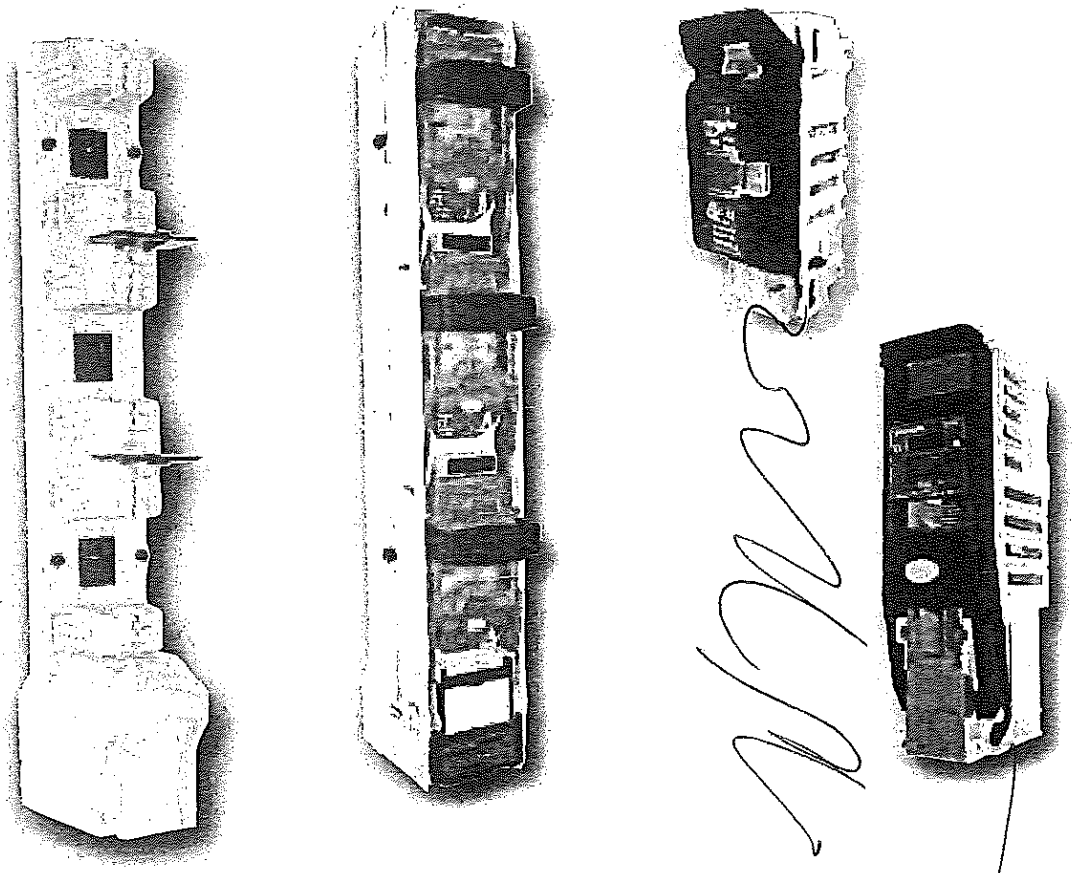
Bases portafusibles para fusibles tipo NH

NH type Low Voltage Fuse bases

www.pronutec.com

gorlan

Bases portafusibles para fusibles tipo NH



Bases tripolares verticales abiertas TRIVER
Bases tripolares verticales cerradas TRIVER+
Bases de seccionamiento tripolares verticales cerradas TRIVER+
Bases unipolares abiertas para AC
Bases tripolares horizontales abiertas
Bases unipolares desconectables en carga – NHC
Bases tripolares horizontales cerradas
Bases de neutro
Bases portafusibles para DC

LV Three pole Vertical design fuse rails TRIVER
LV Three pole Vertical design fuse switches TRIVER+
LV Three pole Vertical design disconnectors TRIVER+
LV One pole AC fuse bases
LV Three pole Horizontal design fuse bases
LV One pole fuse switches – NHC
LV Three pole Horizontal design fuse switches
Neutral links
LV fuse bases for DC

Índice / *Contents*

Página / *Page*

Abreviaturas / *Abbreviations*

Base tripolar vertical abierta	*Vertical design fuse rail*
Base tripolar vertical abierta protegida	*Vertical design protected fuse rail*
Base tripolar vertical cerrada desconexión unipolar	*Vertical design fuse switch one pole switching*
Base tripolar vertical cerrada desconexión tripolar	*Vertical design three pole switching fuse switch*
Base tripolar vertical cerrada doble	*Vertical design double fuse switch*
Base tripolar vertical cerrada de seccionamiento	*Vertical design disconnector*
Base tripolar vertical cerrada de seccionamiento de desconexión tripolar	*Vertical design three pole switching disconnector*
Base tripolar vertical cerrada doble de seccionamiento	*Vertical design double disconnector*
Base portafusibles NH unipolar cerrada desconectable en carga	*One pole LV fuse switch*
Base portafusible unipolar abierta	*One pole LV fuse base*
Doble desconexión tripolar	*Double three pole switching*
Base bipolar vertical abierta NH-1 / 1XL / 2XL / 3L	*Vertical design 2 pole fuse rail NH-1 / 1XL / 2XL / 3L*
Base bipolar vertical abierta protegida NH-1 / 1XL / 2XL / 3L	*Vertical design 2 pole protected fuse rail NH-1 / 1XL / 2XL / 3L*
Base bipolar vertical cerrada NH-1XL / 2XL / 3L	*Vertical design 2 pole fuse switch NH1-XL / 2XL / 3L*
Base tripolar horizontal cerrada NH-000 / 00 / 1 / 2 / 3	*Three pole LV fuse switches – Horizontal design NH-000 / 00 / 1 / 2 / 3*

Códigos / *General codes*

- Bases tripolares verticales abiertas y cerradas NH-00 / 160 A / 100mm distancia de embarrado	- *Vertical design 3P fuse rails and fuse switches NH-00 / 160 A / 100mm busbar spacing*
- Bases tripolares verticales abiertas y cerradas NH-00 / 160 A / 185mm distancia de embarrado	- *Vertical design 3P fuse rails and fuse switches NH-00 / 160 A / 185mm busbar spacing*
- Bases tripolares verticales abiertas NH-1/2/3, 250 / 400 / 630 A 185mm distancia de embarrado	- *Vertical design 3P fuse rails NH-1/2/3, 250/400/630 A 185mm busbar spacing*
- Bases tripolares verticales cerradas NH-1/2/3, 250 / 400 / 630 / 800 / 910 / 1260 A	- *Vertical design 3P fuse switches NH-1/2/3, 250/400/630/800/910/1260 A*
- Base tripolar vertical cerrada de seccionamiento NH-2 / 3, 400 / 630 / 1000 / 2000 A	- *Vertical design 3P disconnectors NH-2 / 3, 400/630/1000/2000 A*
- Base portafusibles NH unipolar desconectable en carga - NHC	- *One pole LV fuse switches – NHC*
- Bases unipolares abiertas para AC / DC - Bases tripolares horizontales abiertas - Bases de neutro	- *One pole AC / DC fuse bases* - *Three pole horizontal design fuse bases* - *Neutral links*
- Bases tripolares horizontales cerradas NH-000 / 00 / 1 / 2 / 3	- *Three pole LV fuse switches – Horizontal design NH-000 / 00 / 1 / 2 / 3*
- Base bipolar vertical NH-1 / 1XL / 2XL / 3L	- *2 pole fuserail disconnector NH-1 / 1XL / 2XL / 3L*

1504

Configuración de referencias / *Configuration*

COMO AGREGAR LOS CODIGOS DE LOS TERMINALES Y DE LOS ACCESORIOS PARA CONSTRUIR LAS REFERENCIAS:

REFERENCIA DEL ARTÍCULO = Código del artículo + XX (Código del terminal) + YY (Código del accesorio).

(Código del artículo= familia de producto/ tipo de maniobra / amperaje / tipo de base)

Por ejemplo:

REFERENCIA DE ARTÍCULO =438.52.10. 01. 02

CÓDIGO DE ARTÍCULO **CÓDIGO XX** **CÓDIGO YY**

Familia 438, BTVC , 400 A, NH-2 (438.52.10) +Tornillo M10 inoxidable (CÓDIGO 01) +Tapa de conexión (CÓDIGO 02)

CÓDIGO DEL ARTÍCULO **CÓDIGO XX** **CÓDIGO YY**

Para conocer la información sobre los códigos de accesorios y terminales compatibles, planos y datos técnicos, consultar las notas a pie de página en cada artículo.

