Приложение 5; 6; 7

ОДОБРИЛ: УПРАВИТЕЛ:	**ОБЯСНИТЕЛНА ЗАПИСКА И ТЕХНИЧЕСКО ОПИСАНИЕ** БЕТОННИ КОМПЛЕКТНИ ТРАНСФОРМАТОРНИ ПОСТОВЕ 20(10)/0,4 kV ТИП БКТП	PS ELECTRIC **ФС-БКТП**

1. ОБЩИ ПОЛОЖЕНИЯ

Обяснителната записка и техническо описание се отнася за бетонните монолитни комплектни трансформаторни постове 20(10)/0,4 kV тип "БКТП" и определя областта на приложение, техническите изисквания, методите на изпитване, оценяването на съответствието и изискванията за безопасност при транспортирането и монтажа , указания за монтаж и експлоатация.

Бетонните комплектни трансформаторни постове 20(10)/0,4 kV тип "БКТП" са производство на "ПС електрик" ООД гр. Шумен и са разработени съгласно изискванията на Процедура с РЕФ. № PPD 15-042 „Доставка и монтаж на бетонни комплектни трансформаторни постове/БКТП/ на територията на „ЧЕЗ Разпределение България" АД" от 2015 год. на ЧЕЗ България ЕАД за доставка на бетонни комплектни трансформаторни постове /БКТП/.

Приложението на бетонните комплектни трансформаторни постове 20(10)/0,4 kV за конкретни обекти става с инвестиционни проекти, като се спазват изискванията на ЗУТ и съответните наредби към него, на Наредба № 3 за устройството на електрическите уредби и електропроводните линии и на Наредба № 2 за Противопожарните строително-технически норми.

1.1. ОПИСАНИЕ

Бетонните комплектни трансформаторни постове 20/0,4 kV (наричани по-нататък за краткост само "БКТП") представляват готова за работа бетонна комплектна разпределителна уредба, пригодена за пренасяне и монтиране на избрания терен и комплектована с необходимото електрооборудване.

В БКТП са обособени три съставни единици – разпределителна уредба средно напрежение (РУСрН) 20 kV, трансформатор и разпределителна уредба ниско напрежение (РУНН).

БКТП позволяват бързо и лесно монтиране върху предварително подготвена пясъчна възглавница в изкоп според приложените чертежи. Стоманобетоновата конструкция има необходимата якост и притежават добра антикорозионна защита, която осигурява дълъг експлоатационен срок. БКТП се вписва добре в околното пространство.

Строителната конструкция на БКТП е негорима. Съставните материали на строителната конструкция и обзавеждането са физиологически безвредни.

1.2. ОБЛАСТ НА ПРИЛОЖЕНИЕ

БКТП са предназначени за захранване с електрическа енергия на жилищни, обществени, производствени и селскостопански сгради и комплекси. Предвидени са за монтаж на открито, като самостоятелно разположени сгради.

Осигуряват трансформиране на захранващото напрежение от 10 kV или 20 kV на 0,4/0,231 kV, 50 Hz и разпределянето й към консуматорите.

БКТП са предвидени за продължителен режим на работа в условия на нормален климат.

2. ТЕХНИЧЕСКИ ХАРАКТЕРИСТИКИ И ИЗИСКВАНИЯ

2.1. Техническите характеристики на БКТП осигуряват приложението им при:

2.1.1. Нормален климат (N) и следните условия: температура на околната среда не повече от -25 °C до + 40 °C, като средната й стойност за 24 часа не трябва да бъде повече от 35 °C; относителна влажност на въздуха до 100% (дъжд); надморска височина – до 2000 m;

2.1.2. Отсъствие на токопроводими прахове, активни газове и пари;

2.1.3. В среда с нормална пожаро- и взривоопасност;

2.1.4. В сеизмични райони – IX степен, съгласно НПССЗР.

2.2. По отношение на основните си функции БКТП съответстват на Наредба № 3 за устройство на електрическите уредби и електропроводните линии; Наредба № 2 за Противопожарните строително-технически норми; Правилник за безопасност и здраве при работа в електрически уредби на електрически и топлофикационни централи и по електрически мрежи.

2.4. Степен на защита на обвивката на БКТП – IP-43 B, съгласно БДС EN 60529;

2.5. Неразделна част от настоящата техническа спецификация са проектните документации на част "Архитектурна; част "Конструктивна; част "Електро".

2.6. Присъединяването на БКТП на страна СрН и на страна НН е чрез кабели, които влизат/излизат през отвори в подземната част на конструкцията.

2.7. Основното електрообзавеждане на МКТП е:

– за РУСрН - КРУ SF6 – мощностни разединители и шини във среда от елегаз.

за силовия трансформатор – трансформатор маслен, херметичен.
Кабелите СрН са тип NA2XS(F)2Y 3x1x50 mm2. Свързването на кабела към КРУ е чрез съответни щепселни адаптори, а към изолаторите на трансформатора - с кабелни глави изпълнени по термосвиваема технология

Проводниците НН са тип NYY-0 с брой на жилата на фаза в зависимост от мощността на монтирания трансформатор;

– за РУНН – разпределително табло с главен автоматичен прекъсвач с електронна регулируема защита и номинален ток, съответстващ на номиналния вторичен ток на трансформатора; токови трансформатори; регистрираща апаратура; място за монтаж на индиректен електромер и изводи, изпълнени с вертикални разединители с предпазители.
Нулевата шина е със сечение като на фазовите, окомплектована с V-образни клеми.

Таблата са за долно електрическо свързване на изходящите кабели и са окомплектовани със скоби за неподвижно прикрепване на кабелите в долната част.;

2.8. Конструкция

Бетонният корпус е изпълнен от бетон С30/37, с добавка за водоплътност Sika ViscoCrete-5.

Предвидено е БКТП да бъде монтирано в изкоп върху трамбована пясъчна възглавница до ниво -0,8 м от кота "Готова настилка". След поставянето съоръжението се нивелира и се демонтират такелажните приспособления. Преди да се изпълни обратният насип, се изработва външният заземителен контур, който се свързва с БКТП. След изпълнение на обратния насип се оформя настилката около БКТП.

Във фундамента са предвидени отвори с кабелни преходи HSI-150 за входящите и изходящи кабели СрН и НН. Под ниво -0,8 м външно и вътрешно е нанесено хидроизолационно покритие Sikalastic-450. В маслосборната яма (трафопомещението) под ниво -0,5м е нанесено маслоустойчиво покритие Епизол.

Стените на БКТП са бетонни. Предвидени са и два отвора за включване на резервен генератор, затворени отвън с пластмасови капаци, с монтирани приспособления за отваряне само отвътре. На челната страна на БКТП на височина 1.8 m от терена са оставени отвори за монтиране на външните светлоизточници на системата за индикация на къси и земни съединения.

Вратите са изпълнени изцяло от анодиран (елоксиран) алуминий със сребристо-бял цвят. Пантите са с висока механична якост и устойчива на износване. Конструкцията на корпуса, вратите и системата за вентилация на съоръжението осигурява сигурна защита на стените и тавана от конденз.

Вентилационните решетки са защитени от проникването на птици, гризачи и влечуги и не позволяват проникване с тел или друго приспособление до части под напрежение Вратите на отделните отсеци се оборудват с брави с възможност за монтаж на секретен патрон.

Всички съоръжения са заземени чрез общ вътрешен заземителен контур. Заземителният контур е изпълнен съгласно изискванията на Наредба № 3 за устройство на електрическите уредби и електропроводни линии и Наредба № 9 за техническата експлоатация на електрически мрежи и централи. Между корпуса и вратите има електрическа връзка чрез гъвкав заземителен проводник.

Предвидено е място за присъединяване на вътрешния към външния заземителен контур. Местата за присъединяване на преносими заземители са обозначени.

БКТП има вътрешно осветление включващо се чрез крайни изключватели при отваряне на вратите.

За всички части на съоръжението се използват качествени стандартни материали, които не замърсяват околната среда. За същите доставчикът представя сертификати или декларации за съответствие.

2.9. При разработката и изпълнението на БКТП са приложени изискванията на действащите стандарти и нормативни документи:

- Наредба № 3 от 09.06.2004 год. за устройство на електрическите уредби и електропроводни линии;

- Наредба № 9 за техническата експлоатация на електрическите централи и мрежи;
- Правилник за безопасност и здраве при работа в електрически уредби на електрически и топлофикационни централи и по електрически мрежи;
- Наредба № 4 за техническа експлоатация на енергообзавеждането;
- Наредба № 2 Противопожарни строително-технически норми;
- БДС EN 62271-202:2007 „Комутационни апарати за високо напрежение. Част 202: Комплектни подстанции за високо /ниско напрежение изработени в заводски условия";
- БДС 10699-80 "Подстанции трансформаторни комплектни за общо предназначение до 20 кV. Общи технически изисквания";
- БДС EN 60439 "Комплектни комутационни устройства за ниско напрежение"
- БДС IEC 60364 "Електрически уредби в сгради";
- БДС EN 60694 "Общи технически изисквания за стандартите за комутационните апарати за високи напрежения".
- БДС EN 60947 "Комутационни апарати за ниски напрежения"

3. МЕТОДИ ЗА ИЗПИТВАНЕ

Всяко произведено БКТП се изпитва по следната програма:

3.1. външен преглед за съответствие с работния проект и за комплектност;

3.2. външен преглед за спазване изискванията на производителите за монтаж на комплектоващите елементи (КРУ, прекъсвачи, предпазител-разединители, измервателни трансформатори и пр.) и на качеството на електрическите връзки.

3.3. външен преглед на средствата за защита – прегради за защита срещу директен допир до части под напрежение, блокировки, заземителни клеми, предупредителни табели и пр.;

3.4. проверка съпротивлението на изолацията на кабелите;

3.5. проверка съпротивлението на изолацията на изводи НН в РУНН;

3.6. проверка непрекъснатостта на заземителните проводници.

Методите на изпитване и нормените стойности на комплектоващите елементи на електрообзавеждането на БКТП са съгласно документациите на техните производители, а за готовите БКТП са съгласно БДС 10699-80 т.5 "Контролни изпитания".

4. ПРАВИЛА ЗА ПРИЕМАНЕ И ОЦЕНЯВАНЕ НА СЪОТВЕТСТВИЕТО

4.1. Производството на всяко БКТП се извършва по работен проект.

4.2. За осигуряване на съответствието с основните изисквания на т.2 е разработена и се поддържа система за производствен контрол, като част от системата за оценяване на съответствието на БКТП.

4.3. В системата за производствен контрол се включва и контролът на производството на бетонният корпус.

4.4. Системата за производствен контрол включва следните основни елементи:

4.4.1. входящ контрол на съществените показатели на съставните продукти (строителни материали оборудване и пр.), като се обръща особено внимание на:

- продуктите за бетон (цимент, пясък, чакъл, добавки и др.), продуктите за армировка и за изолация;
- електрическото оборудване;
- на вносните градивни елементи – следене и водене на регистър на сертификатите на производителите им и др.

4.4.2. Контрол по време на производството – спазване на технологичните карти, рецептури, инструкции.

4.4.3. Контрол на показателите на готовото изделие, като всяко произведено БКТП се проверява от инспектор по качеството на производствените процеси за изпълнение на основните изисквания, определени в т.2 и при спазване на програмата по т.т. 3.1, 3.2 и 3.3.

4.4.4. При изпълнението и приемането на строително-монтажните работи се спазват:

- за бетонният корпус – Наредба № 3 за контрол и приемане на бетонни и стоманобетонни конструкции;
- за електромонтажните работи – Правилник за приемане на електромонтажните работи, в частта, която се отнася за БКТП.

4.4.5. Произведеният от подизпълнител бетонен корпус се представя на Главния изпълнител с приемно-предавателен протокол, към който е приложен протокол за изпитването на бетона от акредитирана лаборатория. Това приемане е елемент от системата за производствен контрол.

4.5. Качеството на изпълнените електромонтажни работи за всяко произведено БКТП се проверява по т. 3.4 и т. 3.5 и се доказва с протоколи от акредитирана за такава дейност лаборатория.

4.6. Въз основа на вътрешния производствен контрол и протоколите от акредитираните лаборатории за изпитванията по т. 4.4.5 и т. 4.5 за всяко произведено БКТП се издава декларация за съответствие, която съдържа най-малко:

- наименованието и адреса на производителя – "ПС електрик" ООД – гр. Шумен, 9700 бул. "Мадара" № 12, телефон 054/874 499, факс 054/874 500;
- наименование на потребителя и на обекта;

- означението на БКТП, съгласно изработения вариант и фабричния номер (номер на поръчката);
- нормативните актове и техническите спецификации, на които съответства;
- указания за проектиране, изпълнение и експлоатация;
- номерата и датите на издадени протоколи от изпитване и на ЕО сертификати;

4.7. Производителят поема отговорност за качеството на всяко произведено БКТП. Гаранционните срокове са:

- за строителната конструкция и антикорозионните покрития – 10 години, съгласно ЗУТ;
- за всички останали строителни и монтажни работи – 5 години, съгласно ЗУТ;
- за електрообзавеждането – най-малко 12 месеца.

4.8. Всяко БКТП се предава на Възложителя с приемно-предавателен протокол.

5. ОПАКОВКА И МАРКИРОВКА

5.1. Напълно завършено в архитектурно-конструктивно отношение и комплектовано с електрооборудването БКТП се заключва и се подготвя за транспортиране, като не се предвижда специално опаковка.

5.2. На всяко БКТП се поставя фирмена табела, по образец;

5.3. На всяко БКТП се поставят предупредителни табели, надписи и знаци, изисквани от нормативните документи по безопасност при работа;

6. ТРАНСПОРТ И СЪХРАНЕНИЕ

6.1. Транспортирането на БКТП се извършва с подходящи открити транспортни средства, като се отчитат габаритните им размери и масата им. Повдигането и поставянето в транспортното средство се извършва посредством автокран, като се предвижда съответното сигурно фиксиране и закрепване на съоръжението върху транспортното средство чрез транспортни колани и др. На местоназначението БКТП се сваля с автокран.

6.2. БКТП могат да се съхраняват на открити охранявани площадки.

6.3. При транспортирането и складирането се вземат мерки за предпазване от повреди, кражби и други посегателства върху целостта на съоръжението.

7. БЕЗОПАСНОСТ НА ТРУДА И ЕКОЛОГИЯ

7.1. При монтажа и инсталирането, както и при извършването на останалите видове строително-монтажни работи на местостроежа е необходимо да се спазват изискванията на Наредба № 2 за минималните изисквания за здравословни и безопасни условия на труд при извършване на СМР. При транспортирането се вземат необходимите мерки за безопасност, като се отчитат масата и габаритните размери на съоръжението.

7.2. За безопасна експлоатация на БКТП се изпълняват изискванията на Правилник за безопасност и здраве при работа в електрически уредби на електрически и топлофикационни централи и по електрически мрежи.

7.3. БКТП не създават вредни излъчвания и опасности за хората и увреждане на околната среда.

8. УКАЗАНИЯ ЗА ПРОЕКТИРАНЕ

8.1. Приложението на БКТП за конкретни обекти става с инвестиционни проекти, които са задължение и се изпълняват от Възложителя (Инвеститора). При изготвяне на проектите, тяхното съгласуване и даването на строително разрешение е задължително спазването на ЗУТ и наредбите към него, Наредба № 2 за Противопожарните-строително технически норми и Наредба № 3 за устройство на електрическите уредби и електропроводните линии.

9. МОНТАЖ НА МЕСТОСТРОЕЖА И ВЪВЕЖДАНЕ В ЕКСПЛОАТАЦИЯ

9.1. БКТП се монтира в изкоп с размери, съгласно приложените конструктивни проекти.

9.2. Монтажните операции на строителната конструкция са:

- изготвяне на пясъчна възглавница до ниво -0,8 м от кота "Готова настилка";
- след поставянето в изкопа, съоръжението се нивелира и се демонтират такелажните приспособления.

9.3. Монтажните операции на електрообзавеждането са:

- присъединяване на изходящите кабели за мрежово захранване СрН и НН;
- изпълнение на външна заземителна инсталация, преходното съпротивление на която не трябва да надвишава 4 ома;
- присъединяване на вътрешната заземителна инсталация към външния заземителен контур с лентовидна горещо поцинкована стомана с размери 40х4;
- проверка на електрическите връзки и при необходимост да се притегнат;
- проверка за наличието и целостта на изискваната маркировка – предпазни табели, знаци, цветова маркировка, надписи и др.;

9.5. След изпълнение на обратния насип се оформя настилката около БКТП.

9.6. След инсталирането се извършват предпускови електролабораторни измервания на електрическата част – кабели СрН, кабели НН и преходното съпротивление на заземителната инсталация.

9.7. Съгласно изискванията на Наредба № 2 за Противопожарните строително-технически норми Възложителят следва да съоръжи БКТП със следните противопожарни уреди:

- прахов пожарогасител 12 кг - 1 броя;
- пожарогасител с CO2 - 1 броя;

Приемането и въвеждането в експлоатация на БКТП става при спазване изискванията на ЗУТ и Наредба № 6 за разрешаване ползването на строежите в Република България.

10. ЕКСПЛОАТАЦИЯ И ПОДДРЪЖКА

10.1. Техническата експлоатация на БКТП се извършва при спазване изискванията на Наредба № 16-116 от 08.02.2008 год. за техническа експлоатация на енергообзавеждането или съответно на Наредба № 9 за техническата експлоатация на електрически централи и мрежи, съобразно това, чия собственост е съоръжението.

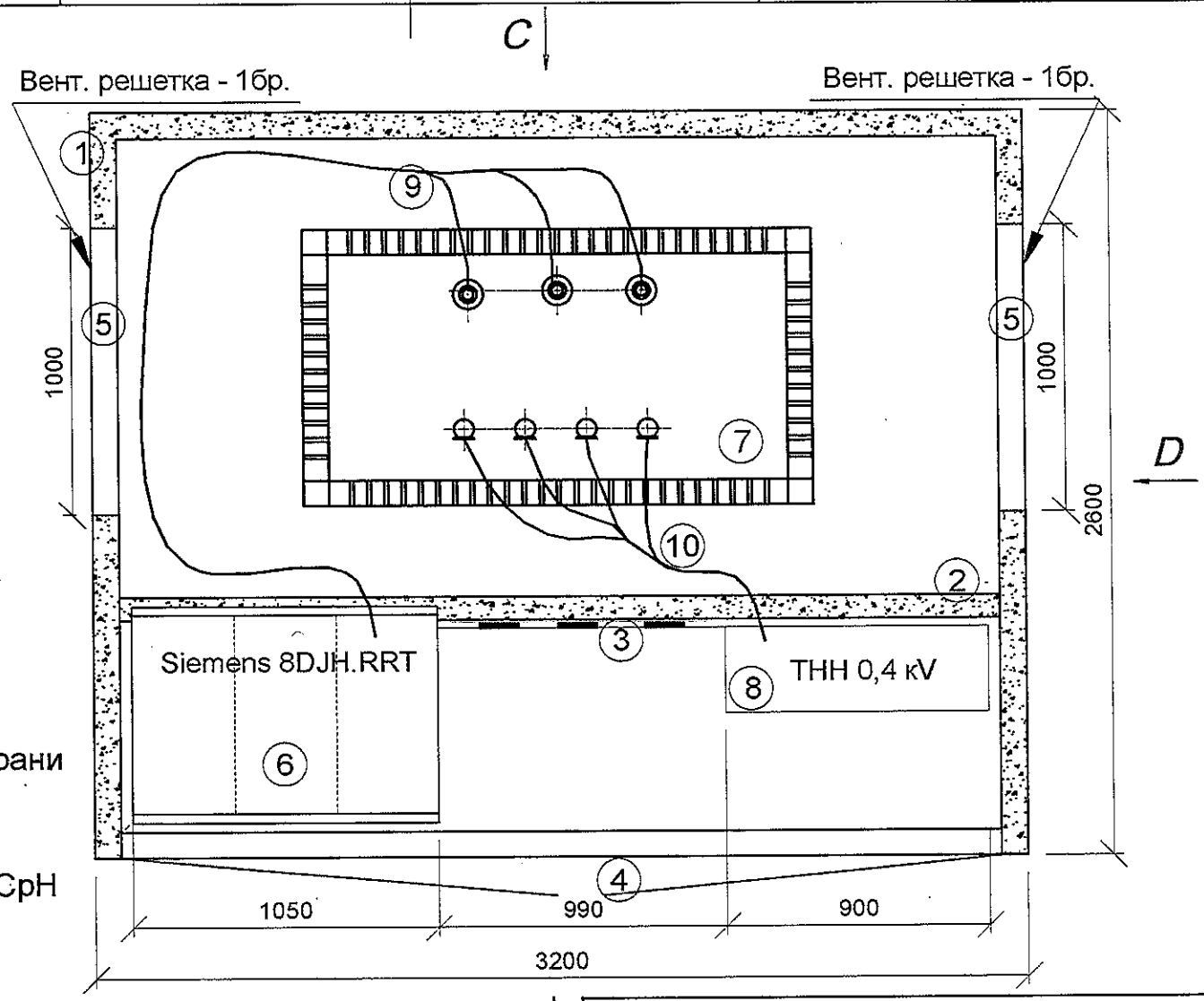
10.2. Периодично се извършват прегледи за състоянието на съоръжението, в срокове, съгласно изискванията на цитираните в предходната точка нормативни документи. Констатираните повреди или неизправности се отстраняват своевременно.

10.3. При експлоатацията на БКТП е необходимо да се спазват изискванията на действащите норми за безопасност и здраве при работа и за пожарна безопасност.

10.4. При правилна експлоатация и редовна поддръжка, съоръжението има дълъг експлоатационен срок – над 50 години.

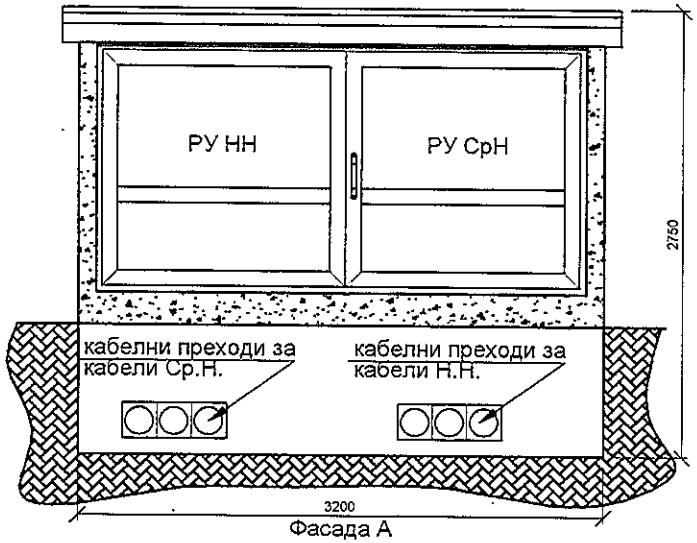
11. ДОКУМЕНТАЦИЯ

11.1. За всяко БКТП на Възложителя се предоставят:
11.1.1. По три проекта: архитектурни проекти, съдържащи разпределение, разрез и фасади; конструктивна част – монтаж в изкопа; част електро -еднолинейна електрическа схема, разпределение и разрез, осветителна и вътрешна заземителна инсталация;
11.1.2. Декларация за съответствие в 2 екземпляра;
11.1.3. Свидетелство за качество в 2 екземпляра.
11.1.4. Инструкция за монтаж и експлоатация в 2 екземпляра.
11.1.5. Гаранционна карта в 2 екземпляра.
11.1.6. Сертификати за контрол, издадени от сертифициран орган за контрол;
11.1.7. Инструкция за работа с КРУ.
11.1.8. Изпитателни протоколи на токовите трансформатори;
11.1.9. Тестови протоколи с резултати от проверките на КРУ;
11.2. При поискване от страна на Възложителя, Производителя може да предостави и други данни от техническата документация на БКТП и/или допълнителни указания за прилагане на съоръжението.

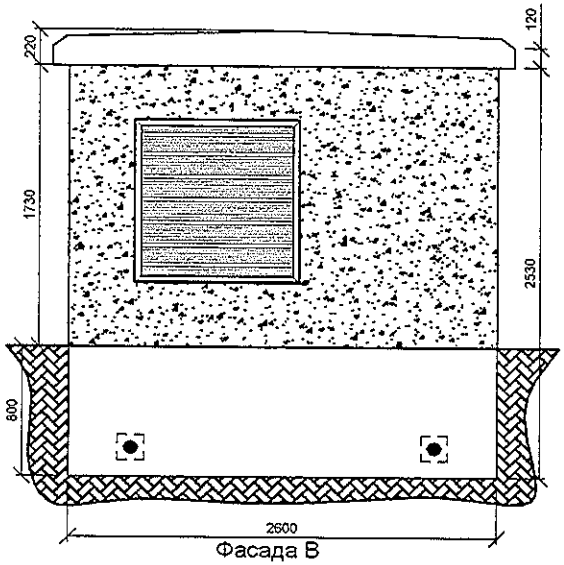


1. Бетонен корпус - монолитен
2. Стоманобетонна стена
3. Предпазна мрежеста врата
4. Врати - алуминиеви елоксирани
5. Вентилационна решетка
6. Разпределителна уредба - СрН
7. Трансформатор
8. Табло ниско напрежение
9. Кабел 20 kV
10. Кабел НН

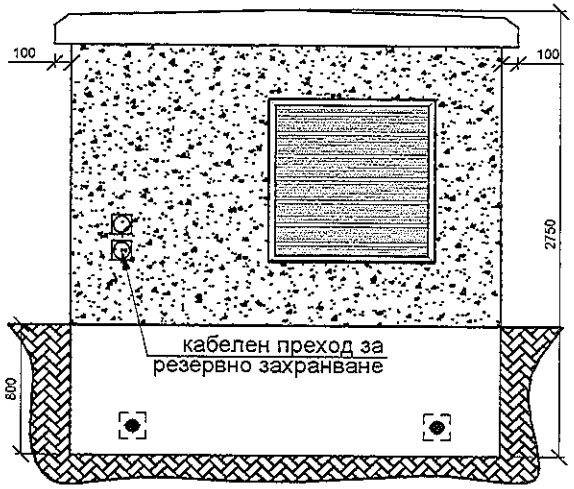
PS ELECTRIC	"ПС електрик" ООД, Шумен
ВМ 01 ЕО 20(10)/0.4 kV 1x800 kVA	
Разпределение	



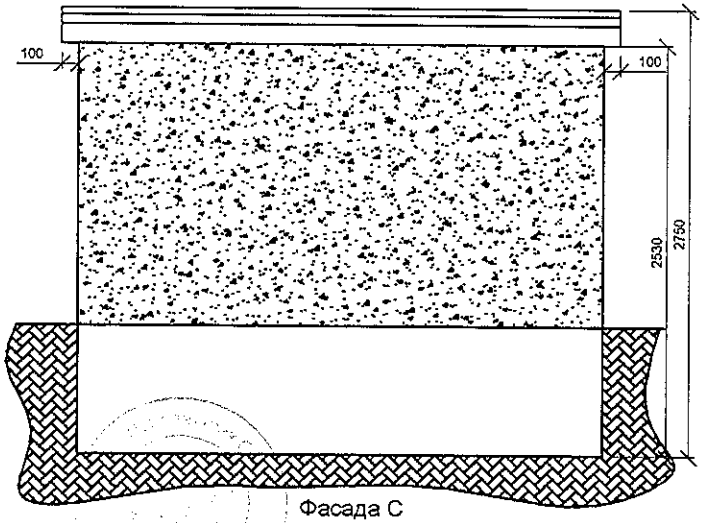
Фасада А



Фасада В

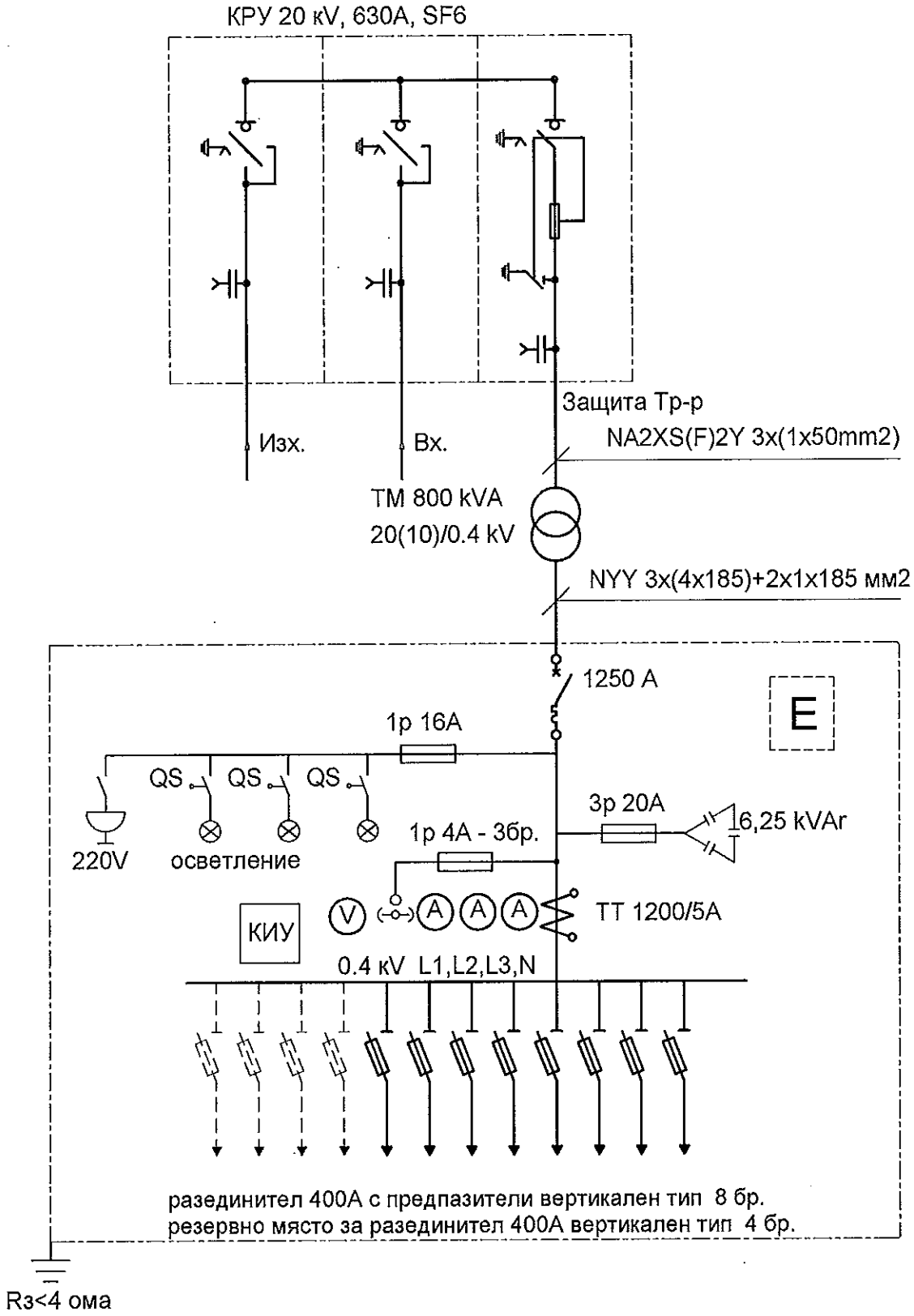


Фасада D



Фасада С

PS ELECTRIC "ПС електрик" ООД, Шумен	
ВМ 01 ЕО 20(10)/0.4 kV 1x800 kVA	
ФАСАДИ	



PS ELECTRIC	"ПС електрик" ООД, Шумен
ВМ 01 ЕО 20(10)/0.4 kV 1x800 kVA	
Еднолинейна схема	

Приложение 8

RESEARCH-DEVELOPMENT AND TESTING NATIONAL
INSTITUTE FOR ELECTRICAL ENGINEERING
ICMET CRAIOVA
HIGH POWER DIVISION

HIGH POWER LABORATORY
"Ovidiu Rarinca"
200746-CRAIOVA, Blvd. DECEBAL No. 118A, ROMANIA
Matriculation certificate: J16/312/1999, VAT number RO387 1599
Phone: (351) 402 427; Fax: (251) 415482; (351) 404 890;
E-mail: lhp@icmet.ro

acreditat pentru
ÎNCERCARE
RE
SR EN ISO/CEI 17025:2005
CERTIFICAT DE ACREDITARE
nr. LI 004/2010

TEST REPORT
No. 11202

CUSTOMER: **"PAVEL and SONS electric" Ltd**
12 Madara Blvd. 9700 Shumen, Bulgaria

MANUFACTURER: **"PAVEL and SONS electric" Ltd**
12 Madara Blvd. 9700 Shumen, Bulgaria

TESTED PRODUCT: 20/0.4 kV, 1250 kVA Prefabricated Transformer Substation

REFERENCE STANDARD: IEC 62271-202/2003, Annex A

TEST PERFORMED: Internal arc test

TEST DATE: 29.07.2011

TEST RESULT: Passed the test

Test Report has 17 pages and it is edited in 4 copies from which copy 1 for laboratory and copies 2, 3 and 4 for customer.

HEAD OF HIGH POWER DIVISION:
Dr. Eng. George Curcanu

ICMET
LABORATORUL
* DE MARE PUTERE *
"OVIDIU RARINCA"
CRAIOVA

HEAD OF LABORATORY:
Eng. Constantin Iancu

ВЯРНО С
ОРИГИНАЛА

DATE OF ISSUE: 05.08.2011

1. Results refer to test product only.
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Content

1.	Identification of the tested product	3
2.	Technical characteristics established by producer	3
3.	Tests program	3
4.	Responsible for tests	3
5.	Present at the tests	3
6.	Test report documentation	3
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8.	Internal arc test	4
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	Technical specification	9
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	Oscillograms	15

ВЯРНО С ОРИГИНАЛА

1. IDENTIFICATION OF THE TESTED PRODUCT

	Substation	MV Switchgear (RMU Siemens)
Type	CCTS 20/0.4 kV/1x1250 kVA	8DJH RRT
Serial number/year	11319/2011	CV 815242-000040/002/2011 for IAC-A CV 815242-000040/001/2011 for IAC-B
Technical specification	See pages 9 and 10	
Drawing	See pages 11 to 14	
Contract No.	705.2/8520/03.05.2011	
Product receiving date	29.07.2011	
Product condition at receiving	New	

2. TECHNICAL CHARACTERISTICS ESTABLISHED BY PRODUCER

	Substation	MV Switchgear
Rated power	1250 kVA	-
Rated voltage	20/0.4 kV	24 kV
Rated current	36.08/1804.2 A	630 A
Rated frequency	50 Hz	50 Hz
Rated short - time withstand current:		
- peak value	40 kA	40 kA
- r.m.s. value	16 kA	16 kA
Rated duration of short-circuit (t_k)	1 s	1 s
IAC Classification	AB	AFL
Internal fault current	16 kA	16 kA
Rated duration of internal fault current	1 s	1 s

3. TESTS PROGRAM

The internal arc test was performed on MV Switchgears Assembly (RMU Siemens) containing:
- cell 1 – Incoming/Outgoing switchgear serial no. CV 815242-000040/002/2011 for IAC-A
  – Incoming/Outgoing switchgear serial no. CV 815242-000040/001/2011 for IAC-B
- cell 2 – Incoming/Outgoing switchgear
- cell 3 – Transformer protection

3.1 Current calibration test

3.2 Internal arc test for IAC – A with arc initiation point made by customer inside of tank of cell no. 1, on LBS terminals, and three phase applied voltage on the input terminals of cell no. 2 with 3x1x185 mm^2 copper cables.

3.3 Current calibration test

3.4 Internal arc test for IAC – B with arc initiation point made by customer inside of tank of cell no. 1 and three phase applied voltage on the input terminals of cell no. 2 with 3x1x185 mm^2 copper cables.

Test parameters were I_p= 40 kA, I_k = 16 kA, t_k =1 s.

The combined vertical and horizontal indicators (simulators) were placed:
- for IAC-A in the front of MV Switchgear at 300 mm distance with door of substation in open position and in front of chimney cover (transformer side and cubicle side) at 100 mm distance;
- for IAC-B in front of door of substation in close position, in front of chimney cover (transformer side and cubicles side) at 100 mm distance.

Test were performed according to own procedure PT 03.07.

4. RESPONSIBLE FOR TESTS: Eng. Ilie Sbora

5. PRESENT AT THE TESTS: Eng. Dimitar Dimitrov from "PAVEL and SONS electric" Ltd, Bulgaria

6. TEST REPORT DOCUMENTATION Oscillograms 3; Tables 3; Photos 7; Drawings 4.

ВЯРНО С ОРИГИНАЛА

7. DATA OF TESTING AND MEASURING CIRCUIT

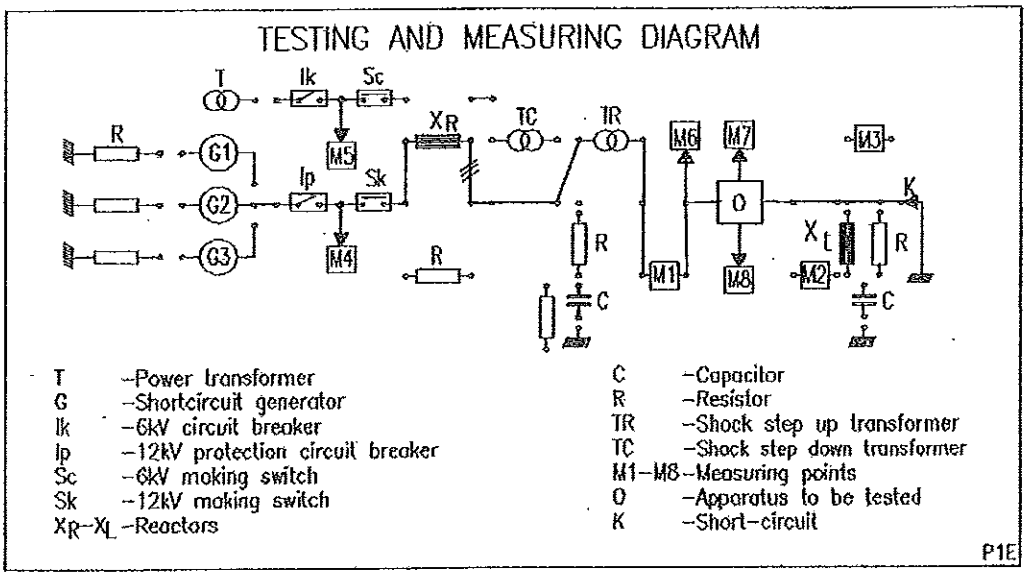

Table 1

Number of phases		3
Power supply / Connection		G2 /Δ
Transformer / Ratio		TR 4, 5, 6 / 1.07
Earthing	Power supply	-
	Apparatus	Net earthing connection
Reactor [Ω]		0.6
Power factor		<0.133
M1 - Test current - Rogowski coils 30 kA/V		
M4 - Power supply voltage - Voltage transformer 15000 V/100 V		
M6 - Test voltage - Voltage divider 120 kV/ 60V		
M8 - Data acquisition system TRAS 1 - 16 bit, 16 channels		

8. INTERNAL ARC TEST

The test results are presented in table 2.

Table 2

Oscillogram No.	U_{RS} U_{ST} U_{TR} [kV]	I_{pR} I_{pS} I_{pT} [kA]	I_{tR} I_{tR} I_{tT} [kA]	t_t [sec.]	$I_{t\,med}$ [kA]	DU_{RS} DU_{ST} DU_{TR} [V]	Remarks
80950/2011	6.2 6.2 6.2	40.5 - -	16.1 16.3 16.2	0.2	16.2	- - -	Current calibration
80951/2011	6.6 6.6 6.6	40 - -	16.2 16.2 16.3	1	16.23	538 554 497	Test for IAC-A
80952/2011	6.6 6.6 6.6	41 - -	16.4 16.6 16.4	1	16.43	408 566 517	Test for IAC-B

The measurements were performed with expanded uncertainty of: 1% for voltages; 1.5% for currents; 0.1% for time and the confidence level P = 95%

8.1. Symbols used in tables and oscillograms

I_R I_S I_T = Short-circuit current

I_{pR} I_{pS} I_{pT} = Peak values of short-time withstand currents on the phases R, S, T.

I_{tR} I_{tS} I_{tT} = R.m.s. values of short - time withstand currents on the phases R, S, T.

t_t = The duration of short – circuit

$I_{t\,med}$ = Effective current mean value

DU_{RS}, DU_{ST}, DU_{TR} = Voltage drop on arc

U_{RS}, U_{ST}, U_{TR} = No-load applied voltage

8.2 Opinions and interpretations

1. Aspect of the MV Switchgears and simulators in the test circuit before test for IAC-A is presented in photo 1.
2. Aspect of the substation and simulators in the test circuit before test for IAC-A is presented in photo 2.
3. Aspect of the substation and simulators after test for IAC-A is presented in photo 3.
4. Aspect of the MV Switchgears and simulators after test for IAC-A is presented in photo 4.
5. Aspect of the substation and simulators in the test circuit for IAC-B before test for IAC-B is presented in photos 5 and 6.
6. Aspect of the substation and simulators after test for IAC-B is presented in photos 7 and 8.
7. Aspect of the MV Switchgears after tests is presented in photo 9.
8. At the test for IAC-A:
   - the doors of MV Switchgears did not open;
   - the indicators did not ignite;
   - parts from the substation and MV Switchgears did not fly oft;
   - the earthing connection are effective.
9. At the test for IAC-B:
   - the doors of the substation did not open;
   - the indicators did not ignite;
   - parts from the substation did not fly oft;
   - the earthing connection are effective

8,3 Assessment of the test result

Table 3

Criterion	Result
1.The doors, covers etc. correctly secured do not open	Fulfilled
2. Parts which may cause a hazard do not fly off	Fulfilled
3. Arcing does not cause holes to develop in the freely accessible external parts of the enclosure as a result of burning or other effects	Fulfilled
4.The indicators do not ignite	Fulfilled
5. All earthing connections are still effective	Fulfilled

9. TEST RESULT: PASSED THE TEST

ВЯРНО С ОРИГИНАЛА

copy 4

RESEARCH-DEVELOPMENT AND TESTING NATIONAL
INSTITUTE FOR ELECTRICAL ENGINEERING
ICMET CRAIOVA
HIGH POWER DIVISION

HIGH POWER LABORATORY "Ovidiu Rarinca"
200746-CRAIOVA, Blvd. DECEBAL, No.118A, ROMANIA
Old address 200515-CRAIOVA Calea Bucuresti Nr. 144 ROMANIA)
Matriculation certificate: J16/312/1999, VAT number RO387 1599
Phone: (351) 402 427; Fax: (251) 415482; (351) 404 890;
E-mail: lmp@icmet.ro

ÎNCERCARE
SR EN ISO / CEI 17025: 2005
CERTIFICAT DE ACREDITARE
nr. LI 004 / 2007

TEST REPORT
No. 11239

CUSTOMER: **"PAVEL and SONS" Electric Ltd.**
12 Madara Blvd.Shumen Bulgaria

MANUFACTURER: **"PAVEL and SONS" Electric Ltd.**
12 Madara Blvd.Shumen Bulgaria

TESTED PRODUCT: 20 / 0.4 kV, 1250 kVA Prefabricated Transformer Substation

REFERENCE STANDARD: IEC 62271-202 / 2006 clause 6.3

TEST PERFORMED: Temperature-rise test and determination of thermal class

TEST DATE: 22.09.2011

TEST RESULT: Passed the tests

Report has 14 pages and it is edited in 4 copies from which copy 1 for laboratory and copies 2, 3 and 4 for customer.

HEAD OF HIGH POWER DIVISION:
Dr. Eng. George Curcanu

ICMET LABORATORUL DE MARE PUTERE "OVIDIU RARINCA" CRAIOVA

HEAD OF LABORATORY:
Eng. Constantin Iancu

DATE OF ISSUE: 25.09.2011

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ВЯРНО С ОРИГИНАЛА

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4.	Responsible for tests	3
5.	Present at the tests	3
6.	Test report documentation	3
7.	Temperature – rise test	4
8.	Thermal class determination	7
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10	Test result	7
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	- Photo	8
	-Technical specification	9
	- Drawing	11

ВЯРНО С ОРИГИНАЛА

1. IDENTIFICATION OF TEST PRODUCT

	Prefabricated Substation	MV Switchgear	Transformer
Type	CCTS 20/0.4kV 1x1250kVA	8DJH/RRT	TM 1250/20/0.4
Serial number/year	11319 / 2011	-/2010	142377
Technical specification /Drawing	See page 9,10 / See pages 11 to 14		
Contract no:	705.2/8547/17.08.2011		
Product receiving date:	22.08.2011		
Product condition at receiving:	New		

2. TECHNICAL CHARACTERISTICS ESTABLISHED BY MANUFACTURER

	Substation	MV Switchgear	LV Panel	Transformer
Rated power	1250 kVA		-	1250 kVA
Rated voltage	20/0.4kV	20kV	0.4 kV	20/0.4 kV
Rated current	-	630A	2500A	36.08/1804A
Rated frequency	50Hz	50Hz	50Hz	50Hz
Short-circuit voltage	-	-	-	5.47%
Connection	-	-	-	Dyn5
Total loses				14145W

3. TESTS PROGRAM

3.1 One test to check the temperature-rise test of the transformer inside of the substation and the low voltage panel.

- During the test the power transformer was supplied on the high voltage windings, at total losses Ptot – 14145W, and the low voltage winding was short circuited.
- During the test the Low Voltage equipment was supplied through fuses other power supply at I= 1804A, and the shortcircuit was made at the end of the cables supply the transformer on low voltage windings.

3.2 Determination of thermal class of the substation.

4. RESPONSIBLE FOR TESTS: Eng. Sbora Ilie

5. PRESENT AT THE TESTS: Mr. Velimir Dimitrov from 'Pavel and Sons' Electric Ltd

6. TEST REPORT DOCUMENTATION

Diagrams - ; Tables 6 ;

Photos 1 ; Drawings 4 .

ВЯРНО С ОРИГИНАЛА

7. TEMPERATURE-RISE TEST

7.1 Three-phase supply circuit for temperature rise test

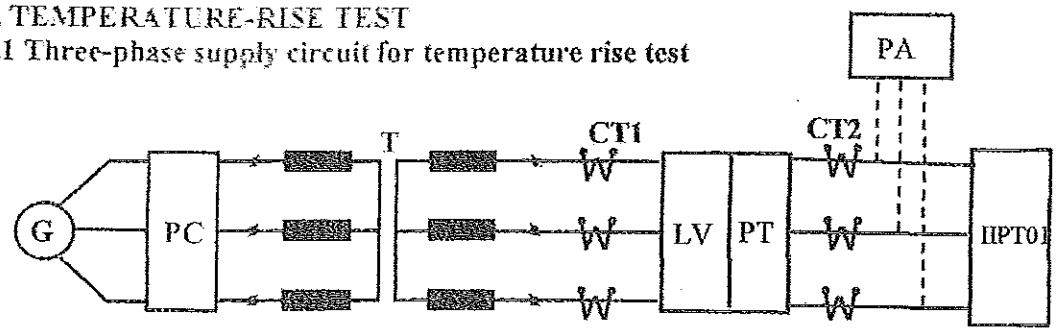

Fig. 1 – Test diagram for current paths temperature-rise test

G - Generator type GSAM – 390 kVA, 400 V, 50 Hz
PC - Connections panel
T - Adapting transformer made of 3 single-phase transformers of 400 / 25V, 10 kA, 50 Hz
CT1 - Current transformers type CIRSO – 2000 / 5 A
CT2 - Current transformers type CIRSO – 2x50/5 A
LV - Low Voltage equipment
PT - Power Transformer tested
PA - Power analysing device
IIPT Substation test installation

7.2 TEST CONDITIONS AND CALCULATION RELATIONS OF TEMPERATURE-RISE

Table 1

Test stage	I	II
Load type	Loss (W)	Current / period (A / minutes)
	14145	36.08/60

Calculation relations (IEC 60076-2:1993, clause 5.4):

$\theta_2 = (R_2 / R_1)*(235 + \theta_1) - 235$ - for cooper winding
$\Delta\theta = \theta_2 - \theta_a$
$\Delta\theta_u = \theta_u - \theta_a$

where:

θ_2 , θ_2' - windings average temperature (inside the substation and outside the substation)
R_1, R_1' - windings resistance measured in cold condition(inside the substation and outside the substation)
R_2, R_2' - windings resistance measured at shutdown(inside the substation and outside the substation)
θ_1, θ_1' - environment temperature in cold condition (inside the substation and outside the substation)
θ_a , θ_a' - environment temperature at the end of temperature-rise test (inside the substation and outside the substation)
$\Delta\theta$, $\Delta\theta$' - windings temperature-rise(inside the substation and outside the substation)
θ_u , θ_u' - oil average temperature at the upper part(inside the substation and outside the substation)
$\Delta\theta_u$, $\Delta\theta_u$' – oil temperature-rise (inside the substation and outside the substation)

7.3 RESULTS OBTAINED AT TEST

7.3.1 Transformer's temperature-rise test inside the substation

Table 2

Windings	Determined values						Oil
	R_1' (Ω)	θ_1' (°C)	R_2' (Ω)	θ_a' (°C)	θ_2' (°C)	$\Delta\theta'$ (K)	$\Delta\theta_u'$ (K)
HV	2.579	23	3.305	26	95.63	69.63	67
LV	870.3×10^{-6}		1110×10^{-6}		94.06	68.06	

Measurements were performed with expanded uncertainty of: 3 % for voltages; 3% for currents: 2.5% for time and the confidence level P = 95%.

where:

HV - high voltage winding

LV - low voltage winding

Remarks: Values of the measured resistances, calculated temperatures are presented in pages 5, 6

7.3.2 Measured values of currents, losses and temperatures

Table 3

Time		Hour	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:01	21:01
Current on phases	I_1	A	40.53	39.31	38.79	38.21	37.66	37.10	36.50	36.15	36.07
	I_2	A	40.73	39.46	38.93	38.32	37.80	37.18	36.72	36.06	36.09
	I_3	A	40.90	39.61	39.13	38.44	37.97	37.32	36.89	36.09	36.08
Average current	I_m	A	40.72	39.46	38.95	38.32	37.81	37.20	36.70	36.08	36.09
Measured loss	P_1	W	3810	3870	3930	3860	3910	3900	3970	3629	3634
	P_2	W	6150	6130	5950	5780	5900	5920	5942	5380	5372
	P_3	W	4260	4250	4310	4400	4342	4338	4240	3841	3834
Total loss	P_m	W	14220	14250	14190	14200	14152	14158	14152	12850	12840
Environment temperature	θ_{a1}	°C	24.1	24.4	24.5	24.8	25.0	25.4	25.7	25.7	25.7
	θ_{a2}	°C	24.2	24.4	24.7	24.8	24.9	25.2	25.3	25.4	25.4
	θ_{a3}	°C	24.6	25.0	25.5	25.7	26.0	26.5	26.7	26.9	26.9
	θ_a	°C	24.3	24.6	24.9	25.1	25.3	25.7	25.9	26.0	26.0
Oil temperature	θ_u	°C	47.2	65.8	77.2	85.8	89.8	91.2	92.3	93.5	93.0
Oil temperature-rise	$\Delta\theta_u$	°C	22.9	41.2	51.3	60.7	64.5	65.5	66.4	67.5	67.0

Measurements were performed with expanded uncertainty of: 5 % for powers; 3% for currents; 2.5% for time and the confidence level P = 95%.

ВЯРНО С ОРИГИНАЛА

7.3.3 Values of the high and low voltage windings resistance measured after shutdown inside the substation
The resistances of high and low voltage windings were measured in direct current for 10 minutes (one reading at each minute) using the ammeter-voltmeter method. The windings resistances determination at the time of shutdown (t_0).

Table 4

t [min]	R_{HV} [Ω]	R_{LV} [mΩ]
1	3.30	1.105
2	3.29	1.10
3	3.28	1.08
4	3.27	1.075
5	3.26	1.06
6	3.255	1.05
7	3.25	1.04
8	3.24	1.035
9	3.23	1.02
10	3.22	1.015

Measurements were performed with expanded uncertainty of: 2.5 % for resistances and the confidence level P = 95%.

* The windings resistances determination at the time of shutdown (t_0)

R_1= 3.305 Ω HV - high voltage winding; R_2=1.11*10^{-3}Ω LV - low voltage winding

ВЯРНО С ОРИГИНАЛ

7.3.4 Temperature-rise of the low voltage equipment

Table 5

No.	Element and temperature measuring points	Temperature-rise [°K]			
		Calculed			Admitted
		R	S	T	
1	Circuit breaker terminals				80
	-Input	73.47	74.38	73.62	
	-Output	74.33	75.12	75.24	
2	Terminal connection of fuses	64.32	65.47	65.58	70
3	Bus bar low voltage compartment in upper part	68.59	67.81	67.20	
	Bus bar low voltage compartment in lower part	65.56	66.47	67.30	
4	Fuse handler	12.94			25
5	Environment temperature	26.00			-

The measurements were performed with expanded uncertainty of: 1.1% for temperature and the confidence level P = 95%.

* Temperature-rise of the low voltage equipment did not exceed the specified limits (see table 5)

8. THERMAL CLASS DETERMINATION

To assess the thermal class the following relations (IEC 62271-202:2006, clause 6.3) will be applied:

$$\Delta t_1 = t_{t1} - t_{a1},$$
$$\Delta t_2 = t_{t2} - t_{a2},$$
$$\Delta t = \Delta t_2 - \Delta t_1$$

where:

t_{t1}= - temperature of the transformer windings outside the substation,

t_{a1}= -environment temperature at the end of transformer temperature-rise test outside the substation

Δt_1= - temperature-rise of the transformer windings outside the substation

t_{t2}= - temperature of the transformer windings inside the substation

t_{a2}= - environment temperature at the end of transformer temperature-rise test inside the substation

Δt_2= - temperature-rise of the transformer windings inside the substation.

Table 6

	Δt_1 [^{0}C]	t_{t1} [^{0}C]	t_{a1} [^{0}C]	Δt_2 [^{0}C]	t_{t2} [^{0}C]	t_{a2} [^{0}C]	Δt [^{0}C]
HV winding	50.11	75.11	25.00	69.62	95.63	26.00	19.52
LV winding	48.86	73.86		68.06	94.06		19.20
Oil	49.80	74.80		67.00	93.00		17.20
* Remarks	* These data are according to technical records made by ELPROM TRAFO test report no.T П - 161			These data are according to table 2 of this Test Report			

Thermal class: because 15 K < Δt < 20 K ⇒ **Class 20**

* Thermal class is 20 (see table 6).

9. REMARK

Aspect of the substation in the test circuit is presented in photo from page 8.

10. TEST RESULT: PASSED THE TEST

ex3

RESEARCH , DEVELOPMENT AND
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Nr. 450 - L

LIT

ICMET CRAIOVA

ROMANIA
HIGH VOLTAGE LABORATORY - LIT

200515 Craiova, Calea Bucuresti 144
Phone : 0351 - 404888, 0351 - 404889, 0351 - 402425, Fax: 0251 – 415482; 0351 – 404890

TEST REPORT
No.41063 / 03.05.2007

1. Product: **Prefabricated Substation 24 kV, 800 kVA type BM 01 A31**
Serial no. 07057
2. Tests: Dielectric tests according to IEC 62271 -- 202 : 2006
   - Lightning impulse withstand voltage test
   - Power frequency voltage test
   - Tests to verify the degree of protection IP - 43
   - Measurement of partial discharge
3. Test order: 20499 / 23.04.2007 (Contract no.3266 / 28.02.2007)
4. Producer: Pavel & Sons
5. Customer: Pavel & Sons
6. Customer's address: Central office: 9700, Shumen - BULGARIA

Test Supervisor,
Eng.A.Ungureanu

Q.A. Responsible,
Eng. Gh.Macovei

APPROVED
LABORATORY HEAD,
Eng. Dorin POPA
ICMET CRAIOVA DIVIZIA DE ÎNALTĂ TENSIUNE

TEST WITNESSED BY,
Eng. Pavel Marinov Petrov

7. The test report contains 14 pages.
8. The test report was edited in 4 ex.; 1 ex to LIT and 3 ex to customer.

CAUTION:

a. The test result makes reference only to tested product .
b. Integral reproduction of the test report is forbidden.
c. Any part of this test report may be reproduced only with the accord of LIT and RENAR.
d. Reports without original signatures are not valid.
e. Laboratory accreditation or any of its test reports elaborated in accreditation conditions not constitute or imply, themselves, an approval of product by RENAR, which has accredited the test laboratory, or by any other organization.

ВЯРНО С
ОРИГИНАЛА

LIT

1. Table of contents

	Page
Front sheet	1
1. Table of contents	2
2. Conclusions	2
3. Rating of the **Prefabricated Substation**	3
4. Mounting arrangement	3
5. Test procedures	3
6. Lightning impulse voltage test	4,5
7. Power frequency voltage test	6,7
8. Tests to verify the degree of protection	8
9. Measurement of partial discharge	9
10. Drawing: sheet 1/1 – circuit diagram	10
11. Drawing: sheet 4/5 - part: electrical	11
12. Drawing: sheet 5/5 - part: electrical	12
13. Pictures	13,14

2. CONCLUSIONS:

Prefabricated Substation 24 kV; 800kVA type BM 01 A31 is considered satisfactory.

ВЯРНО С ОРИГИНАЛА

L I T

3. Ratings of the Prefabricated Substation

Apparatus	: **Prefabricated Substation 24 kV; 20 / 0.4 kV; 800kVA**
- type	: **BM 01 A31**
- manufacturing serial no.	: **07057**
Manufacturer	: Pavel & Sons Ltd., Shumen Bulgaria
Rated voltage	: 20 kV
Rated insulation level	
- power frequency	: 50 $kV_{r.m.s.}$, 50Hz, 1 min
- lightning impulse	: 125 kV_{peak}, 1.2 / 50 μs
Rated current	: 400 - 1250 A

4. Mounting arrangement

Prefabricated Substation 24 kV; 20 / 0.4 kV 800 kVA, sheet 1/1 – circuit diagram, sheet 4/5 - part: electrical, sheet 5/5 - part: electrical drawings.

5. Test standard:

IEC 62271 – 202 : 2006; IEC 60694 : 2002; Technical Specification BM01 A31 no.1107 / 21.04.2007.

6. Test procedures

6.1. Application of the test voltage

To entrance in S2 of MV switchboard they were connected three MV cables by customer (see pictures from pages 13 and 14), where it was applied the specified voltage level.
Disconnector S1 open, disconnector S2 and disconnector S3 closed.
Test to earth and between phases: When voltage was applied to on phase, the other phases were earthed.
During the test, the MV transformer (20 / 0.4 kV) were connected in the tested circuit and LV circuit breakers were in open position.

6.2. Test with lightning impulse voltage

Withstand voltage level
3 impulses, for polarity (-), with specified level were applied.

6.3. Power frequency voltage tests

Withstand voltage test
The specified voltage level was maintained for 60 s.

ВЯРНО С ОРИГИНАЛА

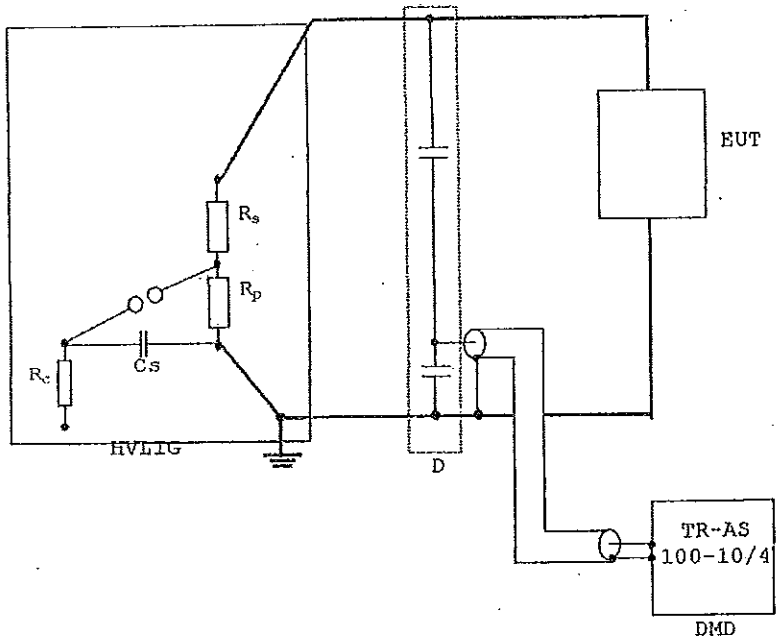
LIT

6. Lightning impulse voltage test

6.1. Reception date : 23.04.2007
6.2. Test date : 23.04.2007
6.3. Atmospheric conditions :

pressure	p = 1014 mbar
temperature	t = (14.7 ± 0.5) °C
absolute humidity	h = 34.4 %

6.4. Test voltage: 125 kV
6.5. Test standard: IEC 62271 – 202; IEC 60694 / 2002 subclause 6.2.6.2
6.6. Test circuit diagram and equipment used :



HVLIG - High Voltage Lightning Impulse Generator HV, no.5 - 1197, connection I (1x2)
Value of stage elements
C_s = 0.576 μF; R_s = 32.7 Ω; R_p = 115 Ω
D - Capacitor divider, dividing ratio k_{div} = 348
DMD - Digital Measuring Device type TR – AS 100 – 10 / 4 Dr. Strauss, no.241, channel 3;
Uncertainty of measuring chain: The expanded uncertainty of measurements for the coverage factor k = 2 (coverage probability appr. 95 %) equal with 1.2 % for peak value and 4.1 % for front and tail times (Calibration Certificate no.0049a / DKD – K – 18702 / 03.06).
EUT - Equipment Under Test.

Measuring uncertainty for the peak value of lightning impulse is: 1.7 %.
The uncertainty stated is expanded uncertainty obtained by multiplying the standard uncertainty by the coverage factor k = 2. The value of measurand lies within the assigned range of values with probability of 95 %.

ВЯРНО С ОРИГИНАЛА

6.7. Table with testing sequence and results

Test condition			Earthed connected to	Voltage applied to	Pol	Level of testing voltage [kV]	Test result
S1	S2	S3					
open	closed	closed	L2,L3	L1	Neg	125	Withstood 3 impulses
open	closed	closed	L1,L3	L2	Neg	125	Withstood 3 impulses
open	closed	closed	L1,L2	L3	Neg	125	Withstood 3 impulses

Legend: L1, L2, L3 – terminals.
Note: For terminal identification see drawing sheet 1/1 – circuit diagram from page 10.

6.8. Conclusion: The product passed the test.

6.9. Test responsible: Eng.I.Badea

ВЯРНО С ОРИГИНАЛА

LIT

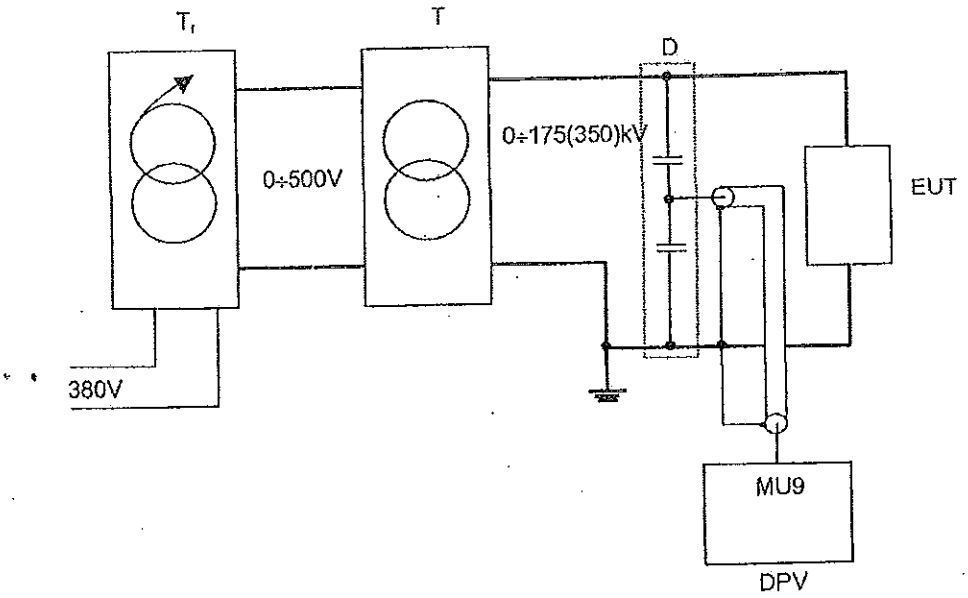
7. Power frequency voltage test

7.1. Reception date : 24.04.2007
7.2. Test date : 24.04.2007
7.3. Atmospheric conditions :

pressure	p = 1006 mbar
temperature	t = (14.5 ± 0.1) °C
absolute humidity	h = 43.7 %

7.4. Test standard: IEC 61330

7.5. Test circuit diagram and equipment used :



Tr - Regulating transformer 380 V / 0 ÷ 500 V
T - High voltage set up transformer 0.5 / 175 (350) kV 350 kVA
DPV - Digital Peak Voltmeter type MU9, no.892204
EUT - Equipment Under Test
D -Capacitor divider 350 kV consists of: high voltage compressed gas capacitor type MCF 75/350P, no.853889 and low voltage arm type H90, no.898939

Measuring uncertainty is ± 1.2 %.
The reported uncertainty is an expanded uncertainty, based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95 %.

ВЯРНО С ОРИГИНАЛА

7.6. Table with testing sequence and results

Test condition			Earthed connected to	Voltage applied to	Level of testing voltage [kV]	Test result
S1	S2	S3				
open	closed	closed	L2,L3	L1	50	Withstood 60 sec
open	closed	closed	L1,L3	L2	50	Withstood 60 sec
open	closed	closed	L1,L2	L3	50	Withstood 60 sec

Legend: L1, L2, L3 – terminals.
Note: For terminal identification see drawing sheet 1/1 – circuit diagram from page 10.

7.7. Conclusion: The product passed the test.

7.8. Test responsible: Eng.Gh.Macovei

ВЯРНО С
ОРИГИНАЛА

8. – VERIFICATION ON THE DEGREE PROTECTION IP – 43

8.1. Reception date of the product: 24.04.2007
8.2. Measurement date: 24.04.2007
8.3. Atmospheric conditions: p = 1006 mbar; t = (14.5 ± 0.1) °C; h = 43.7 %
8.4. Test standard: CEI 60529 / 1999

a. Verification of the first characteristic numeral, "4"

a.1. Protection against access to hazardous parts
a.2. Protection against the penetration of solid foreign objects

For a.1 were used the test access probe of 1 mm diameter and a length of 100 mm.
For a.2 were used the object probe of 1 mm diameter.
They did not penetrate the test object.

b. Verification of the second characteristic numeral "3", against spraying water

b.1. Against spraying water at angle up to 60° on either side of the vertical.
It was used the spay nozzle compliant with Fig.5 of IEC 60529.

The spaying time was of 7.5 min, because total area A_T = 7.5 m^2.
The debit was 10 l / min.
There was no ingress of water into the test object.

8.5. Conclusion: The product corresponding to the degree of protection IP – 43.

8.6. Test responsible: Eng.Gh.Macovei

ВЯРНО С ОРИГИНАЛА

Ex.2

RESEARCH, DEVELOPMENT AND TESTING
NATIONAL INSTITUTE FOR
ELECTRICAL ENGINEERING

I C M E T CRAIOVA

HIGH VOLTAGE DIVISION - HVD

Low Voltage Laboratory

Calea Bucureşti No.144, 200515 Craiova, ROMANIA

Phone: +40 0351 402425, 404888; Fax: +40 0251 415482, 0351 404890

www.icmet.ro, e-mail: market@icmet.ro; ljt@icmet.ro

TEST REPORT
Nr. 41064 / 24.04.2007

1.	**Test product:**	**24kV, 800VA Prefabricated Substation**
		Type BM01A31, Serial no.07057
2.	**Tests:**	I. Dielectric tests on auxiliary and control circuit
		II. Withstand of the enclosure against mechanical stress
3.	**Test order:**	Contract No. 3266 / 28.02.2007
4.	**Client:**	PAVEL & SONS
5.	**Client address:**	Central office 9700, Shumen, BULGARIA
6.	**Manufacturer:**	PAVEL & SONS
7.	**Test responsible:**	Eng. Catalin Boltasu (I)
		Eng. Hermina Deliu (II)

ICMET DIVIZIA DE ÎNALTĂ TENSIUNE CRAIOVA

Head of HV Division,
Eng. Dorin Popa

Quality Manager,
Eng. Gheorghe Macovei

Head of LV Laboratory,
Eng. Aurelia Scornea

8. **The report contains 3 pages.**
9. **The report is edited in 3 copies: 2 copies for the client and 1 copy for HVD**

WARNINGS:

a. *Test results refer to the equipment under test mentioned at point 1, only;*
b. *The integral reproduction of the present report is forbidden;*
c. *Partial reproduction of the present report is only allowed with prior written consent of HVD;*
d. *All signatures of the present report are originals.*

ВЯРНО С ОРИГИНАЛА

1 - DIELECTRIC TESTS ON AUXILIARY AND CONTROL CIRCUIT

1. **Reception product date:** 24.04.2007
2. **Test date:** 24.04.2007
3. **Test standard:** IEC 61330:1995
4. **Atmospheric conditions:** t = 18 ^{0}C, RH = 53 %
5. **Equipment and apparatus used:**
   - Impulse generator type SIP 01, serial no. 620090, manufactured by RFT Germany, CE no. 0088/26.10.2006, expanded uncertainty U=2,2% for coverage factor k=2
   - Impulse generator type SIP 01, serial no. 620091, manufactured by RFT Germany, CE no. 0089/26.10.2006 expanded uncertainty U=2,3% for coverage factor k=2
   - Thermohigrometer type HD 100, serial no. 06102404, manufactured by KIMO, France, CE no.4.8-11-06-025/13.11.2006, expanded uncertainty U=0,3°C for temperature measurement and U=2% for relative humidity for coverage factor k=2.
6. **Procedure**

Dielectric tests on auxiliary and control circuits are performed according IEC 61330:1995, subclause 6.1.2 and consists in the following tests:

a) Impulse voltage withstand test

The impulse test voltage of 5kV, 1,2/50μs was applied three times for each polarity at intervals of 1s minimum.

The test voltage is applied as follows:
- between all poles connected together and the earth;
- between each pole and the others poles connected together and to the earth.

b) Power frequency withstand test

The power frequency test voltage of 2,5kV, 1 min was applied as follows:
- between all poles connected together and the earth;
- between each pole and the others poles connected together and to the earth.

7. **Results**

There were not disruptive discharges during the tests. The product withstood the test.

ВЯРНО С ОРИГИНАЛА

II – WITHSTAND OF THE ENCLOSURE AGAINST MECHANICAL STRESS

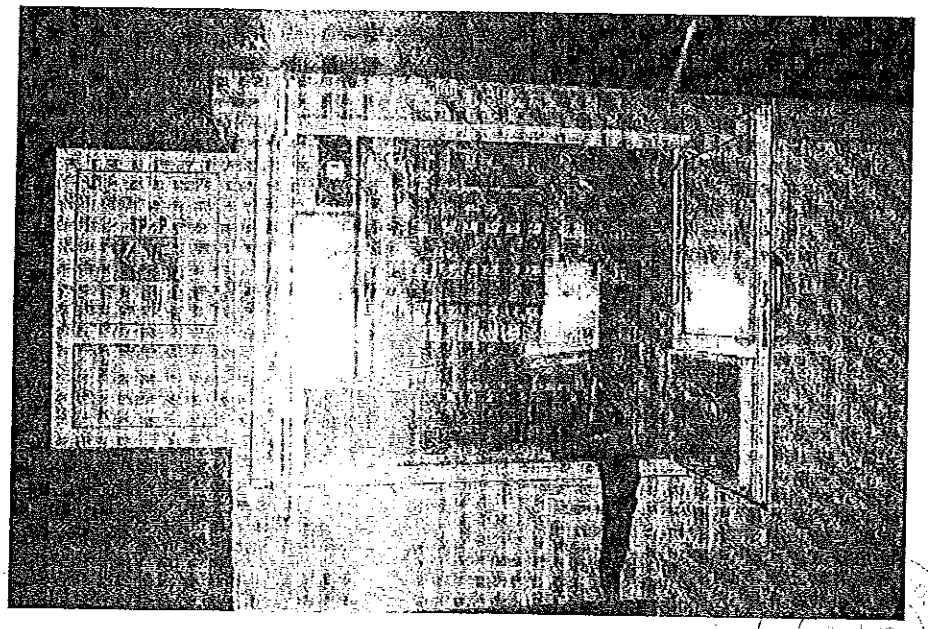
1. **Reception product date:** 24.04.2007
2. **Test date:** 24.04.2007
3. **Test standard:** IEC 61330:1995
4. **Atmospheric conditions:** $t = 18\ ^0C$, $u_r = 53\ \%$
5. **Equipment and apparatus used:** - Pendulum hammer, manufacturer ICMET according IEC 60068-2-75:1997, serial no.3, CE no.Dj 06-3061545/2006, expanded uncertainty U=0,75% for coverage factor k=2
   - Thermohigrometer type HD 100, series 06102404, manufactured by KIMO, France, CE no.4.8-11-06-025/13.11.2006, expanded uncertainty U=0,3°C for temperature measurement and U=2% for relative humidity for coverage factor k=2

6. **Procedure**

The mechanical impact tests were performed according IEC 61330:1995, subclause 6.6.
The product was visually examined before the tests.
The impact energy was 20 J, produced by a pendulum hammer with an equivalent mass of 5kg±5% and the height of fall 400mm ± 1%.
Three blows were applied on each access door, ventilation openings and covers of the enclosure to points that are likely to be the weakest points.
After the tests, the enclosure did not present any breaks or deformations which could affect the normal function of the equipment.

7. **Result**

The product withstood the mechanical impact test.



ВЯРНО С ОРИГИНАЛА

Приложение 9

ROMANIAN ACCREDITATION ASSOCIATION - RENAR

Bucharest, Calea Vitan no. 242, sector 3, zip code 031301
CIF RO 4311980

RENAR is EA-MLA signitory for Testing.

ACCREDITATION CERTIFICATE
No. LI 1036

Romanian Accreditation Association – RENAR, being recognized as National Accreditation Body by OG 23/2009, herewith attests that the organization:

NATIONAL INSTITUTE FOR RESEARCH-DEVELOPMENT AND TESTING IN ELECTRICAL ENGINEERING

Craiova, Decebal Avenue no. 118 A, Dolj county

through

Low and High Voltage Testing Laboratory

fulfills the requirements of **SR EN ISO/CEI 17025:2005** and is competent to carry on **TESTING** activities, as it is detailed in the Annex of the present accreditation certificate.

This accreditation is maintained provided that the accreditation criteria established by the Romanian Accreditation Association – RENAR are met continuously.

The present certificate includes Annex no. 1 (43 pages), which is an integrated part of this certificate.

In order to check the validity of the accreditation certificate, including the Annex, the website of RENAR shall be consulted: www.renar.ro.

Date of initial accreditation: 10.10.2014
The accreditation is valid until: 09.10.2018

GENERAL DIRECTOR

Cătălina Viorica NEAGUE

PRESIDENT OF THE ACCREDITATION COUNCIL

PhD. Eng. Dumitru DINU

ВЯРНО С ОРИГИНАЛА

Приложение 10

PS ELECTRIC

"ПС електрик" ООД – гр. Шумен

ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ

Долуподписаният, **"ПС ЕЛЕКТРИК" ООД,**
(име на производителя или неговия упълномощен представител, наименование на дружеството /фирмата производител или негов представител)

9700 гр. Шумен, бул. "Мадара" № 12,
(адрес)

декларирам на собствена отговорност, че продуктът

Бетонен комплектен трансформаторен пост 1x800kVA,
(наименование и търговска марка, тип или модел, предназначение)

произведен в
производствената база на "ПС ЕЛЕКТРИК" ООД в гр. Шумен, бул. "Мадара" № 12
(място на производство на разглеждания продукт)

за който се отнася тази декларация, е произведен в условията на въведена и поддържана от производителя система за производствен контрол и е в съответствие със следния(те) стандарт(и), Българско техническо одобрение (БТО) или друг(и) нормативен(ни) акт(актове):

БДС EN 62271-202:2007; БДС 10699:1980, БДС EN – 60439-1 , НУЕУЕЛ - 2004
(наименование и/или номер и дата на издаване на стандарта(тите), БТО или друг(и) нормативен(ни) акт (актове)

и съответствието е оценено съгласно Наредбата за съществените изисквания и оценяване съответствието на строителните продукти. Декларацията се издава въз основа на (сертификат на продукт или сертификат на система за производствен контрол, или протокол(и) от първоначално изпитване на типа):

№ 11413/07.05.2012; № 11400/09.04.2012; № 9865/26.04.2007; № 41063/03.05.2007; № 41064/24.04.2007;

издаден(и) от:

Научно-изследователски и изпитателен национален институт по електротехника ICMET КРАЙОВА РУМЪНИЯ

(наименование, адрес и идентификационен номер на лицето, издало сертификата или протокола(ите)
Забележка: За продуктите, за които е определена система 4 за оценяване на съответствието, се записва само номерът на системата за оценяване на съответствието

Съществени изисквания за безопасност на други наредби за оценяване на съответствието (ако има): .....

Специфични изисквания, свързани с употребата на продукта (указания за проектиране, изпълнение и експлоатация на български език) - могат да се приложат отделно към декларацията.

.....

Маркировката "CO" е поставена за първи път на продукта на .....(дата).

Декларирам, че ми е известна отговорността, която нося съгласно чл. 313 от НК.

07.01.2016 год.
гр. Шумен
(място и дата на издаване)

Божидар Маринов
Управител

(фамилия, длъжност и подпис на производителя или на неговия представител)

Приложение 11

PS ELECTRIC

"ПС електрик" ООД – гр.Шумен

ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ

Долуподписаният, **"ПС ЕЛЕКТРИК" ООД,**
(име на производителя или неговия упълномощен представител, наименование на дружеството /фирмата производител или негов представител)

9700 гр. Шумен, бул. "Мадара" № 12,
(адрес)

декларирам на собствена отговорност, че продуктът

Бетонен комплектен трансформаторен пост 1x800kVA,
(наименование и търговска марка, тип или модел, предназначение)

произведен в
производствената база на "ПС ЕЛЕКТРИК" ООД в гр. Шумен, бул. "Мадара" № 12
(място на производство на разглежданият продукт)

за който се отнася тази декларация, е произведен в условията на въведена и поддържана от производителя система за производствен контрол и е в съответствие със следния(те) стандарт(и), Българско техническо одобрение (БТО) или друг(и) нормативен(ни) акт(актове):
БДС EN 62271-202:2007; БДС 10699:1980, БДС EN – 60439-1 , НУЕУЕЛ - 2004
(наименование и/или номер и дата на издаване на стандарта(тите), БТО или друг(и) нормативен(ни) акт (актове)

и съответствието е оценено съгласно Наредбата за съществените изисквания и оценяване съответствието на строителните продукти. Декларацията се издава въз основа на (сертификат на продукт или сертификат на система за производствен контрол, или протокол(и) от първоначално изпитване на типа):
№ 11202/29.07.2011; № 11239/22.09.2011; № 41063/03.05.2007; № 41064/24.04.2007;

издаден(и) от:
Научно-изследователски и изпитателен национален институт по електротехника ICMET КРАЙОВА РУМЪНИЯ
(наименование, адрес и идентификационен номер на лицето, издало сертификата или протокола(ите)
Забележка: За продуктите, за които е определена система 4 за оценяване на съответствието, се записва само номерът на системата за оценяване на съответствието

Съществени изисквания за безопасност на други наредби за оценяване на съответствието (ако има): .....

Специфични изисквания, свързани с употребата на продукта (указания за проектиране, изпълнение и експлоатация на български език) - могат да се приложат отделно към декларацията.

.....

Маркировката "CO" е поставена за първи път на продукта на .....(дата).

Декларирам, че ми е известна отговорността, която нося съгласно чл. 313 от НК.

07.01.2016 год.
гр. Шумен
(място и дата на издаване)

Божидар Маринов
Управител

(фамилия, длъжност и подпис на производителя или на неговия представител)

Приложение 12; 13

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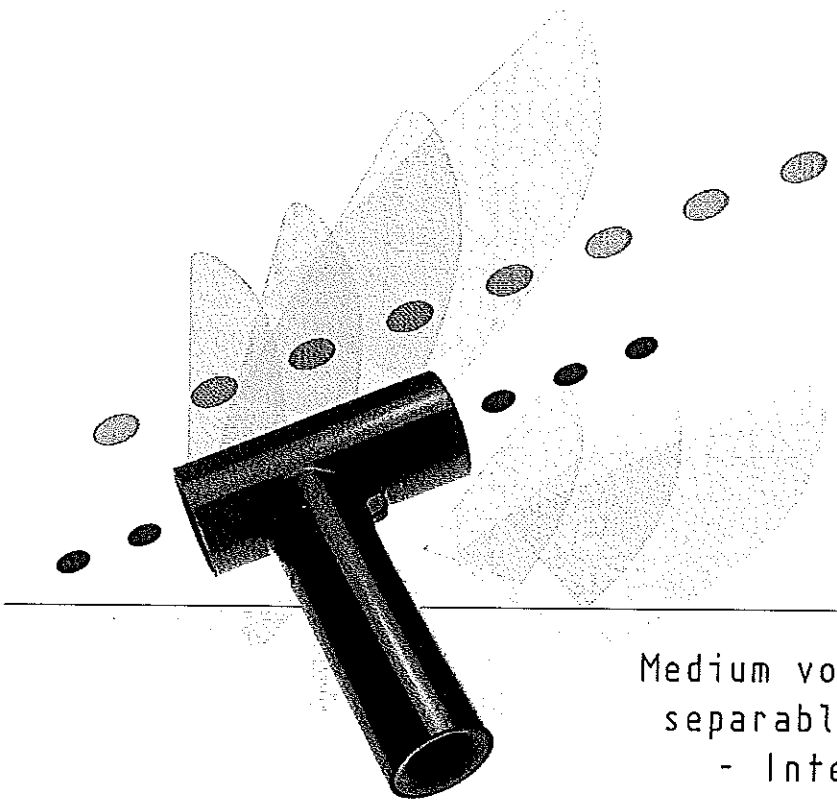


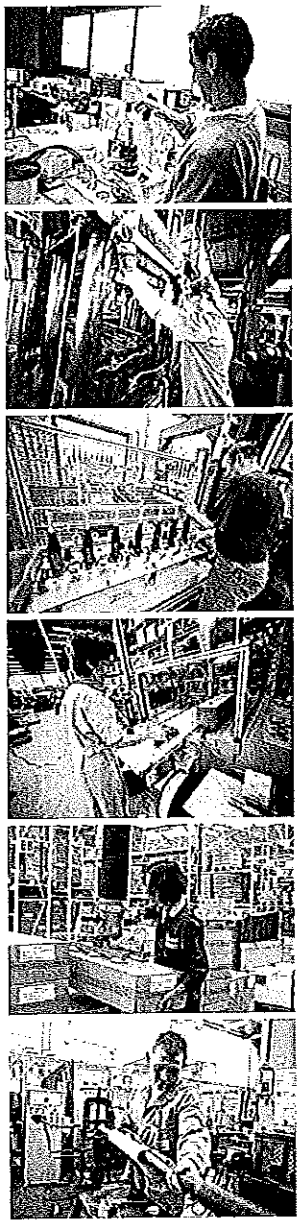
Medium voltage compact separable connectors - Interface C -

Catalogue 2013

Euromold
a Nexans company

Nexans Network Solutions Div. Euromold

COMPANY PRESENTATION



EUROMOLD

Euromold is the leading European specialised designer, manufacturer and distributor of prefabricated cable accessories for medium voltage energy distribution. Euromold provides a complete range of accessories for underground cables: premoulded EPDM rubber connectors for cables and epoxy bushings for transformers and switchgear, as well as a large range of cold-shrinkable terminations and joints from 12 to 42 kV. Euromold is also the manufacturer of electrical components for the high voltage accessories of the Nexans group.

ISO 9001 Certificate

Since 1992, Euromold's commitment to quality is demonstrated by its ISO 9001 certification.

International standards

All our products meet the International standards like CENELEC HD 629.1, CENELEC EN 50180, IEC 60137, IEC 60502-4... or country specifications. Official certificates, CESI, KEMA, ATEX... prove the conformity of our products. Long duration tests of existing or new products are continuously performed in our test fields.

Laboratory accreditation

Since June 2000, Euromold's independent ELAB laboratory obtained the BELAC accreditation no.144-TEST conform with the European standards for laboratories ISO 17025 for electrical testing of low and medium voltage cable accessories according to the international standards EN 50393, IEC 60502-4, IEC 61442 and HD 629.

03/2013

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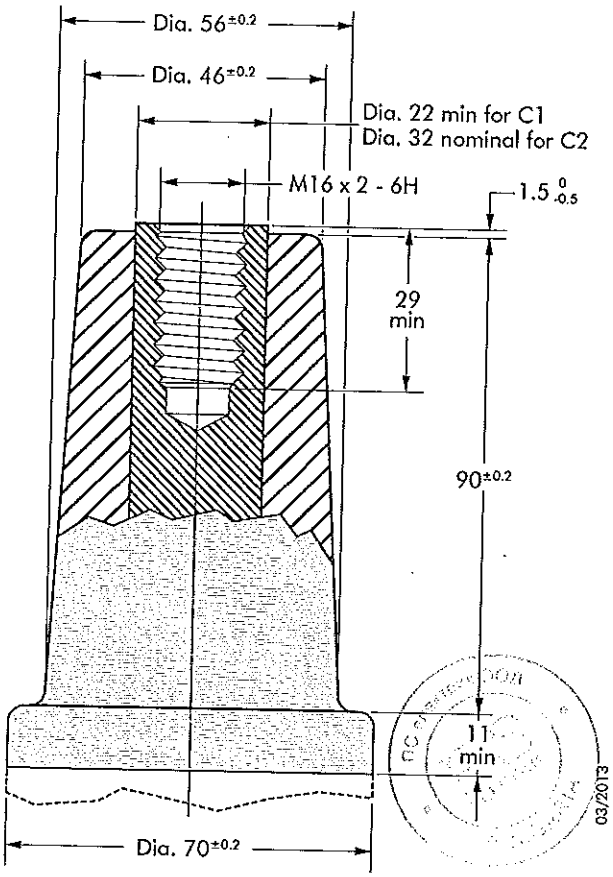
SEPARABLE CONNECTORS
INTERFACE C

Table of contents

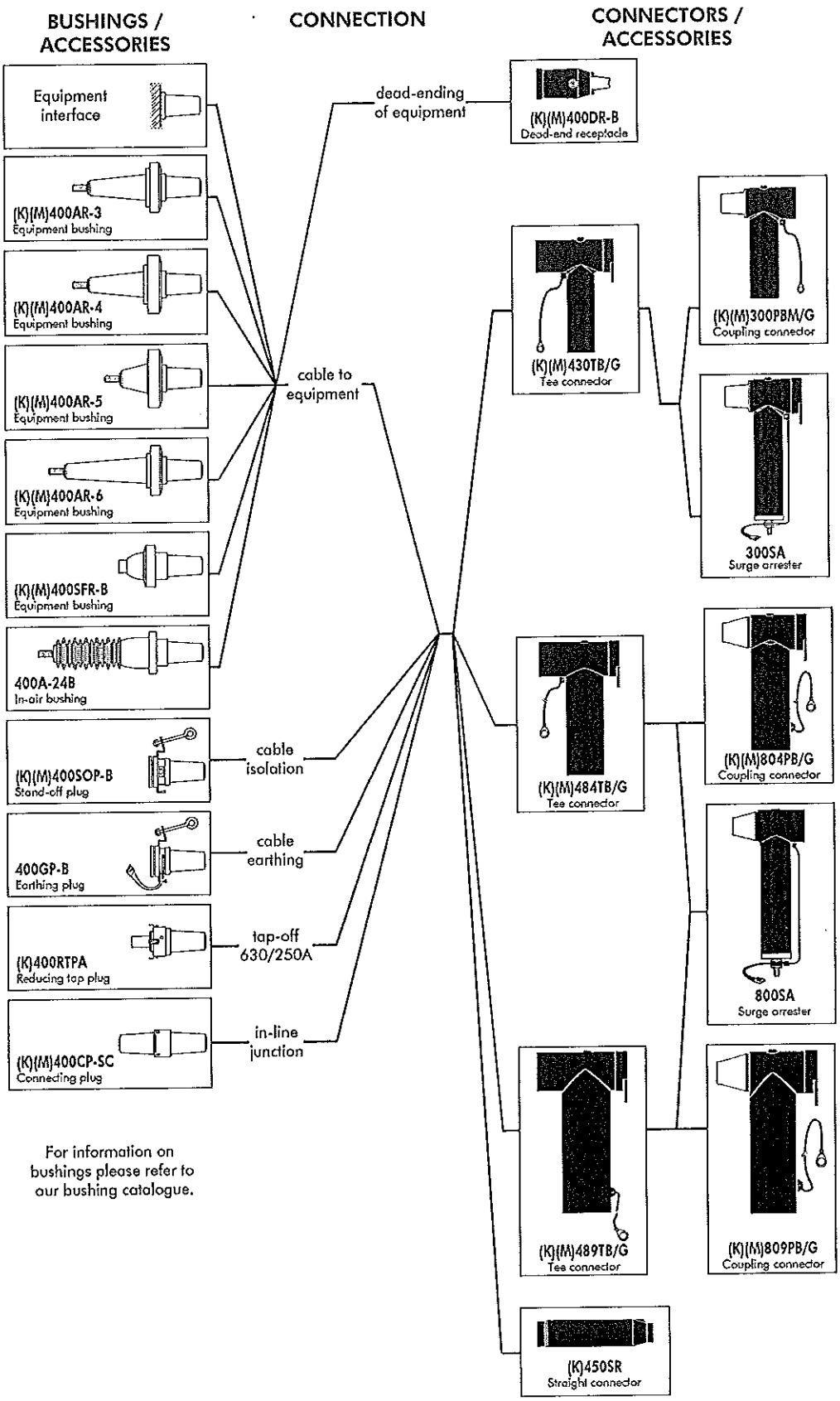
430TB - tee connector
484TB - tee connector
489TB - tee connector
300PBM - coupling connector
430TBM-P2/P3 - dual/triple cable arrangement
804PB - coupling connector
809PB - coupling connector
450SR - straight connector
300SA - surge arrester
800SA - surge arrester
400TR and 800TR - test rod
400TK and 400SW installation tools
Accessories
Possible arrangements
T-HSTBK - Three core heat-shrink breakout kit

Interface C1 & C2

Dimensions according to European CENELEC EN 50180 and 50181 (in mm).



Connecting possibilities



For information on bushings please refer to our bushing catalogue.

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430TB
INTERFACE C
TEE CONNECTOR

Up to 36 kV
630 A -1250 A

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV

Application

Separable tee shape connector (bolted type) designed to connect polymeric insulated cable to equipment (transformers, switchgear, motors, ...).
Also connects cable to cable when using the appropriate mating parts.

Technical characteristics

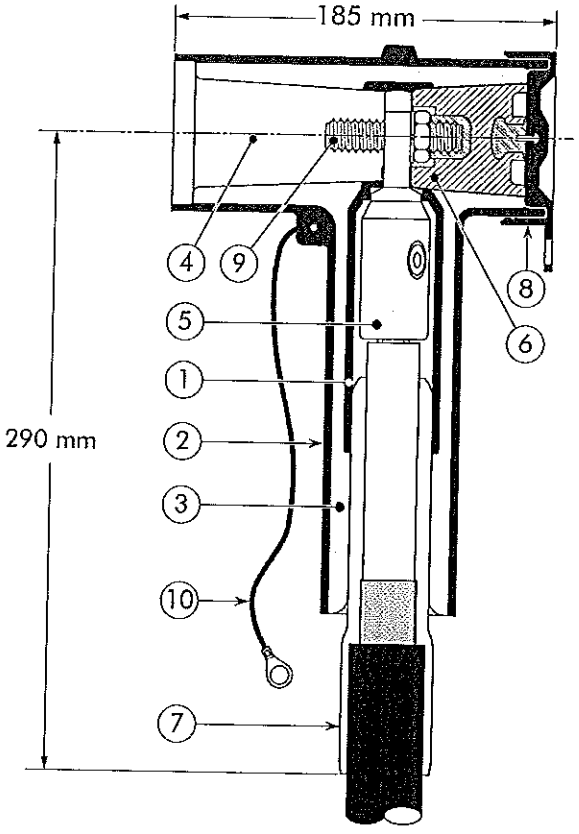
- A thick conductive EPDM jacket provides a total safe to touch screen.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

Design

Separable connector comprising:

1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type C interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector.
6. Basic insulating plug (with VD point).
7. Cable reducer.
8. Conductive rubber cap.
9. Clamping screw.
10. Earthing lead.