HOW TO ADD TERMINALS AND ACCESSORIES CODES TO MAKE ARTICLE REFERENCES:

ARTICLE REFERENCE = article code + XX (Terminal code) + YY (Accesories code).

(article code= product family/ type of switching / Amp.rating / type of fuse switch)

For example:

ARTICLE REFERENCE = 438.52.10. 01. 02

ARTICLE CODE *XX CODE* *YY CODE*

Type 438, BTVC , 400 A, NH-2 (438.52.10) + M10 Bolt Stainless Steel (CODE 01) + Connection cover (CODE 02)

ARTICLE CODE *XX CODE* *YY CODE*

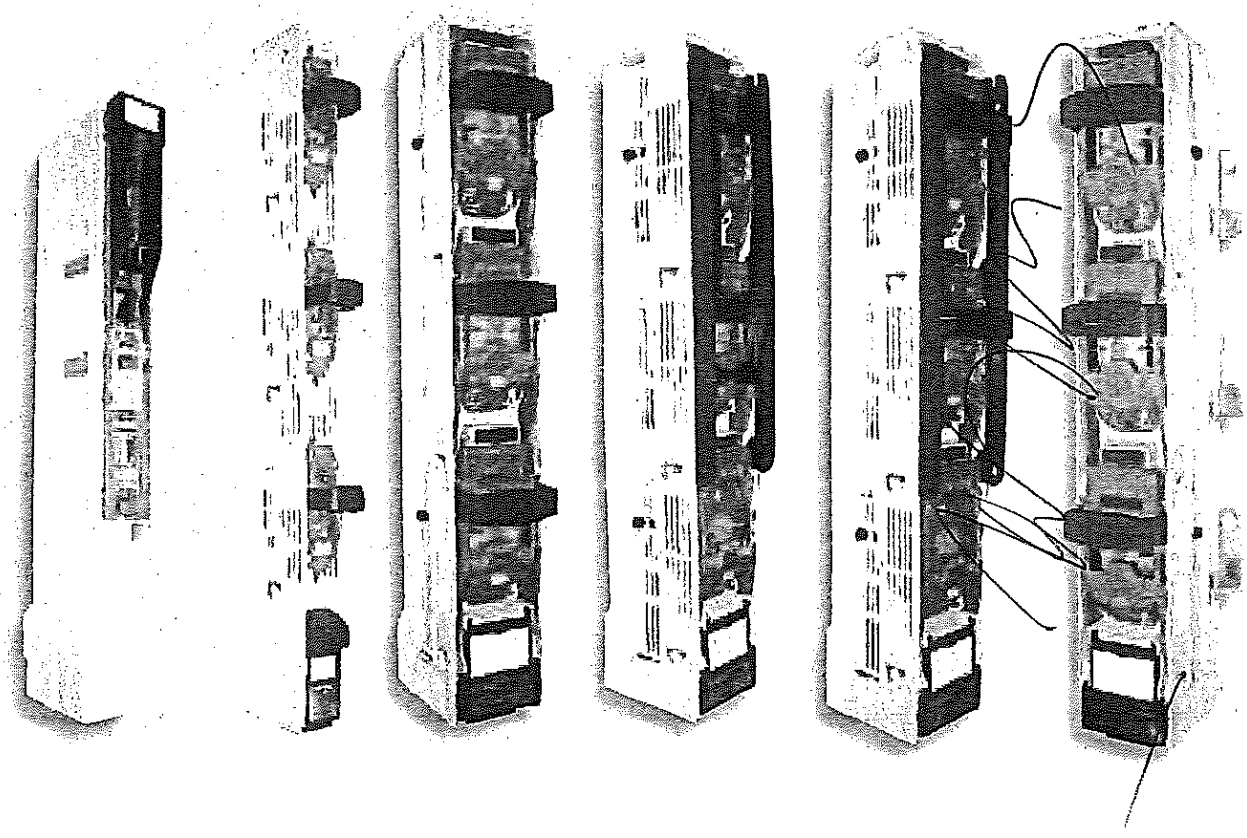
For information about compatible terminal and accessory codes, drawings and technical data, refer to notes below which indicate the pages to be consulted.

1506

2

Bases tripolares verticales cerradas y bases de seccionamiento - TRIVER +

Vertical design fuse switches and disconnectors -TRIVER +



Pronutec presenta su nueva generación de Bases Portafusibles verticales cerradas NH-00/1/2/3 TRIVER+
Esta nueva gama pretende satisfacer las necesidades actuales y futuras de nuestros clientes.

Pronutec presents the latest generation of vertical fuse switches NH-00/1/2/3 TRIVER+. This new range aims to meet our customers present and future requirements.

1506

Ventajas / *Features*

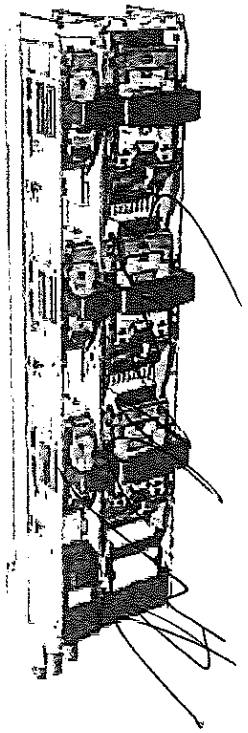
TOTALMENTE COMPATIBLES / *FULLY COMPATIBLE*

TRIVER+ es 100% compatible con la anterior gama de bases portafusibles. Mantiene las mismas dimensiones exteriores por lo que puede ser instalada en cualquier tipo de cuadro que actualmente hay en el mercado. Bases validas para paneles frontales de 600mm ó 650mm de altura.

Así mismo, ha sido diseñada y ensayada según la norma IEC 60947-3 y acorde con las normas de las principales compañías eléctricas del mundo.

TRIVER+ is 100% compatible with the previous range. It maintains the same external dimensions so they can be assembled in any already installed LV panels in the market. The fuse switches are also valid for 600mm and 650mm front frame panels.

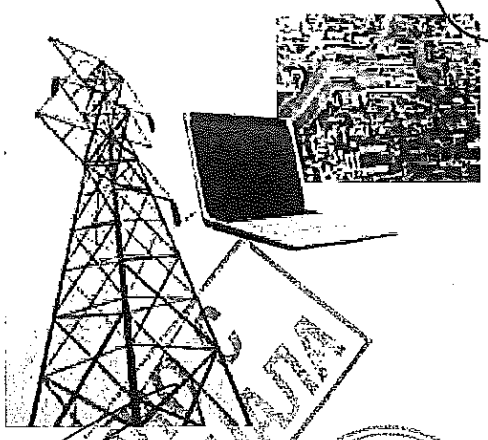
It has also been designed and tested according to IEC 60947-3 standard and in accordance with the specifications of the main electric utilities all around the world.



ADAPTADAS AL FUTURO / *ADAPTED TO FUTURE*

Esta nueva generación de bases tripolares está preparada para cubrir las necesidades del mercado que aparecerán en un futuro próximo con la implantación de redes inteligentes (Smart Grids). Para ello incorpora soluciones y accesorios para la telegestión como pueden ser conjuntos de medida integrados o independientes, el control electrónico de fusión, etc.

This new generation of three pole vertical fuse switches are prepared to meet the market´s future requirements with regard to implementation of smart grids. For such purpose, it incorporates features and accessories for remote supervision such as integrated or independent metering sets, Fuse Supervision Control, etc.



Ventajas / *Features*

EFICIENCIA ENERGETICA
ENERGY EFFICIENCY

La nueva base TRIVER+, ha sido diseñada para conseguir un mayor rendimiento energético en las condiciones reales de trabajo.

Por una parte se reducen las pérdidas de la base (gracias al nuevo diseño del contacto) y por otra, la disipación de calor de la misma es mayor (gracias a la ventilación que ofrece la nueva carcasa aislante).

The new TRIVER+ has been designed to achieve an optimal energy efficiency in real working conditions.

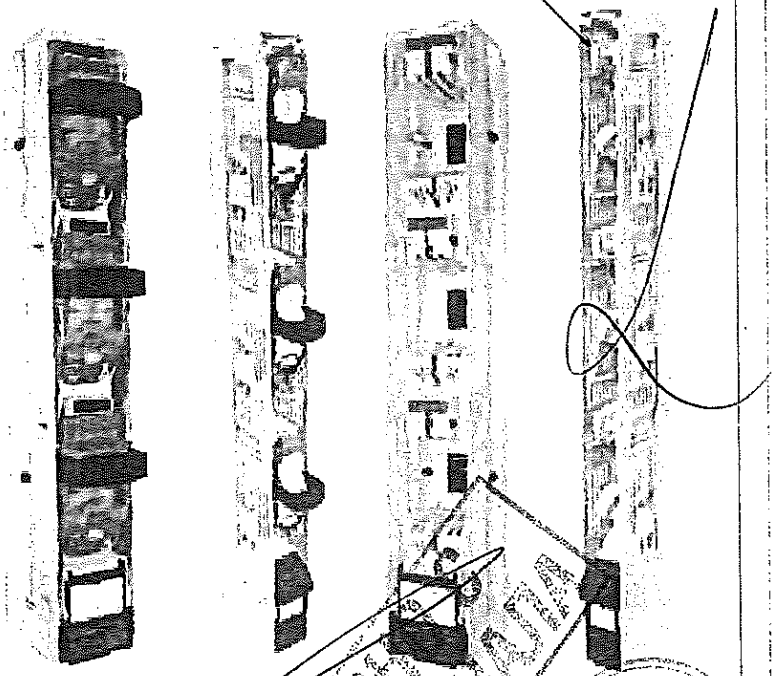
This is achived by the combined effect of both lower power losses in the contacts and improved self ventilation of the insulating parts.

SEGURIDAD FRENTE A CONTACTOS ACCIDENTALES
SAFETY AGAINST ACCIDENTAL CONTACTS

La seguridad es el aspecto principal sobre el cual gira el desarrollo del producto de Pronutec. La nueva base TRIVER+, presenta un grado de protección IP 30 en posición cerrada e IP 20 en posición abierta, garantizando una máxima protección frente a contactos accidentales.

Safety is the main aspect for the development of new products in Pronutec. The new TRIVER+ provides an IP30 protection degree in the closed position and IP20 in the open position, ensuring maximum protection against accidental contacts.

Grado de protección IP frontal
Front protection degree



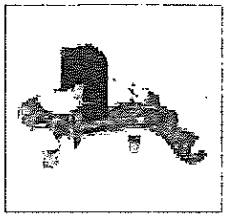
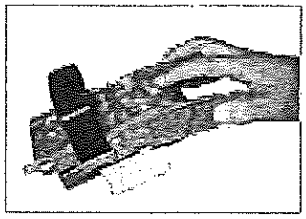
Cerrada: IP30
Closed: IP 30

Abierta: IP20
Open: IP 20

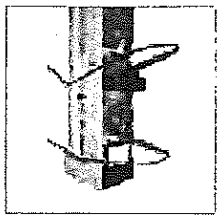
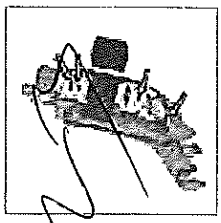
Ventajas / *Features*

SEGURIDAD Y MANIPULACIÓN / *SAFETY & HANDLING*

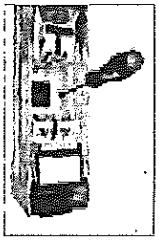
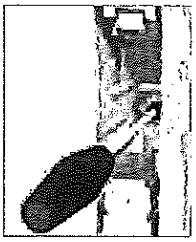
Mayor seguridad en la instalación y el manejo en todos los tamaños.
Increased safety in installation and handling to all sizes.

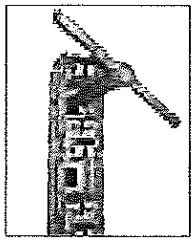
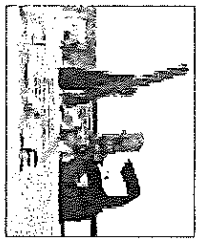
Seguridad y comodidad en la extracción del fusible sin tocarlo mediante un accionamiento exterior.
Safety and comfort in the removal of the fuse.
Unlocking tag prevents from touching any internal part.

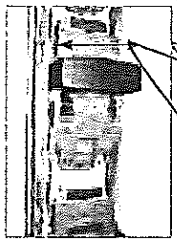
Tapa con un dispositivo que permite acceder directamente a la cuchilla del fusible para realizar pruebas de tensión.
Cover including provision to allow direct access to the blade of the fuse in order to make voltage testing.

Fácil montaje del lateral.
Easy to install the switching case.

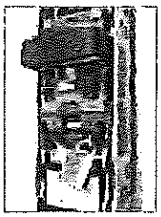



Posibilidad de montaje en tensión a través de las ventanas de acceso a embarrados.
Installation in live panels possible by means of busbar access window.

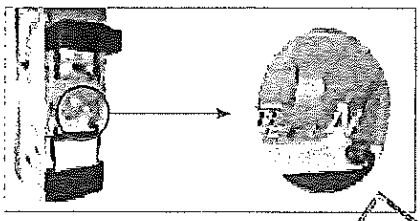



Gran espacio en la maneta.
Big space in the handle.

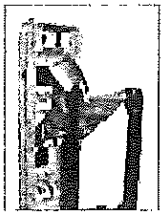
BLOQUEO / *PROVISION FOR PADLOCK*



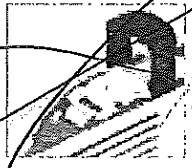
Posición cerrada con bloqueo de candado en cada fase.
Closed position with padlock in each phase.



Bloqueo sellado de cada fase en posición cerrada así como de la zona del terminal y del tarjetero.
Provision for installing a sealing plumb for each phase and sealing plumb in the card holder.



Posición abierta con bloqueo de candado en DT.
Open position with padlock in DT.




Ventajas / *Features*

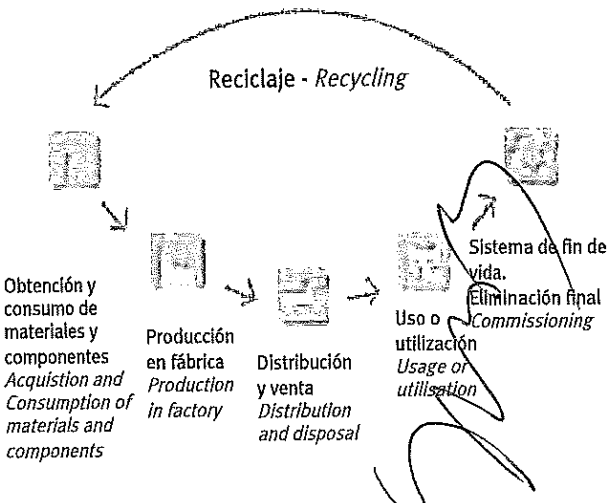
ECODISEÑO / *ECODESIGN*

La reducción de pérdidas de energía con la que nos beneficia el nuevo diseño de la base TRIVER+, tiene un efecto positivo sobre el medio ambiente.

Al mismo tiempo, con el diseño de esta nueva base TRIVER+, se ha conseguido reducir el impacto ambiental del producto a lo largo de todo su ciclo de vida.

The reduction of power losses thanks to the new design of the TRIVER+ has a positive effect on the environment.

Additionally, with the design of this new TRIVER+, the impact of the product on the environment has been reduced throughout its whole life cycle.



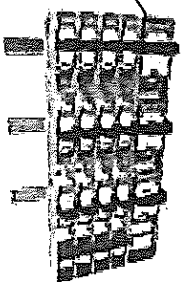
UN DISEÑO ERGONÓMICO, MODERNO Y FUNCIONAL
ERGONOMIC, MODERN AND FUNCTIONAL DESIGN

Mejor maniobrabilidad. Mayor rapidez de montaje y manipulación. Mayor efectividad. Más seguridad.

Better maneuverability. Faster to install and operate. More effective. Safer.

Diseño compatible con marcos de cuadros de distribución.

Design compatible with LV distribution panels frames



ASA ESCAMOTEABLE / CUADROS MÁS COMPACTOS
La profundidad se reduce de 192 a 166mm. Se pueden diseñar cuadros con menos profundidad.

RETRACTABLE HANDLE / MORE COMPACT PANELS.
Depth reduces from 192mm to 166mm.
LV panels can be designed with less depth.

REVERSIBILIDAD
Las conexiones de los cables se pueden hacer tanto en la parte superior como inferior, solo girando la carcasa.

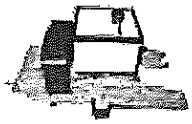
REVERSIBILITY
Connections can be done either in the top or bottom by simply turning the base upside down.

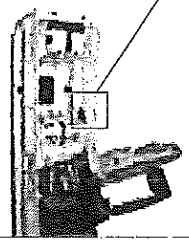
Ventajas / *Features*

ACCESORIOS / *ACCESSORIES*

Amplia gama de accesorios que aportan mayores beneficios sobre la nueva base TRIVER +
Wide range of accessories that provides additional advantages inside the new TRIVER+.