The screen break design enables cable outer sheath testing without removing or dismantling the connector.



Specifications and standards

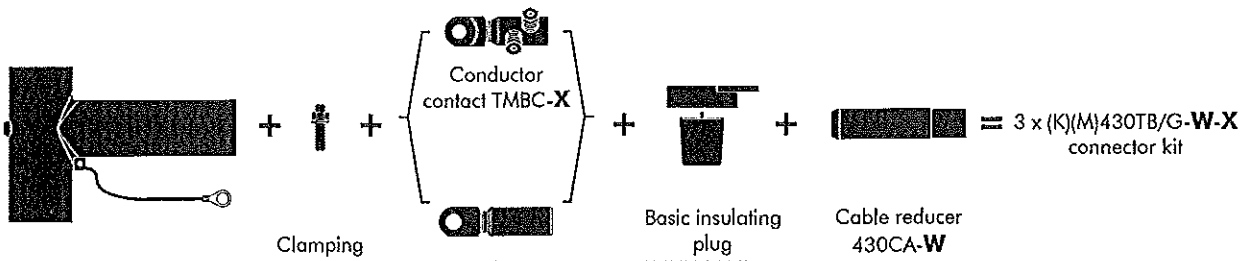
The 430TB separable connector meets the requirements of CENELEC HD 629.1.

Separable connector type	Voltage Um (kV)	Current Ir (A)	Current Ir (A) When using a copper (-11-2) or a bolted (14-5) conductor contact	Conductor sizes (mm²)	
				min	max
430TB/G	12	630	1250	35	300
K430TB/G	24	630	1250	35	300
M430TB/G	36	630	1250	50	240

Kit contents

The complete (K)(M)430TB/G tee connector kit comprises 3 x the following components:

The kit also comprises silicone grease, field control mastic, installation rod, installation instructions and crimp chart.



Connector housing (K)(M)430BT/G

Clamping screw 430TCS

Conductor contact TBC-X

Basic insulating plug (K)(M)300BIPA + rubber cap

Cable reducer 430CA-W

Ordering instructions

To order the tee connector, select the ordering part number which gives you the best centring of your core insulation diameter and substitute **X** using table X, according to your conductor size and type.
Add a 'K' for use up to 24 kV, add an 'M' for use up to 36 kV.

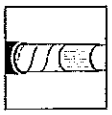
Example:
The cable is 24 kV, 150 mm² compact stranded copper with a diameter over core insulation of 27.5 mm.
Order 3 x K430TB/G-18-95.240-14-5

Table W

Ordering part number	Dia. over core insulation (mm)	
	min	max
3 x 430TB/G-11-**X**	12.0	17.5
3 x 430TB/G-16-**X**	17.0	23.5
3 x 430TB/G-18-**X**	19.0	32.6
3 x 430TB/G-27-**X**	28.5	37.5

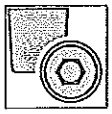
Table X

Conductor sizes (mm²)	Aluminium conductor		Aluminium and copper conductor	Copper conductor
	DIN hexagonal	Deep indent	Bolted	DIN hexagonal
35	35(K)M-10-2	35KM-10-1	16.95-14-5	35(K)M-11-2
50	50(K)M-10-2	50(K)M-10-1	50.150-14-5	50(K)M-11-2
70	70(K)M-10-2	70(K)M-10-1		70(K)M-11-2
95	95(K)M-10-2	95(K)M-10-1	95.240-14-5	95(K)M-11-2
120	120(K)M-10-2	120(K)M-10-1		120(K)M-11-2
150	150(K)M-10-2	150(K)M-10-1		150(K)M-11-2
185	185(K)M-10-2	185(K)M-10-1		185(K)M-11-2
240	240(K)M-10-2	240(K)M-10-1	120.300-14-5	240(K)M-11-2
300	300(K)M-10-2	–		300(K)M-11-2



For use with copper tape screened cables. Order: Kit MT.

For use in potentially explosive atmospheres (for 12 kV max). Add -/ATEX to part number.



Up to 24 kV this product can also be installed using a 300BIPR (without VD point) Order: BIPR.

For use with other cable types. Please contact our representative.

For applications outdoors and in humid climate. Order: +MWS.

411CA

This product can also be installed using a 411 CA. Please contact our representative.

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484TB
INTERFACE C
TEE CONNECTOR

Up to 42 kV
1250 A

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV
20.8/36 (42) kV

Application

Separable tee shape connector (bolted type) designed to connect polymeric insulated cable to equipment (transformers, switchgear, motors, ...).
Also connects cable to cable when using the appropriate mating parts.

Technical characteristics

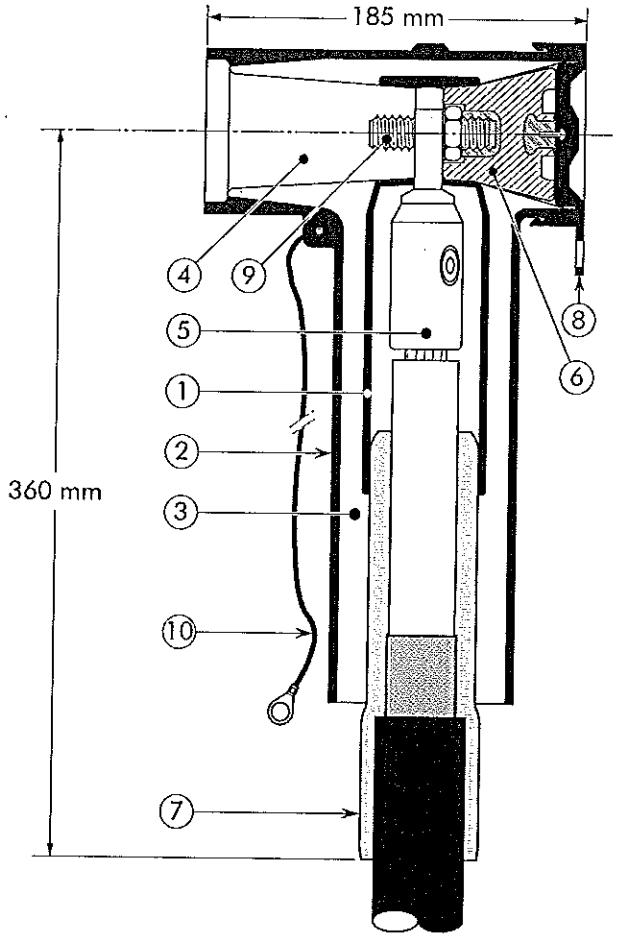
- The thick conductive EPDM jacket provides a total safe to touch screen which ensures safety for personnel.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

Design

Separable connector comprising:

1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type C - interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector.
6. Basic insulating plug (with VD point).
7. Cable reducer.
8. Conductive rubber cap.
9. Clamping screw.
10. Earthing lead.

The screen break design enables cable outer sheath testing without removing or dismantling the connector.



Specifications and standards

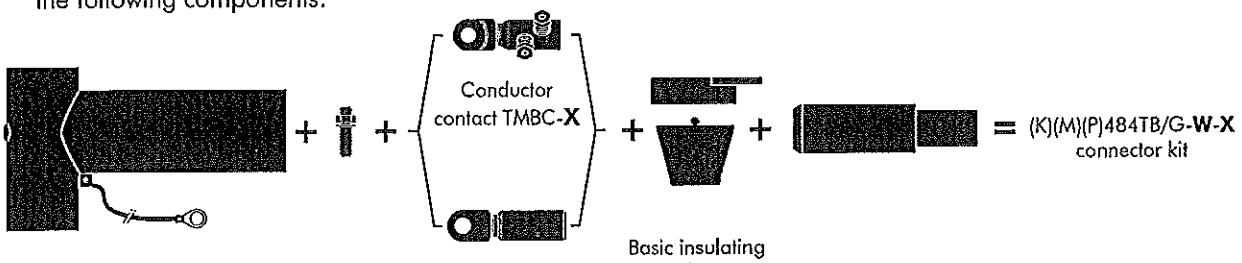
The 484TB separable connector meets the requirements of CENELEC HD 629.1.

Separable connector type	Voltage Um (kV)	Current Ir (A) When installed on an appropriate equipment bushing	Conductor sizes (mm²)	
			min	max
484TB/G	12	1250	50	630
K484TB/G	24	1250	35	630
M484TB/G	36	1250	35	630
P484TB/G	42	1250	35	630

Kit contents

The complete (K)(M)(P)484TB/G tee connector kit comprises 3x the following components:

The kit also comprises silicone grease, field control mastic, gloves, roll adhesive tape, installation instructions and crimp chart.



Connector housing (K)(M)(P)484BT/G

Clamping screw 430TCS

Conductor contact TBC-**X**

Basic insulating plug (K)(M)(P)800BIPA + rubber cap

Cable reducer 611CA-**W**

Ordering instructions

To order the tee connector, select the ordering part number which gives you the best centring of your core insulation diameter and substitute **X** using table X, according to your conductor size and type.
Add a 'K' for use up to 24 kV, add an 'M' for use up to 36 kV, add a 'P' for use up to 42 kV.

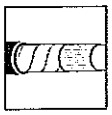
Example:
The copper wire screened cable is 36 kV, 240 mm² stranded aluminium with a diameter over core insulation of 37.0 mm.
Order 3 x M484TB/G-32-240(K)M-12-2 tee connector kit.

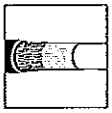
Table W

Ordering part number	Dia. over core insulation (mm)	
	min	max
3 x 484TB/G-15-**X**	16.0	22.0
3 x 484TB/G-19-**X**	20.0	26.5
3 x 484TB/G-22-**X**	23.5	31.0
3 x 484TB/G-27-**X**	28.5	37.5
3 x 484TB/G-32-**X**	34.0	42.5
3 x 484TB/G-37-**X**	39.0	48.5
3 x 484TB/G-43-**X**	45.5	56.0

Table X

Conductor sizes (mm²)	Aluminium conductor		Aluminium and copper conductor	Copper conductor
	DIN hexagonal	Deep indent	Bolted	DIN hexagonal
35	35(K)M-12-2	35KM-12-1	16.95-14-5	35(K)M-11-2
50	50(K)M-12-2	50KM-12-1	50.150-14-5	50(K)M-11-2
70	70(K)M-12-2	70KM-12-1		70(K)M-11-2
95	95(K)M-12-2	95KM-12-1	95.240-14-5	95(K)M-11-2
120	120(K)M-12-2	120KM-12-1		120(K)M-11-2
150	150(K)M-12-2	150KM-12-1	120.300-14-5	150(K)M-11-2
185	185(K)M-12-2	185KM-12-1		185(K)M-11-2
240	240(K)M-12-2	240KM-12-1	185.400-14-5	240(K)M-11-2
300	300(K)M-12-2	300KM-12-1		300(K)M-11-2
400	400(K)M-12-2	400KM-12-1		400(K)M-11-2
500	500(K)M-12-2	500KM-12-1	400.630-14-5	500(K)M-11-2
630	–	630KM-12-1		630(K)M-11-2


For use with copper tape screened cables. Order: Kit MT.


For use with copper wire screened cables. No earthing device is necessary.


For use with other cable types. Please contact our representative.


For applications outdoors and in humid climate. Order: +MWS.


Components can be ordered individually.

For use in potentially explosive atmospheres (for 12 kV max). Add -/ATEX to part number.

Euromold
a Nexans company

489TB
INTERFACE C
TEE CONNECTOR

Up to 42 kV
1250 A

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV
20.8/36 (42) kV

Application

Separable tee shape connector (bolted type) designed to connect polymeric insulated cable to equipment (transformers, switchgear, motors, ...).
Also connects cable to cable when using the appropriate mating parts.

Technical characteristics

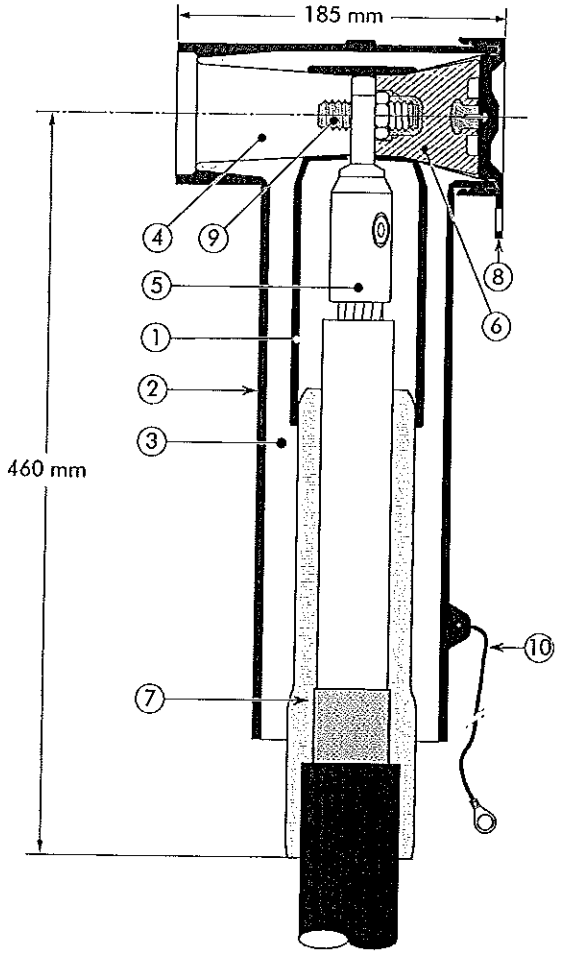
- The thick conductive EPDM jacket provides a total safe to touch screen which ensures safety for personnel.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

Design

Separable connector comprising:

1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type C - interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector.
6. Basic insulating plug (with VD point).
7. Cable reducer.
8. Conductive rubber cap.
9. Stud+nut.
10. Earthing lead.

The screen break design enables cable outer sheath testing without removing or dismantling the connector.



Specifications and standards

The 489TB separable connector meets the requirements of CENELEC HD 629.1.

Separable connector type	Voltage Um (kV)	Current Ir (A)	Conductor sizes (mm²)	
			min	max
489TB/G	12	1250	630	1200
K489TB/G	24	1250	630	1200
M489TB/G	36	1250	630	1200
P489TB/G	42	1250	630	1200

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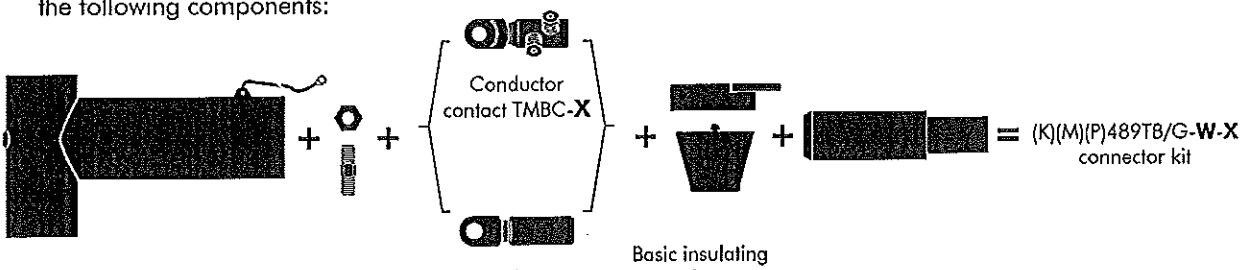
Kit contents

The complete (K)(M)(P)489TB/G tee connector kit comprises 3x the following components:

The kit also comprises silicone grease, field control mastic, gloves, roll adhesive tape, installation instructions and crimp chart.



Connector housing (K)(M)(P)489BT/G | Stud+nut | Conductor contact TBC-**X** | Basic insulating plug (K)(M)(P)800BIPA + rubber cap | Cable reducer 911CA-**W**

Ordering instructions

To order the tee connector, select the ordering part number which gives you the best centring of your core insulation diameter and substitute **X** using table X, according to your conductor size and type.
Add a 'K' for use up to 24 kV, add an 'M' for use up to 36 kV, add a 'P' for use up to 42 kV.

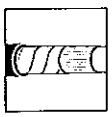
Example:
The copper wire screened cable is 36 kV, 1000 mm² stranded aluminium with a diameter over core insulation of 52 mm.
Order 3 x M489TB/G-43-1000(K)M-12-1 tee connector kit.

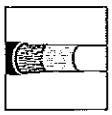
Table W

Ordering part number	Dia. over core insulation (mm)	
	min	max
3 x 489TB/G-37-**X**	40	48
3 x 489TB/G-43-**X**	46	54
3 x 489TB/G-50-**X**	53	59
3 x 489TB/G-53-**X**	56	62
3 x 489TB/G-56-**X**	59	65
3 x 489TB/G-59-**X**	62	68

Table X

Conductor sizes (mm²)	Aluminium conductor	Aluminium and copper conductor	Copper conductor
	Deep indent	Bolted	DIN hexagonal
630	630KM-12-1	400.630-14-5	630(K)M-11-2
800	800KM-12-1	800.1000-14-5	800(K)M-11-2
1000	1000KM-12-1		1000(K)M-11-2
1200	1200KM-12-1	-	-


For use with copper tape screened cables. Order: Kit MT.


For use with copper wire screened cables. No earthing device is necessary.


For use with other cable types. Please contact our representative.


For applications outdoors and in humid climate. Order: +MWS.


Components can be ordered individually.

When installed on an appropriate equipment bushing: 1250 A continuously

Euromold
a Nexans company

Euromold
a Nexans company

300PBM
COUPLING CONNECTOR FOR 430TB/G

Up to 36 kV
630A - 1250 A

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV

Application

Separable coupling connector (bolted type) for dual cable arrangement. It has been designed to be used with 430TB separable Tee connector.

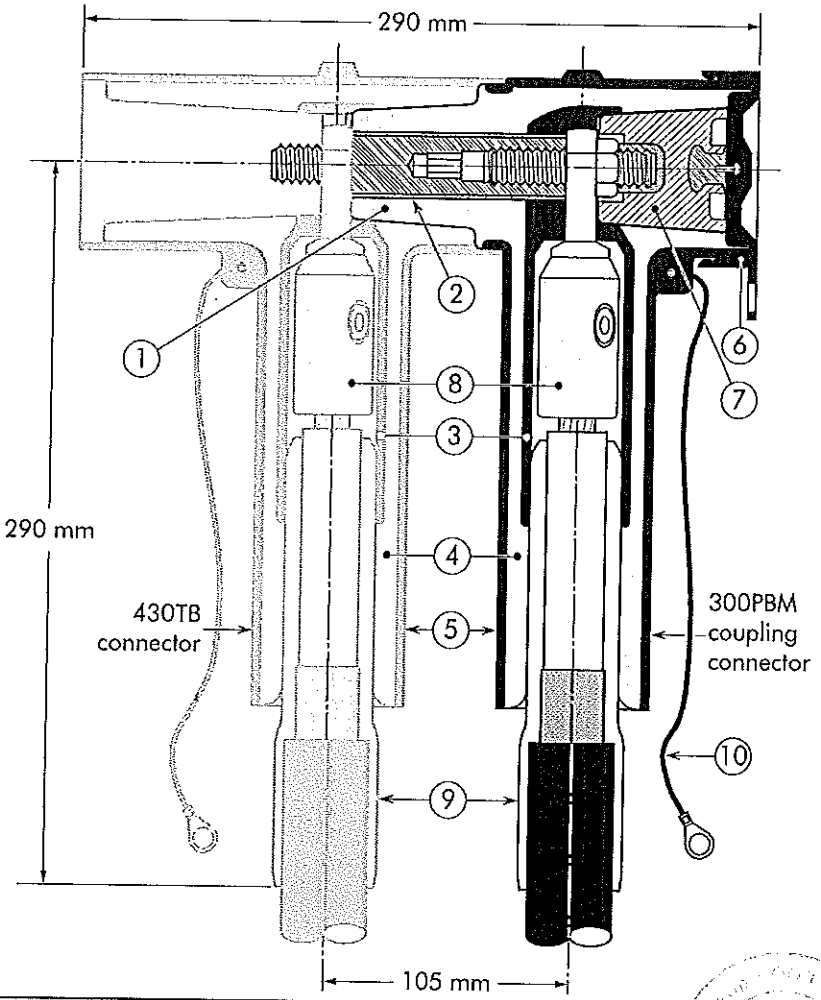
Technical characteristics

- A thick conductive EPDM jacket provides a total safe to touch screen.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

Design

1. Interface designed to fit 430TB connector.
2. Bus for 300PBM.
3. Conductive EPDM insert.
4. Insulating EPDM layer moulded between the insert and the jacket.
5. Conductive EPDM jacket.
6. Conductive EPDM cap.
7. Basic insulating plug (with VD point).
8. Conductor connector (hexagonal crimping, deep indent crimping or bolted).
9. Cable reducer.
10. Earthing lead.

The screen break design enables cable outer sheath testing without removing or dismantling the connector.



Specifications and standards

The 300PBM coupling connector meets the requirements of CENELEC HD 629.1.

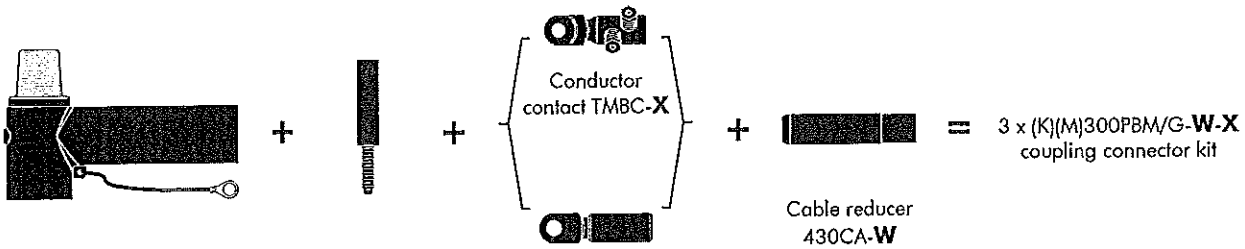
Separable connector type	Voltage Um (kV)	Current Ir (A)	Current Ir (A) When using a copper (-11-2) or a bolted (14-5) conductor contact	Conductor sizes (mm²) min	Conductor sizes (mm²) max
300PBM/G	12	630	1250	35	300
K300PBM/G	24	630	1250	35	300
M300PBM/G	36	630	1250	50	240

03/2013

Kit contents

The complete (K)(M)300PBM/G coupling connector kit comprises 3 x the following components:

The kit also comprises silicone grease, field control mastic, installation rod, installation instructions and crimp chart.



Ordering instructions

To order the coupling connector, select the ordering part number which gives you the best centring of your core insulation diameter and substitute **X** using table X, according to your conductor size and type.
Add a 'K' for use up to 24 kV, add an 'M' for use up to 36 kV.

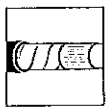
Example:
The cable is 24 kV, 150 mm² compact stranded copper with a diameter over core insulation of 27.5 mm.
Order 3 x K300PBM/G-18-95.240-14-5 coupling connector kit.

Table W

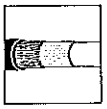
Ordering part number	Dia. over core insulation (mm)	
	min	max
3 x 300PBM/G-11-**X**	12.0	17.5
3 x 300PBM/G-16-**X**	17.0	23.5
3 x 300PBM/G-18-**X**	19.0	32.6
3 x 300PBM/G-27-**X**	28.5	37.5

Table X

Conductor sizes (mm²)	Aluminium conductor		Aluminium and copper conductor	Copper conductor
	DIN hexagonal	Deep indent	Bolted	DIN hexagonal
35	35(K)M-10-2	35KM-10-1	16.95-14-5	35(K)M-11-2
50	50(K)M-10-2	50(K)M-10-1		50(K)M-11-2
70	70(K)M-10-2	70(K)M-10-1	50.150-14-5	70(K)M-11-2
95	95(K)M-10-2	95(K)M-10-1		95(K)M-11-2
120	120(K)M-10-2	120(K)M-10-1	95.240-14-5	120(K)M-11-2
150	150(K)M-10-2	150(K)M-10-1		150(K)M-11-2
185	185(K)M-10-2	185(K)M-10-1	120.300-14-5	185(K)M-11-2
240	240(K)M-10-2	240(K)M-10-1		240(K)M-11-2
300	300(K)M-10-2	–		300(K)M-11-2


For use with copper tape screened cables. Order: Kit MT.


For use in potentially explosive atmospheres (for 12 kV max). Add -/ATEX to part number.


For use with copper wire screened cables. No earthing device is necessary.


For use with other cable types. Please contact our representative.


For outdoor applications. Order: +MWS.

411CA

This product can also be installed using a 411 CA. Please contact our representative.

Euromold
a Nexans company

430TBM-P2/P3
DUAL/TRIPLE CABLE ARRANGEMENT FOR 430TB CONNECTOR

Up to 36 kV
1250 A

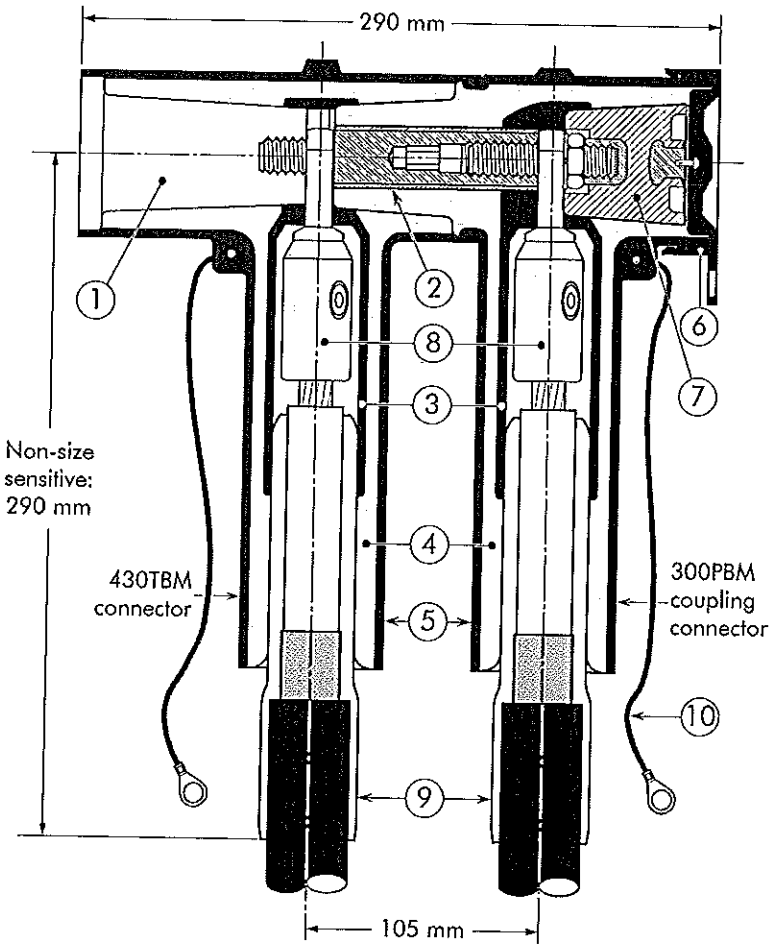
6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV

Application
Separable connectors (bolted type) for dual (P2) and triple (P3) cable arrangements.

Technical characteristics
- A thick conductive EPDM jacket provides a total safe to touch screen.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

Design
1. Type C interface as described by CENELEC EN 50180 and 50181.
2. Bus for 300PBM.
3. Conductive EPDM insert.
4. Insulating EPDM layer moulded between the insert and the jacket.
5. Conductive EPDM jacket.
6. Conductive EPDM cap.
7. Basic insulating plug (with VD point).
8. Conductor connector.
9. Cable reducer.
10. Earthing lead.

The screen break design enables cable outer sheath testing without removing or dismantling the connector.



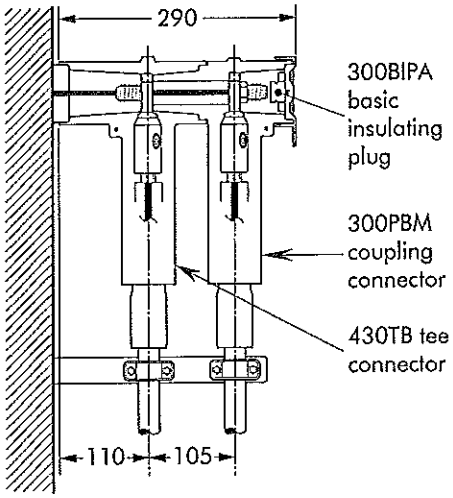
Specifications and standards
The 430TBM-P2/P3 connectors meet the requirements of CENELEC HD 629.1.

Separable connector type	Voltage Um (kV)	Current Ir (A)	Current Ir (A) When using a copper (-11-2) or a bolted (14-5) conductor contact	Conductor sizes (mm²)	
				min	max
430TBM-P2/P3	12	630	1250	35	300
K430TBM-P2/P3	24	630	1250	35	300
M430TBM-P2/P3	36	630	1250	50	240

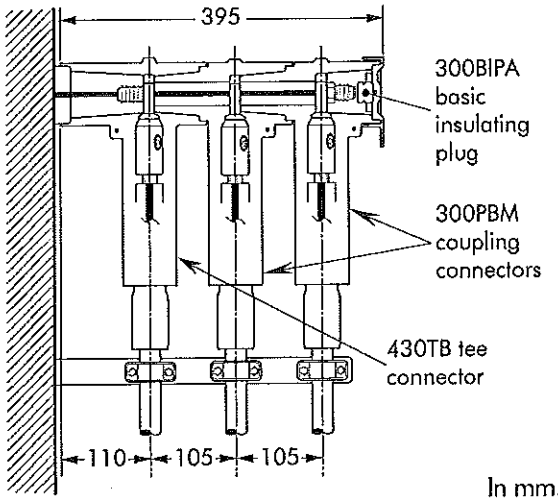
03/2013

Kit contents

The complete (K)(M)430TBM-P2 connector kit comprises 3 x the following components:



The complete (K)(M)430TBM-P3 connector kit comprises 3 x the following components:



In mm.

Ordering instructions

To order the separable connectors for dual cable arrangement, use the tables beside to substitute for **W** and **X** in the formula:
3 x 430TBM-P2-**W-X**,
for use up to 12 kV.
Add a 'K' for use up to 24 kV:
3 x K430TBM-P2-**W-X**.
Add an 'M' for use up to 36 kV:
3 x M430TBM-P2-**W-X**.

For triple cable arrangement:
3 x 430TBM-P3-**W-X**,
for use up to 12 kV.
Add a 'K' for use up to 24 kV:
3 x K430TBM-P3-**W-X**.
Add an 'M' for use up to 36 kV:
3 x M430TBM-P3-**W-X**.

Example:
The two cables are 24 kV, 150 mm² stranded aluminium with a diameter over core insulation of 27.5 mm.
Order 3 x K430TBM-P2-18-150(K)M-10-2.

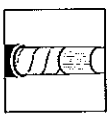
1. **From table W:** select the symbol which gives the best centring of your core insulation diameter.
2. **From table X:** according to your conductor size and type, select the designation which completes the part number.

Table W

Dia. over core insulation (mm)		W
min	max	
12.0	17.5	11
17.0	23.5	16
19.0	32.6	18
28.5	37.5	27

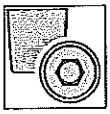
Table X

Conductor sizes (mm²)	Aluminium conductor		Aluminium and copper conductor	Copper conductor
	DIN hexagonal	Deep indent	Bolted	DIN hexagonal
35	35(K)M-10-2	35KM-10-1	16.95-14-5	35(K)M-11-2
50	50(K)M-10-2	50(K)M-10-1	50.150-14-5	50(K)M-11-2
70	70(K)M-10-2	70(K)M-10-1		70(K)M-11-2
95	95(K)M-10-2	95(K)M-10-1	95.240-14-5	95(K)M-11-2
120	120(K)M-10-2	120(K)M-10-1		120(K)M-11-2
150	150(K)M-10-2	150(K)M-10-1		150(K)M-11-2
185	185(K)M-10-2	185(K)M-10-1	120.300-14-5	185(K)M-11-2
240	240(K)M-10-2	240(K)M-10-1		240(K)M-11-2
300	300(K)M-10-2	–		300(K)M-11-2


For use with copper tape screened cables. Order: Kit MT.


For use with Alupe or C 33-226 cables. Please contact our representative.


For use with other cable types. Please contact our representative.


Up to 24 kV this product can also be installed using a 300BIPR (without VD point) Order: BIPR.


For applications outdoors and in humid climate. Order: +MWS.


For use in potentially explosive atmospheres (for 12 kV max). Add -/ATEX to part number.

Euromold
a Nexans company

804PB
COUPLING CONNECTOR FOR 484TB/G

Up to 42 kV
1250 A

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV
20.8/36 (42) kV

Application

Separable coupling connector (bolted type) for dual cable arrangement. It has been designed to be used with 484TB and 489TB separable Tee connectors.

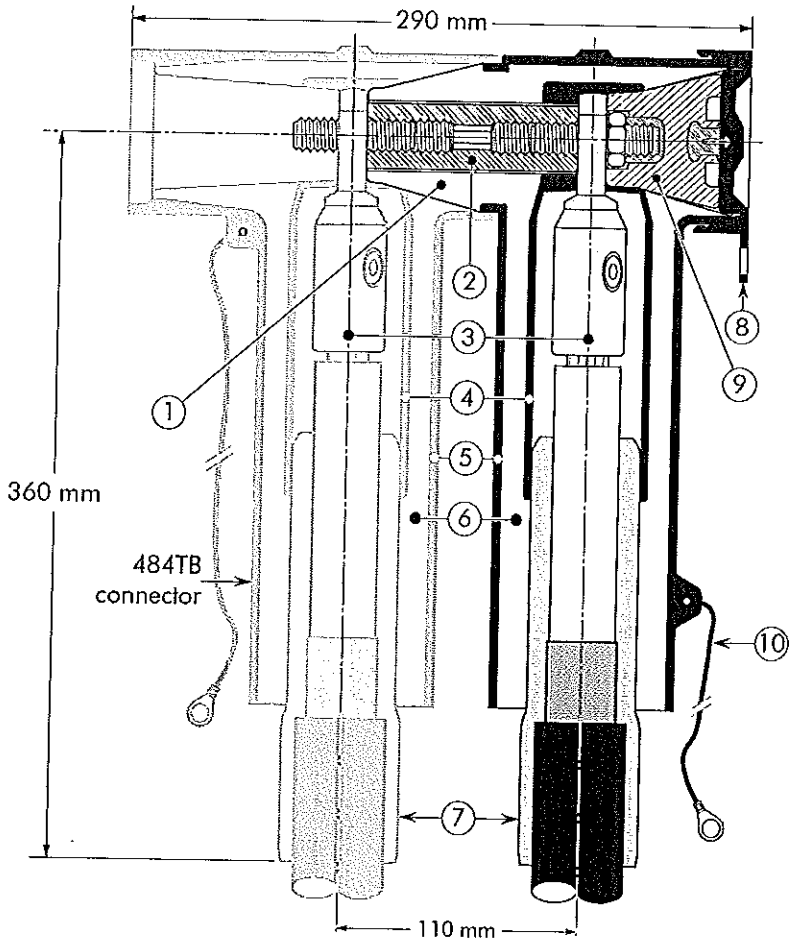
Technical characteristics

- A thick conductive EPDM jacket provides a total safe to touch screen.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

Design

1. Interface designed to fit 484TB and 489TB connector.
2. Bus for 804PB.
3. Conductor connector (hexagonal crimping, deep indent crimping or bolted).
4. Conductive EPDM insert.
5. Conductive EPDM jacket.
6. Insulating EPDM layer moulded between the insert and the jacket.
7. Cable reducer.
8. Conductive EPDM cap.
9. Basic insulating plug (with VD point).
10. Earth lead.

The screen break design enables cable outer sheath testing without removing or dismantling the connector.



Specifications and standards

The 804PB coupling connector meets the requirements of CENELEC HD 629.1.

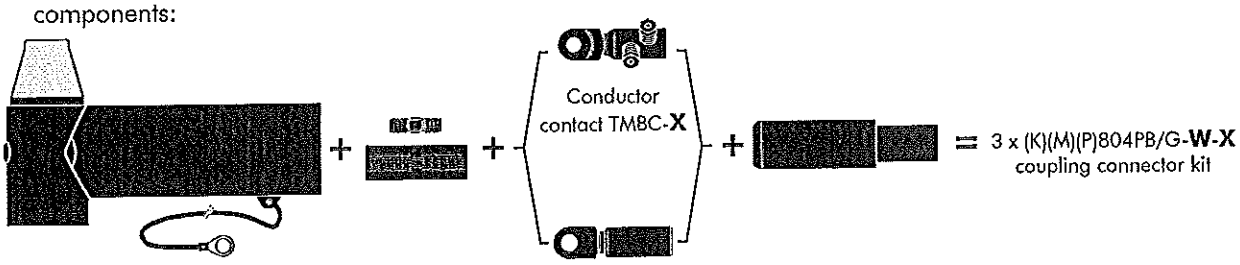
Separable connector type	Voltage Um (kV)	Current Ir (A)	Conductor sizes (mm²)	
			min	max
804PB/G	12	1250	50	630
K804PB/G	24	1250	35	630
M804PB/G	36	1250	35	630
P804PB/G	42	1250	35	630

03/2013

Kit contents

The complete (K)(M)(P)804PB/G coupling connector kit comprises 3 x the following components:

The kit also comprises silicone grease, field control mastic, gloves, roll adhesive tape, installation instructions and crimp chart.



Connector housing (K)(M)(P)804BP/G | Contact rod and stud | Conductor contact TBC-**X** | Cable reducer 611CA-**W**

Ordering instructions

To order the coupling connector, select the ordering part number which gives you the best centring of your core insulation diameter and substitute **X** using table X, according to your conductor size and type.
Add a 'K' for use up to 24 kV, add an 'M' for use up to 36 kV, add a 'P' for use up to 42 kV.

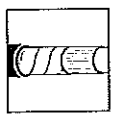
Example:
The copper wire screened cable is 36 kV, 240 mm² stranded aluminium with a diameter over core insulation of 37.0 mm.
Order 3 x M804PB/G-32-240(K)M-12-2 coupling connector kit.

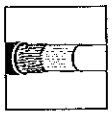
Table W

Ordering part number	Dia. over core insulation (mm)	
	min	max
3 x 804PB/G-15-**X**	16.0	22.0
3 x 804PB/G-19-**X**	20.0	26.5
3 x 804PB/G-22-**X**	23.5	31.0
3 x 804PB/G-27-**X**	28.5	37.5
3 x 804PB/G-32-**X**	34.0	42.5
3 x 804PB/G-37-**X**	39.0	48.5
3 x 804PB/G-43-**X**	45.5	56.0

Table X

Conductor sizes (mm²)	Aluminium conductor		Aluminium and copper conductor	Copper conductor
	DIN hexagonal	Deep indent	Bolted	DIN hexagonal
35	35(K)M-12-2	35KM-12-1	16.95-14-5	35(K)M-11-2
50	50(K)M-12-2	50KM-12-1	50.150-14-5	50(K)M-11-2
70	70(K)M-12-2	70KM-12-1		70(K)M-11-2
95	95(K)M-12-2	95KM-12-1	95.240-14-5	95(K)M-11-2
120	120(K)M-12-2	120KM-12-1		120(K)M-11-2
150	150(K)M-12-2	150KM-12-1	120.300-14-5	150(K)M-11-2
185	185(K)M-12-2	185KM-12-1		185(K)M-11-2
240	240(K)M-12-2	240KM-12-1	185.400-14-5	240(K)M-11-2
300	300(K)M-12-2	300KM-12-1		300(K)M-11-2
400	400(K)M-12-2	400KM-12-1	400.630-14-5	400(K)M-11-2
500	500(K)M-12-2	500KM-12-1		500(K)M-11-2
630	–	630KM-12-1		630(K)M-11-2


For use with copper tape screened cables. Order: Kit MT.


For use with copper wire screened cables. No earthing device is necessary.


For use with other cable types. Please contact our representative.


For applications outdoors and in humid climate. Order: +MWS.


Components can be ordered individually.

For use in potentially explosive atmospheres (for 12 kV max). Add -/ATEX to part number.

Euromold
a Nexans company

Euromold
a Nexans company

809PB
COUPLING CONNECTOR FOR 484TB/G AND 489TB/G

Up to 42 kV
1250 A

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV
20.8/36 (42) kV

Application

Separable coupling connector (bolted type) for dual cable arrangement. It has been designed to be used with 484TB and 489TB separable Tee connector.

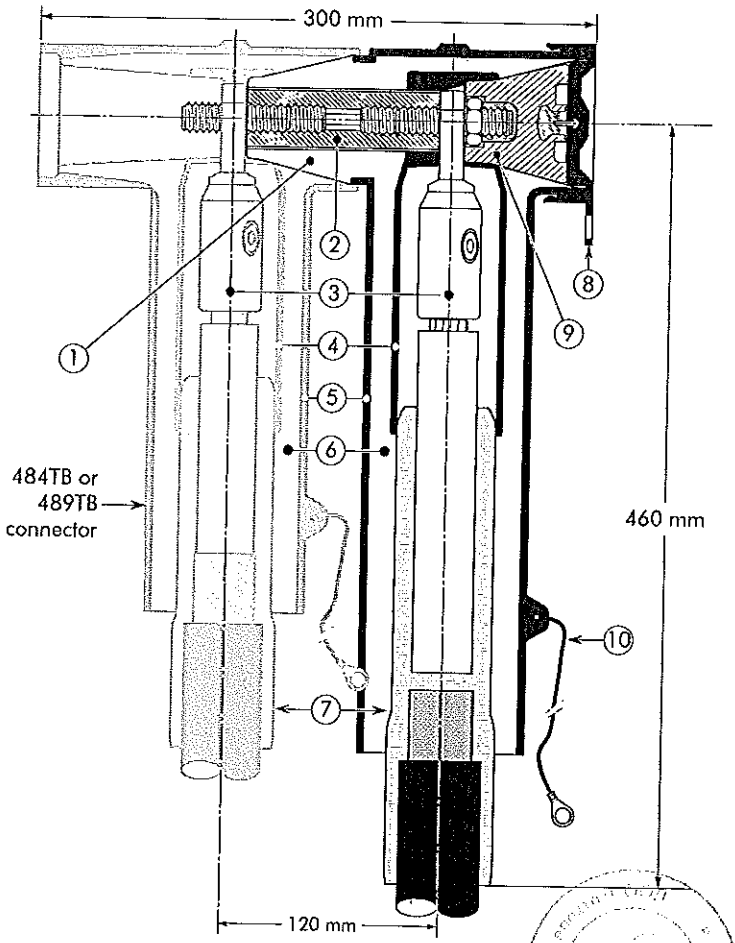
Technical characteristics

- A thick conductive EPDM jacket provides a total safe to touch screen.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

Design

1. Interface designed to fit 484TB and 489TB connector.
2. Bus for 809PB.
3. Conductor connector (hexagonal crimping, deep indent crimping or bolted).
4. Conductive EPDM insert.
5. Conductive EPDM jacket.
6. Insulating EPDM layer moulded between the insert and the jacket.
7. Cable reducer.
8. Conductive EPDM cap.
9. Basic insulating plug (with VD point).
10. Earth lead.

The screen break design enables cable outer sheath testing without removing or dismantling the connector.



Specifications and standards

The 809PB coupling connector meets the requirements of CENELEC HD 629.1.

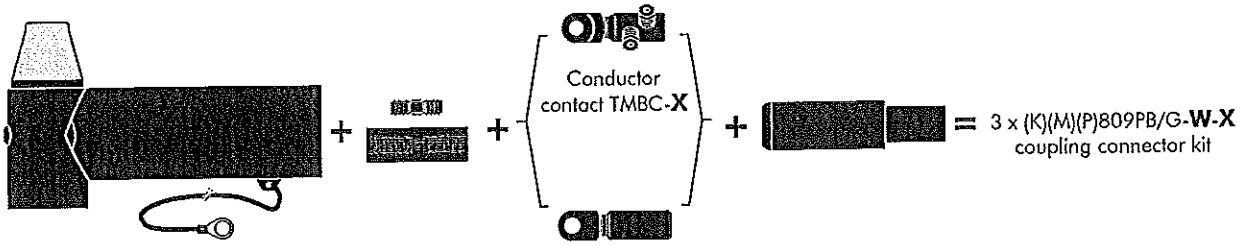
Separable connector type	Voltage Um (kV)	Current Ir (A)	Conductor sizes (mm²)	
			min	max
809PB/G	12	1250	630	1200
K809PB/G	24	1250	630	1200
M809PB/G	36	1250	630	1200
P809PB/G	42	1250	630	1200

03/2013

Kit contents

The complete (K)(M)(P)809PB/G coupling connector kit comprises 3 x the following components:

The kit also comprises silicone grease, field control mastic, gloves, roll adhesive tape, installation instructions and crimp chart.



Connector housing (K)(M)(P)809BP/G

Contact rod and stud

Conductor contact TBC-**X**

Cable reducer 911CA-**W**

Ordering instructions

To order the coupling connector, select the ordering part number which gives you the best centring of your core insulation diameter and substitute **X** using table X, according to your conductor size and type.
Add a 'K' for use up to 24 kV, add an 'M' for use up to 36 kV, add a 'P' for use up to 42 kV.

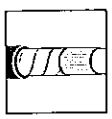
Example:
The copper wire screened cable is 36 kV, 1000 mm² stranded aluminium with a diameter over core insulation of 52 mm.
Order 3 x M809PB/G-43-1000(K)M-12-1 coupling connector kit.

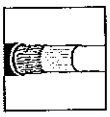
Table W

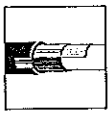
Ordering part number	Dia. over core insulation (mm)	
	min	max
3 x 809PB/G-37-**X**	40	48
3 x 809PB/G-43-**X**	46	54
3 x 809PB/G-50-**X**	53	54
3 x 809PB/G-53-**X**	56	62
3 x 809PB/G-56-**X**	59	65
3 x 809PB/G-59-**X**	62	68

Table X

Conductor sizes (mm²)	Aluminium conductor	Aluminium and copper conductor	Copper conductor
	Deep indent	Bolted	DIN hexagonal
630	630KM-12-1	400.630-14-5	630(K)M-11-2
800	800KM-12-1	800.1000-14-5	800(K)M-11-2
1000	1000KM-12-1		1000(K)M-11-2
1200	1200KM-12-1	-	-


For use with copper tape screened cables. Order: Kit MT.


For use with copper wire screened cables. No earthing device is necessary.


For use with Alupe or C 33-226 cables. Please contact our representative.


For use with other cable types. Please contact our representative.


For applications outdoors and in humid climate. Order: +MWS.


Components can be ordered individually.

Euromold
a Nexans company

450SR
INTERFACE C
STRAIGHT CONNECTOR

Up to 24 kV - 630A

Application

Separable straight connector designed to connect polymeric insulated cable to equipment (transformers, switch gear, motors...).
Also connects cable to cable, using the appropriate mating part.

Technical characteristics

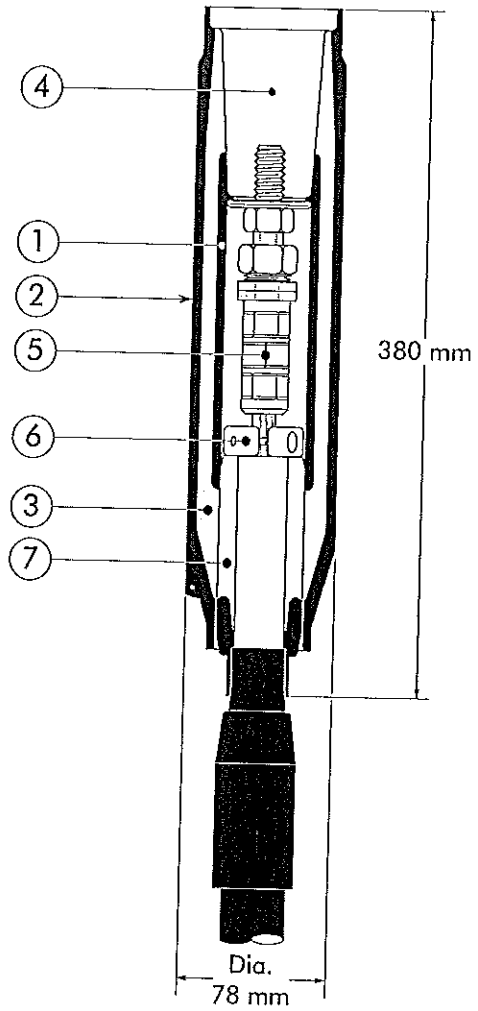
- The thick conductive EPDM jacket provides a total safe to touch screen which ensures safety for personnel.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Design

Separable connector comprising:

1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type C - 630 A interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector assembly.
6. Retaining ring.
7. Cable reducer.



Specifications and standards

The separable connector 450SR meets the requirements of CENELEC HD 629.1 S1.

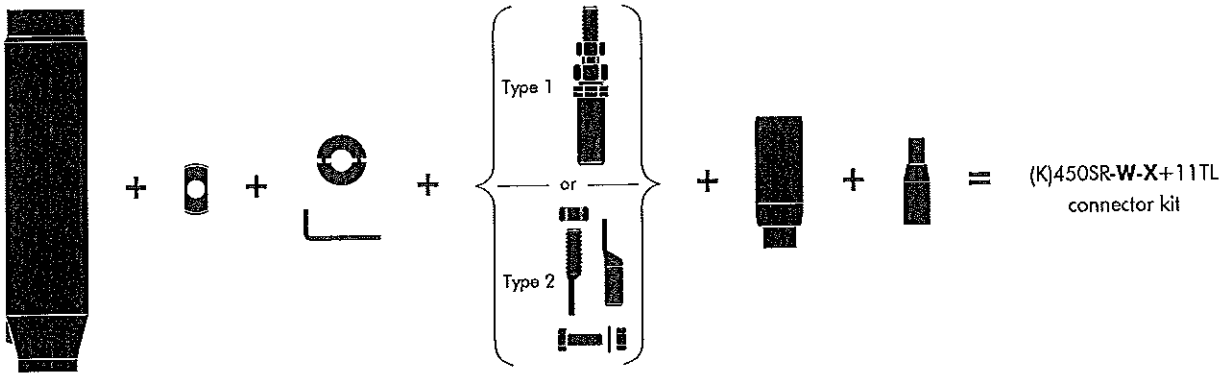
Separable connector type	Voltage Um (kV)	Current Ir (A)	Conductor size (mm²)	
			min.	max.
450SR	12	630	50	300
K450SR	24	630	25	300

03/2013

Kit contents

The complete (K)450SR straight connector kit comprises the following components:

The kit also comprises lubricant, wipers, installation instructions and crimp chart.



Connector housing (K)450SRH | Locking disc 450SRD | Retaining ring + hex key 400RR-**X** | Contact assembly 450SRC-**X**-Assy | Cable reducer 450CA-**W** | Cable adaptor 11TL

Ordering instructions

To order the straight connector, select the ordering part number which gives you the best centring of your core insulation diameter and substitute **X** using table X, according to your conductor size and type.
Add a 'K' for use up to 24 kV.

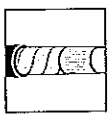
Table W

Ordering part number	Dia. over core insulation (mm)	
	min.	max.
450SR-06-**X**+11TL	16.5	21.5
450SR-08-**X**+11TL	19.9	24.4
450SR-10-**X**+11TL	23.2	28.0
450SR-12-**X**+11TL	26.1	31.0
450SR-14-**X**+11TL	30.0	36.1

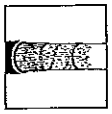
Table X

Conductor size (mm^2)	Conductor contact type (DIN standards only)			
	Type 1		Type 2	
	Aluminium	Copper	Aluminium	Copper
25	–	25KM-11-2	–	–
35	35KM-12-2	35KM-11-2	35KM-12-2-L	35KM-11-2-L
50	50KM-12-2	50KM-11-2	50KM-12-2-L	50KM-11-2-L
70	70KM-12-2	70KM-11-2	70KM-12-2-L	70KM-11-2-L
95	95KM-12-2	95KM-11-2	95KM-12-2-L	95KM-11-2-L
120	120KM-12-2	120KM-11-2	120KM-12-2-L	120KM-11-2-L
150	150KM-12-2	150KM-11-2	–	–
185	185KM-12-2	185KM-11-2	–	–
240	240KM-12-2	240KM-11-2	–	–
300	300KM-12-2	300KM-11-2	–	–

Example:
The copper wire screened cables are 24 kV, 240 mm^2 stranded aluminium with a diameter over core insulation of 32.2 mm.
Order 3 x K450SR-14-240KM-12-2+11TL straight connector kit.


For use with copper tape screened cables. Order: Kit MT.


For use with Alupe or C 33-226 cables. Please contact our representative.


For use with fabric tape (graphite) screened cables. Order additional semi-conductive tape (type TSC).


For use with other cable types. Please contact our representative.


For outdoor applications. Order: +MWS.


Components can be ordered individually.

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300SA
SURGE ARRESTER FOR 430TB CONNECTOR

Up to 36 kV

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV

Application

Surge arrester designed to protect 12, 24 and 36 kV class components, including transformers, equipment, cable and accessories from high voltage surges resulting from lightning or switching.
It has been designed to be used with the 430TB separable tee connector.

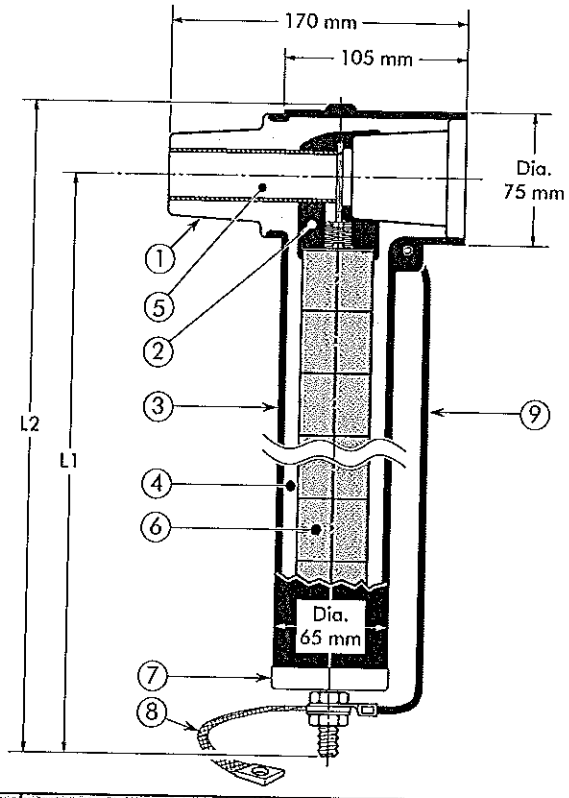
Technical characteristics

- This surge arrester is a metal oxide varistor surge arrester in an elbow configuration.
- Each arrester is tested for AC withstand, partial discharge and critical voltage prior to leaving the factory.

Design

Surge arrester comprising:

1. Interface designed to fit the 430TB tee connector.
2. Conductive EPDM insert.
3. Conductive EPDM jacket.
4. Insulating EPDM layer moulded between the insert and the jacket.
5. Receptacle for contact rod.
6. Metal oxide valve elements.
7. Steel cap.
8. Earth connection.
9. Earth lead.



Specifications and standards

The 300SA surge arresters meet the test requirements of IEC 60099-4.

Surge arrester type	Nominal discharge current In (kA)	Rated voltage Ur (kV)	Max. continuous operating voltage Uc (kV)	Dimensions (mm)	
				L1	L2
300SA-10-6N	10	6	4.8	250	290
300SA-10-9N	10	9	7.2	250	290
300SA-10-12N	10	12	9.6	250	290
300SA-10-15N	10	15	12.0	250	290
300SA-10-18N	10	18	14.4	250	290
300SA-10-22N	10	22	17.6	250	290
300SA-10-24N	10	24	19.2	350	390
300SA-10-30N	10	30	24.0	350	390
300SA-10-33N	10	33	26.4	350	390
300SA-10-36N	10	36	28.8	350	390
300SA-10-45N	10	45	36.0	450	490

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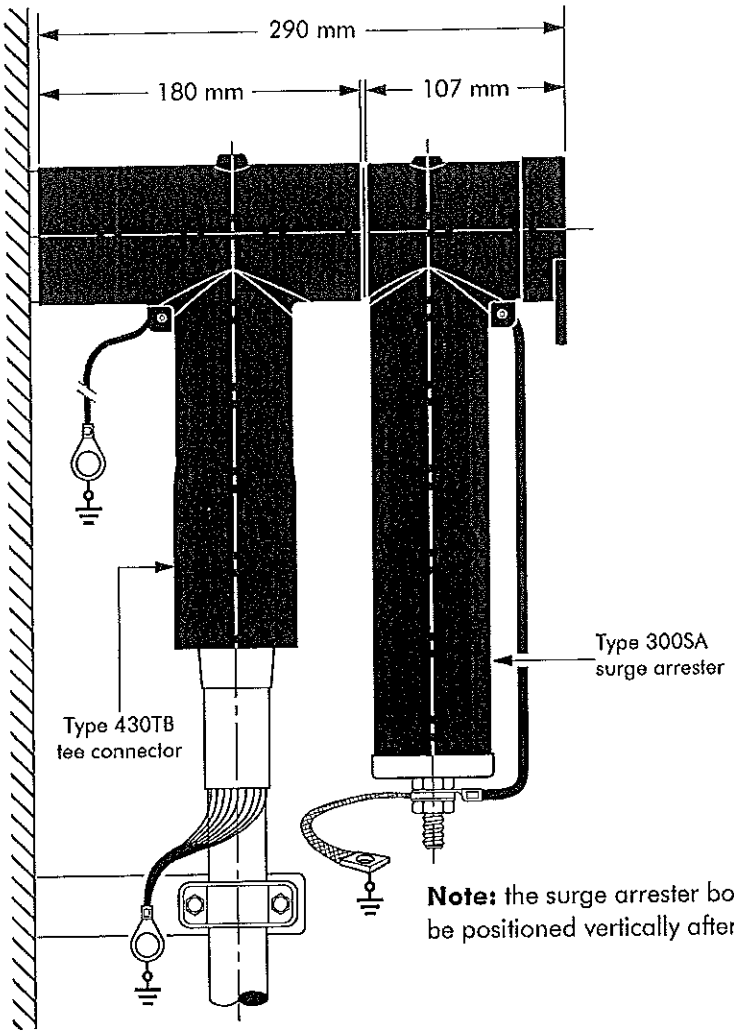
Typical application and dimensions



Note: the surge arrester body needs to be positioned vertically after installation.

Ordering instructions

To order the surge arrester, specify the surge arrester type, as described on previous page.

Example:
For a maximum continuous operating voltage (r.m.s.) of 24 kV and a nominal discharge current of 10 kA.
Order a 300SA-10-30N surge arrester.

For use in potentially explosive atmospheres (for 12 kV max). Add -/ATEX to part number.

Technical data

Surge arrester type	Steep current residual voltage @ 10 kA [1/20 µs] (kV)	Lightning current residual voltage [8/20 µs] (kV)			Switching impulse residual voltage [36/90 µs] (kV)		High current impulse withstand (kA)
		@ 5 kA	@ 10 kA	@ 20 kA	@ 125 A	@ 500 A	
300SA-10-6N	20.4	16.8	18.3	20.5	12.9	13.7	100
300SA-10-9N	28.5	23.5	25.6	28.7	18.0	19.2	100
300SA-10-12N	38.0	31.4	34.2	38.3	24.1	25.7	100
300SA-10-15N	48.1	39.7	43.2	48.4	30.5	32.5	100
300SA-10-18N	58.1	48.0	52.2	58.5	36.8	39.2	100
300SA-10-22N	70.1	57.9	63.0	70.6	44.4	47.3	100
300SA-10-24N	77.0	63.6	69.2	77.6	48.8	52.0	100
300SA-10-30N	97.0	80.1	87.2	97.7	61.5	65.5	100
300SA-10-33N	106.3	83.1	90.5	101.4	63.8	68.0	100
300SA-10-36N	115.9	95.7	104.2	116.8	73.5	78.3	100
300SA-10-45N	144.1	119.0	129.5	145.1	91.3	97.3	100

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800SA
SURGE ARRESTER FOR 484TB CONNECTOR

Up to 42 kV

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV
20.8/36 (42) kV

Application

Surge arrester designed to protect 12, 24, 36 and 42 kV class components, including transformers, equipment, cable and accessories from high voltage surges resulting from lightning or switching.
It has been designed to be used with the 484TB and 489TB separable tee connectors.

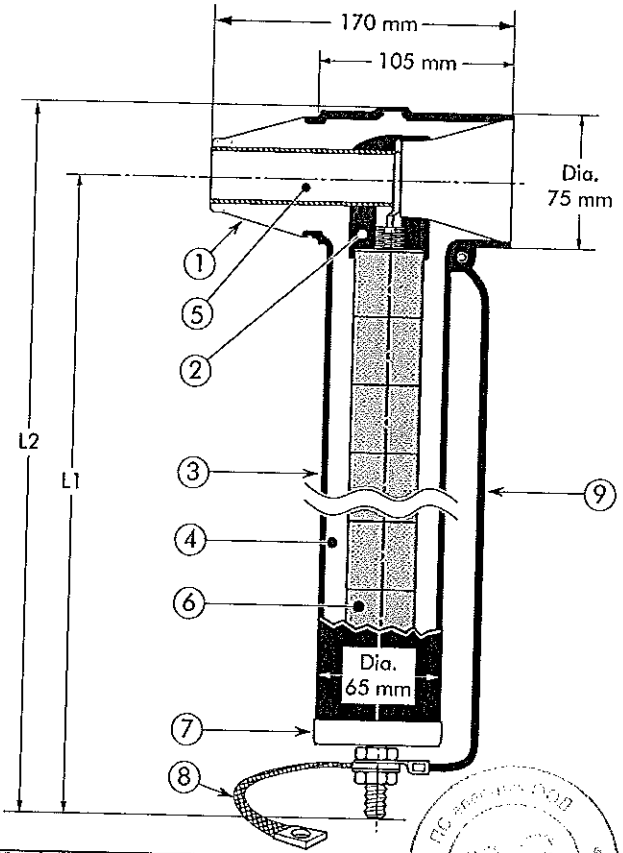
Technical characteristics

- This surge arrester is a metal oxide varistor surge arrester in an elbow configuration.
- Each arrester is tested for AC withstand, partial discharge and critical voltage prior to leaving the factory.

Design

Surge arrester comprising:

1. Interface designed to fit the 484TB and 489TB tee connector.
2. Conductive EPDM insert.
3. Conductive EPDM jacket.
4. Insulating EPDM layer moulded between the insert and the jacket.
5. Receptacle for contact rod.
6. Metal oxide valve elements.
7. Steel cap.
8. Earth connection.
9. Earth lead.



Specifications and standards

The 800SA surge arresters meet the test requirements of IEC 60099-4.

Surge arrester type	Nominal discharge current In (kA)	Rated voltage Ur (kV)	Max. continuous operating voltage Uc (kV)	Dimensions (mm)	
				L1	L2
800SA-10-15N	10	15	12.0	250	290
800SA-10-18N	10	18	14.4	250	290
800SA-10-22N	10	22	17.6	250	290
800SA-10-24N	10	24	19.2	350	390
800SA-10-30N	10	30	24.0	350	390
800SA-10-33N	10	33	26.4	350	390
800SA-10-36N	10	36	28.8	350	390
800SA-10-45N	10	45	36.0	450	490

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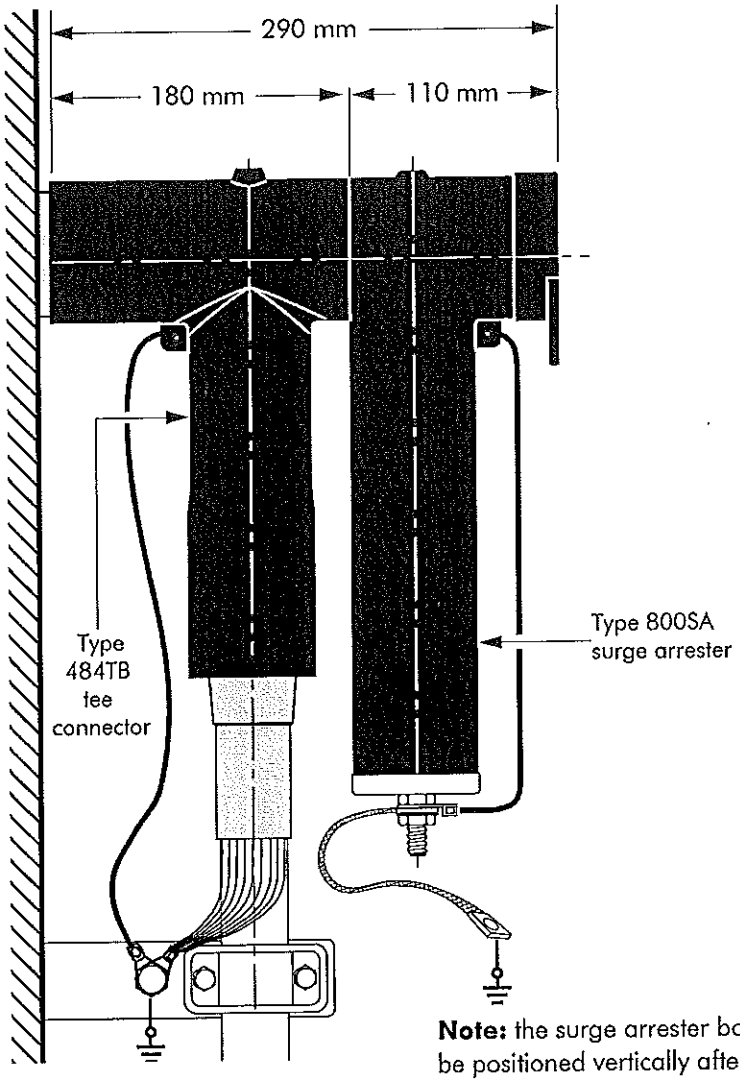
Typical application and dimensions



Note: the surge arrester body needs to be positioned vertically after installation.

Ordering instructions

To order the surge arrester, specify the surge arrester type, as described on previous page.

Example:
For a maximum continuous operating voltage (r.m.s.) of 24 kV and a nominal discharge current of 10 kA.
Order a 800SA-10-30N surge arrester.

For use in potentially explosive atmospheres (for 12 kV max). Add -/ATEX to part number.

Technical data

Surge arrester type	Steep current residual voltage @ 10 kA [1/20 µs] (kV)	Lightning current residual voltage [8/20 µs] (kV)			Switching impulse residual voltage [36/90 µs] (kV)		High current impulse withstand (kA)
		@ 5 kA	@ 10 kA	@ 20 kA	@ 125 A	@ 500 A	
800SA-10-15N	48.1	39.7	43.2	48.4	30.5	32.5	100
800SA-10-18N	58.1	48.0	52.2	58.5	36.8	39.2	100
800SA-10-22N	70.1	57.9	63.0	70.6	44.4	47.3	100
800SA-10-24N	77.0	63.6	69.2	77.6	48.8	52.0	100
800SA-10-30N	97.0	80.1	87.2	97.7	61.5	65.5	100
800SA-10-33N	106.3	83.1	90.5	101.4	63.8	68.0	100
800SA-10-36N	115.9	95.7	104.2	116.8	73.5	78.3	100
800SA-10-45N	144.1	119.0	129.5	145.1	91.3	97.3	100

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400TR and 800TR
INTERFACE C
TEST RODS

Application

- The test rod can be used for:
  - cable fault location
  - cable testing
  - phasing checks, etc.
- Connections may be made with a cable lug, a 4 mm plug or spring clips.

Technical characteristics

- The 400TR test rod can be used with 430TB connectors.
- The 800TR is for use with the 484TB.

Design

1. Insulating shroud.
2. Threaded rod for test connection.
3. Two nuts M12.
4. Insulation.
5. Copper test rod stem.

An insulating shroud is provided to allow the application of test voltages when bushings are closely spaced.

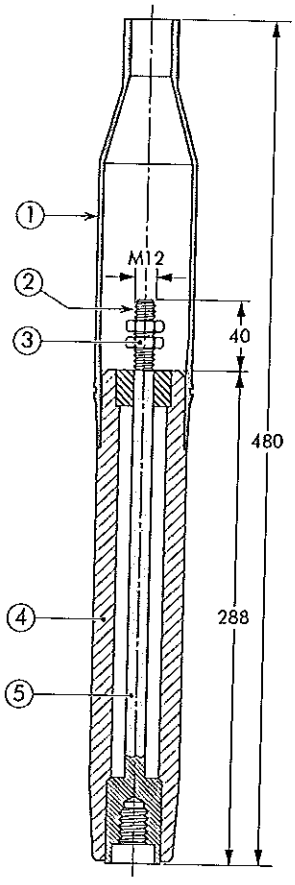
Installation

The test rod is mounted on to the clamping screw in the type C interface tee and coupling connectors. The test cable is connected to the threaded stem and the insulating shroud moved to its final position over the end of the test rod.

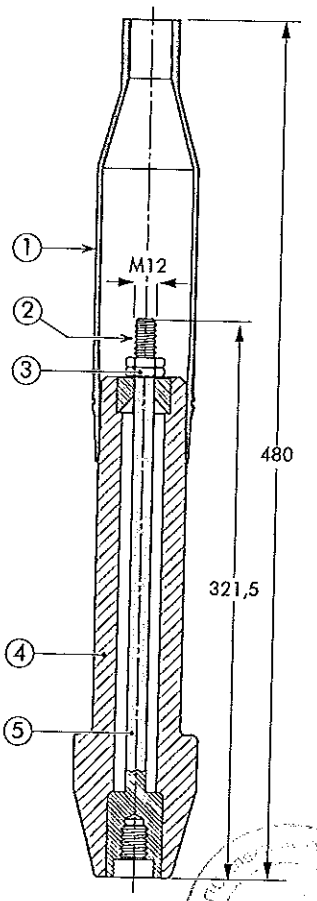
Ordering instructions

Simply specify:
400TR or 800TR test rod.

400TR



800TR



In mm.

Test rod type	Maximum A.C. test voltage (50 Hz - 1 min)	Maximum D.C. test voltage (8 x U_0 - 30 min)	Impulse voltage (1.2 x 50 µs) min
400TR	36 kV	96 kV	95 kV
800TR	36 kV	96 kV	95 kV

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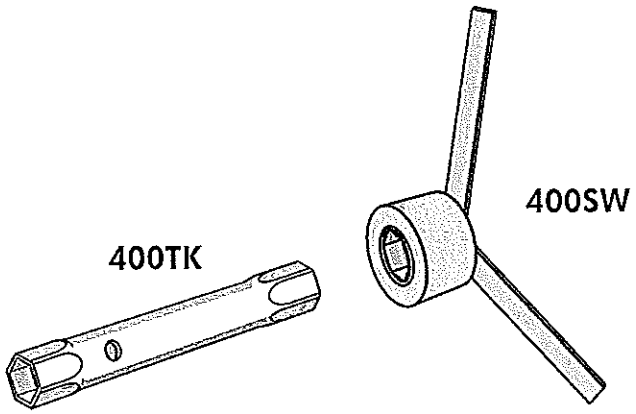
400TK and 400SW
INSTALLATION TOOL

Application

- The box spanner and box spanner key are designed to facilitate assembly of 400TE, 400TB and 440TB connectors.
- The 400TK box spanner is used to install the 400TEF clamping pin contact or 400TCS clamping screw.
- The 400SW box spanner key fits on the hex nut of the 400BIPA basic insulating plug.



Ordering instructions

Simply specify:
- 400TK box spanner
- 400SW box spanner key

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ACCESSORIES
INTERFACE C

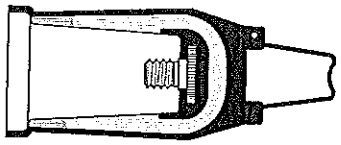
Application
For use with connectors and bushings with an interface C as described by CENELEC EN 50180 and 50181.

Technical characteristics
All these products, except the earthing plugs, are tested for AC withstand and partial discharge prior to leaving the factory.

Up to 36 kV

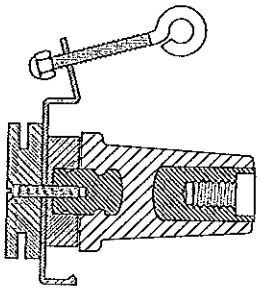
6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV
18/30 (36) kV
19/33 (36) kV
20,8/36 (42) kV

400DR-B/G
Dead-end receptacle
Fits over a bushing with a type C interface to provide 'dead-end' facility. The dead-end receptacle is supplied with an earth lead.



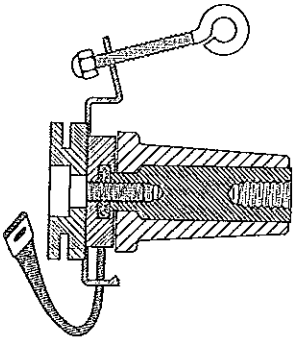
Ordering instructions
Order
400DR-B/G for 12 kV,
K400DR-B/G for 24 kV or
M400DR-B/G for 36 kV applications.

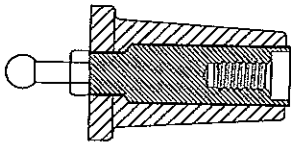
400SOP-B
Stand-off plug
Is designed to support and 'dead-end' connectors with a type C interface when removed from equipment.



Ordering instructions
Order
400SOP-B for 12 kV,
K400SOP-B for 24 kV,
M400SOP-B for 36 kV or
P400SOP-B for 42 kV applications.

400GP-B
Earthing plug
Is designed to support and earth connectors with a type C interface when removed from equipment.





Ordering instructions
Order
400GP-B for 12, 24, 36 or 42 kV applications.

Order
400GP-SBT for a version with a straight bolt terminal.

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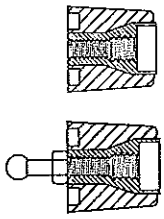
300GP-B
Earthing plug

Is designed to earth the 430TB, 300PB connectors when it is fixed-mounted to the equipment (maintenance earthing).



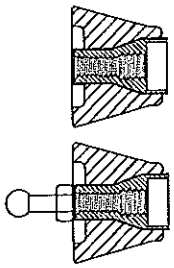
Ordering instructions

Order
300GP-B for 12, 24 or 36 kV applications.

Order
300GP-SBT for a version with a straight ball terminal.

800GP-B
Earthing plug

Is designed to earth the 484TB and 804PB connectors when it is fixed-mounted to the equipment (maintenance earthing).



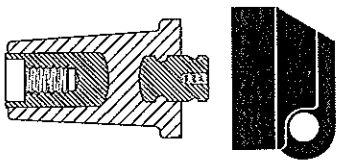
Ordering instructions

Order
800GP-B for 12, 24, 36 or 42 kV applications.

Order
800GP-SBT for a version with a straight ball terminal.

400BIPA
Basic insulating plug

Acts as a tightening nut for the 400TB and 440TB tee connector kits.
The plug contains a voltage detection point.
The conductive rubber protection cap is included.

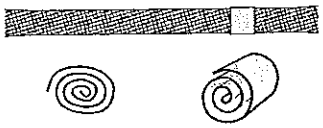


Ordering instructions

Order
400BIPA for 12 kV,
K400BIPA for 24 kV
M400BIPA for 36 kV or
P400BIPA for 42 kV
applications.

Kit MT
Earthing kit for copper tape screened cables

Contains a tinned copper braid (25 mm² - L = 500 mm), a tinned copper wire for cleating and some water sealing mastic.



Ordering instructions

Order
Kit MT for 12 kV, 24 kV, 36 kV or 42 kV applications.

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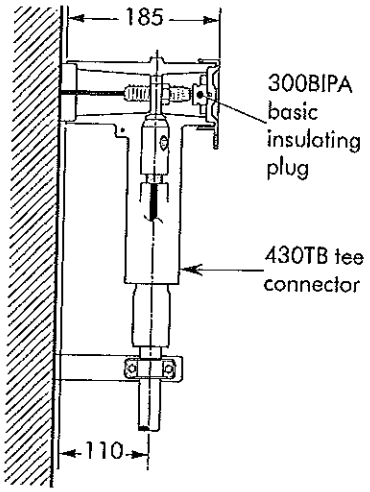
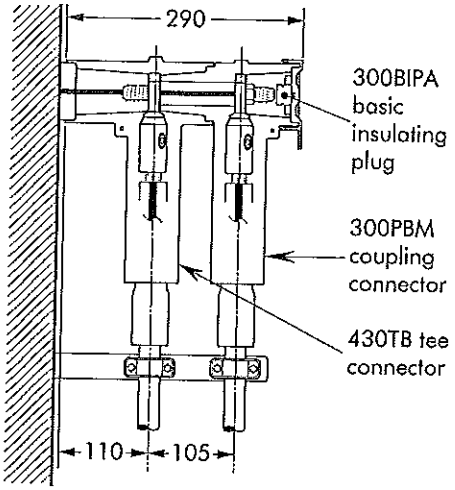
POSSIBLE ARRANGEMENTS
INTERFACE C

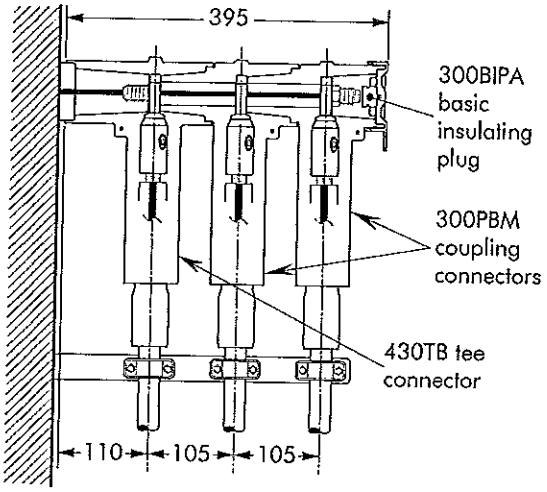
430TB
Single cable arrangement.
Order 430TB for 12 kV,
K430TB for 24 kV or M430TB
for 36 kV applications.



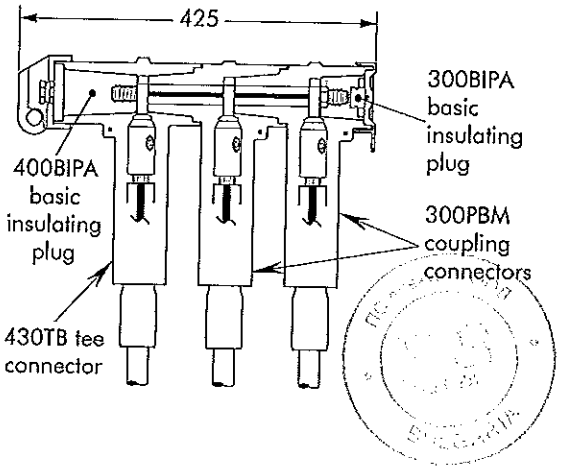
430TBM-P2
Dual cable arrangement.
Order 430TBM-P2 for 12 kV,
K430TBM-P2 for 24 kV or
M430TBM-P2 for 36 kV
applications.



430TBM-P3
Triple cable arrangement.
Order 430TBM-P3 for 12 kV,
K430TBM-P3 for 24 kV or
M430TBM-P3 for 36 kV
applications.



430TBM-L3
3-way connection.
Order 430TBM-L3 for 12 kV,
K430TBM-L3 for 24 kV or
M430TBM-L3 for 36 kV
applications.



ВЯРНО С ОРИГИНАЛА

In mm.

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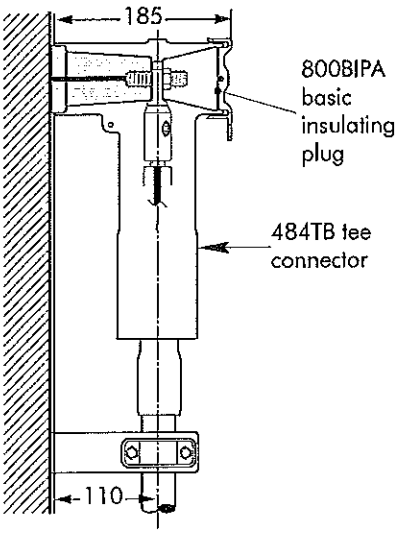
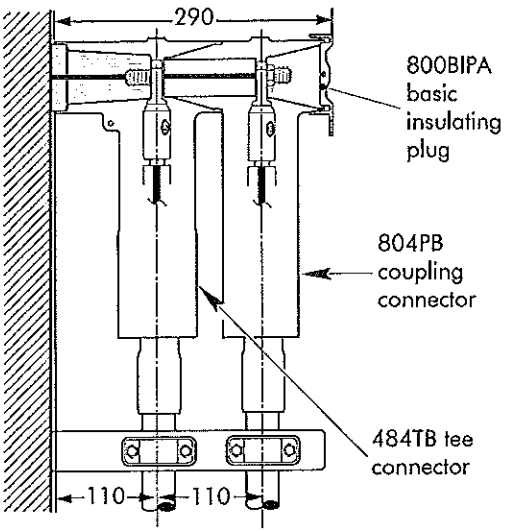
484TB

Single cable arrangement.
Order 484TB for 12 kV, K484TB for 24 kV, M484TB for 36 kV or P484TB for 42 kV applications.



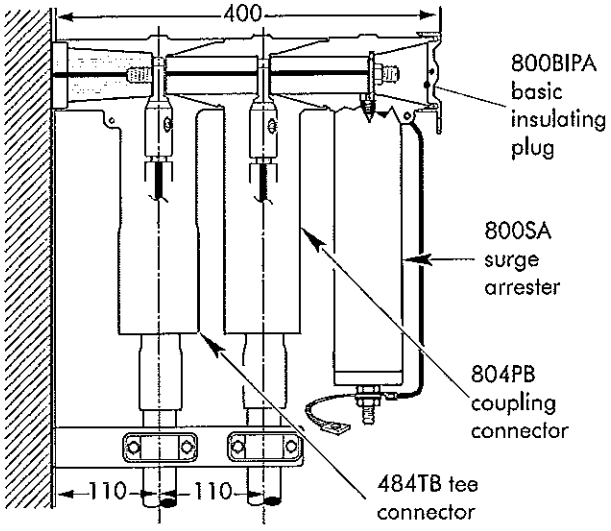
484TB-P2

Dual cable arrangement.
Order 484TB-P2 for 12 kV, K484TB-P2 for 24 kV or M484TB-P2 for 36 kV or P484TB-P2 for 42kV applications.



484TB-P2 + 800SA

Dual cable arrangement with surge arrester.
Order 484TB-P2+800SA for 12 kV, K484TB-P2+800SA for 24 kV, M484TB-P2+800SA for 36 kV or P484TB-P2+800SA for 42 kV applications.

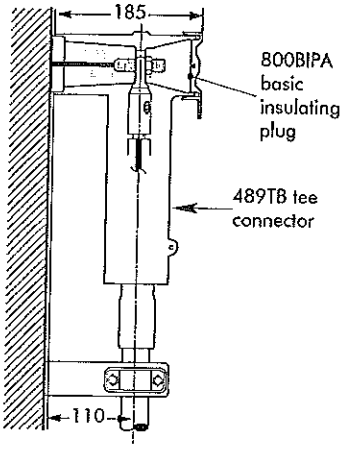


ВЯРНО С ОРИГИНАЛА

In mm.

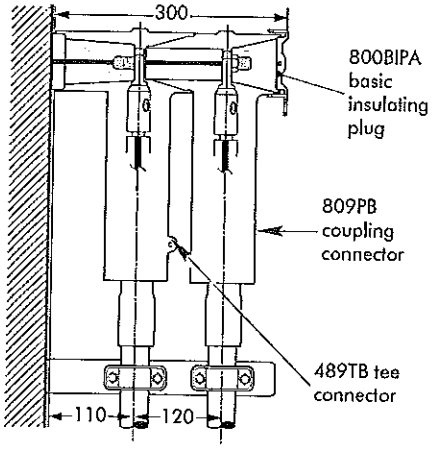
489TB

Single cable arrangement.
Order 489TB for 12 kV,
K489TB for 24 kV, M489TB
for 36 kV or P484TB for 42 kV
applications.



489TB-P2

Dual cable arrangement.
Order 489TB-P2 for 12 kV,
K489TB-P2 for 24 kV or
M489TB-P2 for 36 kV
or P489TB-P2 for 42kV
applications.



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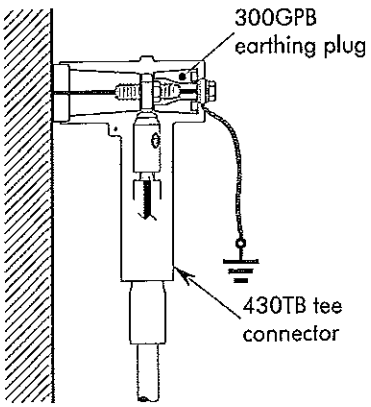
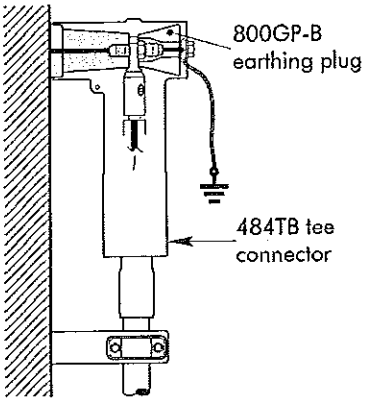
Earthing plug on connector

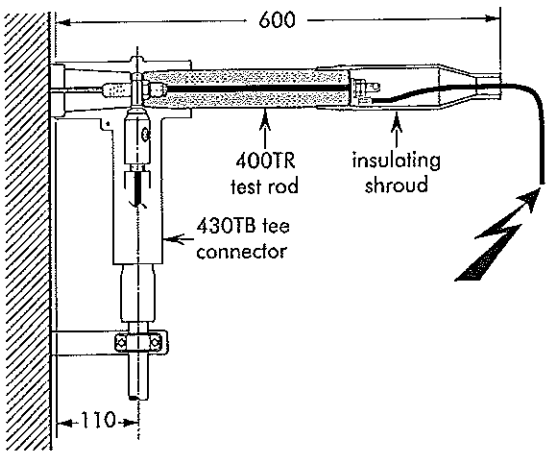
Order 300GP-B for 12 kV, 24 kV and 36 kV applications.

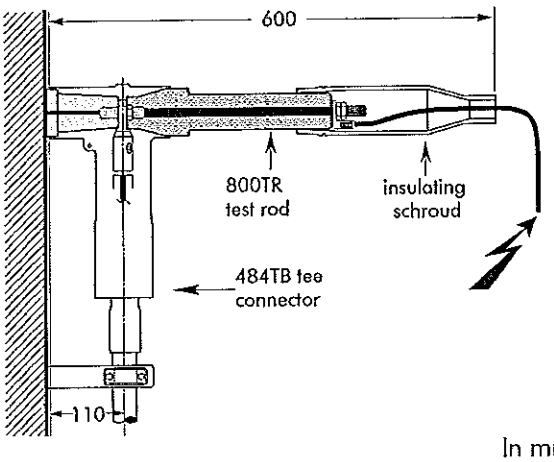


Order 800GP-B for 12 kV, 24 kV, 36 kV or 42 kV applications.



Cable and equipment testing





In mm.

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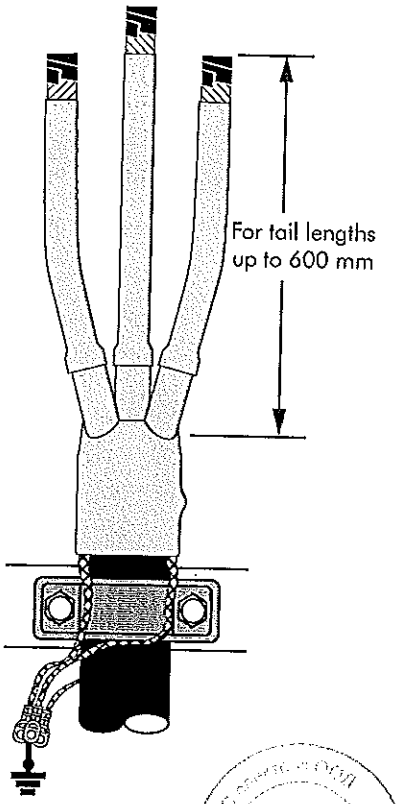
T-HSBK
THREE CORE HEAT-SHRINK BREAKOUT KIT

Application
For sealing of three core polymeric insulated cable crutches and earthing of the metallic screens and armour. For use with Euromold separable connectors with ground lead (/G) or with terminations.

Technical characteristics
The installed breakout fullfills the requirements of IP54. The armouring and screen connection systems have short circuit rating (Isc) of up to 5,1 kA/1s.

Design
The three core heat-shrink breakout kit consists of (depending on cable type): a heat-shrinkable breakout, 3 sleeves, earth braid and roll springs, hose clamp, water sealing mastic and installation instructions.

Ordering instructions
To order the 3-core kit, select the part number, which gives you the best centering over the cable core insulation diameter and substitute **X** using table X, according to your cable type.



Ordering part number	Typical use Conductor sizes (mm²)		Diameter over core isolation (mm)	Diameter over armour (mm)
	12, 17 & 24 kV	36 kV		
T-HSBK-20-**X**	16-95	-	12-23	50-70
T-HSBK-30-**X**	95-240	16-95	19-31	60-80
T-HSBK-40-**X**	185-400	95-240	24-35	70-90
T-HSBK-50-**X**	-	185-400	32-40	80-100

Table X

X depending on cable type	X
Unarmoured, individual copper tape screen	DR1K
Unarmoured, individual copper wire screen	DR2K
Unarmoured, common copper wire screen	DR3K
Armoured, individual copper tape or wire screen	DR1F/DR2F
Armoured, common copper wire screen	DR3F

03/2013

Additional catalogue information on power cable accessories
is available by contacting us at the address below:

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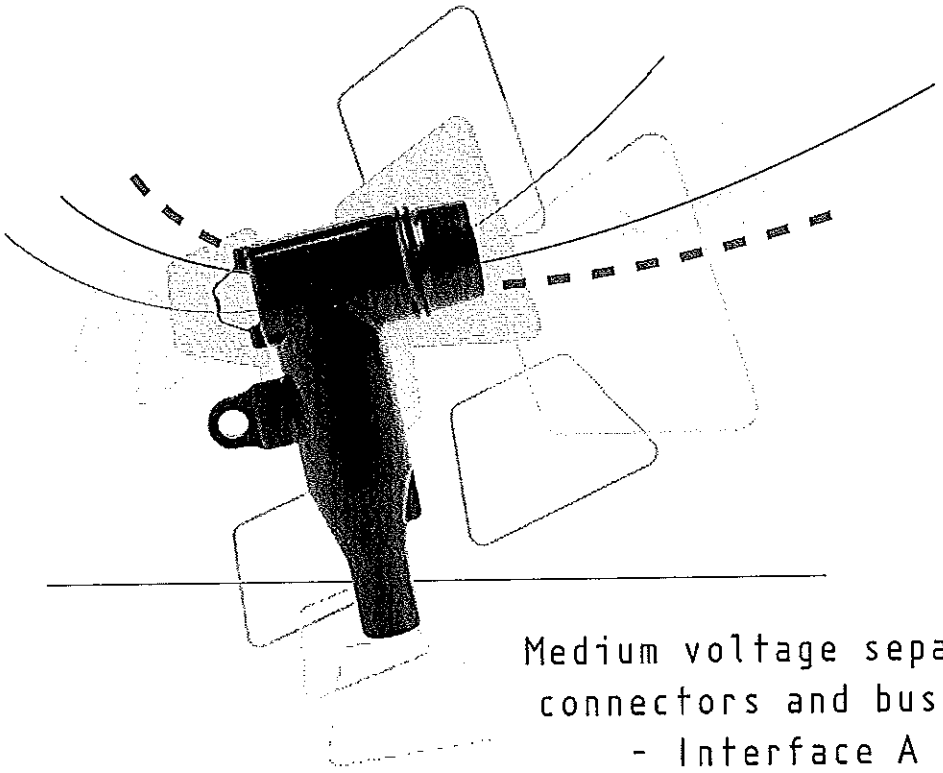

Medium voltage separable connectors and bushings
- Interface A -

Catalogue 2011

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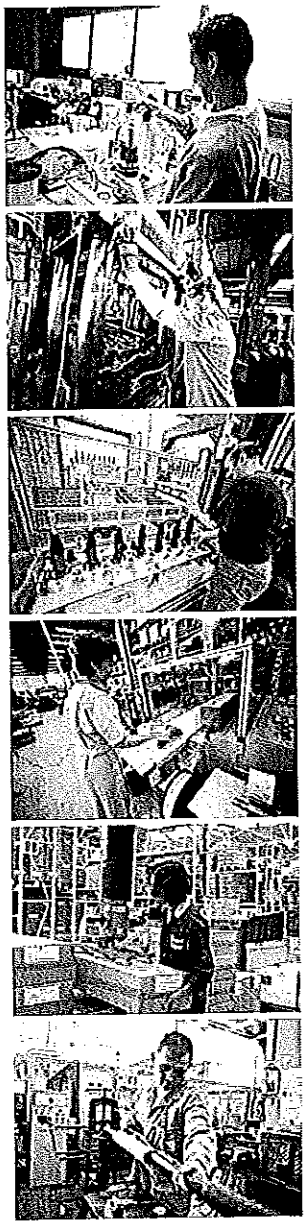
EUROMOLD
COMPANY PRESENTATION



EUROMOLD
Euromold is the leading European specialised designer, manufacturer and distributor of prefabricated cable accessories for medium voltage energy distribution. Euromold provides a complete range of accessories for underground cables: pre-moulded EPDM or silicone rubber connectors, terminations and joints for cables and epoxy bushings for transformers and switchgear, as well as a large range of cold-shrinkable terminations and joints from 12 to 42 kV.
Euromold is also the manufacturer of electrical components for the high voltage accessories of the Nexans group.