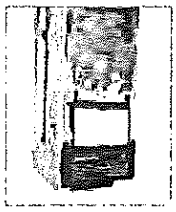
Medida permanente/temporal a través del conjunto fusible-transformador de intensidad-amperímetro.
Permanent or temporary metering by means of a combined set of fuse - current transformer - ammeter.

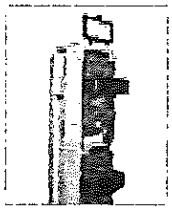


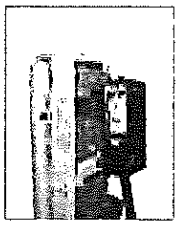


Dispositivo que permite la indicación del estado abierto/cerrado de la tapa en cada fase. Indicador de fusión de fusibles, integrado en el lateral (ILF).
Microswitch which enables open / close indicator.
LED - Integrated blown fuse indicator.

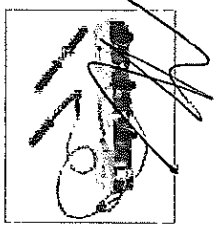
Tarjetero superior / inferior
Top / Bottom card holders



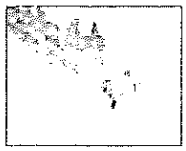


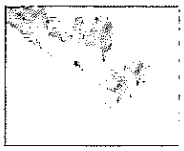


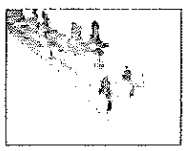
Salida auxiliar protegida con fusibles hasta 160 A para consumos temporales sin tener que instalar una base adicional.
Fuse protected auxiliary supply (up to 160A fuses) used to provide temporary supply with no need for installing an additional fuse rail.

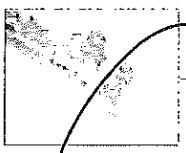


Preparada para la conexión de puestas a tierra para los cables de salida. La cuchilla de puesta a tierra se aloja en la posición del fusible. La base se pondrá a tierra a través de una trenza de cobre.
It is possible to connect earthing kits for outgoing cables. The blade of the earthing link is located in the position of the fuse in the base. The base is earthed by means of a copper braid.









Amplia gama de terminales que se adapta a todas las necesidades de secciones y tipos de conexión d(páginas 35, 42 y 59).
Large range of terminals adapted to fit several type of cable terminations (pages 35, 42 & 59).

Gama / *Range*

438

Bases de seccionamiento, BTVC-S, BTVC-S, 400 / 630 / 1000 A

Disconnectors, BTVC-S, 400 / 630 / 1000 A

Referencia *Reference*	Tipo *Type*	Intensidad *Current*	Desconexión *Disconnection*	Terminales *Terminal type*	Conexiones *Connections*	Cuchillas de Seccionamiento *Solid Links*
438.52.12.XX.02*	BTVC-S	400 A	Unipolar *One pole*	Terminales código XX *XX Code Terminal*	Superior / Inferior *Top / Bottom*	NH-2
438.53.12.XX.02*		630 A		Terminales código XX *XX Code Terminal*	Superior / Inferior *Top / Bottom*	NH-3
438.55.12.04.02*		1000 A		Tuerca inoxidableM12 *M12 inserted nut stainless steel*	Superior / Inferior *Top / Bottom*	NH-3
438.55.12.36.00		1000 A		ø14 mm	Superior / *Top*	NH-3
438.62.12.XX.02*	BTVC-SDT 2 asas *BTVC-SDT 2 handles*	400 A	Tripolar *Three pole*	Terminales código XX *XX Code Terminal*	Superior / Inferior *Top / Bottom*	NH-2
438.63.12.XX.02*		630 A		Terminales código XX *XX Code Terminal*	Superior / Inferior *Top / Bottom*	NH-3
438.65.12.04.02*		1000 A		Tuerca inoxidableM12 *M12 inserted nut stainless steel*	Superior / Inferior *Top / Bottom*	NH-3
438.65.12.36.00		1000 A		ø14 mm	Superior / *Top*	NH-3
438.72.12.XX.02*	BTVC-SDT 1 asa *BTVC-SDT 1 handle*	400 A	Tripolar *Three pole*	Terminales código XX *XX Code Terminal*	Superior / Inferior *Top / Bottom*	NH-2
438.73.12.XX.02*		630 A		Terminales código XX *XX Code Terminal*	Superior / Inferior *Top / Bottom*	NH-3
438.75.12.04.02*		1000 A		Tuerca inoxidableM12 *M12 inserted nut stainless steel*	Superior / Inferior *Top / Bottom*	NH-3
438.75.12.36.00		1000 A		ø14 mm	Superior / *Top*	NH-3

* Con tapa de conexiones / *With connection cover*

185 mm

BTVC-S

BTVC-SDT 2 ASAS
BTVC-SDT 2 HANDLES

BTVC-S CONEXIÓN SUPERIOR
BTVC-S TOP CONNECTION

Terminales código XX/ *Terminals XX Code:* P. 60
Accesorios código YY / *Accessories YY Code:* P. 61-63

Datos Técnicos / *Technical Data:* P. 156-157
Planos y esquemas eléctricos: P. 70-71
Dimension drawing and wiring diagrams: P. 70-71

Gama / *Range*

438

Bases de seccionamiento, BTVC-S, 400/630/1000 A seccionamiento de embarrados

Disconnectors, BTVC-S, 400 / 630 / 1000 A busbar connection

Referencia *Reference*	Tipo *Type*	Intensidad *Current*	Desconexión *Disconnection*	Terminales *Terminal type*	Conexiones *Connections*	Cuchillas de Seccionamiento *Solid Link*
438.52.65.08.00	BTVC-S	400 A	Unipolar *One pole*	ø14 mm	Seccionamiento de embarrado *Busbar connection*	NH-2
438.53.65.08.00		630 A				NH-3
438.55.65.08.00		1000 A				NH-3
438.62.65.08.00	BTVC-SDT 2 asas *BTVC-SDT 2 handles*	400 A	Tripolar *Three pole*	ø14 mm	Seccionamiento de embarrado *Busbar connection*	NH-2
438.63.65.08.00		630 A				NH-3
438.65.65.08.00		1000 A				NH-3
438.72.65.08.00	BTVC-SDT 1 asa *BTVC-SDT 1 handle*	400 A	Tripolar *Three pole*	ø14 mm	Seccionamiento de embarrado *Busbar connection*	NH-2
438.73.65.08.00		630 A				NH-3
438.75.65.08.00		1000 A				NH-3

185 mm

BTVC-S SECCIONAMIENTO DE EMBARRADOS
BTVC-S BUSBAR CONNECTION

Terminales código XX/ *Terminals XX Code:* P. 60
Accesorios código YY / *Accessories YY Code:* P- 61-68

Datos Técnicos / *Technical Data:* P. 156-157
Planos y esquemas eléctricos: P. 71
Dimension drawing and wiring diagrams: P. 71

Gama / *Range*

438

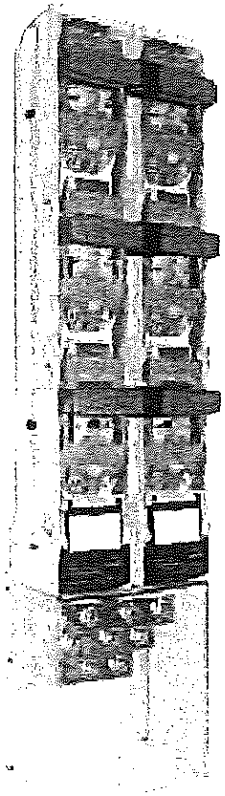
Bases de seccionamiento dobles, BTVC-DS, 2000 A

NH-Double Disconnectors, BTVC-DS, 2000 A

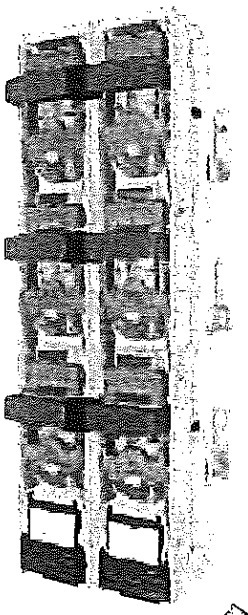
Referencia *Reference*	Tipo *Type*	Intensidad *Current*	Distancia entre BTVC (mm) *Fuse switch distance(mm)*	Terminales *Terminal type*	Conexiones *Connections*	Cuchillas de Seccionamiento *Solid Link*
438.57.70.04.02*	BTVC-DS	2000 A	100	Tuerca M12 inoxidable *M12 inserted nut stainlees steel*	Superior / Inferior *Top / Bottom*	NH-3
438.57.71.04.02*			105			
438.57.13.07.02			110	2 x M14 *2 x M14*		
438.57.80.04.00	BTVC-DS	2000 A	100	Tuerca M12 inoxidable *M12 inserted nut stainlees steel*	Seccionamiento de embarrado *Busbar connection*	NH-3