ISO 9001 Certificate
Since 1992, Euromold's commitment to quality is demonstrated by its ISO 9001 certification.

International standards
All our products meet the International standards like CENELEC HD 629.1, CENELEC EN 50180, IEC 60137, IEEE 386 & 404... or country specifications. Official certificates, CESI, KEMA, ATEX... prove the conformity of our products. Long duration tests of existing or new products are continuously performed in our test fields.

Laboratory accreditation
Since June 2000, Euromold's independent ELAB laboratory obtained the BELTEST accreditation no.192-T-ISO 17025 conform with the European standards for laboratories ISO 17025 for electrical testing of medium voltage cable accessories according to the International standards IEC 61442 and HD 629.

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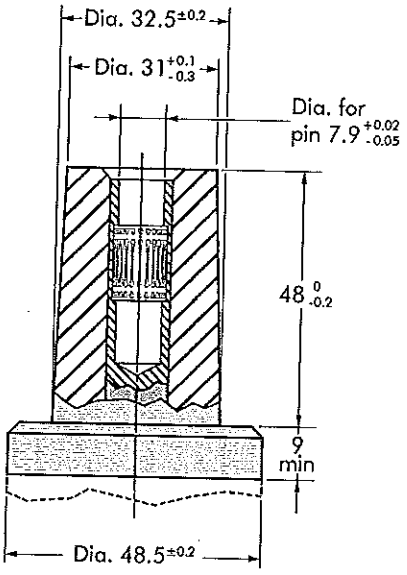
SEPARABLE CONNECTORS AND BUSHINGS
INTERFACE A

Table of contents

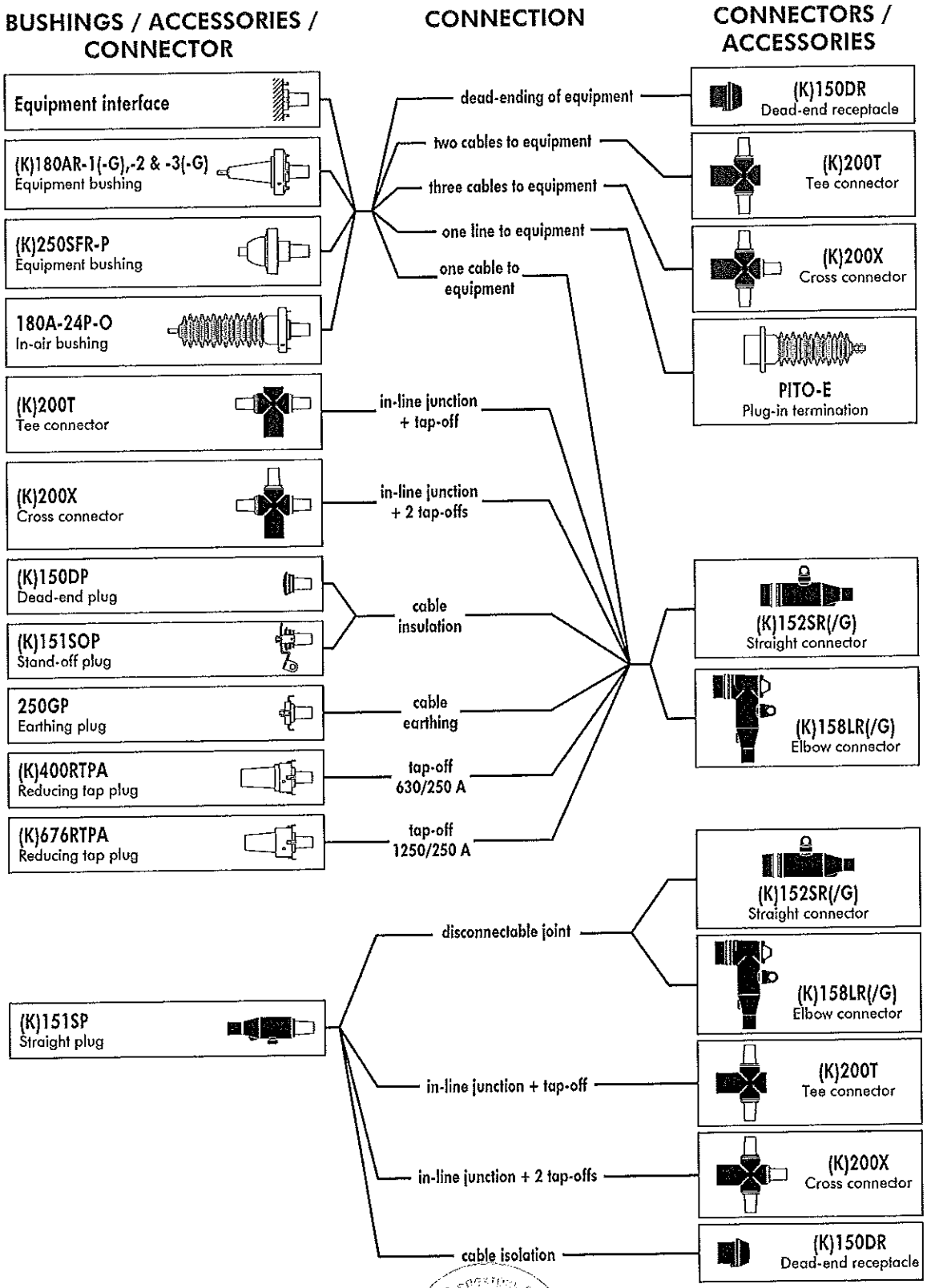
158LR - elbow connector
152SR - straight connector
151SP - straight plug
156SA - surge arrester
180AR-1 /-2 /-3 and 180AR-1-G /-3-G - equipment bushings
250SFR-P - equipment bushing
180A-24P-O - in-air bushing
PITO-E - plug-in termination
Accessories
Bail restraints

Interface A

Dimensions according to European CENELEC EN 50180 and 50181 (in mm).



Connecting possibilities



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158LR
INTERFACE A
ELBOW CONNECTOR

Up to 24 kV - 250 A

Application

Separable elbow connector designed to connect polymeric insulated cable to equipment (transformers, switchgear, motors...).
Also connects cable to cable, using the appropriate mating part.

Technical characteristics

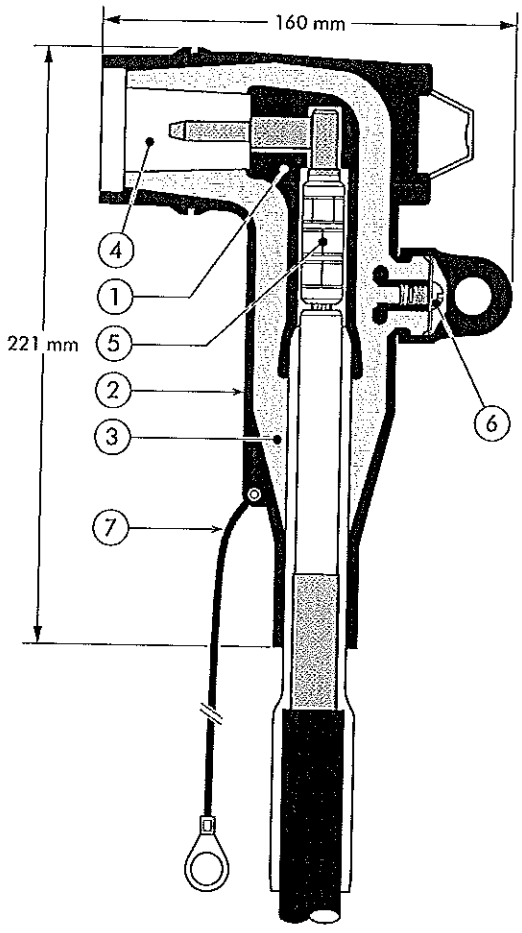
- The thick conductive EPDM jacket provides a total safe to touch screen which ensures safety for personnel.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Design

Separable connector comprising:

1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type A - 250 A interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector.
6. Voltage test point.
7. Earthing lead (-/G version only).



Specifications and standards

The separable connector 158LR meets the requirements of CENELEC HD 629.1.

Separable connector type	Voltage Um (kV)	Current Ir (A)	Conductor sizes (mm²)	
			min	max
158LR/G	12	250	16	70
158LR	12	250	70	95
K158LR/G	24	250	16	25
K158LR	24	250	25	95

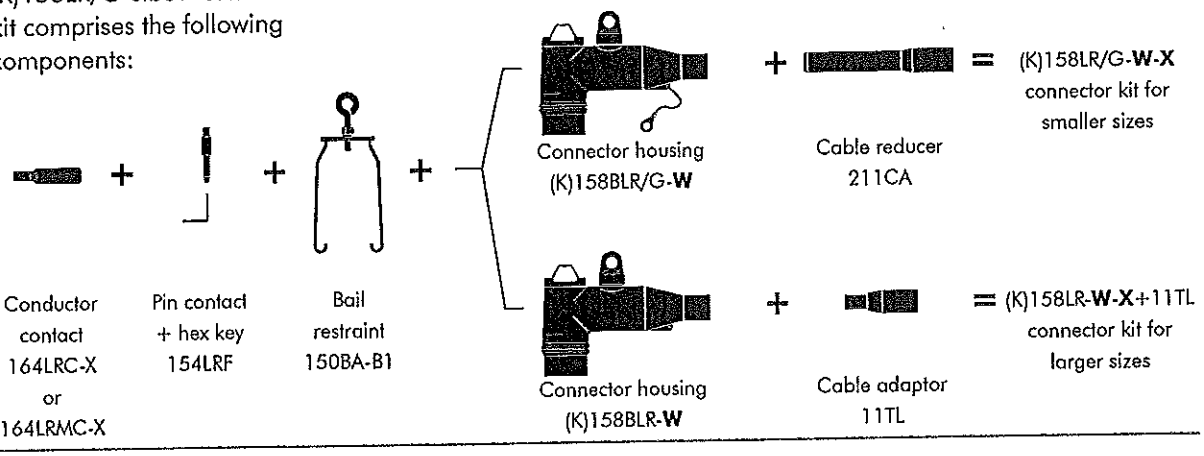
02/2011

ВЯРНО С ОРИГИНАЛА

Kit contents

The complete (K)158LR or (K)158LR/G elbow connector kit comprises the following components:

The kit also comprises lubricant, wipers, installation instructions and crimp chart.



Ordering instructions

Select the part number which gives the best centring to the cable core insulation diameter and substitute **X** using table X, according to the conductor size and type.
Add a 'K' for use up to 24 kV.

Example:
The copper wire screened cable is 24 kV, 50 mm² stranded aluminium with a diameter over core insulation of 20.4 mm.
Order a K158LR-FG-50(K)M-12-2+11TL elbow connector kit.

For an option with a bolted conductor contact,
specify the ordering part number below.

Table W

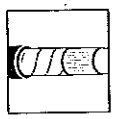
Ordering part number	Dia. over core insulation (mm)	
	min	max
158LR/G-11-**X**	12.6	16.1
158LR/G-13-**X**	14.6	18.7
158LR-FB-**X**+11TL	17.5	20.2
158LR-FG-**X**+11TL	18.4	21.2
158LR-GA-**X**+11TL	19.7	22.5
158LR-GAB-**X**+11TL	21.0	23.8
158LR-GH-**X**+11TL	23.2	26.4

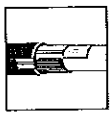
Table X

Conductor sizes (mm²)	Aluminium		Copper
	DIN hexagonal	Deep indent	DIN hexagonal
16	-	-	16(K)M-11-2
25	25(K)M-12-2	25KM-12-1	25(K)M-11-2
35	35(K)M-12-2	35KM-12-1	35(K)M-11-2
50	50(K)M-12-2	50(K)M-12-1*	50(K)M-11-2
70	70(K)M-12-2	70(K)M-12-1*	70(K)M-11-2
95	95(K)M-12-2*	95(K)M-12-1*	95(K)M-11-2

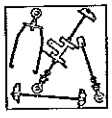
* The 158LR-FB is not compatible with these conductor contacts.

Ordering part number	Dia. over core insulation (mm)	Conductor sizes (mm²)
158LR/G-13-25.95-14-5	14.6 - 22.7	25 - 95
158LR-GAS-50.95-14-5+11TL	19.7 - 25.4	50 - 95


For use with copper tape screened cables. Order: Kit MT.


For use with Alupe or C 33-226 cables. Please contact our representative.


For use with other cable types. Please contact our representative.


For adopted bail restraints: see 'Bail restraints and typical applications'.


For outdoor applications. Order: +MWS.


Components can be ordered individually.

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152SR
INTERFACE A
STRAIGHT CONNECTOR

Up to 24 kV - 250 A

Application

Separable straight connector designed to connect polymeric insulated cable to equipment (transformers, switchgear, motors...).
Also connects cable to cable, using the appropriate mating part.

Technical characteristics

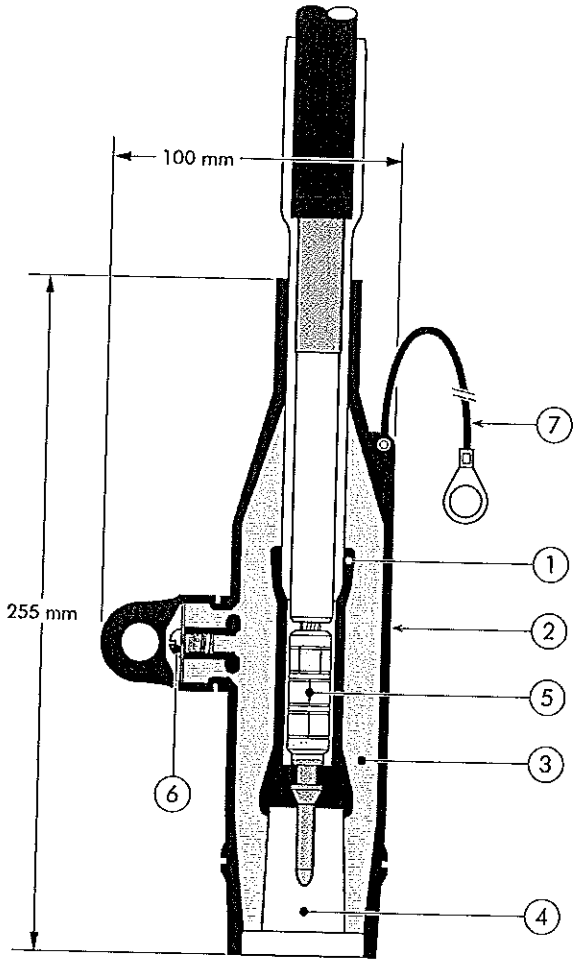
- The thick conductive EPDM jacket provides a total safe to touch screen which ensures safety for personnel.
- Each separable connector is tested for AC withstand and partial discharge prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Design

Separable connector comprising:

1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type A - 250 A interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector.
6. Voltage test point.
7. Earthing lead (-/G version only).



Specifications and standards

The separable connector 152SR meets the requirements of CENELEC HD 629.1.

Separable connector type	Voltage Um (kV)	Current Ir (A)	Conductor sizes (mm²)	
			min	max
152SR/G	12	250	16	70
152SR	12	250	70	95
K152SR/G	24	250	16	25
K152SR	24	250	25	95

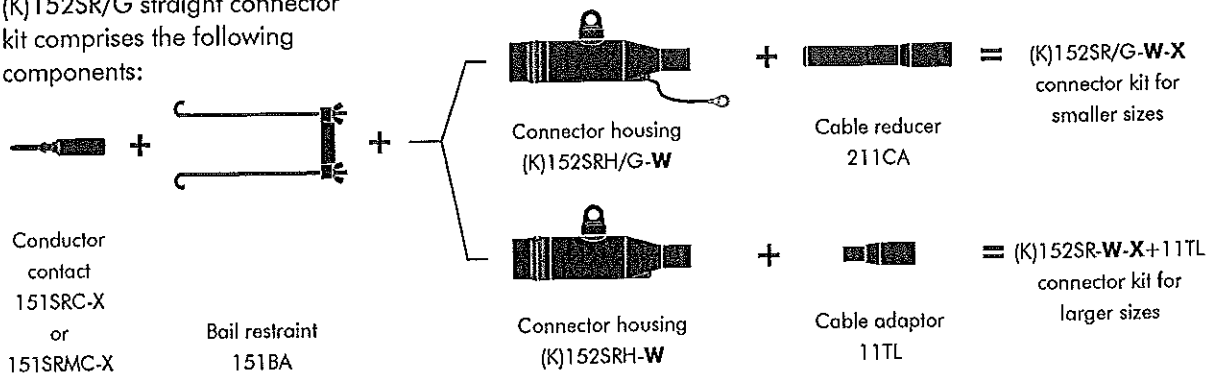
02/2011

ВЯРНО С ОРИГИНАЛА

Kit contents

The complete (K)152SR or (K)152SR/G straight connector kit comprises the following components:

The kit also comprises lubricant, wipers, installation instructions and crimp chart.



Ordering instructions

Select the part number which gives the best centring to the cable core insulation diameter and substitute **X** using table X, according to the conductor size and type.
Add a 'K' for use up to 24 kV.

Example:
The copper wire screened cable is 24 kV, 50 mm² stranded aluminium with a diameter over core insulation of 20.4 mm. Order a K152SR-FG-50(K)M-12-2+11TL straight connector kit.

For an option with a bolted conductor contact,
specify the ordering part number below.

Table W

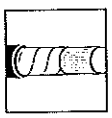
Ordering part number	Dia. over core insulation (mm)	
	min	max
152SR/G-11-**X**	12.6	16.1
152SR/G-13-**X**	14.6	18.7
152SR-FB-**X**+11TL	17.5	20.2
152SR-FG-**X**+11TL	18.4	21.2
152SR-GA-**X**+11TL	19.7	22.5
152SR-GAB-**X**+11TL	21.0	23.8
152SR-GH-**X**+11TL	23.2	26.4

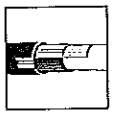
Table X

Conductor sizes (mm²)	Aluminium		Copper
	DIN hexagonal	Deep indent	DIN hexagonal
16	-	-	16(K)M-11-2
25	25(K)M-12-2	25KM-12-1	25(K)M-11-2
35	35(K)M-12-2	35KM-12-1	35(K)M-11-2
50	50(K)M-12-2	50(K)M-12-1*	50(K)M-11-2
70	70(K)M-12-2	70(K)M-12-1*	70(K)M-11-2
95	95(K)M-12-2*	95(K)M-12-1*	95(K)M-11-2

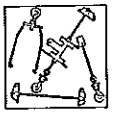
* The 152SR-FB is not compatible with these conductor contacts.

Ordering part number	Dia. over core insulation (mm)	Conductor sizes (mm²)
152SR/G-13-25.95-14-5	14.6 - 22.7	35 - 70
152SR-GAS-50.95-14-5+11TL	19.7 - 25.4	50 - 95


For use with copper tape screened cables. Order: Kit MT.


For use with Alupe or C 33-226 cables. Please contact our representative.


For use with other cable types. Please contact our representative.


For adapted bail restraints: see 'Bail restraints and typical applications'.


For outdoor applications. Order: +MWS.


Components can be ordered individually.

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151SP
INTERFACE A
STRAIGHT PLUG

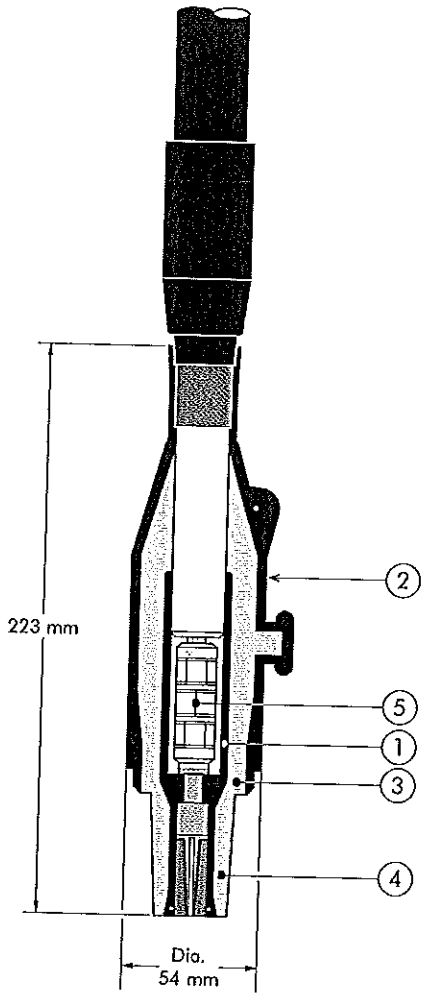
Up to 24 kV - 200 A

Application
Separable straight plug designed to connect polymeric insulated cable to cable.
Mates with the elbow, straight and branch joint connectors.

Technical characteristics
- The thick conductive EPDM jacket provides a total safe to touch screen which ensures safety for personnel.
- Each straight plug is tested for AC withstand and partial discharge prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Design
Separable connector comprising:
1. Conductive EPDM insert.
2. Conductive EPDM jacket.
3. Insulating EPDM layer moulded between the insert and the jacket.
4. Type A interface as described by CENELEC EN 50180 and 50181.
5. Conductor connector.



Separable plug type	Voltage Um (kV)	Current Ir (A)	Conductor sizes (mm²)	
			min	max
151SP	12	200	16	95
K151SP	24	200	16	95

02/2011

ВЯРНО С ОРИГИНАЛА

Kit contents

The complete (K)151SP straight plug kit comprises the following components:

The kit also comprises lubricant, wipers, installation instructions and crimp chart.

Straight plug housing (K)151SPH-W

+

Conductor contact 151SPC-X

+

Cable adaptor 11TL

=

(K)151SP-W-X+11TL straight plug kit

Ordering instructions

Select the part number which gives the best centring to the cable core insulation diameter and substitute **X** using table X, according to the conductor size and type. Add a 'K' for use up to 24 kV.

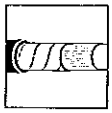
Table W

Ordering part number	Dia. over core insulation (mm)	
	min	max
151SP-A-**X**+11TL-FA/FAB	14.6	18.7
151SP-B-**X**+11TL-FB/FG	17.2	21.2
151SP-B-**X**+11TL-GA/GAB	19.7	23.0
151SP-C-**X**+11TL-GB/GH	22.2	26.4

Table X

Conductor sizes (mm^2)	Aluminium		Copper
	DIN hexagonal	Deep indent	DIN hexagonal
16	-	-	16(K)M-11-2
25	25(K)M-12-2	25KM-12-1	25(K)M-11-2
35	35(K)M-12-2	35KM-12-1	35(K)M-11-2
50	50(K)M-12-2	50(K)M-12-1	50(K)M-11-2
70	70(K)M-12-2	70(K)M-12-1	70(K)M-11-2
95	95(K)M-12-2	95(K)M-12-1	95(K)M-11-2

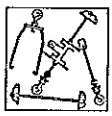
Example:
The copper wire screened cable is 12 kV, 50 mm^2 stranded aluminium with a diameter over core insulation of 16.9 mm. Order a 151SP-A-50(K)M-12-2+11TL-FA/FAB straight plug kit.



For use with copper tape screened cables. Order: Kit MT.

For use with Alupe or C 33-226 cables. Please contact our representative.

For use with other cable types. Please contact our representative.



For adapted bail restraints: see 'Bail restraints and typical applications'.

For outdoor applications. Order: +MWS.

Components can be ordered individually.

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156SA
INTERFACE A SURGE ARRESTER

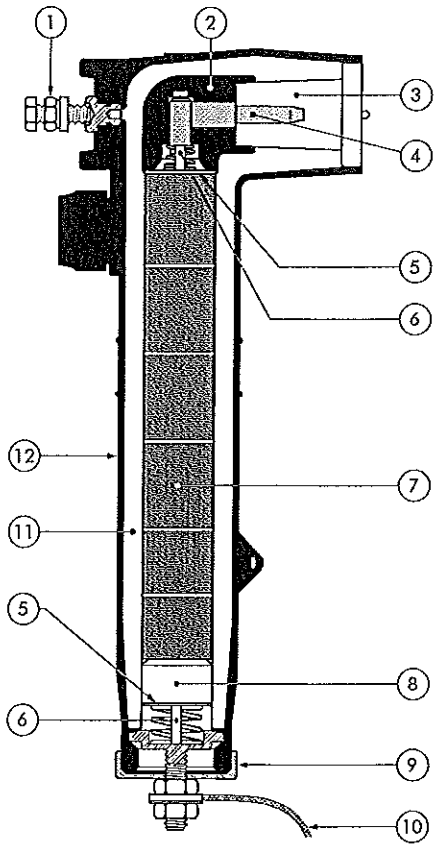
Up to 24 kV

Application
Surge arrester designed to protect 12 and 24 kV class components, including transformers, equipment, cable and accessories from high voltage surges resulting from lightning or switching.

Technical characteristics
- This surge arrester is a metal oxide varistor surge arrester in an elbow configuration.
- Each arrester is tested for AC withstand and partial discharge prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Design
Surge arrester comprising:
1. Bail restraint.
2. Conductive EPDM insert.
3. Type A - 250 A interface as described by CENELEC EN 50180 and 50181.
4. Pin contact.
5. Contact disc.
6. Copper shunt.
7. Metal oxide valve elements.
8. Aluminium spacer.
9. Steel cap.
10. Earth connection.
11. Insulating EPDM layer moulded between the insert and the jacket.
12. Conductive EPDM jacket.

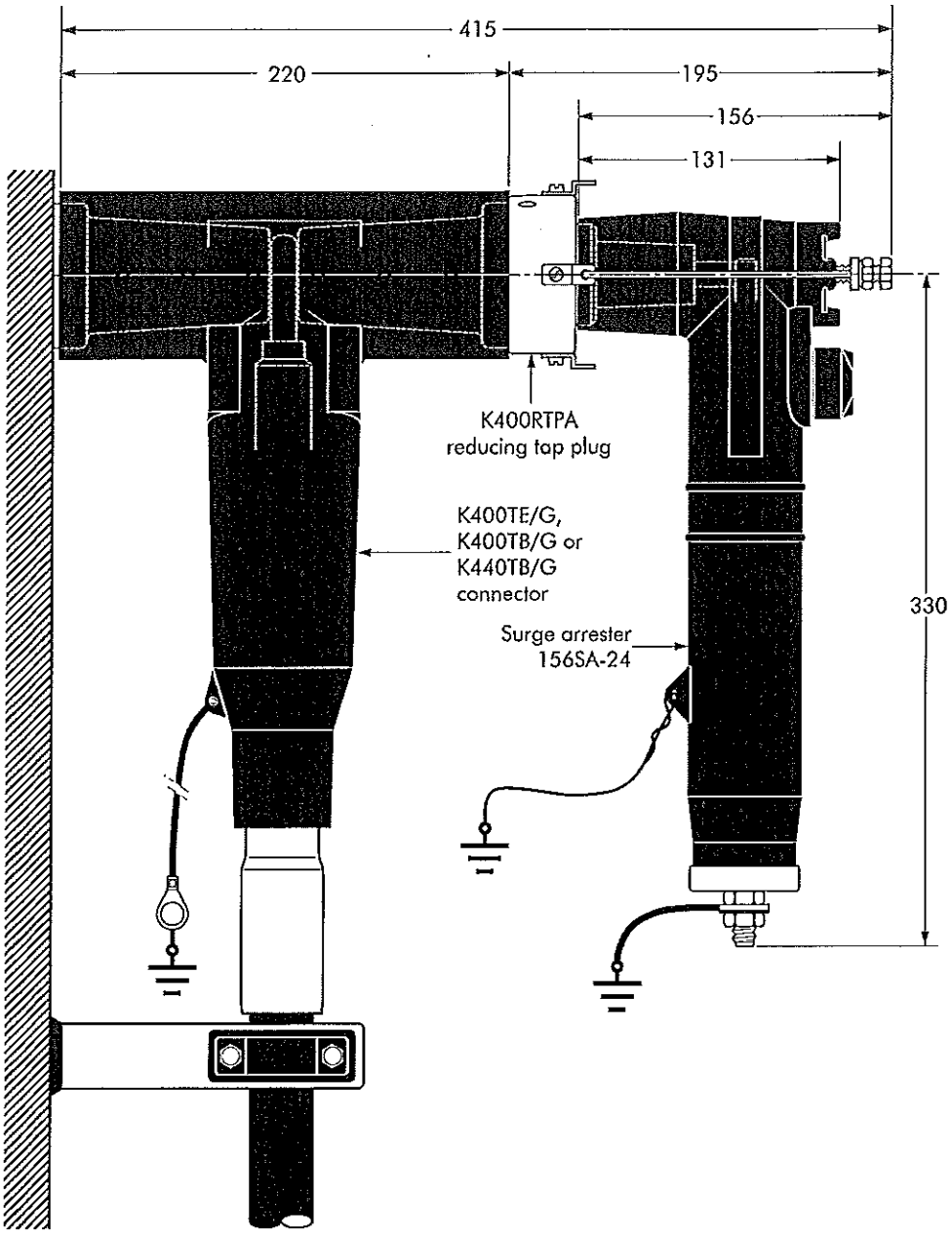


Surge arrester type	Nominal discharge current In (kA)	Rated voltage Ur (kV)	Max continuous operating voltage Uc (kV)	Steep current residual voltage @ 5 kA [1/20 µs] (kV)	Lightning current residual voltage @ 5 kA [8/20 µs] (kV)	High current impulse withstand (kA)
156SA-12	5	15	12.5	62.5	54.5	40
156SA-15	5	19	15.5	77.0	69.0	40
156SA-18	5	22	18.0	87.0	79.0	40
156SA-21	5	26	21.0	101.5	93.5	40
156SA-24	5	30	24.5	116.5	108.5	40

02/2011

ВЯРНО С ОРИГИНАЛА

Typical application and dimensions



In mm.

Ordering instructions

To order the surge arrester, specify the surge arrester type, as described on previous page.

Example:
For a maximum continuous operating voltage (r.m.s.) of 21 kV.
Order a 156SA-21 surge arrester.

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180AR-1 /180AR-2 /180AR-3
INTERFACE A
EQUIPMENT BUSHINGS

Up to 24 kV - 250 A

Application
For use in equipment insulated with oil fluid, typically for transformers, switchgear, capacitors...

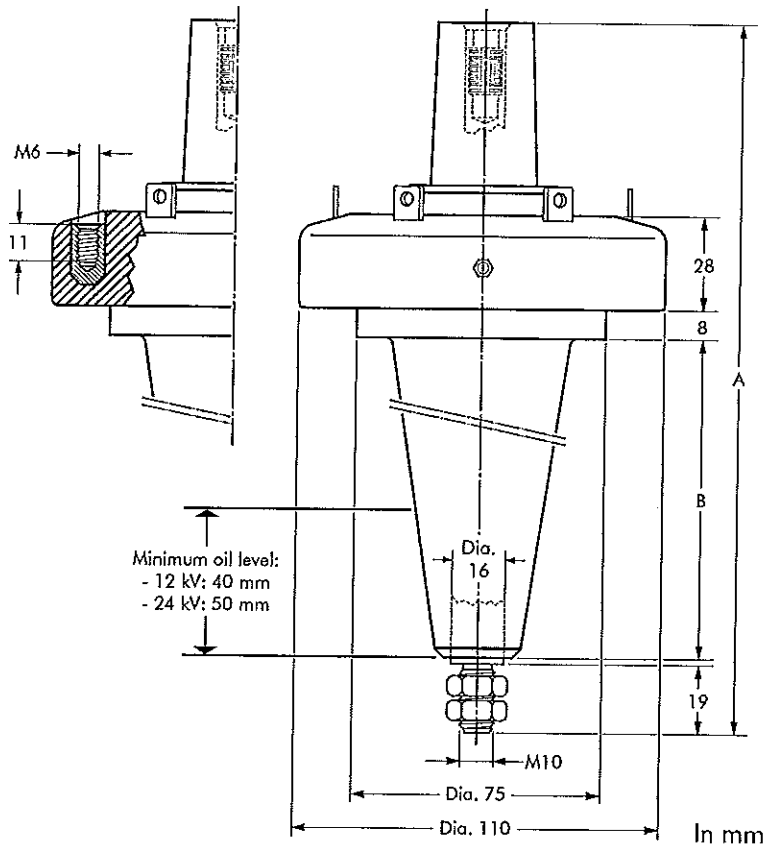
Specifications and standards
The plug-in type equipment bushings 180AR-... meet the requirements of CENELEC EN 50180 and IEC 60137.

Technical characteristics
Each bushing is tested for AC withstand and partial discharge prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Design
- The equipment bushings are moulded epoxy insulated parts in accordance with CENELEC EN 50180.
  The 180AR-2 bushing has a length B outside this standard.
- The standard bushings, (K)180AR-1 /-2 /-3, are equipped with 6 tabs for the bail restraint.
- The (K)180AR-1-G and (K)180AR-3-G are equipped with 4 tabs and 2 threaded inserts M6 (-G version).

Type 180AR-1-G /-3-G **Type 180AR-1 /-2 /-3**



In mm.

Ordering instructions
To order the equipment bushing, specify the type.
The bushings are supplied with an earth jumper (/J) or an earth plate (/GS). This earth connection must be specified when ordering.
E.g. K180AR-1/J.

Equipment bushing type	Voltage Ur (kV)	Current Ir (A)	Dimensions (mm)	
			A	B
180AR-1	12	250	222	106
K180AR-1	24	250	222	106
180AR-2	12	250	284	168
K180AR-2	24	250	284	168
180AR-3	12	250	171	55
K180AR-3	24	250	171	55

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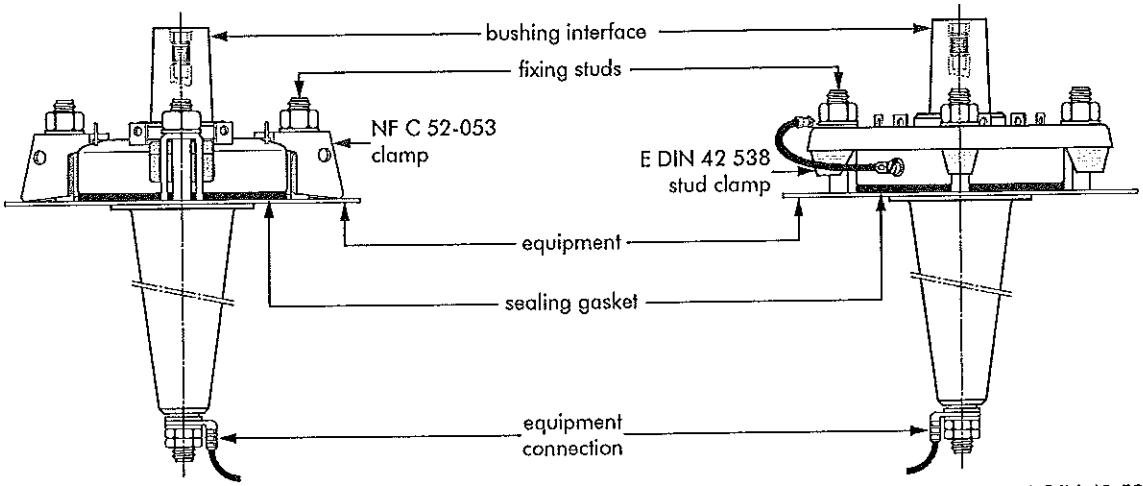
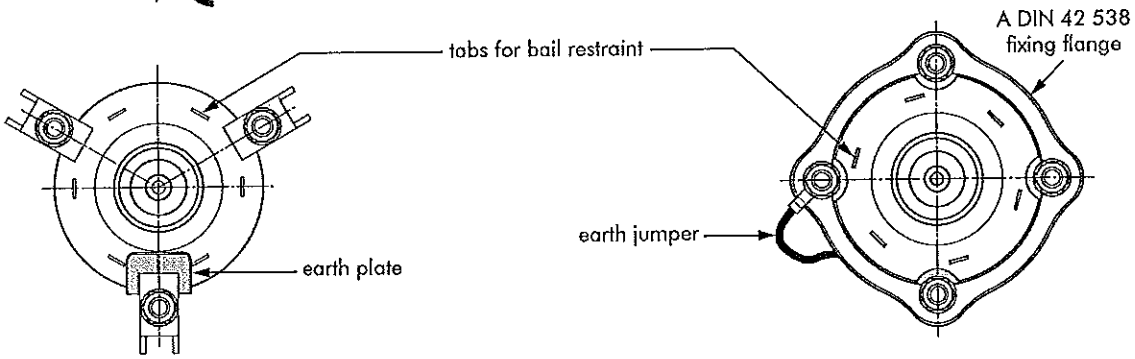
FIXINGS FOR EQUIPMENT BUSHINGS

180AR-1/GS
180AR-1-G/GS
180AR-2/GS
180AR-3/GS and
180AR-3-G/GS Bushings

180AR-1/J
180AR-1-G/J
180AR-2/J
180AR-3/J and
180AR-3-G/J Bushings





Bushing clamping kit

To order the bushing clamping kit, according to NFC 52-053 standards, simply specify KBCNF1-200.

Contents: - 3 x claw clamp NF
- 1 x sealing gasket.

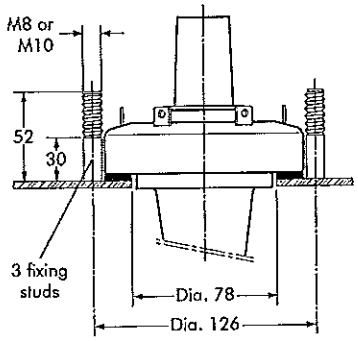
Bushing clamping kit

To order the bushing clamping kit, according to DIN 42 538 standards, simply specify: KBCD-200.

Contents: - 1 x fixing flange A
- 4 x stud clamp E
- 1 x sealing gasket.

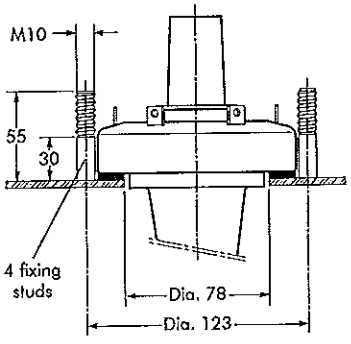
Fixing dimensions standards NF C 52-053

French standards.



Fixing dimensions standards DIN 42 538

German standards.



In mm.

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250SFR-P
INTERFACE A
EQUIPMENT BUSHING

Up to 24 kV - 250 A

Application
For use in equipment insulated with SF_6 gas.

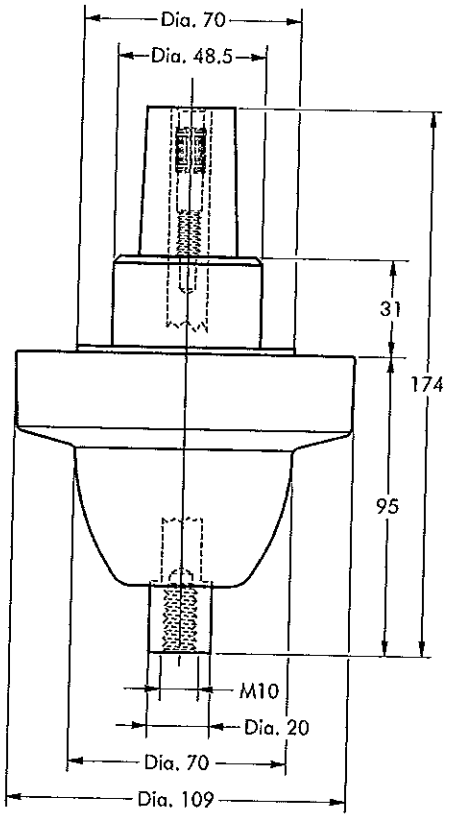
Technical characteristics
Each bushing is tested for AC withstand and partial discharge prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Design
The equipment bushing is a moulded epoxy insulated part with a connector interface in accordance with CENELEC EN 50180.
The 250SFR-P bushing has a shank outside this standard, adapted to use in SF_6 gas.

Specifications and standards
The plug-in type equipment bushings 250SFR-P meet the requirements of CENELEC EN 50180 and IEC 60137.

Ordering instructions
To order the equipment bushing, simply specify the type.



In mm.

Equipment bushing type	Voltage Ur (kV)	Current Ir (A)
250SFR-P K250SFR-P	12 24	250 250

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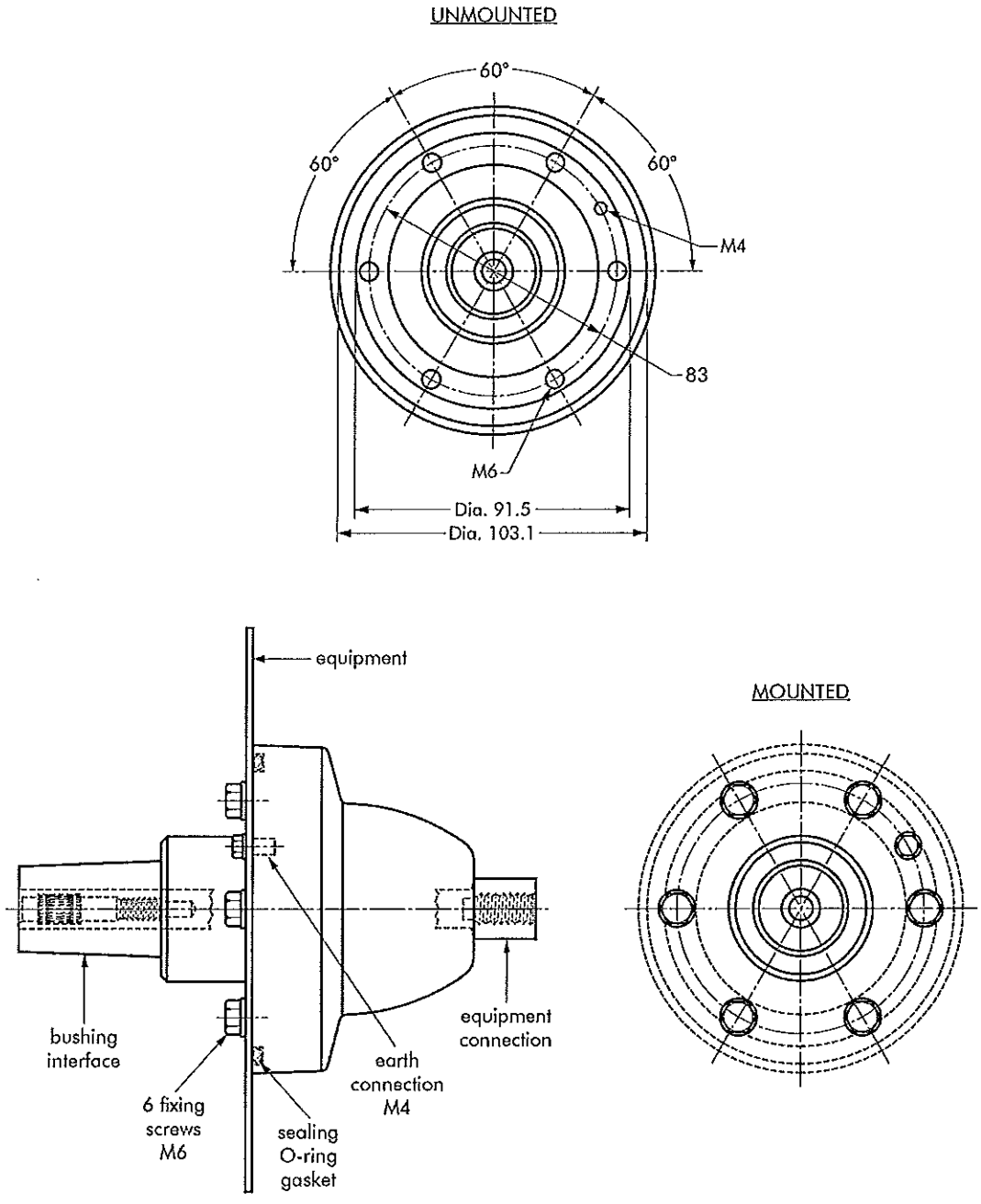
250SFR-P Bushing for gas insulated switchgear



In mm.

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180A-24P-O
INTERFACE A
IN-AIR BUSHING

Up to 24 kV - 250 A

Application
For use in equipment insulated with air, typically for dry type transformers, motors, switchgear, capacitors...

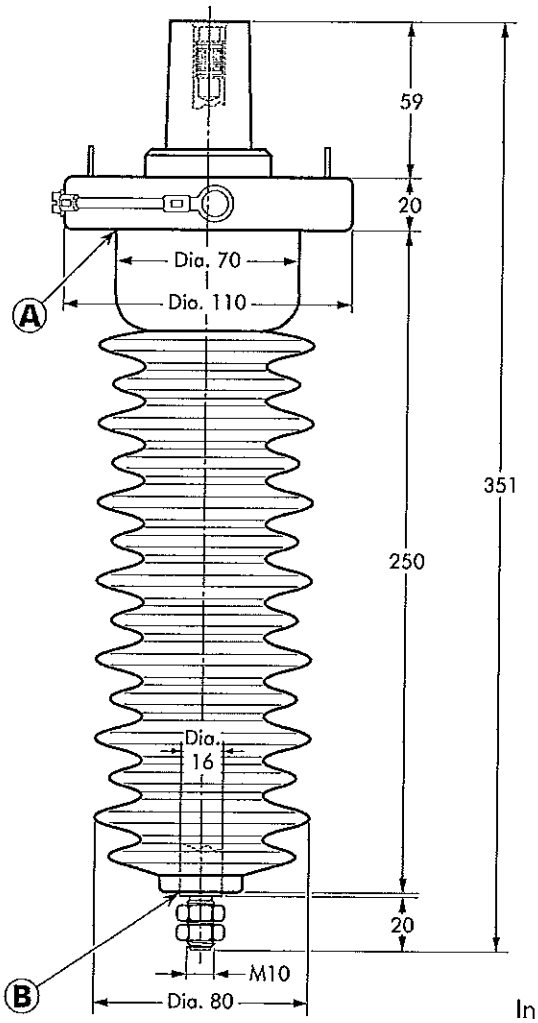
Technical characteristics
Each bushing is tested for AC withstand and partial discharge prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Specifications and standards
The plug-in type equipment bushings 180A-24P-O are moulded epoxy insulated parts and meet the requirements of CENELEC EN 50181, IEC 60071 and IEC 60137.

Ordering instructions
To order the equipment bushing, specify the type.
The bushings are supplied with an earth jumper.
To include the ring clamp, add:
- /B, if per British standards
- /D, if per German standards
- /F, if per French standards.

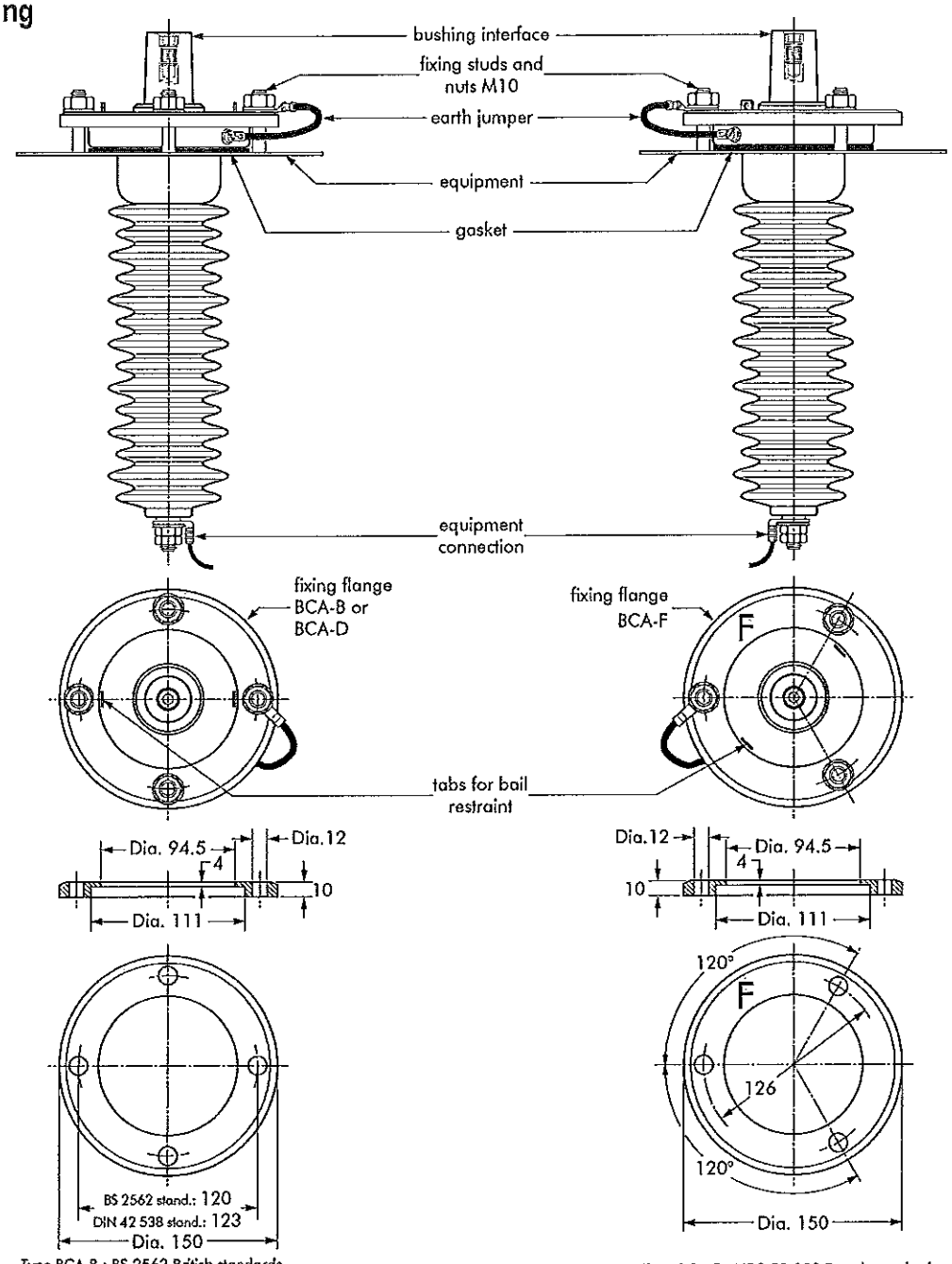
E.g. 180A-24P-O/F.



In mm.

Equipment bushing type	Voltage Ur (kV)	Current Ir (A)	Creepage distance A-B (mm)
180A-24P-O	12	250	630
180A-24P-O	24	250	630

180A-24P-O In-air bushing

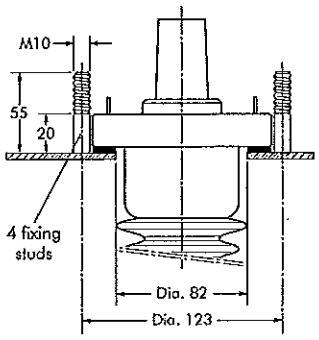


Type BCA-B : BS 2562 British standards
Type BCA-D : DIN 42 538 German standards

Type BCA-F : NFC 52-053 French standards

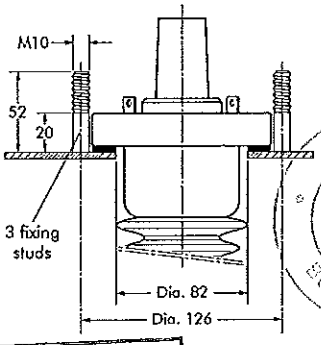
Fixing dimensions standards DIN 42 538

German standards.



Fixing dimensions standards NF C 52-053

French standards.



In mm.

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PITO-E
PLUG-IN TERMINATION

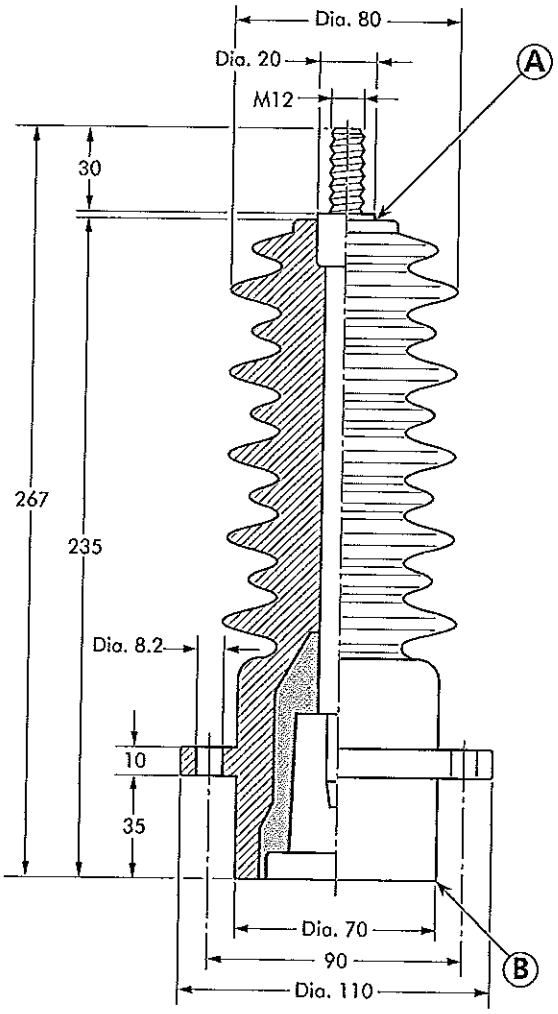
Up to 24 kV - 250 A

Application
- Separable termination designed to connect overhead lines or bus bars to equipment.
- Is suitable for indoor and outdoor use for medium polluted atmosphere.

Technical characteristics
Each plug-in termination is tested for AC withstand prior to leaving the factory.

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

Design
The plug-in termination is a moulded epoxy insulated part. It meets the type A - 250 A interface as described in CENELEC EN 50180 and 50181.



In mm.

Specifications and standards
The separable termination PITO-E meets the requirements of IEC 60137.

Ordering instructions
To order the plug-in termination for 12 or 24 kV, specify PITO-E. The kit includes the bail restraint and 2 brass nuts.

Plug-in termination type	Voltage Ur (kV)	Current Ir (A)	Creepage distance A-B (mm)
PITO-E	12	250	510
PITO-E	24	250	510

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ACCESSORIES
INTERFACE A

Application
For use with connectors and bushings with an interface A as described by CENELEC EN 50180 and 50181.

Technical characteristics
All these products, except the earthing plug, are tested for AC withstand and partial discharge prior to leaving the factory.

Up to 24 kV

6/10 (12) kV
6.35/11 (12) kV
8.7/15 (17.5) kV
12/20 (24) kV
12.7/22 (24) kV

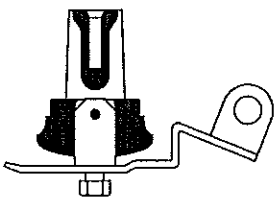
150DR
Dead-end receptacle
Fits over a bushing with a type A interface to provide 'dead-end' facility.
Renders the assembly watertight.

Ordering instructions
Order
150DR for 12 kV or
K150DR for 24 kV applications.
The dead-end receptacle can be supplied with an earth lead.
Order: -/G. E.g. K150DR/G.

150DP
Dead-end plug
Plugs into connectors or receptacles to provide 'dead-end' facility.
Renders the assembly watertight.

Ordering instructions
Order
150DP for 12 kV or
K150DP for 24 kV applications.

151SOP
Stand-off plug
Is designed to support and 'dead-end' connectors with a type A interface when removed from equipment.



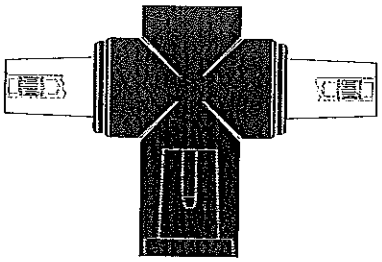
Ordering instructions
Order
151SOP for 12 kV or
K151SOP for 24 kV applications.

250GP
Earthing plug
Is designed to support and earth connectors with a type A interface when removed from equipment.

Ordering instructions
Order
250GP for 12 kV or 24 kV applications.

200T
Separable tee connector

Is designed to connect three cables of the same or varying sizes or two cables to equipment.
For an adapted bail, please refer to the catalogue or contact our representative.

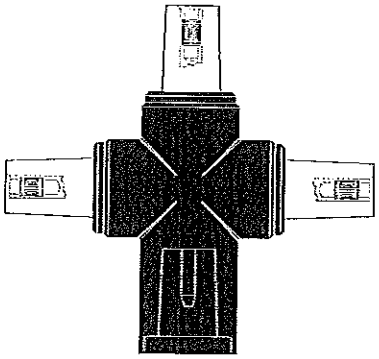


Ordering instructions

Order
200T for 12 kV or
K200T for 24 kV
applications.

200X
Separable cross connector

Is designed to connect four cables of the same or varying sizes or three cables to equipment.
For an adapted bail, please refer to the catalogue or contact our representative.

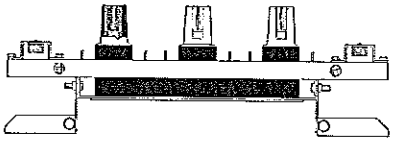


Ordering instructions

Order
200X for 12 kV or
K200X for 24 kV
applications.

1501J3-U-8
Three-way junction

Provides a flexible means of connecting two or three cables of the same or varying sizes.
For an adapted bail, please refer to the catalogue or contact our representative.

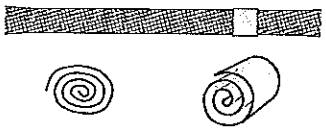


Ordering instructions

Order
1501J3-U-8 for 12 kV or
K1501J3-U-8 for 24 kV
applications.

Kit MT
Earthing kit for copper tape screened cables

Contains a tinned copper braid (25 mm² - L=500 mm), a tinned copper wire for cleating and water sealing mastic.



Ordering instructions

Order
Kit MT for 12 kV or 24 kV
applications.

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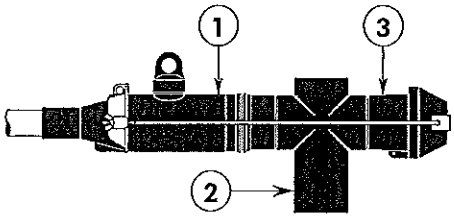
BAIL RESTRAINTS
INTERFACE A

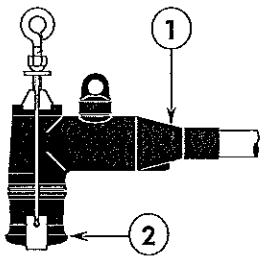
Application
For use with connectors, receptacles and bushings with an interface A as described by CENELEC EN 50180 and 50181.

Ordering instructions
The type of bail restraint is defined by its intended use with different types of connector, receptacle and/or bushing.
To order the bail restraint, specify the type needed.

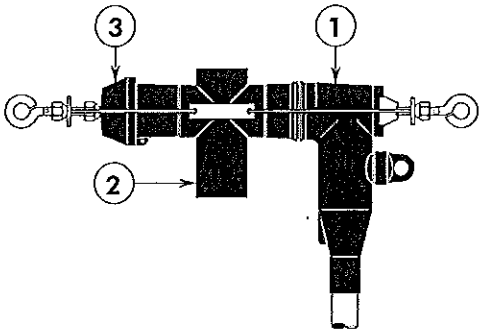
147BA
For use with:
1. (K)152SR straight connector,
2. (K)200T tee connector and
3. (K)150DR dead-end receptacle.



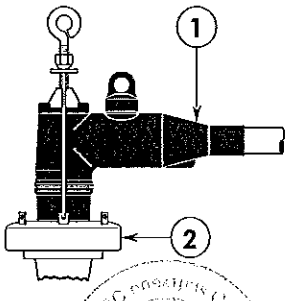
148BA
For use with:
1. (K)158LR elbow connector and
2. (K)150DP dead-end plug.

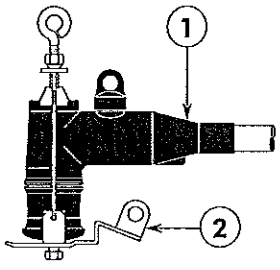


149BA
For use with:
1. (K)158LR elbow connector,
2. (K)200T tee connector and
3. (K)150DR dead-end receptacle.



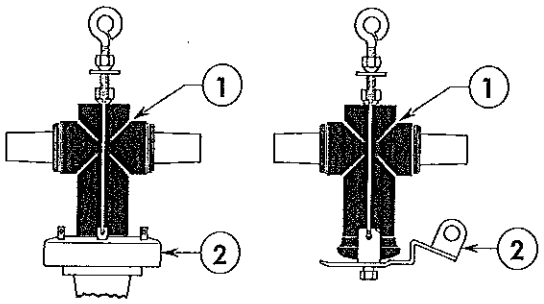
150BA-B1
For use with:
1. (K)158LR elbow connector and
2. an interface A equipment bushing (shown), 250GP earthing plug, (K)151SOP stand-off plug (shown) or (K)1501J3-U-8 three-way junction.





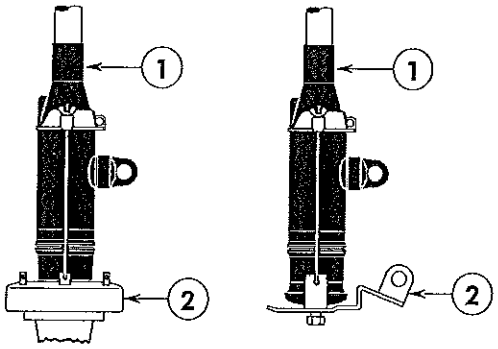
150TB-1

For use with:
1. (K)200T tee connector and
2. an interface A equipment bushing (shown), 250GP earthing plug, (K)151SOP stand-off plug (shown) or (K)1501J3-U-8 three way junction.



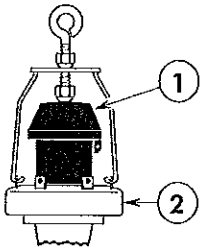
151BA

For use with:
1. (K)152SR straight connector and
2. an interface A equipment bushing (shown), 250GP earthing plug, (K)151SOP stand-off plug (shown) or (K)1501J3-U-8 three-way junction.



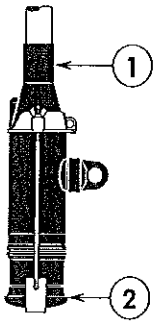
152BA

For use with:
1. (K)150DR dead-end receptacle and
2. an interface A equipment bushing (shown) or (K)1501J3-U-8 three-way junction.



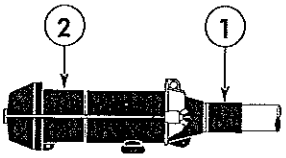
153BA

For use with:
1. (K)152SR straight connector and
2. (K)150DP dead-end plug.



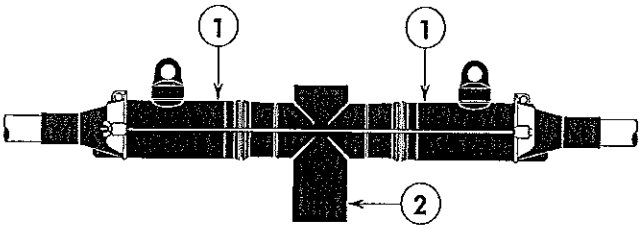
154BA-CS180

For use with:
1. (K)151SP straight plug and
2. (K)150DR dead-end receptacle.



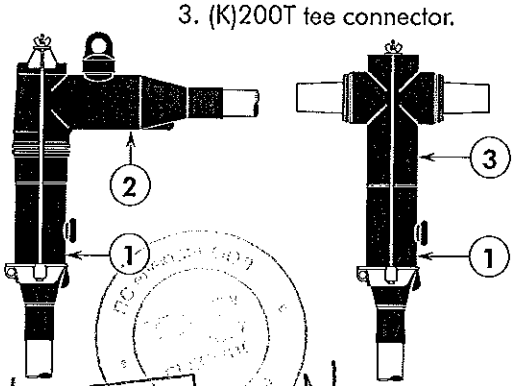
155BA-1

For use with:
1. 2 x (K)152SR straight connector and
2. (K)200T tee connector.



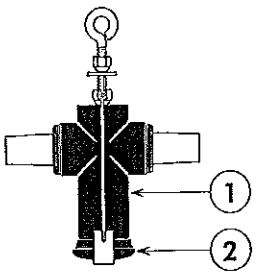
155BA-2 - CS180

For use with:
1. (K)151SP straight plug and
2. (K)158LR elbow connector or
3. (K)200T tee connector.



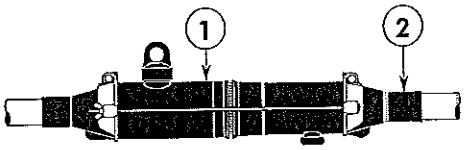
156BA-1

For use with:
1. (K)200T tee connector and
2. (K)150DP dead-end plug.



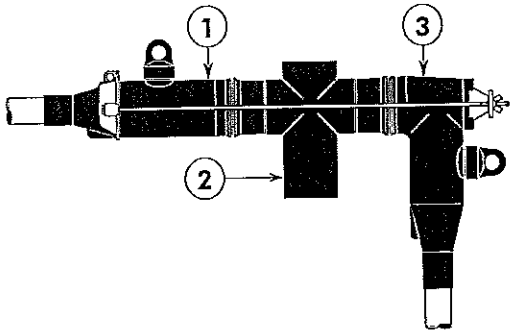
157BA - CS181

For use with:
1. (K)152SR straight connector and
2. (K)151SP straight plug.



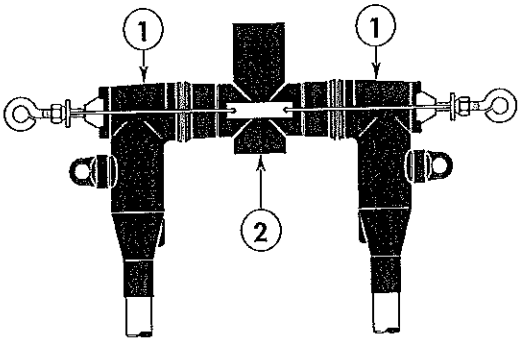
158BA

For use with:
1. (K)152SR straight connector,
2. (K)200T tee connector and
3. (K)158LR elbow connector.



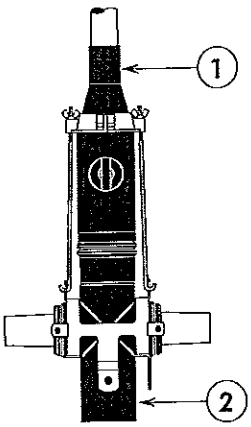
159BA

For use with:
1. 2 x (K)158LR elbow connector and
2. (K)200T tee connector.



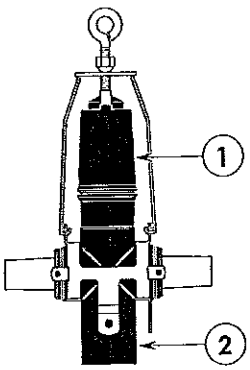
200BA

For use with:
1. (K)152SR straight connector and
2. (K)200X cross connector.



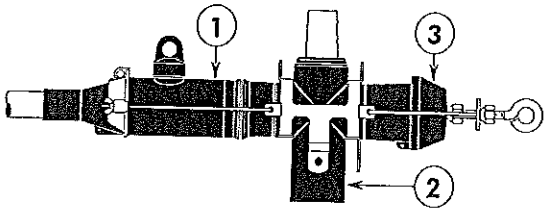
201BA

For use with:
1. (K)158LR elbow connector and
2. (K)200X cross connector.



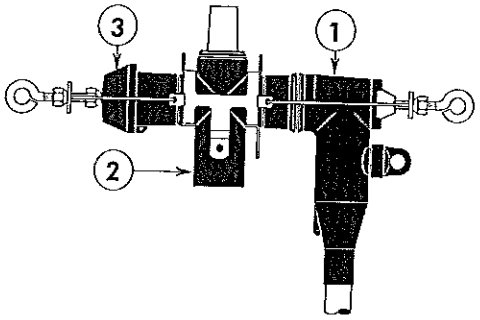
202BA

For use with:
1. (K)152SR straight connector,
2. (K)200X cross connector and
3. (K)150DR dead-end receptacle.



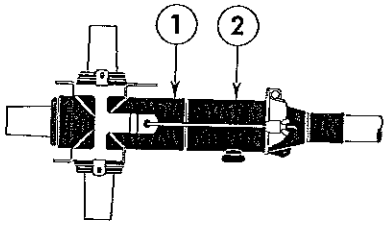
203BA

For use with:
1. (K)158LR elbow connector,
2. (K)200X cross connector and
3. (K)150DR dead-end receptacle.



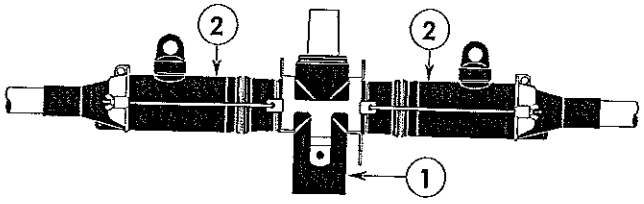
204BA

For use with:
1. (K)200X cross connector and
2. (K)151SP straight plug.



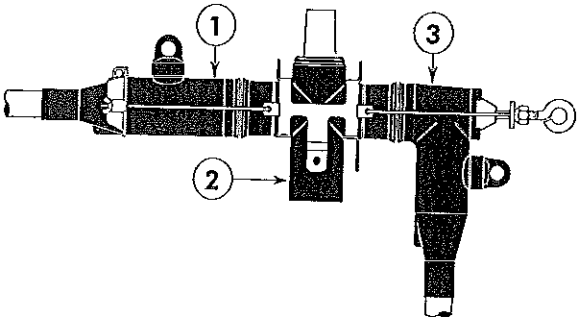
205BA

For use with:
1. (K)200X cross connector and
2. 2 x (K)152SR straight connector.



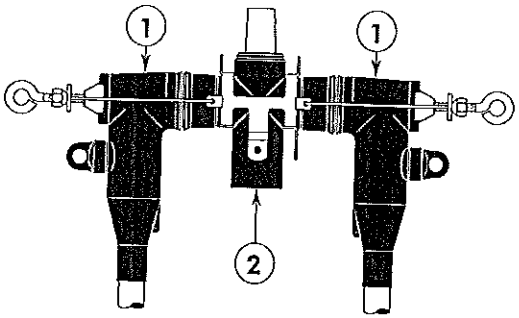
206BA

For use with:
1. (K)152SR straight connector,
2. (K)200X cross connector and
3. (K)158LR elbow connector.



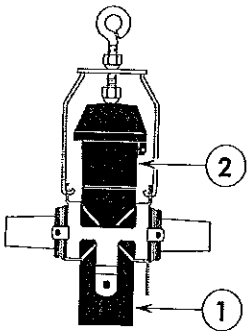
207BA

For use with:
1. 2 x (K)158LR elbow connector and
2. (K)200X cross connector.



208BA

For use with:
1. (K)200X cross connector and
2. (K)150DR dead-end receptacle.



Additional catalogue information on power cable accessories is available by contacting us at the address below:

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Приложение 14

Deutscher Akkreditierungs Rat
DAR
DAT-P 027/92-00

VEW EUROtest GmbH
ELEKTROTECHNISCHES PRÜFLABORATORIUM

Test certificate

No.: 98.02.21.066 Version: 3/4

Client	:	EUROMOLD N.V. 3de Industriezone - Industrielaan 12 B-9320 Erembodegem-Aalst
Object tested	:	Screened bolted-type separable connector 12/20 (24) kV
Type	:	(K)400LB
Manufacturer	:	EUROMOLD N.V.
Date received	:	05-06-1998
Date of test	:	15-06-1998 to 01-10-1998
Test regulations applied	:	DIN VDE 0278-629-1:1997-11/DIN VDE 0278-628:1997-11
Test carried out	:	Type tests
Test result	:	The screened bolted-type separable connector 12/20 (24) kV of the type (K)400LB made by EUROMOLD N.V. qualified in the type tests according to VDE 0278-629-1:1997-11/DIN VDE 0278-628:1997-11.
Specialist testers	:	Dipl.-Ing. Rosenkaimer, Dipl.-Ing. Volpert, Herr Kliesch

VEW EUROtest GmbH
Elektrotechnisches Prüflaboratorium

Dortmund, 15-10-1998

Dipl.-Ing. I. Krage Dr.-Ing. M. Hassan

Report No.98.02.21.066 contains 09 pages and 07 appendices.

VEW EUROtest GmbH, Unterste-Wilms-Str. 52, 44148 Dortmund, Telefon 02 31-4 38 28 61, Telefax 02 31-4 38 26 34

ВЯРНО С ОРИГИНАЛА

Summary

VEW EUROtest GmbH performed type tests according to DIN VDE 0278-629-1:1997-11/ DIN VDE 0278-628:1997-11 on the screened bolted-type separable connector 12/20 (24) kV of the type (K)400LB made by EUROMOLD N.V.. The type tests had the following result:

The screened bolted-type separable connector 12/20 (24) kV of the type (K)400LB made by EUROMOLD N.V. qualified in the type tests according to DIN VDE 0278-629-1: 1997-11/DIN VDE 0278-628:1997-11.

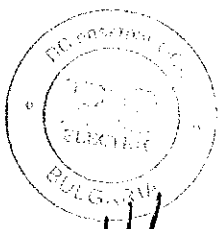
ВЯРНО С ОРИГИНАЛА

Contents

		Page
1	Test regulations	04
2	Parameters of the test specimen and test lengths	04
3	Performance and results of the tests	06

Annex

01	EUROMOLD's installation instructions for the screened bolted-type separable connector 12/20 (24) kV of the type (K)400LB (10 sheets)
02	Tests at elevated temperature (calibration) (1 sheet)
03	Impulse withstand voltage test (2 sheets)
04	Thermal cycling test in air (1 sheet)
05	Thermal short-circuit test (conductor) (2 sheets)
06	Screen fault current initiation test (1 sheet)
07	Measuring instruments and testing units (2 sheets)



ВЯРНО С ОРИГИНАЛА

1 Test regulations

DIN VDE 0278-629-1:1997-11

Power cable accessories with

rated voltages U up to 30 kV (U_m up to 36 kV)

Part 629: Test requirements on accessories for use on power cables of rated voltage from 3,6/6 (7,2) kV up to 20,8/36 (42) kV

Part 1: Cables with extruded insulation German version HD 629.1 S1:1996

DIN VDE 0278-628:1997-11

Power cable accessories with

rated voltages U up to 30 kV (U_m up to 36 kV)

Part 628: Test methods for accessories for power cables with rated voltage from 3,6/6 (7,2) kV up to and including 20,8/36 (42) kV German version HD 628 S1:1996

2 Parameters of the test specimen and test lengths

Test specimen

Screened bolted-type separable connector 12/20 (24) kV:

Manufacturer:	EUROMOLD N.V.
Type:	(K)400LB
Nominal voltage U_0/U (U_m):	12/20 (24) kV
Nominal frequency:	50 Hz
Number of phases:	1
Cross section of conductor:	185 mm²
Structure and installation instructions:	see annex 01

ВЯРНО С ОРИГИНАЛА

Test cable

Manufacturer:	Kabel Rheydt
Cable marking:	N2XSY 185/RM 12/20 kV
Rated voltage U_0/U (U_m):	12/20 (24) kV
Standard:	HD 620
Construction:	1-core
Conductors:	Cu, stranded, round, 185 mm²
Insulation:	XLPE
Insulation screen:	bonded
Metallic shield:	wire
Oversheath:	PVC
Water blocking:	under oversheath
Diameters (measured values)	
- Conductor:	16,20 mm
- Insulation:	29,68 mm
- Insulation sreen:	30,58 mm
- Oversheath:	39,26 mm
Year of manufacture:	1995

Structure of the test lengths

The test specimens including bushings, connecting plugs and sealing ends were mounted by the client. A total of seven test lengths was made (see figure 1).

ВЯРНО С ОРИГИНАЛА

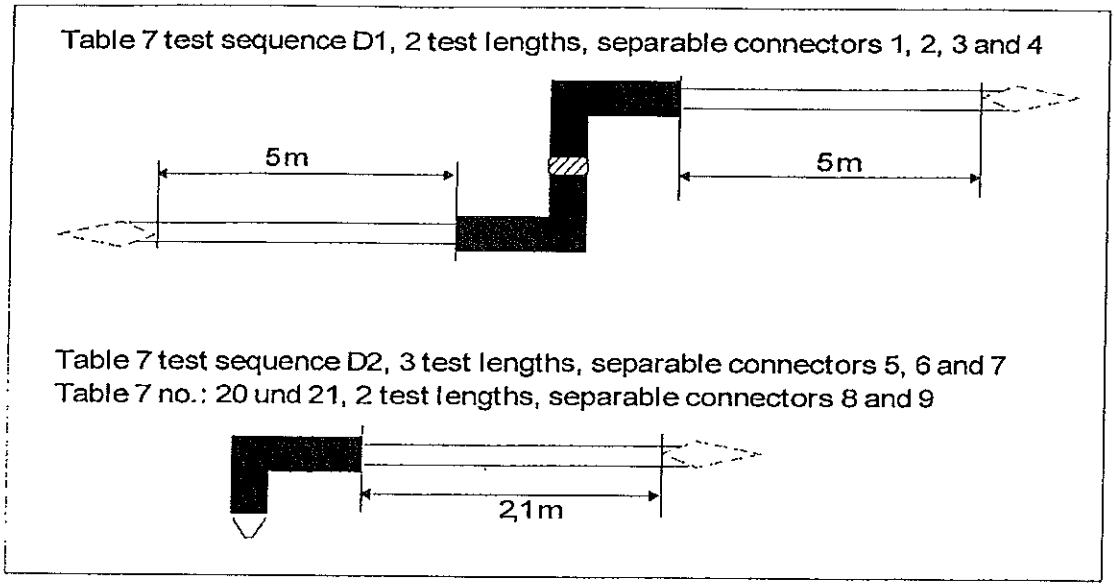


Figure 1: Structure of the test lengths

3 Performance and results of the tests

Annex 07 includes a table of the measuring instruments and testing units used during the test.

Tests at elevated temperature (calibration)

The heating current for tests at elevated temperature (see annex 02) was defined at a cable length of 10 m (acc. to ch. 2).

The calibration was carried out according to HD 628 S1 annex A, section A.3.2 method 2: "Test based on measurement of the external surface temperature".

The application and arrangement of the thermal elements was implemented according to DIN VDE 0278-628 annex A figures A.1 and A.2.

Results of the tests

The tests were performed according to the order in DIN VDE 0278-629-1 table 7.

The results are summarized in the tables 1, 2, 3 and 4.

ВЯРНО С ОРИГИНАЛА

DIN VDE 0278-629-1 table 7 test sequence D1 2 test lengths, separable connectors: 1, 2, 3 und 4 (figure 1)					
	Test	[1]	**Test requirements**	**Test requirements met**	**Annex**
1	DC voltage dry withstand	5	15 min at 6.0 U_0 [2]	yes	
2	AC voltage dry withstand	4	5 min at 4.5 U_0	yes	
3	Partial discharge at ambient temperature	7	XLPE: max. 10 pC at 1.73 U_0 [3]	yes	
4	Impuls voltage at elevated temperature	6	10 surges of either polarity (90 °C +5 to 10 K) [4]	yes	03
5	Electrical heating cycles in air	9	3 cycles at 2.5 U_0 (90 °C + 5 to 10 K)	yes	04
6	Partial discharge at - ambient temperature - elevated temperature	7	XLPE: max. 10 pC at 1.73 U_0 [3] (90 °C +5 to 10 K)	 yes yes	
10	Electrical heating cycles in air	9	60 cycles at 2.5 U_0 (90 °C +5 to 10 K)	yes	04
11	Electrical heating cycles in water	9	63 cycles at 2.5 U_0 (90 °C +5 to 10 K)	yes	
12	Disconnection/connection		5 complete operations	yes	
13	Partial discharge at - ambient temperature - elevated temperature	7	XLPE: max. 10 pC at 1.73 U_0 [3] (90 °C +5 to 10 K)	 yes yes	
14	Impulse voltage at ambient temperature	6	10 surges of either polarity	yes	03
15	AC voltage dry withstand	4	15 min at 2.5 U_0	yes	
18	Examination		carried out		

1) Tests acc. to DIN VDE 0278-628 clause
2) U_0 = 12 kV
3) Manufacturer's requirement: additional test with 2 U_0
4) Maximum cable conductor temperature for XLPE insulated conductors at standard operation acc. to HD 620 S1 part 5: 90 °C

Table 1: test results, test sequence D1

ВЯРНО С ОРИГИНАЛА

Prüf-Nr.: 98.02.21.066 Seite: 8

DIN VDE 0278-629-1 table 7 test sequence D2 3 test lengths, separable connectors: 5, 6 and 7 (figure 1)					
	Test	[1]	**Test requirements**	**Test requirements met**	**Annex**
1	DC voltage dry withstand	5	15 min at 6.0 U_0 [2]	yes	
2	AC voltage dry withstand	4	5 min at 4.5 U_0	yes	
7	Thermal short circuit (screen)	10			
8	Thermal short circuit (conductor)	11	2 short circuits to raise conductor to Q_{sc} [3] of the cable I^2t = 1105 MA^2s at 23 °C	yes	05
9	Dynamic short circuit	12			
12	Disconnection/connection		5 complete operations	yes	
14	Impulse voltage at ambient temperature	6	10 surges of either polarity	yes	03
15	AC voltage dry withstand	4	15 min at 2.5 U_0	yes	
18	Examination		carried out		

1) Tests acc. to DIN VDE 0278-628 clause
2) U_0 = 12 kV
3) Maximum admissible short-circuit temperature for XLPE insulated conductors acc. to HD 620 S1 part 5: Θ_{sc} = 250 °C

Table 2: test results, test sequence D2

ВЯРНО С ОРИГИНАЛА

DIN VDE 0278-629-1 table 7 test sequence D3					
	Test	[1]	**Test requirements**	**Test requirements met**	**Annex**
16	Operating eye	20	This test is only required for screened separable connectors equipped with a sliding contact.		
17	Partial discharge at ambient temperature	7			
18	Examination				
1) Tests acc. to DIN VDE 0278-628 clause					

Table 3: test results, test sequence D3

DIN VDE 0278-629-1 table 7 no.: 19 - 23 2 test lengths, separable connectors: 8 and 9 (figure 1)					
	Test	[1]	**Test requirements**	**Test requirements met**	**Annex**
19	Screen resistance measurement	16	max. 5000 Ω	yes	
20	Leakage current measurement	17	max. 0,5 mA at U_m [2]	yes	
21	Screen fault current initiation	18	fault current to flow continuously	yes	06
22	Operating force	19	not required [3]		
23	Capacitive test point	20	not required [4]		
1) Tests acc. to DIN VDE 0278-628 clause 2) U_m = 24 kV 3) This test is only required for screened separable connectors equipped with a sliding contact. 4) The specime has no capacitive test point.					

Table 4: test results no.: 19 - 23

EUROMOLD

CAUTION :
Read instructions thoroughly and completely prior to beginning installation.

Installation Instructions

(K)400LB

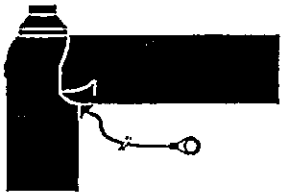
Elbow Connector - 400 Series

24 kV max. - 630 A

Only to be used on copper wire screened cable with extruded easy strip conductive screen (Part A), bonded extruded conductive screen (Part B) or fabric tape screen (Part C).

Contents :

1 x Elbow connector housing - 400BLB



1 x Cable reducer - 400CA

1 x Basic insulating plug

1 x M10 screw assembly

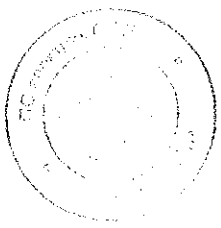
1 x Transition contact M16/M10

1 x Cable screen adaptor - 11TL

- Self-amalgamating tape (optional, for outdoor use)

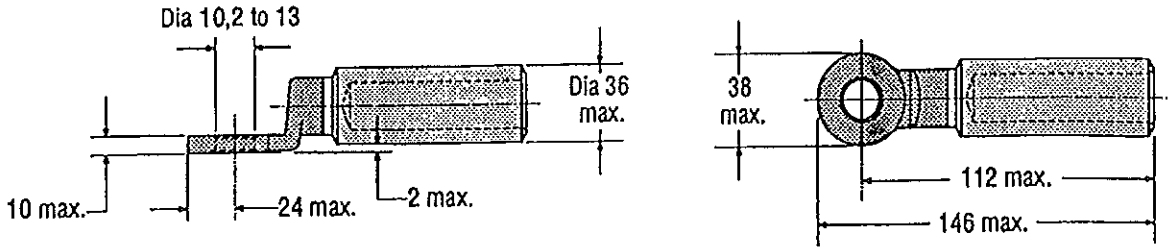
- Silicone grease

- Installation instructions + crimp chart



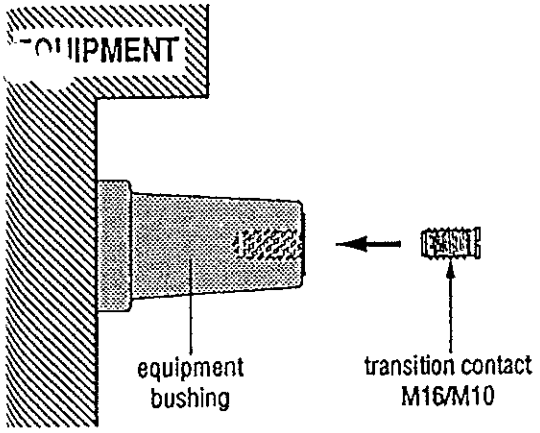
B4701291-R/1

This product should be installed only by competent personnel trained in good safety practices involving high voltage electrical equipment. These instructions are not intended as a substitute for adequate training or experience in such safety practices. These instructions do not attempt to provide for every possible contingency.
Failure to follow these instructions could result in damage to the product and serious or fatal injury.
IMPORTANT : Cable and associated apparatus must be de-energised, locked out, and tagged prior to product installation.

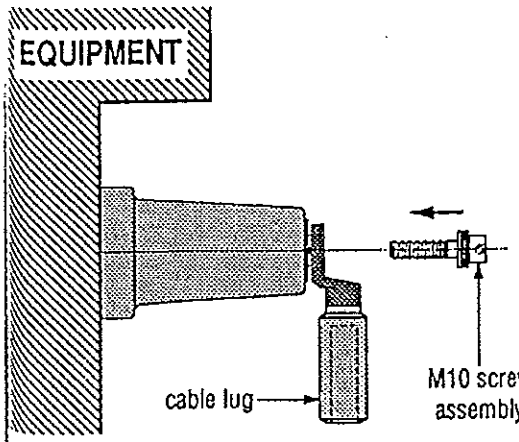


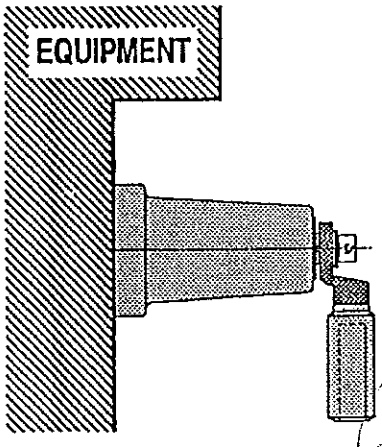
;OMPRESSION CABLE LUG MAXIMUM DIMENSIONS

he compression cable lug should not exceed dimensions shown above.



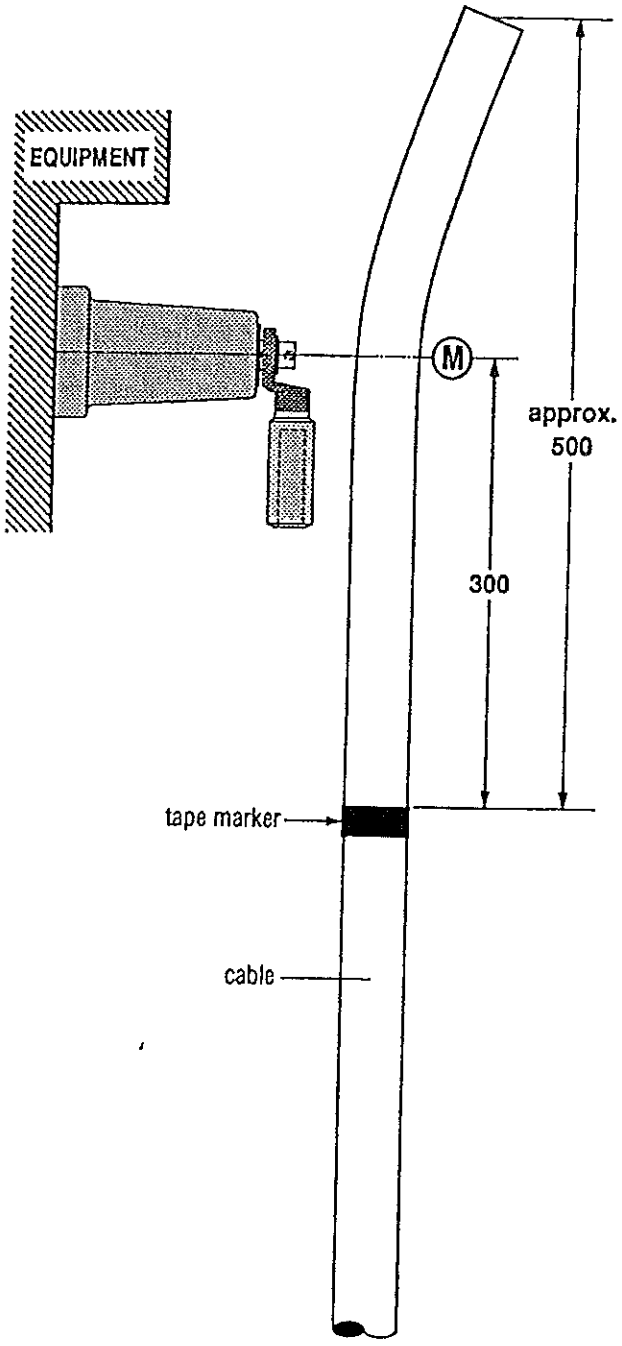
. Screw the transition contact M16/M10 into the threaded hole of the bushing and tighten.

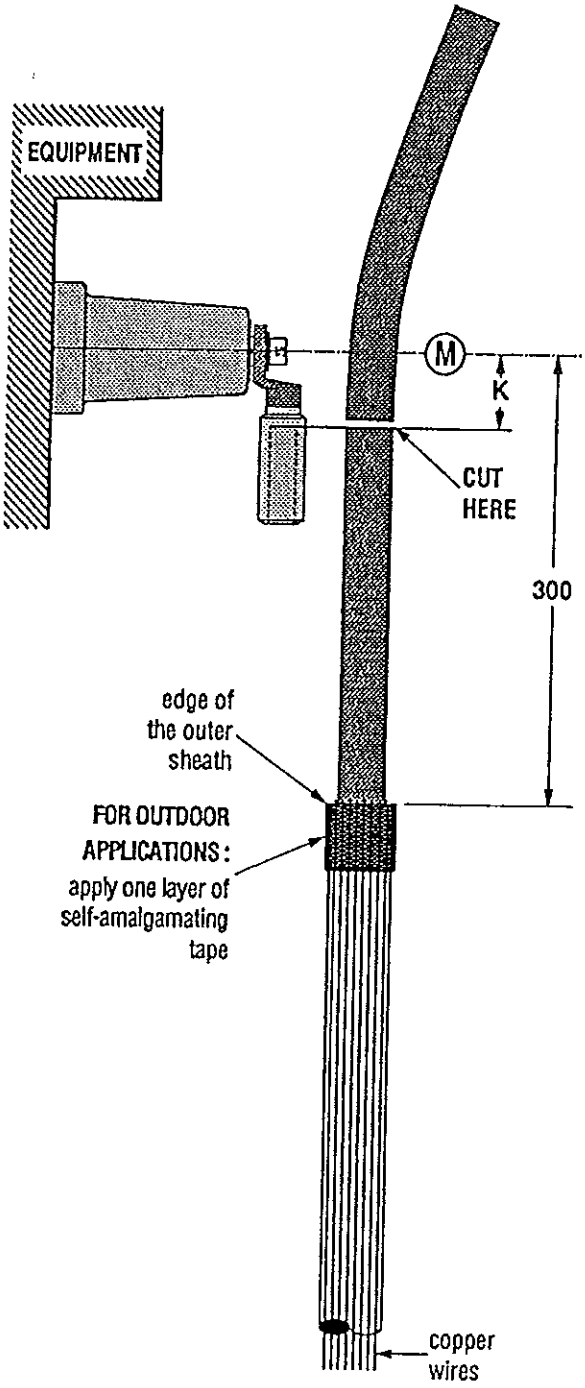




Temporarily install the cable lug onto the transition contact M16/M10 using the M10 screw assembly.