* Con tapa de conexiones / *With connection cover*

185 mm



BTVC-DS SUPERIOR / INFERIOR
BTVC-DS TOP/BOTTON



BTVC-DS 2000 A SECCIONAMIENTO DE EMBARRADOS
BTVC-DS 2000 A BUSBAR CONNECTION

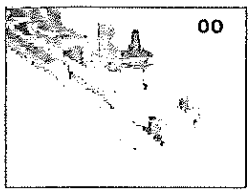
Terminales código XX/ *Terminals XX Code:* P. *60*
Accesorios código YY / *Accessories YY Code:* P. *61-63*

Datos Técnicos / *Technical Data:* P. *156-157*
Planos y esquemas eléctricos: P. *72*
Dimension drawing and wiring diagrams: P. 72

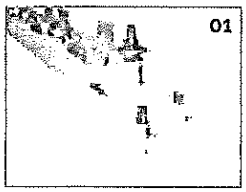
438

BTVC / BTVC-DT & BTVC / BTVC-DT acometida lateral, NH-1/2/3

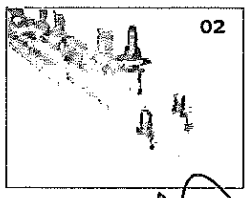
NH fuse switches BTVC/BTVC -DT & BTVC/BTVC -DT lateral input, NH -1/2/3



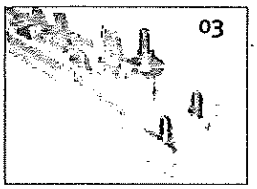
TORNILLO M10
M10 BOLT



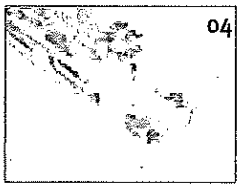
TORNILLO M10 INOXIDABLE
M10 BOLT STAINLESS STEEL



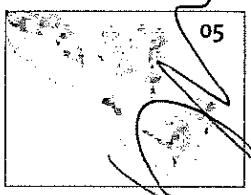
TORNILLO M12
M12 BOLT



TORNILLO M12 INOXIDABLE
M12 BOLT
STAINLESS STEEL

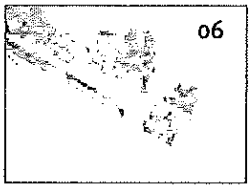


TUERCA M12 INOXIDABLE
M12 NUT
STAINLESS STEEL



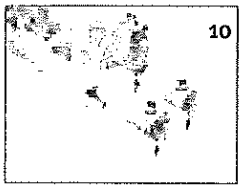
TERMINAL V REVERSIBLE CON PIEZA DE PRESION
V-TERMINAL WITH REVERSIBLE PRESSURE PAD

	rm	re	sm	se
mm²	50-185	70-240	70-240	95-300
Nm	25			



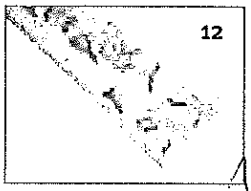
TERMINAL BIMETÁLICO
BIMETALLIC TERMINAL

	rm	re	sm	se
mm²	35-70	50	35-150	50-185
Nm	32			

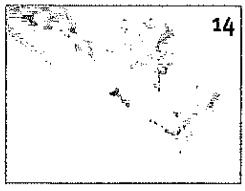


TERMINAL V CON TORNILLO DE ROTURA CONTROLADA
V-TERMINAL WITH SHEAR HEAD SCREW

	rm	re	sm	se
mm²	50-185	70-240	70-240	95-300
Nm	25			

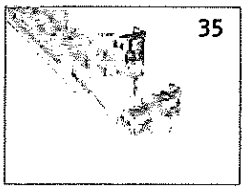


PLETINA PARA TERMINAL V (SIN TERMINAL)
V SHAPED OUTGOING PLATE WITHOUT V TERMINAL



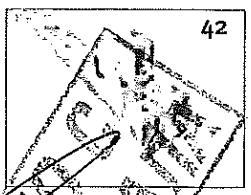
TERMINAL V
V-TERMINAL

	rm	re	sm	se
mm²	35-70	35-50	50-185	50-240
Nm	25			



TERMINAL V DE ACERO
STEEL V TERMINAL

	rm	re	sm	se
mm²	35-185	35-150	50-240	50-300
Nm	35			



TERMINAL V DOBLE
DOUBLE V-TERMINAL

	rm	re	sm	se
mm²	Código 42 / Code 42		50-185	70-240
Nm	25			

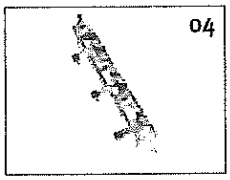
Para otros terminales o secciones de cable consultar código
For other options or other cable sections consult code

438

para bases especiales

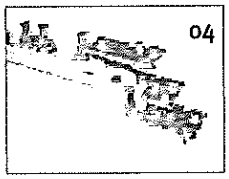
for special fuse switches

BTVC / BTVC-DT salida lateral
BTVC/ BTVC-DT lateral output

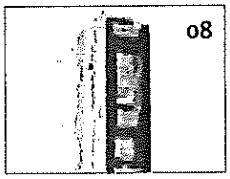


TUERCA M 12 INOXIDABLE
M12 INSERTED NUT STAINLESS STEEL

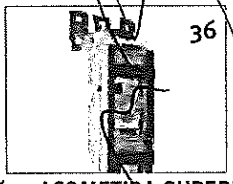
BTVC/ BTVC-DT 910 A



TUERCA M 12 INOXIDABLE
M12 INSERTED NUT STAINLESS STEEL

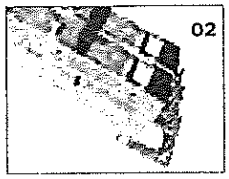


Ø 14 ACOMETIDA TRASERA
Ø 14 REAR PLATE

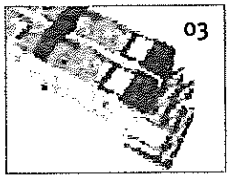


Ø 14 ACOMETIDA SUPERIOR
Ø 14 TOP CONNECTION

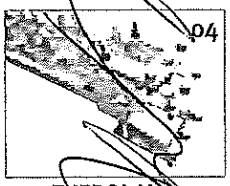
BTVC -D 800/ 1260 A



TORNILLO M 12
M12 BOLT



TORNILLO M12 INOXIDABLE
M12 BOLT STAINLESS STEEL



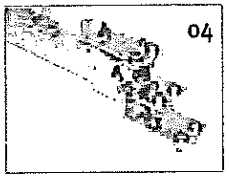
TUERCA M 12 INOXIDABLE
M12 INSERTED NUT STAINLESS STEEL

438

Bases de seccionamiento BTVC-S / BTVC - DS

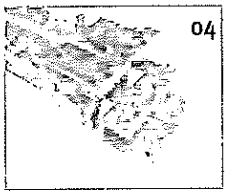
BTVC-S/ BTVC-DS Disconnectors

BTVC -S 1000 A

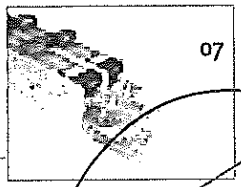


TUERCA M 12 INOXIDABLE
M12 INSERTED NUT STAINLESS STEEL

BTVC -DS 2000 A

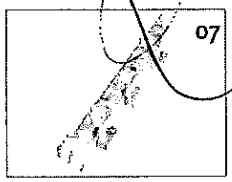


TUERCA M 12 INOXIDABLE
M12 INSERTED NUT STAINLESS STEEL



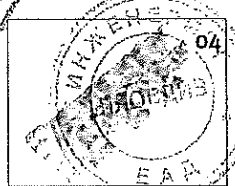
TORNILLO M 14
M14 BOLT

BTVC-S 1000 A seccionamiento de embarrados
BTVC-S 1000 A busbar connection



DIAMETRO 14 MM
14 MM HOLE DIAMETER

BTVC-DS 2000 A seccionamiento de embarrados
BTVC-DS 2000 A busbar connection



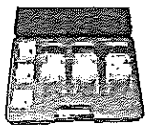
TUERCA M 12 INOXIDABLE
M12 INSERTED NUT STAINLESS STEEL

1546

NH-1/2/3, 250/400/630 A; BTVC 910 A; BTVC-D 400/630/800/1260 A; BTVC-S 1000-2000 A

fuse switches NH-1/2/3, 250/400/630 A; BTVC 910 A; BTVC-D 400/630/800/1260 A; BTVC-S 1000-2000A