ВЯРНО С ОРИГИНАЛА





3. Train the cable into the approximate final position next to the equipment bushing.
4. Apply a tape marker on the outer sheath up to a point 300 mm from the centre line «M» of the bushing.
5. Remove the outer sheath up to the tape marker. Do not cut or nick the copper wire screen.

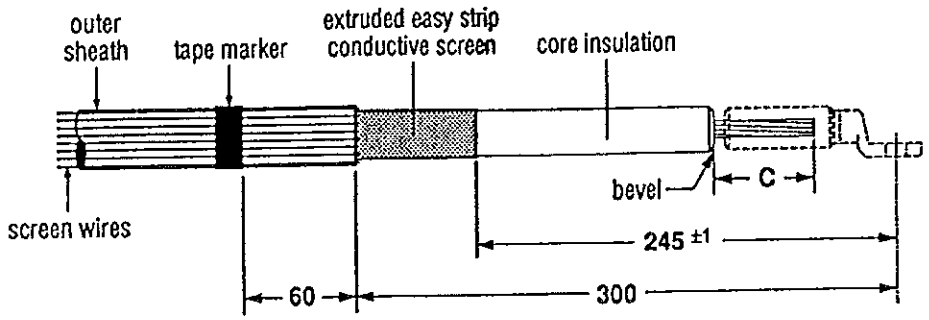
FOR OUTDOOR APPLICATIONS :

Apply one layer of self-amalgamating tape (type SA) on the outer sheath, flush with the end (25 mm minimum width).

6. Bend back screen wires along the outer sheath. For outdoor applications : compress the screen wires into the self-amalgamating tape.
7. Cut the cable at a distance «K» mm from the centre line «M» of the bushing (depending on the bore depth of the cable lug to be used).
8. Remove the temporarily installed cable lug from the equipment bushing.

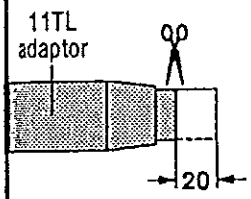
Part A Copper wire screened cable with extruded easy strip conductive screen

CABLE PREPARATION

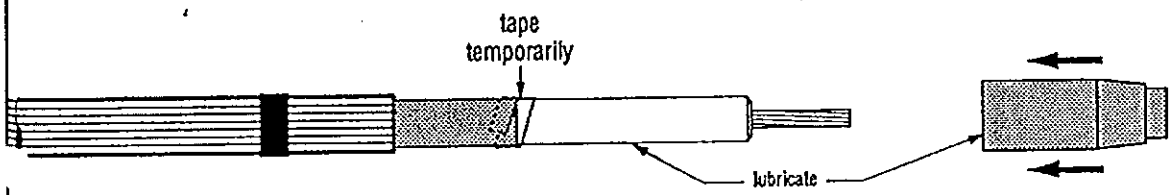


1. Check distance of 300 mm.
2. Apply a tape marker on the outer sheath 60 mm from the end.
3. Bend back the copper wires along the outer sheath.
4. Remove the extruded conductive screen to a point 245 ±1 mm from the centre line of the contact bore. Cut squarely taking care not to cut the core insulation.
5. Remove the core insulation from the conductor for a distance "C" mm (C = depth of contact bore + 15 mm).
6. Slightly break the edge of the core insulation.

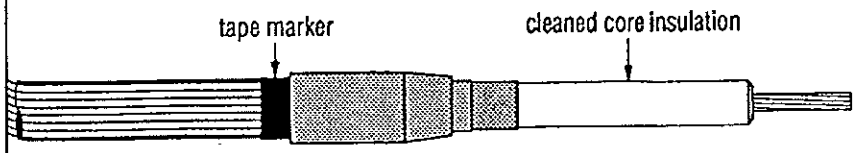
INSTALLATION OF THE 11TL ADAPTOR



7. Cut the collar of the 11TL adaptor for a distance of 20 mm.



8. As an aid to install the adaptor, it is recommended to wrap one or two layers vinyl tape on the step of the extruded conductive screen.
9. Lubricate core insulation and inside of the adaptor*.



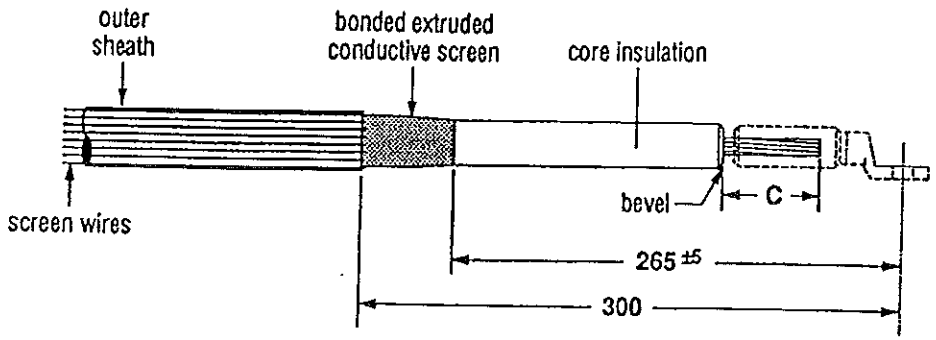
10. Slide the adaptor over the insulation until flush with the tape marker.
11. Remove the vinyl tape applied in step 2.
USING THE WHITE WIPER, THOROUGHLY CLEAN THE CORE INSULATION.
Always wipe towards the screen wires.

PROCEED ON PAGE 6 FOR THE INSTALLATION OF THE CABLE REDUCER

* USE ONLY THE SILICONE LUBRICANT SUPPLIED

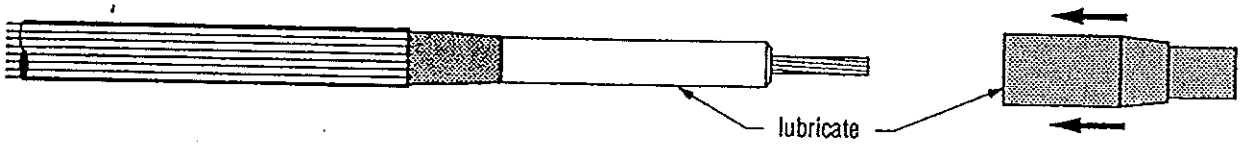
Part B — Copper wire screened cable with bonded extruded conductive screen

CABLE PREPARATION

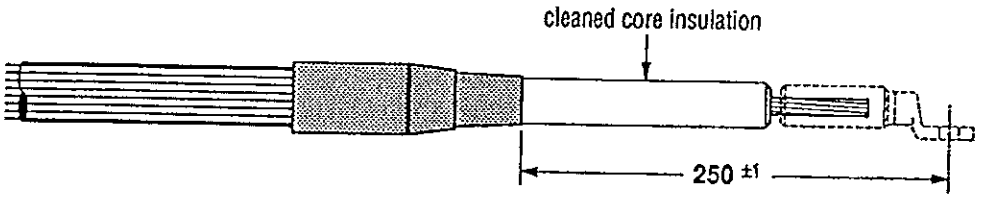


1. Check distance of 300 mm.
2. Bend back the copper wires along the outer sheath.
3. Using an appropriate pencilling tool, remove the extruded conductive screen to a point 265 ±5 mm from the centre line of the contact bore.
   Take care not to cut the core insulation.
4. Remove the core insulation from the conductor for a distance "C" mm (C = depth of contact bore + 15 mm).
5. Slightly break the edge of the core insulation.

INSTALLATION OF THE 11TL ADAPTOR



1. Lubricate core insulation and inside of the adaptor*.



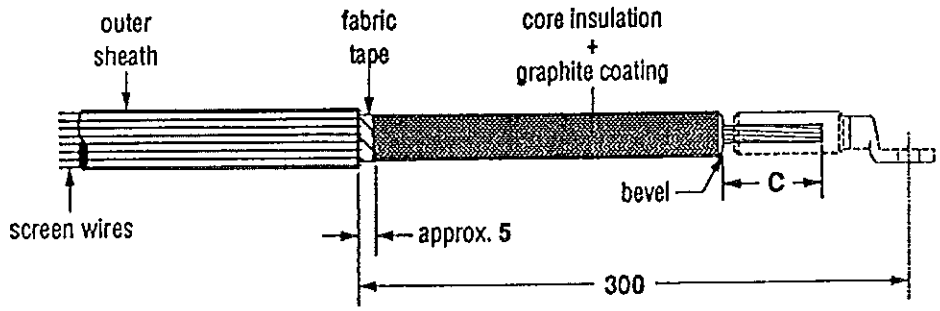
2. Slide the adaptor up to a point 250 ±1 mm from the centre line of the contact bore.
   USING THE WHITE WIPER, THOROUGHLY CLEAN THE CORE INSULATION.
   Always wipe towards the screen wires.

PROCEED ON PAGE 6 FOR THE INSTALLATION OF THE CABLE REDUCER

* USE ONLY THE SILICONE LUBRICANT SUPPLIED

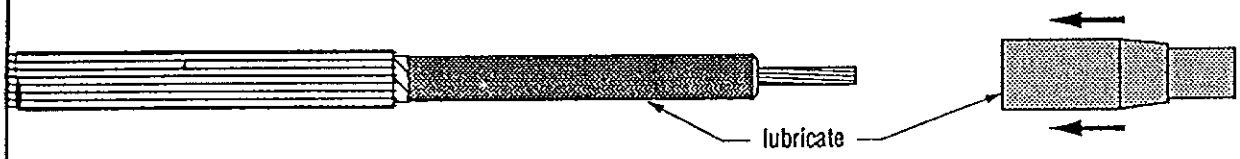
Part C Copper wire screened cable with fabric tape screen

CABLE PREPARATION

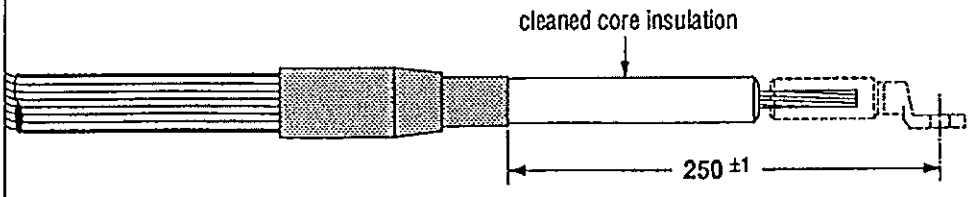


Check distance of 300 mm.
Bend back the copper wires along the outer sheath.
Remove the fabric tape to a point approx. 5 mm from the outer sheath.
DO NOT REMOVE THE GRAPHITE VARNISH AT THIS STAGE.
Remove the core insulation from the conductor for a distance "C" mm (C = depth of contact bore + 15 mm).
Slightly break the edge of the core insulation.

INSTALLATION OF THE 11TL ADAPTOR



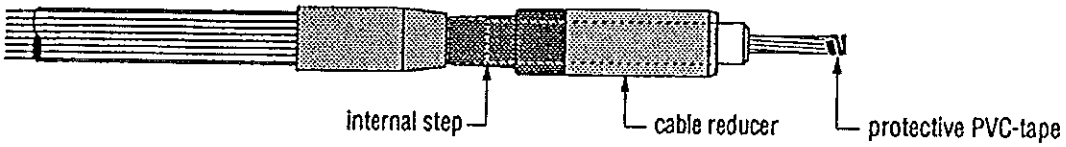
Lubricate core insulation and inside of the adaptor*.



Slide the adaptor up to a point 250 ±1 mm from the centre line of the contact bore.
THOROUGHLY REMOVE THE GRAPHITE COATING USING AN APPROPRIATE SOLVENT
Always wipe towards the screen wires.

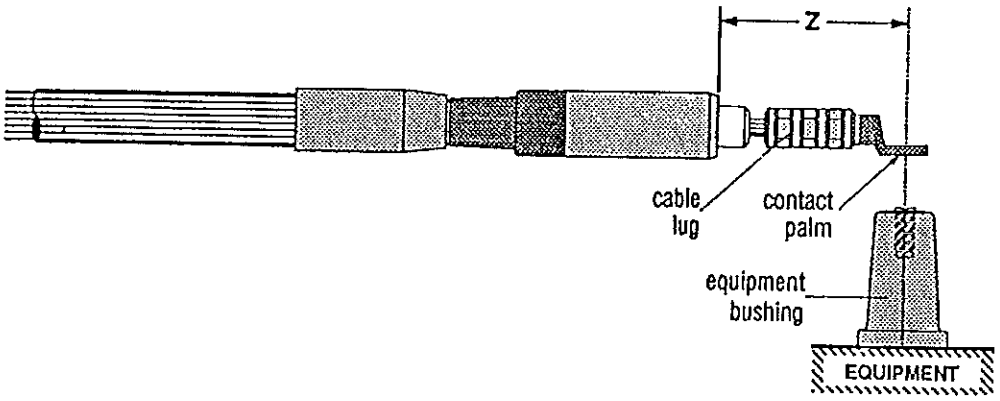
* USE ONLY THE SILICONE LUBRICANT SUPPLIED

INSTALLATION OF THE CABLE REDUCER



1. REMOVE ANY TRACES OF CONDUCTIVE RESIDUE FROM THE CORE INSULATION ABOVE THE ADAPTOR END.
   Always wipe towards the screen wires.
2. As a protection, wrap a few turns of PVC-tape around the conductor end.
3. Clean and lubricate core insulation and the inside surface of the cable reducer *.
   Slide the reducer down the cable until a very definite resistance is felt as the internal step bottoms on the adaptor.
. Remove tape from the conductor.

CRIMPING OF THE CONTACT

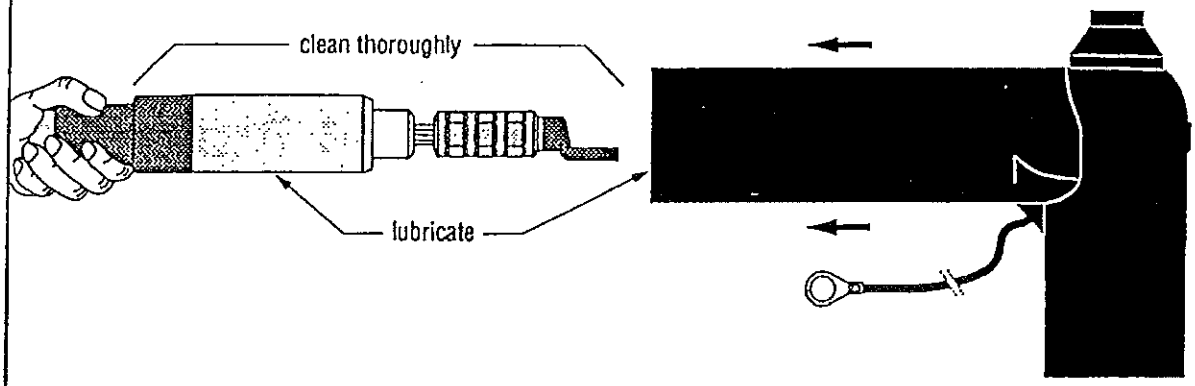


1. For aluminium conductors : before installing the crimp contact, wire brush the conductor.
2. Fit the cable lug onto the conductor. Check the contact palm faces the bushing.
3. Prior to crimping check distance «Z» between the end of the cable reducer and the centre of the contact palm hole.
   This distance must be between 110 and 120 mm.
4. Crimp the cable lug as per manufacturers instructions.
5. After crimping distance «Z» must be between 115 and 125 mm.
6. REMOVE ANY BURRS LEFT AFTER CRIMPING AND WIPE-OFF EXCESS INHIBITOR.

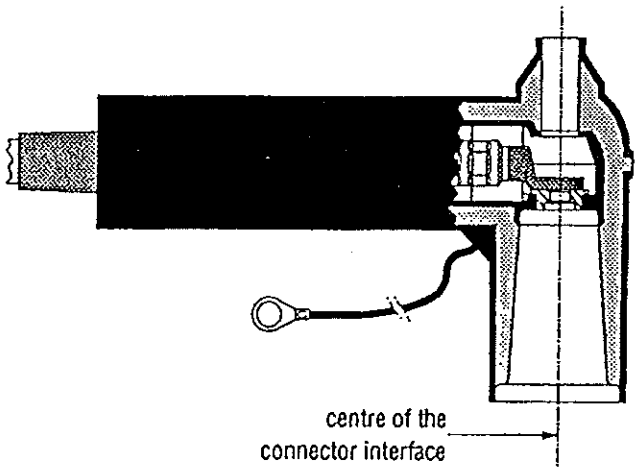
ВЯРНО С

* USE ONLY THE SILICONE LUBRICANT SUPPLIED

CONNECTOR INSTALLATION

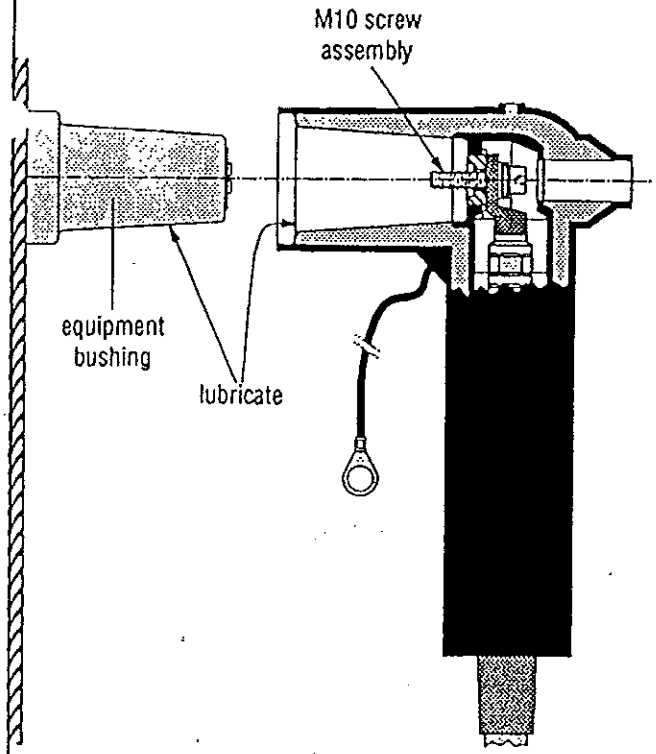


1. Clean and lightly lubricate the inside surface of the elbow connector and outer surface of the cable reducer *.



2. Check if the angle of the elbow connector housing is correct relative to the palm of the cable lug and gently slide the housing on the cable until the palm hole of the cable lug lines up with the centre of the connector interface.

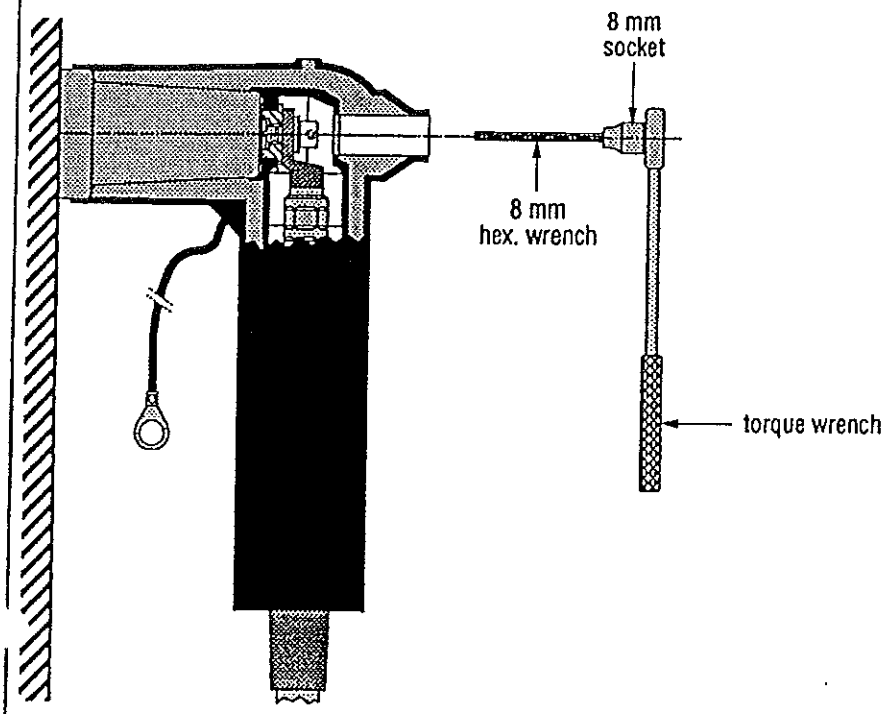
CONNECTOR INSTALLATION ON BUSHING



1. Clean and lubricate lightly both bushing interface and connector interface *.
2. Insert the M10 screw assembly into the cable lug hole.
3. Push the connector on to the bushing.

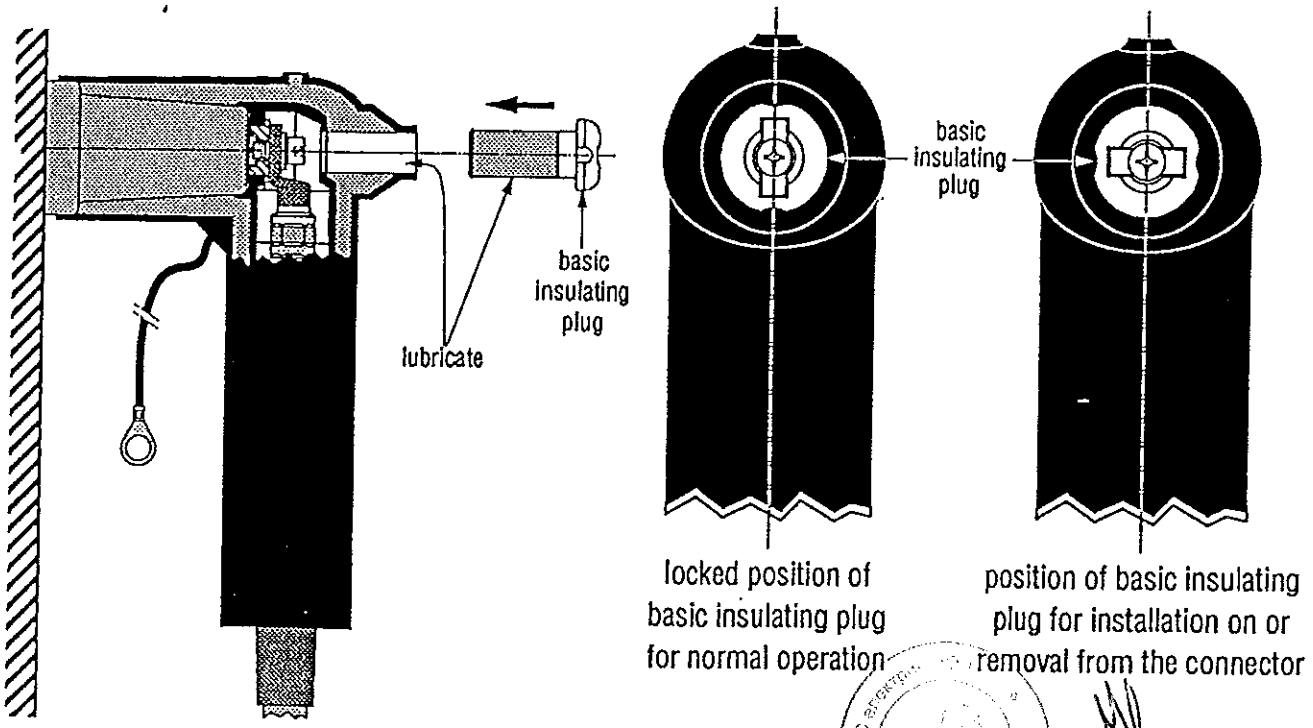
* USE ONLY THE SILICONE LUBRICANT SUPPLIED

ВЯРНО С
ОРИГИНАЛА



4. As an aid to install the M10 screw assembly, fill up the hex. hole of the screw with silicone grease before inserting the hex. key. Secure with the three spring washers and the M10 socket screw.
   Tighten assembly : use torque wrench with socket and hex. key and tighten exerting 25 Nm (2,5 kgm).

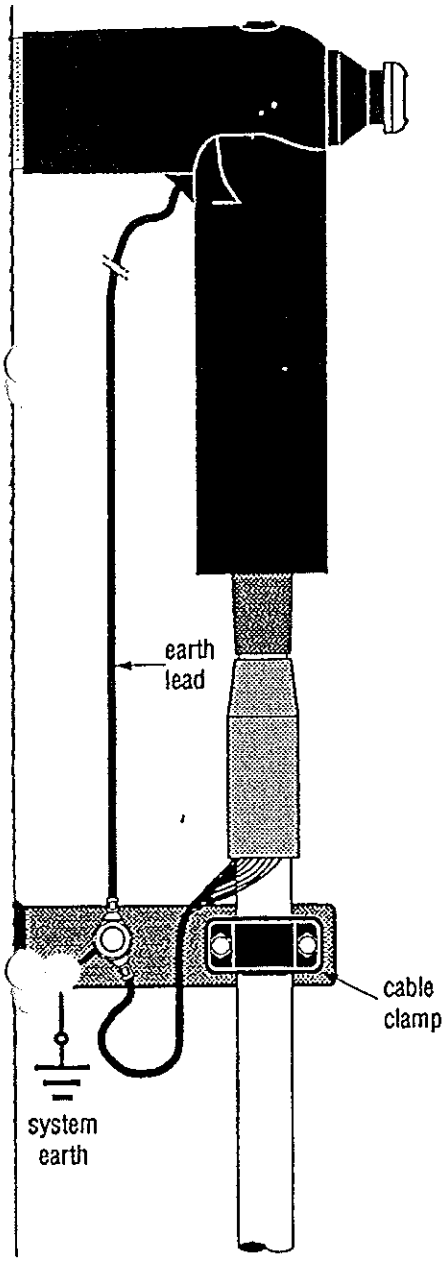
INSTALLATION OF THE BASIC INSULATING PLUG



Lubricate connector entrance and epoxy part of basic insulating plug and snap into place.

*** USE ONLY THE SILICONE LUBRICANT SUPPLIED**

SCREEN EARTHING AND CABLE CLAMPING



1. Bend back the screen wires along the outer sheath to form a pig tail.
2. Connect the earth lead and screen wires to system earth.

NOTE : A connector/bushing mated combination should not be allowed to carry the full weight of the cable.
Therefore it is necessary to clamp the cable immediately beyond the cable screen adaptor.

*** USE ONLY THE SILICONE LUBRICANT SUPPLIED**

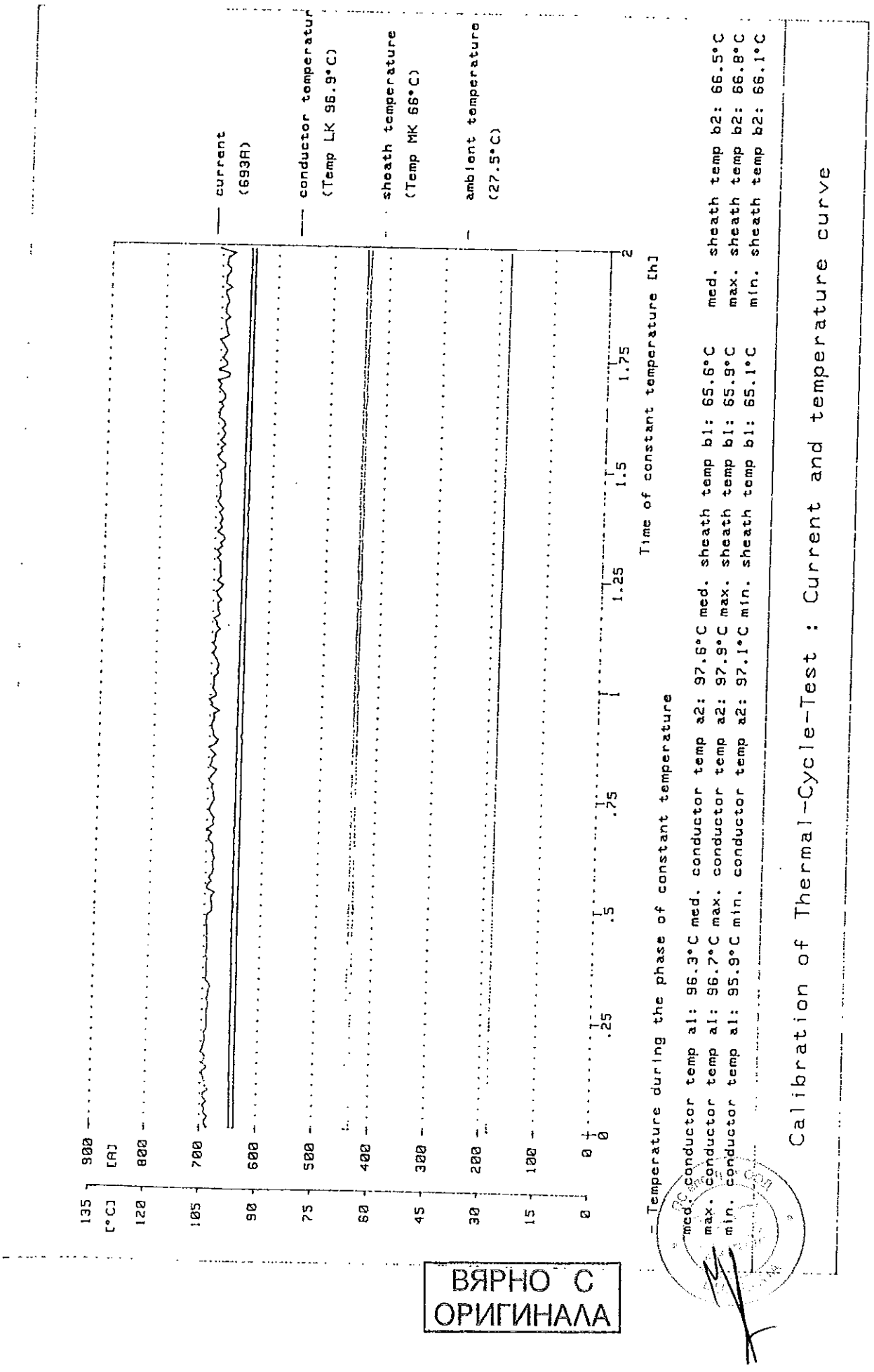
PORTANT NOTES :
: order to achieve the correct applied torque ensure that there is no lubricant on the threaded parts.
ever disconnect the connector from energised equipment.
o not allow hydrocarbon oils or solvents to contaminate the E.P.D.M. rubber.
the event of contamination, wipe the surface clean with a dry cloth.

ALCATEL
CABLE

EUROMOLD N.V.
Industriezone 3
B-9320 EREMBODEGEM-AALST - BELGIUM
Tel. 053/85.02.11 - Telefax 053/83.10.13

Test report no.: 98.02.21.066

Annex 02



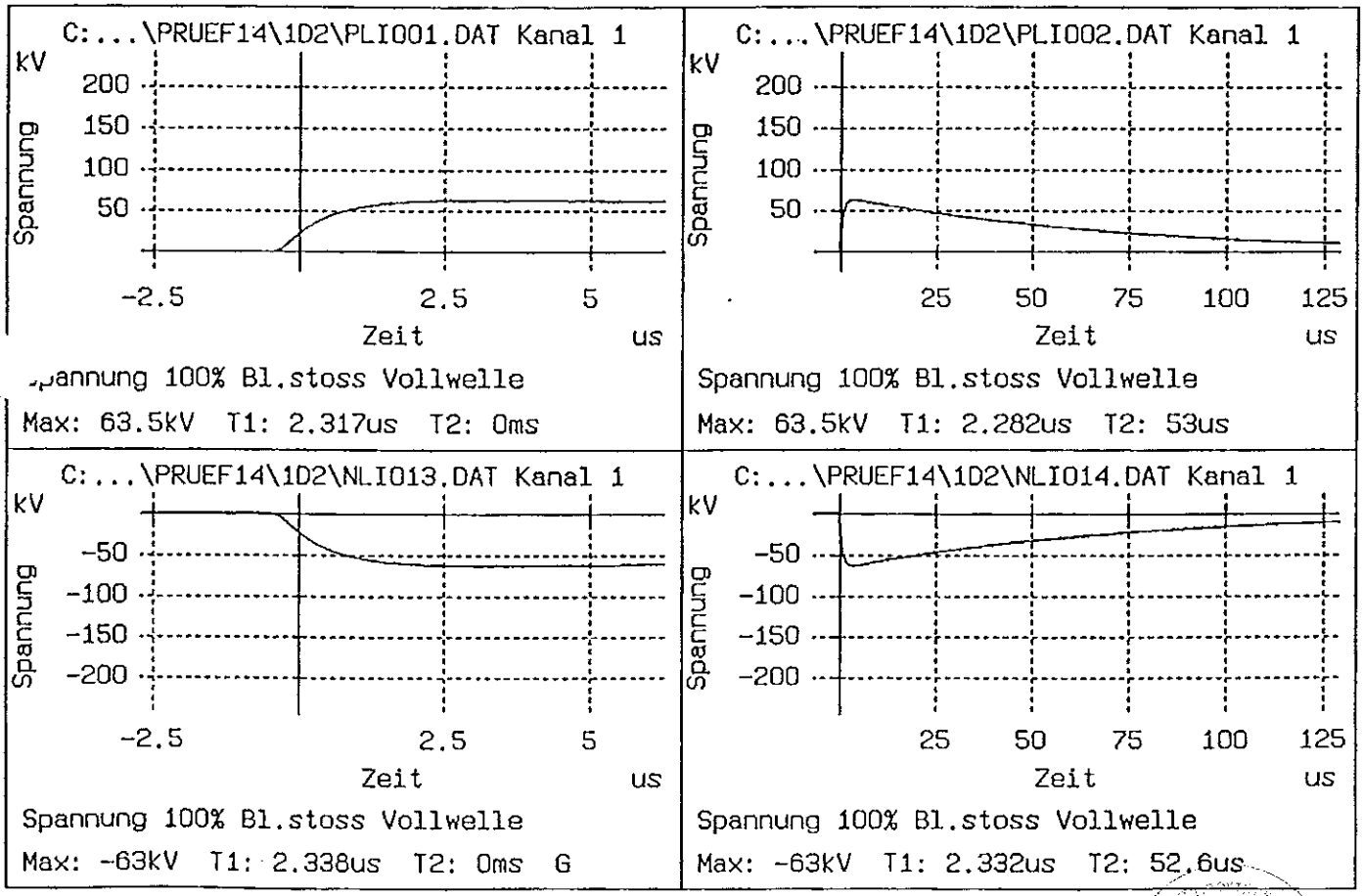
ВЯРНО С ОРИГИНАЛА

Test report no.: 98.02.21.066 **Annex 03**

Verification of the waveform of the impulse voltage

Verification of the impulse voltage parameters carried out before the impulse voltage test showed that the requirements of VDE 0472-511:1985-08 are met.

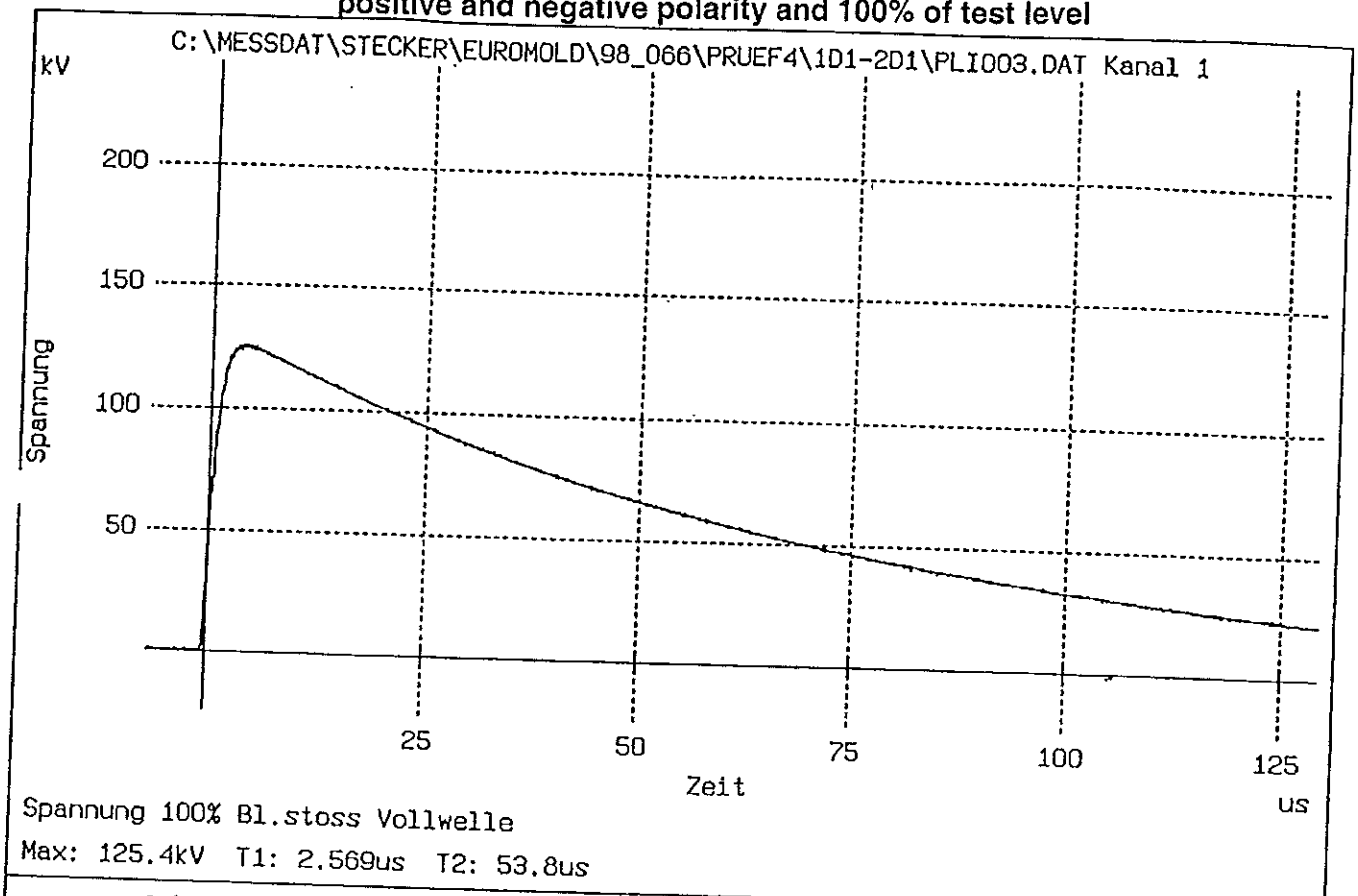
front **rear**

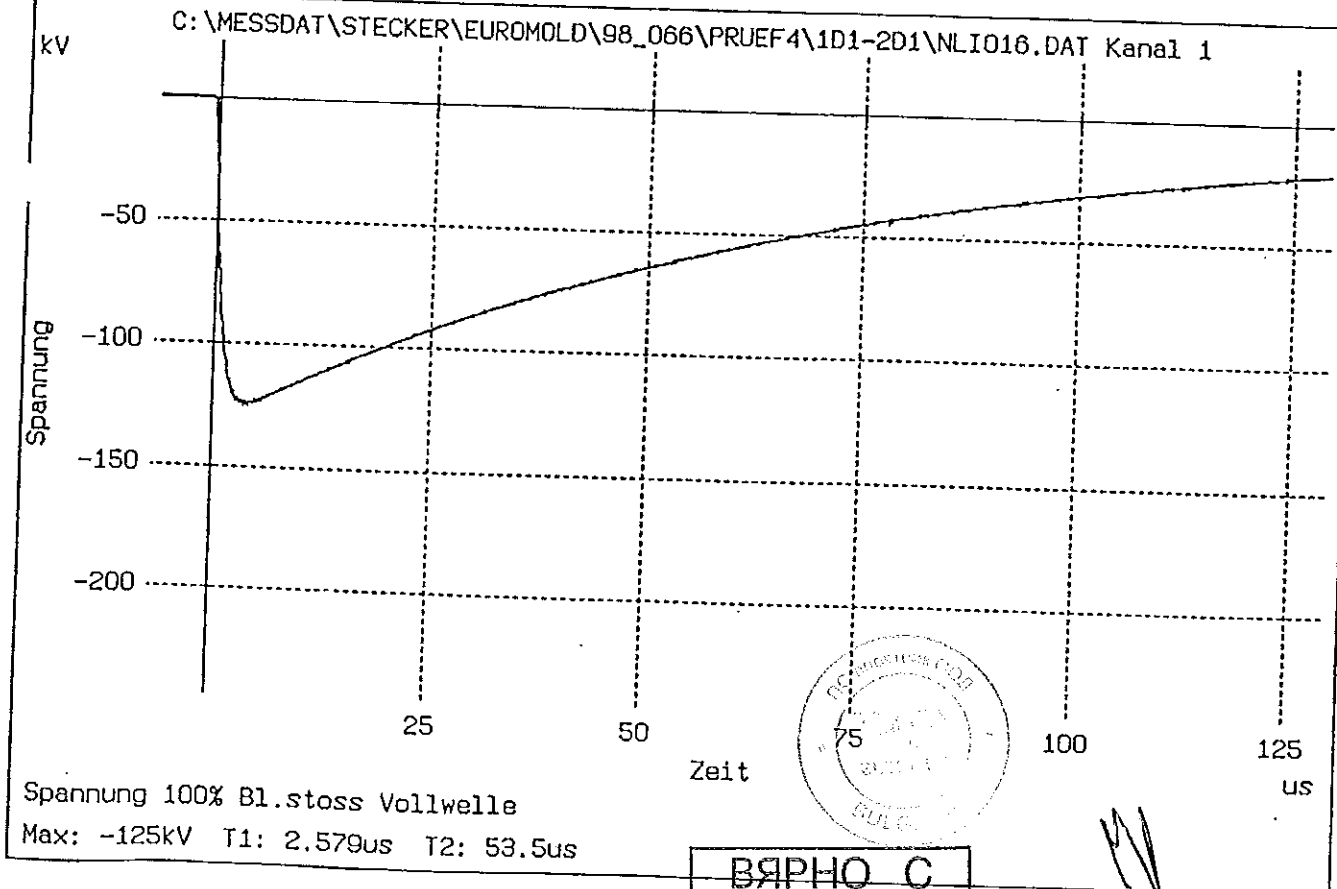


ВЯРНО С ОРИГИНАЛА

Test report no.: 98.02.21.066 **Annex 03**

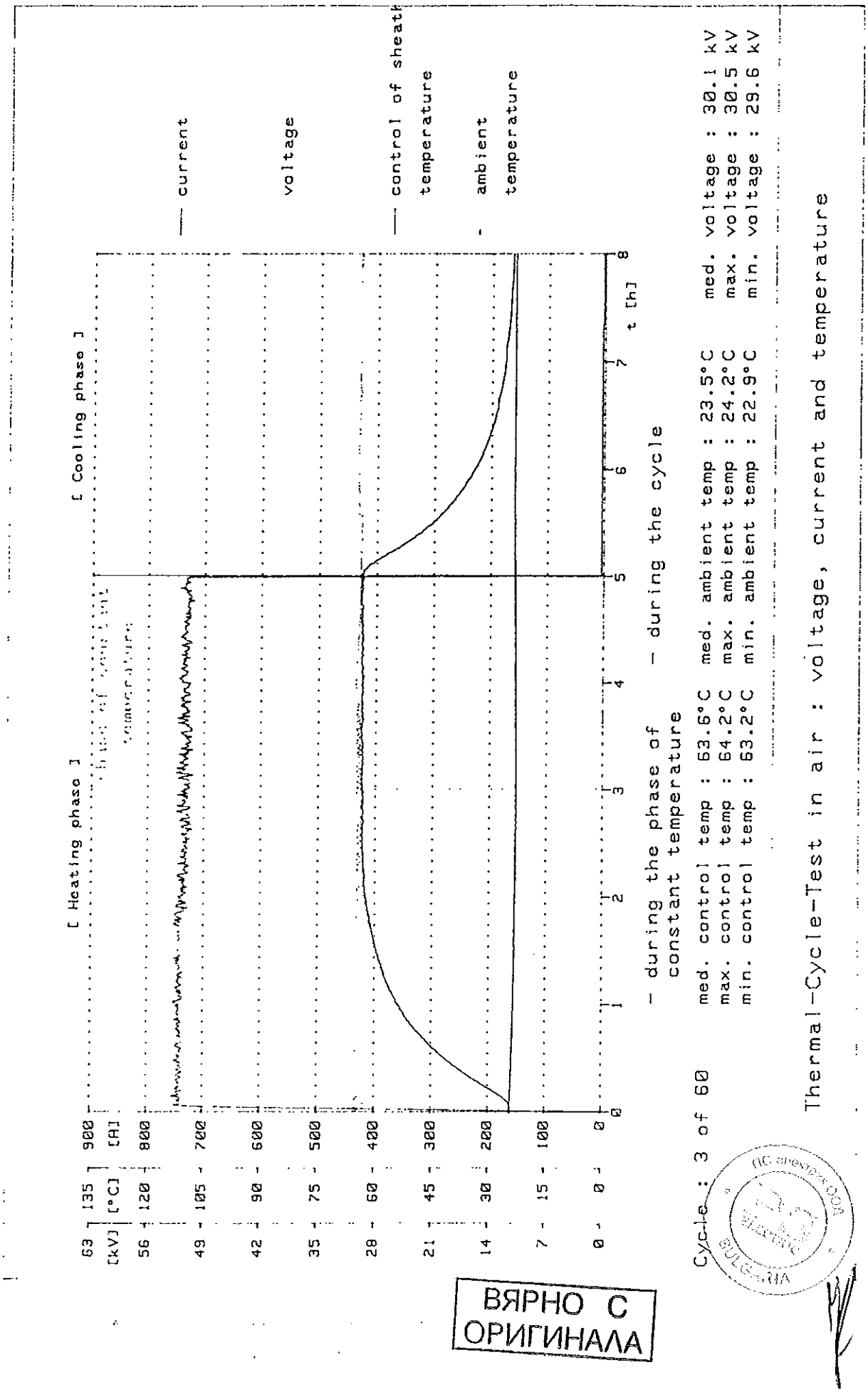
Pulse diagramm of the rated-impulse withstand voltage at positive and negative polarity and 100% of test level





ВЯРНО С ОРИГИНАЛА

Test report no.: 98.02.21.066 **Annex 04**



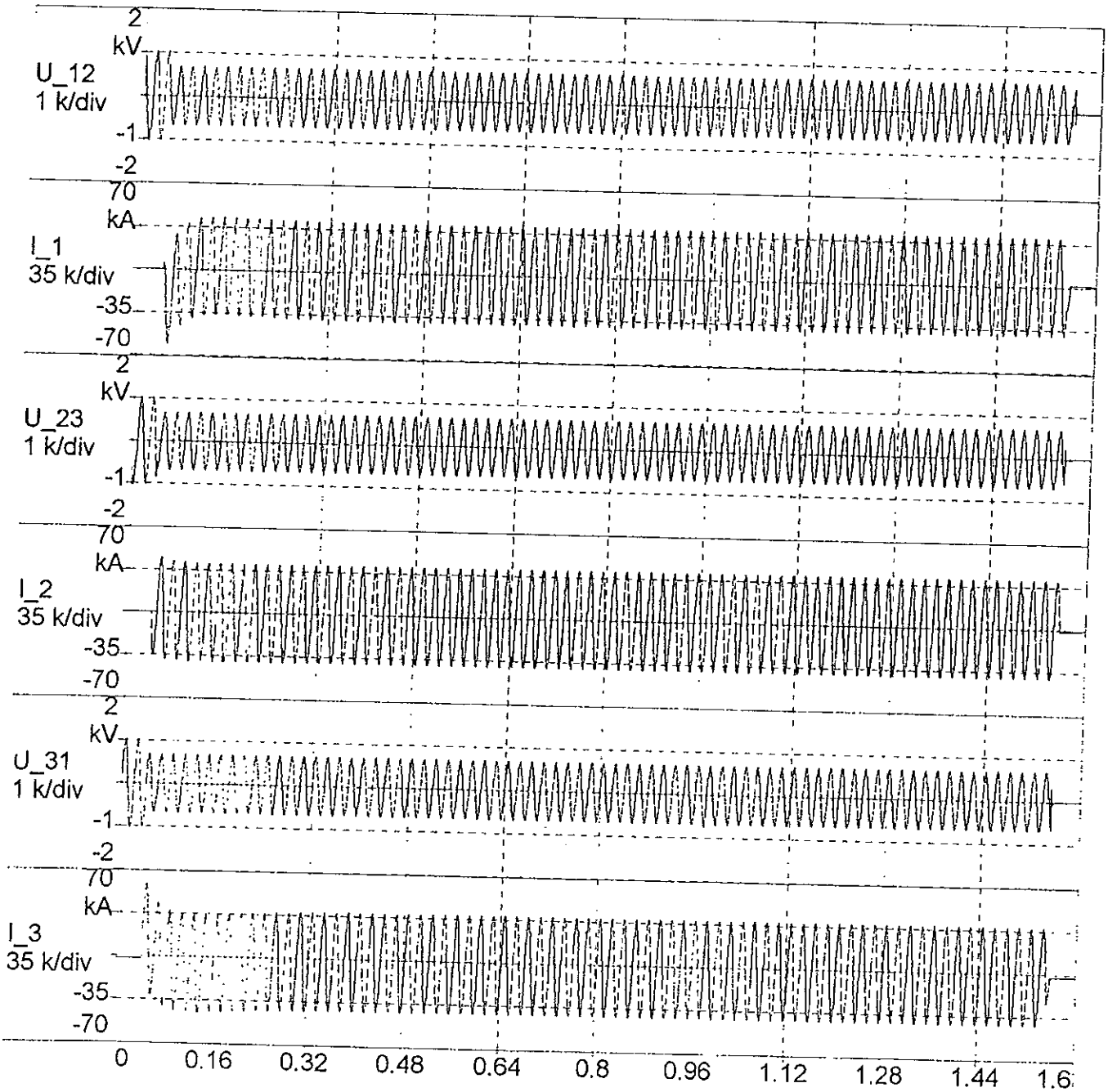
ВЯРНО С ОРИГИНАЛА

Test report no.: 98.02.21.066

Annex : 05

Thermal Short-Circuit Test (Conductor)

Test specimen : 5, 6 and 7
Test : 1



I_{K1}	: 28.3 kA	I_{K2}	: 28.4 kA	I_{K3}	: 28.3 kA
i_{p1}	: 61.2 kA	i_{p2}	: 44.5 kA	i_{p3}	: 58.7 kA
U_{12}	: 473. V	U_{23}	: 471. V	U_{31}	: 471. V
I_1^2t	: 1.22 GA^2s	I_2^2t	: 1.23 GA^2s	I_3^2t	: 1.22 GA^2s
t	: 1.5227 s				

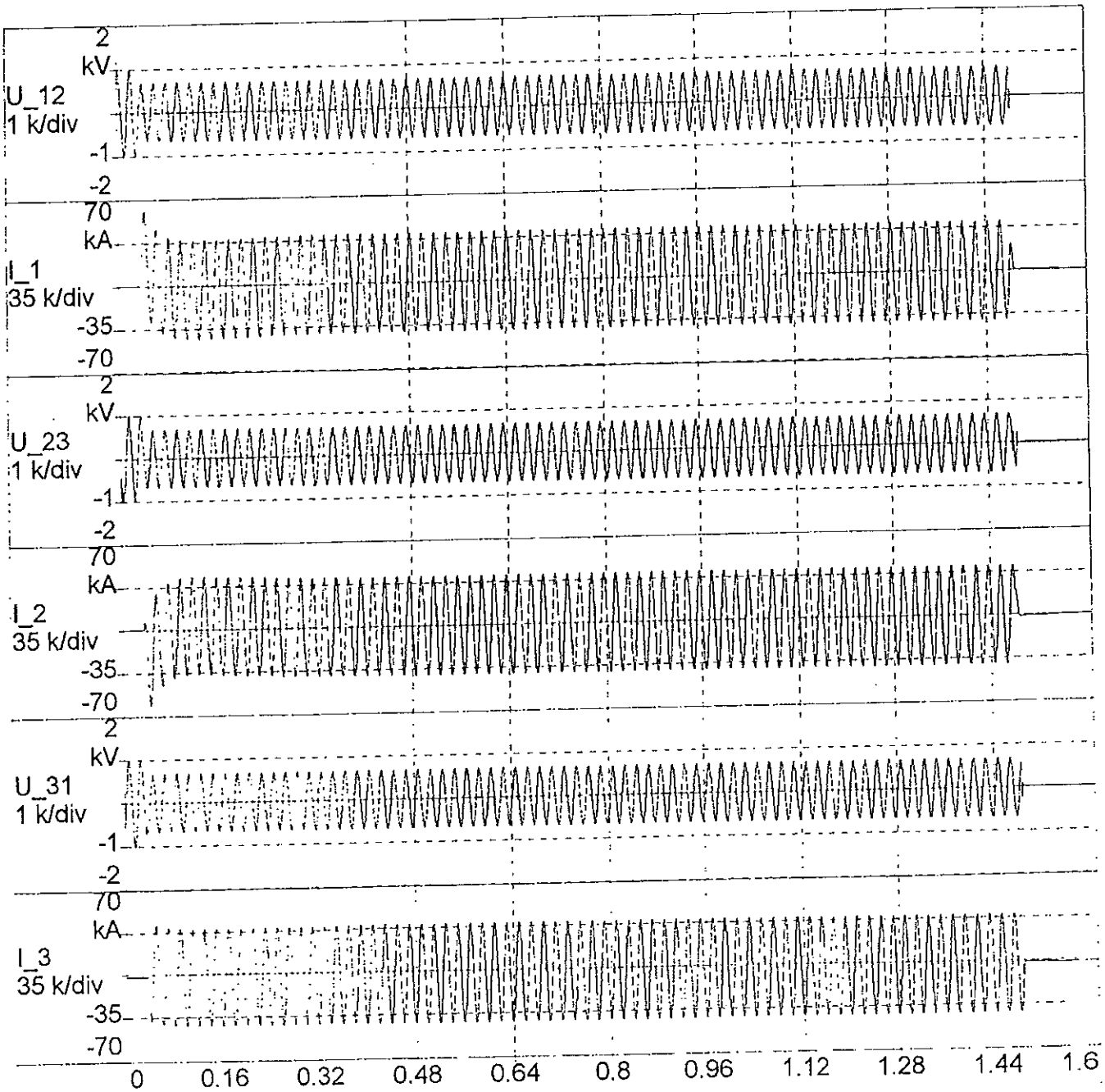
ВЯРНО С ОРИГИНАЛА

Test report no.: 98.02.21.066

Annex : 05

Thermal Short-Circuit Test (Conductor)

Test specimen : 5, 6 and 7
Test : 2

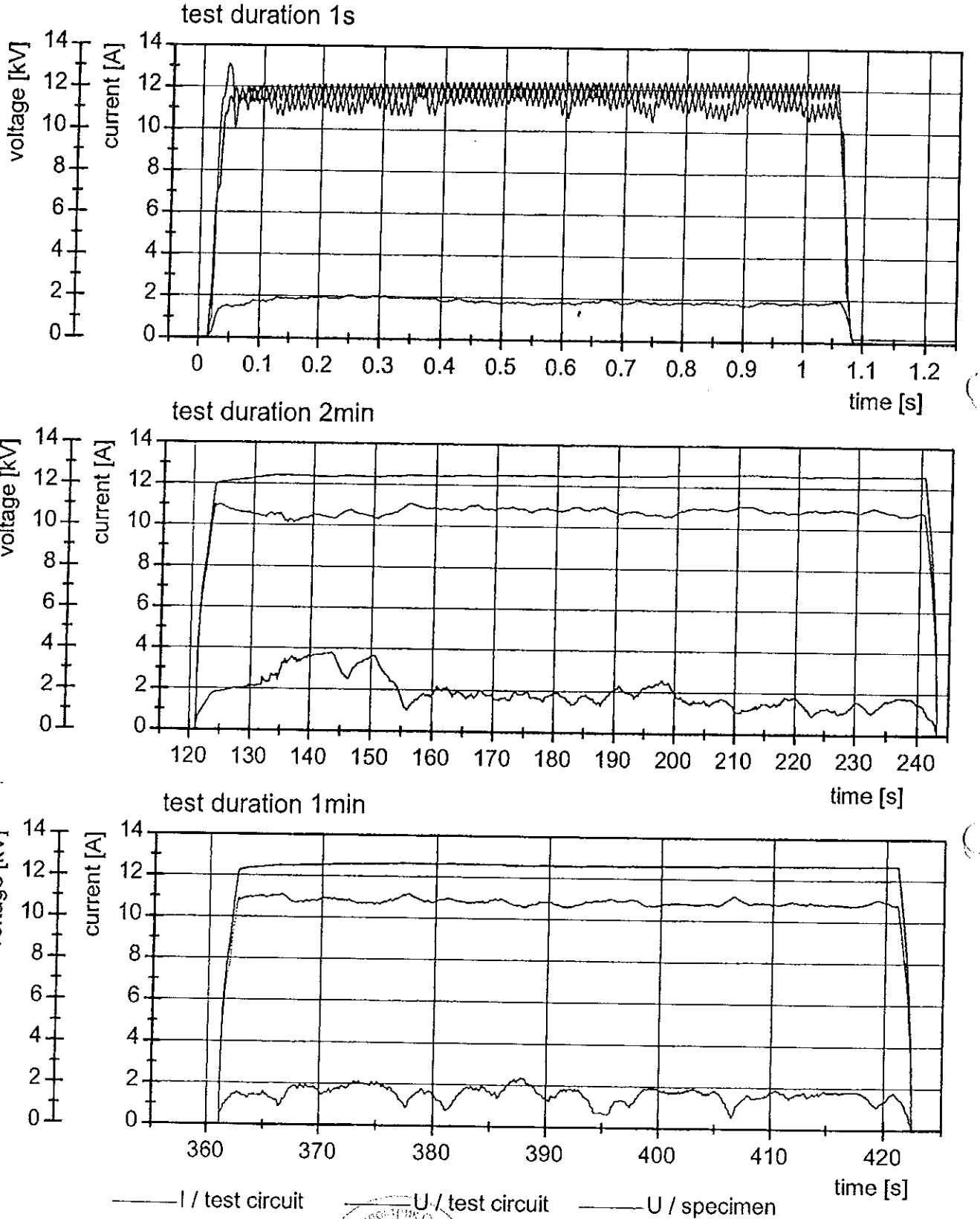


160 ms/div

$I_{K\,1}$	: 28.3 kA	$I_{K\,2}$	: 28.4 kA	$I_{K\,3}$	: 28.2 kA
$i_{p\,1}$	: 60.8 kA	$i_{p\,2}$	: 61.3 kA	$i_{p\,3}$	: 41.7 kA
U_{12}	: 465. V	U_{23}	: 466. V	U_{31}	: 465. V
I_1^2t	: 1.16 GA^2s	I_2^2t	: 1.17 GA^2s	I_3^2t	: 1.15 GA^2s
t	: 1.4506 s				

ВЯРНО С ОРИГИНАЛА

Screen fault current initiation test



ВЯРНО С ОРИГИНАЛА

Test report no.: 98.02.21.066 **Annex 07**

Measuring instruments and testing units

Equip.-no.	cal.	Equipment	Type	Manufacturer
A.C. voltage dry withstand of clause 4 of DIN VDE 0278-628				
107		Prüftransformator 1 350 kV	WOF	Fischer
113		Thoma-Regler 0-500 V 600 kVA	LT/R	Fischer
109		HF-Filter	B84299-G59	Siemens
429	*	Scheitelspannungsmeßsystem	div.	Haefely
D.C. voltage dry withstand of clause 5 of DIN VDE 0278-628				
120		Bedienungsteil	T 26/110	HDW
121		Entladeschalter	T 26/160	HDW
122		Steuerpult	ohne	Eigenbau
123		Wasserwiderstand 350 kV 400 W	T 26/190	HDW
125		Steuergerät	ohne	Eigenbau
126		Grundgerät	T 26/100	HDW
127		Kaskade 200 kV	T 26/141	HDW
128		Kaskade 150 kV	T 26/140	HDW
399	*	DC-Meßeinrichtung	DGM + RM400	MWB
Impulse voltage withstand of clause 6 of DIN VDE 0278-628				
95		Stoßspannungsgenerator	SG 11 16	Micafil
428	*	Stoßspannungsmeßsystem	div.	Haefely
003.011		Kapazitätsmeßbrücke	3000	GS
454	*	Datalogger	DL5	Rössel
26-28	*	Thermo-Meßfühler 1,5mm	NiCr-Ni	Rössel
271	*	Meßumformer	AM5/0,22	K. Pfisterer
Partial Discharge test of clause 7 of DIN VDE 0278-628				
107		Prüftransformator 1 350 kV	WOF	Fischer
113		Thoma-Regler 0-500 V 600 kVA	LT/R	Fischer
109		HF-Filter	B84299-G59	Siemens
429	*	Scheitelspannungsmeßsystem	div.	Haefely
082		TE-Meßgerät	DTM 95095/1	MWB
079		Breitbandeinschub 40-220 kHz	Eb1	MWB
081		Ankoppelvierpol	AKV 95030/1	MWB
090		Speicheroszilloskop	5441	Tektronix
077	*	TE-Impulskalibrator	PDG82 35039	MWB
454	*	Datalogger	DL5	Rössel
26-28	*	Thermo-Meßfühler 1,5mm	NiCr-Ni	Rössel
271	*	Meßumformer	AM5/0,22	K. Pfisterer

ВЯРНО С ОРИГИНАЛА

Test report no.: 98.02.21.066 **Annex 07**

Equip.-no.	cal.	Equipment	Type	Manufacturer
Tests at elevated temperature of clause 8 of DIN VDE 0278-628				
442		Netzspannungsregler 380 V	NRDA	Ruhstrat
443		Säulenstelltrafo 0...400 V	TKSPKT	Ruhstrat
444		Erregereinheiten 2500 A, 28 kVA	EREH	Ruhstrat
068	*	AC-Kalibrator	255800	YEW
439	*	Zangenstromwandler 1000:5 A	IZS	Ritz
440	*	Zangenstromwandler 1000:5 A	IZS	Ritz
004.095		Z-Wandler (Kabelkopf) 5:1 A	ohne	Eigenbau
462	*	Steuerung für Lastwechsel-Prüfraum II	ohne	Eigenbau
497	*	Strom-Meßwandler	UGSS 710	Ritz
136	*	Voltmeter	HP 44701	Hewlett Packard
29-38	*	Thermo-Meßfühler 1,5 mm	NiCr-Ni	Rössel
Short-circuit tests of clause 11 of DIN VDE 0278-628				
505-507	*	Hochstrom-Meßwiderstand 50kA/1s	Shunt ISM 250P	Hilo Test
501	*	Transientenrecorder-Meßsystem	BE 256-M7	Nicolet
533		Hochstromprüfeinrichtung 50 kA/1s	GDPN 5000/12	Siemens
Screen resistance measurement of clause 16 of DIN VDE 0278-628				
223	*	DMM	3458A	Hewlett Packard
480	*	Wärmeofen	ET5038	Heraeus
Leakage current measurement of clause 17 of DIN VDE 0278-628				
107		Prüftransformator 1, 350 MVA	WUF	Fischer
113		Thoma-Regler 0-500 V; 600 MVA	LTIR	Fischer
429	*	Scheitelspannungsmeßsystem	div.	Haefely
396	*	Digitalmultimeter	2001	Haefely
Screen fault current initiation of clause 18 of DIN VDE 0278-628				
7		3-Phasen-Hochstrom-Transformator	TDSB 500/10	Kentler
		315 KVA - Transformator	HUR	Volta-Werke
		E-Spule	TELA 2130	BBC
538	*	Stromwandler	EGSW 10	Ritz
537	*	Spannungswandler	EGSZ 10/0	Ritz
539	*	Spannungswandler	EGSZ 10/0	Ritz

* Measuring equipment has been calibrated based on national or international measurement standards. Records can be inspected on request.

ВЯРНО С ОРИГИНАЛА

Deutscher Akkreditierungs Rat
DAR
DAT-P 027/92-00

VEW EUROtest GmbH
ELEKTROTECHNISCHES PRÜFLABORATORIUM

Test certificate

No.: ~~95.05.21.294 A~~ Version: ~~3/4~~

Client	:	EUROMOLD N.V. 3de Industriezone - Industrielaan 12 B-9320 Erembodegem-Aalst
Object tested	:	Screened bolted-type separable connector 12/20 (24) kV
Type	:	K 158 LR
Manufacturer	:	EUROMOLD N.V.
Date received	:	30-05-1995
Date of test	:	June - November 1995
Test regulations applied	:	DIN VDE 0278 Teil 1:1991-02/DIN VDE 0278 Teil 6:1991-02
Test carried out	:	Type tests according to DIN VDE 0278 Teil 6: 1991-02 table2
Test result	:	The screened bolted-type separable connector 12/20 (24) kV, type K 158 LR manufactured by EUROMOLD N.V. qualified in the type tests according to DIN VDE 0278 Teil 1/DIN VDE 0278 Teil 6:1991-02.
Specialist testers	:	Hemeltjen, Schlüter, Lentsch, Hommernick, Leuchtmann, Dipl.-Ing. Lange

VEW EUROtest GmbH
Elektrotechnisches Prüflaboratorium

Dortmund, 09-09-1999

Dr.-Ing. M. Böhme

Dr.-Ing. M. Hassan

Report No. 95.05.21.294 contains 06 pages and 07 appendices.

VEW EUROtest GmbH, Unterste-Wilms-Str. 52, 44143 Dortmund, Telefon 0231-438 28 61, Telefax 0231-438 26 34

ВЯРНО С ОРИГИНАЛА

Summary

VEW EUROtest GmbH carried out type tests according to DIN VDE 0278 Teil 1:1991-02/ DIN VDE 0278 Teil 6:1991-02 table 2 on the screened bolted-type separable connector 12/20 (24) kV, type K 158 LR manufactured by EUROMOLD N.V..

The screened bolted-type separable connector 12/20 (24) kV of the type K 158 LR manufactured by EUROMOLD N.V. qualified in the type tests according to DIN VDE 0278 Teil 1:1991-02/DIN VDE 0278 Teil 6:1991-02 table 2.

Contents

		Page
1	Test regulations	04
2	Technical data of the test specimens	04
3	Realization and result of the tests	05

Annex

1	Data sheet (4 sheets)
2	Installation instructions (8 sheets)
3	Screen fault current initiation test (7 sheets)
4	Impuls voltage test point 3 (12 sheets)
5	Thermal short-circuit test (3 sheets)
6	Impuls voltage test point 14 (6 sheets)
7	Test equipment (1 sheet)

1 Test regulations

DIN VDE 0278 Teil 1: 1991-02
Accessories for power cables with rated voltage *U* up to 30 kV (U_m up to 36 kV)
Requirements und test methods

DIN VDE 0278 Teil 6: 1991-02
Accessories for power cables with rated voltage *U* up to 30 kV (U_m up to 36 kV)
Bolted-type or plug-in type screened separable connectors over 1 kV (U_m> 1,1 kV)

2 Technical data of the test specimens

Connector

Screened bolted-type separable connector 12/20 kV:

Manufacturer:	EUROMOLD N.V.
Type:	K158LR
Nominal voltage U_0/U (U_m):	12/20 kV
Nominal frequency:	50 Hz
Number of phases:	1
Cross section of conductor:	16 - 150 mm²
Data sheet:	see annex 01
Installation instruction:	see annex 02

Used cable

Cable marking:	N2XS2Y 1x50 mm², rm
Cable length:	about 2500 mm

The test specimens were assembled by the manufacturer.

ВЯРНО С
ОРИГИНАЛА

3 Realization and result of the tests

Result of the tests

The tests were carried out according to DIN VDE 0278 Teil 6 table 2 . The results are summarized in table 1.

DIN VDE 0278 Teil 6 table 2 test sequence 1						
	Test	[1]	Test requirements	Test result	[2]	[3]
1	A.C. voltage dry withstand	3.1	1 min at 50 kV	no disruptive breakdown	yes	
2	Partial discharge test	3.6	20 pC at 24 kV	≤ 1 pC at 24 kV	yes	
3	Impuls voltage test	3.3	10 impulses of each polarity	125kV withstanded	yes	04
4	Electrical heat cycling in air[4])	3.5	2 cycles: I = 245 A at 30 kV	no disruptive breakdown	yes	
5	Disconnection operations/ connection operations	3.17	5 complete operations	no visible damage on contact	yes	
6	Electrical heating cycles in air[4])	3.5	1 cycles: I = 245 A at 30 kV	no disruptive breakdown	yes	
7	Partial discharge test	3.6	20 pC at 24 kV	< 1 pC at 24 kV	yes	
8	Electrical heat cycling in air[4])	3.5	20 cycles: I = 245 A at 30 kV 40 cycles: I = 333 A at 30 kV	no disruptive breakdown	yes	
9	Thermal short circuit test	3.7	6 short circuits at 9,0 kA	no visible damage	yes	05
10	Disconnection operations/ connection operations	3.17	5 complete operations	no visible damage on contact	yes	
11	Electrical heat cycling in air	3.5	54 cycles: I = 333 A at 30 kV	no disruptive breakdown	yes	
12	Partial discharge test	3.6	20 pC at 24 kV	< 1 pC at 24 kV	yes	
13	Electrical heat cycling in water[4]); Partial discharge test	3.11.3	9 cycles: I = 333 A at 30 kV 20 pC at 24 kV	no disruptive breakdown; < 1 pC at 24 kV	yes	

1) Tests acc. to DIN VDE 0278 Teil 1 clause
2) Test requirements met
3) see annex
4)On account of a wrong information the test specimen A031 and A032 were heated with incorrect heating current of 245Aeff during the first 23 load cycles . According to the agreement with the manufacturer the heating current was increased up to the correct value of 333A for the subsequent cycles.

Table 1: test results, test sequence 1 (continued)

DIN VDE 0278 Teil 6 table 2 test sequence 1						
	Test	1)	Test requirements	Test result	2)	3)
14	Impuls voltage test	3.3	10 impulses of each polarity	125kV withstanded	yes	06
15	D.C. voltage dry withstand	3.2	30 min at 96 kV	no disruptive breakdown	yes	
16	Leakage current measurement	3.14	max. 0,5 mA at 20 kV	12 µA at 20 kV	yes	03
18	Screen fault current initiation test	3.15	fault current to flow continuously	fault current to flow continuously	yes	
19	D.C. voltage dry withstand	3.16	5 min at 5 kV	no disruptive breakdown	yes	

1) Tests acc. to DIN VDE 0278 Teil 1 clause
2) Test requirements met
3) see annex

Table 1: test results, test sequence 1

Elastimold®

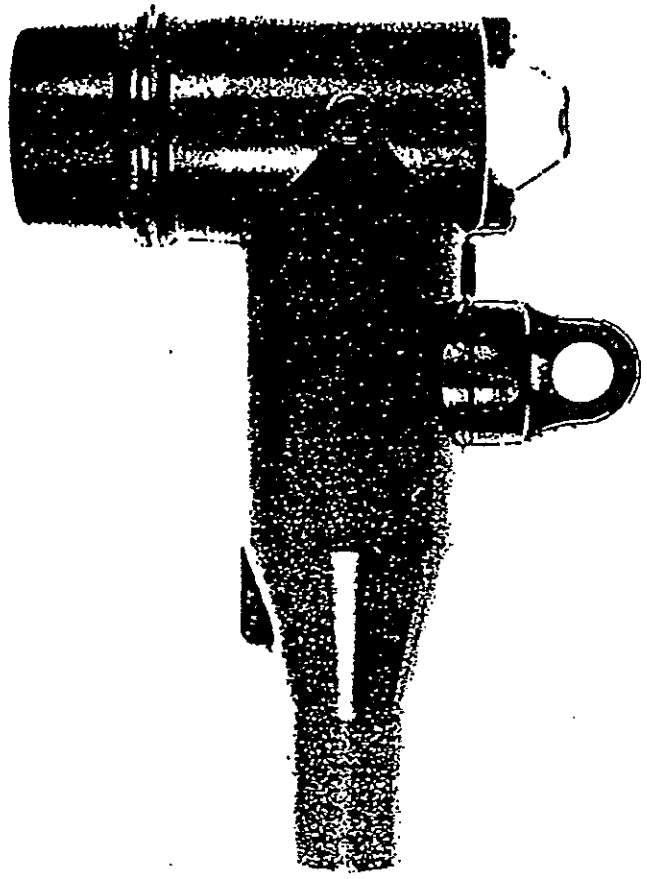
EUROMOLD

ELBOW CONNECTOR

200 SERIES

12 kV : 158LR

24 kV : K158LR



APPLICATION

- separable connector designed to connect cable to equipment (transformers, switchgear, motors). Also connects cable to cable.

TECHNICAL DETAIL

This connector

- is a fully screened and fully submersible product
- will accept the following cables :
  6/10 kV : 16-120 mm²
  12/20 kV : 16-95 mm²
- is designed to terminate extruded screened cables but can be used with other cable types by fitting the appropriate cable adaptor
- mates with the following respective 12 and 24 kV products :
  Bushings : (K)180AR-1, (K)180AR-1-G
  (K)180AR-2
  (K)180AR-3, (K)180AR-3-G
  (K)180S4, (K)180T4
  180A-24P-0
  Three-way junction : (K)1501J3-U
  In-line junction : (K)150S
  Tee connector : (K)150T
  Straight plug : (K)151SP
  Dead-end plug : (K)150DP
  Reducing tap plugs :
  - 400 series : (K)400RTPA
  - 600 series : (K)606RTPA, (K)676RTPA
    (K)600RTP, (K)675RTP
    (K)600RTPS, (K)675RTPS

  Stand-off plug : (K)151SOP
  Earthing plug : 250GP
- meet the requirements of IEC 71, VDE 0278, C 33-051, NBN C68-207, UNESA 5205 A, ANSI/IEEE 386
- has approx. gross shipping wt. : 1,3 kg

ELECTRICAL RATINGS

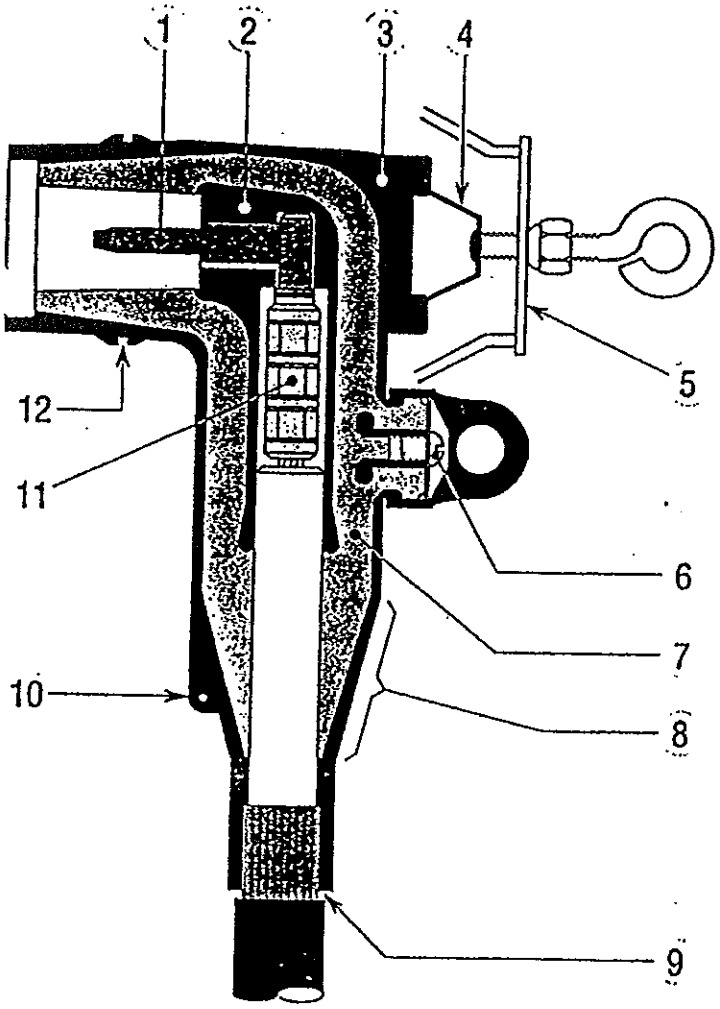
Connector type	158LR	K158LR
VOLTAGE *		
System	6/10 kV (12 kV max)	12/20 kV (24 kV max)
Partial Discharge Extinction** (1 pC sensitivity)	9 kV	18 kV
Impulse (1,2 x 50 µs)	75 kV	125 kV
Industrial Power Frequency** (50 Hz - 1 minute)	35 kV	55 kV
CURRENT		
Continuous (max.)	250 A	250 A
Overload (8 hrs in 24 hr period)	300 A	300 A
Short circuit: RMS symm. 1 sec. Peak asymm.	12,5 kA 22 kA	12,5 kA 22 kA

* Ratings are based on IEC standards and do not reflect maximum withstand levels. For compliance with other standards, refer to your local representative.

** These tests are applied to 100 % of production.

INSTALLATION

The comprehensive installation instructions supplied with each kit describe the cable preparation and crimp barrel compression. The elbow is pushed over the core insulation with the aid of the silicone grease provided. No heating, potting or taping is required when installing. The elbow connector can be energised immediately after installation on its mating part.



DESCRIPTION

① **PIN CONTACT**
Tinned copper pin screws into the conductor contact by means of an hexagonal key (supplied).

② **INTERNAL SCREEN**
A conductive EPDM rubber insert moulded to the connector insulation screens the line connection.

③ **MOULDED CONDUCTIVE SCREEN**
The 3 mm thick conductive EPDM rubber jacket is moulded to the connector insulation and provides the screening and earth continuity between the cable and the mating part.

④ **PULLING RING**
Stainless steel pulling ring also locates the bail restraint.

⑤ **BAIL RESTRAINT**
Secures the elbow connector to the equipment bushing or mating 200 series part.

⑥ **VOLTAGE TEST POINT**
Removal of the conductive rubber cap reveals a capacitive test point which can be used to check locally whether the circuit is energised.

⑦ **INSULATION**
Insulating EPDM rubber exerts a uniform radial pressure on the cable insulation (interference fit) which reinforces the creep strength.

⑧ **STRESS RELIEF**
The diverging conductive jacket moulded to the primary insulation provides stress relief for the cable.

⑨ **CABLE ENTRANCE**
Sized opening engages the insulation screen of the cable providing earth screen continuity. The interference fit keeps moisture out.

⑩ **EARTHING EYE**
Provides a convenient point for bonding the conductive rubber jacket to earth.

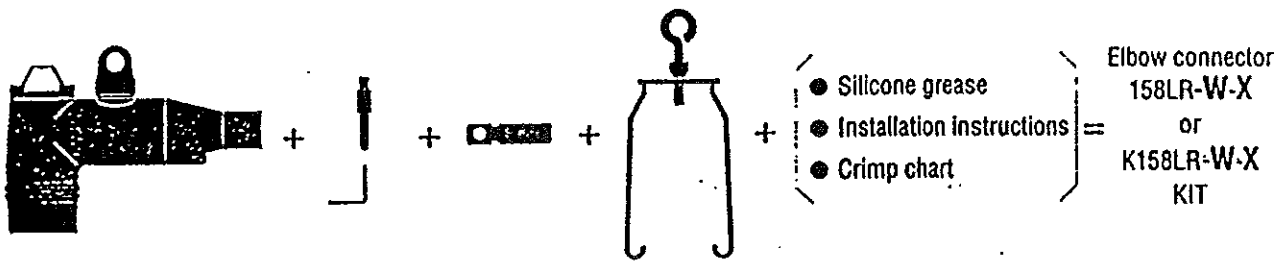
⑪ **CONDUCTOR CONTACT**
Sized to the conductor, this must be crimped with the appropriate tool.

⑫ **LOCKING GROOVE**
A groove moulded into the conductive jacket enables all three phases to be locked together and to equipment. A locking ring can be supplied on request (Ordering part number : 250RM).

ВЯРНО С ОРИГИНАЛА

ORDERING INSTRUCTIONS

The complete 158LR, K158LR elbow connector kit comprises the following component parts :



Connector housing K158BLR-**W**	Pin contact + Hex. key 154LRF	Conductor contact 164LRC-**X**	Bail restraint 150BA-B1

ORDERING FORMULAE *

Up to 12 kV - 158LR-**W**-**X**
Up to 24 kV - K158LR-**W**-**X**
To order the elbow connector, use the tables below to substitute for **W** and **X** in the above formulae :

1. From table **W** : Select the symbol which gives the best centring of your core insulation diameter.
2. From table **X** : According to your conductor size and type, select the designation which completes the part number.

Table W

Insulation dia. (mm)		Symbol for W
min.	max.	
12,6	14,9	EB
13,3	16,1	EF
14,6	17,4	FA
15,9	18,7	FAB°
17,2	19,9	FB°
18,4	21,2	FG
19,7	22,5	GA
21,0	23,8	GAB
23,6	26,4	GH

° Please contact factory for these sizes.

Table X

Section (mm²)	Aluminium			Copper
	DIN style	EDF style		DIN style
	Compacted & uncompacted	Compacted	Uncompacted	Compacted & uncompacted
16	—	—		16(K)M-11-2
25	25(K)M-12-2	25KM-12-1		25(K)M-11-2
35	35(K)M-12-2	35KM-12-1		35(K)M-11-2
50	50(K)M-12-2	50KM-12-1	50M-12-1	50(K)M-11-2
70	70(K)M-12-2	70KM-12-1	70M-12-1	70(K)M-11-2
95	95(K)M-12-2	95KM-12-1	95M-12-1	95(K)M-11-2
120	—	120KM-12-1	120M-12-1	—

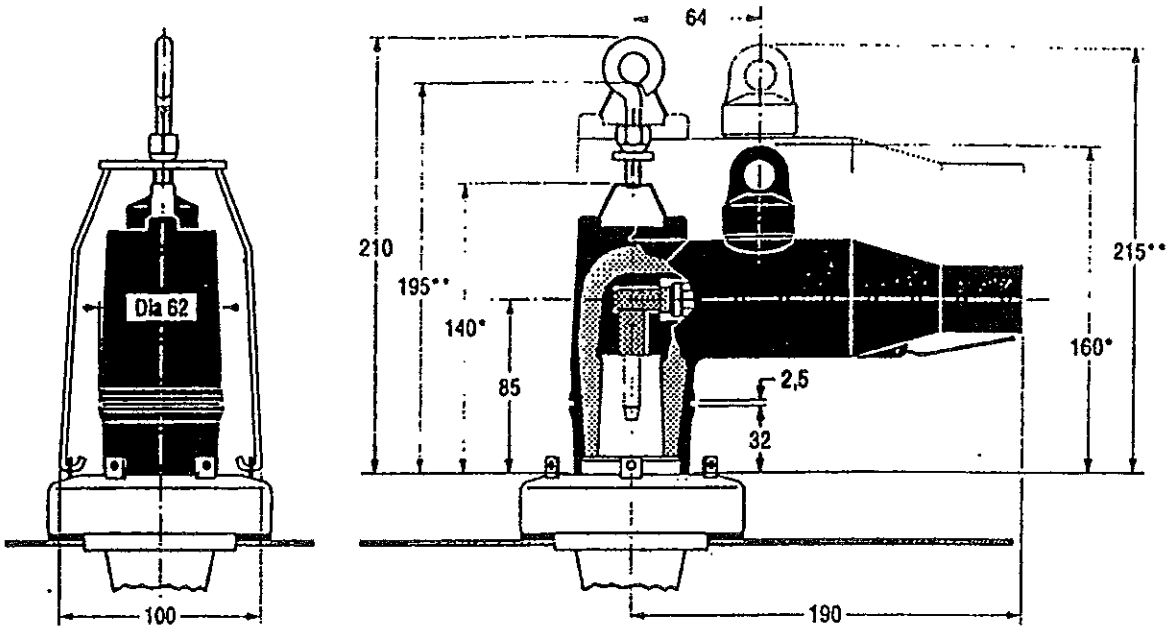
Example : The cable is 20 kV, 50 mm² compact stranded aluminium with a diameter over core insulation of 21,1 mm.
Order a K158LR-GA-50(K)M-12-1 elbow connector.

Component parts can be ordered individually.

Example : An elbow conductor contact is required for a 25 mm² compact copper conductor.
Order a 164LRC-25(K)M-11-2 conductor contact.

• IMPORTANT NOTES : - To select the necessary adaptors or screen devices for the cable used, refer to section 2.
This kit must be specified when ordering.
- When ordering, please specify your type of cable, i.e. metallic screen (copper wires or flat metallic tap and semi-conductive screen (fabric tape, extruded easy strip or bonded).

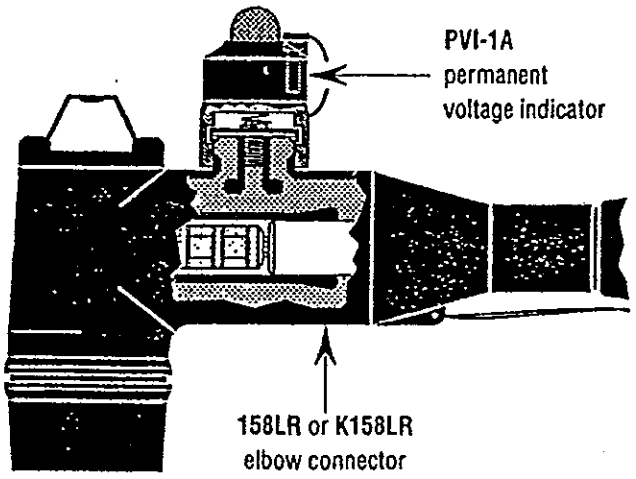
OVERALL DIMENSIONS



Dimensions in mm.
* Dimensions of connector in assembled position.
** Minimum dimensions necessary to disconnect.

IMPORTANT NOTES :

- The K158LR (24 kV) elbow connector is dimensionally identical with the standard 158LR (12 kV) elbow connector.
- The phase segregation provided by the earth screening of this product enables three phases to be mounted as close together as desired. The equipment bushing usually dictates phase centres.
- Cable entry can be accommodated from above, below, side or any angle in between.
- A connector/bushing mated combination should not be allowed to carry the full weight of the cable.
- These connectors must never be energised in isolation. Always ensure they are connected to their mating part.



PERMANENT VOLTAGE INDICATOR PVI-1A

APPLICATION

- Indicates whether the cable and connector or accessory are energised. It also provides access through the 4 mm dia. socket to the VD-point for phasing facility.
- Once installed the voltage indicator is completely watertight.

ELECTRICAL RATINGS

System voltage	6/10 kV (12 kV max.)	12/20 kV (24 kV max.)	18/30 kV (36 kV max.)
Partial Discharge Extinction	Connector ratings are not affected by the presence of the PVI-1A permanent voltage indicator		
Impulse			
Industrial Power Frequency			
Blinking Frequencies	0,7 Hz (40 pulses per minute)	1,4 Hz (80 pulses per minute)	2,1 Hz (120 pulses per minute)

Routine test :
Each permanent voltage indicator is tested at low voltage.

ORDERING INSTRUCTIONS

Simply specify the **PVI-1A** permanent voltage indicator.

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Page 1 of 8 - Ju
Supersedes edition

CAUTION :

Read instructions thoroughly and completely prior to beginning installation.

Installation Instructions

(K)158LR

Elbow Connector - 200 Series

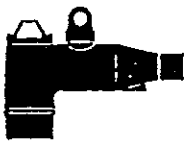
Up to 24 kV

For sizes FG - GA - GAB - GH

Only to be used on copper wire screened cable with extruded easy strip conductive screen (Part A), bonded extruded conductive screen (Part B) or fabric tape screen (Part C).

Contents :

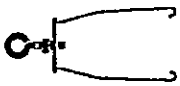
1 x Elbow connector housing



1 x Pin contact + hex. key

1 x Conductor contact

1 x Ball restraint



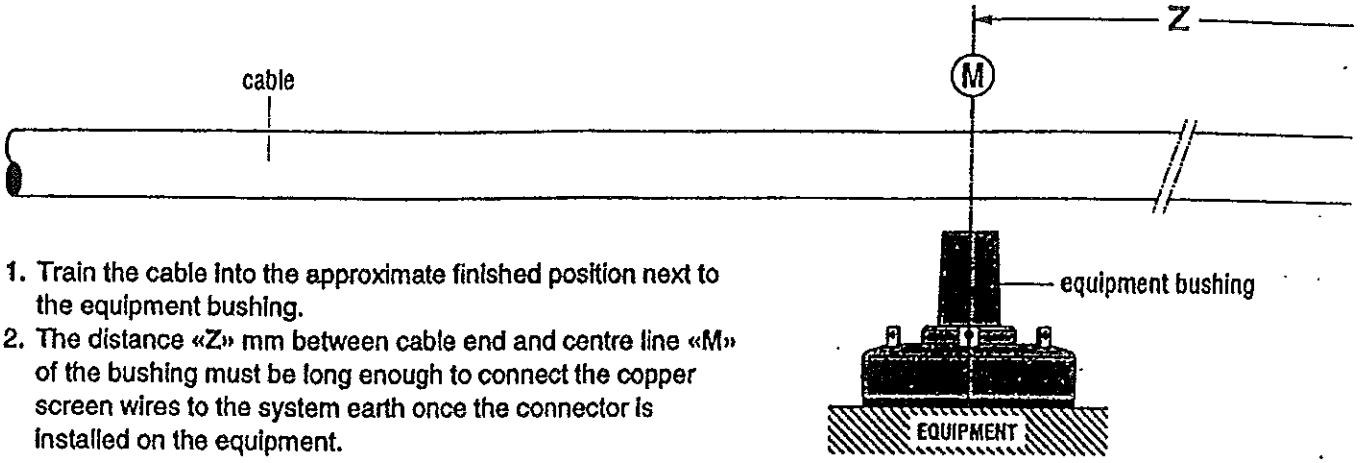
1 x 11TL adaptor

- *Self-amalgamating tape (optional, for outdoor use)*
- *Silicone grease + wipers*
- *Installation instructions + crimp chart*

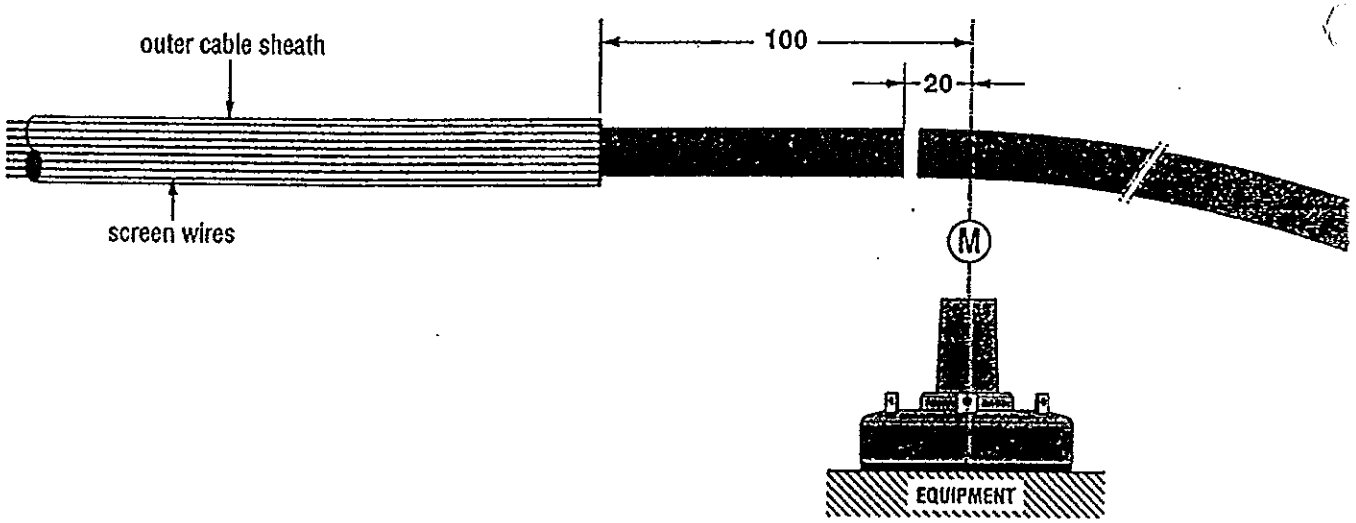
006E-R/3

This product should be installed only by competent personnel trained in good safety practices involving high electrical equipment. These instructions are not intended as a substitute for adequate training or experience in suc practices. These instructions do not attempt to provide for every possible contingency.

CABLE DISPOSAL



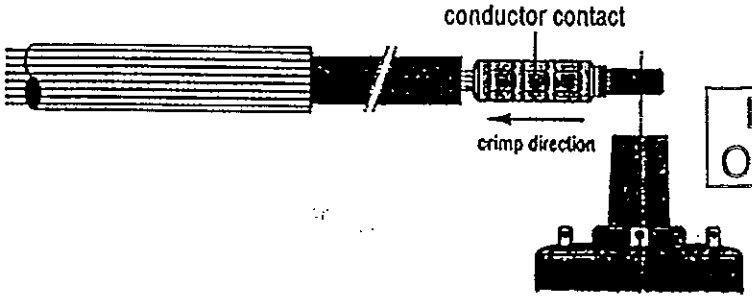
1. Train the cable into the approximate finished position next to the equipment bushing.
2. The distance «Z» mm between cable end and centre line «M» of the bushing must be long enough to connect the copper screen wires to the system earth once the connector is installed on the equipment.

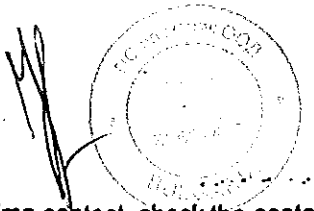


3. Temporarily remove the outer sheath to a point 100 mm from the centre line of the bushing. DO NOT CUT OR NICK THE WIRE SCREEN.
4. Bend back screen wires along the outer sheath.
5. Cut the cable to a point 20 mm from the centre line «M» of the bushing.

CRIMPING OF THE CONTACT

1. Bare the conductor for a distance «L» mm from the cable end.
   Copper conductor : L = 40 mm;
   Aluminium conductor : L = 50 mm.
2. Before installing the crimp contact wire bru the conductor (for aluminium conductors).

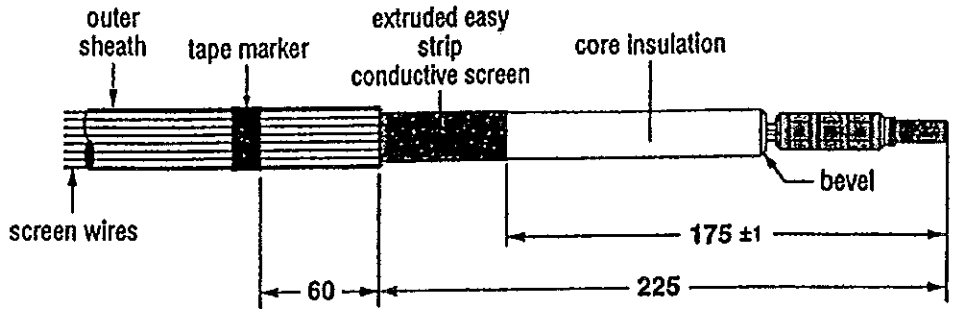




3. Install the crimp contact, check the contact palm faces the bushing interface.
4. Crimp the contact on the conductor.

Part A — Copper wire screened cable with extruded easy strip conductive screen

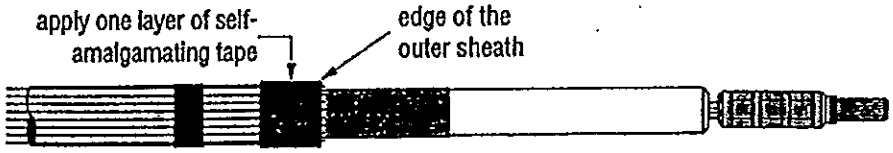
CABLE PREPARATION



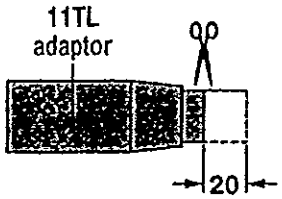
1. Remove the outer sheath to a point **225** mm from the end of the crimped contact.
2. Apply a tape marker on the outer sheath **60** mm from the end.
3. Remove the extruded conductive screen to a point **175** $^{\pm 1}$ mm from the end of the crimped contact.
4. Slightly break the edge of the core insulation.

FOR OUTDOOR APPLICATIONS :

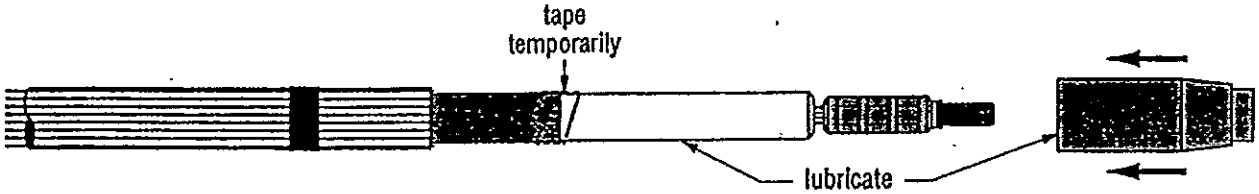
Apply one layer of self-amalgamating tape (type SA) on the outer sheath, flush with the end (25 mm minimum width).
Bend back screen wires along the outer sheath.
Compress the screen wires into the self-amalgamating tape.



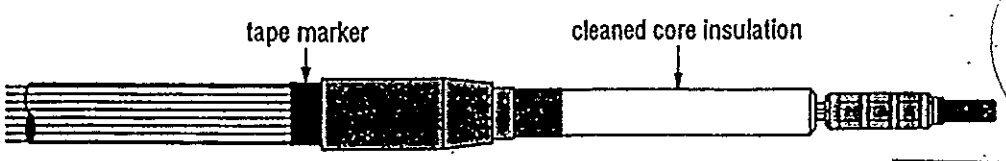
INSTALLATION OF THE 11TL ADAPTOR



1. Cut the collar of the 11TL adaptor for a distance of **20** mm.



2. As an aid to install the adaptor, it is recommended to wrap one or two layers vinyl tape on the step of the extruded conductive screen.
3. Lubricate core insulation and inside of the adaptor*.



4. Slide the adaptor over the insulation until flush with the tape marker.
5. Remove the vinyl tape applied in step 2.

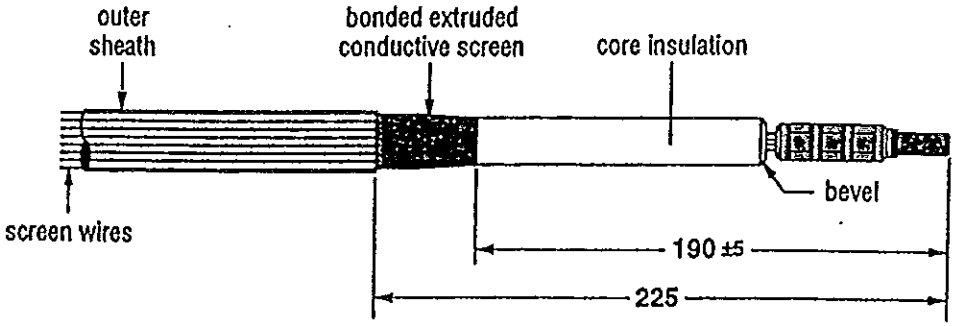
USING THE WHITE WIPER, THOROUGHLY CLEAN THE CORE INSULATION.
Always wipe towards the screen wires.

ВЯРНО С ОРИГИНАЛА

PROCEED ON PAGE 6 FOR THE INSTALLATION OF THE CONNECTOR

Part B Copper wire screened cable with bonded extruded conductive screen

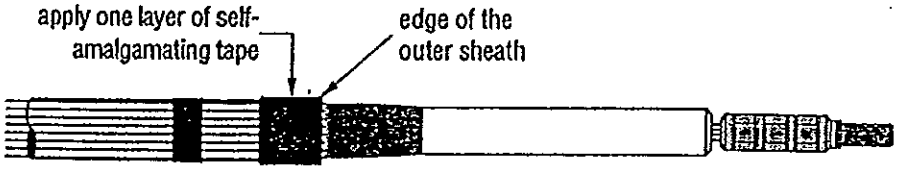
CABLE PREPARATION



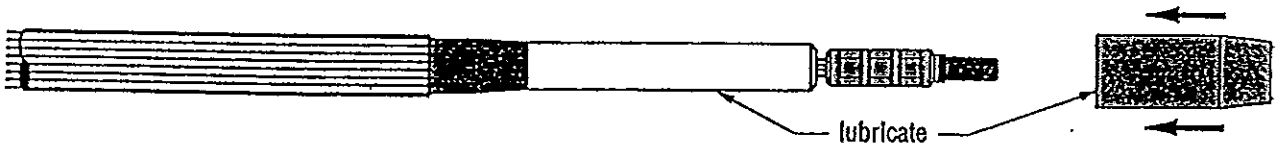
1. Remove the outer sheath to a point 225 mm from the end of the crimped contact.
2. Using a pencilling tool, remove the extruded conductive screen to a point 190 ±5 mm from the end of the crimp contact.
3. Slightly break the edge of the core insulation.

FOR OUTDOOR APPLICATIONS :

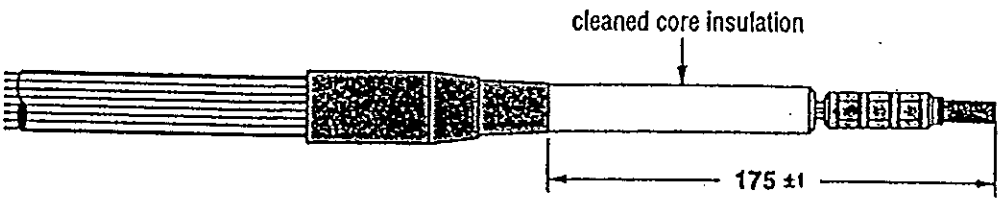
Apply one layer of self-amalgamating tape (type SA) on the outer sheath, flush with the end (25 mm minimum width
Bend back screen wires along the outer sheath.
Compress the screen wires into the self-amalgamating tape.



INSTALLATION OF THE 11TL ADAPTOR



1. Lubricate core insulation and inside of the adaptor*.

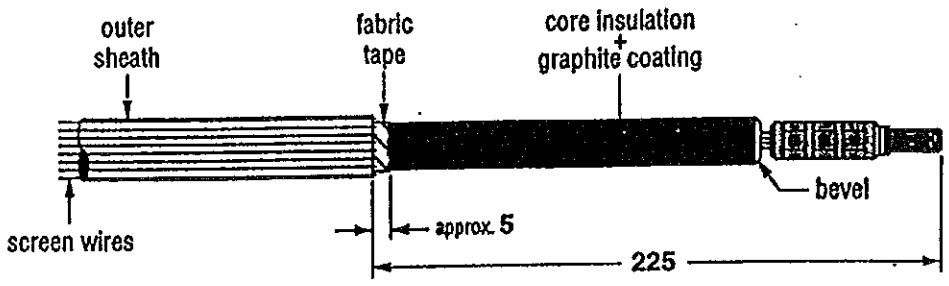


2. Slide the adaptor up to a point 175 ±1 mm from the end of the crimped contact.
USING THE WHITE WIPER, THOROUGHLY CLEAN THE CORE INSULATION.
Always wipe towards the screen wires.

ВЯРНО С ОРИГИНАЛА

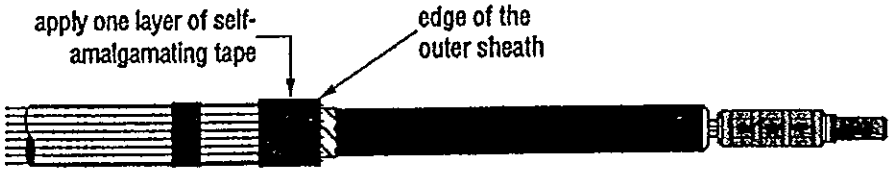
Part C — Copper wire screened cable with fabric tape screen

CABLE PREPARATION

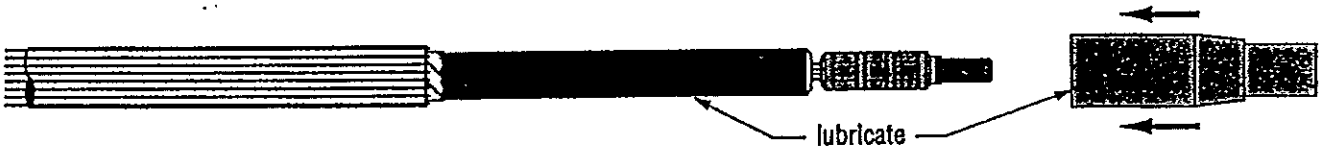


1. Remove the outer sheath to a point **225** mm from the end of the crimped contact.
2. Remove the fabric tape to a point approx. **5** mm from the outer sheath.
   DO NOT REMOVE THE GRAPHITE VARNISH AT THIS STAGE.
3. Slightly break the edge of the core insulation.

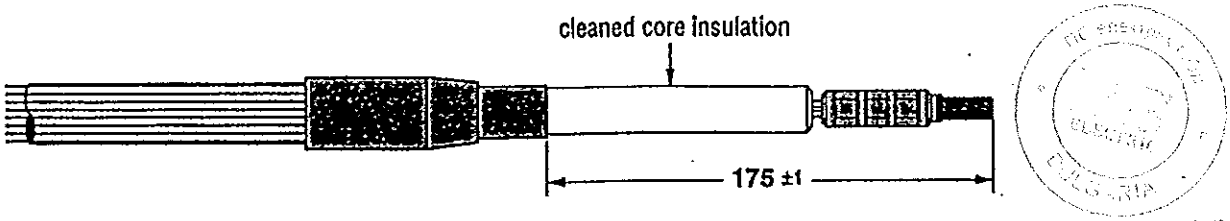
FOR OUTDOOR APPLICATIONS :
Apply one layer of self-amalgamating tape (type SA) on the outer sheath, flush with the end (25 mm minimum width).
Bend back screen wires along the outer sheath.
Compress the screen wires into the self-amalgamating tape.



INSTALLATION OF THE 11TL ADAPTOR



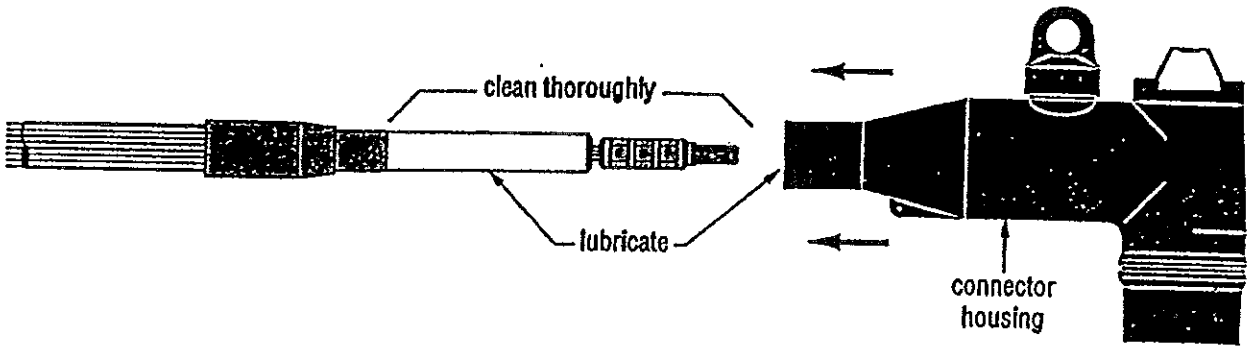
1. Lubricate core insulation and inside of the adaptor*.



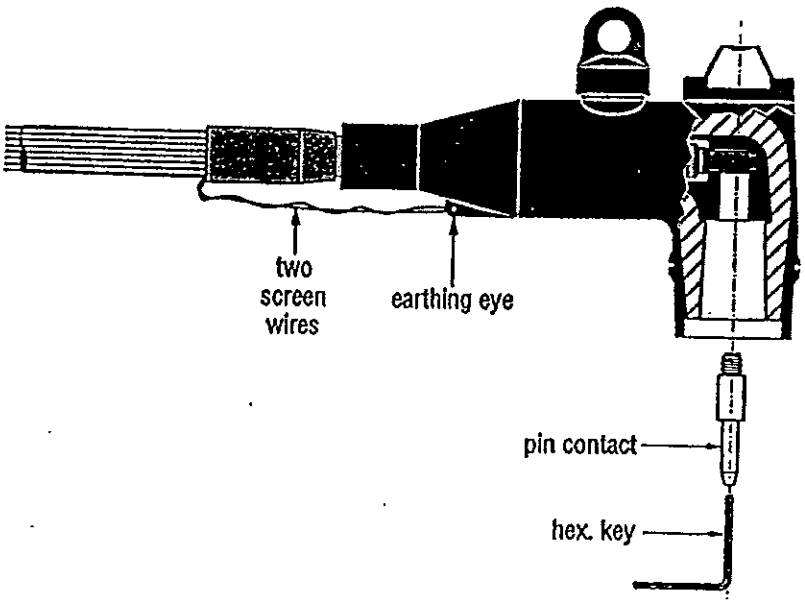
2. Slide the adaptor up to a point **175 ±1** mm from the end of the crimped contact.
   THOROUGHLY REMOVE THE GRAPHITE COATING USING AN APPROPRIATE SOLVENT
   Always wipe towards the screen wires.

ВЯРНО С ОРИГИНАЛА

CONNECTOR INSTALLATION AND CABLE SCREEN EARTHING

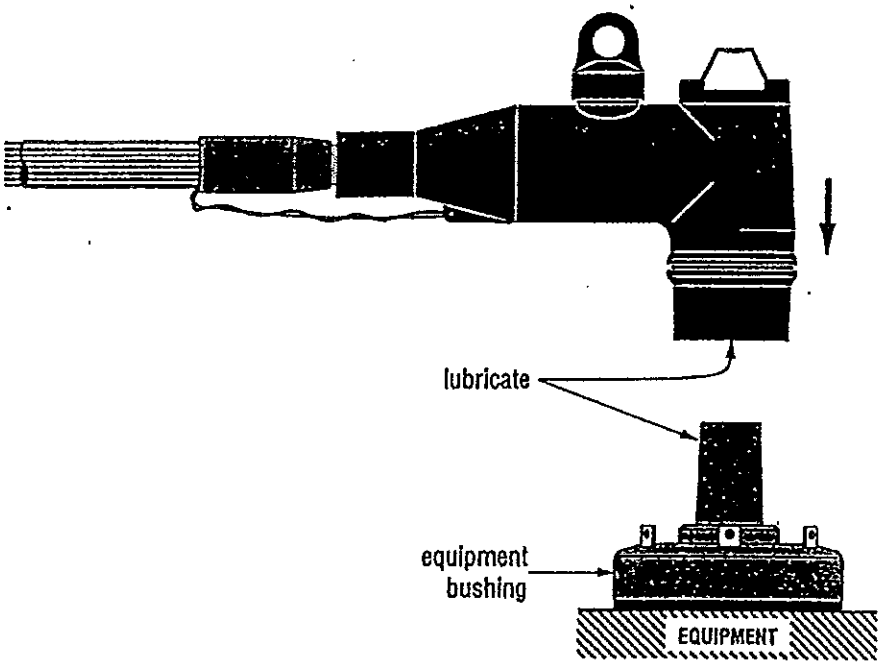


1. REMOVE ANY TRACES OF CONDUCTIVE RESIDUE FROM THE CORE INSULATION ABOVE THE ADAPTOR E
2. Lubricate the core insulation and inside surface of the elbow connector *.
3. Check if the angle of the elbow connector housing is correct relative to the palm of the crimp contact and gently sli the housing on the cable until it cannot advance any further.

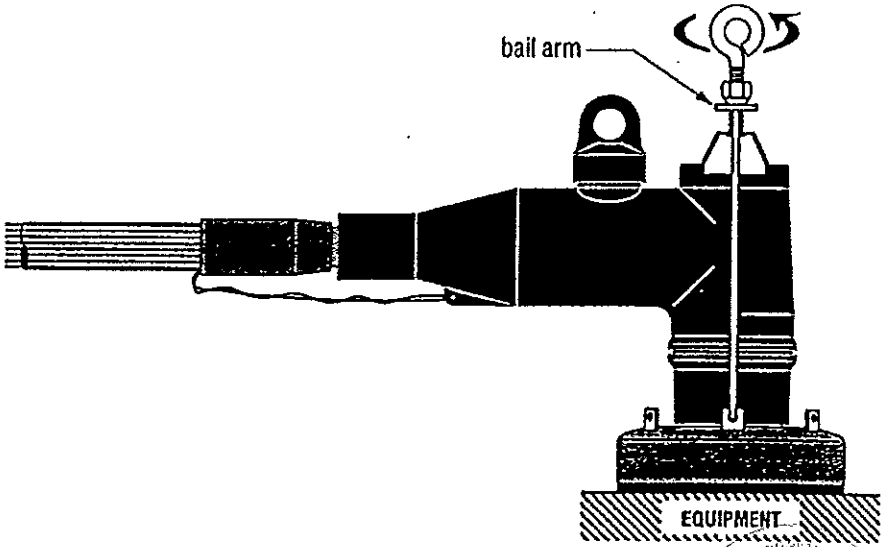


4. Insert the threaded end of the pin contact into the mating part by hand. Take care not to cross thread.
5. Tighten with hex. key until the key has taken a set.
6. Connect two copper screen wires to the earthing eye of the elbow connector.

CONNECTOR INSTALLATION ON BUSHING

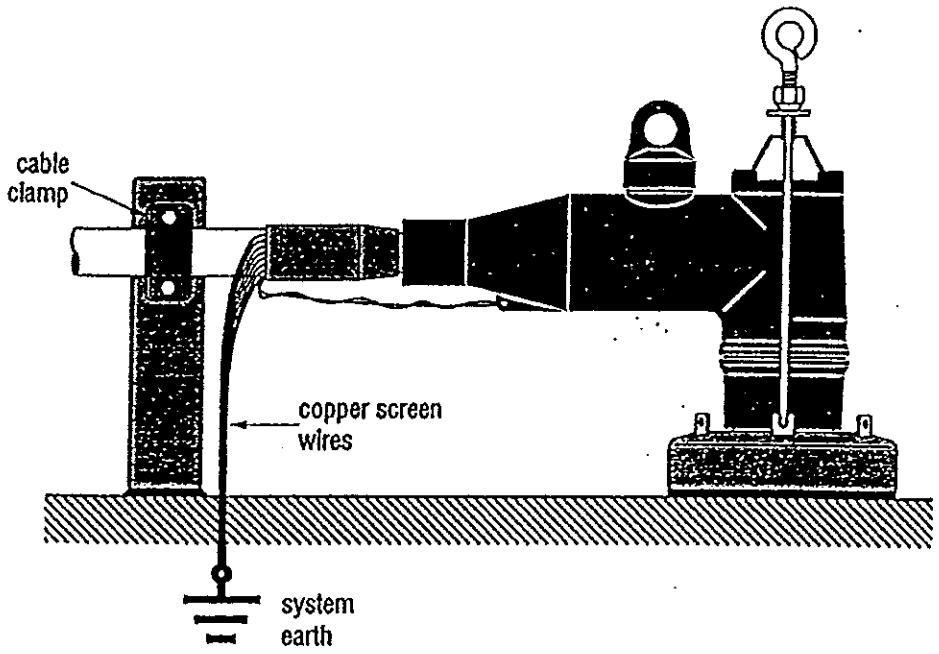


1. Clean and lubricate lightly both bushing interface and connector interface *.
2. Push the elbow connector on the bushing.



3. Insert bail arm into the bushing tabs.
4. Position bail arm and tighten eye bolt.
   DO NOT APPLY EXCESSIVE FORCE ON THE ELBOW CONNECTOR.
   Adjust the nut on the eye bolt until it allows the eye bolt to seat securely on the locator. The nut should act as a stop to prevent the eye bolt from applying excessive force on the elbow connector.
   Once the nut is in final position, it will not have to be readjusted when removing and replacing the elbow connector.

CABLE SCREEN EARTHING AND CABLE CLAMPING



1. Bend back the screen wires along the outer sheath to form a pig tail.
2. Connect the screen wires to system earth.

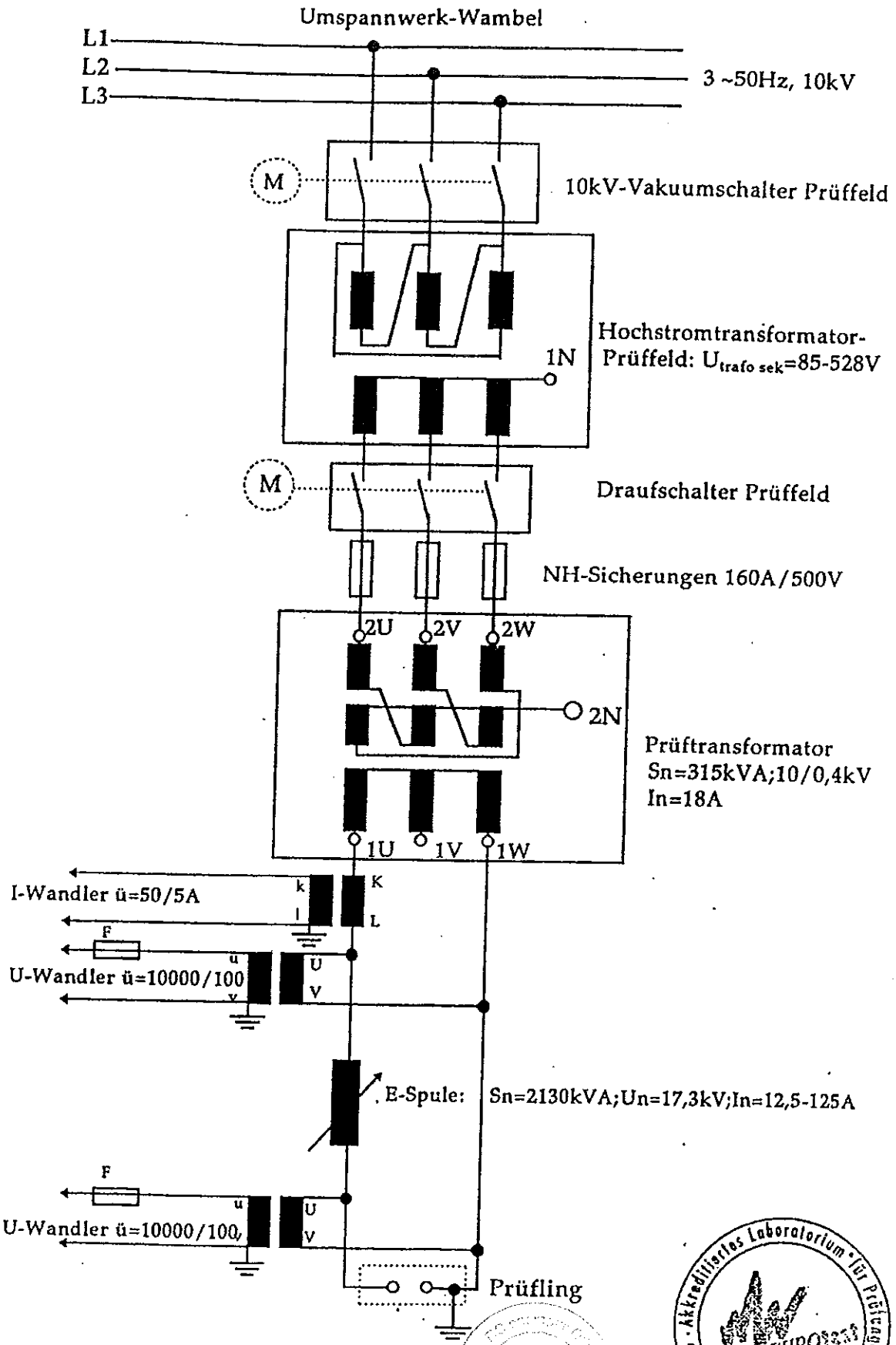
NOTE :

A connector/bushing mated combination should not be allowed to carry the full weight of the cab Therefore it is necessary to clamp the cable immediately beyond the cable screen adaptor.

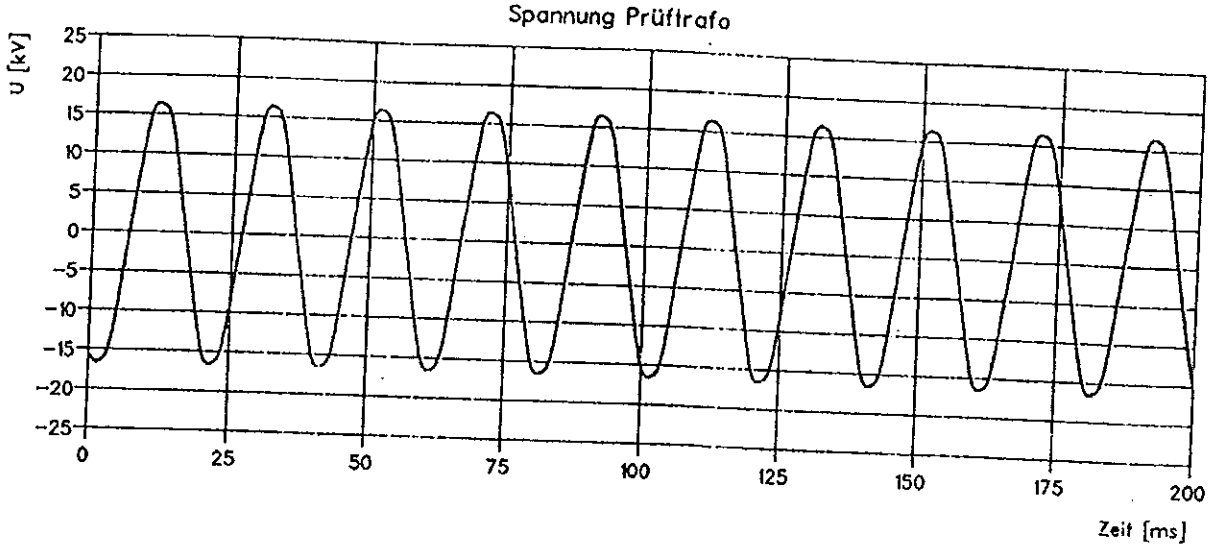
IMPORTANT NOTES :

- **Never disconnect the elbow connector from energised equipment nor energise a disconnected elbow without previously installing on its corresponding Stand-off plug (K)151SOP or Dead-end plug (K)150DP.**
- **Do not allow hydrocarbon oils or solvents to contaminate the E.P.D.M. rubber. In the event of contamination, wipe the surface clean with a dry cloth.**

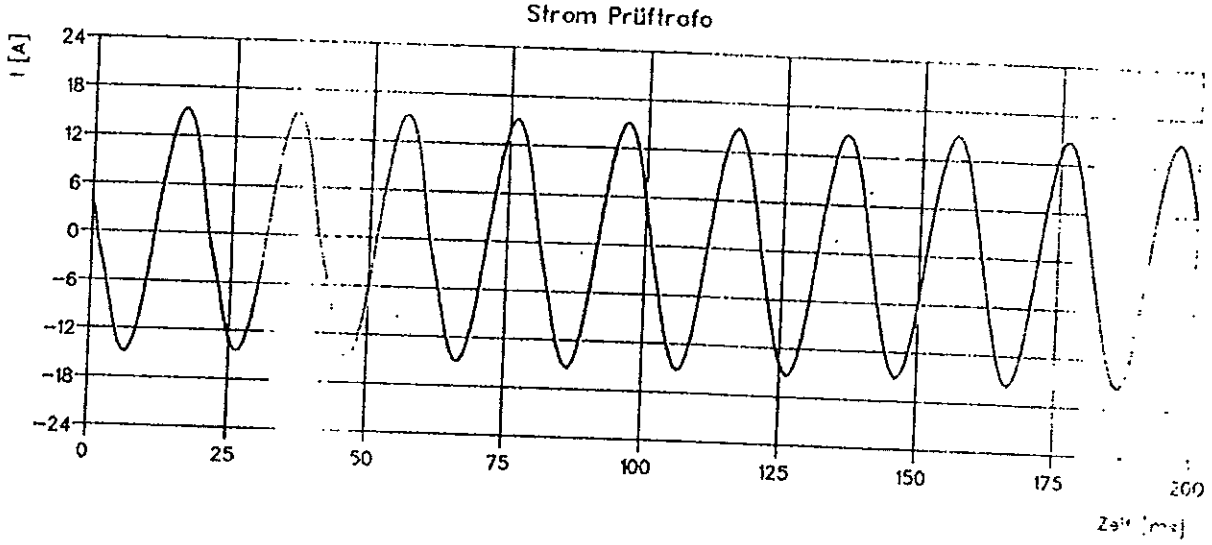
Übersichtsschaltbild der Prüfeinrichtung



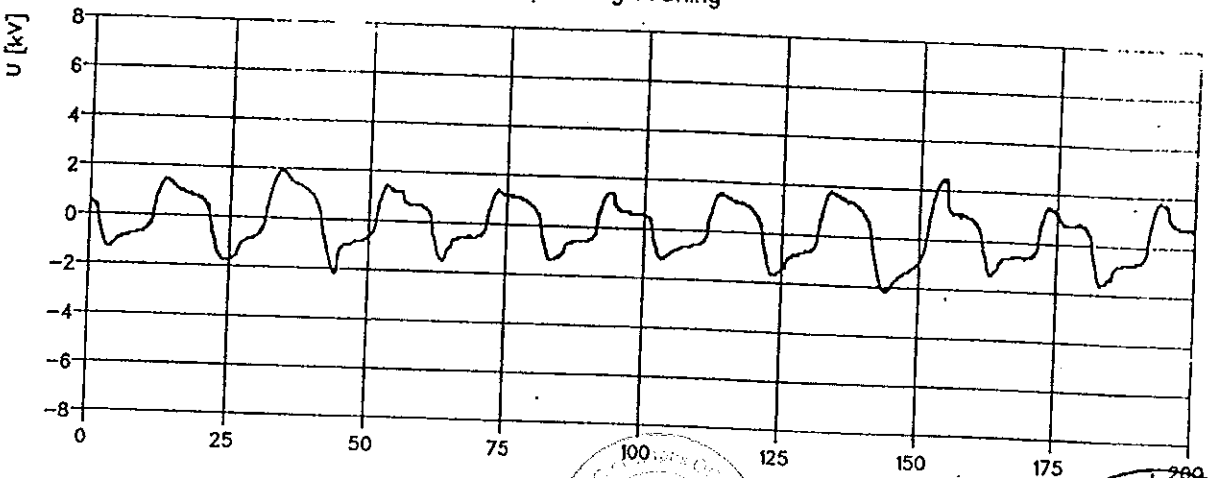
Spannung Prüftrafo



Strom Prüftrafo



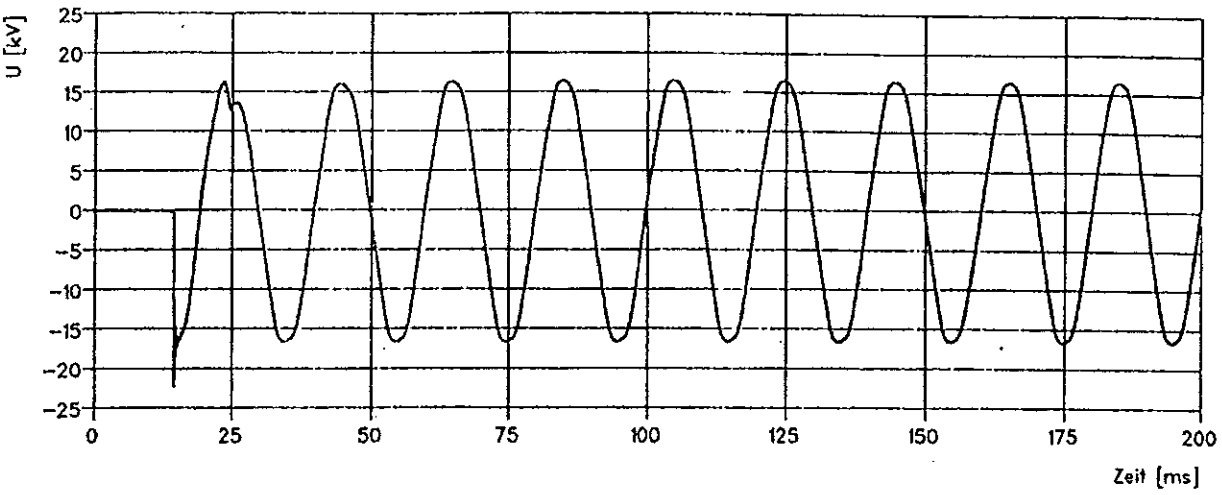
Spannung Prüfling



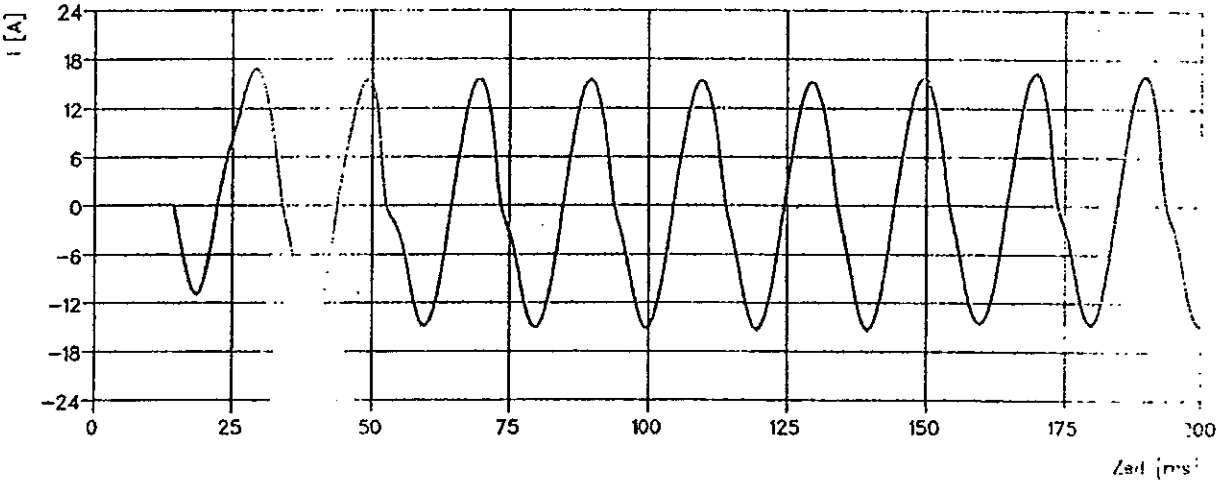
ВЯРНО С ОРИГИНАЛА

Akkreditiertes Laboratorium • BUROtest

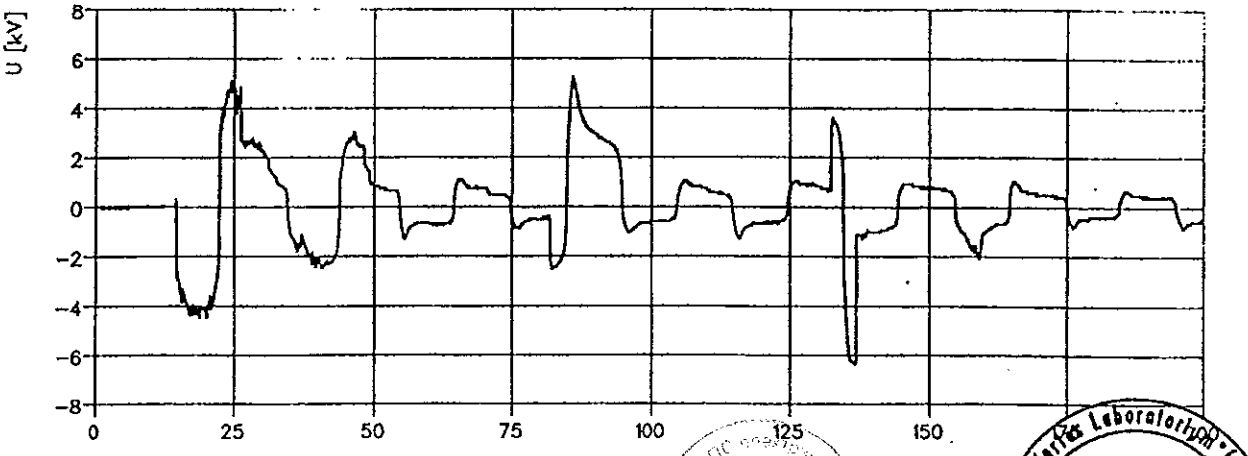
Spannung Prüftrafo



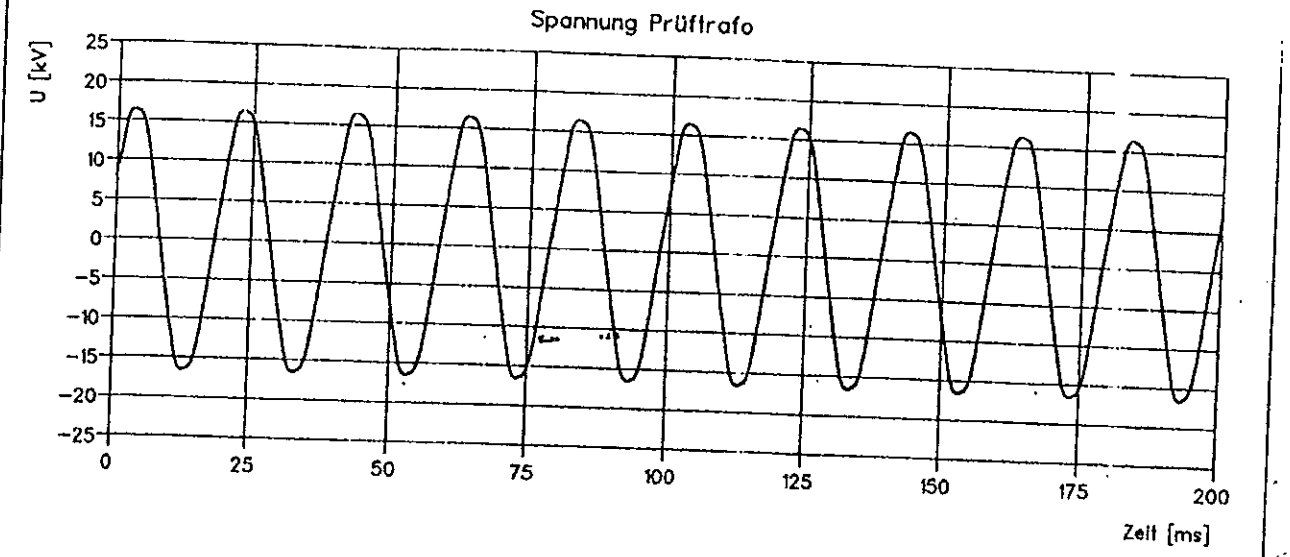
Strom Prüftrafo

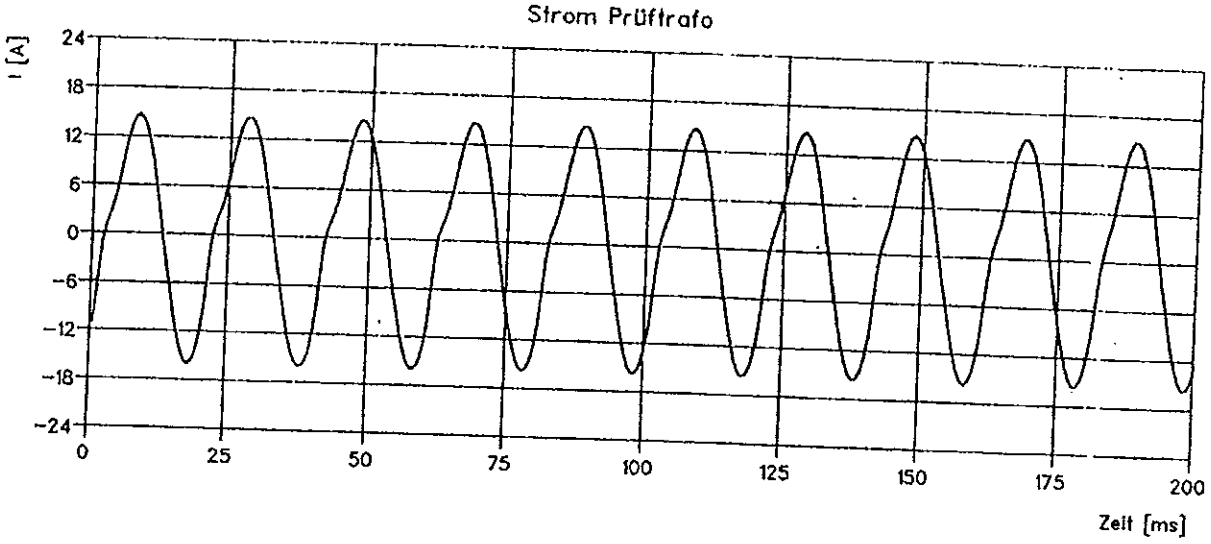


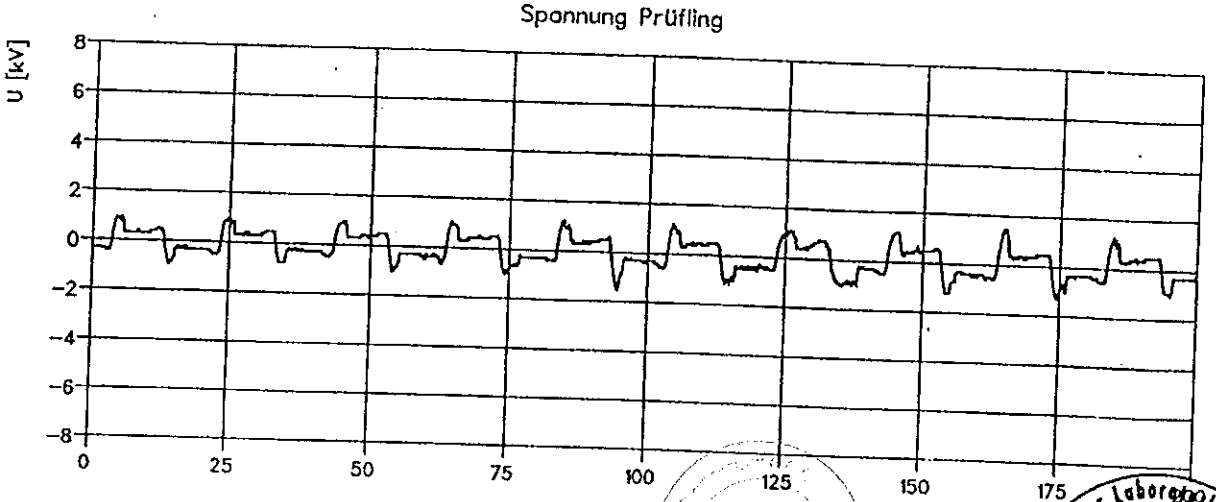
Spannung Prüfling



ВЯРНО С ОРИГИНАЛА







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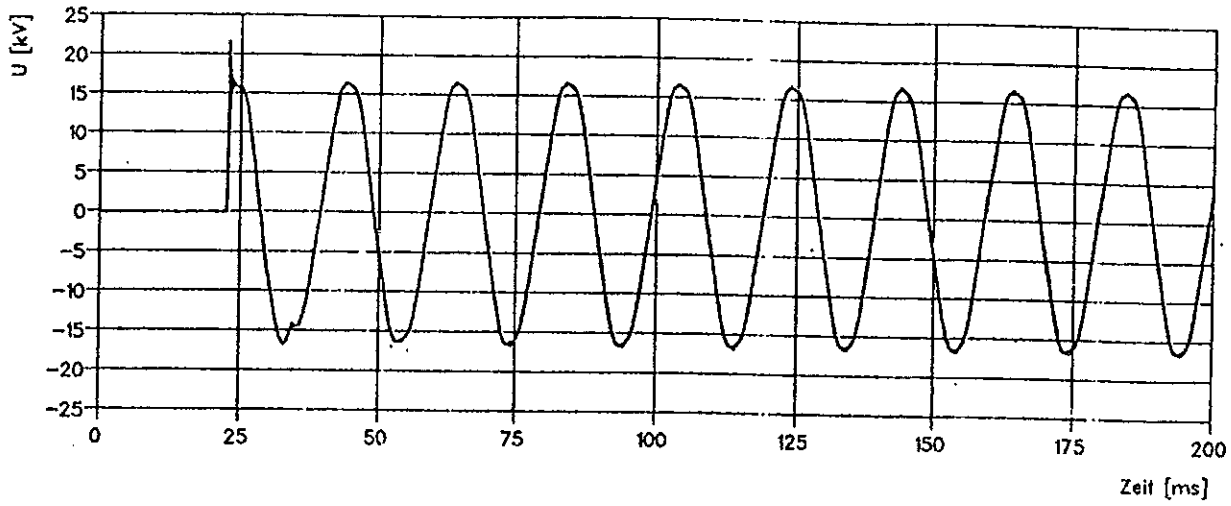

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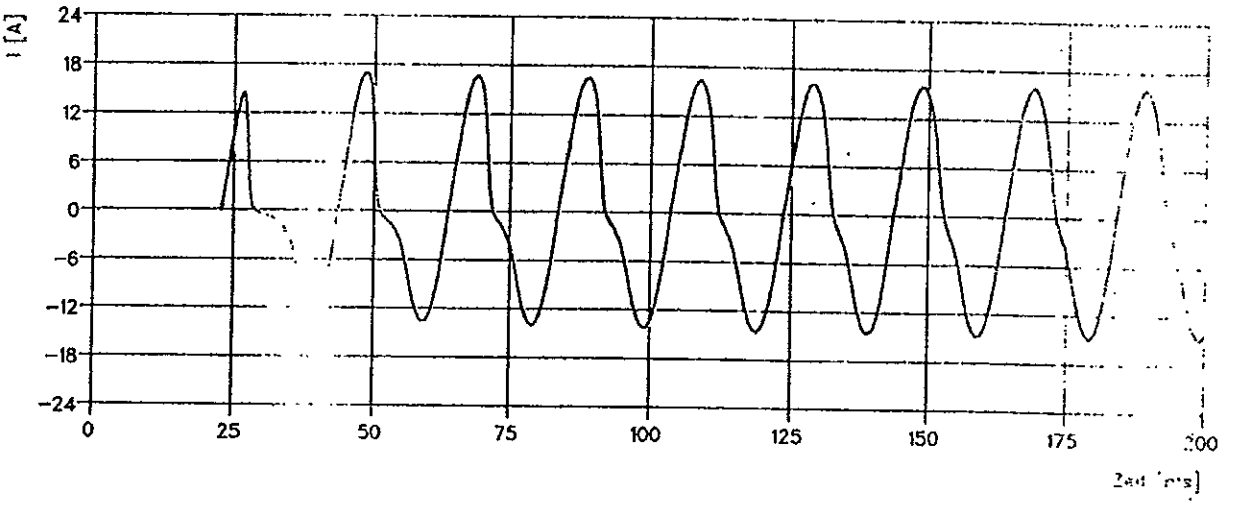

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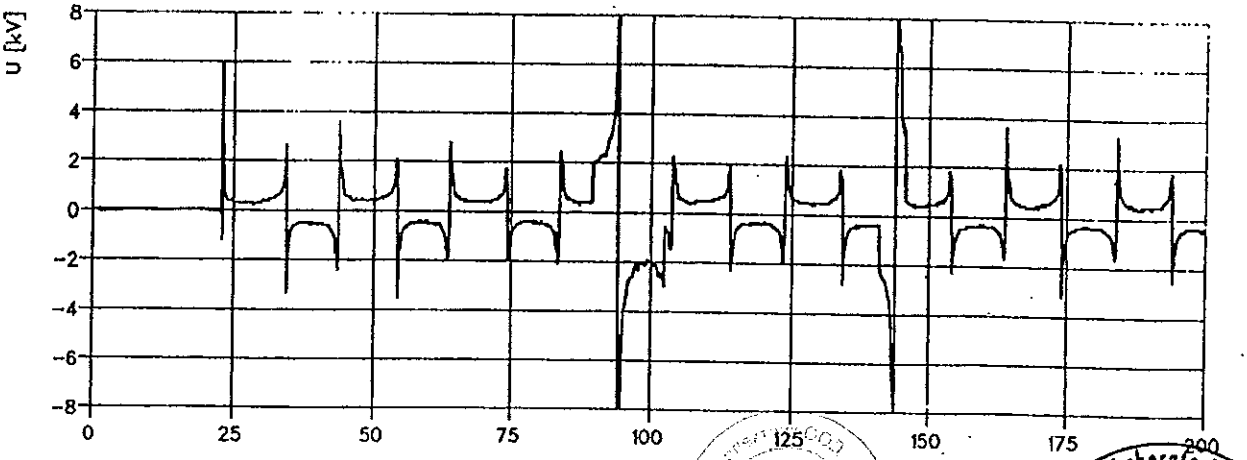

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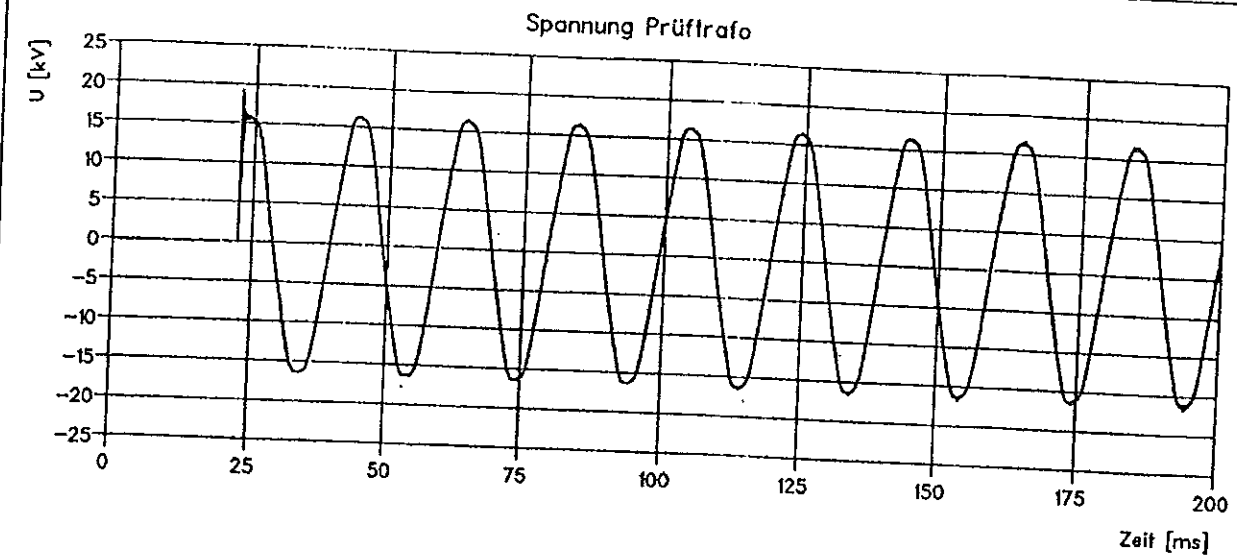

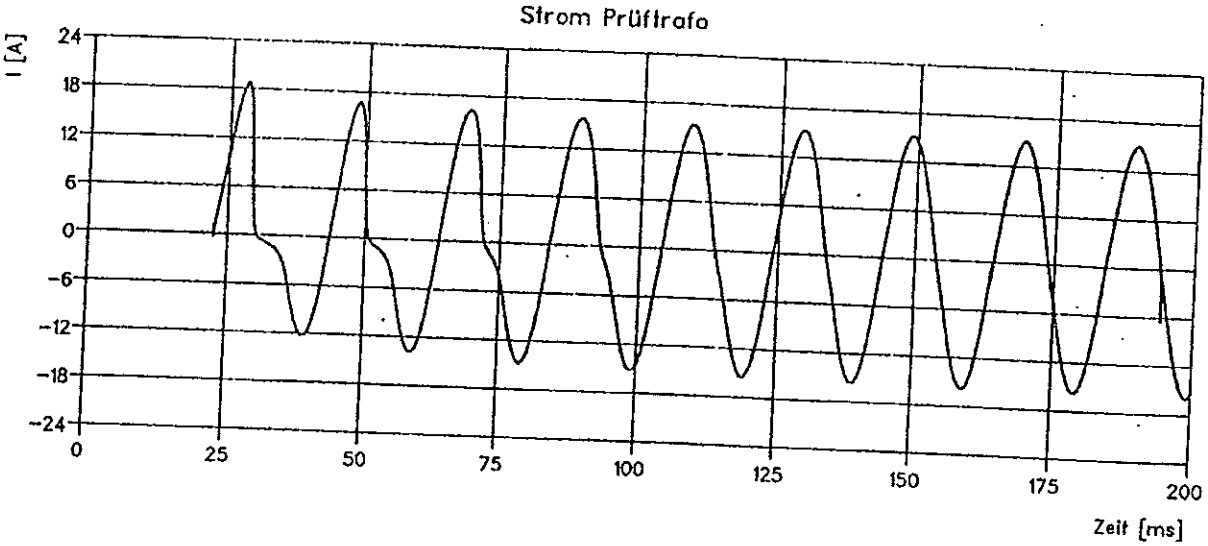

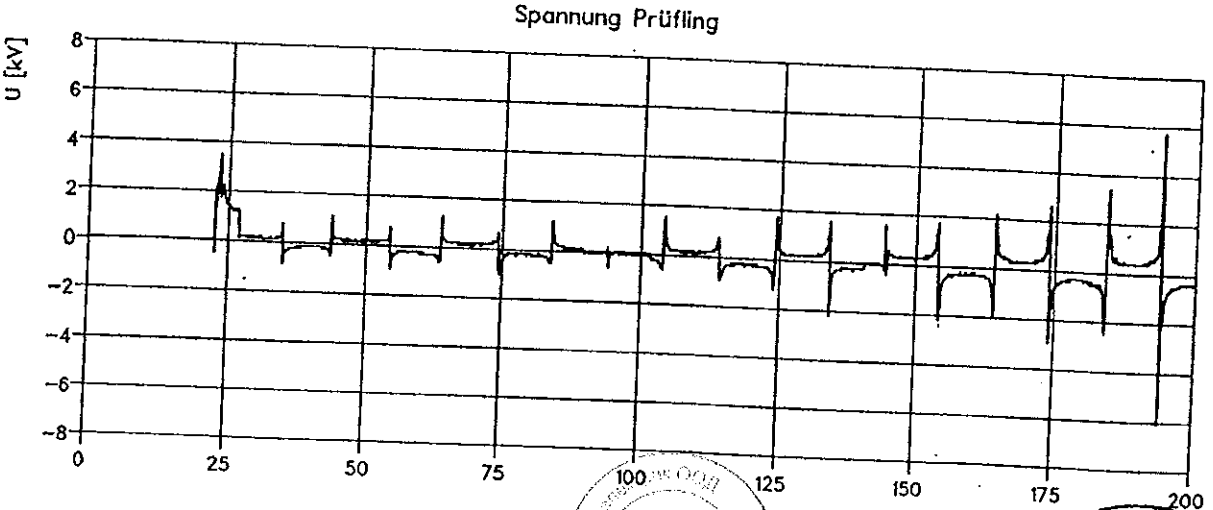

ВЯРНО С ОРИГИНАЛА

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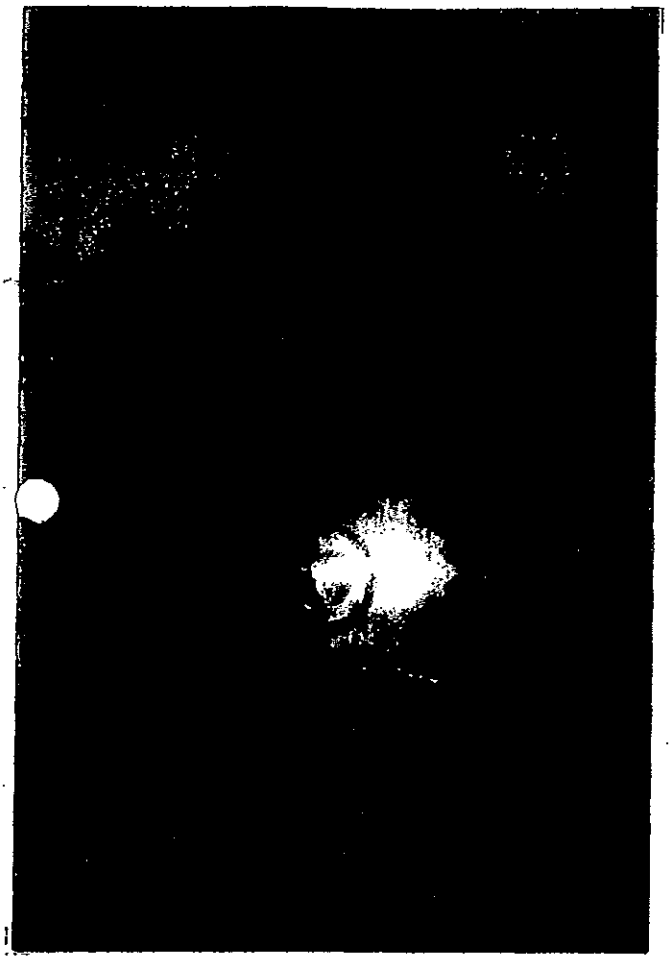


Bild 1: Lichtbogenausbildung beim ersten Prüfzyklus

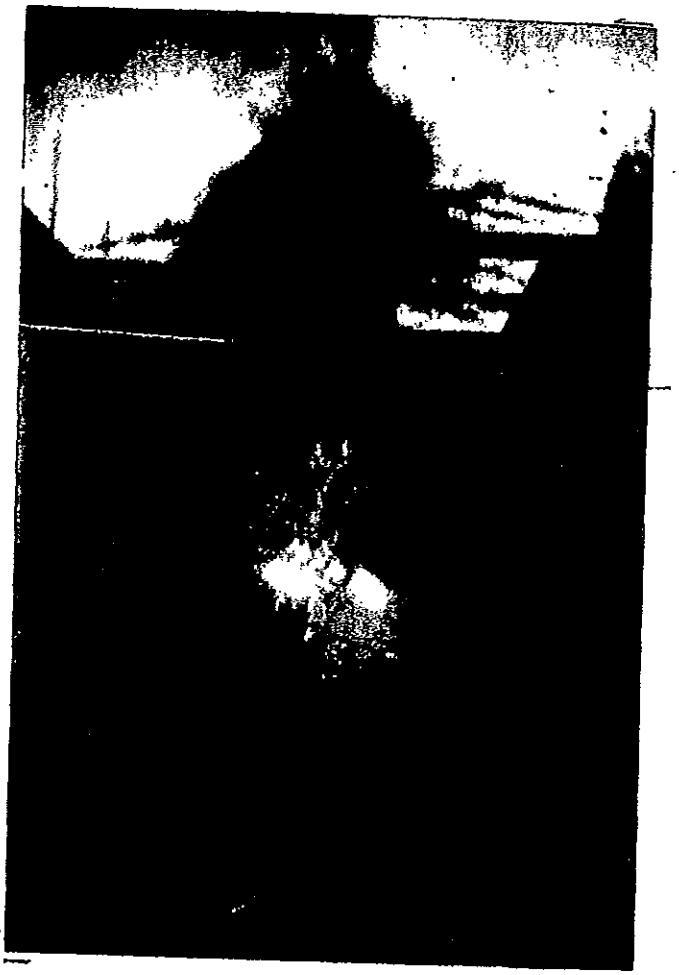
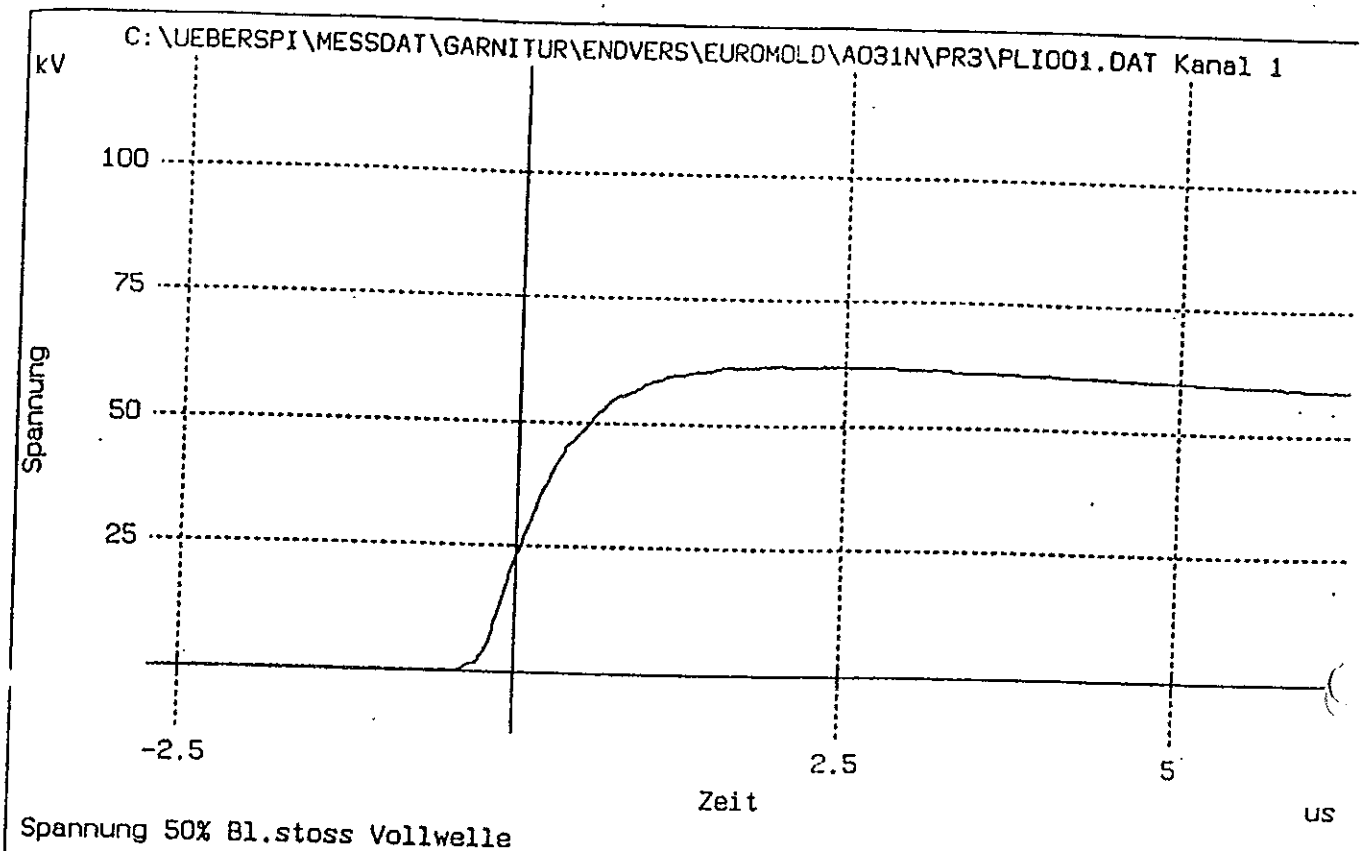


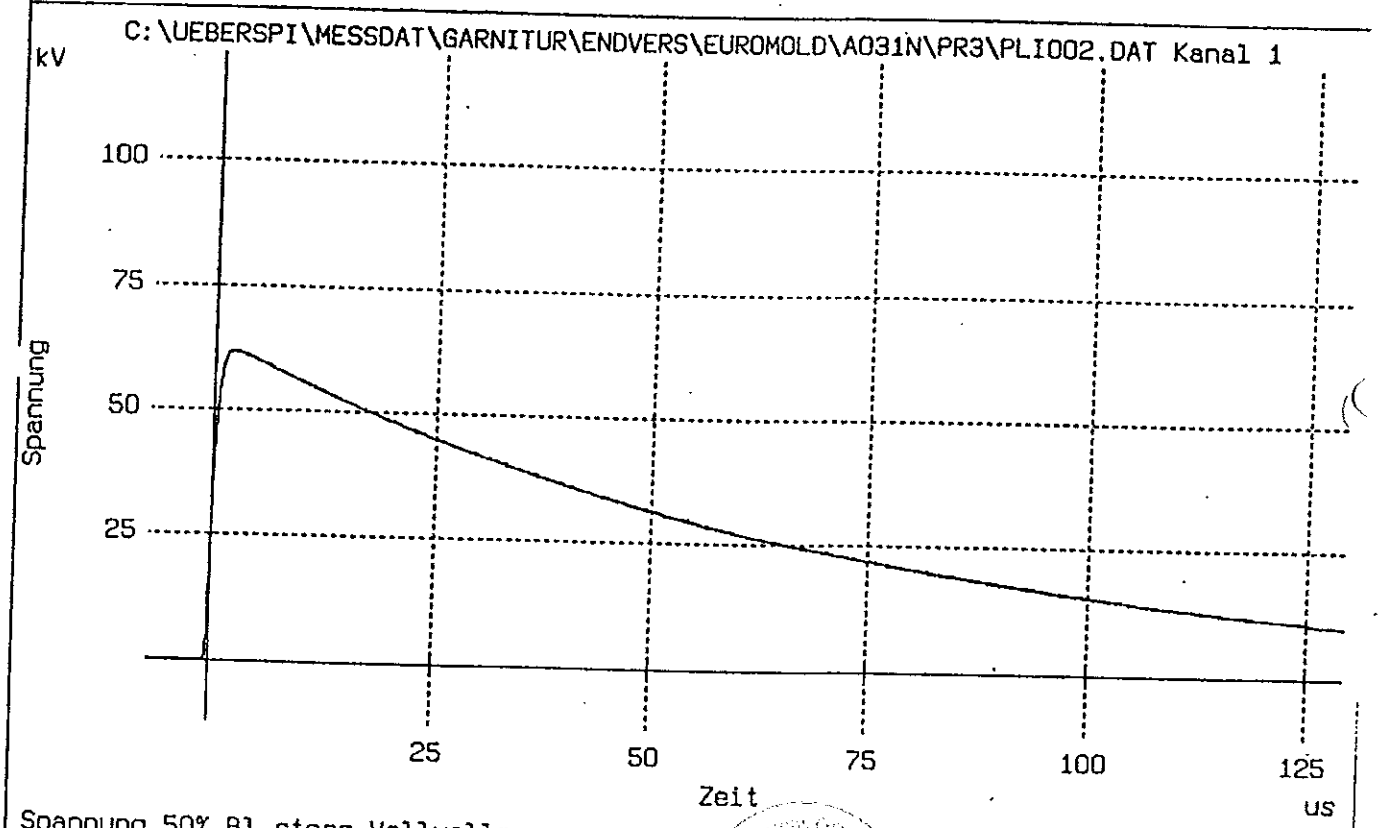
Bild 2: Brandentwicklung bei Versuchsende

ВЯРНО С ОРИГИНАЛА



Spannung 50% Bl.stoss Vollwelle

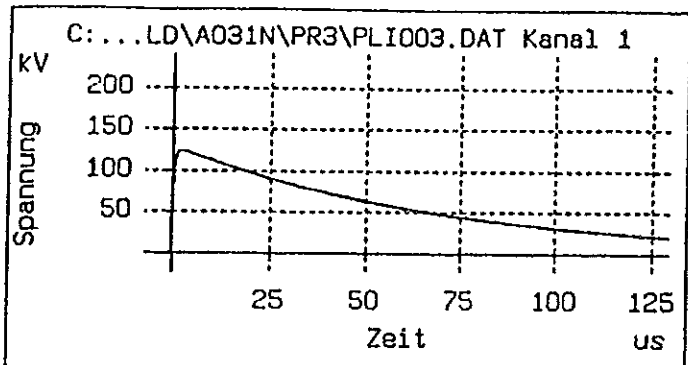
Max: 61.7kV T1: 1.471us T2: 0ms



Spannung 50% Bl.stoss Vollwelle

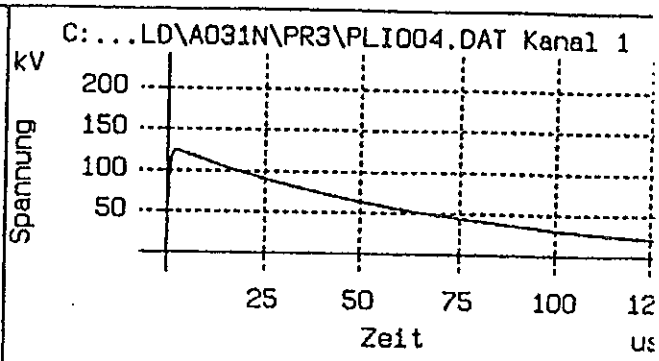
Max: 61.8kV T1: 1.471us T2: 51.2us

ВЯРНО С ОРИГИНАЛА



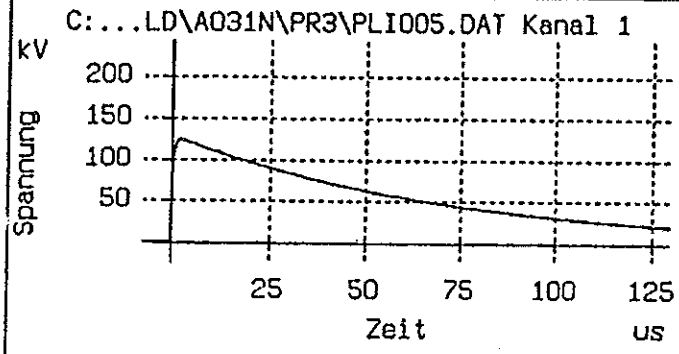
Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.48us T2: 51.3u



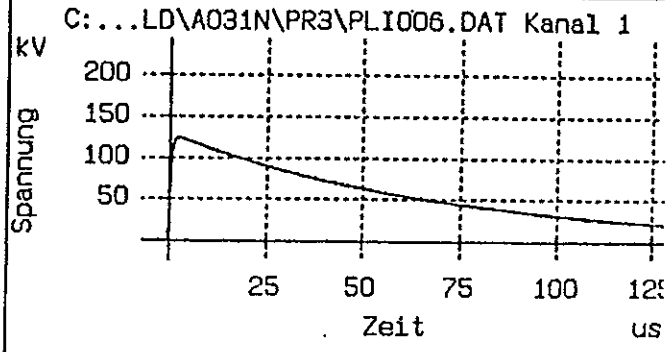
Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.472us T2: 51.2



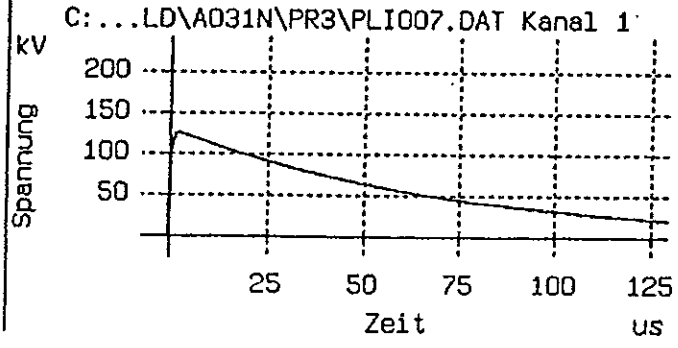
Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.495us T2: 51us



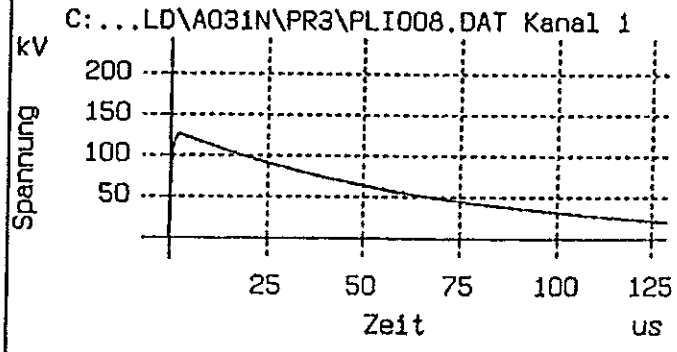
Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.494us T2: 51.1



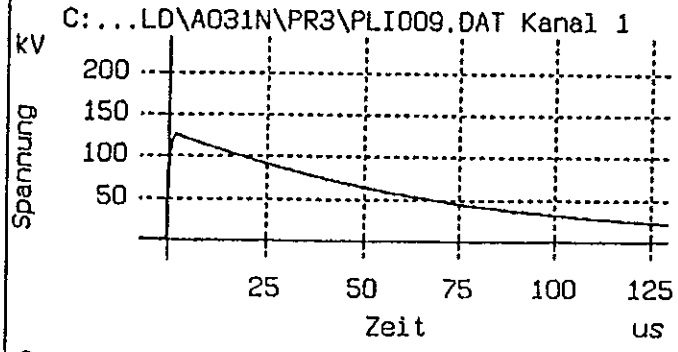
Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.491us T2: 51.1



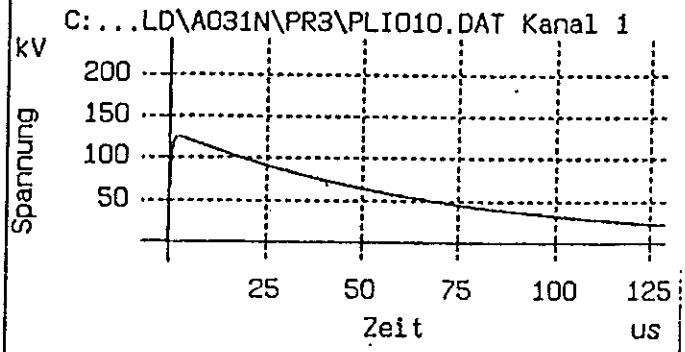
Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.517us T2: 51.1



Spannung 100% Bl.stoss Vollwelle

Max: 125.4kV T1: 1.508us T2: 51.1



Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.494us T2: 51.2

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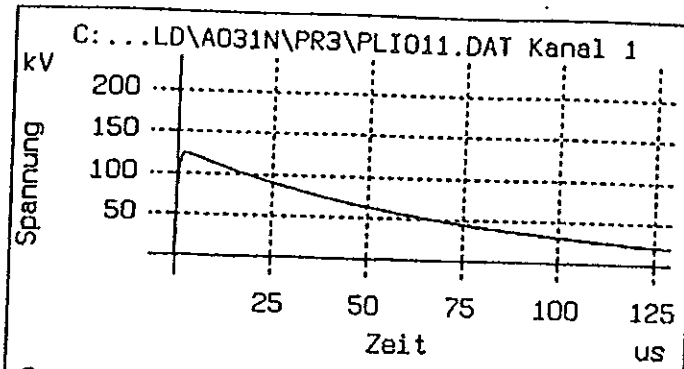
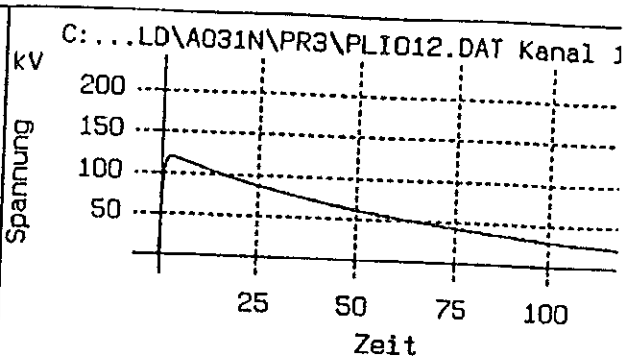


Spannung 100% Bl.stoss Vollwelle

Max: 124.9kV T1: 1.473us T2: 51.5



Spannung 100% Bl.stoss Vollwelle

Max: 120.5kV T1: 1.472us T2: 51us

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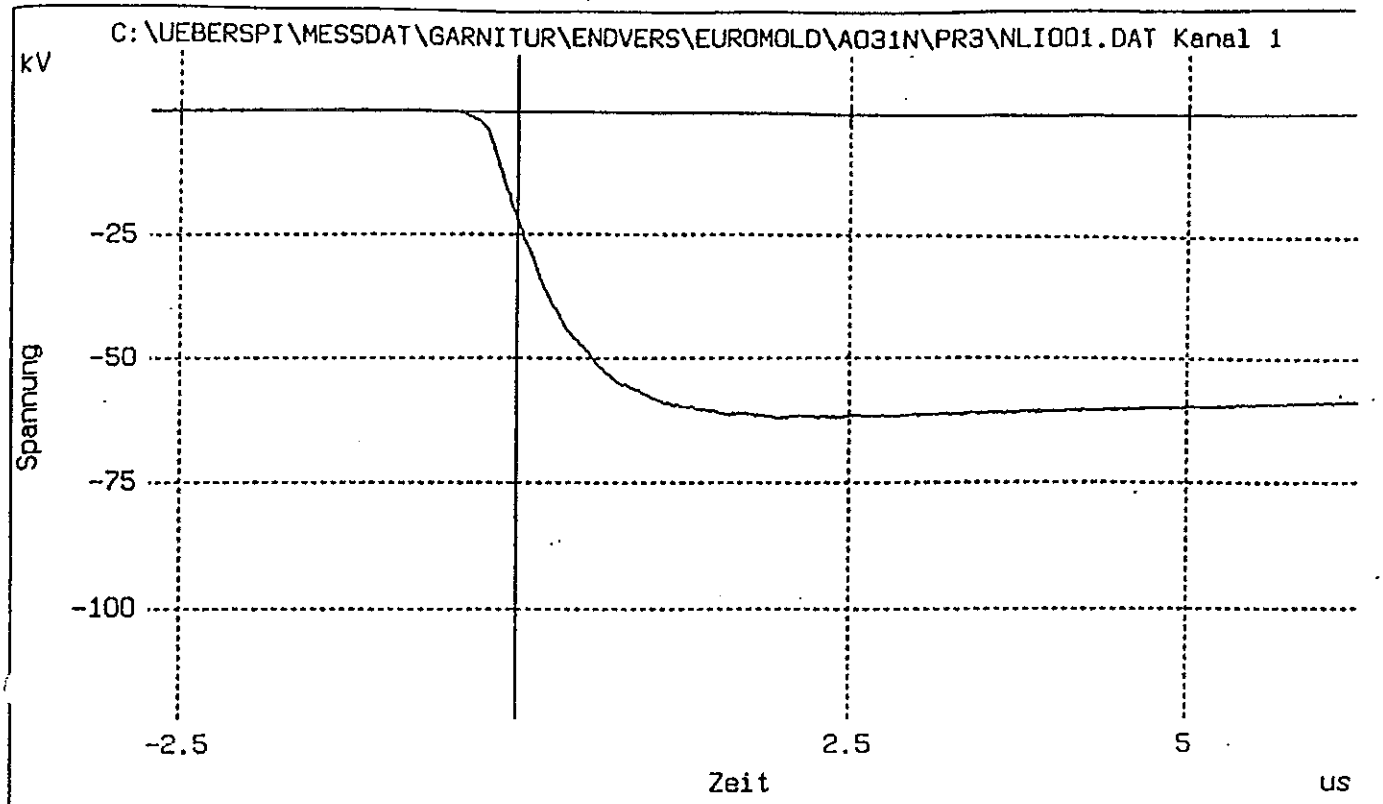
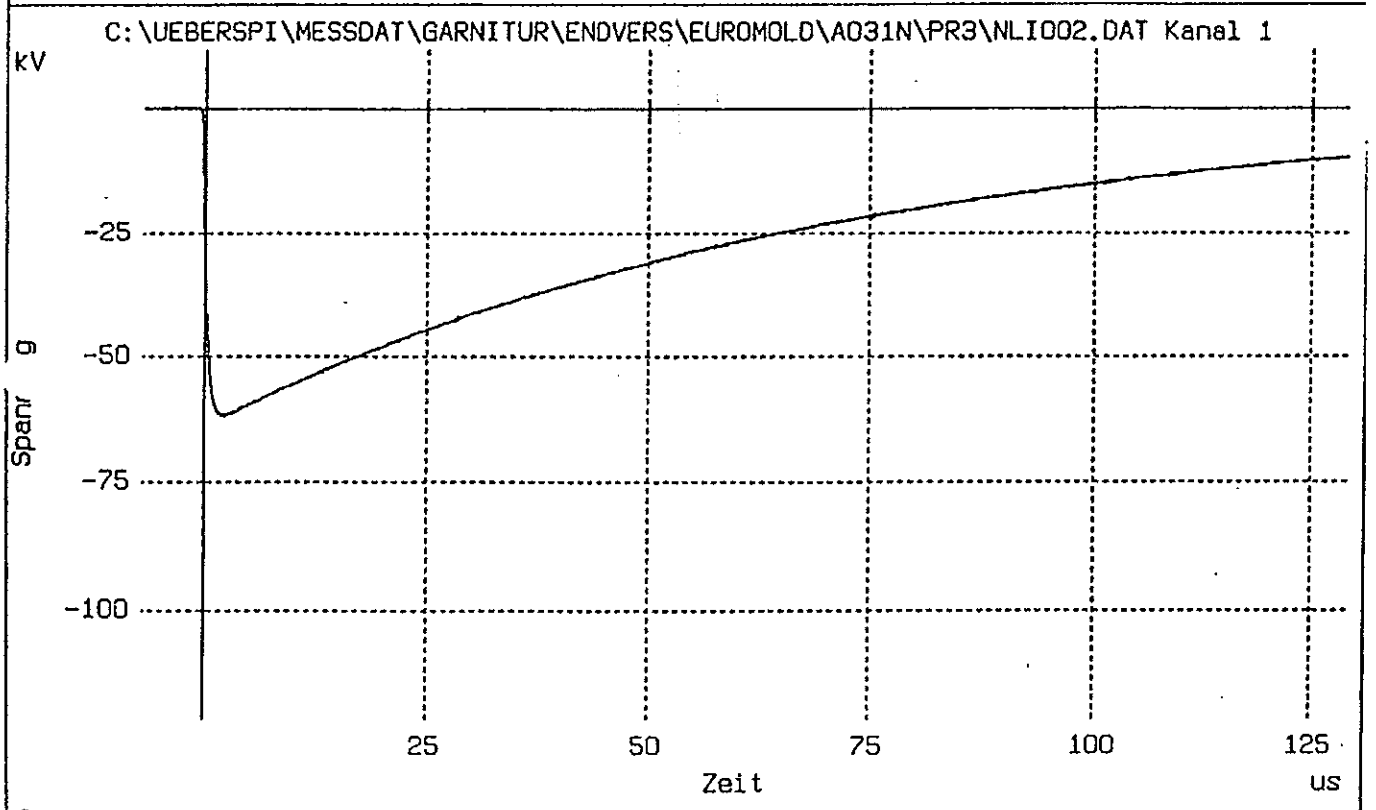
ВЯРНО С ОРИГИНАЛА



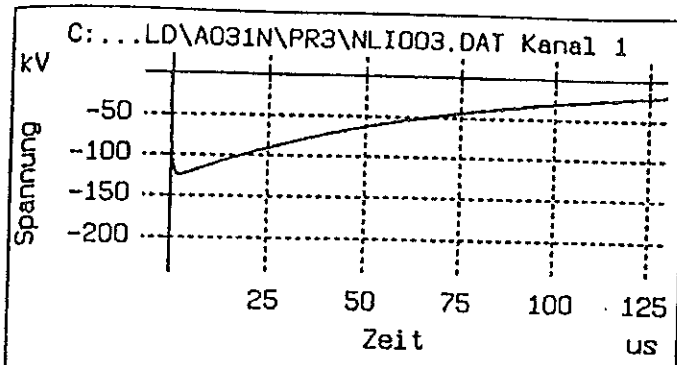
Spannung 50% Bl.stoss Vollwelle

Max: -62kV T1: 1.473us T2: 0ms

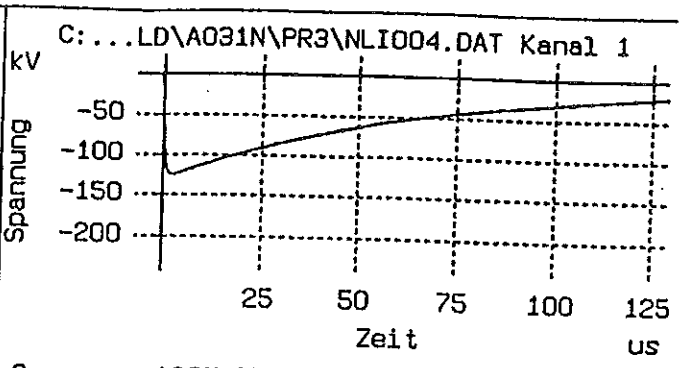


Spannung 50% Bl.stoss Vollwelle

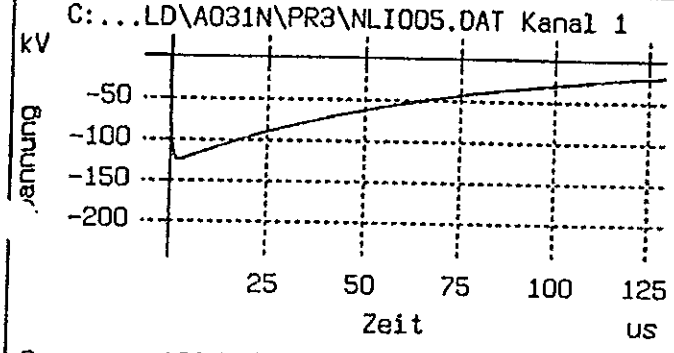
Max: -62kV T1: 1.49us T2: 50.7us



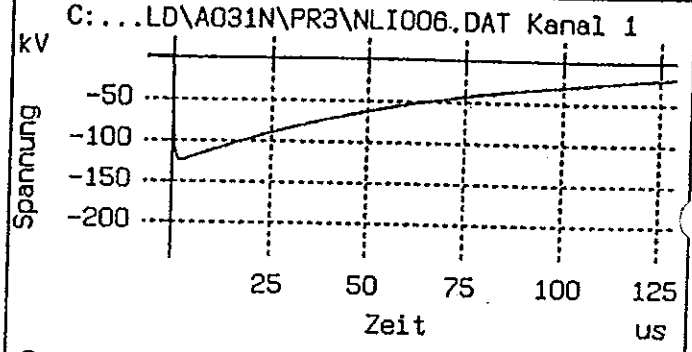
Spannung 100% Bl.stoss Vollwelle
Max: -125kV T1: 1.51us T2: 50.9us



Spannung 100% Bl.stoss Vollwelle
Max: -125kV T1: 1.527us T2: 50.8u



Spannung 100% Bl.stoss Vollwelle
Max: -124kV T1: 1.464us T2: 51.1u



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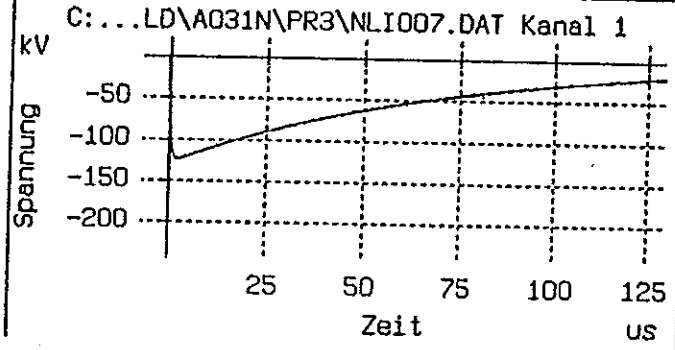
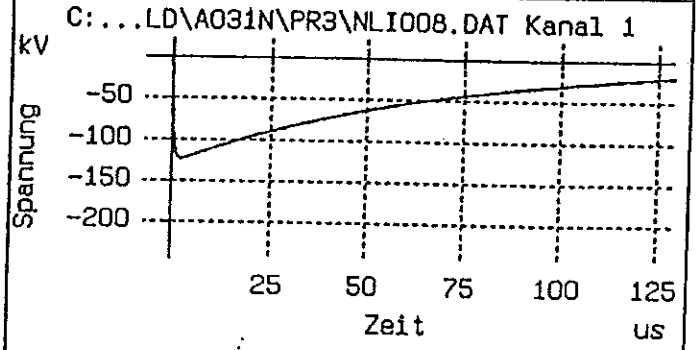
Max: -124kV T1: 1.486us T2: 51us



pannung 100% Bl.stoss Vollwelle
Max: -125kV T1: 1.489us T2: 51us



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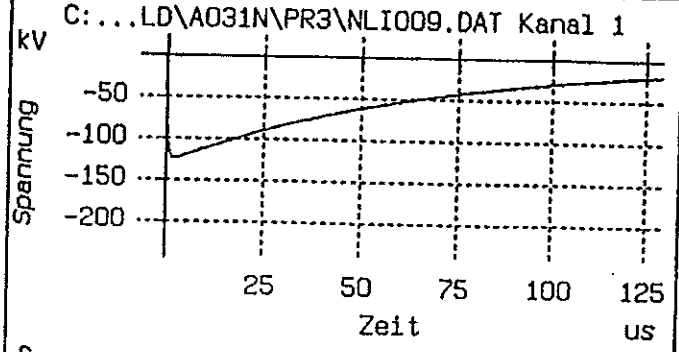
Max: -125kV T1: 1.459us T2: 51us