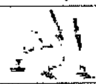
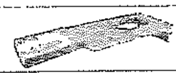
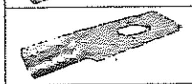
Artículo *Item*	Descripción *Description*	Referencia *Reference*	Código YY *YY Code*
			00= Sin accesorios *00= No Accessories*
	Indicador luminoso de fusión (ILF) *Blown fuse indicator*		01
	Tapa de conexiones para NH-1/2/3 BTVC y BTVC-DT / BTVC-S 400 / 630A *Connection cover for NH-1/2/3 BTVC & BTVC-DT/ BTVC-S 400/ 630A*	4380425	02
	Tapa de conexiones para BTVC 910 A y terminales salida superior *Connection cover for BTVC 910 A and top outgoing terminals*	42804103	
	Tapa de conexiones para BTVC-S 1000A *Connection cover for BTVC-S 1000A*	42801027	
	Tapa de conexiones para BTVC doble y BTVC-DS 2000 A (100mm) *Connection cover for Double BTVC-D and BTVC-DS 2000 A (100mm)*	STD 42801028 FS 42804100	
	Tapa de conexiones para BTVC doble y BTVC-DS 2000 A (105mm) *Connection cover for Double BTVC-D (100mm) and BTVC-DS 2000 A (105 mm)*	STD 42801029 FS 42804100	
	Tapa de conexiones para BTVC-D (110 mm) *Connection cover for Double BTVC-D (110 mm)*	STD 42801030 FS 4280485	
	Código 01+código 02 / *Code 01+code 02*		04

Artículo *Item*	Descripción *Description*	Referencia *Reference*
	Tapa de conexiones corta para NH-1/2/3 BTVC y BTVC-DT *Short connection cover for NH-1/2/3 BTVC & BTVC-DT*	4280410
	Salida auxiliar protegida *Slip on fuse*	4280810
	Maletín medida temporal (con tapas) para NH-1 BTVC y BTVC-DT *Temporary metering set suitcase (with fuse holders) for NH-1 BTVC & BTVC-DT*	42808119
	Maletín medida temporal (con tapas) para NH-2 BTVC y BTVC-DT *Temporary metering set suitcase (with fuse holders) for NH-2 BTVC & BTVC-DT*	42808100
	Maletín medida temporal (con tapas) para NH-3 BTVC y BTVC-DT *Temporary metering set suitcase (with fuse holders) for NH-3 BTVC & BTVC-DT*	42808102
	Protección frontal de embarrados: ancho 100mm con escuadras *Front cover for busbars: 100mm width with fixing brackets*	4150804
	Conjunto protección lateral izquierdo / derecho *Front cover for busbars: 100mm width*	4150807
	Conjunto protección lateral izquierdo / derecho *Protecting polyester strip left/right angle*	4150808S
	Micro-interruptor señalización abierto / cerrado *Micro-switch (open / closed indicator)*	1013406
	Base con control electrónico de fusión para BTVC y BTVC-DT *F5 fuse switch fuse supervision control for BTVC & BTVC -DT*	Referencia estándar + F5 *Standard fuse switch reference + F5*
	Tapa de conexiones con amperímetro para conjunto medida permanente para NH-1/2/3 BTVC y BTVC-DT *Top cover with maximeter for permanent metering set for NH-1/2/3 BTVC & BTVC-DT*	4280821

Bases tripolares verticales cerradas y bases de seccionamiento - TRIVER+
Vertical design fuse switches and disconnectors -TRIVER+

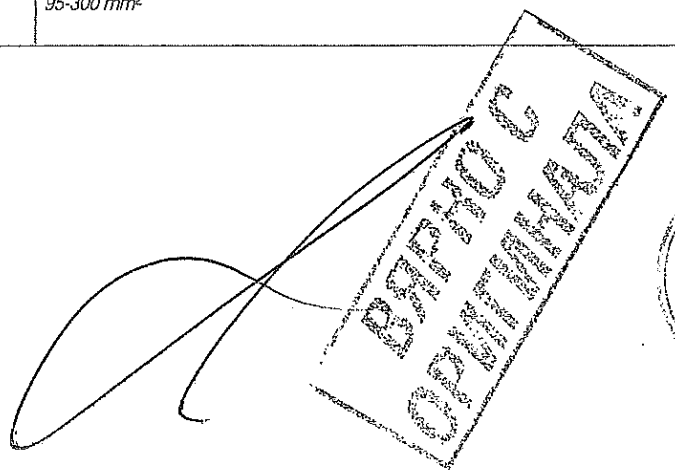
438

NH-1/2/3, 250/400/630 A; BTVC 910 A; BTVC-D 400/630/800/1260 A; BTVC-S 1000-2000 A
fuse switches NH-1/2/3, 250/400/630 A; BTVC 910 A; BTVC-D 400/630/800/1260 A; BTVC-S 1000-2000A

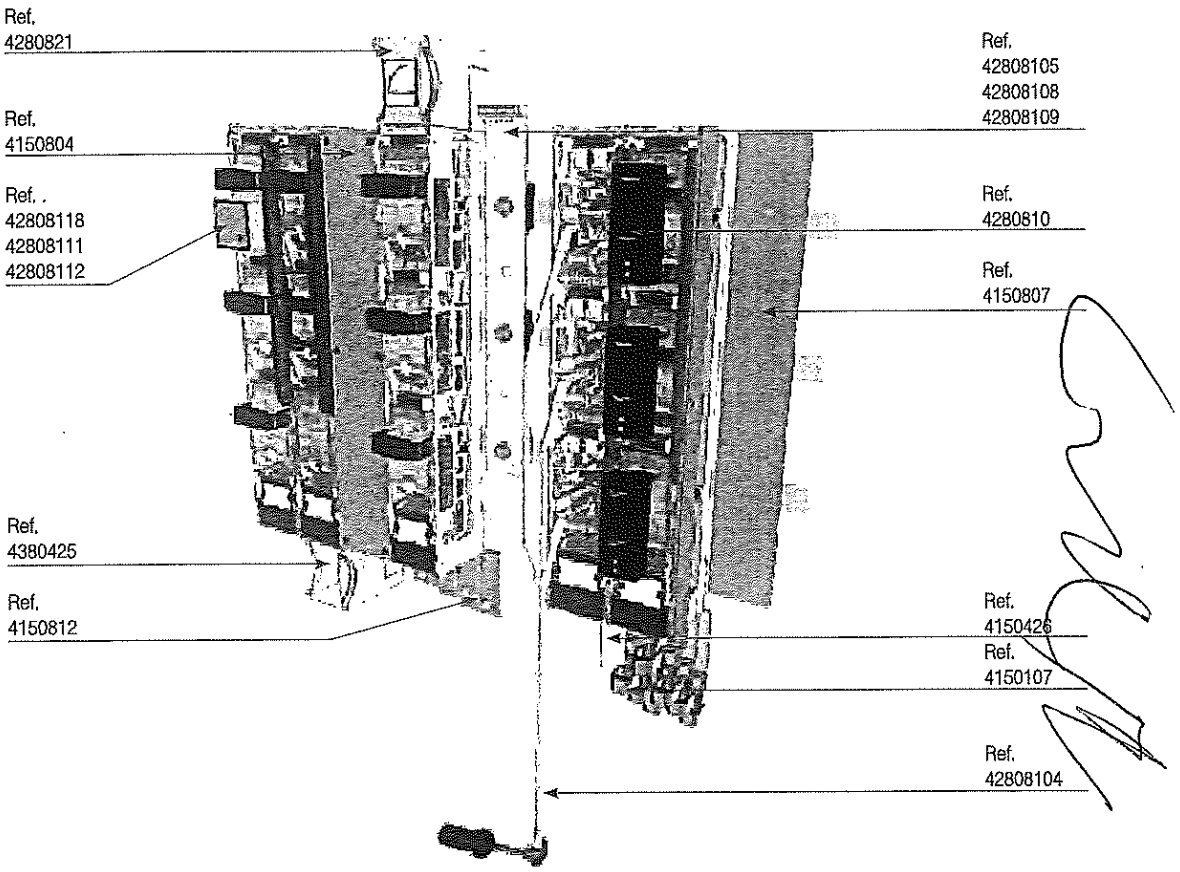
Artículo *Item*	Descripción *Description*		Referencia *Reference*
	Escuadra fijación protección frontal para NH-1/2/3 BTVC & BTVC-DT *Fixing bracket for front cover for NH-1/2/3 BTVC & BTVC-DT*		4150420
	Separador central para terminales de salida: 80 mm *Central barrier for outgoing terminals: 80 mm* Separador central para terminales de salida: 120 mm *Central barrier for outgoing terminals: 120 mm*		4150426
	Kit 3 pletinas salida para 3 tornillos M12 inoxidable por fase *Set of 3 adaptor plates to connect 3 cables lugs M12 stainless steel per phase*		4150126
	Kit 3 pletinas salida para 3 terminales en "V" por fase *Set of 3 adaptor plates to connect 3 V-terminals per phase*		4150107
	Caperuza protección terminal "V" *Insulating cover for V-terminal*		4380454
	Dispositivo de puesta a tierra NH-1/2/3 *Earthing device NH-1/2/3*		42808104
	Conjunto medida temporal (sin tapas) para BTVC y BTVC-DT *Temporary metering set (withouth fuse holders) for BTVC & BTVC-DT*	NH-1	42808118
		NH-2	42808111
		NH-3	42808112
	Conjunto medida permanente para BTVC y BTVC-DT *3 phase permanent metering set for BTVC & BTVC-DT*	250 A	42808105
		400 A	42808108
		630 A	42808109
	Cuchilla de seccionamiento NH-1 *Solid link for NH-1*		2400302
	Cuchilla de seccionamiento NH-2 *Solid link for NH-2*		2400402
	Cuchilla de seccionamiento NH-3 *Solid link for NH-3*		2400502
	Garra de fijación (3 unidades) *Hook-on clamp (set of 3)*		4150820
	Pletinas de adaptación para conectar dos cables de M12 inoxidable por fase *Adaptor plates to connect 2 cable lugs M12 stainless steel per phase*		4150812
	Pletinas en "V" para neutro *Plate for "V" Neutral link*		4280538
	Pletinas plana en "V" para neutro *Flat plate for "V" Neutral link*		4280547
	Kit para doble desconexión unipolar en BTVC-D (2 piezas x 3 polos = 6 piezas) *Kit for double one pole switching for BTVC-D (2 pieces x 3 poles = 6 pieces)*	100mm	4380801
		105mm	4380802
		110mm	4380803
	Tarjetero para terminal V doble. Referencia del accesorio sin marcado. Para tarjetero con marcado consultar referencia.. *Card holder for Double V-Terminals. Accessorie reference without marking. For Card holder including marking, consullt reference*		4280480