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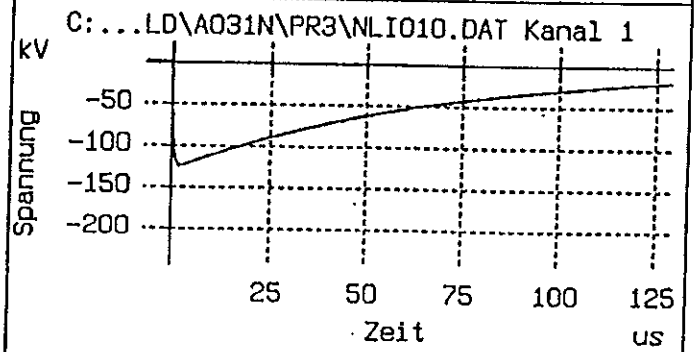

Spannung 100% Bl.stoss Vollwelle
Max: -125kV T1: 1.472us T2: 51

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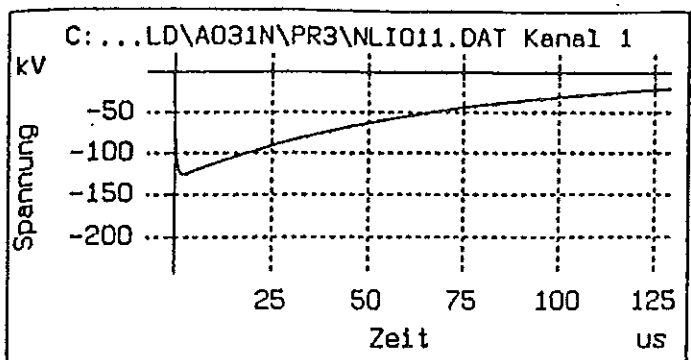
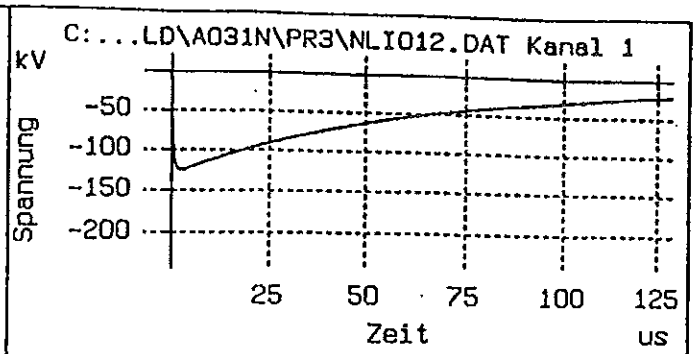


Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.466us T2: 51us



Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.495us T2: 51us

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ВЯРНО С ОРИГИНАЛА

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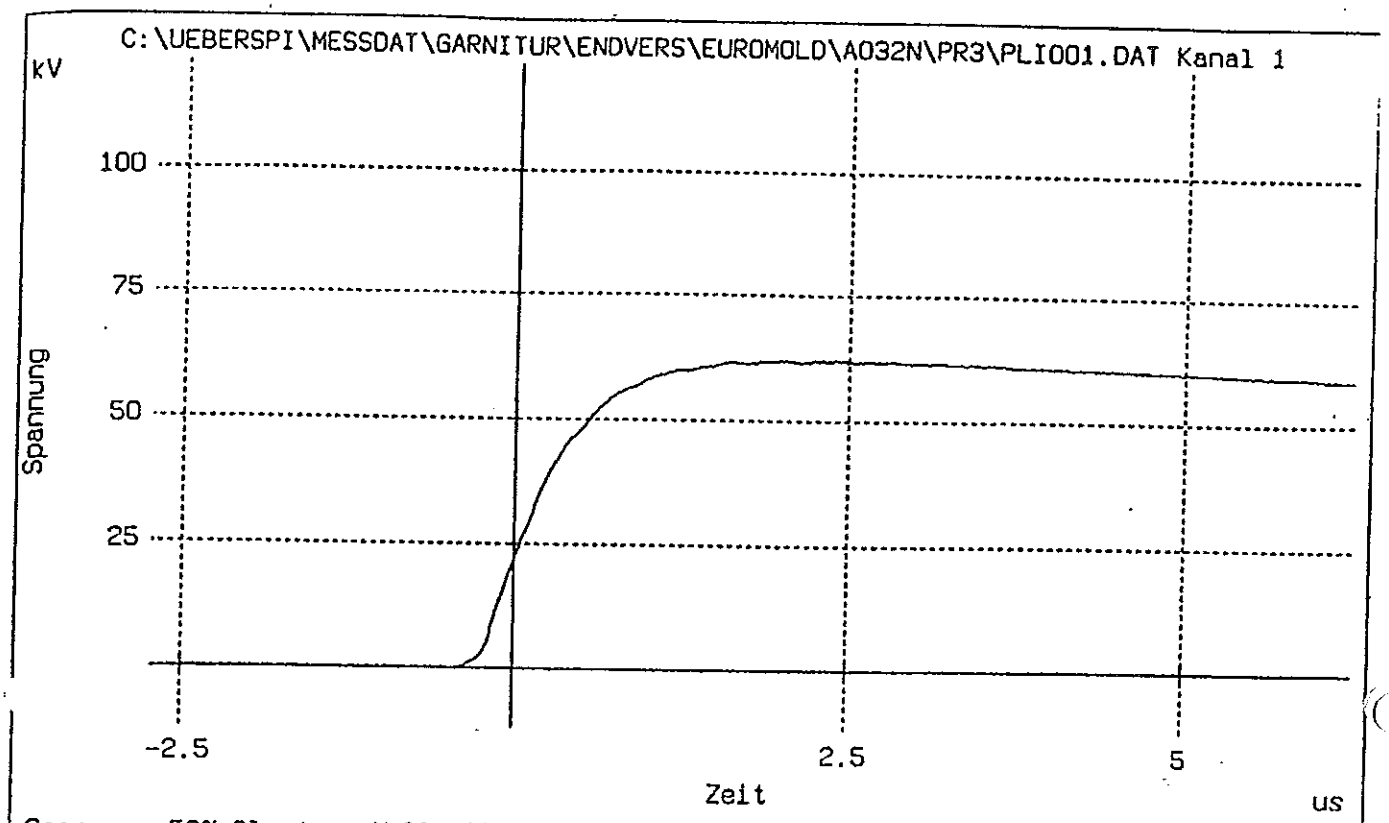
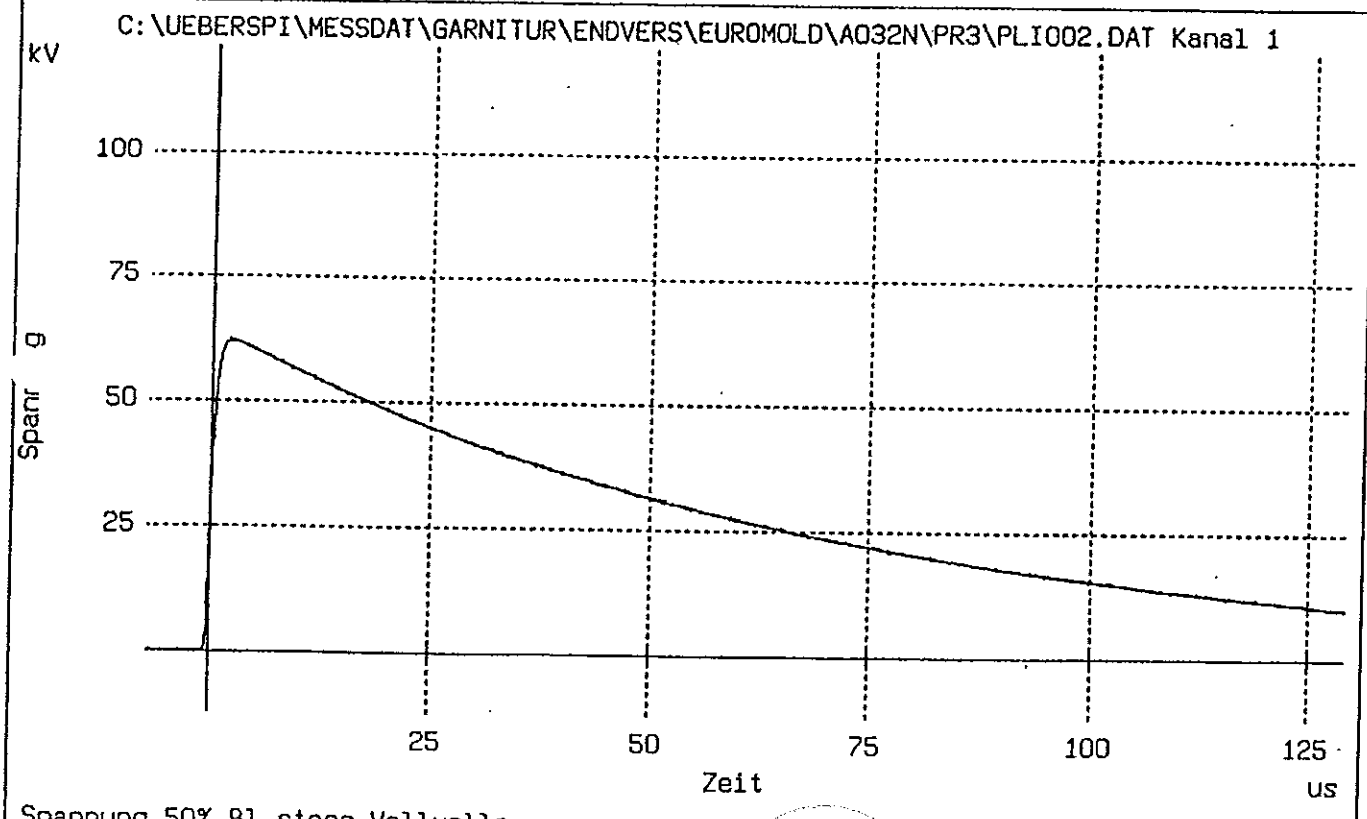
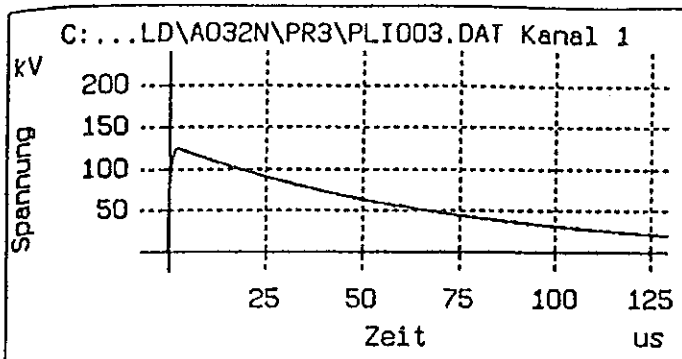


Spannung 50% Bl.stoss Vollwelle
Max: 62.1kV T1: 1.453us T2: 0ms



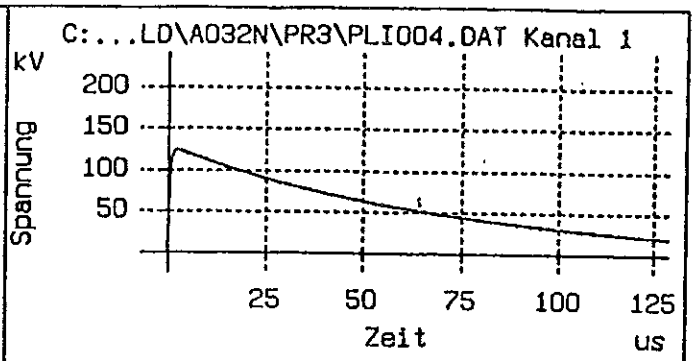
Spannung 50% Bl.stoss Vollwelle
Max: 62.2kV T1: 1.476us T2: 51.3us

ВЯРНО С ОРИГИНАЛА



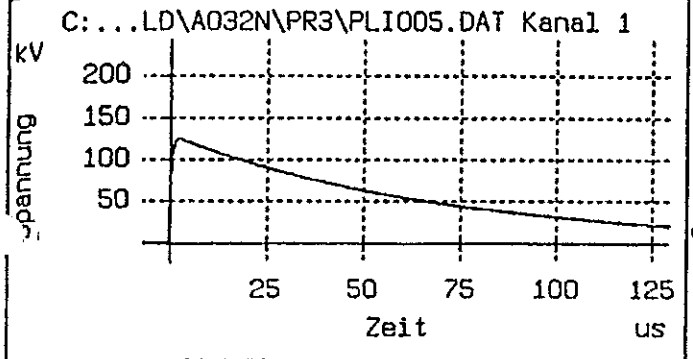
Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.479us T2: 51.2



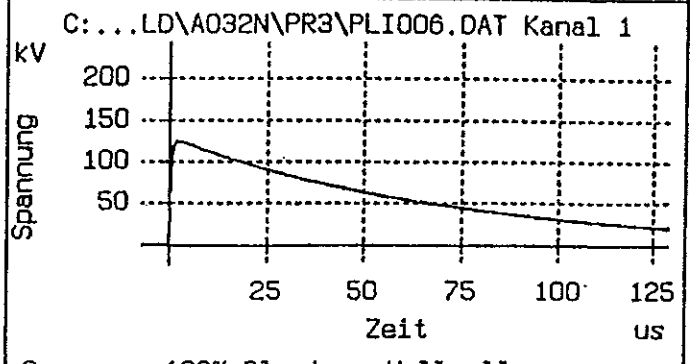
Spannung 100% Bl.stoss Vollwelle

Max: 124.9kV T1: 1.487us T2: 51.4



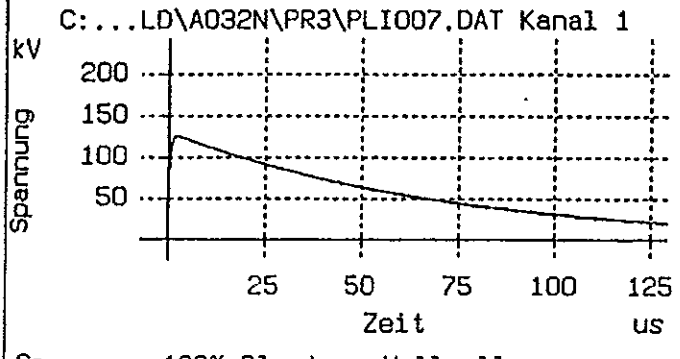
Spannung 100% Bl.stoss Vollwelle

Max: 124.9kV T1: 1.469us T2: 51.4



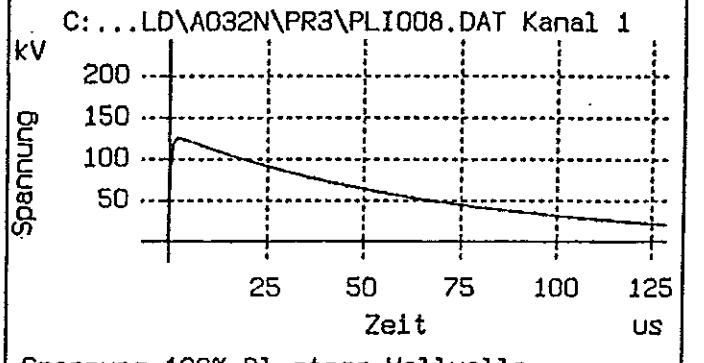
Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.452us T2: 51.3



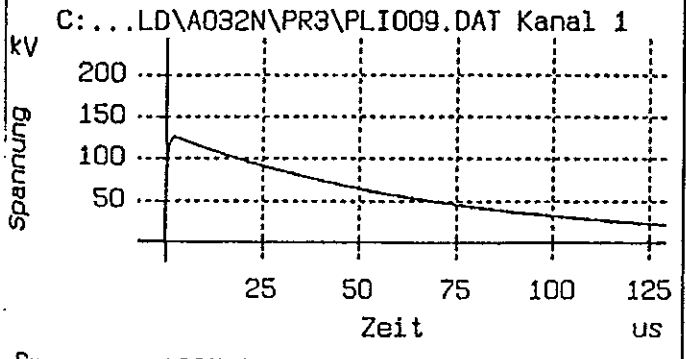
Sp nung 100% Bl.stoss Vollwelle

ax: 125.4kV T1: 1.489us T2: 51.2



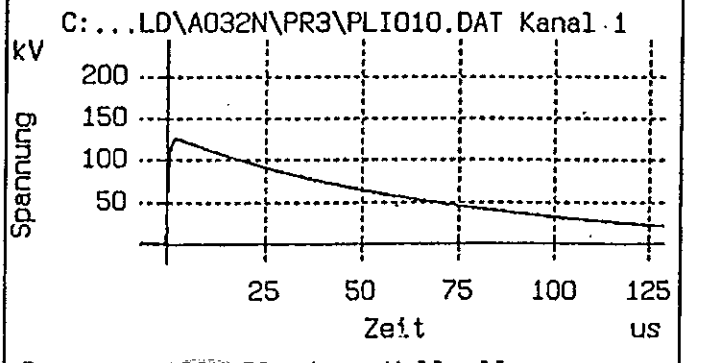
Spannung 100% Bl.stoss Vollwelle

Max: 125.4kV T1: 1.489us T2: 51.1



Spannung 100% Bl.stoss Vollwelle

Max: 125.4kV T1: 1.481us T2: 51.2



Spannung 100% Bl.stoss Vollwelle

Max: 125.4kV T1: 1.497us T2:

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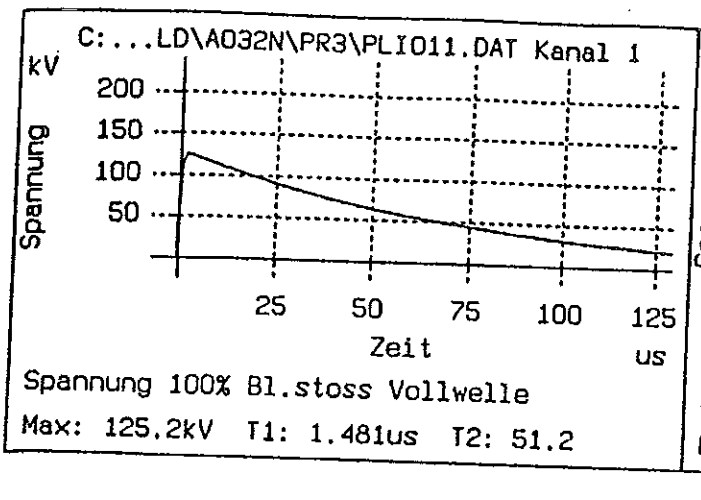

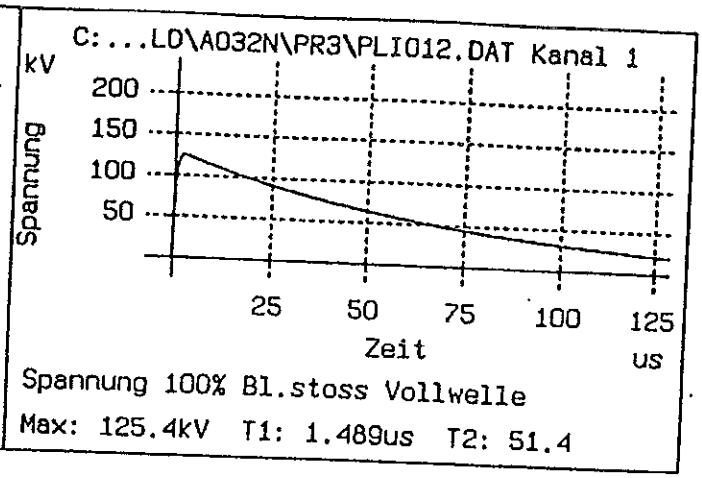

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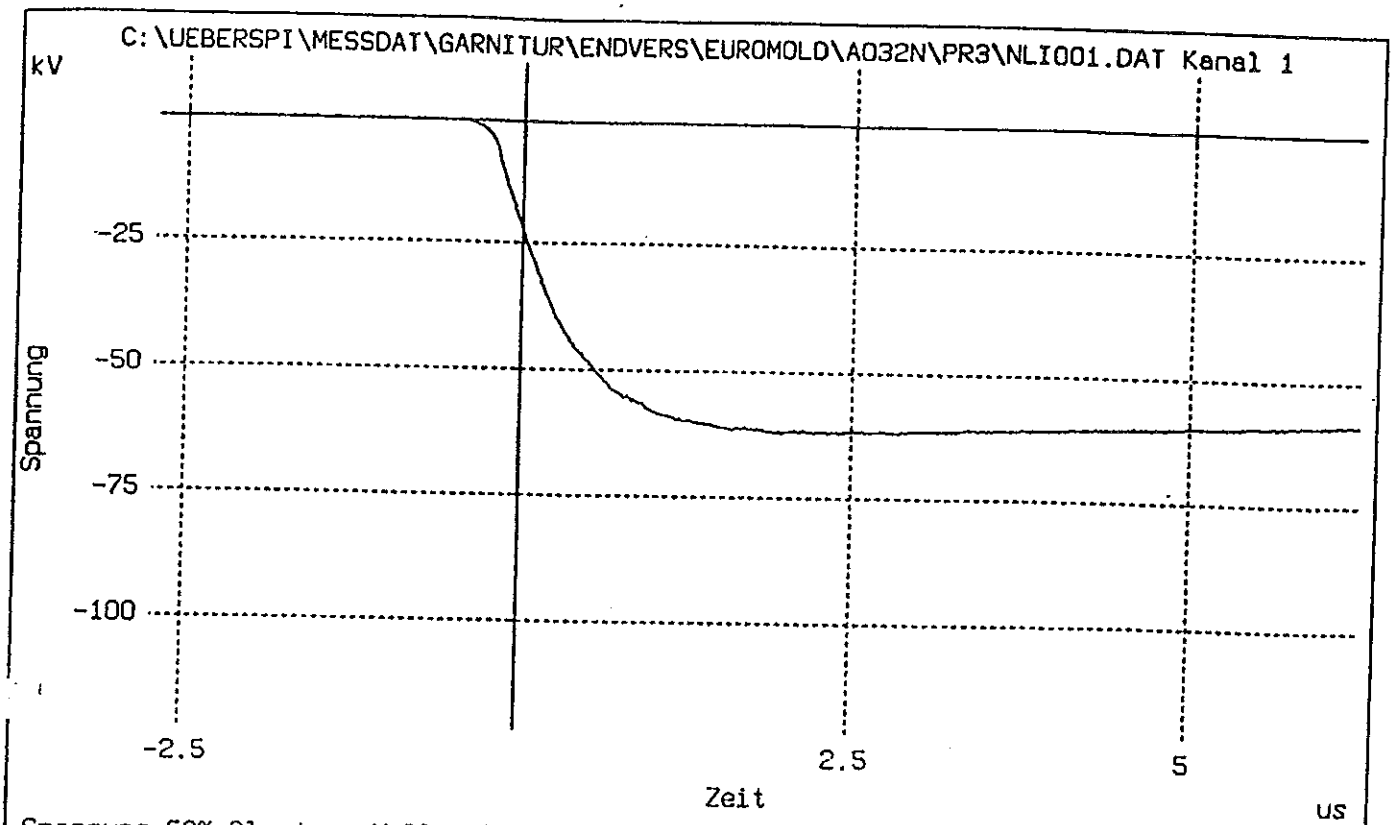
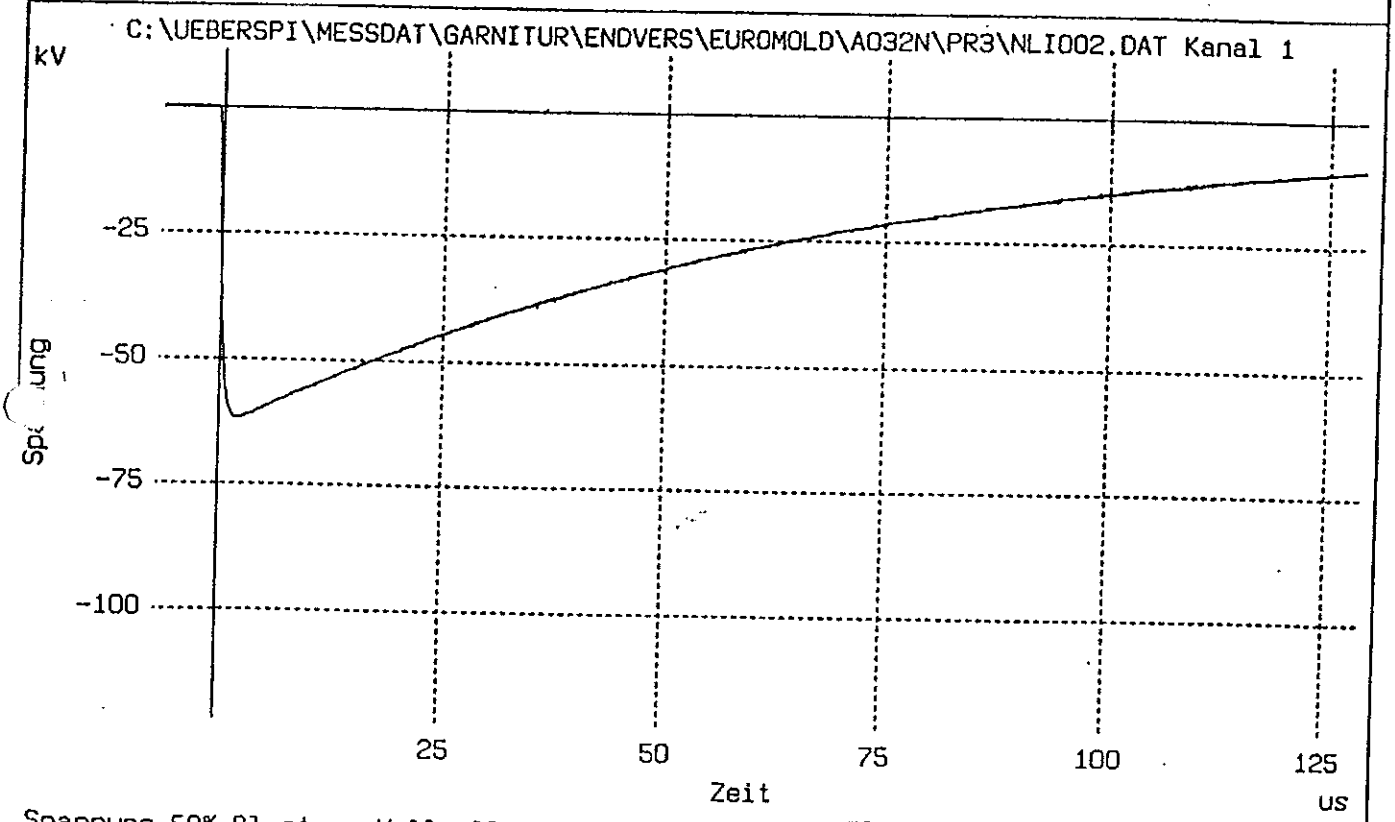
ВЯРНО С ОРИГИНАЛА

EUROtest



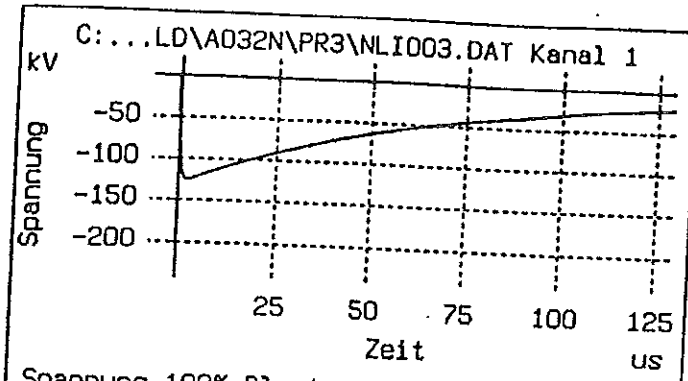
Spannung 50% Bl.stoss Vollwelle
Max: -62kV T1: 1.488us T2: 0ms



Spannung 50% Bl.stoss Vollwelle
Max: -62kV T1: 1.459us T2: 51us

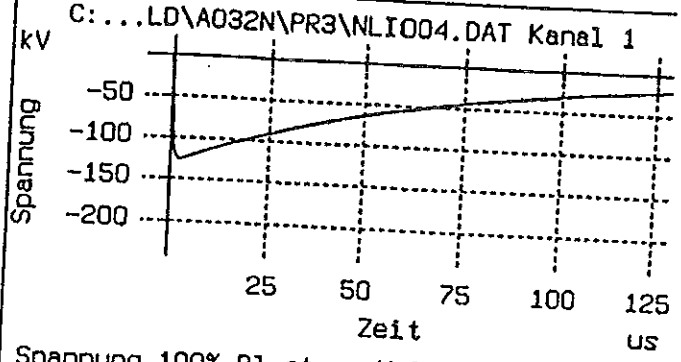
Seite 1 , Pruefling K 158 LR Kabelstecker 906 701 294 02.1996

ВЯРНО С ОРИГИНАЛА



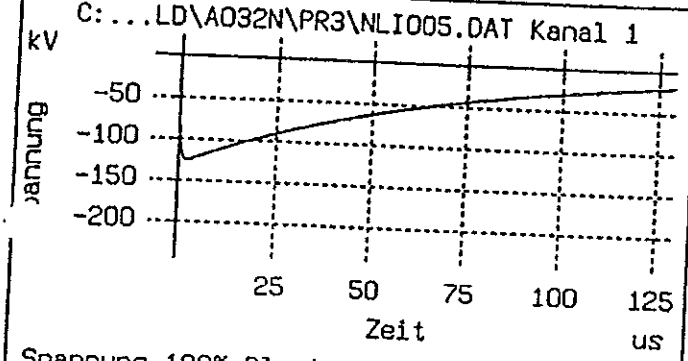
Spannung 100% Bl.stoss Vollwelle

Max: -124kV T1: 1.457us T2: 51.1u



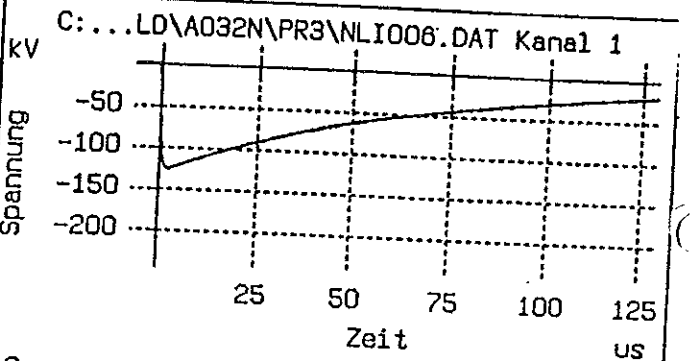
Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.461us T2: 50.9u



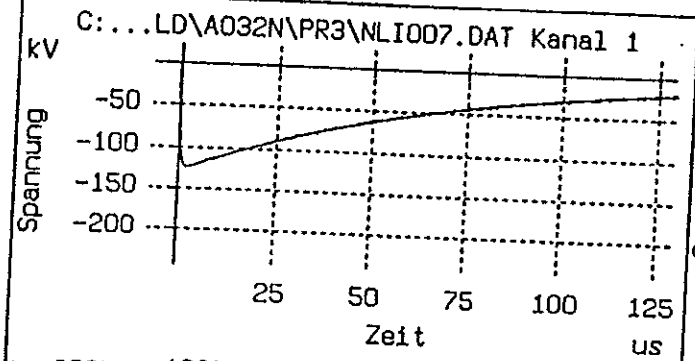
Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.494us T2: 51us



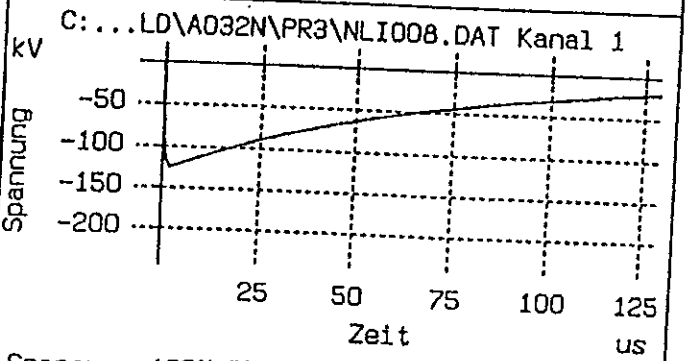
Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.492us T2: 50.9u



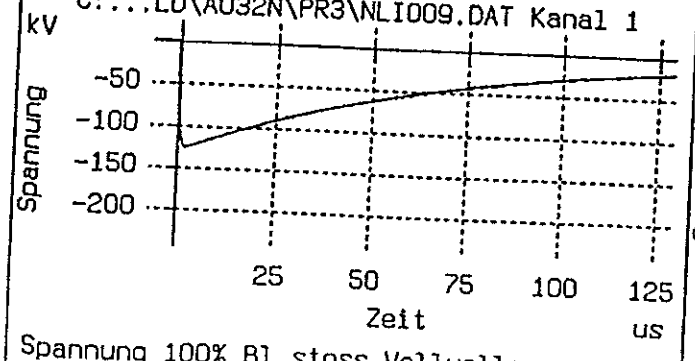
annung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.463us T2: 51us



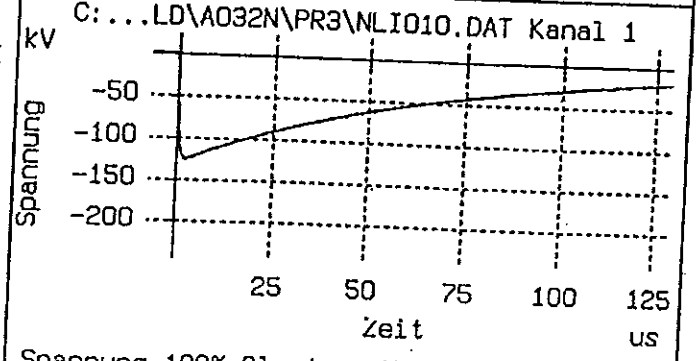
Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.498us T2: 51.1u



Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.458us T2: 51.1u



Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.485us T2: 51us

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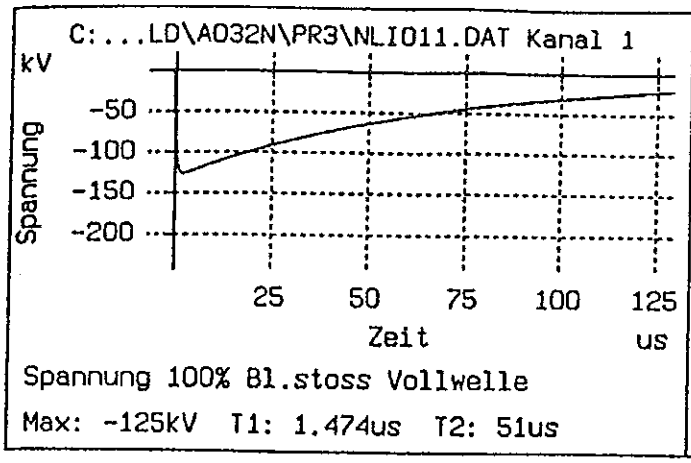
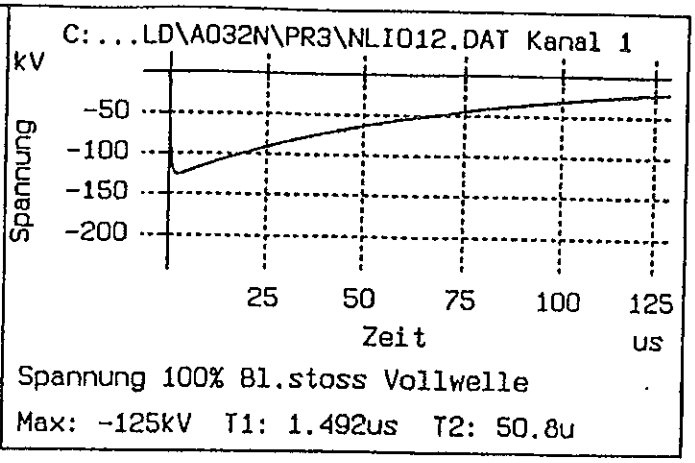


Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.474us T2: 51us



Spannung 100% Bl.stoss Vollwelle

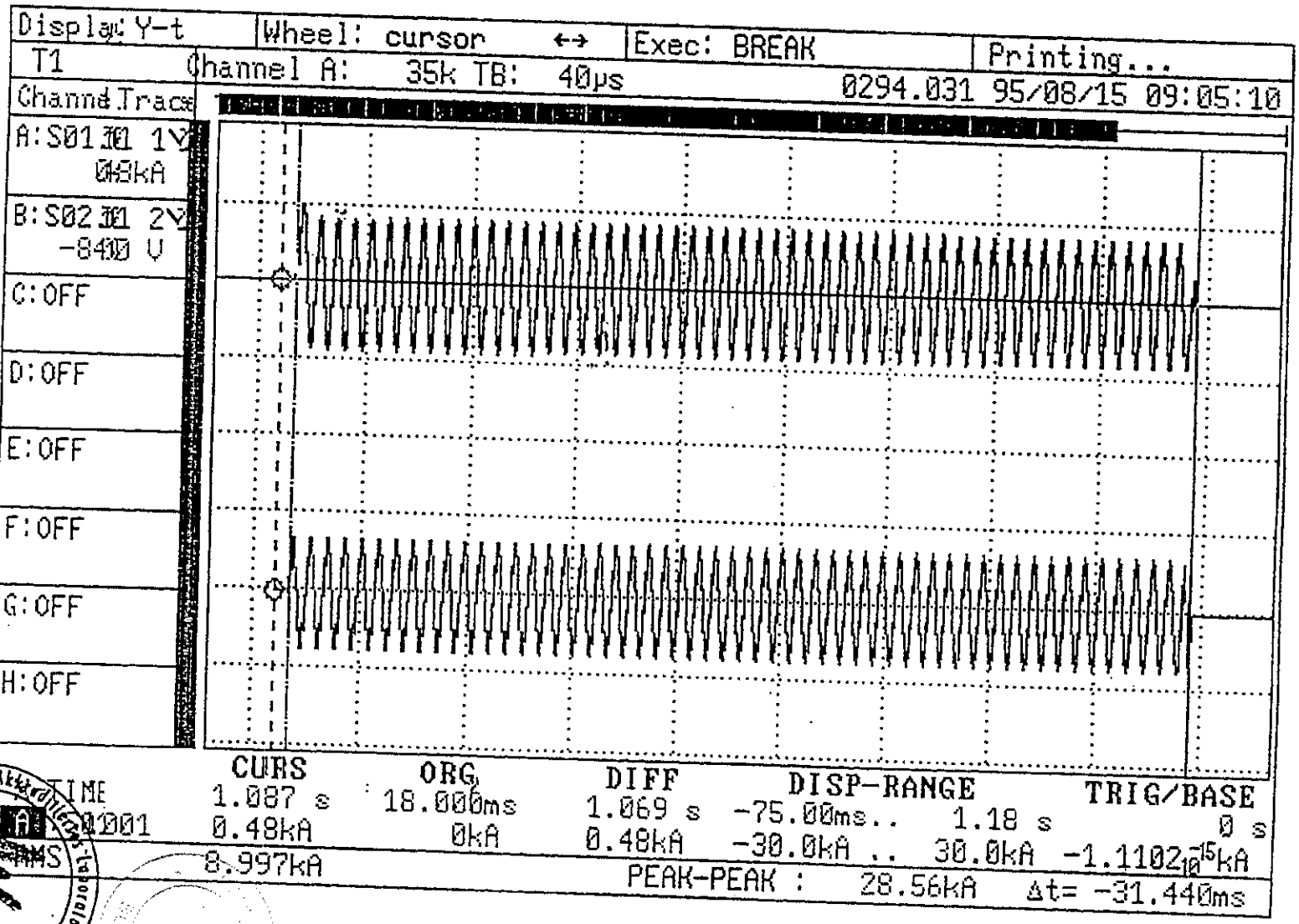
Max: -125kV T1: 1.492us T2: 50.8u

Prüfling K 158 LR , FabNr.:

Kabelstecker

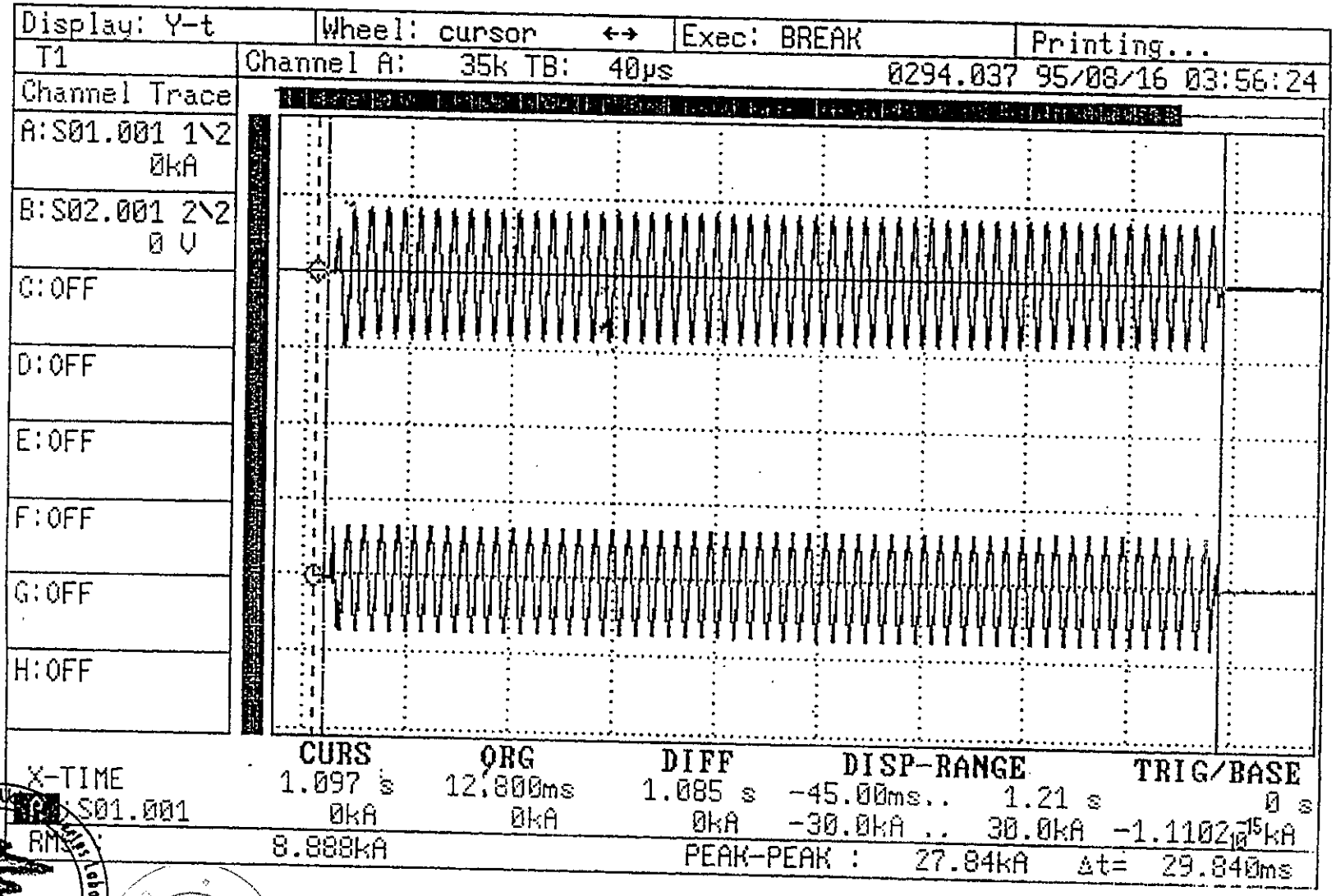
ВЯРНО С ОРИГИНАЛА

Akkreditiertes Laboratorium für Prüfungen elektrotechnischer Erzeugnisse - EUROtest



ВЯРНО С ОРИГИНАЛА

VEW EUROtest
DATUM: 15.8.95
PRÜFER:



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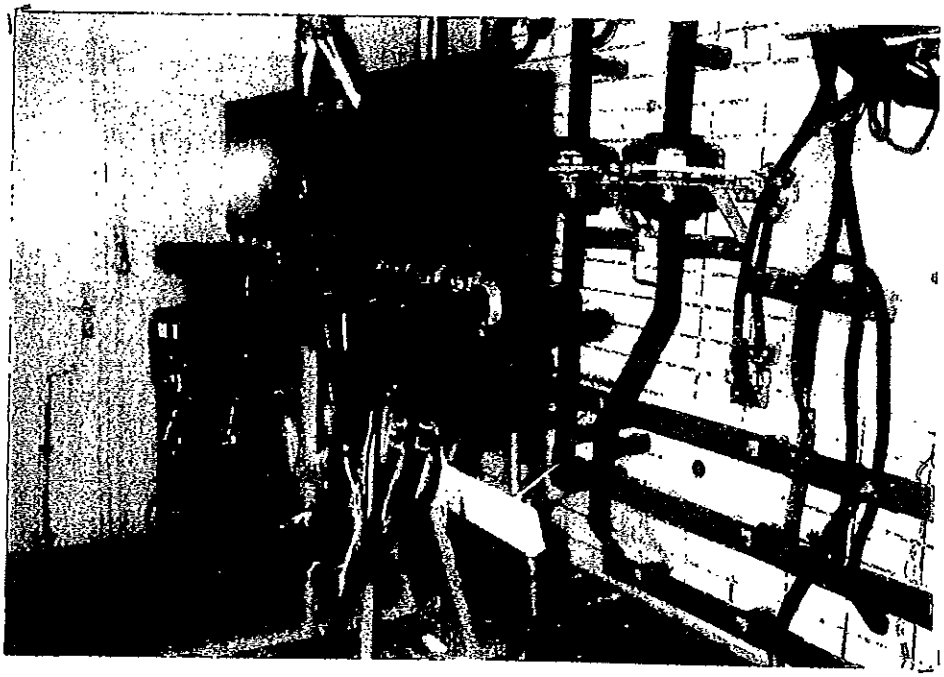


Bild 1: Prüfaufbau Kurzschlußversuch
Steckerseite

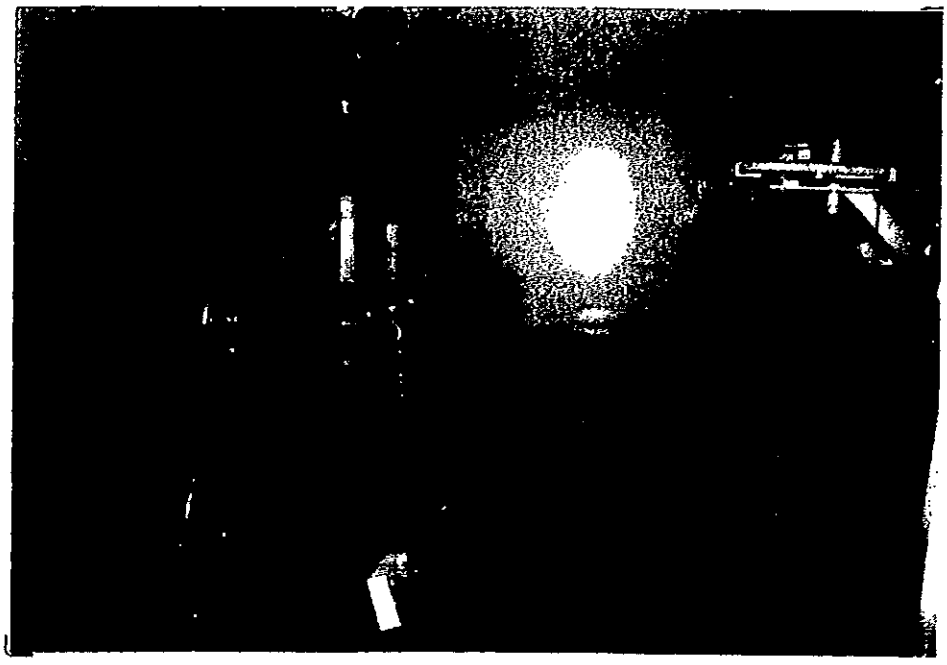
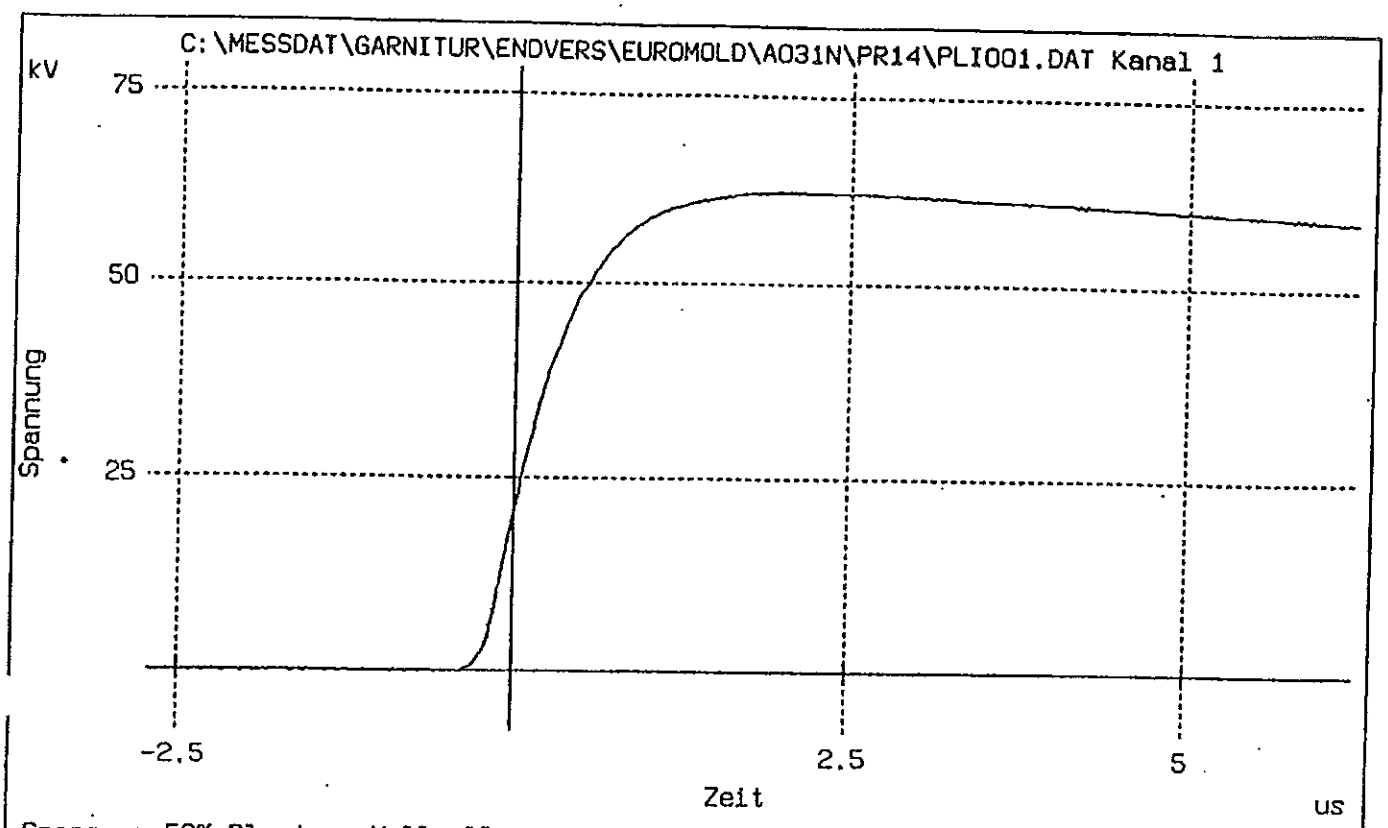


Bild 2: Prüfaufbau Kurzschlußversuch
Durchführungsseite

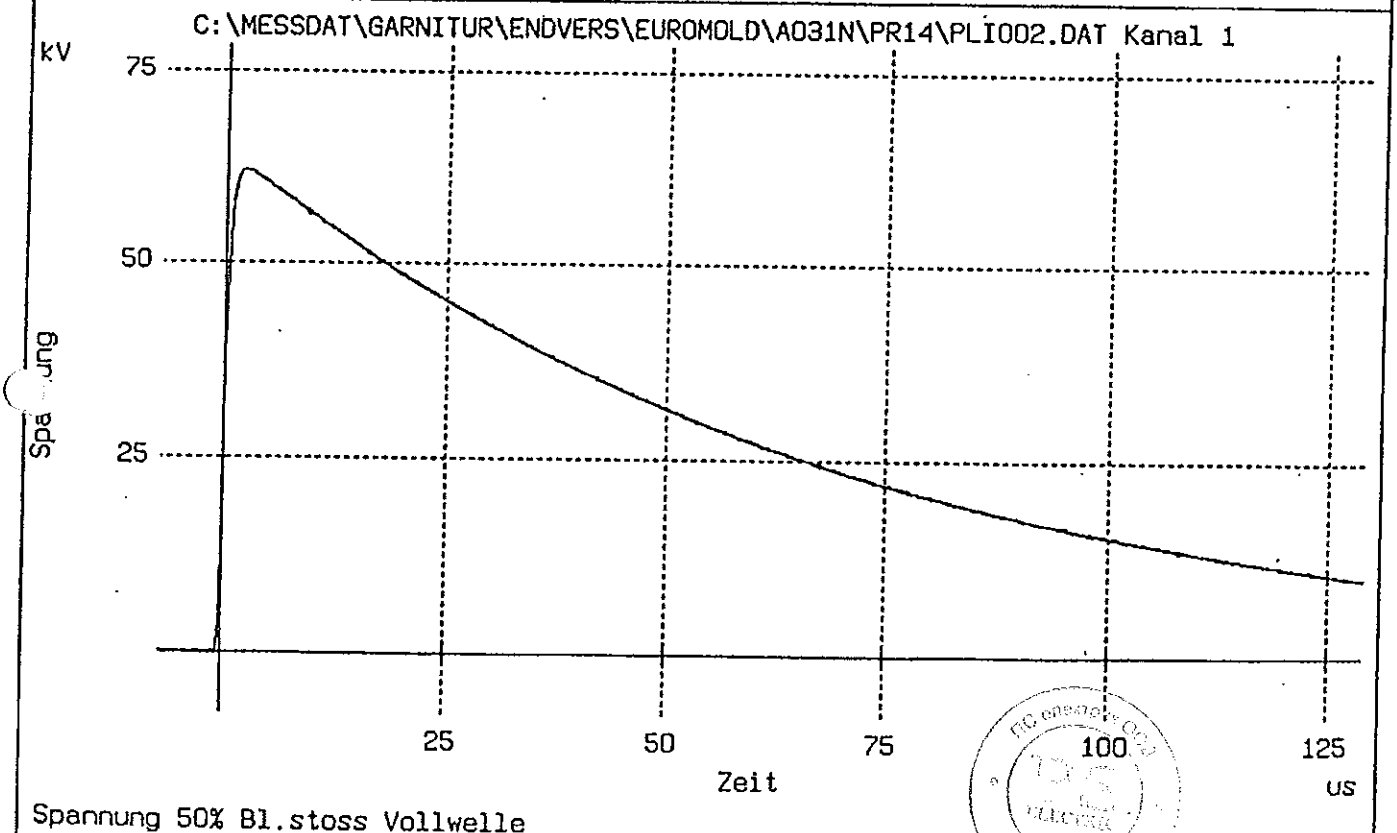
ВЯРНО С
ОРИГИНАЛА

akkreditiertes Laboratorium für Prüfungen elektrotechnischer Erzeugnisse



Spannung 50% Bl.stoss Vollwelle

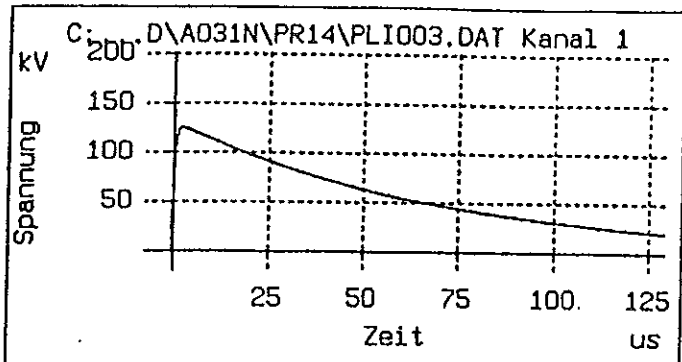
Max: 62.3kV T1: 1.378us T2: 0ms



Spannung 50% Bl.stoss Vollwelle

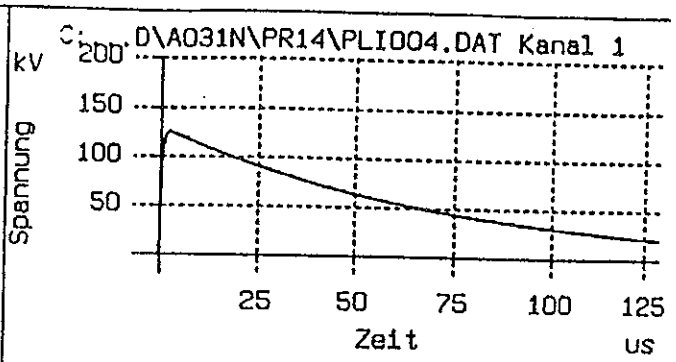
Max: 62.2kV T1: 1.374us T2: 51.3us

ВЯРНО С ОРИГИНАЛА



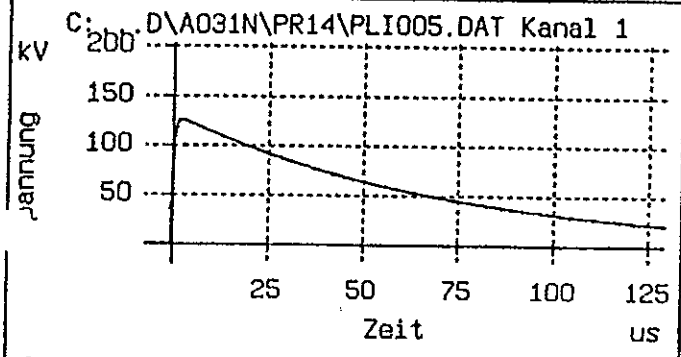
Spannung 100% Bl.stoss Vollwelle

Max: 125.4kV T1: 1.365us T2: 51.3



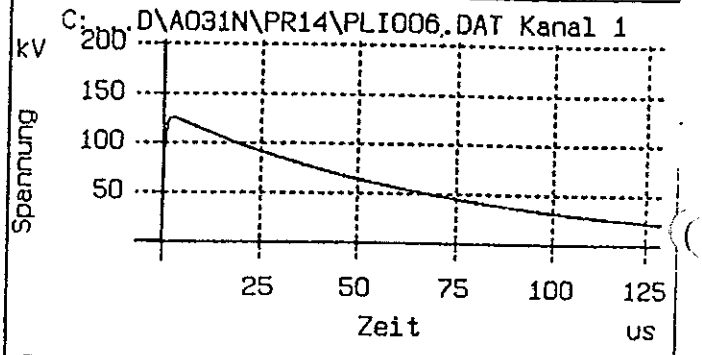
Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.372us T2: 51.3



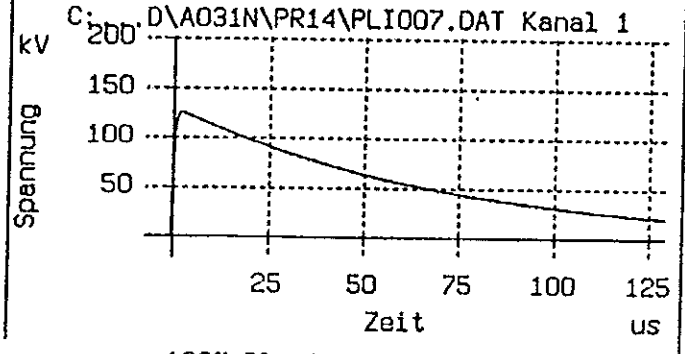
Spannung 100% Bl.stoss Vollwelle

Max: 125.4kV T1: 1.368us T2: 51.2



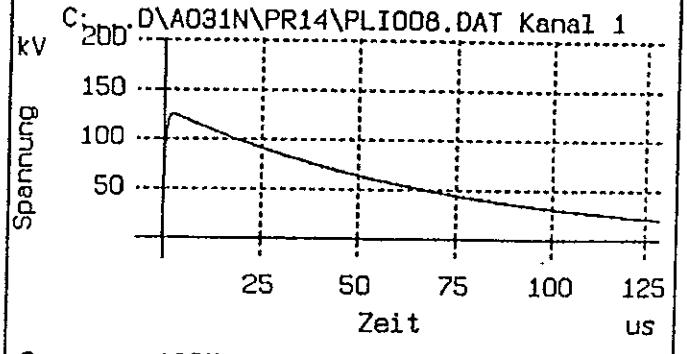
Spannung 100% Bl.stoss Vollwelle

Max: 125.4kV T1: 1.379us T2: 51.5



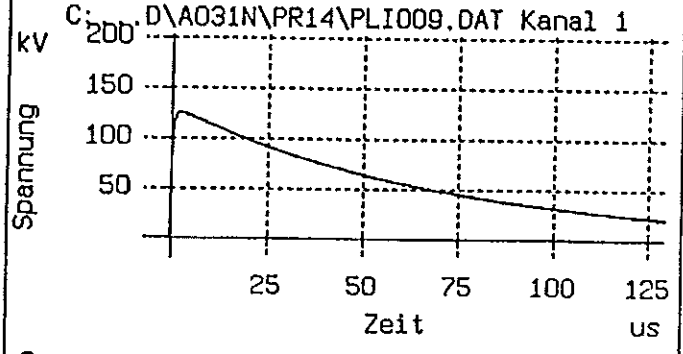
pannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.371us T2: 51.1



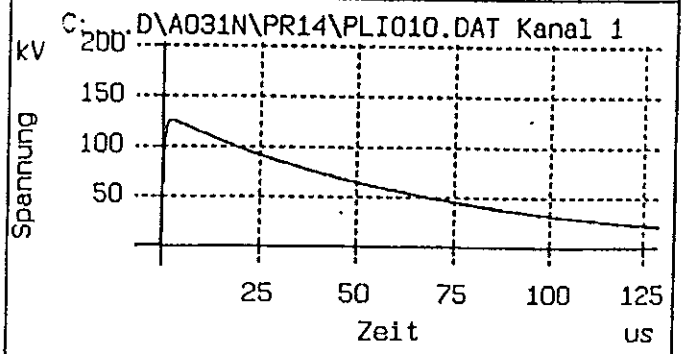
Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.37us T2: 51.2u



Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.376us T2: 51.1



Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.371us T2: 51.2

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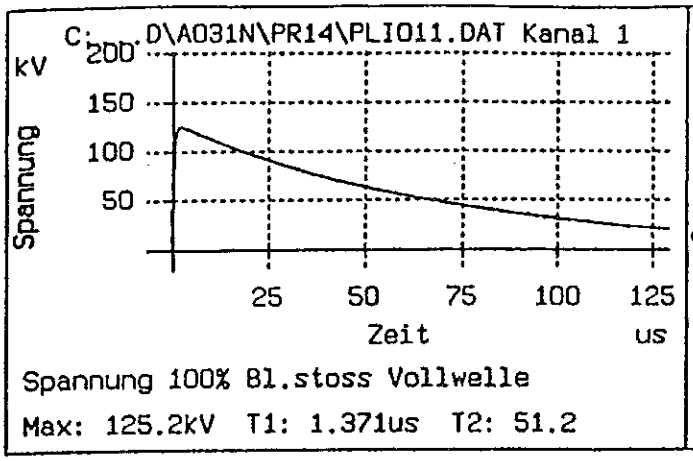
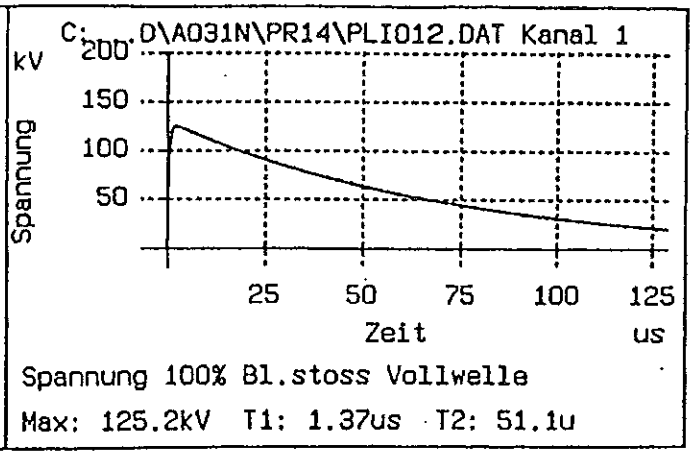


Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.371us T2: 51.2



Spannung 100% Bl.stoss Vollwelle

Max: 125.2kV T1: 1.37us T2: 51.1u

Prüfling K 158 LR , FabNr.: Kabelstecker

ВЯРНО С ОРИГИНАЛА

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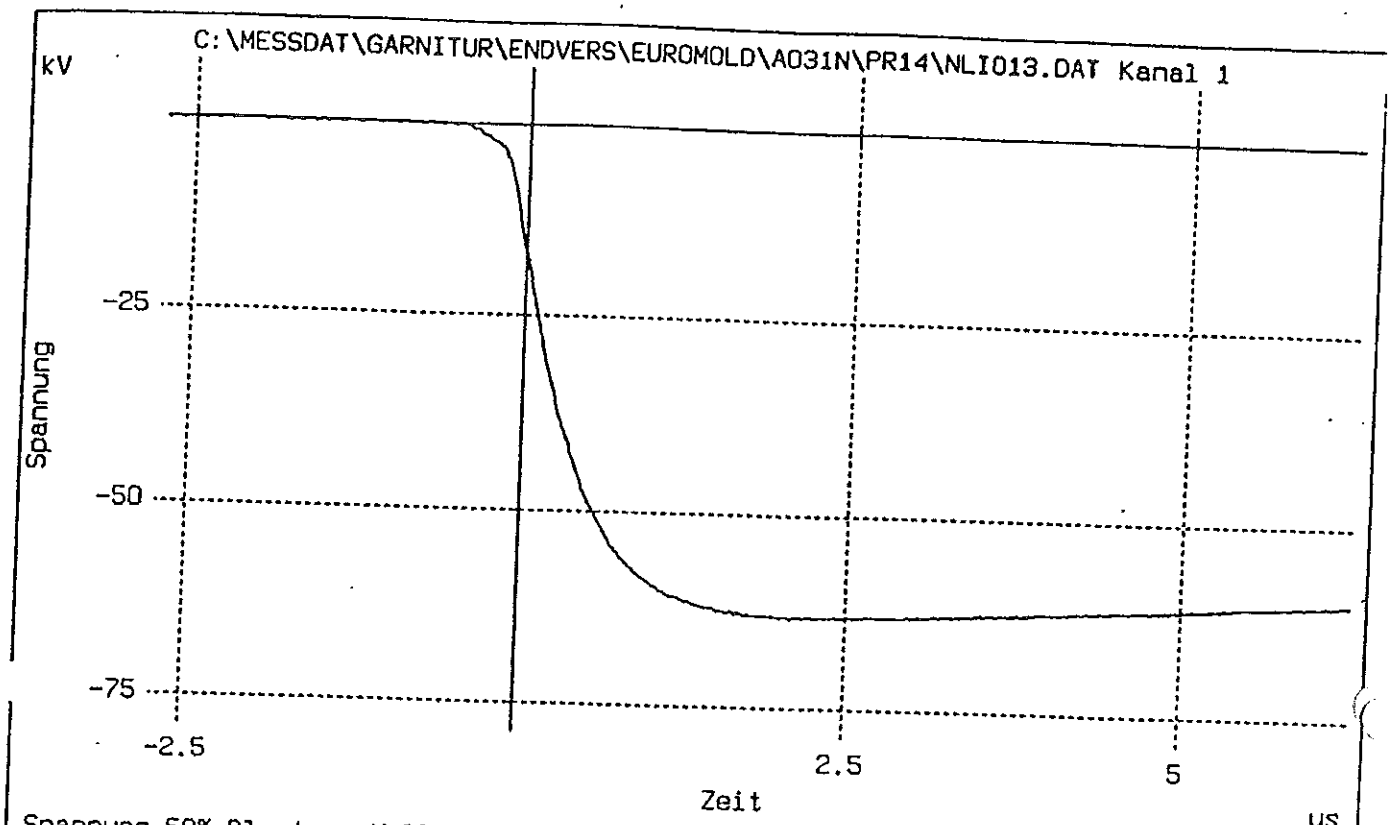
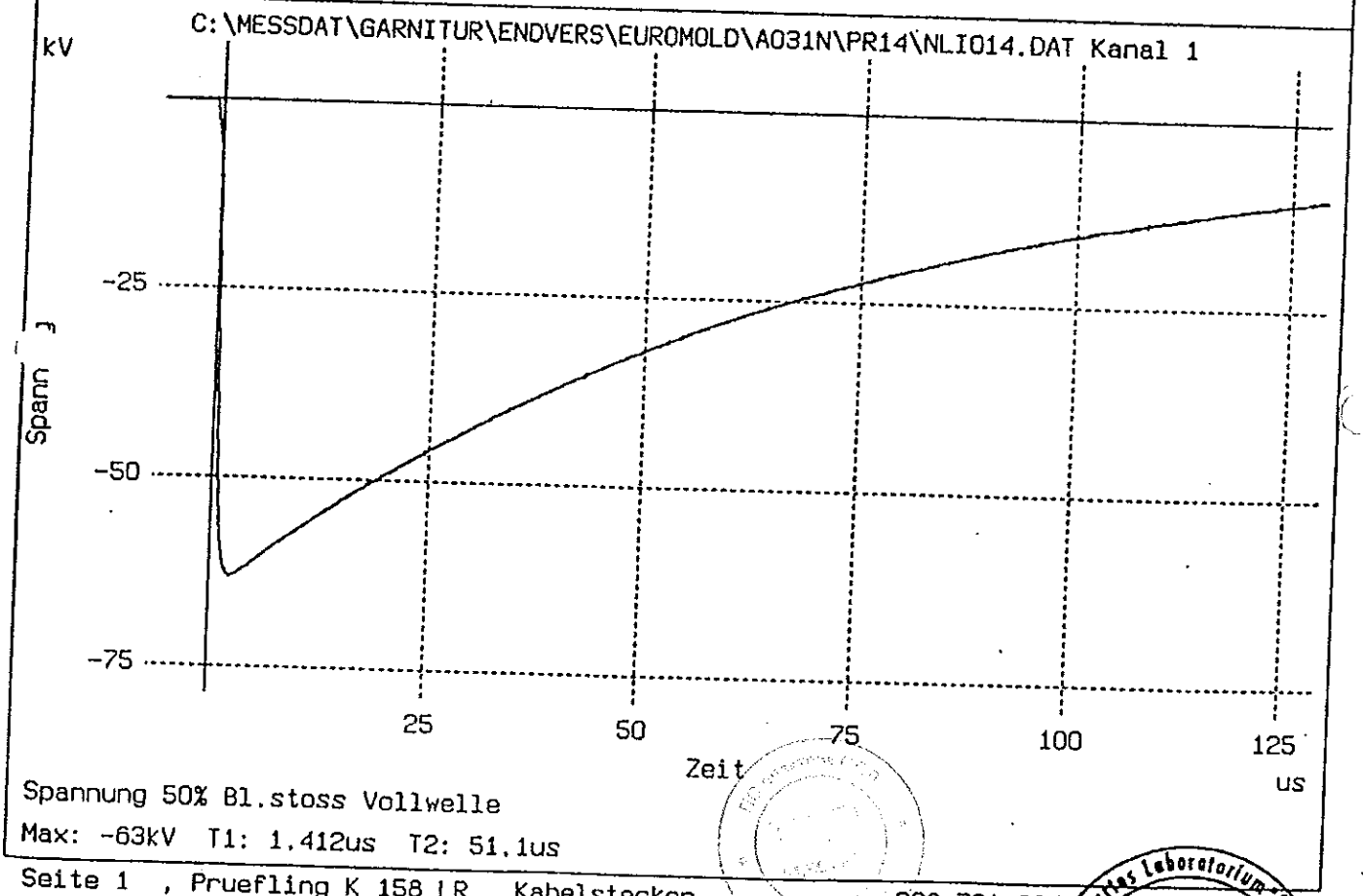


Spannung 50% Bl.stoss Vollwelle
Max: -63kV T1: 1.4us T2: 0ms



Spannung 50% Bl.stoss Vollwelle
Max: -63kV T1: 1.412us T2: 51.1us

ВЯРНО С ОРИГИНАЛА

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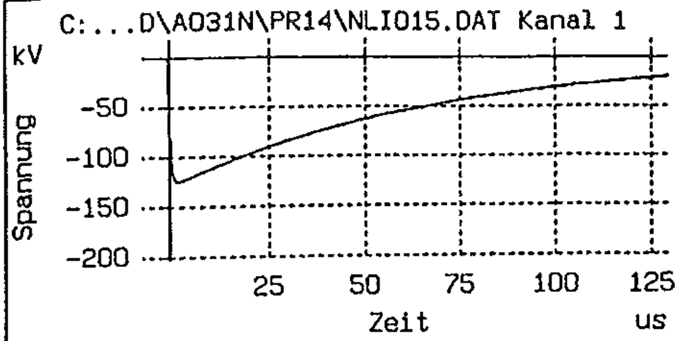
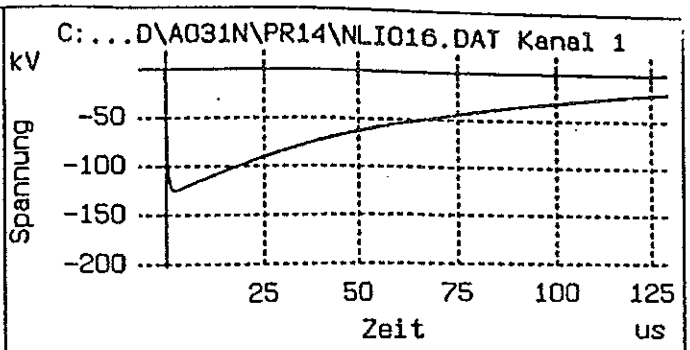
Test-No.: 95.05.21.294 A **Annex 6**



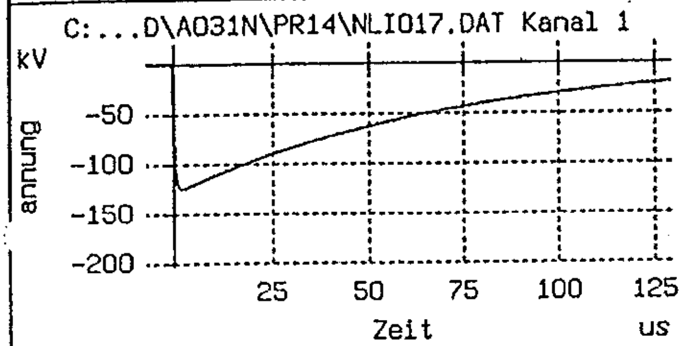
Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.388us T2: 50.9u



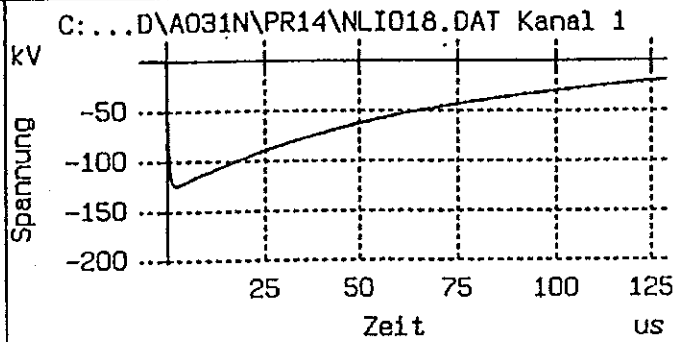
Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.387us T2: 51.1u



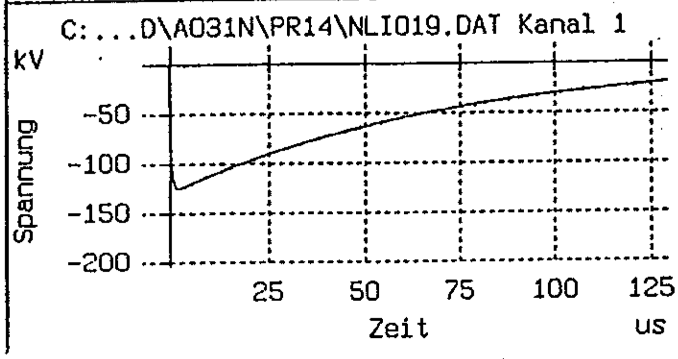
Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.384us T2: 50.9u



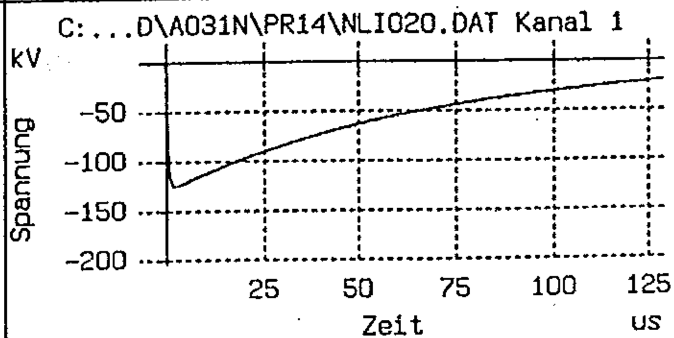
Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.39us T2: 50.8us



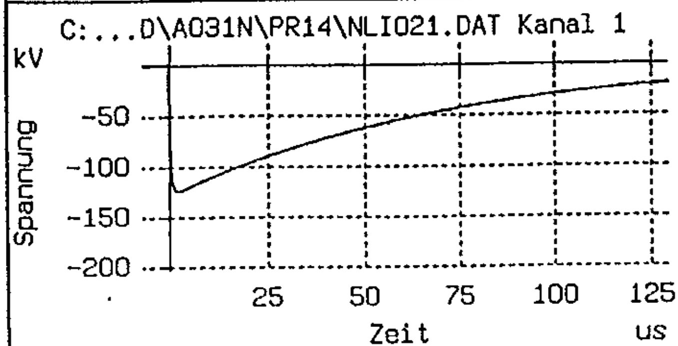
pannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.383us T2: 50.9u



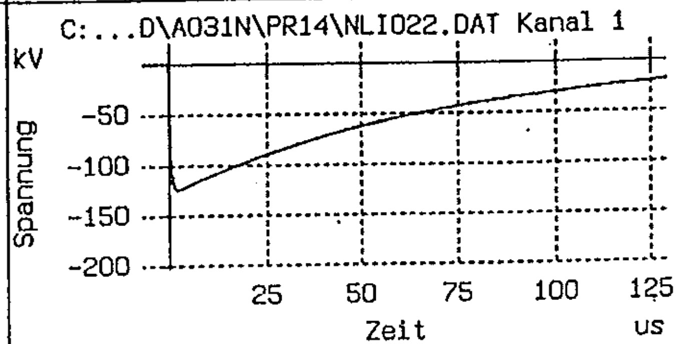
Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.385us T2: 50.9u



Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.383us T2: 51.1u



Spannung 100% Bl.stoss Vollwelle

Max: -125kV T1: 1.392us T2: [illegible]

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ВЯРНО С ОРИГИНАЛА

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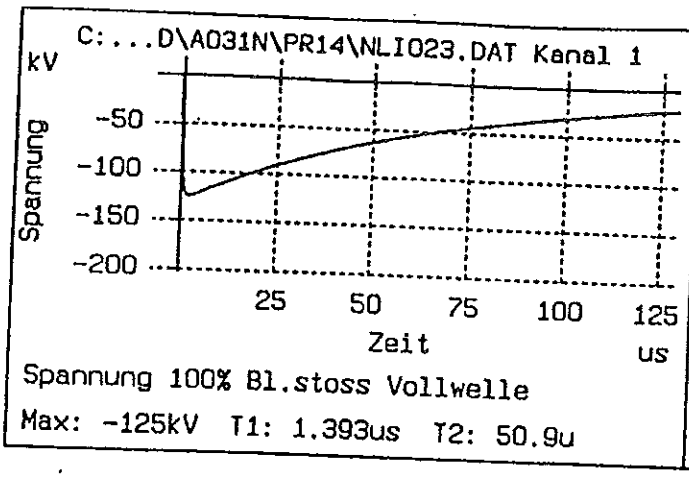

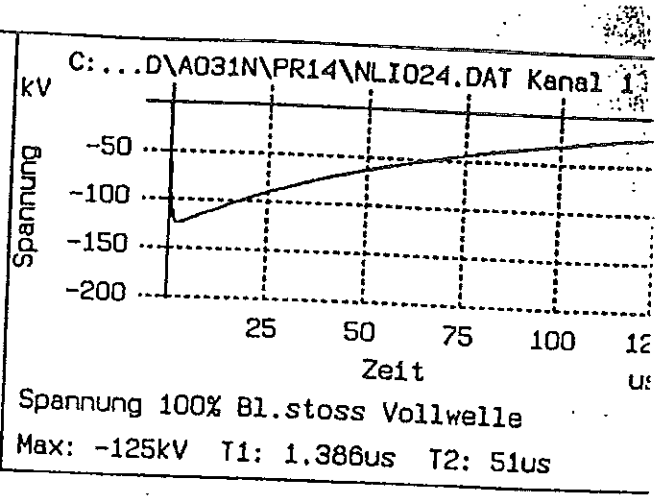

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ВЯРНО С ОРИГИНАЛА

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Test-No.: 95.05.21.294 A **Annex 7**

Test equipment

Kalibrierte Prüf- und Meßmittel
AC-Meßsystem, Geräte-No. 429, bestehend aus: AC-Spannungsteiler Übersetzung 8000 : 1, dig. AC-Voltmeter
Teilentladungs-Meßsystem mit kalibriertem TE-Impulsgenerator Geräte-No. 077
Stoßspannungs-Meßsystem Geräte-No. 428 bestehend aus: Stoßspannungsteiler Teilerschaltung 2 Übersetzung 557,5 : 1, Stoßspannungs-Voltmeter, digitales Meß- und Auswertesystem
AC-Spannungsteiler Übersetzung 2000: 1 kalibriert mit Übersetzungsmeßgerät Geräte-No. 325 mit Digitalmultimeter Geräte-No. 073 Zangenstromwandler Geräte-No. 439/441 Digitalmultimeter Geräte-No. 074/075
Stromwandler Geräte-No. 9, 10, 11 Meßumformer Geräte-No. 228, 229, 230, 233 Hochstrom-Meßwiderstände Geräte-No. 237, 238, 239
DC-Meßsystem Geräte-No. 399 bestehend aus: DC-Spannungsteiler u. digit. DC-Voltmeter
Digitalmultimeter Geräte-No. 71, 396
Hochstrom-Meßwiderstände Geräte No. 1250, 1282, 10-kV-I-Wandler ü = 5 A : 1 A, 10-kV-I-Wandler Ü = 10000 V: 100 V

ВЯРНО С ОРИГИНАЛА

Списък

На отделните изпитания

02	Тестове при различни температури (калибриране)
03	Тест за издръжливост при импулсно напрежение
04	Термичен тест при въздушна среда
05	Термичен тест при късо съединение
06	Изпитване на екранировката при късо съединение

ВЯРНО С ОРИГИНАЛА

Приложение 15

DAkkS
Deutsche
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Beliehene gemäß § 8 Absatz 1 AkkStelleG i.V.m. § 1 Absatz 1 AkkStelleGBV
Unterzeichnerin der Multilateralen Abkommen
von EA, ILAC und IAF zur gegenseitigen Anerkennung

Akkreditierung

Die Deutsche Akkreditierungsstelle GmbH bestätigt hiermit, dass das Prüflaboratorium

RWE Eurotest GmbH
Unterste-Wilms-Str. 52, 44143 Dortmund

die Kompetenz nach DIN EN ISO/IEC 17025:2005 besitzt, Prüfungen in folgenden Bereichen durchzuführen:

**Hochspannungsgeräte und -anlagen, Niederspannungs-Schaltgeräte-Kombinationen,
Kabel, Starkstromkabel-Garnituren, Press- und Schraubverbinder,
Isolierstoffe (Isolieröle), EMV, Erdungsanlagen,
sowie von PSA bei Lichtbogeneinwirkung**

Die Akkreditierungsurkunde gilt nur in Verbindung mit dem Bescheid vom 18.10.2011 mit der Akkreditierungsnummer D-PL-15207-01 und ist gültig bis 17.10.2016. Sie besteht aus diesem Deckblatt, der Rückseite des Deckblatts und der folgenden Anlage mit insgesamt 6 Seiten.

Registrierungsnummer der Urkunde: **D-PL-15207-01-01**

Frankfurt am Main, 18.10.2011

Dipl.-Ing. (FH) Ralf Egner
Leiter Abteilung 2

ВЯРНО С ОРИГИНАЛА

Siehe Hinweise auf der Rückseite

Deutsche Akkreditierungsstelle GmbH

Standort Berlin
Spittelmarkt 10
10117 Berlin

Standort Frankfurt am Main
Gartenstraße 6
60594 Frankfurt am Main

Standort Braunschweig
Bundesallee 100
38116 Braunschweig

Es darf nicht der Anschein erweckt werden, dass sich die Akkreditierung auch auf Bereiche erstreckt, die über den durch die DAkkS bestätigten Akkreditierungsbereich hinausgehen.

Die Akkreditierung erfolgte gemäß des Gesetzes über die Akkreditierungsstelle (AkkStelleG) vom 31. Juli 2009 (BGBl. I S. 2625) sowie der Verordnung (EG) Nr. 765/2008 des Europäischen Parlaments und des Rates vom 9. Juli 2008 über die Vorschriften für die Akkreditierung und Marktüberwachung im Zusammenhang mit der Vermarktung von Produkten (Abl. L 218 vom 9. Juli 2008, S. 30).
Die DAkkS ist Unterzeichnerin der Multilateralen Abkommen zur gegenseitigen Anerkennung der European co-operation for Accreditation (EA), des International Accreditation Forum (IAF) und der International Laboratory Accreditation Cooperation (ILAC). Die Unterzeichner dieser Abkommen erkennen ihre Akkreditierungen gegenseitig an.