1518

Artículo *Item*	Descripción *Description*		Referencia *Reference*
	Soporte de embarrado 185mm, tripolar para embarrados perforados *Busbar support 185mm, 3 pole for drilled flat busbars*		4380811
	Soporte de embarrado universal 185mm, tripolar para embarrado sin perforar 30...120x10mm *Universal busbar support 185mm, 3 pole for undrilled flat busbars 30...120 x10 mm*		4380812
	Tapa para la protección del final del embarrado para referencia 4380812 *Cover, for busbar ends for reference 4380812*		4380813
	Transformador de intensidad para integrar en zócalo. Solo para bases especiales. *Current transformer to join in base board. Exclusive for special fuse switches.*	200/5, 1...3 VA 0,5 S	Consultar *Consult*
		300/5, 1...5 VA 0,5 S	Consultar *Consult*
		400/5, 1...5 VA 0,5 S	Consultar *Consult*
		600/5, 1...5 VA 0,5 S	Consultar *Consult*
		1000/5, 1...5 VA 0,5 S	Consultar *Consult*
	Terminal de conexión para embarrados 30 x 10, y conexión de cables 95-300 mm^2 *Connection terminal for busbars 30 x 10, and cable connection 95-300 mm^2*		4230812



1519



Ref. 4280821	Tapa de conexiones con amperímetro para conjunto medida permanente para NH-1/2/3 BTVC y BTVC-DT *Top cover with maximeter for permanent metering set for NH-1/2/3 BTVC & BTVC-DT*
Ref. 4150804	Protección frontal de embarrados: ancho 100mm con escuadras *Front cover for busbars: 100 mm width with fixing brackets*
Ref. 42808118	Conjunto medida temporal (sin tapas) para NH-1 BTVC y BTVC-DT *Temporary metering set (withouth fuse holders) for NH-1 BTVC & BTVC-DT*
Ref. 42808111	Conjunto medida temporal (sin tapas) para NH-2 BTVC y BTVC-DT *Temporary metering set (withouth fuse holders) for NH-2 BTVC & BTVC-DT*
Ref. 42808112	Conjunto medida temporal (sin tapas) para NH-3 BTVC y BTVC-DT *Temporary metering set (withouth fuse holders) for NH-3 BTVC & BTVC-DT*
Ref. 4380425	Tapa de conexiones para NH-1/2/3 BTVC y BTVC-DT / BTVC-S 400 / 630 A *Connection cover for NH-1/2/3 BTVC & BTVC-DT / BTVC-S 400/ 630 A*
Ref. 4150812	Pletinas de adaptación para conectar dos cables de M12 inoxidable por fase *Adaptor plates to connect 2 cable lugs M12 stainless steel per phase*

Ref. 42808105	Conjunto medida permanente para BTVC y BTVC-DT 250 A *3 phase permanent metering set for BTVC & BTVC-DT 250 A*
Ref. 42808108	Conjunto medida permanente para BTVC y BTVC-DT 400 A *3 phase permanent metering set for BTVC & BTVC-DT 400A*
Ref. 42808109	Conjunto medida permanente para BTVC y BTVC-DT 630 A *3 phase permanent metering set for BTVC & BTVC-DT 630A*
Ref. 4280810	Salida auxiliar protegida *Slip on fuse*
Ref. 4150807	Protección frontal de embarrados: ancho 100mm fijación al embarrado con tornillos nylon *Front cover for busbars: 100 mm width with nylon bolts for busbar fixing*
Ref. 4150426	Separador central para terminales de salida *Central barrier for outgoing terminals*
Ref. 4150107	Kit 3 pletinas salida para 3 terminales en "V" por fase *Set of 3 adaptor plates to connect 3 V-terminals per phase*
Ref. 42808104	Dispositivo de puesta a tierra NH-1/2/3 *Earthing device NH-1/2/3*

Bases de seccionamiento tripolares verticales cerradas BTVC-S NH-3 y dobles BTVC-DS NH-3

438

Vertical design disconnectors BTVC-S NH-3 and BTVC-DS NH-3

IEC / EN 60947-3		Tipo / *Type* →	BTVC / BTVC-DS Tipo / *Type* 438			
			400 A	630 A	1000 A	2000 A
Datos eléctricos *Electrical characteristics*	Tensión asignada de empleo *Rated operational voltage*	U_e (V)	AC 500 / AC 690			
	Intensidad asignada de empleo *Rated operational current*	I_e (A)	400	630	1000	2000
	Intensidad térmica convencional al aire libre con fusibles *Conventional free air thermal current with fuses*	I_{th} (A)	400	630	1000	2000
	Frecuencia asignada *Rated frequency*	(Hz)	40 - 60			
	Tensión asignada de aislamiento *Rated insulation voltage*	U_i (V)	1000			
	Intensidad asignada de cortocircuito condicional *Rated conditional short-circuit current*	(kA_{eff})	11 *(2)			
	Categoría de empleo *Utilization category*	–	AC-20B	AC-20B	AC-20	AC-20B
	intensidad asignada de cierre *Rated making capacity*	(A)	-	-	1500	-
	intensidad asignada de corte *Rated breaking capacity*	(A)	-	-	1500	-
	Tensión asignada de resistencia a los impulsos *Rated impulse withstand voltage*	U_{imp} (kV)	20			
	Potencia disipada sin fusibles *Total power loss at I_{th} (without fuse)*	P_v (W)	52	98	280	600
Datos mecánicos *Mechanical characteristics*	Peso *Weight*	(kg)	5,430	6,240	9,316	20,010
	Distancia de embarrado *Busbar distance*	(mm)	185			
	Panel frontal *Panel front opening*	(mm)	600/650			
Cuchilla *Solid link*	Tamaño según CEI / EN 60269 *Size to CEI / EN 60269*	–	2	3		
	Intensidad asignada máxima *Max. rated current*	I_n (A)	400	630	1000	

Bases de seccionamiento tripolares verticales cerradas BTVC-S NH-3 y dobles BTVC-DS NH-3

438

Vertical design disconnectors BTVC-S NH-3 and BTVC-DS NH-3

IEC / EN 60947-3			Tipo / *Type* →	BTVC / BTVC-DS Tipo / *Type* 438 400 A	630 A	1000 A	2000 A
Terminales *Terminals*		Diametro *Diameter*	–	M10/M12		M12	
	Terminal de tornillo *Bolt terminal*	Terminal de compresión (S/DIN 46235) *Cable lug (S/DIN 46235)*	(mm²)	2x25-300		2x95-300	4x95-300
		Par de apriete *Torque*	(Nm)	32			
Grado de protección *Protection degree*	Frontal *Front operated switchgear fitted*		–	IP30			
Condiciones de servicio *Operating Conditions*	Temperatura de ambiente *Ambient temperature*		(°C)	de -25 hasta +55 *(1) / *-25 to +55 *(1)*			
	Servicio asignado *Rated operating mode*		–	Ininterrumpido *continuous operation*			
	Maniobra *Actuation*		–	manual dependiente *dependant manual operation*			
	Altitud *Altitude*		(m)	hasta 2000 / *up to 2000*			
	Grado de contaminación *Pollution degree*		–	3			
	Categoría de sobretensión *Overvoltage category*		–	IV			

*(1) 35° C temperatura media, a 55° C con intensidad asignada de empleo reducida / **(1) 35°C normal temperature, at 55°C with reduced operating current*

*(2) 25kA con accesorio especial / **(2) 25KA with special accesory*

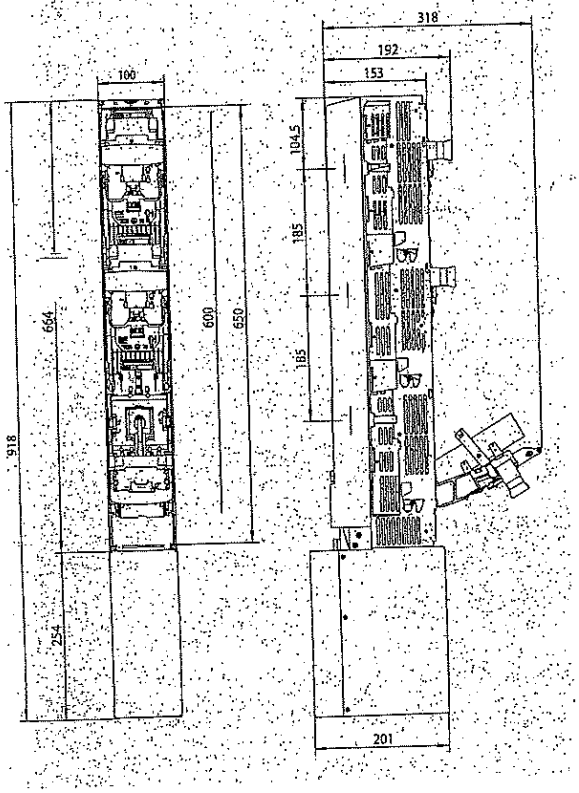
1522

438 Type / Typ
1000|2000

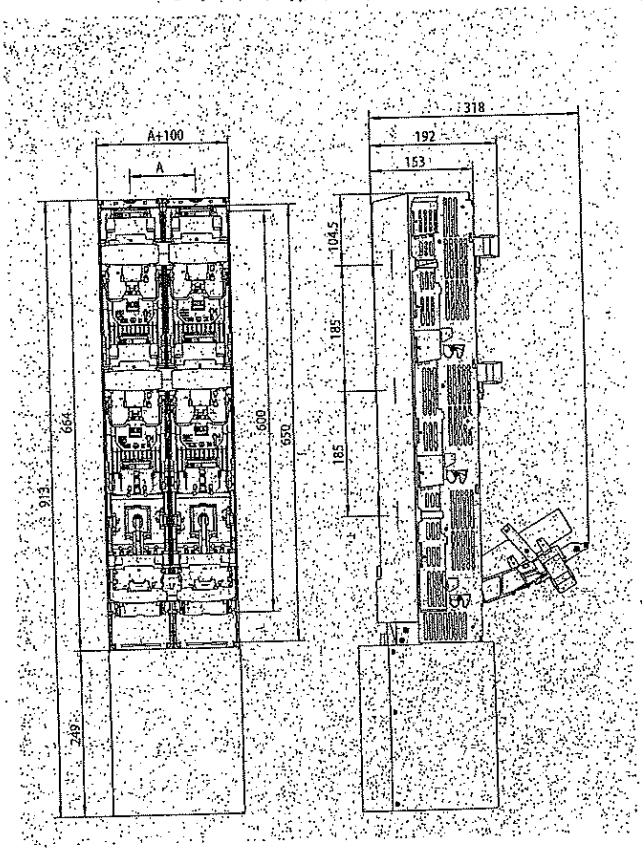
Switch disconnector able to withstand High Short circuit currents
NH-trennleiste mit erhöhter Kurzschlussfestigkeit (BTVC-S/BTVC-DS/BTVC-SDT)

mensions / Abmessungen

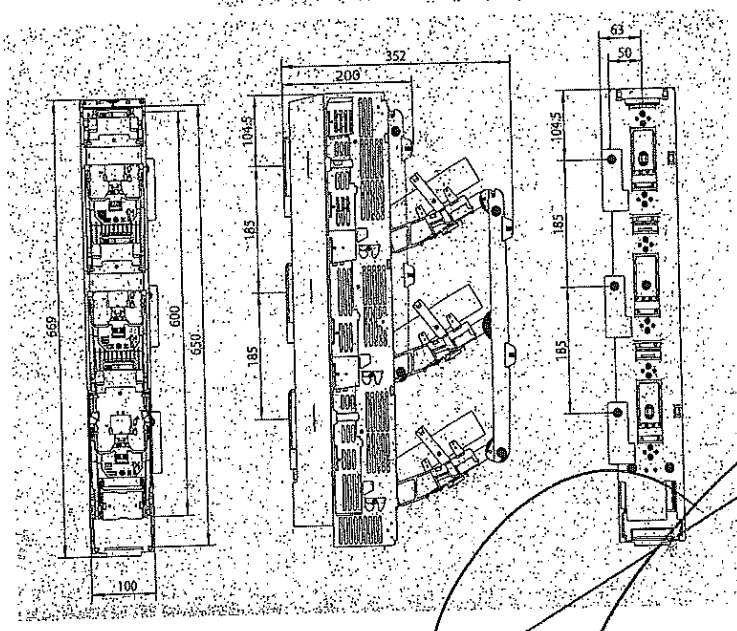
BTCV-S 1 pole disconnection
BTVC-S 1-polig-schaltbar



BTCV-DS 1 pole disconnection
BTVC-DS 1-polig-schaltbar



BTCV-SDT 2 handles
BTVC-SDT 2-hand-betrieben



Width A / Breite A
100 mm
105 mm
110 mm

...inge / Produktpalette: Page / Seite 59

1523

Списък на отделните изпитвания на български език

Изследван образец:

Вертикален разединител с предпазители от типа BTVC 1000A ,400V a.c.,50Hz
триполюсен размер 3

Производител:

Pronutec S.A. , Испания

Изпълнени тестове съгласно IEC/EN 60947-3; IEC 60947-1)

1) Проверка на конструкцията
2) Тест за повишаване на температурата –проверка на нагряването
3) Проверка на диелектричните свойства
4) Проверка на включвателна и изключвателна способност
5) Проверка на оперативна ефективност
6) Проверка на тока на термична устойчивост Icw
7) Проверка на включвателна възможност (върхова) Icm

1

Accredited by BMWA with GZ: 92714/237-IV/9/00 as test- and inspection body
and with BGBl. II Nr. 244//2005 as certification body for personnel

AUSTRIAN INSTITUTE OF TECHNOLOGY

Test Report

Project Designation

TYPE TEST
AT LOW-VOLTAGE
SWITCH-DISCONNECTOR
TYPE BTVC-S:

- 400V a.c. up to 690V a.c. / 1000A / size 3
- single pole operated three pole device
- 185mm busbar system

Client

PRONUTEC S.A.
Parque Empresarial Boroa
Parcela 2c-1
E-48340 Amorebieta – VIZCAYA
SPAIN

Order from / No. 01/2011 / ---

Project Number 2.03.02216.1.0/BTVC-S/size3/1p-operated/185 Test Engineer Ing.J.Ainetter

Date of issue	29.03.2011
Total number of issues / No.	1 / 1
Number of pages	18
Annex: Number of pages	---

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1524