Der aktuelle Stand der Mitgliedschaft kann folgenden Webseiten entnommen werden:
EA: www.european-accreditation.org
ILAC: www.ilac.org
IAF: www.iaf.nu

ВЯРНО С ОРИГИНАЛА

DAkkS
Deutsche
Akkreditierungsstelle

Deutsche Akkreditierungsstelle GmbH

Anlage zur Akkreditierungsurkunde D-PL-15207-01-01 nach DIN EN ISO/IEC 17025:2005

Gültigkeitsdauer: 18.10.2011 bis 17.10.2016

Urkundeninhaber:

RWE Eurotest GmbH
Unterste-Wilms-Str. 52, 44143 Dortmund

Prüfungen in den Bereichen:

Fachbereich	Norm/ Hausverfahren/ Version	Titel der Norm oder des Hausverfahrens[1] (ggf. Abweichungen / Modifizierungen von Normverfahren angeben)	Prüfbereich/ Einschränkung
Hochspannungsgeräte und -anlagen	VDE 0432 Teil 1 HD 588.1 S1 DIN IEC 60060-1 IEC 60060-1	Hochspannungs-Prüftechnik – Teil 1: Allgemeine Festlegungen und Prüfbedingungen	Prüfbereich: Wechselspannung bis 600 kV Gleichspannung bis 350 kV Stoßspannung 1,2/50 µs bis 1,6 MV 250/2500 µs bis 1,2 MV
	VDE 0434 DIN EN 60270 EN 60270 IEC 60270	Hochspannungs-Prüftechnik – Teilentladungsmessungen	

ВЯРНО С ОРИГИНАЛА

[1] Im Titel des Hausverfahrens sind Methode und Prüfgegenstand zu nennen

Fachbereich	Norm/ Hausverfahren/ Version	Titel der Norm oder des Hausverfahrens (ggf. Abweichungen / Modifizierungen von Normverfahren angeben)	Prüfbereich/ Einschränkung
	VDE 0682 Teil 411 DIN EN 61243-1 EN 61243-1 IEC 61243-1	Arbeiten unter Spannung – Spannungsprüfer – Teil 1: Kapazitive Ausführung für Wechselspannungen über 1 kV	Einschränkung: keine • Rüttelfestigkeit Abs. 6.4.3 • Fallfestigkeit Abs. 6.4.4 • Klimafestigkeit Abs. 6.4.6 • Einfluss der ein. gem. Abs. 6.2.6 • Frequenzabhängigkeit gem. Abs. 5.2.5 • Zweifelsfreie Wahrnehmbarkeit gem. Abs. 6.2.3.1 und 6.2.2.1 • Prüfung der Eigenprüfvorrichtung gem. Abs. 6.2.7
	VDE 0682 Teil 431 DIN EN 61481 EN 61481 IEC 61481	Arbeiten unter Spannung – Phasenvergleicher für Wechselspannungen von 1 kV bis 36 kV	Einschränkung: keine • Rüttelfestigkeit Abs. 5.4.4 • Fallfestigkeit Abs. 5.4.5 • Festigkeit der Verbindungsleitung,.. gem Abs. 5.4.3 • Klimafestigkeit Abs. 5.4.7 • Einfluss der ein. gem. Abs. 5.2.7 • Frequenzabhängigkeit gem. 5.2.5 • Zweifelsfreie Wahrnehmbarkeit gem. Abs. 5.2.4 • Kontrolle der Eigenprüfvorrichtung gem. Abs. 5.2.8
	DIN VDE 0101 HD 637 S1	Starkstromanlagen mit Nennspannungen über 1 kV	Einschänkung: nur Erdungsmessungen gemäß Anhang N

ВЯРНО С ОРИГИНАЛА

Fachbereich	Norm/ Hausverfahren/ Version	Titel der Norm oder des Hausverfahrens (ggf. Abweichungen / Modifizierungen von Normverfahren angeben)	Prüfbereich/ Einschränkung
Niederspannungsgeräte und -anlagen	VDE 0660 Teil 600-1 DIN EN 61439-1 EN 61439-1 IEC 61439-1	Niederspannungs-Schaltgerätekombinationen; Teil 1: Allgemeine Festlegungen	
	VDE 0660 Teil 600-5 DIN EN 61439-5 EN 61439-5 IEC 61439-5	Niederspannungs-Schaltgerätekombinationen; Teil 5: Schaltgerätekombinationen in öffentlichen Energieversorgungsnetzen	
	VDE 0660 Teil 505 DIN VDE 0660-505	Niederspannungs-Schaltgerätekombinationen; Teil 505: Bestimmung für Hausanschlusskästen und Sicherungskästen	
	VDE 0682-1-2 DIN EN 61482-1-2	Arbeiten unter Spannung - Schutzkleidung gegen die thermischen Gefahren eines elektrischen Lichtbogens - Teil 1-2: Prüfverfahren - Verfahren 2: Bestimmung der Lichtbogen-Schutzklasse des Materials und der Kleidung unter Verwendung eines gerichteten Prüflichtbogens (Box-Test)	
	GS-ET-29	BG-Prüfzert: Zusatzanforderungen für die Prüfung und Zertifizierung von Elektriker-Gesichtsschutz	
	PIP001	RWE Eurotest GmbH: Prüfung der Störlichtbogenfestigkeit von Schutzkleidung	
	VDE 0122-1; DIN EN 61851-1; IEC 61851-1	Elektrische Ausrüstung von Elektro-Straßenfahrzeugen - Konduktive Ladesysteme für Elektrofahrzeuge - Teil 1: Allgemeine Anforderungen	
	VDE 0122-2-2; DIN EN 61851-22; IEC 61851-22	Elektrische Ausrüstung von Elektro-Straßenfahrzeugen - Konduktive Ladesysteme für Elektrofahrzeuge - Teil 2-2: Wechselstrom-Ladestation für Elektrofahrzeuge	
EMV-Prüfungen	DIN EN 50160	Merkmale der Spannung in öffentlichen Elektrizitätsversorgungsnetzen	Prüfbereich: Messungen bis 1000V und 1000 A
	DIN EN 50413 (VDE 0848-1)	Grundnorm zu Mess- und Berechnungsverfahren der Exposition von Personen in elektrischen, magnetischen und elektromagnetischen Feldern (0 Hz bis 300 GHz);	Prüfbereich: Messung der elektrischen und magnetischen Felder von 0-30 kHz
Kabel und Leitungen	VDE 0271 DIN VDE 0271	Starkstromkabel - Festlegungen für Starkstromkabel ab 0,6/1 kV für besondere Anwendungen	Einschänkung: kein - Brennverhalten

ВЯРНО С ОРИГИНАЛА

Fachbereich	Norm/ Hausverfahren/ Version	Titel der Norm oder des Hausverfahrens (ggf. Abweichungen / Modifizierungen von Normverfahren angeben)	Prüfbereich/ Einschränkung
	VDE 0276 Teil 603 DIN VDE 0276-603 HD 603 S1/A3	Starkstromkabel - Teil 603: Energieverteilungskabel mit Nennspannungen U_0/U 0,6/1 kV	Einschänkung: kein ▪ Brennverhalten
	VDE 0276 Teil 605 DIN VDE 0276-605 HD 605 S2	Starkstromkabel - Teil 605: Ergänzende Prüfverfahren	Einschänkung: kein ▪ Weiterreißwiderstand ▪ Druckprüfung ▪ Bestimmung der Härte von elastomeren Isolierhüllen und Mänteln ▪ Umweltbeständigkeit UV; Bewitterung; ▪ Wickelprüfungen ▪ Biegeprüfungen ▪ Torsionsprüfungen ▪ Abriebprüfung ▪ Kerbkraftprüfung ▪ Verzinkungsgüte ▪ Steifigkeit ▪ Thermogravimetrische Prüfung ▪ Wasseraufnahme durch Kapazitätsmessung ▪ Vernetzungsgrad von VPE ▪ Durchlaufspannungsprüfung ▪ Brandprüfungen
	VDE 0276 Teil 620 DIN VDE 0276-620 HD 620 S2	Starkstromkabel - Teil 620: Energieverteilungskabel mit extrudierter Isolierung für Nennspannungen U_0/U 3,6/6 kV bis 20,8/36 kV	Einschänkung: kein ▪ Brennverhalten ▪ Langzeitprüfung
	VDE 0276 Teil 626 + A1 DIN VDE 0276-626 + A1 HD 626 S1 + A1	Starkstromkabel - Teil 626: Isolierte Freileitungsseile für oberirdische Verteilungsnetze mit Nennspannung U_0/U (U_m) 0,6/1 (1,2) kV	Einschänkung: Bei HD 626 S1 + A1 nur Teil 4 F
	IEC 60840	Power cables with extruded insulation and their accessories for rated voltages above 30 kV (Um = 36 kV) up to 150 kV (Um = 170 kV) - Test methods and requirements	Ohne Brandprüfungen

ВЯРНО С ОРИГИНАЛА

Fachbereich	Norm/ Hausverfahren/ Version	Titel der Norm oder des Hausverfahrens (ggf. Abweichungen / Modifizierungen von Normverfahren angeben)	Prüfbereich/ Einschränkung
Starkstrom-kabel-Garnituren	VDE 0278-393 DIN EN 50393	Prüfverfahren und Prüfanforderungen für die Garnituren von Verteilerkabeln mit einer Nennspannung von 0,6/1,0 (1,2) kV	
	VDE 0278 Teil 442 DIN EN 61442	Prüfverfahren für Starkstromkabelgarnituren mit einer Nennspannung von 6 kV (U = 7,2 kV) bis 36 kV (U = 42 kV) (IEC 61442:2005, modifiziert)	
	VDE 0278 Teil 629-1 DIN VDE 0278-629-1 HD 629.1 S2	Prüfanforderungen für Kabelgarnituren für Starkstromkabel mit einer Nennspannung von 3,6/6(7,2) kV bis 20,8/36(42) kV - Teil 1: Kabel mit extrudierter Kunststoffisolierung	
	VDE 0278 Teil 629-2 DIN VDE 0278-629-2 HD 629.2 S2	Prüfanforderungen für Kabelgarnituren für Starkstromkabel mit einer Nennspannung von 3,6/6(7,2) kV bis 20,8/36(42) kV - Teil 2: Kabel mit massegetränkter Papierisolierung	
	IEC 60502-1	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV) - Part 1: Cables for rated voltages of 1 kV (U_m = 1.2 kV) and 3 kV (U_m = 3.6 kV)	
	IEC 60502-2	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV) - Part 2: Cables for rated voltages from 6 kV (U_m = 7.2 kV) up to 30 kV (U_m = 36 kV)	
	IEC 60502-4	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV) - Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (U_m = 7,2 kV) up to 30 kV (U_m = 36 kV)	
Press- und Schraub-verbinder	zVDE 0220 Teil 1 zDIN VDE 0220-1	Bestimmungen für lösbare Kabelklemmen in Starkstrom-Kabelanlagen bis 1000 V	
	zVDE 0220 Teil 2 zDIN VDE 0220-2	Bestimmungen für Pressverbinder in Starkstrom-Kabelanlagen	
	VDE 0220 Teil 100 DIN EN 61238-1 IEC 61238-1	Pressverbinder und Schraubverbinder für Starkstromkabel für Nennspannungen bis einschließlich 36 kV (U_m = 42 kV) - Teil 1: Prüfverfahren und Anforderungen	
Isolierstoffe	VDE 0370 Teil 2 DIN EN 60422 IEC 60422	Richtlinie zur Überwachung und Wartung von Isolierölen auf Mineralölbasis in elektrischen Betriebsmitteln (IEC 60422:2005	

ВЯРНО С ОРИГИНАЛА

Fachbereich	Norm/ Hausverfahren/ Version	Titel der Norm oder des Hausverfahrens[1] (ggf. Abweichungen / Modifizierungen von Normverfahren angeben)	Prüfbereich/ Einschränkung
	VDE 0370 Teil 5 DIN EN 60156 EN 60156 IEC 60156	Isolierflüssigkeiten Bestimmung der Durchschlagspannung bei Netzfrequenz Prüfverfahren	
	VDE 0370 Teil 20 DIN EN 60814 IEC 60814	Isolierflüssigkeiten Ölimprägniertes Papier und ölimprägnierter Pressspan; Bestimmung von Wasser mit automatischer Karl-Fischer-Titration	
	VDE 0380 Teil 2 DIN EN 60247 IEC 60247	Isolierflüssigkeiten - Messung der Permittivitätszahl, des dielektrischen Verlustfaktors (tan δ) und des spezifischen Gleichstrom-Widerstandes	
	VDE 0370-31 DIN EN 62021-1 IEC 62021-1	Isolierflüssigkeiten - Bestimmung des Säuregehaltes - Teil 1: Automatische potentiometrische Titration	
	VDE 0278-631-1 DIN VDE 0278-631-1 HD 631.1 S2	Kabel und isolierte Leitungen - Garnituren - Materialcharakterisierung - Teil 1: Fingerprint- und Typprüfungen für Reaktionsharzmassen	Einschänkung: keine ▪ Volumenschwindung

ВЯРНО С ОРИГИНАЛА

Organisme belge d'Accréditation
Belgische Accreditatieinstelling
Belgische Akkreditierungsstelle
Belgian Accreditation Body

Signatory to EA, ILAC and IAF
Multilateral Agreements

Accreditation Certificate No. 144-TEST

In compliance with the provisions of the Royal Decree of 31 January 2006 setting up BELAC, the Accreditation Board hereby declares, that the test laboratory

NEXANS NETWORK SOLUTIONS NV
DIV. EUROMOLD
ELAB
Industrielaan, 12 - Zuid III
9320 EREMBODEGEM - Belgium

has the competence to perform the tests as described in the annex which is an integral part of the present certificate, in accordance with the requirements of the standard NBN EN ISO/IEC 17025:2005. The present accreditation is the subject of regular surveillance in order to confirm the compliance with the accreditation conditions.

ВЯРНО С ОРИГИНАЛА

The Chair of the Accreditation Board BELAC,

Issue date : **2011-09-06**

Validity date : **2016-06-14**

Nicole MEURÉE-VANLAETHEM

Original version of this certificate is in Dutch.

.be

Приложение 16

PS ELECTRIC

ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ

Долуподписаният: **ПС Електрик ООД**

С адрес на управление: **9700 гр. Шумен, бул Мадара 12**

Декларирам на собствена отговорност, че продуктът

Щепселна кабелна глава Euromold K158 LR

Произведена от:

Nexans Network Solutions NV

За която се отнася тази декларация,
Отговаря на приложимите български и международни стандарти или еквиваленти и на техните валидни изменения и поправки:
БДС HD 629.1 S2: 2006 Изисквания за изпитване на аксесоари за използване със силови кабели с обявено напрежение от 3,6/6(7.2) kV до 20,8/36(42) kV. Част 1: Кабели с екструдирана изолация;
БДС HD 629.1 S2: 2006/A1: 2008 Изисквания за изпитване на аксесоари за използване със силови кабели с обявено напрежение от 3,6/6(7.2) kV до 20,8/36(42) kV. Част 1: Кабели с екструдирана изолация;
БДС EN 50181:2001 Проходни изводи щепселен тип над 1kV до 36kV и от 250A до 31,5kA за съоръжения, различни от маслени трансформатори;
БДС HD 620 S2: 2010 Разпределителни кабели с екструдирана изолация за обявено напрежение от 3,6/6(7.2) kV до 20,8/36(42) kV

Декларирам, че ми е известна отговорността, която нося по член 313 от НК

30.08.2013 год
Гр. Шумен

Божидар Маринов
Управител

Приложение 14.

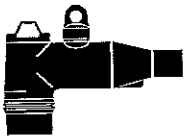
ВНИМАНИЕ: Да се прочетат инструкциите преди началото на монтажа.

Инструкции за монтаж на разглобяем L-образен конектор - тип A за кабели с екран от медни телове

(K)158LR

За размери FG - GA - GAB - GH

Нужните компоненти за монтаж на конектора:

1 x L-образно тяло на конектора 

1 x Щифтов контакт + ключе 

1 x Кабелен контакт (обувка) 

1 x Осигурителна скоба 

1 x 11TL адаптор (опция за кабели с ограничено екструдиран полупроводим слой

- Силиконова смазка

- Инструкции за монтаж и схема на каб. разделка

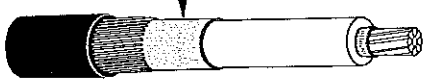
Други компоненти, зависещи от приложението (само по заявка) :

- Водохерметизиращ мастик, тип MWS, само за открит монтаж

Изберете схемата съгласно типа на кабела

A

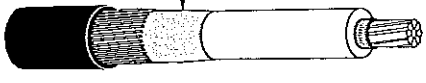
Ограничено екстр. полупроводим слой



Отиди на стр. 2

B

Свободно екстр. полупроводим слой



Отиди на стр. 4

C

Полупроводим слой от графит

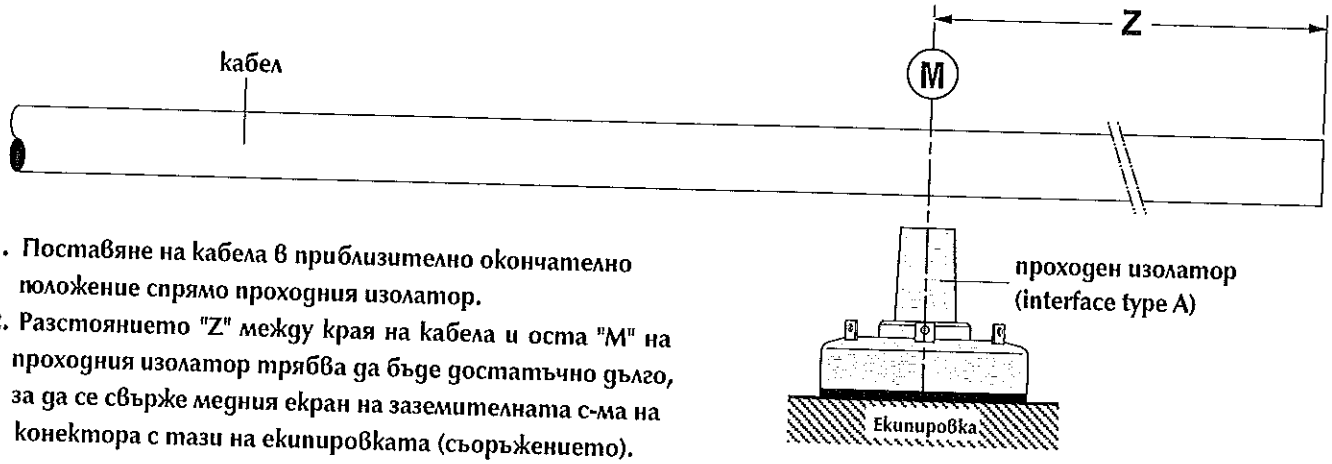
Отиди на стр. 6

90006BG-R/0

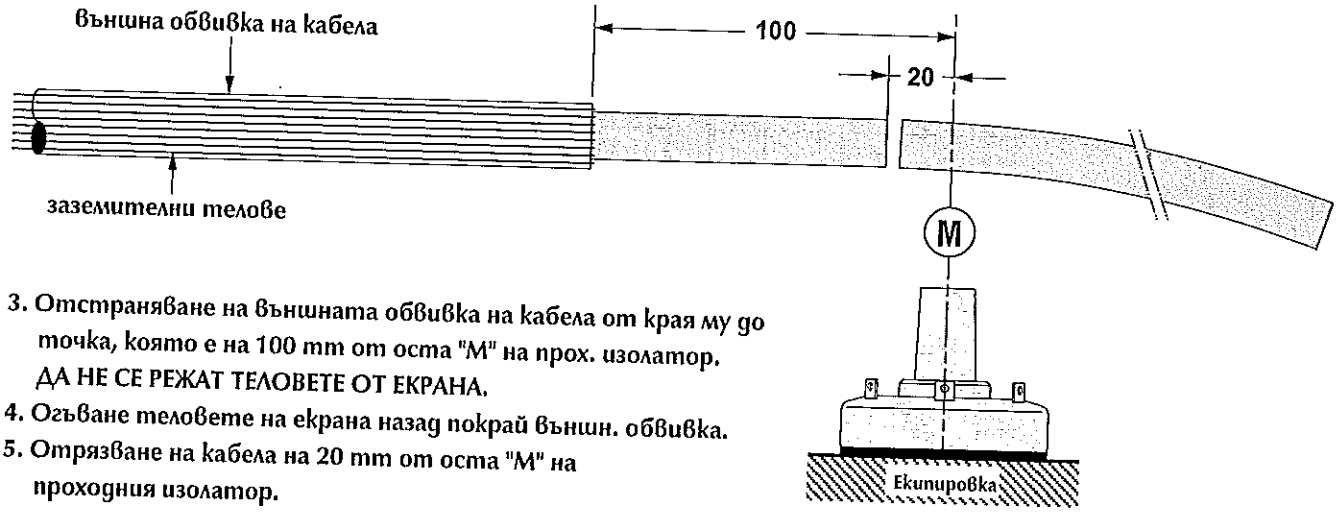
Този продукт трябва да се монтира от компетентен работник, който има разрешение да работи с високоволтова екипировка. Тези инструкции не са замислени като заместител на адекватния опит по условията на безопасност. Тези инструкции не заместват осигуряването за всеки възможен случай. Неспазването им може да доведе до увреждане на продукта и до сериозни и фатални загуби.
ВАЖНО: Кабелът и съедин. апаратура трябва да се изключат и обозначат преди началото на монтажа.

A С ограничено екструдиран полупр. слой

КАБЕЛНА РАЗДЕЛКА

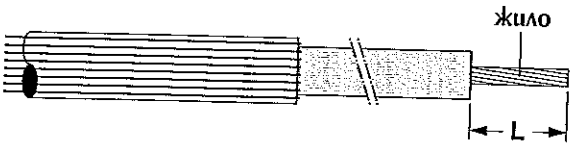


1. Поставяне на кабела в приблизително окончателно положение спрямо проходния изолатор.
2. Разстоянието "Z" между края на кабела и оста "M" на проходния изолатор трябва да бъде достатъчно дълго, за да се свърже медния екран на заземителната с-ма на конектора с тази на екипировката (съоръжението).

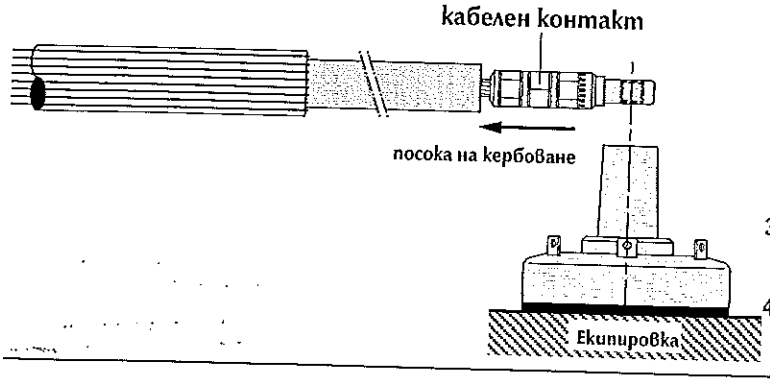


3. Отстраняване на външната обвивка на кабела от края му до точка, която е на 100 mm от оста "M" на прох. изолатор. ДА НЕ СЕ РЕЖАТ ТЕЛОВЕТЕ ОТ ЕКРАНА.
4. Огъване телоевете на екрана назад покрай външн. обвивка.
5. Отрязване на кабела на 20 mm от оста "M" на проходния изолатор.

КЕРБОВАНЕ НА КАБЕЛНИЯ КОНТАКТ

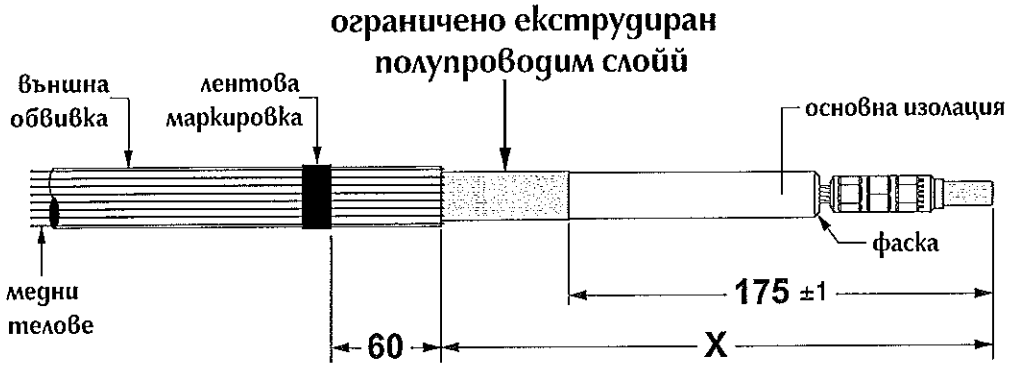


1. Отстраняване на осн. изолация от жилото на разстояние "L" от края на кабела:
   - за медно жило: L = 40 mm;
   - за алуминиево жило: L = 50 mm.
2. При алуминиево жило: преди монтирането на каб. контакт, жилото се почиства с телена четка.



3. Поставяне на каб. контакт, така че отворът му да е съосен с отвора на проходния изолатор.
4. Пресоване на кабелния контакт. СТАРАТЕЛНО ИЗБЪРСВАНЕ.

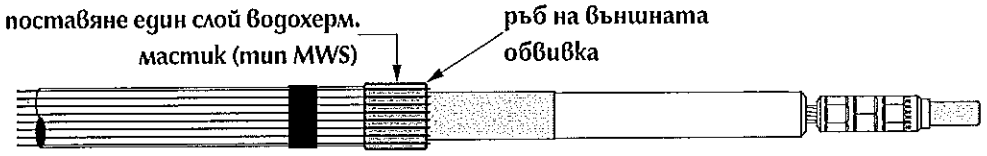
ПОДГОТОВКА НА КАБЕЛА И МОНТАЖ НА 11TL-АДАПТОРА (ако се изисква)

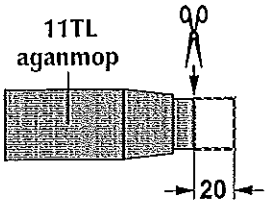


Използван адаптор	X (mm)
не	205
11TL	230

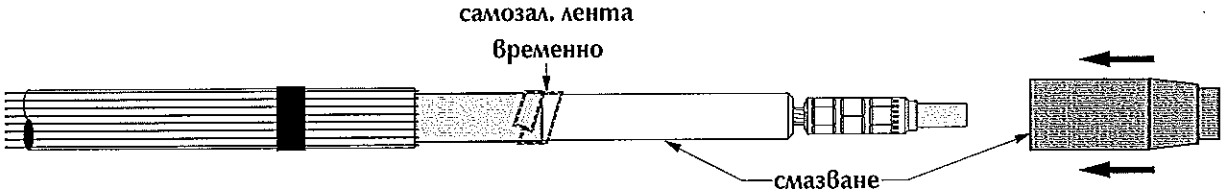
1. Отстраняване на външната обвивка на кабела до точка, която е на "X" mm от края на кабелния контакт.
2. Ако се използва адаптор 11TL, се поставя лентова маркировка на 60 mm от края на външната обвивка.
3. Отстраняване на полупроводимия слой на разстояние 175 ±1 mm от края на кабелния контакт.
4. Направа на малка фаска на края на основната изолация (2 mm max).
5. Ако не се използва адаптор 11 TL се продължава на стр. 8: "Монтаж на конектора".

6. ЗА ОТКРИТ МОНТАЖ
   Поставяне един слой водохерметизиращ мастик (тип MWS) върху външн. обвивка наравно с края й (min 25 mm шир.).
   Отново огъване на телovете назад покрай външната обвивка като се натискват в херметизиращия мастик.

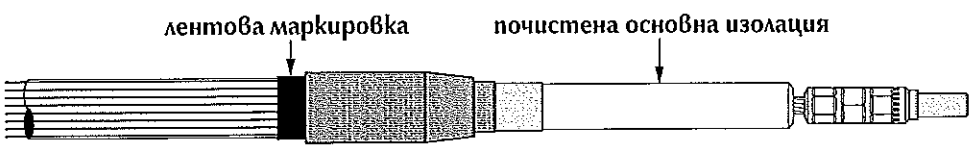




7. Отрязване пръстена на адаптора 11TL на разстояние 20 mm.



8. Като помощ при монтажа на адаптора се препоръчва да се навият един или два слоя самозалепваща се лента застъпващо върху края на полупроводимия слой.
9. Да се намаже* основната изолация и вътрешността на адаптора.



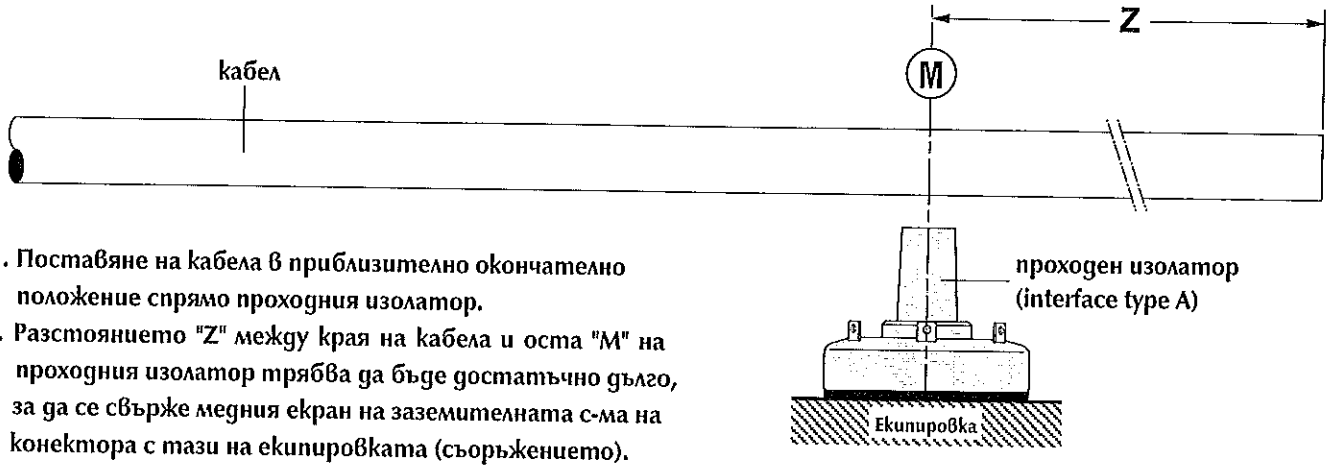
10. Плъзгане на адаптора над основната изолация, докато се изравни с лентовата маркировка.
11. Отстраняване на самозалепващата се лента, използвана в стъпка 8.
    ВНИМАТЕЛНО ПОЧИСТВАНЕ НА ОСНОВНАТА ИЗОЛАЦИЯ, ИЗПОЛЗВАЙКИ ПОЧИСТВАЩИТЕ МАТЕРИАЛИ.
    Избърсването винаги да става по посока телovете на екрана.

ПРЕМИНАВАНЕ НА СТРАНИЦА 8 ЗА МОНТАЖ НА КОНЕКТОРА

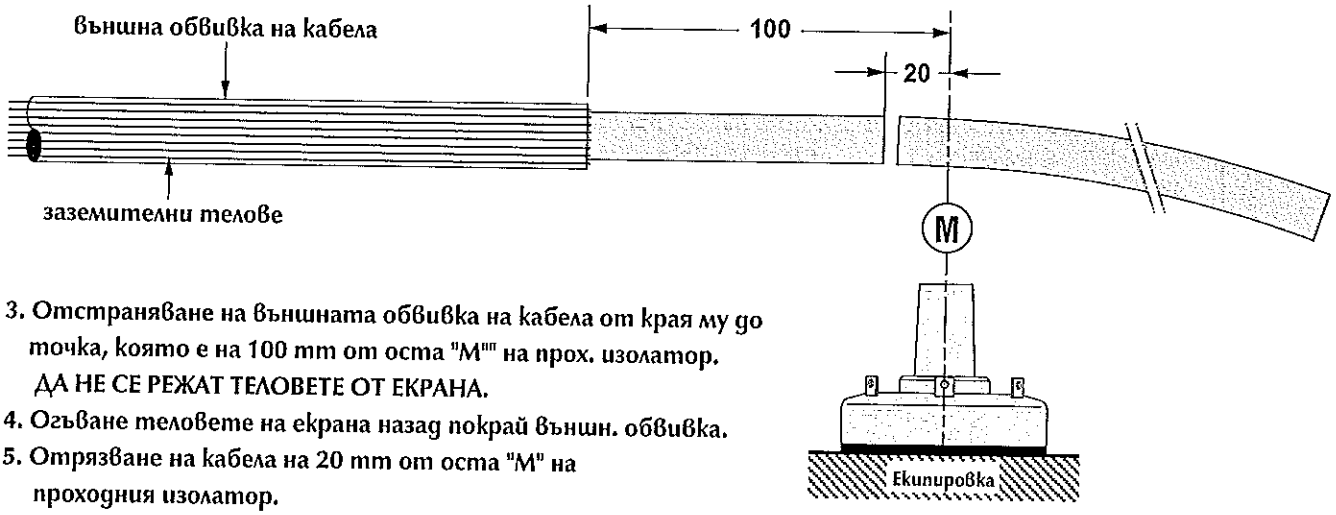
* Да се използва само поставената в комплекта силиконова смазка

B Свободно екструдиран полупров. слой

КАБЕЛНА РАЗДЕЛКА

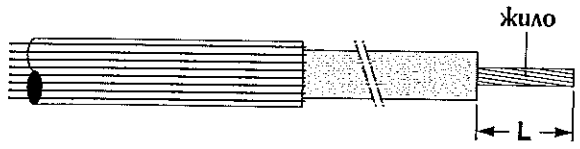


1. Поставяне на кабела в приблизително окончателно положение спрямо проходния изолатор.
2. Разстоянието "Z" между края на кабела и оста "M" на проходния изолатор трябва да бъде достатъчно дълго, за да се свърже медния екран на заземителната с-ма на конектора с тази на екипировката (съоръжението).

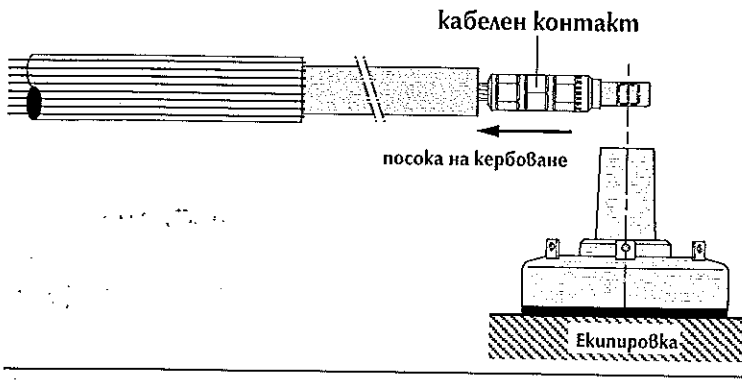


3. Отстраняване на външната обвивка на кабела от края му до точка, която е на 100 mm от оста "M"" на прох. изолатор. ДА НЕ СЕ РЕЖАТ ТЕЛОВЕТЕ ОТ ЕКРАНА.
4. Огъване теловетe на екрана назад покрай външн. обвивка.
5. Отрязване на кабела на 20 mm от оста "M" на проходния изолатор.

КЕРБОВАНЕ НА КАБЕЛНИЯ КОНТАКТ

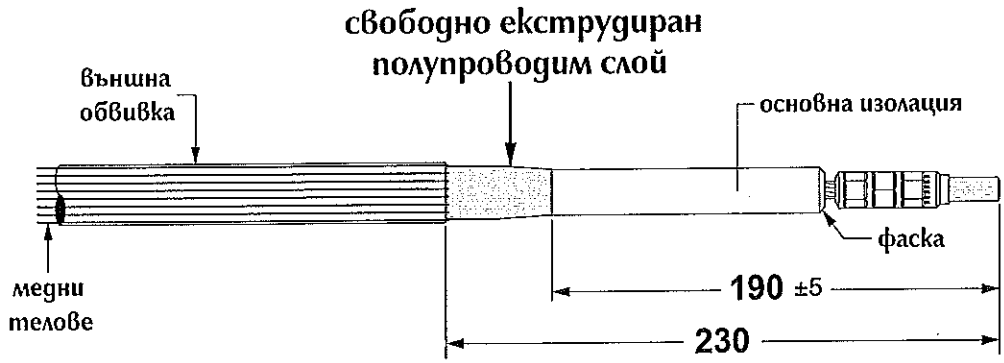


1. Отстраняване на осн. изолация от жилото на разстояние "L" от края на кабела:
   - за медно жило: L = 40 mm;
   - за алуминиево жило: L = 50 mm.
2. При алуминиево жило: преди монтирането на каб. контакт, жилото се почиства с телена четка.



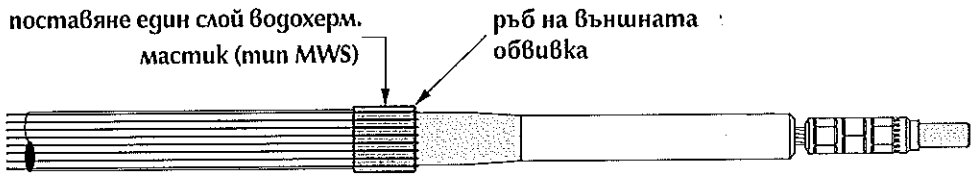
3. Поставяне на каб. контакт, така че отворът му да е съосен с отвора на проходния изолатор.
4. Пресоване на кабелния контакт; СТАРАТЕЛНО ИЗБЪРСВАНЕ.

ПОДГОТОВКА НА КАБЕЛА И МОНТАЖ НА 11 TL-АДАПТОРА

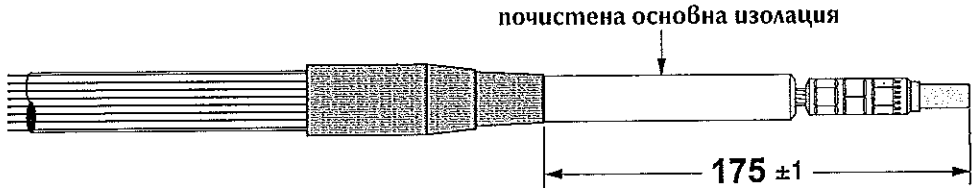


1. Отстраняване на външната обвивка на кабела до точка, която е на 230 mm от края на кабелния контакт.
2. Отстраняване на полупроводимия слой на разстояние 190 ±5 mm от края на кабелния контакт.
3. Направа на малка фаска на края на основната изолация (2 mm max).

4. ЗА ОТКРИТ МОНТАЖ
   Поставяне един слой водохерметизиращ мастик (тип MWS) върху външн. обвивка наравно с края ѝ (min 25 mm шир.). Отново огъване на теловете назад покрай външната обвивка като се натикват в херметизиращия мастик.



5. Да се намаже* основната изолация и вътрешността на адаптора.

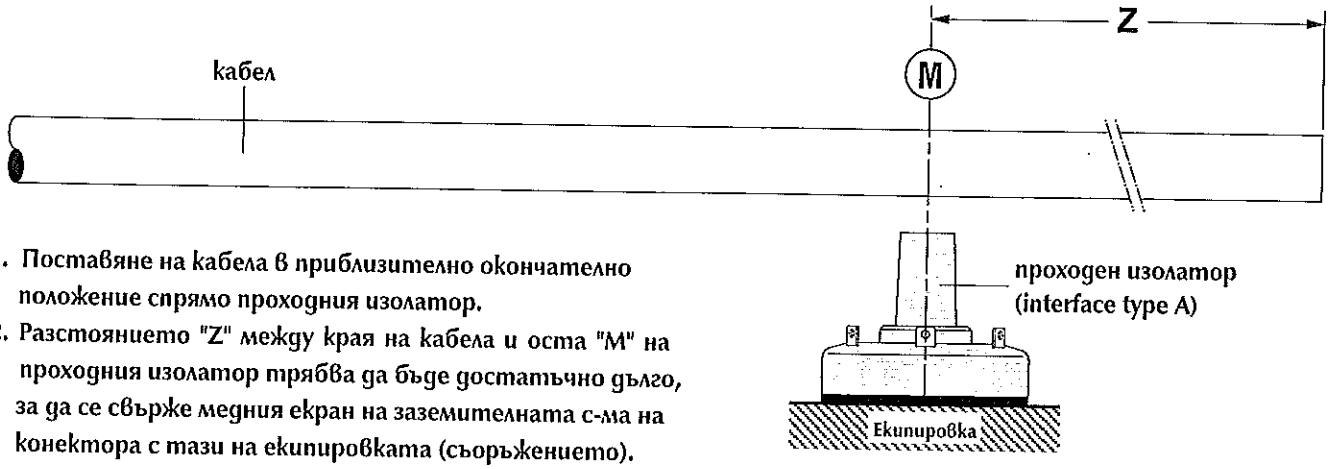


6. Плъзгане на адаптора над основната изолация до точка 175 ±1 mm от края на кабелния контакт.
   ВНИМАТЕЛНО ПОЧИСТВАНЕ НА ОСНОВНАТА ИЗОЛАЦИЯ, ИЗПОЛЗВАЙКИ ПОДХОДЯЩ РАЗТВОРИТЕЛ.
   Избърсването винаги да става по посока теловете на екрана.

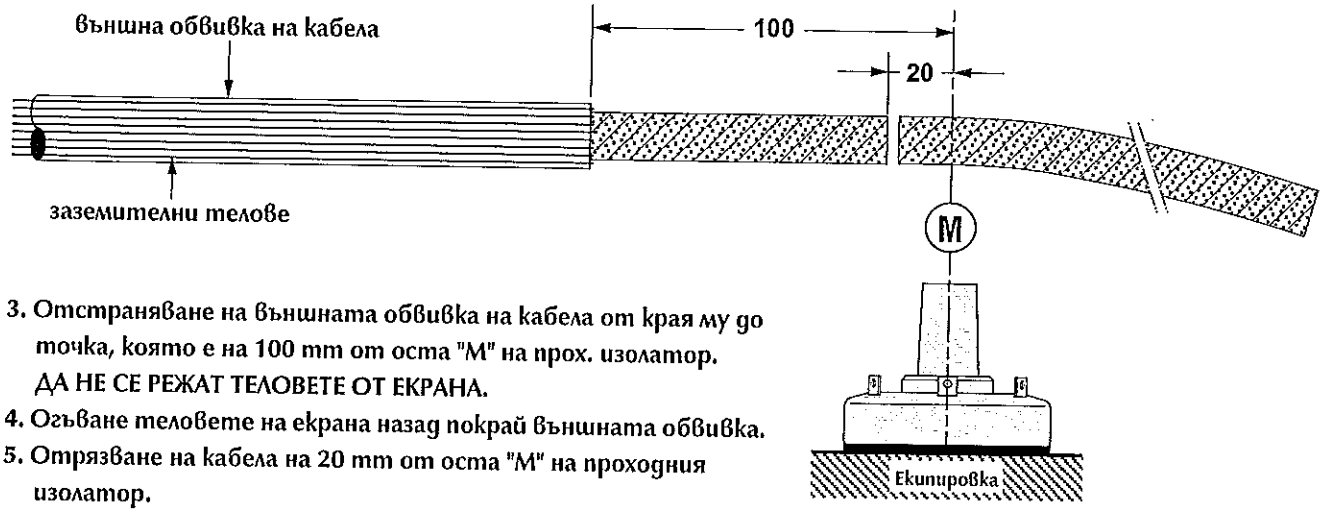
ПРЕМИНАВАНЕ НА СТРАНИЦА 8 ЗА МОНТАЖ НА КОНЕКТОРА

C Екран от графитна обмазка

КАБЕЛНА РАЗДЕЛКА

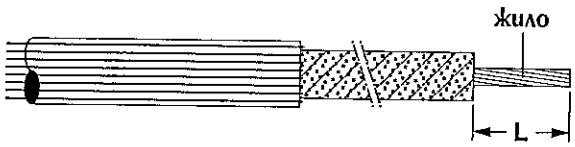


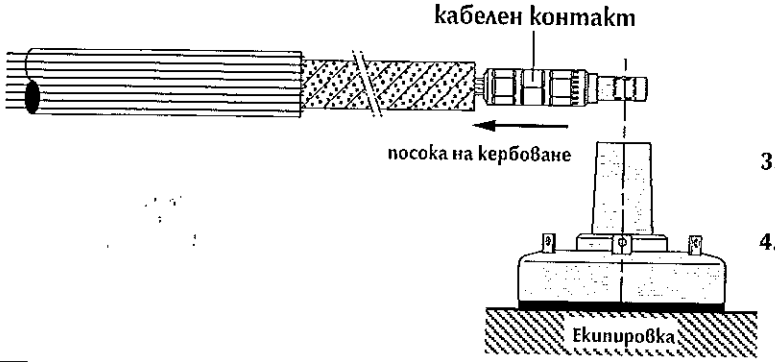
1. Поставяне на кабела в приблизително окончателно положение спрямо проходния изолатор.
2. Разстоянието "Z" между края на кабела и оста "M" на проходния изолатор трябва да бъде достатъчно дълго, за да се свърже медния екран на заземителната с-ма на конектора с тази на екипировката (съоръжението).



3. Отстраняване на външната обвивка на кабела от края му до точка, която е на 100 mm от оста "M" на прох. изолатор. ДА НЕ СЕ РЕЖАТ ТЕЛОВЕТЕ ОТ ЕКРАНА.
4. Огъване телоовете на екрана назад покрай външната обвивка.
5. Отрязване на кабела на 20 mm от оста "M" на проходния изолатор.

КЕРБОВАНЕ НА КАБЕЛНИЯ КОНТАКТ

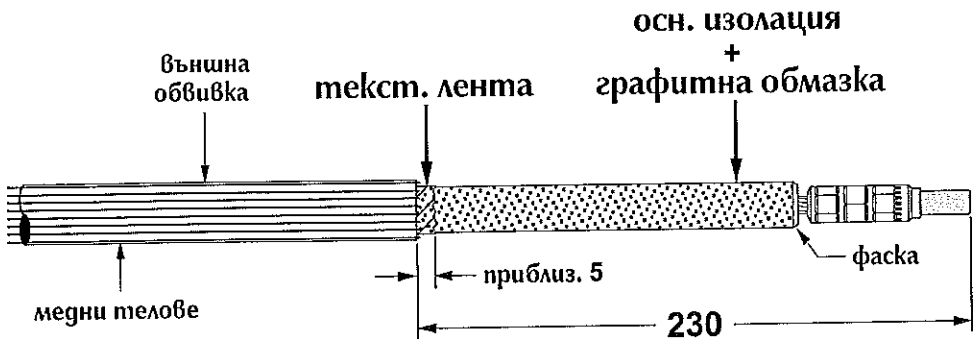




1. Отстраняване на осн. изолация от жилото на разстояние "L" от края на кабела:
   - за медно жило: L = 40 mm;
   - за алуминиево жило: L = 50 mm.
2. При алуминиево жило: преди монтирането на каб. контакт, жилото се почиства с телена четка.
3. Поставяне на каб. контакт, така че отворът му да е съосен с отвора на проходния изолатор.
4. Пресоване на кабелния контакт. СТАРАТЕЛНО ИЗБЪРСВАНЕ.

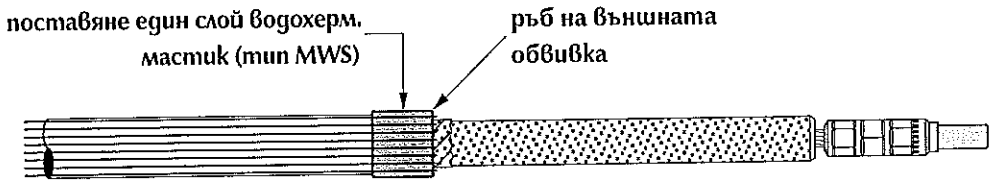
ВЯРНО С ОРИГИНАЛА

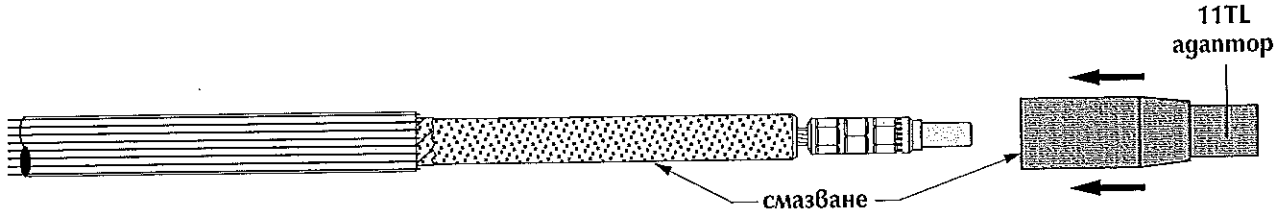
ПОДГОТОВКА НА КАБЕЛА И МОНТАЖ НА 11 TL-АДАПТОРА



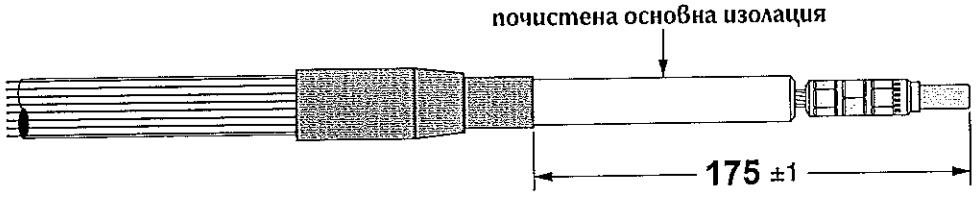
1. Отстраняване на външната обвивка на кабела до точка, която е на 230 mm от края на кабелния контакт.
2. Отстраняване на текстилната лента на разстояние приблизително 5 mm от края на външната обвивка.
   НА ТОЗИ ЕТАП ДА НЕ СЕ ОТСТРАНЯВА ГРАФИТНАТА ОБМАЗКА.
3. Направа на малка фаска на края на основната изолация (2 mm max).

4. ЗА ОТКРИТ МОНТАЖ
   Поставяне един слой водохерметизиращ мастик (тип MWS) върху външн. обвивка наравно с края ѝ (min 25 mm шир.).
   Отново огъване на теловете назад покрай външната обвивка като се натискват в херметизиращия мастик.





5. Да се намаже* основната изолация и вътрешността на адаптора.

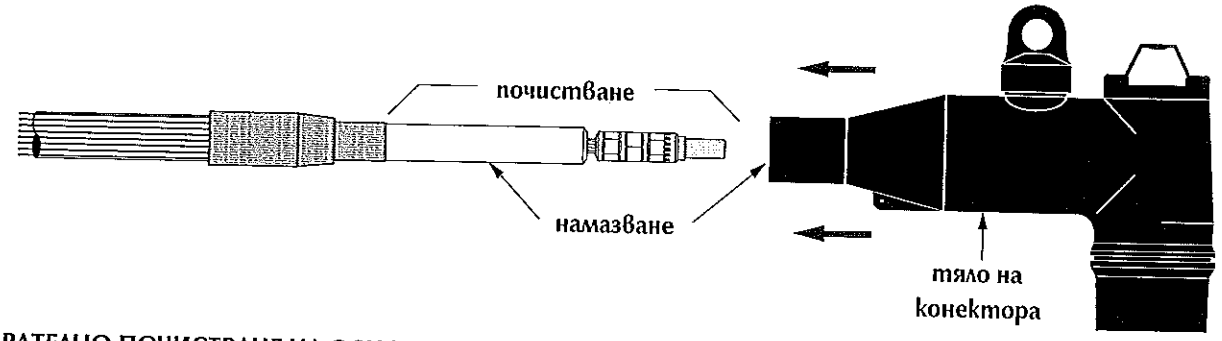


6. Плъзгане на адаптора над основната изолация до точка 175 ±1 mm от края на кабелния контакт.
   ВНИМАТЕЛНО ПОЧИСТВАНЕ НА ГРАФИТНАТА ОБМАЗКА, ИЗПОЛЗВАЙКИ ПОДХОДЯЩ РАЗТВОРИТЕЛ.
   Избърсването винаги да става по посока теловете на екрана.

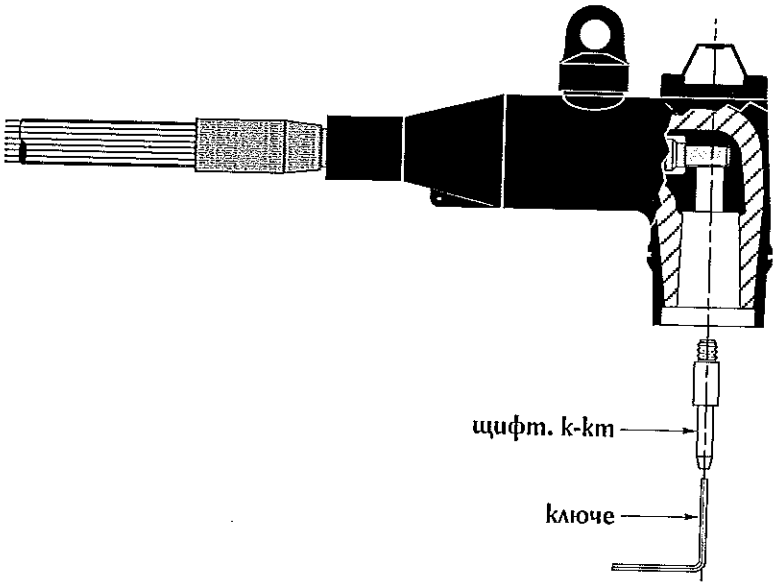
* Да се използва само поставената в комплекта силиконова смазка.

A B C **Прилага се при всички кабели**

МОНТАЖ НА КОНЕКТОРА И НА ЗАЗЕМИТЕЛНИЯ ЕКРАН

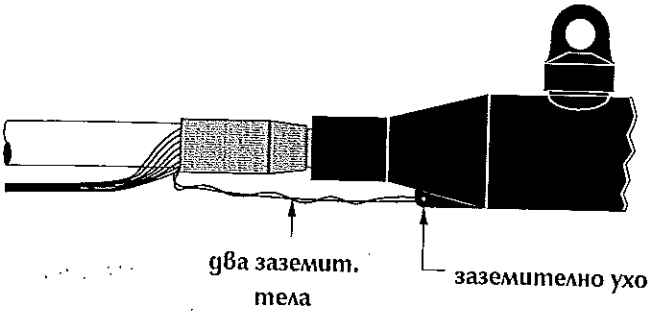


1. СТАРАТЕЛНО ПОЧИСТВАНЕ НА ОСНОВНАТА ИЗОЛАЦИЯ, ОТСТРАНЯВАЙКИ ВСИЧКИ ОСТАТЪЦИ ОТ ПОЛУПРОВОДИМИЯ СЛОЙ. Избърсването винаги да става по посока теловете на екрана.
2. Намазване* на основната изолация и вътрешната повърхнина на конектора.
3. Проверка на позиционирането на L-образния конектор спрямо отвора в ухото на кабелния контакт и тялото на конектора се плъзга спокойно по кабела, докато повече не може да се придвижи.

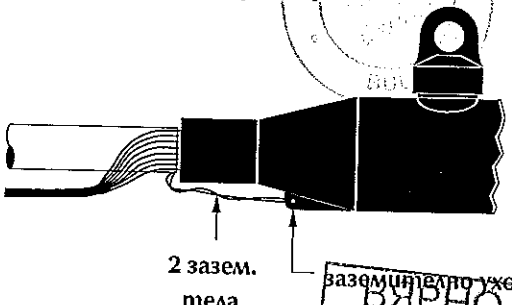


4. Поставяне с ръка на щифтовия контакт с резбата напред в съединителната част на конектора.
5. Завиване чрез шестостенното ключе от комплекта докато понататъшното навиване стане невъзможно.

Монтаж с 11TL-адаптор



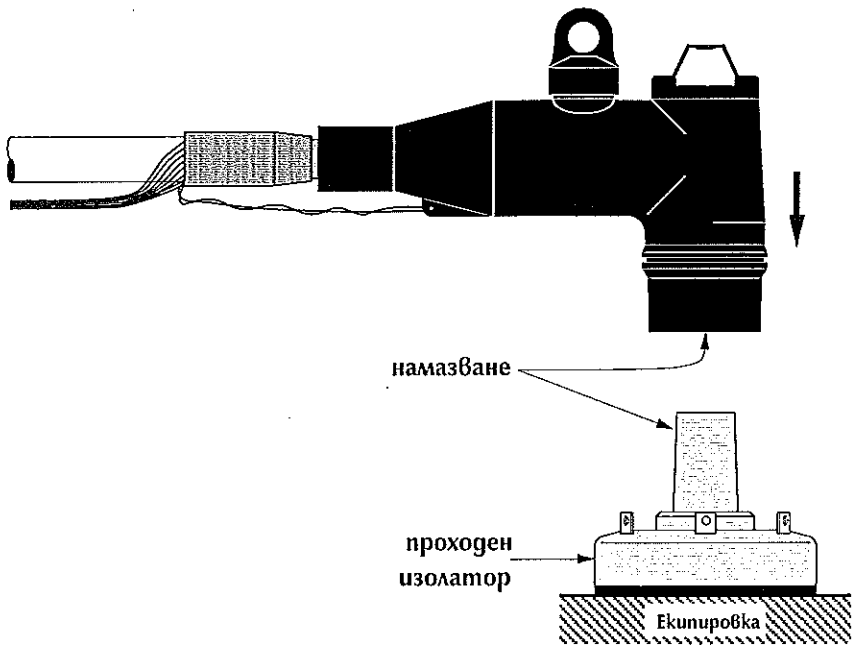
Монтаж без 11TL-адаптор



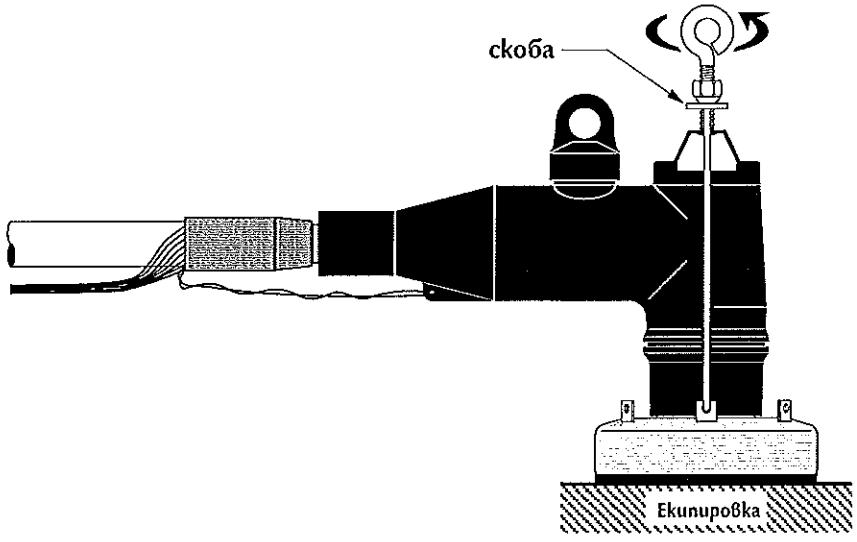
6. Свързване на заземит. екран на кабела чрез два от заземит. телове със зазем. ухо на конектора.

*Да се използва само поставената в комплекта силиконова смазка.

МОНТАЖ НА КОНЕКТОРА КЪМ ПРОХОДНИЯ ИЗОЛАТОР



1. Почистване и намазване* вътрешната повърхнина на конектора и външната повърхнина на проходния изолатор.
2. Набутване на конектора върху проходния изолатор.



3. Поставяне на скобата в ушите на проходния изолатор.
4. Позициониране на скобата и завиване на ухото-болт.

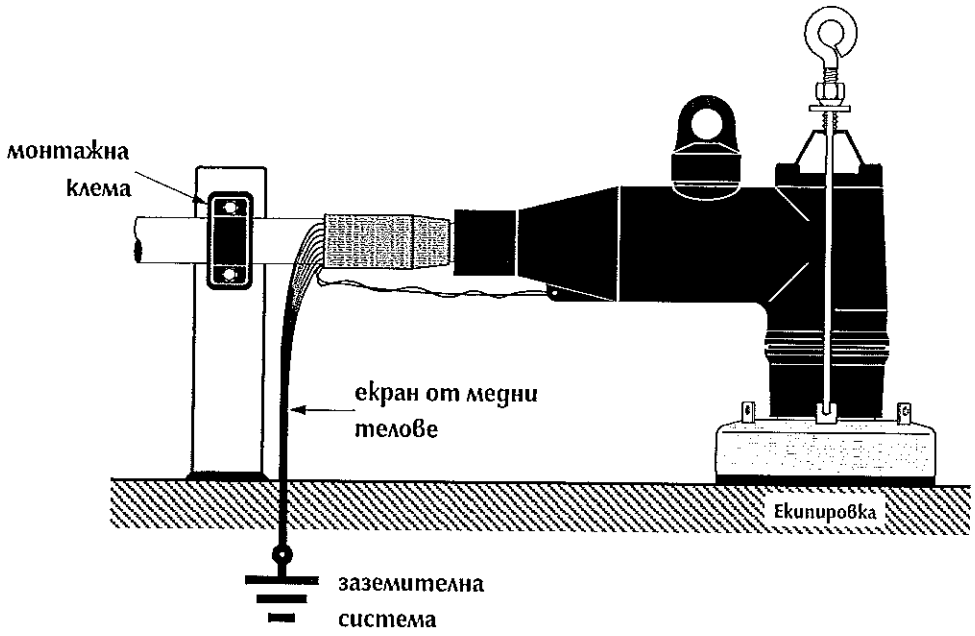
ДА НЕ СЕ ПРИЛАГА ПРЕКАЛЕНА СИЛА ВЪРХУ L-КОНЕКТОРА.

Нагласяване на контрагайката, така че ухото-болт сигурно да стои върху фиксатора. Контрагайката не позволява чрез ухото-болт да се прилага допълнително прекалено усилие върху конектора. Щом веднъж е нагласена контрагайката, тя не трябва да се пренастройва при вадене на конектора.

ВЯРНО С ОРИГИНАЛА

*Да се използва само поставената в комплекта силиконова смазка.

ЗАЗЕМЯВАНЕ НА ЕКРАНА И УКРЕПВАНЕ НА КАБЕЛА



1. Извиване назад на теловете от екрана и оформянето им като "свинска опашка".
2. Свързване на теловете от екрана със заземителната система.

БЕЛЕЖКА:

Комбинацията конектор/проходен изолатор не би могла да носи цялото тегло на кабела.

Необходимо е да се укрепи кабела възможно най-близко до конектора.

ВАЖНИ БЕЛЕЖКИ:

- Никога да не се съединява или разединява конектора без да са инсталирани преди това неговите съставни части.
- Да не се използват хидрокарбонови масла и разредители, защото разлагат EPDM гумата. В случай на замърсяване, повърхнините да се избърсват със сух парцал.

Euromold
a Nexans company

"МАКРИС-ГПХ" ООД
Промишлена зона "Орион", ул. "3020" №34
1360 СОФИЯ, БЪЛГАРИЯ
тел.: +359 (0)2/920 41 43, телефакс: +359 (0)2/20 29 20

Внимание: Да се прочетат инструкциите преди началото на монтажа.

Инструкции за монтаж

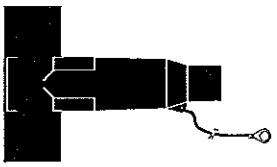
(K),(M)400TB/G

Разглобяем Т-образен конектор - тип С

Да се използва само за кабели с екран от медни телове
и екструдиран полупроводим слой (Част А) или графитен полупроводим слой (Част В)

Нужните компоненти за монтаж на конектора:

1 x Тяло на конектора - 400BT/G



1 x Кабелен редуцир - 411CA-W

1 x Клемна шпилка - 400TCS

1 x Кабелен контакт (обувка) - TBC-X или TMBC-X

1 x Осн. изолационна тапа + капачка - 400BIPA

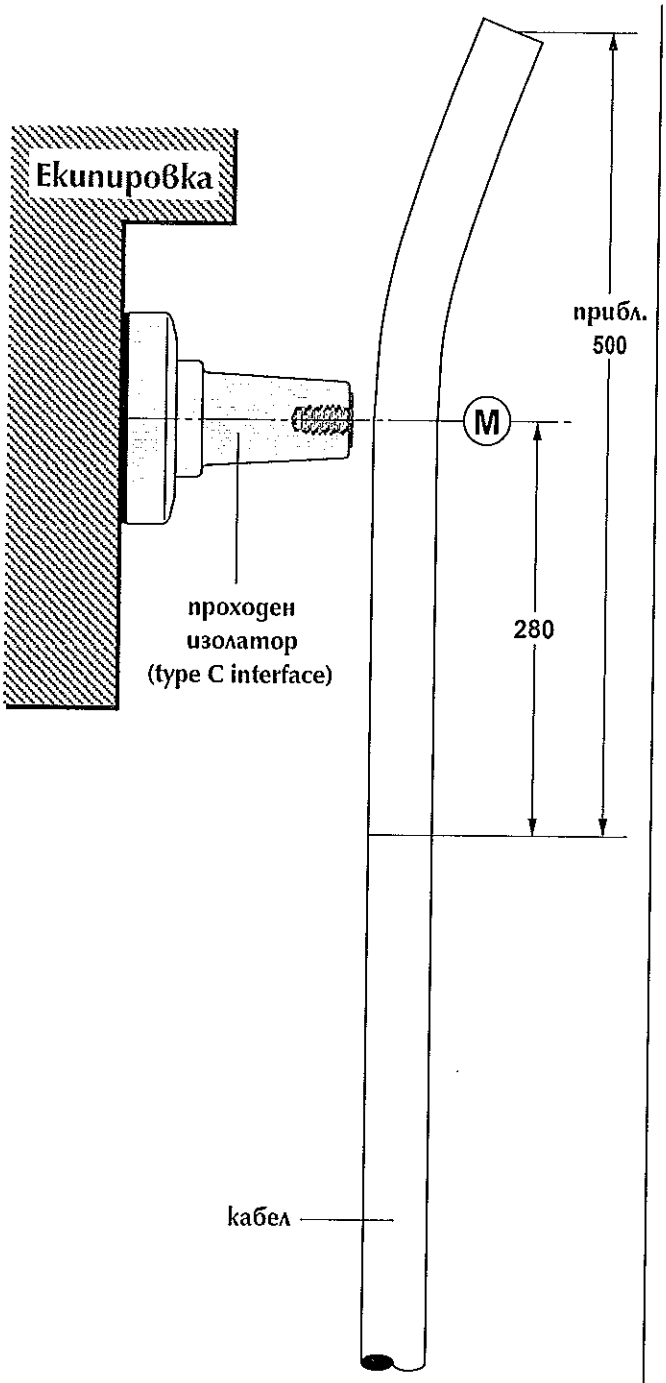
- Мастик за контрол на полето, тип MFC
- Силиконова смазка + почистващи материали
- Инструкции за монтаж + схема на кабелната разделка

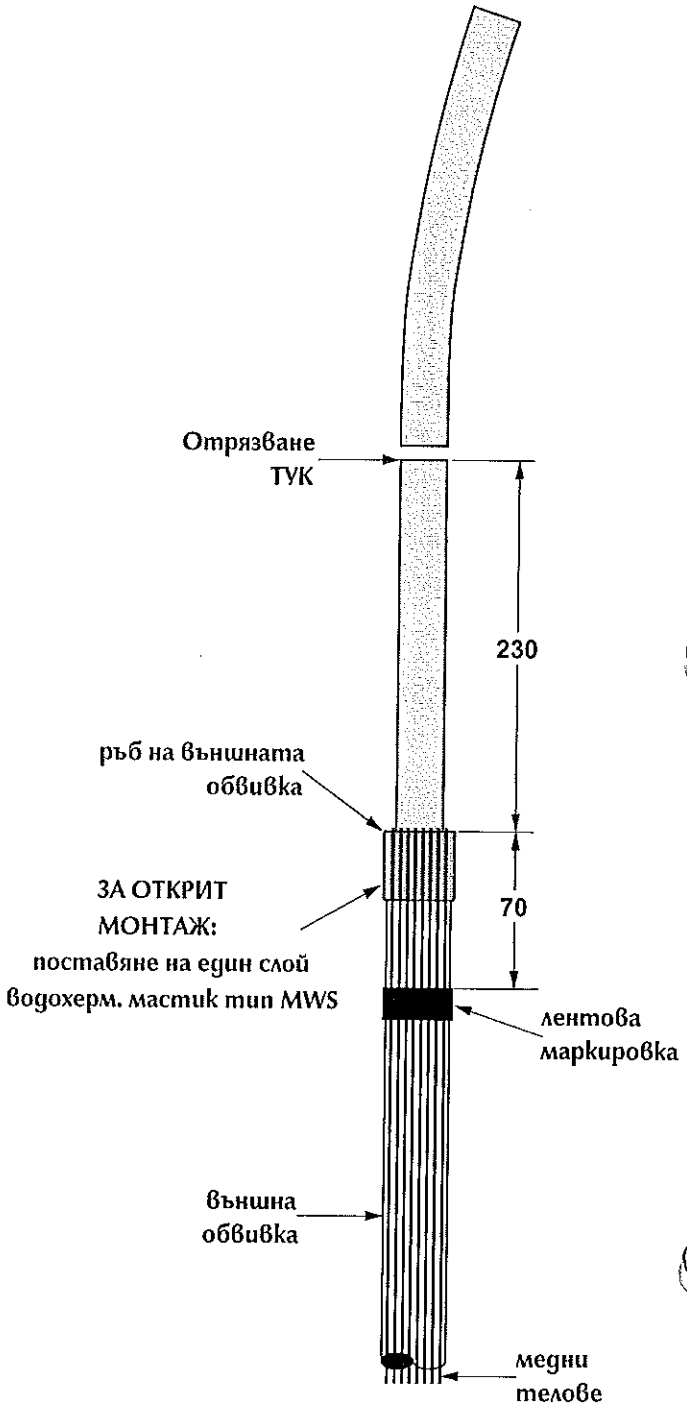
Допълнителни компоненти, зависещи от приложението и типа на кабела (само по заявка):

- Полупроводима лента, тип TSC, за кабел с графитен полупроводим слой;
- Водохерметизиращ мастик, тип MWS, само за открит монтаж.

90358BG-R/0

Този продукт трябва да се монтира от компетентен работник, който има разрешение да работи с високоволтова екипировка. Тези инструкции не са замислени като заместител на адекватния опит по условията на безопасност. Тези инструкции не заместват осигуряването за всеки възможен случай. Неспазването им може да доведе до увреждане на продукта и до сериозни и фатални загуби.
ВАЖНО: Кабелът и съедин. апаратура трябва да се изключат и обозначат преди началото на монтажа.





1. Поставяне на кабела в приблизително окончателно положение спрямо проходния изолатор.
2. Отстраняване на външн. обвивка на кабела от края му до точка, която е на 280 mm от оста «M».
3. Поставяне на лентова маркировка на 70 mm от ръба на външната обвивка. При вътрешен монтаж теловете от екрана се огъват назад покрай външната обвивка, след което се продължава със стъпка 4.

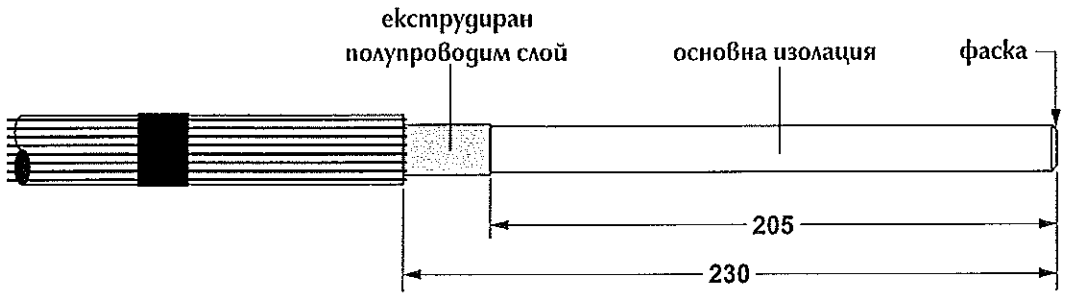
   ЗА МОНТАЖ НА ОТКРИТО:

   - Поставяне един слой водохерметизиращ мастик, тип MWS, върху външната обвивка наравно с края й (min 25 mm шири на), като трябва кабелът напълно да се обгърне.
   - Огъване теловете на екрана назад покрай външн. обвивка и натикване на същите в херметизиращия мастик.

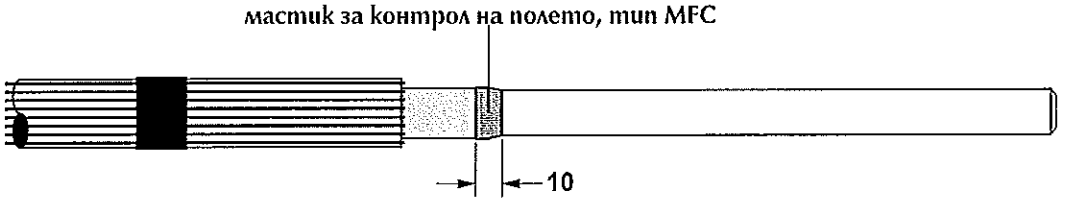
   ВАЖНО: Теловете от екрана не трябва да се допират един до друг, когато се напъхват в мастика, за да се предотвра ти влизането на вода.
4. Отрязване на кабела на 230 mm от края на външн. обвивка.

КАБЕЛНА РАЗДЕЛКА

Част А | Кабел с екран от медни телове и екструд. полупров. слой



1. Проверка на разстоянието от 230 mm.
2. Отстраняване на полупроводимия слой на разстояние 205 mm от края на кабела.
   За ограничено екструдиран полупроводим слой: да се сваля като се щади основната изолация.
   За свободно екструдиран полупроводим слой (тип "банан"): да се сваля с подходящ инструмент.
3. Направа на малка фаска на края на основната изолация.

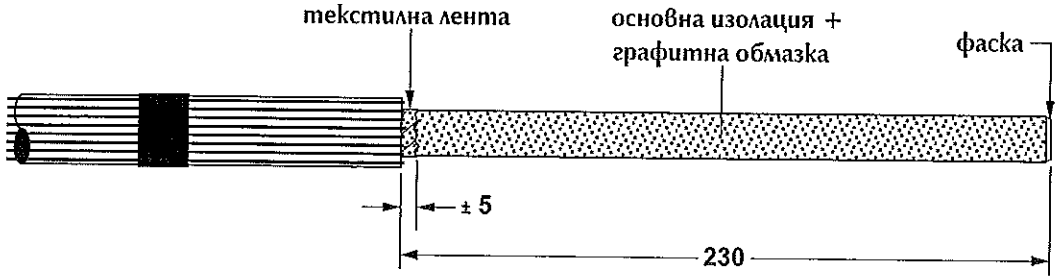


4. Отстраняване на опаковъчната хартия от мастика за контрол на полето, тип MFC.
5. Внимателно мастикът се разтегля от единия край, като се внимава да не се скъса.
6. Позиционира се мастика, така че да покрива приблизително 5 mm от полупроводимия слой и 5 mm от основната изолация.
7. Притискайки мастика в мястото на разтягане се навива, докато се припокрият двата края и се къса излишното.
8. Използвайки опаковъчната хартия плътно се притиска мастика върху полупроводимия екран.

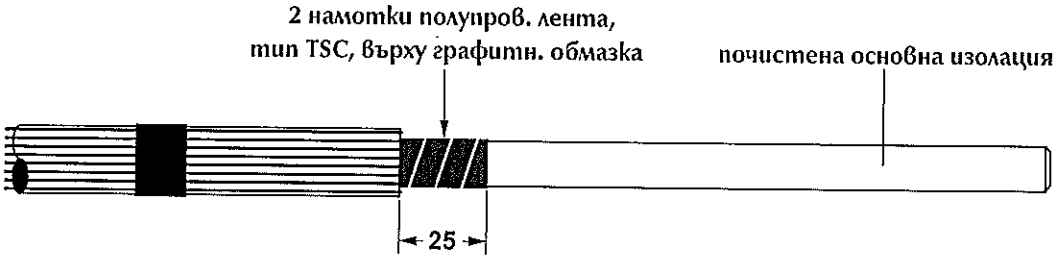
ПРЕМИНАВАНЕ НА СТРАНИЦА 5 ЗА МОНТАЖ НА КАБЕЛНИЯ РЕДУЦИР

КАБЕЛНА РАЗДЕЛКА

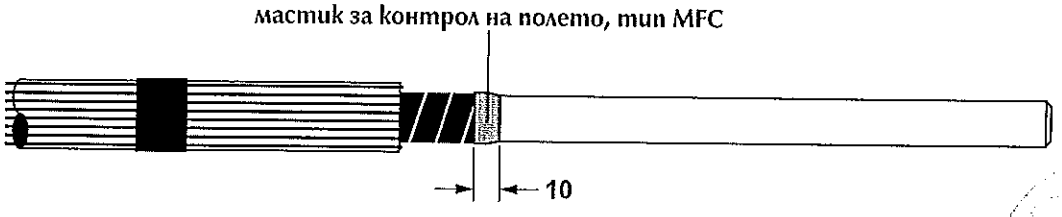
Част B | Кабел с екран от медни телове и граф. полупров. слой



1. Проверка на разстоянието от 230 mm.
2. Отстраняване на текстилната лента на приблизително 5 mm от външната обвивка.
   НА ТОЗИ ЕТАП ДА НЕ СЕ ОТСТРАНЯВА ГРАФИТНАТА ОБМАЗКА.
3. Направа на малка фаска на края на основната изолация.



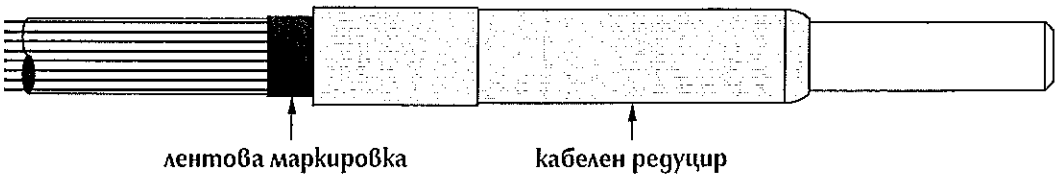
4. Навиване на 2 намотки от полупроводима лента, тип TSC, върху графитната обмазка на 25 mm от външната обвивка.
5. ВНИМАТЕЛНО ОТСТРАНЯВАНЕ НА ГРАФИТНАТА ОБМАЗКА ДО ПОЛУПРОВОДИМАТА ЛЕНТА, ИЗПОЛЗВАЙКИ ПОДХОДЯЩ РАЗТВОРИТЕЛ.



6. Отстраняване на опаковъчната хартия от мастика за контрол на полето, тип MFC.
7. Внимателно се разтегля мастика от единия край, като се внимава да не се скъса.
8. Позиционира се мастика, така че да покрива приблизително 5 mm от полупроводимата лента и 5 mm от основната изолация.
9. Притискайки мастика в мястото на разтегляне се навива, докато се припокрият двата края и излишното се къса.
10. Използвайки опаковъчната хартия плътно се притиска мастика върху полупроводимата лента.

ВЯРНО С ОРИГИНАЛА

МОНТАЖ НА КАБЕЛНИЯ РЕДУЦИР

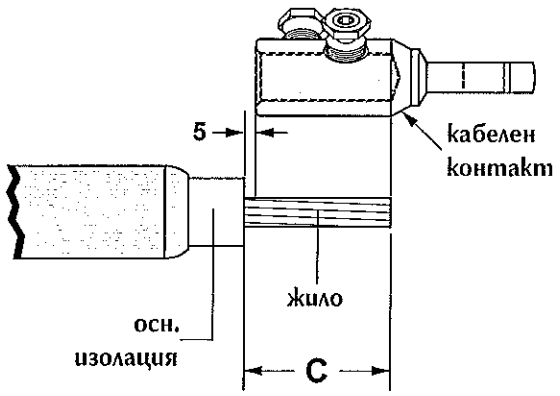


1. ОТСТРАНЯВАНЕ НА ВСИЧКИ ОСТАТЪЦИ ОТ ПОЛУПРОВОДИМИЯ СЛОЙ ВЪРХУ ОСНОВНАТА ИЗОЛАЦИЯ. Избърсването винаги да става по посока теловете на екрана.
2. Почистване и намазване* на основната изолация и вътрешната повърхнина на кабелния редуцир. Плъзгане на редуцира по основната изолация, докато края му се изравни с лентовата маркировка.

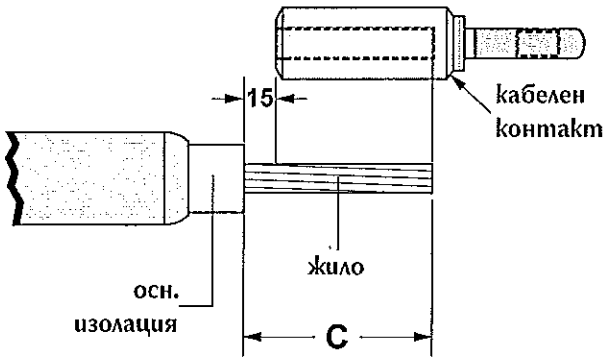
ПРЕСОВАНЕ НА КАБЕЛНИЯ КОНТАКТ

Моля използвайте една от двете схеми съгласно вида на кабелния контакт.

А. Винтов кабелен контакт



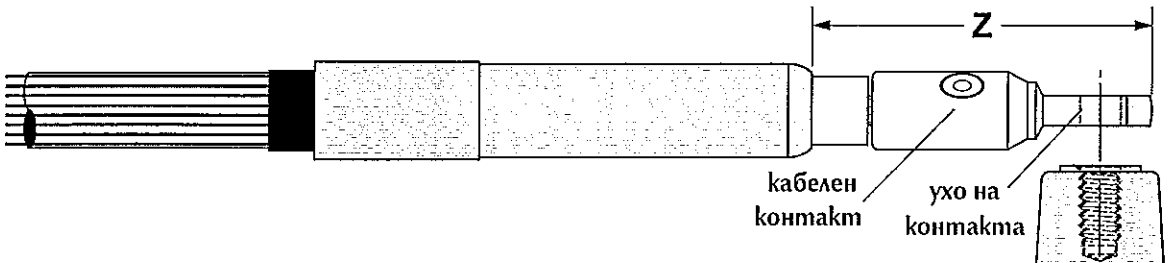
В. Пресов кабелен контакт



1А. За винтов кабелен контакт: отстраняване на основната изолация от жилото на разстояние "С" mm (С = дълбочината на отвора в кабелния контакт + 5 mm).

1В. За пресов кабелен контакт: отстраняване на основната изолация от жилото на разстояние "С" mm (С = дълбочината на отвора в кабелния контакт + 15 mm).

2. При алуминиево жило: преди монтирането на кабелния контакт, жилото се почиства с телена четка.

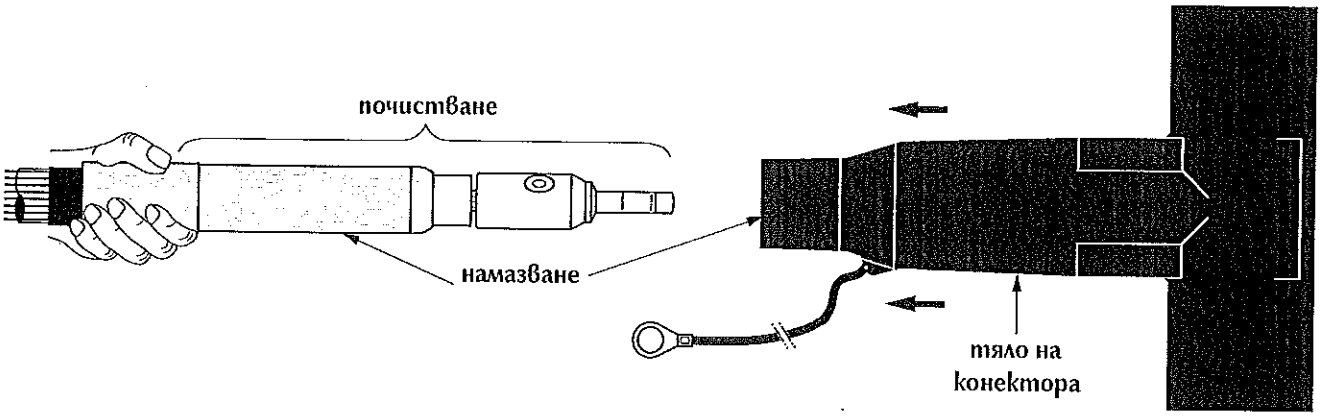


3. Поставяне на кабелния контакт върху жилото.
4. Позициониране на кабелния контакт, така че отворът му да е съосен с отвора на проходния изолатор.
5. Разстоянието «Z» преди кербоване трябва да бъде между 150 и 160 mm.
6. Пресоване на кабелния контакт.
7. След пресоването разстоянието «Z» трябва да бъде между 155 и 165 mm.
8. ОТСТРАНЯВАНЕ НА ЧЕПЪЦИ ОТ ПРЕСОВАНЕТО И СТАРАТЕЛНО ИЗБЪРСВАНЕ.

проходен изолатор

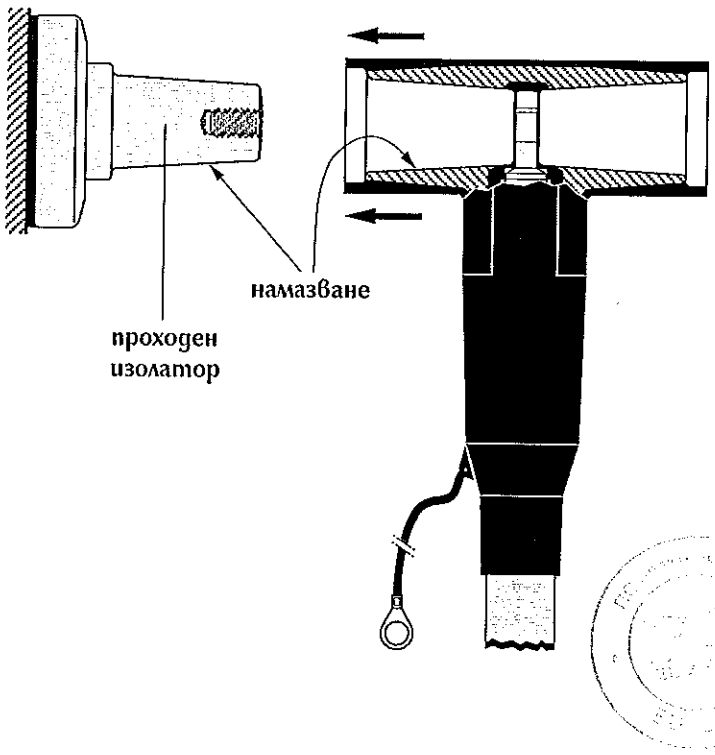
*Да се използва само поставената в комплекта силиконова смазка

МОНТАЖ НА КОНЕКТОРА



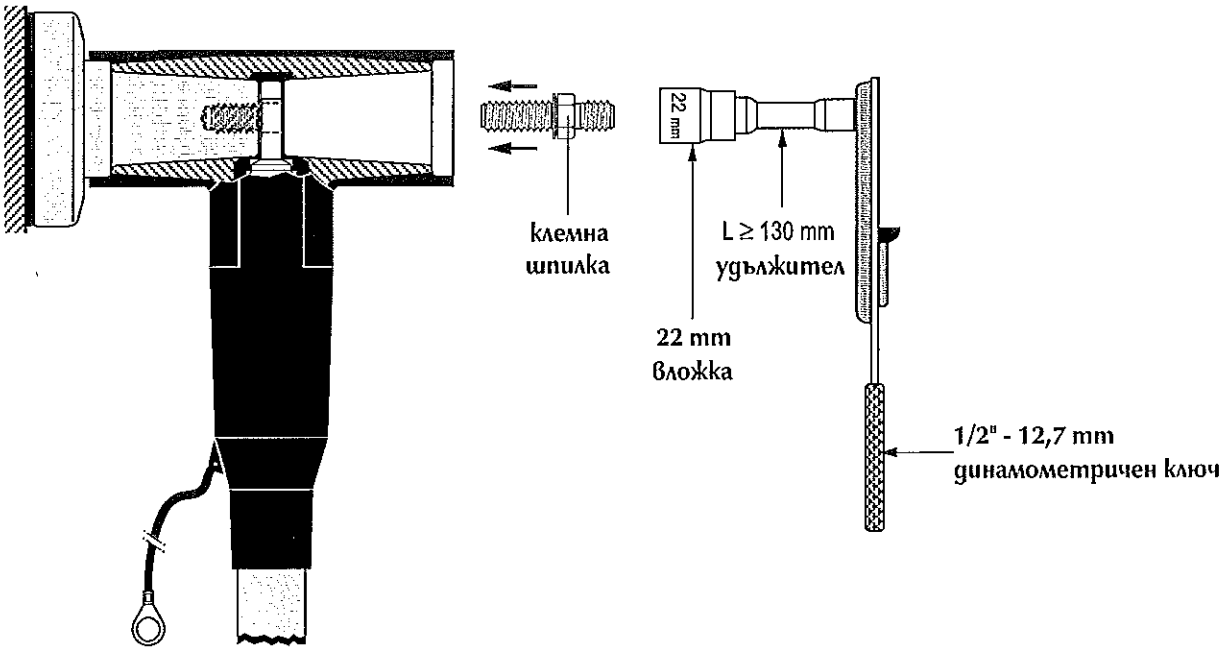
1. Почистване и намазване* вътрешната повърхнина на конектора и външната повърхнина на кабелния редуцир.
2. Проверка на позиционирането на Т-образния конектор спрямо ухото на кабелния контакт и като се придържа превантивно кабелния редуцир, тялото на конектора се плъзга спокойно по кабела, докато повече не може да се придвижи назад.
3. Проверка дали кабелния редуцир е останал на мястото си повреме на монтажа и отстраняване на лент. маркировка.

МОНТАЖ НА КОНЕКТОРА КЪМ ПРОХОДНИЯ ИЗОЛАТОР



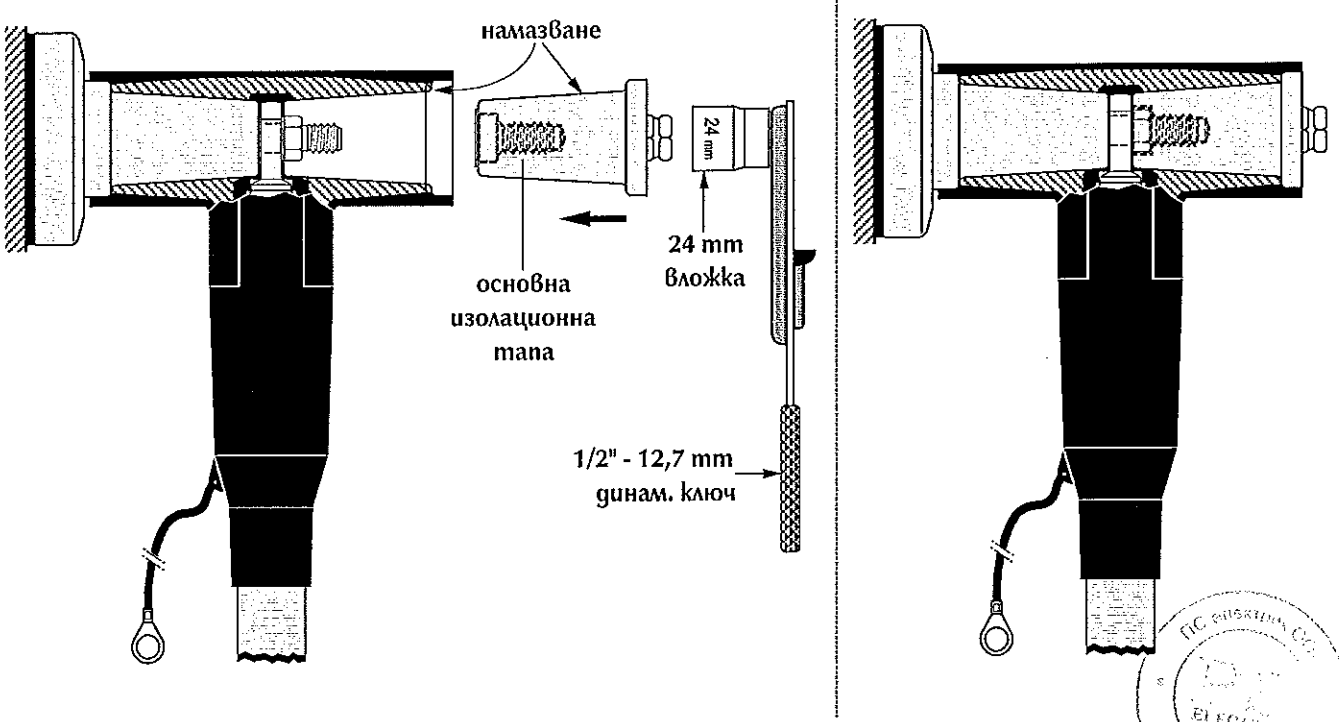
1. Почистване и намазване* вътрешната повърхнина на конектора и външната повърхнина на проходния изолатор.
2. Набутване на конектора върху проходния изолатор (ВИЖ ВАЖНИТЕ БЕЛЕЖКИ ОТ СТРАНИЦА 8).

*Да се използва само поставената в комплекта силиконова смазка



3. Поставяне на клемната шпилка в резбовия отвор на проходния изолатор.
4. Използвайки динамометричен ключ с вложка 22, се завива с въртящ момент 50 Nm.

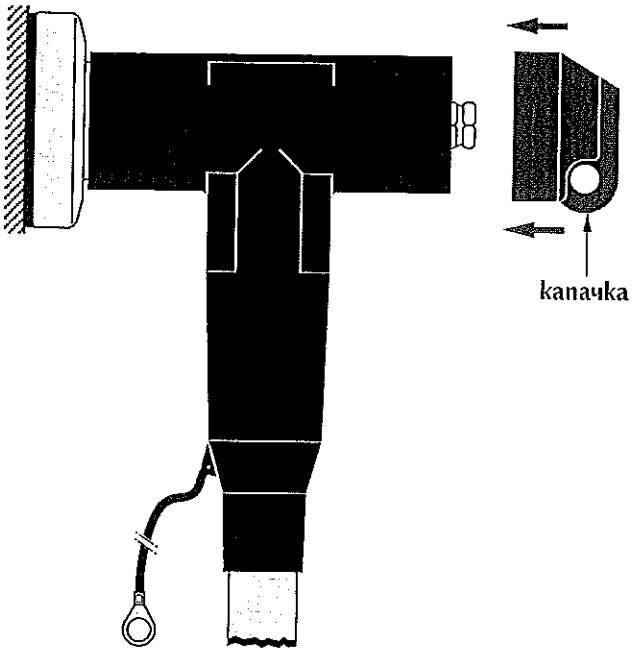
(ВИЖ ВАЖНИТЕ БЕЛЕЖКИ ОТ СТРАНИЦА 8).



5. Почистване и намазване* на основната изолационна тапа и задната вътрешна повърхнина на конектора.
6. Поставяне на тапата в конектора, зацепване с резбата на клемната шпилка и навиване на ръка.
7. Използвайки динамометричен ключ с вложка 24 се завива тапата с въртящ момент 50 Nm.

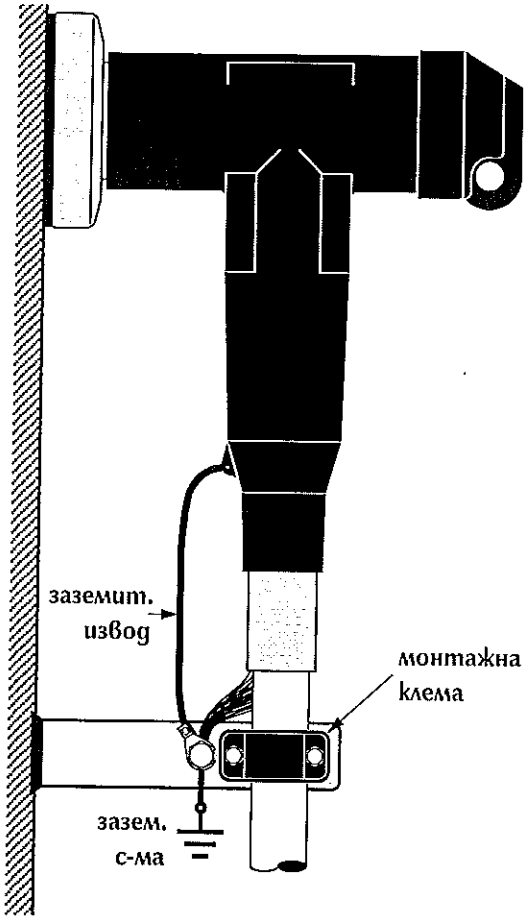
(ВИЖ ВАЖНИТЕ БЕЛЕЖКИ ОТ СТРАНИЦА 8).

*Да се използва само поставената в комплекта силиконова смазка.



8. Почистване на вътрешната повърхнина на капачката (не се маже) и поставяне върху конектора. Здраво да се притисне, докато щракне в мястото си.

ЗАЗЕМЯВАНЕ НА ЕКРАНА И УКРЕПВАНЕ НА КАБЕЛА



1. Оплитане на теловете на екрана покрай външната обвивка на кабела под формата на опашка.
2. Свързване на заземителния извод на конектора и екрана на кабела със заземителната система.

БЕЛЕЖКА:

Комбинацията конектор / проходен изолатор не би могла да носи цялото тегло на кабела. Необходимо е да се укрепи кабела възможно най-близко до конектора.

ВАЖНИ БЕЛЕЖКИ:

- За да се постигне коректния въртящ момент не трябва да се намазват резбовите части.
- Никога да не се съединява или разединява конектора без да са инсталирани преди това неговите съставни части.
- Да не се използват хидрокарбонови масла и разредители, защото разлагат EPDM гумата. В случай на замърсяване повърхнините да се избърсват със сух парцал.

Euromold
a Nexans company

"МАКРИС-ГПХ" ООД
Промишлена зона "Орион", ул. "3020" №34
1360 СОФИЯ, БЪЛГАРИЯ
тел.: +359 (0)2/920 41 43, телефакс: +359 (0)2/20 29 20

ОБОСОБЕНА ПОЗИЦИЯ 1
ЧАСТ 2

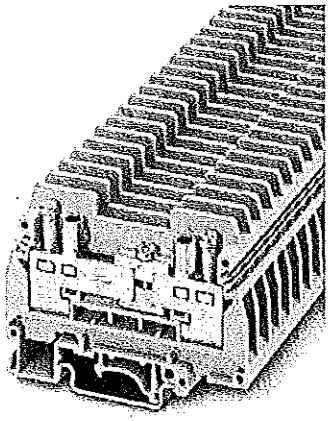
Приложение 18

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

Product notes

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

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)

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

ВЯРНО С ОРИГИНАЛА

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

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

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

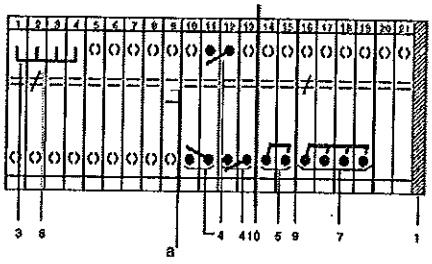
0311728	PSBJ-URTK/S BK	Female test connector, Color: black
0311757	PSBJ-URTK/S BU	Female test connector, Color: blue
0311760	PSBJ-URTK/S GN	Female test connector, Color: green
0311744	PSBJ-URTK/S RD	Female test connector, Color: red
0311773	PSBJ-URTK/S VT	Female test connector, Color: violet
0311731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

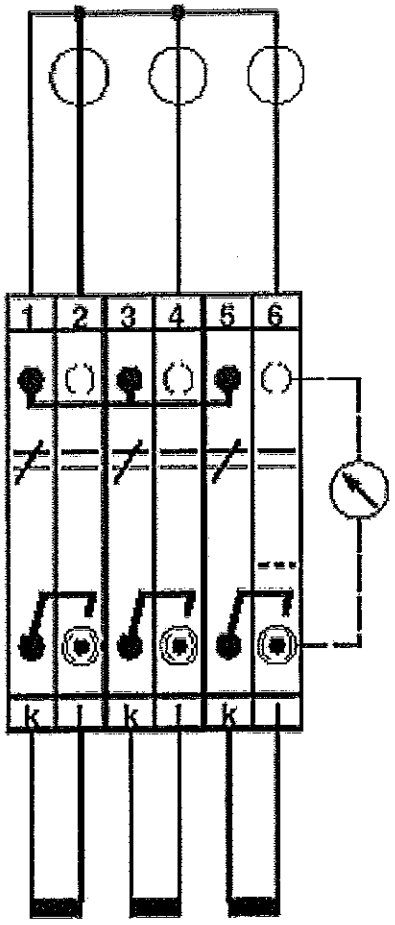
Diagrams/Drawings

Circuit diagram

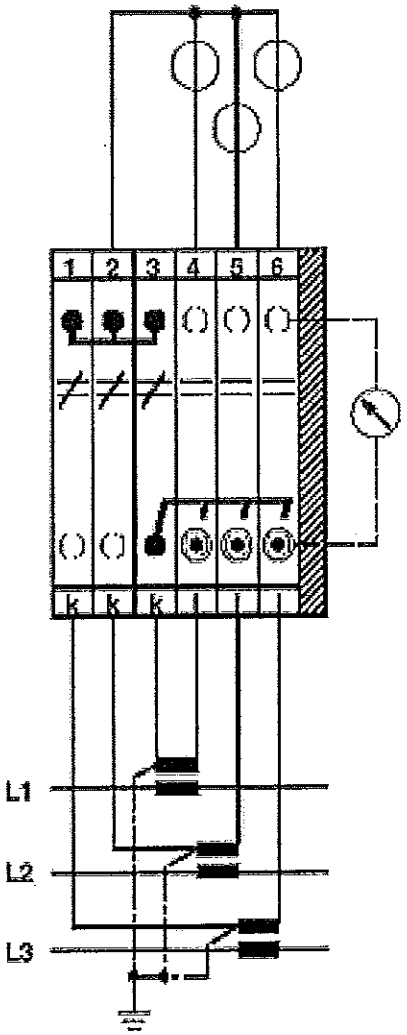


a = open
1 = cover
3 = fixed bridge
4 = switch bar, for 2 terminal blocks, useable on both sides of the disconnect point, inward switching motion
5 = switch bar, for 2 terminal blocks, useable on both sides of the disconnect point, outward switching motion
7 = switch bar, for 3-phasige short-circuiting 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

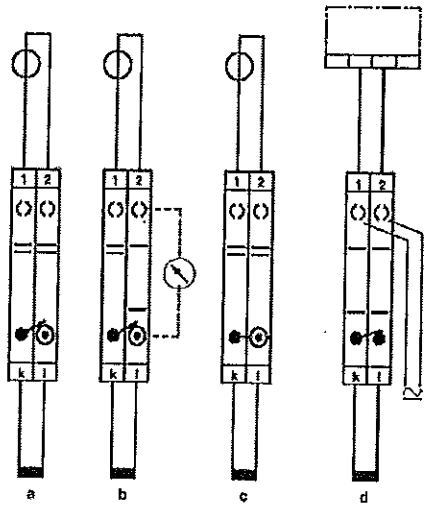
Schematic diagram



Three-phase transducer test set



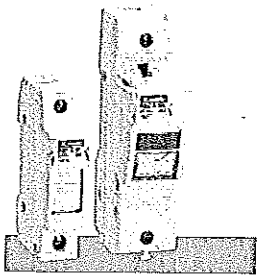
Three-phase linked transducer test set



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

Address

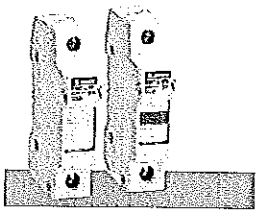
PHOENIX CONTACT GmbH & Co. KG
Flachsmarktstr. 8
32825 Blomberg,Germany
Phone +49 5235 3 00
Fax +49 5235 3 41200
http://www.phoenixcontact.com



Page 12-2

AC FUSE HOLDERS

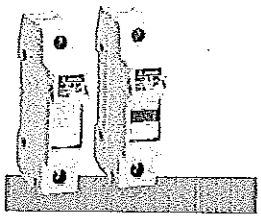
- Version without indicator: 1P, 1P+N, 2P, 3P, 3P+N
- Version with indicator: 1P
- For fuses 10x38, 14x51 and 22x58mm IEC class gG or aM.
- Rated current: 32A, 50A, 125A
- Rated voltage: 690VAC.



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

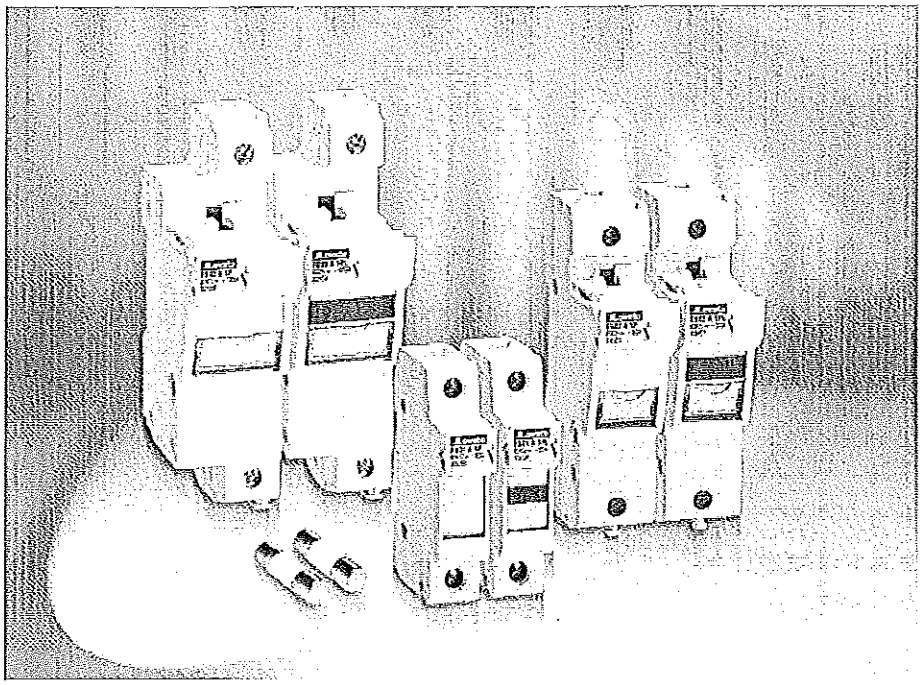
- Version without indicator: 1P, 2P
- Version with indicator: 1P, 2P
- For 10x38mm IEC class gPV fuses
- Rated current: 32A
- Rated voltage: 1000VDC
- IEC utilisation category: DC20B.

Page 12-3

DC FUSES FOR PHOTOVOLTAIC APPLICATIONS

- 10x38mm, IEC class gPV
- Rated current: 20A
- Rated voltage: 1000VDC.

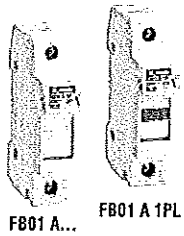
Fuse holders

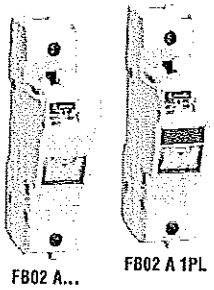


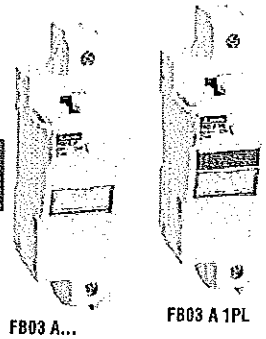
- Modular size for 10x38, 14x51 and 22x58mm fuses
- Finger safe - IP20 IEC degree of protection against accidental contact with live parts and with sealable cover for operators' safety
- Version with status indicator to quickly determine if the fuse is still operative or needs to be replaced
- UL and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

	Sec. - Page
Fuse holders	
AC fuse holders	12 - 2
DC fuse holders for photovoltaic applications	12 - 3
Fuses for photovoltaic applications	12 - 3
Accessories	12 - 3
Dimensions	12 - 4
Wiring diagrams	12 - 4
Technical characteristics	12 - 5

Fuse holders UL Recognized and CSA certified







Order code	Pole arrange-ment	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:

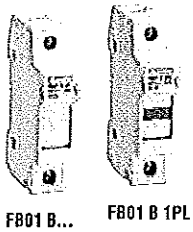
Type	UL Recognized for USA (File E343395)	CSA certified (File 252040 class 6255)	UL Recognized for USA and Canada (File E343395)
FB01 A 1P, FB01 A 1PL, FB01 A 1N	❷	❷	—
FB02 A...	—	—	❷
FB03 A...	—	—	❷

❷ 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.

Fuse holders

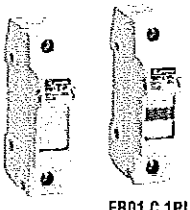


Order code	Pole arrange-ment	Status indicator	DIN size	Qty per pkg	Wt
			n°	n°	[kg]
For 10x38mm fuses. 32A rated current at 690VAC.					
FB01 B 1P	1P	—	1	12	0.062
FB01 B 1PL	1P	YES	1	12	0.064
FB01 B 1N	1P+N	—	2	6	0.127
FB01 B 2P	2P	—	2	6	0.128
FB01 B 3P	3P	—	3	4	0.185
FB01 B 3N	3P+N	—	4	3	0.247

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



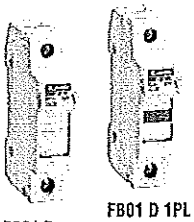
Order code	Pole arrange-ment	Status indicator	DIN size	Qty per pkg	Wt
			n°	n°	[kg]
For 10x38mm fuses. 30A rated current at 600VAC.					
FB01 C 1P	1P	—	1	12	0.070
FB01 C 1PL	1P	YES	1	12	0.072
FB01 C 2P	2P	—	2	6	0.140
FB01 C 3P	3P	—	3	4	0.210

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.

Fuse holders for photovoltaic applications


FB01 D...

FB01 D 1PL

Order code	Pole arrange-ment	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

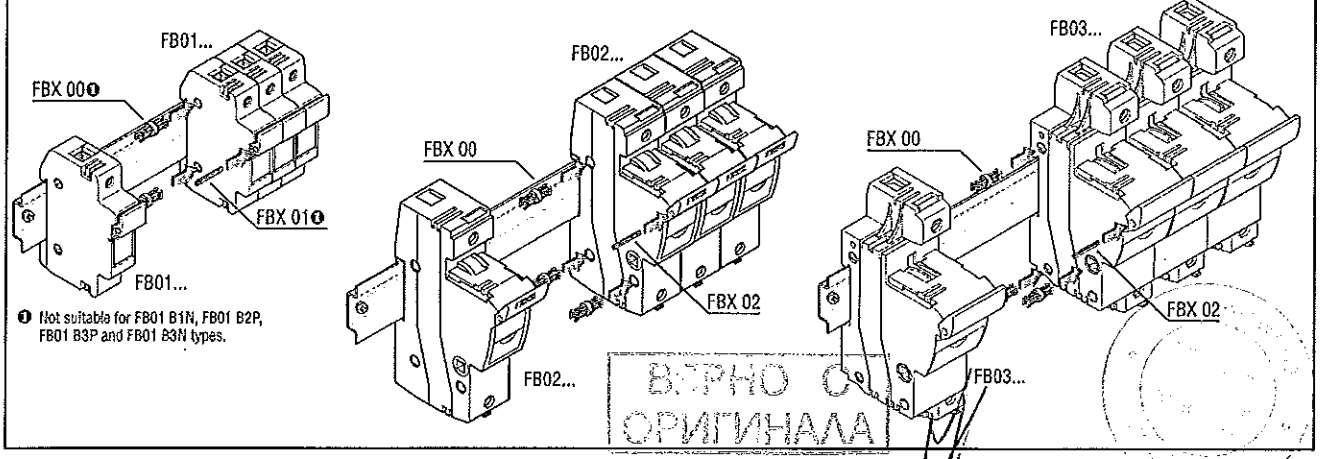
Order code	Description	Qty per pkg	Wt
	[A]	n°	[kg]
FBX 00❶	Coupling clip for 10x38, 14x51 and 22x58mm sizes❶	100	0.003
FBX 01❶	Coupling pin for 10x38mm size❶	100	0.005
FBX 02	Coupling pin for 14x51 and 22x58mm sizes	100	0.008
For FB01 A... and FB01 B... types.			
FBX 05	Three-phase connection busbar, 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

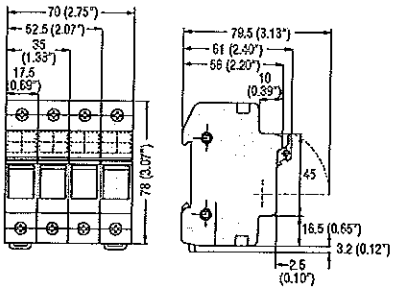


❶ Not suitable for FB01 B1N, FB01 B2P, FB01 B3P and FB01 B3N types.

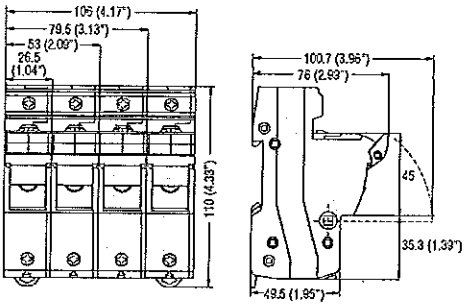
Fuse holders
Dimensions [mm (in)]

FUSE HOLDERS

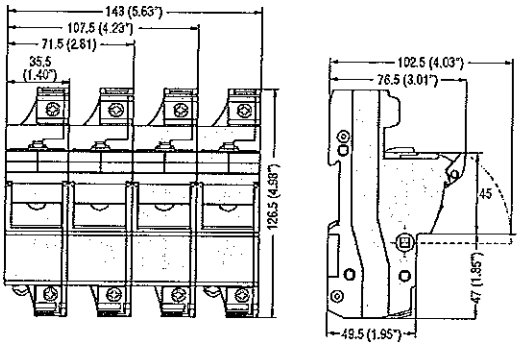
FB01 A... FB01 B... FB01 C... FB01 D...



FB02 A...



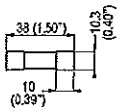
FB03 A...



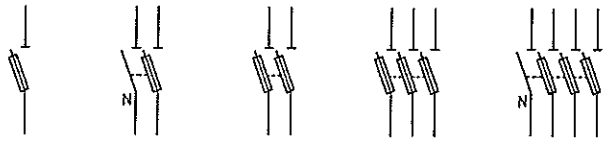
2

FUSES

FE01 D 0...



Wiring diagrams



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

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.

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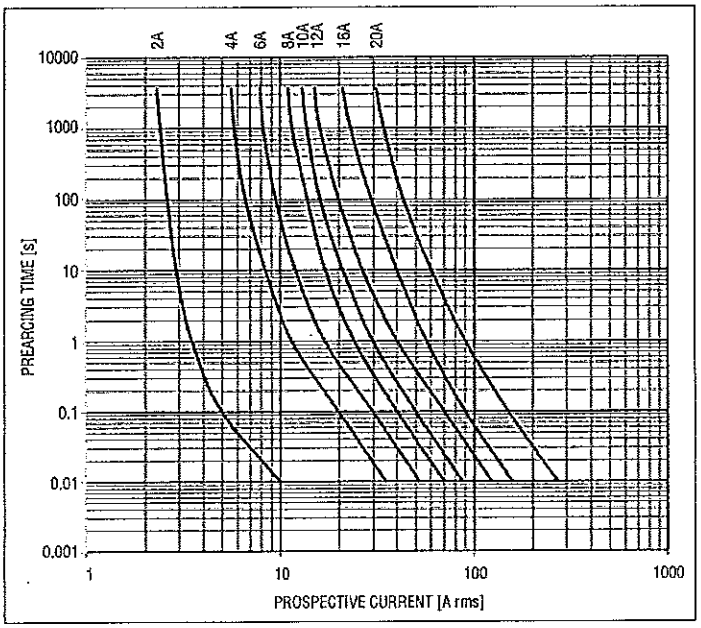
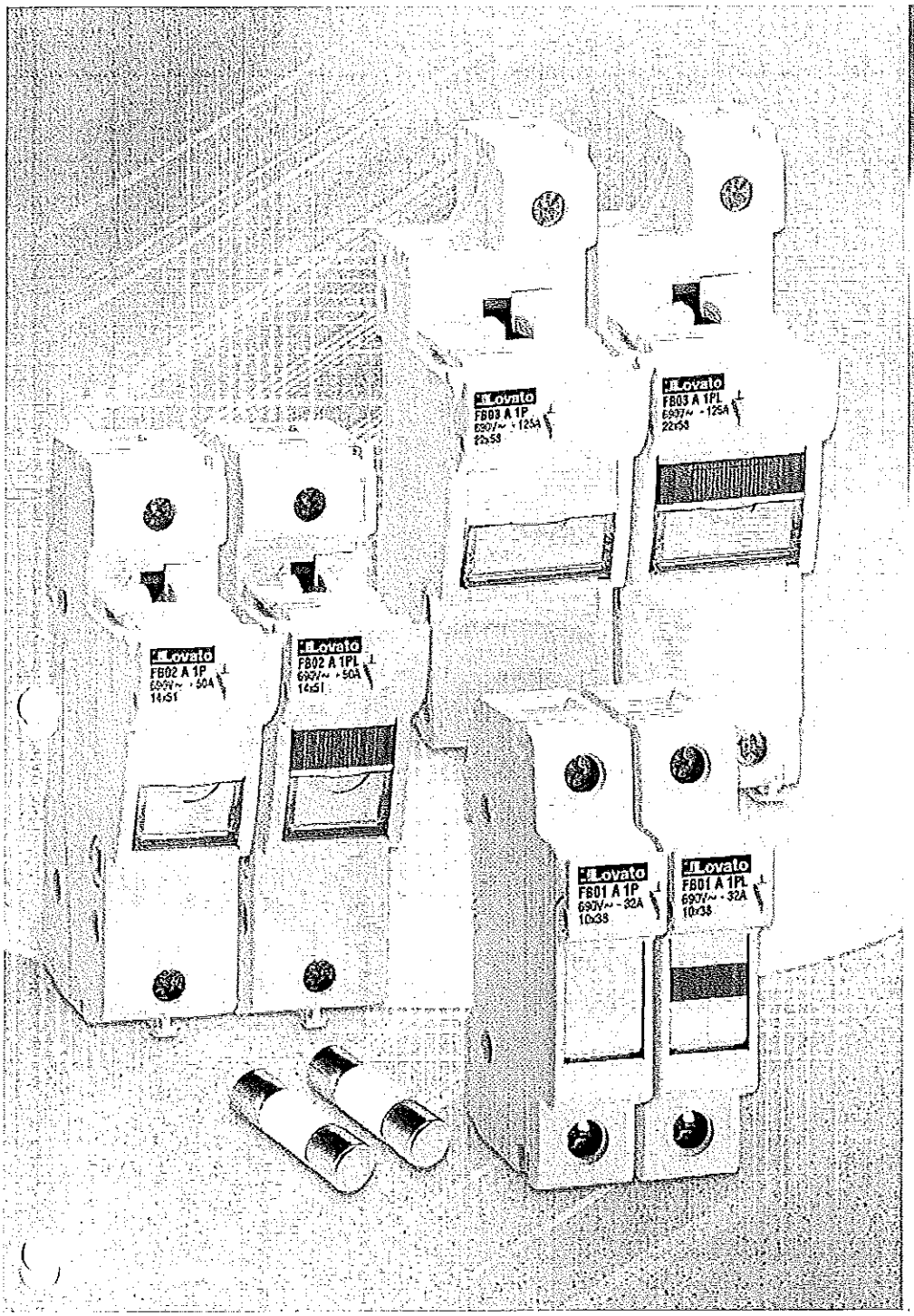
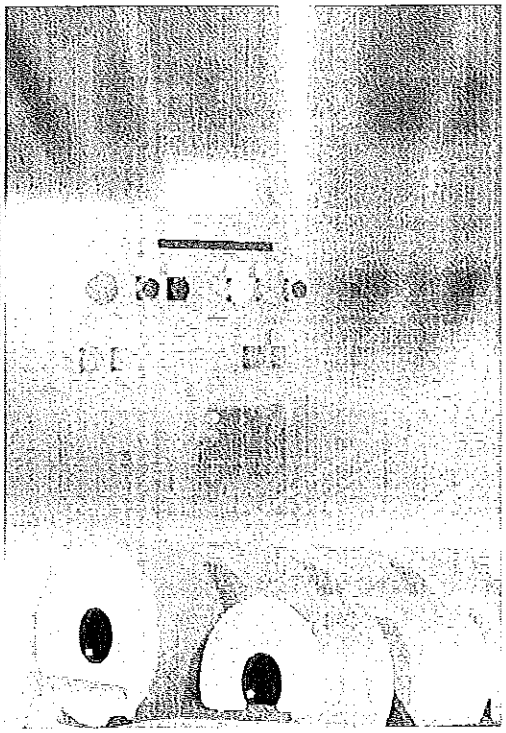
TECHNICAL CHARACTERISTICS FOR FE01 D... FUSES

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





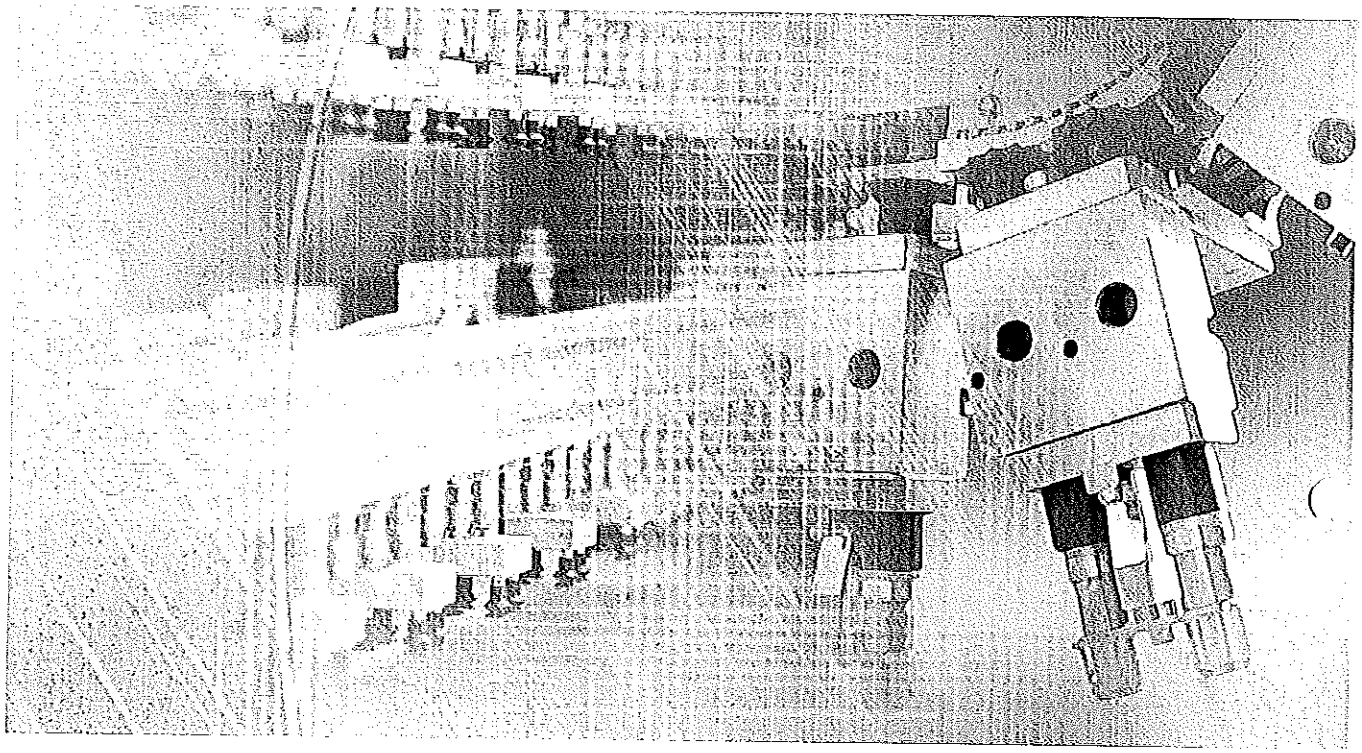


Fuse holders and fuses

Lovato electric

100% electricity

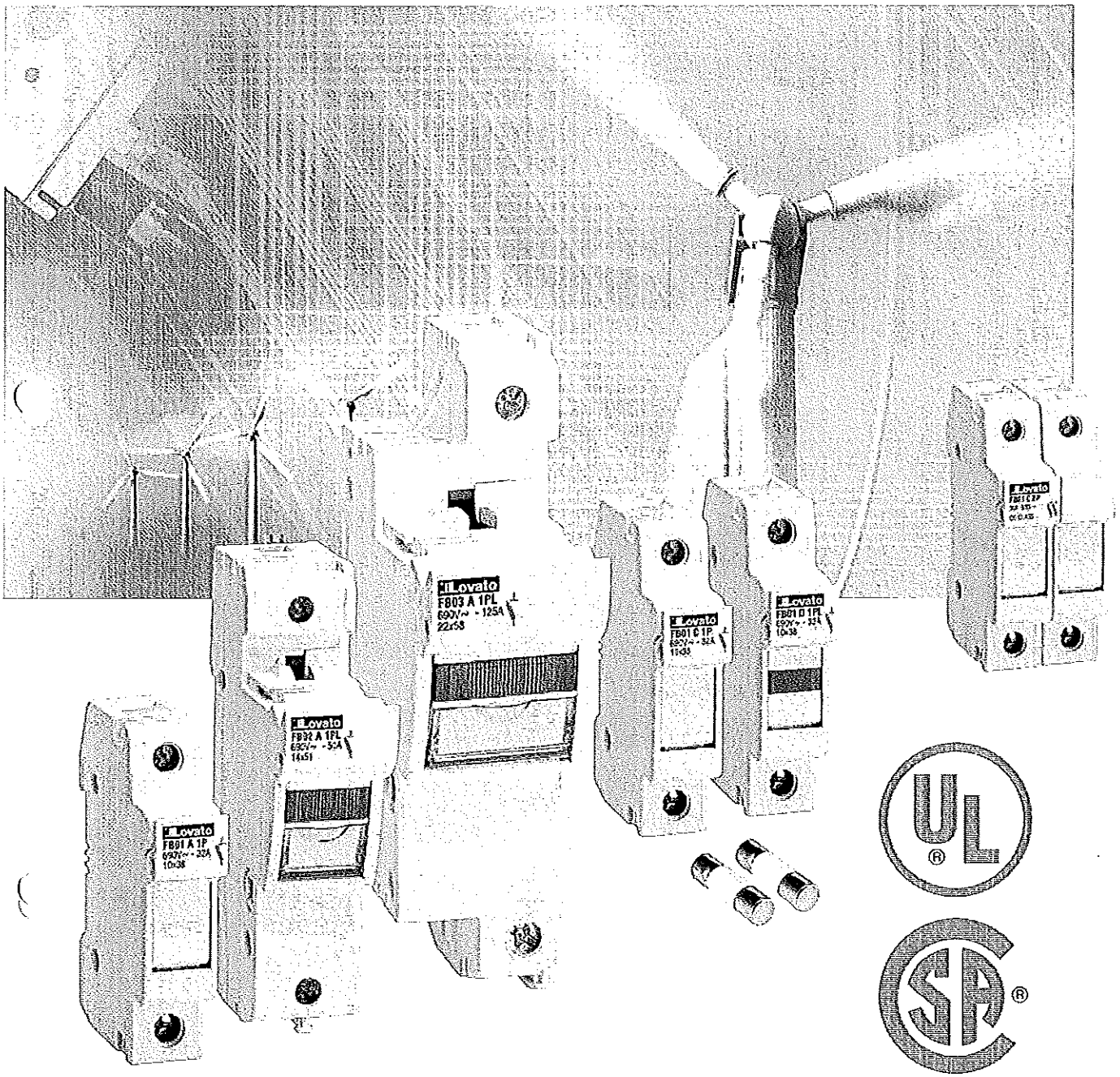
Fuse holders



- 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 photovolatic 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



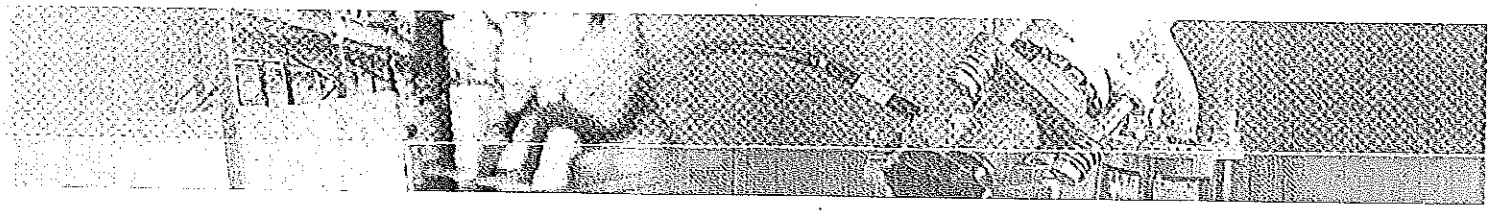
LOVATO Electric fuse holders can be used to protect against overloads and short circuits of electric lines, for motor protection and control and for the protection of electric installations.

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.

Lovato electric

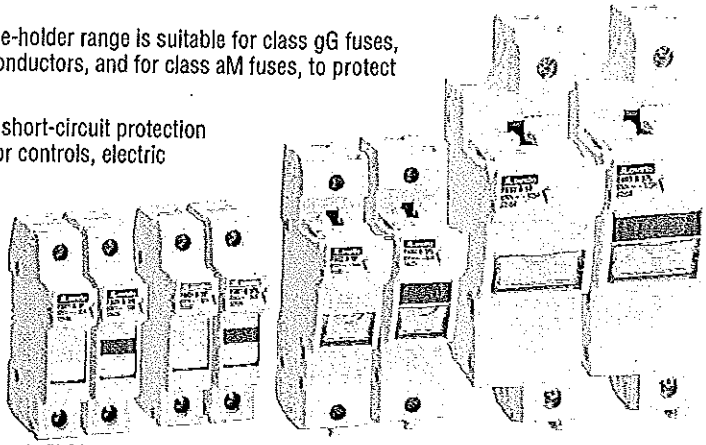


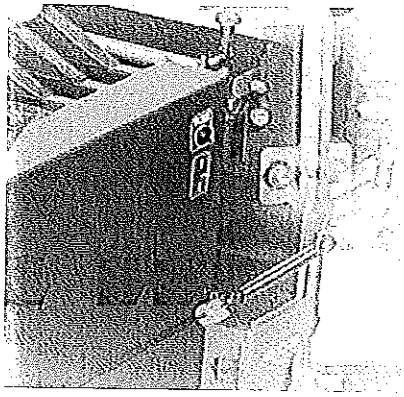
Fuse holders AC RANGE

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.

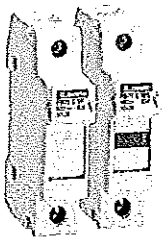




	FB01 A...	FB01 B...	FB02 A...	FB03 A...
Fuse Size	10x38		14x51	22x58
Version without indicator	1P, 1P+N, 2P, 3P, 3P+N			
Version with indicator	1P			
Main characteristics				
- Rated voltage	690VAC			
- Rated current	32A		50A	125A
- Utilisation category	AC-22B 500V, AC-21B 690V		AC-22B 500V, AC-21B 690V	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

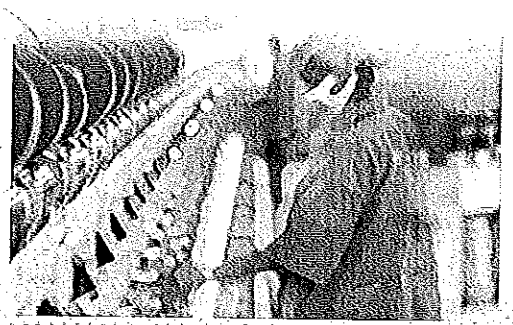


FB01 C...

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.

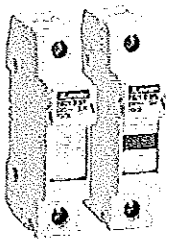
Fuse Size	**Class CC**
Version without indicator	1P, 2P, 3P
Version with indicator	1P
Main characteristics	
- Rated voltage	600VAC
- Rated current	30A
- Utilisation category	AC-22B 500V, AC-21B 690V
- Suitable for fuses	10x38 class CC
- Maximum conductor cross section	16mm² flexible/stranded; 25mm² rigid/solid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



Lovato electric

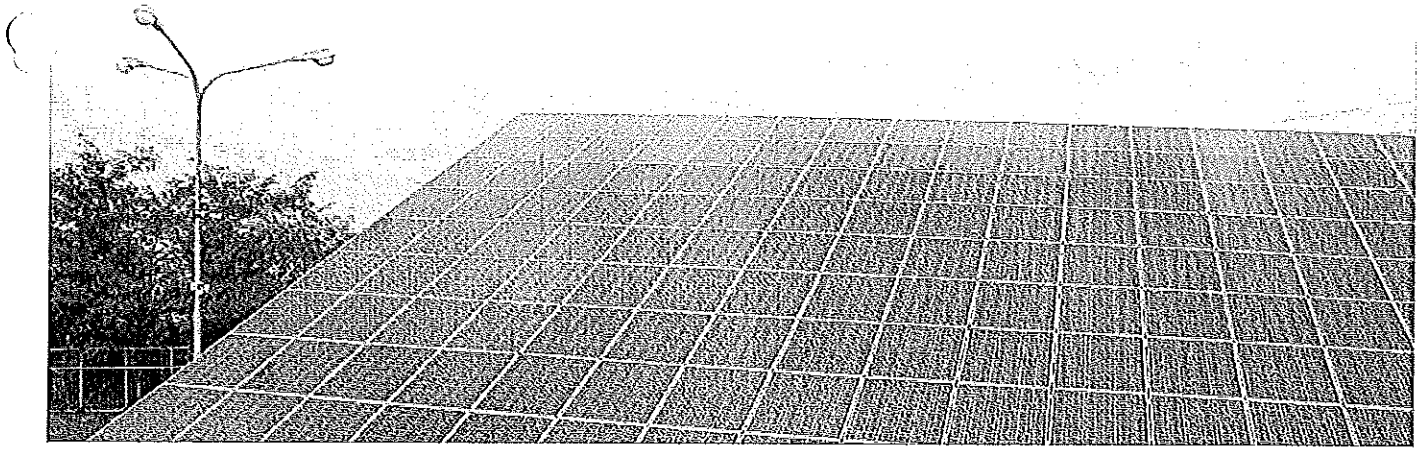
Fuse holders RANGE DC

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.



FB01 D...

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



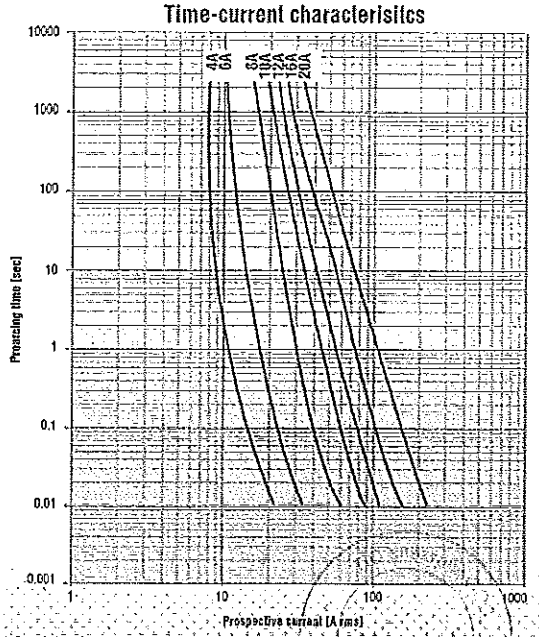
Fuses RANGE DC

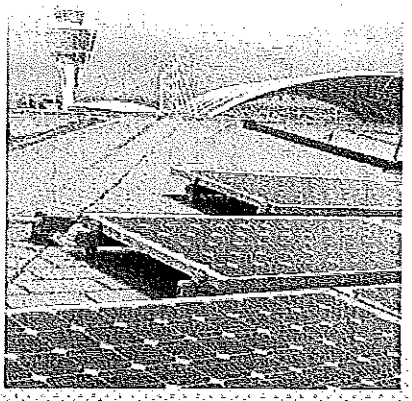
LOVATO Electric offers a range of cylindrical 10x38 fuses dedicated to photovoltaic duty and designed for 1000VDC maximum use.
Contrary to AC type fuses that blow for high overcurrent values, this type of DC fuse is designed to blow with low-intensity overcurrent values, created on photovoltaic cells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

FE01 D 0...

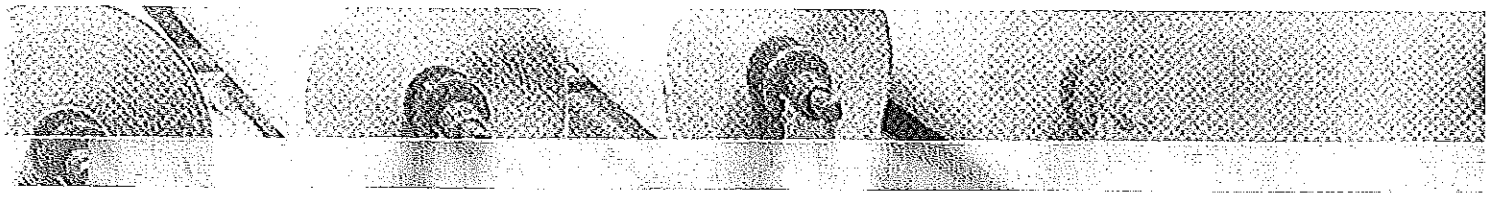
Fuses for photovoltaic application	
Breaking capacity	30kA
Mains characteristics	
- Rated voltage	1000VDC
- Rated current	2...20A

Time-current characteristics





Lovato electric

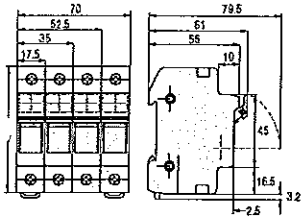


TECHNICAL CHARACTERISTICS

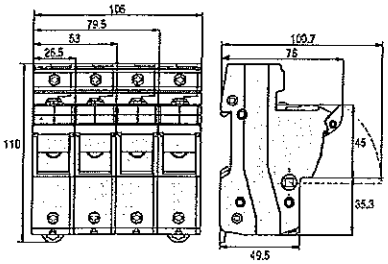
Type		FB01 A...	FB01 B...	FB02 A...	FB03 A...	FB01 C...	FB01 D...
Range		**AC**	**AC**	**AC**	**AC**	**Class CC (AC)**	**DC**
Certifications obtained		UR, CSA	–	cURus	cURus	UL, CSA	–
Maximum power dissipation		3W	3W	5W	9.5W	3W	4W
Derating factor of current Ie for different ambient temperatures	20°C	1	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/22ibin
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

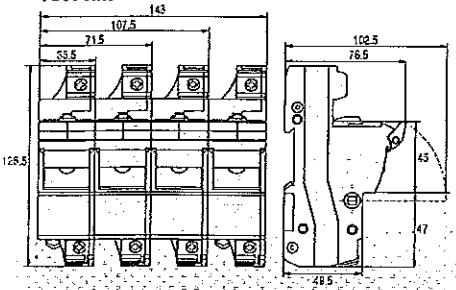
FB01 A... FB01 B... FB01 C... FB01 D...



FB02 A...

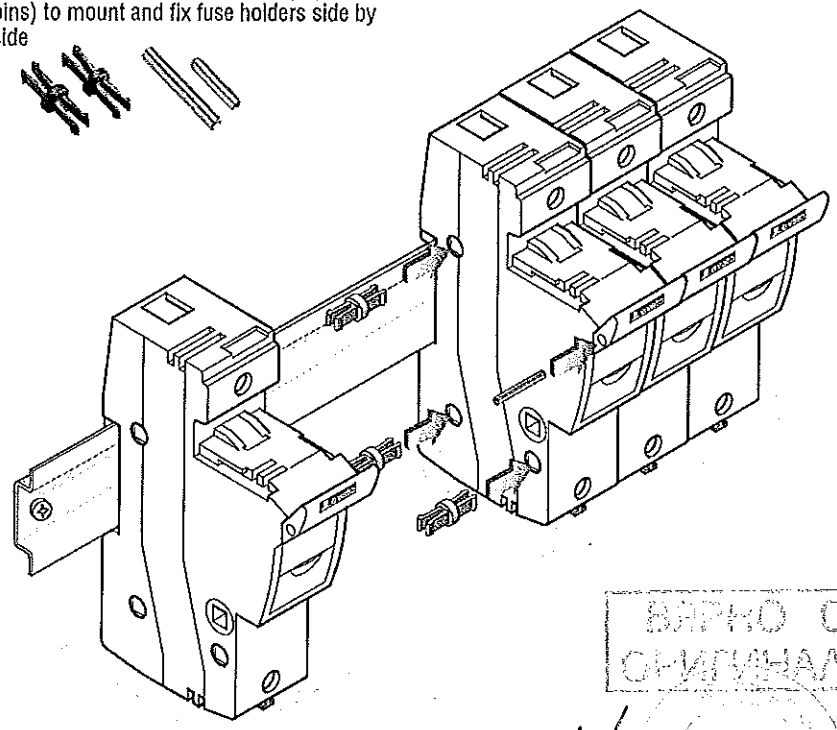


FB03 A...



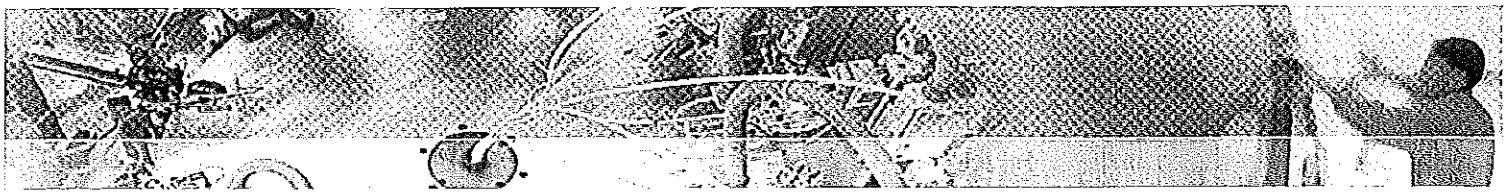
ASSEMBLY

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

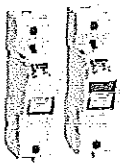


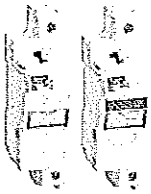
ВЯРНО С ОРИГИНАЛА

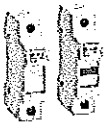
Lovato electric



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

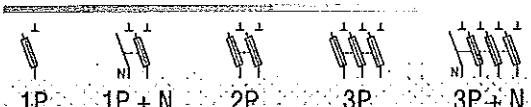
Order code	Rated breaking capacity	Rated voltage Ue	Rated current Ie	Qty per pkg	Weight
	[kA]	[V]	[A]	n°	[kg]
FE01 D 00200	30	1000VDC	2	10	0.130
FE01 D 00400	30	1000VDC	4	10	0.130
FE01 D 00600	30	1000VDC	6	10	0.130
FE01 D 00800	30	1000VDC	8	10	0.130
FE01 D 01000	30	1000VDC	10	10	0.130
FE01 D 01200	30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

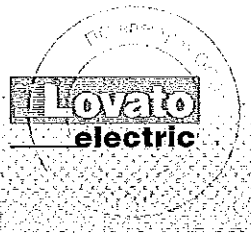
ACCESSORIES

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 holder FB01... types.
Three clips FBX 00 and one pin FBX 02 are needed to couple two fuse holder FB02... and FB03... types.

WIRING DIAGRAMS

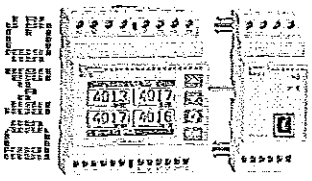




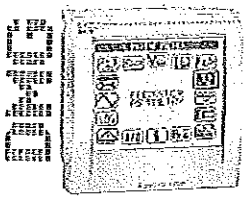
new

2011

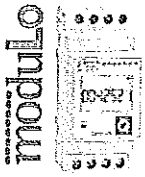
Switch disconnectors
16 to 1600A



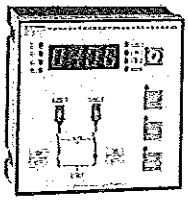
Modular digital multimeters



Flush-mount digital multimeters
and power analyzers



Energy meters



Automatic transfer switch
controllers

Switching power supplies

Lovato
electric
100% electricity

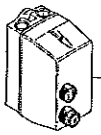
Power switch

Motor protection circuit breakers

Switch disconnectors

Contactors

Motor protection relays



Electromechanical starters

Control and signalling units

Limit , micro and foot switches

Rotary cam switches

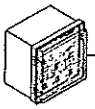
Power, DIN

Modular contactors

Time relays

Protection relays

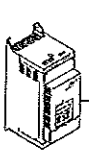
Level control relays



Earth leakage relays

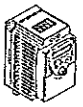
Fuse holders

Power Logic



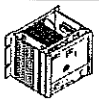
Metering instruments and current transformers

Soft starters

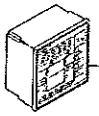


AC motor drives

Automatic power factor controllers

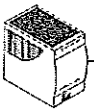


Automatic battery chargers

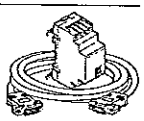


Automatic transfer switch controllers

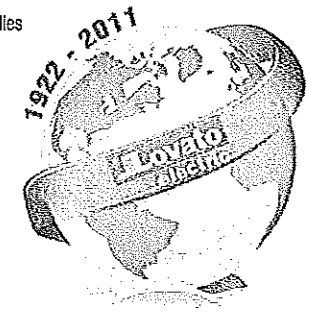
Programmable logic relays



Switching power supplies



Expansion modules and accessories



Present in over 90 countries

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LOVATO ELECTRIC S.P.A.
CONTROL SOLUTIONS FOR INDUSTRY
VIA DON E. MAZZA, 12 - 24020 GORLE (BERGAMO) ITALY
Tel. +39 035 4282111 **Fax** +39 035 4282200
E-mail: info@LovatoElectric.com
Sales department: **Tel.** +39 035 4282354 - **Fax** +39 035 4282400

LOVATO Electric offices in the world

United Kingdom
LOVATO (UK) LTD
Tel. +44 8458 110023
www.Lovato.co.uk

Germany
DELTEC LOVATO GmbH
Tel. +49 7237 1733
www.DeltecLovato.de

Spain
LOVATO ELECTRIC S.L.U.
Tel. +34 93 7812016
www.LovatoElectric.es

Poland
LOVATO ELECTRIC SP. Z O.O.
Tel. +48 71 7979010
www.LovatoElectric.pl

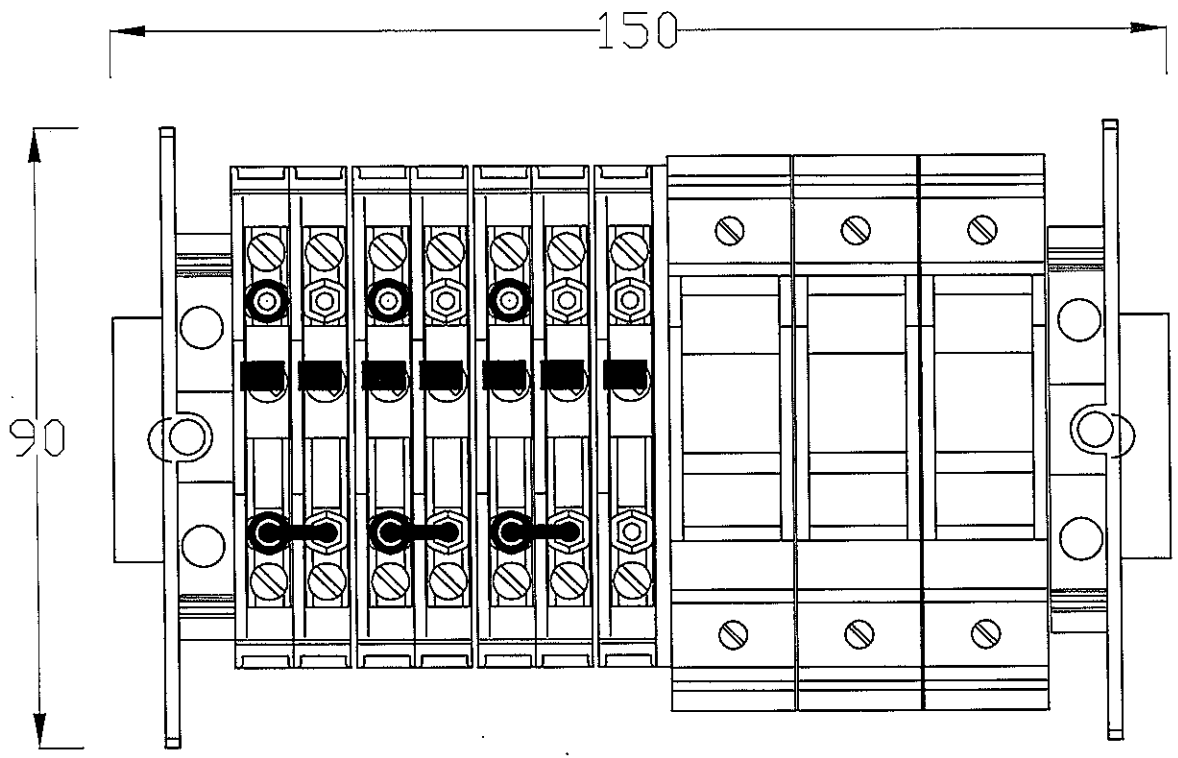
Czech Republic
LOVATO S.R.O.
Tel. +420 382 265482
www.Lovato.cz

USA
LOVATO ELECTRIC INC
Tel. +1 757 545 4700
www.LovatoUsa.com

Canada
LOVATO ELECTRIC
CORPORATION
Tel. +1 450 681 9200
www.Lovato.ca

Mexico
LOVATO ELECTRIC
DE MEXICO, S.A. DE C.V.
Tel. +52 555 3415662
www.LovatoElectric.com.mx

PD57 GB 01 11



ВиВ Изоматик ООД
1680 София, ул. "Пирин" No40А
тел. 02 958 63 40, 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

Приложение 4

ViV Изоматик ООД
София 1404, ул."Цани 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

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

ВЕРНО С ОРИГИНАЛА

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;

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. Владимир Лазаров
"ВиВ Изоматик" ООД

Приложение 20

PHOENIX CONTACT GmbH & Co. KG
Flachsmarktstraße 8
32825 Blomberg, Germany
Telefon: ++49 / (0) 52 35/300
Telefax: ++49 / (0) 52 35/34 12 00
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

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

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

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

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

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

PHOENIX CONTACT GmbH & Co. KG

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

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

Приложение 21

KEMA
REGISTERED QUALITY

KEMA KEUR

CERTIFICATE

KEMA No.: 97.4117.13

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

C.M. Boschloo
Certification Manager

N.V. KEMA
Utrechtseweg 310, 6812 AR Arnhem, The Netherlands
P.O. Box 9035, 6800 ET Arnhem, The Netherlands
Telephone +31 26 3 56 28 50, Telefax +31 26 3 51 49 22

ACCREDITED BY
THE DUTCH COUNCIL
FOR ACCREDITATION

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

N.V. KEMA
Utrechtseweg 310, 6812 AR Arnhem, The Netherlands
P.O. Box 9035, 6800 ET ARNHEM, The Netherlands
Telephone +31 26 3562850, Telefax +31 26 3514922

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

N.V. KEMA
Utrechtseweg 310, 6812 AR Arnhem, The Netherlands
P.O. Box 9035, 6800 ET ARNHEM, The Netherlands
Telephone +31 26 3562850, Telefax +31 26 3514922

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 Megen b.a.

FACTORY-LOCATION(S)

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

N.V. KEMA
Utrechtseweg 310, 6812 AR Arnhem, The Netherlands
P.O. Box 9035, 6800 ET ARNHEM, The Netherlands
Telephone +31 26 3562850, Telefax +31 26 3514922

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 ..... ☒ Eliminated / returned to customer ☐ Storage :

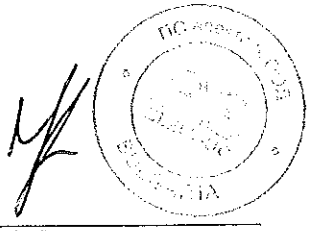
INDEX .....

1. PURPOPSE OF TESTING.....2
2. TEST SAMPLES.....2
3. TEST METHOD.....2
4. TEST PROCEDURES.....2
5. TEST RESULTS 3
6. TEST EQUIPMENT 5
7. REMARKS & ANALYS.....5
8. ANNEX.....6

ISSUE 16/05/2011

COMPILED ..... STAFF LPR

APPROVED ..... RESP. LPR



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

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.

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

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

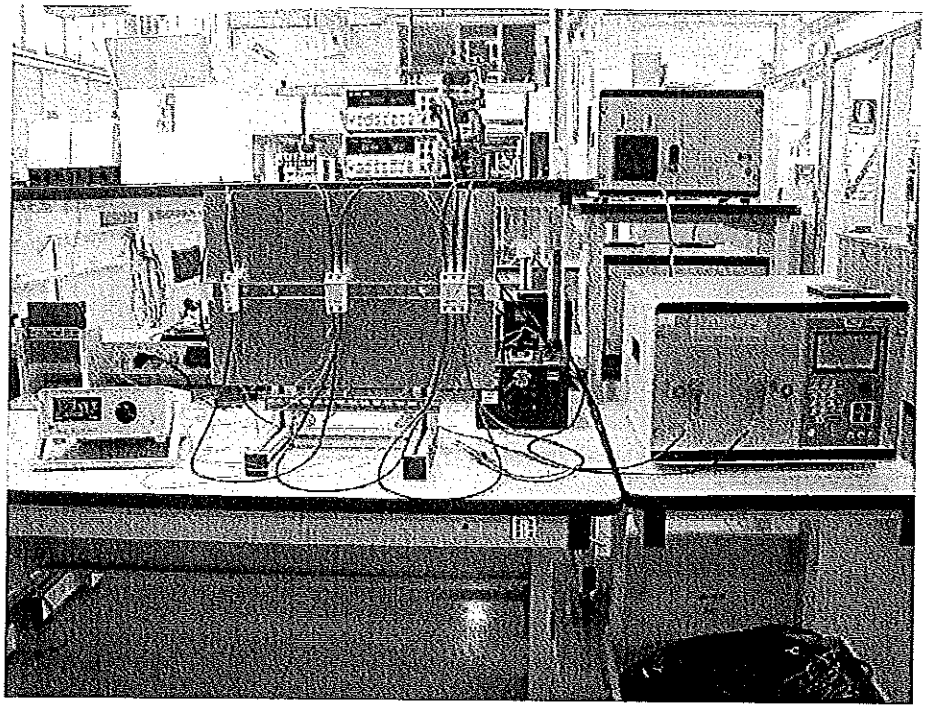
Description	Used to measure	Full scale	Code	Calibration expiration date
Thermohygrometer	Ambient temperature	-5 ÷ 50 °C	LPR 1 65	27/10/2011
Thermohygrometer	Relative humidity	10 ÷ 90%	LPR 165	27/10/2011
Termometric instrument	Temperature rise	-30 ÷ +200 °C	LPR 201	10/01/2012
Termocouple T type	Temperature 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	11/05/2014
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

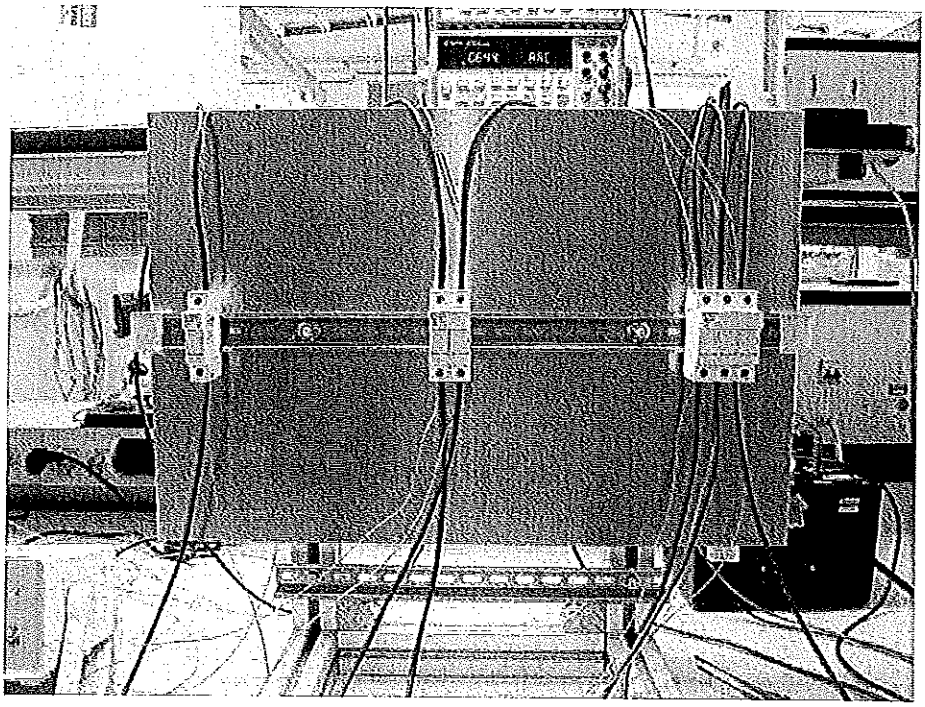
Temperature rise test 690V – 32A: test passed

8. ANNEX

Picture 1: Temperature rise – test setup



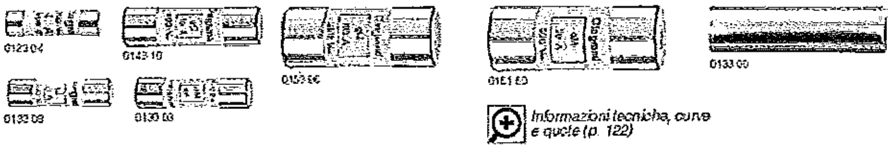
Picture 1a: Temperature rise – test setup



Picture 2: Catalogue Legrand fuses

legrand

fusibili cilindrici



Informazioni tecniche, curve e quote (p. 122)

Tipo "gG"

B.C.R. (Basse 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	Intensità 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		
100/10	0133 32	0134 32	32	400	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	Senza segnalatore	Con segnalatore	Intensità 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		
	Senza percussore	Con percussore	**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 alla norma IEC EN 60269-1
Approvazione Bureau Veritas

Imballo	Articoli Senza percussore	Articoli Con percussore	Intensità 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 norme IEC 60269-1,2 e 2-1; EN 60269-1; CEI 32.1 e 32.4
Approvazioni Bureau Veritas

Imballo	Senza percussore	Con percussore	Intensità nominale (A)	Tensione (V~)	Potere interruzione (kA)
			10,3 x 38 mm		
10	0130 92		0,25		
10	0130 95		0,50		
10	0130 01		1		
10	0130 02		2		
10	0130 04		4		
10	0130 06		6	500	100
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 95	0151 95	100		
10	0150 97	0151 97	125	400	

Neutri

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) calibro non normalizzato

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The test results are related only to the exemplary tested and listed under the "test samples".

СПИСЪК

На отделните изпитания

1. Изолационно напрежение
2. Контактни повърхности
3. Проверка с импулсно напрежение
4. Термично претоварване
5. Устойчивост на температура

Приложение 22

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 ≥V	
	Up to 1 mV		0,4 ≥V	
	1 mV to 10 mV		$3·10^{-4}U$	
	10 mV to 100 mV		$3·10^{-5}U$	
	100 mV to 10 V		$5·10^{-6}U$	
	10 V to 100 V		$1·10^{-5}U$	
	100 V to 1100 V		$2·10^{-5}U$	
	Zener Reference Standards			
	1 V and 1,018 V		3 ≥V	
	10 V		20 ≥V	
	High Voltage			Measuring
	1 kV to 6 kV		$2·10^{-3}U$	
LF 2 0	DC Current			
	10 ≥A to 3 A		$2·10^{-5}I$	
	3 A to 10 A		$2{,}5·10^{-5}I$	
	10 A to 20 A		$6·10^{-5}I$	

This annex has been approved by:

Ir. J.C. van der Poel
Chief Executive

ВЯРНО С ОРИГИНАЛА

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		$1I10^{-4}I$	
LF 3 1	AC Voltage			
	60 mV to 1000 V	40 Hz to 20 kHz	$2I10^{-4}IU$	
	60 mV to 1000 V	20 kHz to 50 kHz	$3I10^{-4}IU$	
	60 mV to 220 V	20 kHz to 50 kHz 50 kHz to 100 kHz	$4I10^{-4}IU$	
	220 V to 1000 V	50 kHz to 100 kHz	$4I10^{-4}IU$	
	220 V to 1000 V	50 kHz to 100 kHz	$2I10^{-3}IU$	
	High Voltage			Measuring
	1 kV tot 6 kV	50 Hz	$2I10^{-3}IU$	
LF 3 2	AC Voltage Ratio			
	(instrument transformers)			
	Primary: (10-600)V Secondary: (0,1-240)V	50 Hz and 60 Hz	$3I10^{-5}IU_{uit}/U_{in}$ and 90 ≥rad	
LF 3 3	AC Current			
	0,1 mA to 300 mA	40 Hz to 5 kHz	$3I10^{-4}I$	
	300 mA to 20 A	40 Hz to 1 kHz	$3I10^{-4}I$	
	20 A to 50 A	40 Hz to 1 kHz	$6I10^{-4}I$	
LF 4 2	AC Current Ratio			ambient temp. (23 ± 2) πC
	(instrument transformers)	50 Hz and 60 Hz	$3I10^{-5}I_{uit}/I_{in}$ and 90 ≥rad	Measuring

Annex to ISO/IEC 17025 declaration of accreditation
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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
	Primary: 5 A to 6000 A Secondary: 1A or 5A			
LF 4 3	High Current			
	10 A to 6000 A	50 Hz, 60 Hz	$3 \times 10^{-4} \times I$	
LF 5 0	Power and Energy			10 mV to 1100 V,
	Power			10 ≥A to 100 A
	0,1 ≥W to 1 ≥W		$1 \times 10^{-4} \times P$	
	1 ≥W to 1 kW		$5 \times 10^{-5} \times P$	
	1 kW tot 10 kW		$1 \times 10^{-4} \times P$	
	10 kW tot 110 kW		$2 \times 10^{-4} \times P$	
	3 W to 57,6 kW	50 Hz and 60 Hz	$\frac{3 \times 10^{-4}}{\cos\partial} \times P$	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	$\frac{2 \times 10^{-4}}{\cos\partial} \times P$	measuring 20 V to 1100 V 100 mA to 6000A cos ∂ = 0 to 1
	Reactive Power (P_r) 6 var to 1,8 Mvar	50 Hz and 60 Hz	$\frac{5 \times 10^{-4}}{\sin\partial} \times P_r$	60 V to 300 V 100 mA to 6000 A
	Electrical (reactive-) energy			see (reactive-) power and time
LF 5 1	Power Factor cos ∂ : 0 to 1	40 Hz to 100 Hz	$\frac{2 \times 10^{-3}}{\cos\partial} \times PF$	

Annex to ISO/IEC 17025 declaration of accreditation
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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
LF 6	Impedance (DC/LF)			
LF 6 2	DC Resistance			Non-decadic values
	20 ≥⊃ to 50 ≥⊃		$3 \cdot 10^{-4}.R$	
	50 ≥⊃ to 100 ≥⊃		$1 \cdot 10^{-4}.R$	
	100 ≥⊃ to 20 k⊃		$1{,}2 \cdot 10^{-5}.R$	
	1 m⊃ to 10 m⊃		6 5I10^{-6}IR	
	10 m⊃ to 1000 m⊃		$7.10^{-6}.R$	
	1 ⊃ to 10 k⊃		5I10^{-6}IR	
	10 k⊃ to 1 M⊃		1I10^{-5}IR	
	1 M⊃ to 10 M⊃		1,2I10^{-5}IR	
	10 M⊃ to 100 M⊃		$3.10^{-5}.R$	
	100 ≥⊃ to 10 k⊃		$6.10^{-6}.R$	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	1I10^{-3}IC	
	1 µF	50 Hz, 200 Hz, 1 kHz	1I10^{-3}IC	
LF 6 7	Inductance			
	1 mH to 10 mH	1 kHz, (400-1692)Hz	1I10^{-3}IL	
	100 mH	100 Hz, 1 kHz 1,592 kHz	1I10^{-3}IL	
	1 H	100 Hz, 200 Hz, 400 Hz and 1 kHz	1I10^{-3}IL	
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	

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		$2 \cdot 10^{-2}$ ← +200 ps	10 mV/div to 1 kV/div
TF 0 0	TIME and FREQUENCY			
TF2 1	Frequency	1 Hz to 1,2 GHz	$5 \cdot 10^{-10} f$	
TF 2 2	Time interval	1 ≥s to {	$5 \cdot 10^{-10} t$ + 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	$3 \cdot 10^{-4} p_e$ + 4 Pa	medium: air
		(-98 to 100) kPa	$3 \cdot 10^{-4} p_e$ + 5 Pa	medium: nitrogen
		100 kPa to 10 MPa	$3 \cdot 10^{-4} p_e$	medium: nitrogen
		(10 to 70) MPa	$3 \cdot 10^{-4} p_e$	medium: oil

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
	Absolute Pressure	(80 to 110) kPa	$3I10^{-4}Ip$	medium: air
		(2 to 200) kPa	$3I10^{-4}Ip$ + 5 Pa	medium: nitrogen
		200 kPa to 10 MPa	$3I10^{-4}Ip$	medium: nitrogen
		(10 to 70) MPa	$3I10^{-4}Ip$	medium: oil
TE 0 0	TEMPERATURE, HUMIDITY AND THERMOPHYSICAL PROPERTIES			
TE 1 0	Resistance thermometers	-50 πC to 20 πC	0,02 K	
		20 πC to 50 πC	0,05 K	
		50 πC to 300 πC	0,05 K	
		300 πC to 550 πC	0,16 K	
		550 πC to 650 πC	0,50 K	
TE 3 0	Thermocouples	-50 πC to 20 πC	0,16 K	Including C.J. references
		20 πC to 50 πC	0,16 K	
		50 πC to 300 πC	0,16 K	
		300 πC to 550 πC	0,21 K	
		550 πC to 650 πC	0,6 K	
		650 πC to 1000 πC	1,6 K	
TE 4 0	Liquid-in-glass thermometers	-50 πC to 50 πC	0,02 K	
		20 πC to 50 πC	0,04 K	
		50 πC to 300 πC	0,02 K	
	Differential Temperature	-50 πC to 200 πC	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 ºC to 650 ºC	$(8 \cdot 10^{-4} \cdot t_{90} + 0{,}06)$ K	
	Writing thermometers	15 ºC to 50 ºC	0,5 K	
	Digital thermometers	-50 ºC to 20 ºC	0,02 K	including C.J. references
		20 ºC to 50 ºC	0,05 K	resolution 1 digit
		50 ºC to 300 ºC	0,05 K	
		300 ºC to 550 ºC	0,16 K	
		550 ºC to 630 ºC	0,50 K	
		630 ºC to 1000 ºC	1,5 K	

Remarks:

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

(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.

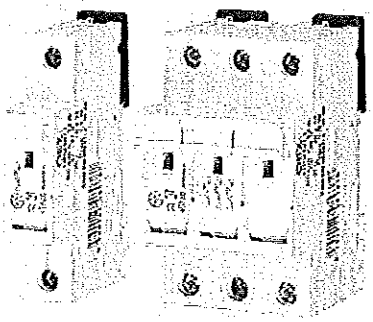
The best measurement capability is the highest achievable accuracy for a given measuring value or measuring range, expressed as the total positive and negative measurement uncertainty.

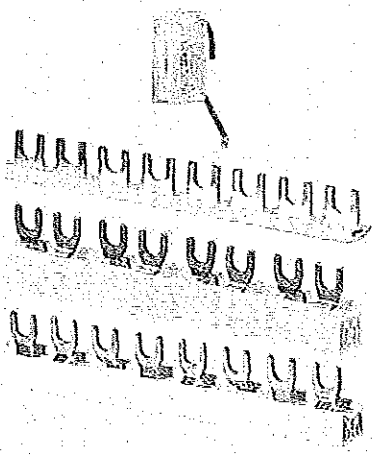
The uncertainty is calculated according to EA-4/02 "Expression of the Uncertainty of Measurement in Calibration".

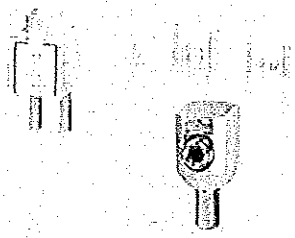
Calibrations are performed inside the laboratory, unless specified otherwise.

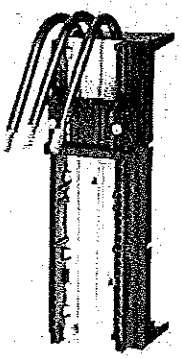
Приложение 23; 24

FUSE SWITCH-DISCONNECTORS FOR CYLINDRICAL FUSE-LINKS UP TO 32 A









Fuse switch-disconnectors OPV10 are intended for cylindrical fuse-links PV10 size 10x38. They can safely switch off rated current and overcurrent up to 1.5 rated current and meet the requirements for safe disconnection. Inverse connection is permissible and it affects neither the technical parameters nor the safety of the operator.

- Switch-disconnectors OPV can be sealed in the closed state.
- The devices are designed as modular for 45 mm cutout in the switchboard.
- Optional light indication of fuse state.
- Mounted on „U" rail of type TH35 according to EN 60715 or on the panel (steel rail recommended).
- Fuse-link state can be indicated by means of electronic signalling, see page D17.

Fuse switch-disconnectors

Type	Product code	I_e [A]	Number of poles	Weight [kg]	Package [pcs]
OPV10S-1	38819		1	0.100	12
OPV10-N	38825		N	0.107	12
OPV10S-1N	38820		1+N	0.187	6
OPV10S-2	38821	32	2	0.180	6
OPV10S-3	38822		3	0.280	4
OPV10S-3N	38823		3+N	0.360	3
OPV10S-4	38824		4	0.360	3

[1] OPV10-N design is without the possibility of signalling of fuse state.

Accessories

Description	Type	Product code	Weight [kg]	Package [pcs]
Light indication, operating voltage 100 ÷ 500 V a.c., d.c.	S - OPV10	08703	0.002	1
Light indication, operating voltage 12 ÷ 48 V d.c., a.c. (+ pole up)	S - OPV10/48	11812	0.002	1
Light indication, operating voltage 12 ÷ 48 V d.c., a.c. (+ pole down)	S - OPV10/48PD	18234	0.002	1
1-pole interconnecting busbar, cross-section 12 mm², max. current 65 A, rated operating voltage 415 V, max. operating voltage 500 V, length 1 m	G1L-1000-12	37355	0.300	1
2-pole interconnecting busbar, cross-section 16 mm², max. current 80 A rated operating voltage 415 V, max. operating voltage 500 V, length 1 m	G2L-1000-16	37361	0.477	20
3-pole interconnecting busbar, cross-section 10 mm², max. current 63 A, rated operating voltage 415 V, max. operating voltage 500 V, length 1 m	G3L-1000-10C	37365	0.300	1
End cap, for 1-pole busbars with diameter 10, 12, 16 mm²	EKC-1	37383	0.0005	10
End cap, for 3-pole busbars with diameter 10 mm²	EKC-3	37385	0.001	10
End cap, for 2-pole and 3-pole busbars with diameter 16 mm²	EKC-2+3	37384	0.001	10
Terminal extension, for connection of conductor of cross-section up to 25 mm²	AS-25-G	37390	0.012	10
Terminal extension, for connection of Cu/Al conductor of cross-section 2.5 ÷ 50 mm²	AS-50-S-AL01	38749	0.02	1
Adapter for busbars with spacing 60 mm, busbar thickness 5 or 10 mm, busbar width 12 ÷ 30 mm, cable outlet bottom, max. current 63 A	GA-60/63/54-1x7,5	11883	0.560	1

Specifications

Rated operating current	I_e		32 A
Rated operating voltage (a.c./d.c.)	U_e		690 V
Utilization category		690 V a.c.	AC-21B
		250 V d.c.	DC-21B
		700 V d.c.	DC-20B
Rated thermal current with fuse-link	I_{th}		32 A
Rated frequency	f_e		40 ÷ 60 Hz
Rated insulation voltage	U_i		800 V a.c.

ВЯРНО С ОРИГИНАЛА

FUSE SWITCH-DISCONNECTORS FOR CYLINDRICAL FUSE-LINKS UP TO 32 A

Specifications

Rated conditional short-circuit current with fuse-links PV (RMS)	I_{cc}	690 V	110 kA
Rated pulse withstand voltage	U_{imp}		4 kV
Fuse-link size	diameter x length		10x38
Max. rated current of the fuse-link	I_n		32 A
Max. power losses of the fuse-link**	P_v		3.5 W
Rated short-time withstand current	I_{cw} 1s		1.6 kA
Rated short-circuit making capacity at 400 V a.c.	I_{cm}		4 kA
Electrical endurance			300
Mechanical endurance			1700
Degree of protection, cover closed			IP20
Degree of protection, cover opened			IP20
Connection cross-section			Cu/0.5 ÷ 25 mm² (2x 16 mm²)
Torque			2 Nm
Operating ambient temperature	t		-25 ÷ +55 °C
Max. sea level			2000 m
Seismic resistance according to VE ŠKODA			3 g/8 ÷ 50 Hz
Overvoltage category/Rated voltage			I (II*)/690 V a.c., II (III*)/500 V a.c., III/400 V a.c.
Standards			IEC 60947-1, -3; EN 60947-1, -3
Approval marks			EAC CE PCT

* For underground cable distribution systems with overvoltage protection or for exposure to a low thunderstorm electricity (table H2 EN 60947-1, IEC 60947-1).

** Conditions for the use of fuse-links for semiconductor protection PV510 in chapter „Conditions for the use of fuse-links in fuse switch-disconnectors" see page H33.

EN 60947-3 ed. 2/A2, p. C.5 Instructions for the use of 1-pole controlled devices states:
These devices are intended for distribution systems, with possible necessity of switching and/or safe disconnection of individual phases, and must not be used for switching a primary circuit of a three-phase equipment.

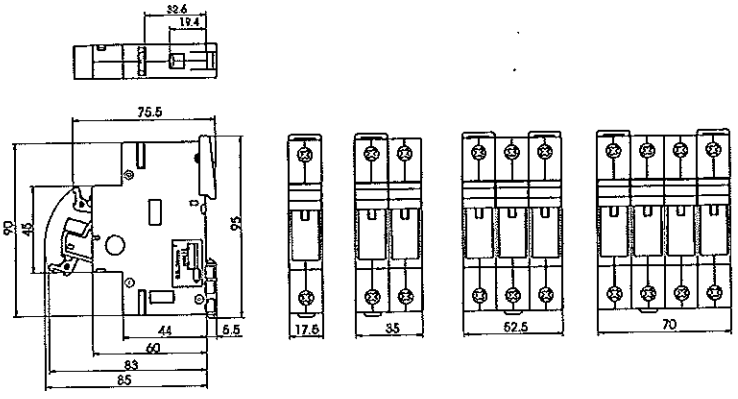
Reduction of rated current of fuse-links PV gG, aM according to the number of poles

Type	I_n [A]	Reduced rated current [A] (Number of poles)					
		1	3	5	7	10	
OPV10	32	32	32	32	32	32	

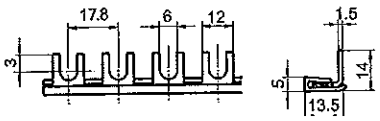
Neutral pole

		OPV10-N
Rated operating current	I_e	32 A
Thermal current with disconnecting link 2PV10	I_{th}	110 A/25 mm²
Utilization category of the neutral pole at I_e		AC-20B
Rated short-time withstand current	I_{cw} 1s	1.6 kA
Rated short-circuit making capacity at 690 V a.c.	I_{cm} [kA]	5 kA
Rated short-circuit making capacity at 250 V d.c.	I_{cm} [kA]	5.1 kA
Power losses with disconnecting link at I_e	P_v [W]	4.8 W
Connection cross-section		0.5 ÷ 25 mm²

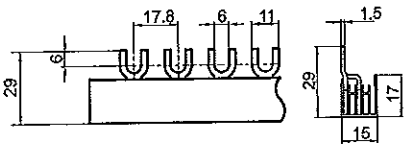
Dimensions



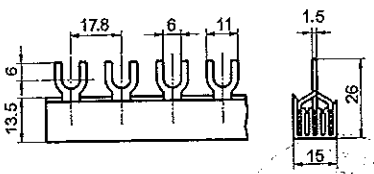
G1L-1000-12



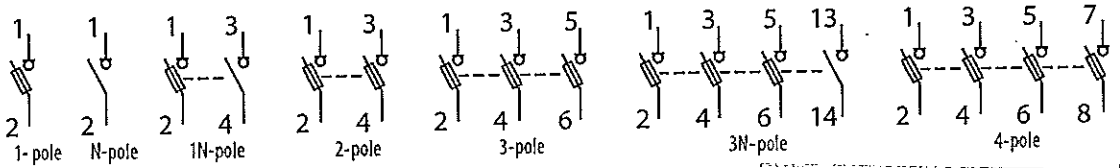
G2L-1000-16



G3L-1000-10C



Diagram



MINIMAL CONNECTING CROSS-SECTION OF FUSE SWITCH-DISCONNECTORS

Minimal connecting cross-section of cables of fuse switch-disconnectors for cylindrical fuse-links

Fuse-links I_n [A]	Fuse switch-disconnectors for cylindrical fuse-links			Cable S [mm²]	
	OPV10	OPV14	OPV22	Cu	Al
0.25	x	x		1	-
0.5	x	x		1	-
1	x	x		1	-
2	x	x		1	-
4	x	x		1	-
6	x	x		1	-
8	x	x		1	-
10	x	x		1.5	-
12	x	x		1.5	-
16	x	x	x	2.5	-
20	x	x	x	2.5	-
25	x	x	x	4	-
32	x	x	x	4	-
40		x	x	10	-
50		x	x	10	16
63		x	x	16	25
80			x	25	35
100			x	35	50
125			x	50	70

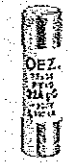
Notes:
1) Applies to ambient temperature of swich-disconnectors max. 40 °C
2) Applies to HRC fuse-links PV10, PV14, PV22

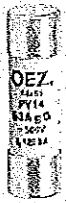
Minimal connecting cross-section of cables and busbars of fuse switch-disconnectors and fuse rails

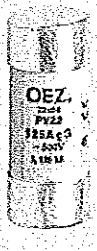
Fuse-links I_n [A]	Fuse switch-disconnectors and fuse-rails									Cable S [mm²]		Busbar w x h	
	FH000	FH00	FH1	FH2	FH3	FD00 FR00	FD1 FR1	FD2 FR2	FD3 FR3	Cu	Al	Cu	Al
4	x	x				x				1	-	-	-
6	x	x	x			x	x			1	-	-	-
8	x	x	x			x	x			1	-	-	-
10	x	x	x			x	x			1.5	-	-	-
12	x	x	x			x	x			1.5	-	-	-
16	x	x	x			x	x			2.5	-	-	-
20	x	x	x			x	x			2.5	-	-	-
25	x	x	x			x	x			4	-	-	-
32	x	x	x	x		x	x	x		4	-	-	-
35	x	x	x	x		x	x	x		6	-	-	-
40	x	x	x	x		x	x	x		10	-	-	-
50	x	x	x	x		x	x	x		10	16	-	-
63	x	x	x	x		x	x	x		16	25	-	-
80	x	x	x	x	x	x	x	x	x	25	35	-	-
100	x	x	x	x	x	x	x	x	x	35	50	20 x 2	25 x 2
125	x	x	x	x	x	x	x	x	x	50	70	25 x 2	25 x 3
160	x	x	x	x	x	x	x	x	x	70	95	25 x 3	25 x 4
200			x	x	x		x	x	x	95	120	25 x 4	25 x 5
224			x	x	x		x	x	x	95	120	25 x 4	25 x 5
250			x	x	x		x	x	x	120	150	25 x 5	25 x 6
315				x	x			x	x	150	185	32 x 5	32 x 6
350				x	x			x	x	185	240	32 x 6	32 x 8
400				x	x			x	x	240	2x 150	32 x 8	40 x 8
500					x				x	2x 150	2x 185	2x 30 x 5	2x 40 x 5
630					x				x	2x 185	2x 240	2x 40 x 5	2x 40 x 8

Notes:
1) Applies to ambient temperature of swich-disconnectors max. 40 °C
2) Applies to HRC fuse-links PNA, PHNA

FUSE-LINKS PV







- Small dimensions.
- High limiting and breaking capacity.
- Low power losses.
- The fuse-links do not contain harmful substances according to the RoHS Regulation (cadmium, lead and other).
- Utilization category gG for protection of lines, cables and other equipment against overload and short- circuit.
- Utilization category aM for protection of motors, overcurrent relays, contactors and similar devices only against short-circuit.

Fuse-links PV

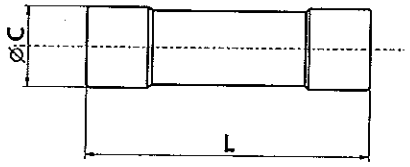
		Utilization category gG				Utilization category aM					
	I_n [A]	Type	U_n [V]	Product code	Power losses [W]	Type	U_n [V]	Product code	Power losses [W]	Weight [kg]	Package [pcs]
10 x 38	0,25	-	-	-	-	PV10 0,25A aM	500	06688	0.11	0.011	20
	0,5	-	-	-	-	PV10 0,5A aM	500	06689	0.17	0.011	20
	1	-	-	-	-	PV10 1A aM	500	06690	0.29	0.011	20
	2	PV10 2A gG	500	06691	0.72	PV10 2A aM	500	06692	0.92	0.011	20
	4	PV10 4A gG	500	06693	1.17	PV10 4A aM	500	06694	0.25	0.011	20
	6	PV10 6A gG	500	06695	0.88	PV10 6A aM	500	06696	0.31	0.011	20
	8	PV10 8A gG	500	06697	1.04	PV10 8A aM	500	06698	0.46	0.011	20
	10	PV10 10A gG	500	06699	1.29	PV10 10A aM	500	06700	0.46	0.011	20
	12	PV10 12A gG	500	06701	1.48	PV10 12A aM	500	06702	0.47	0.011	20
	16	PV10 16A gG	500	06703	1.86	PV10 16A aM	500	06704	0.67	0.011	20
	20	PV10 20A gG	500	06705	2.20	PV10 20A aM	400	06706	0.87	0.011	20
	25	PV10 25A gG	500	06707	2.58	PV10 25A aM	400	06708	1.05	0.011	20
	32	PV10 32A gG	500	06709	2.54	PV10 32A aM	400	06710	1.50	0.011	20
14 x 51	0,25	-	-	-	-	PV14 0,25A aM	690	06711	0.12	0.020	10
	0,5	-	-	-	-	PV14 0,5A aM	690	06712	0.18	0.020	10
	1	-	-	-	-	PV14 1A aM	690	06713	0.30	0.020	10
	2	PV14 2A gG	690	06714	0.95	PV14 2A aM	690	06715	0.99	0.020	10
	4	PV14 4A gG	690	06716	1.57	PV14 4A aM	690	06717	0.31	0.020	10
	6	PV14 6A gG	690	06718	2.24	PV14 6A aM	690	06719	0.34	0.020	10
	8	PV14 8A gG	690	06720	1.20	PV14 8A aM	690	06721	0.45	0.020	10
	10	PV14 10A gG	690	06722	1.58	PV14 10A aM	690	06723	0.56	0.020	10
	12	PV14 12A gG	690	06724	1.49	PV14 12A aM	690	06725	0.63	0.020	10
	16	PV14 16A gG	690	06726	2.0	PV14 16A aM	500	06727	1.01	0.020	10
	20	PV14 20A gG	690	06728	2.24	PV14 20A aM	500	06729	1.04	0.020	10
	25	PV14 25A gG	690	06730	2.70	PV14 25A aM	500	06731	1.30	0.020	10
	32	PV14 32A gG	690	06732	3.33	PV14 32A aM	500	06733	1.94	0.020	10
	40	PV14 40A gG	500	06734	3.86	PV14 40A aM	500	06735	2.04	0.020	10
	50	PV14 50A gG	500	06736	4.10	PV14 50A aM	400	06737	2.91	0.020	10
	63	PV14 63A gG	500	06738	5.35	PV14 63A aM	400	06739	3.69	0.020	10
22 x 58	16	PV22 16A gG	690	06740	2.23	PV22 16A aM	690	06741	0.92	0.060	10
	20	PV22 20A gG	690	06742	2.24	PV22 20A aM	690	06743	1.06	0.060	10
	25	PV22 25A gG	690	06744	2.90	PV22 25A aM	690	06745	1.43	0.060	10
	32	PV22 32A gG	690	06746	4.10	PV22 32A aM	690	06747	2.03	0.060	10
	40	PV22 40A gG	690	06748	4.52	PV22 40A aM	690	06749	2.50	0.060	10
	50	PV22 50A gG	690	06750	6.45	PV22 50A aM	690	06751	2.55	0.060	10
	63	PV22 63A gG	500	06752	5.82	PV22 63A aM	500	06753	4.05	0.060	10
	80	PV22 80A gG	500	06754	6.82	PV22 80A aM	500	06755	4.85	0.060	10
	100	PV22 100A gG	500	06756	7.81	PV22 100A aM	500	06757	5.59	0.060	10
	125	PV22 125A gG	500	18271	10.5	PV22 125A aM	400	06758	6.31	0.060	10

FUSE-LINKS PV

Parameters

Rated voltage	U_n	400 ÷ 690 V a.c. 250 V d.c.
Rated breaking capacity (rms)	I_1	120 kA/400 ÷ 690 V a.c. (100 kA/PV10 32A gG, 80 kA/PV14 63A gG) 50 kA/250 V d.c.
Utilization category		gG aM
Discrimination		1 : 1.6
Standards		IEC 60269 EN 60269
Approval marks		

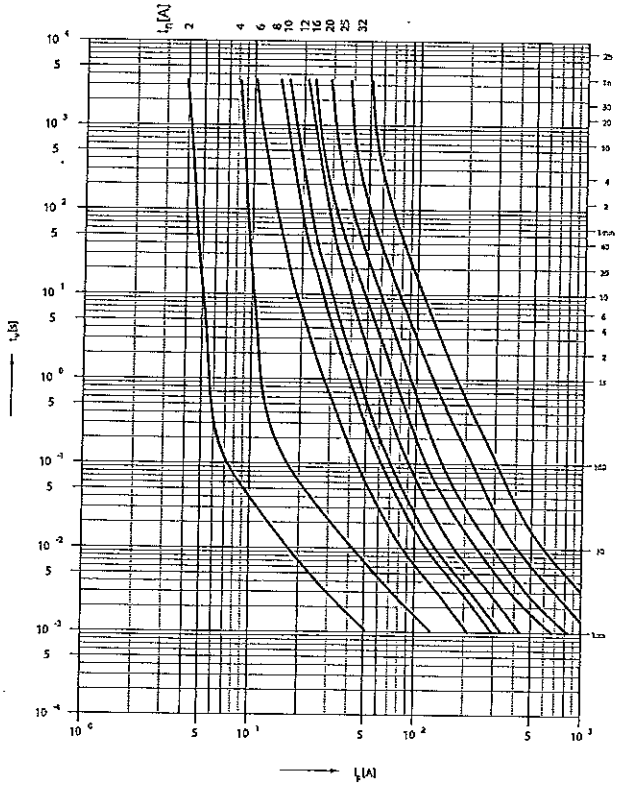
Dimensions



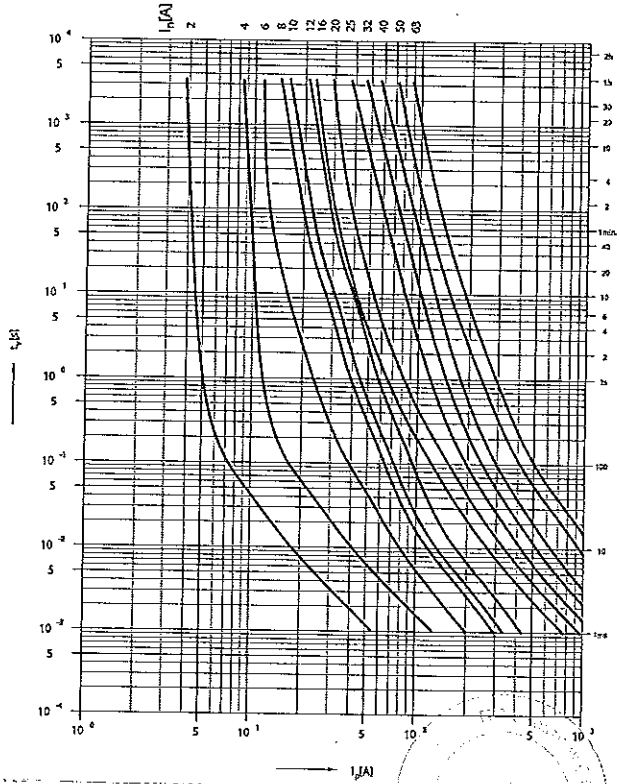
Type	ØC	L
PV10	10.3± 0.1	38± 0.6
PV14	14.3± 0.1	$51^{+0.6}_{-1}$
PV22	22.2± 1	$58^{+0.1}_{-2}$

Characteristics

Prearcing time/current characteristic
PV10 gG



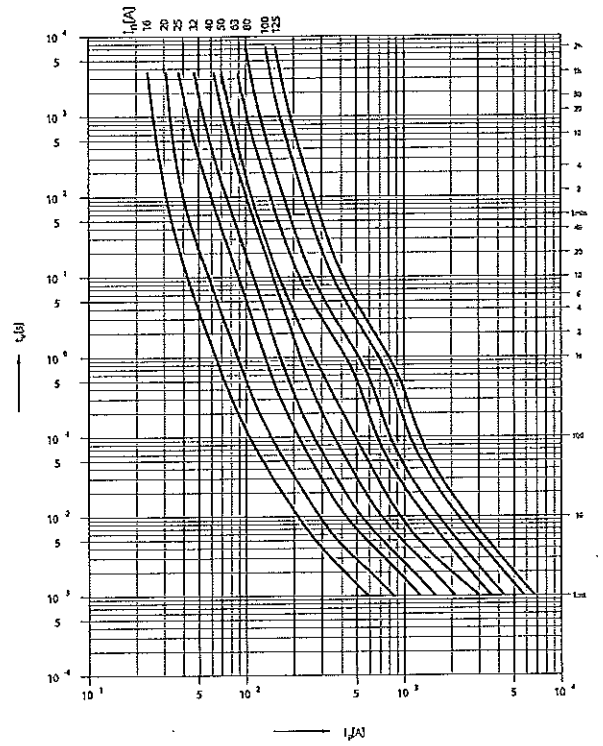
Prearcing time/current characteristic
PV14 gG



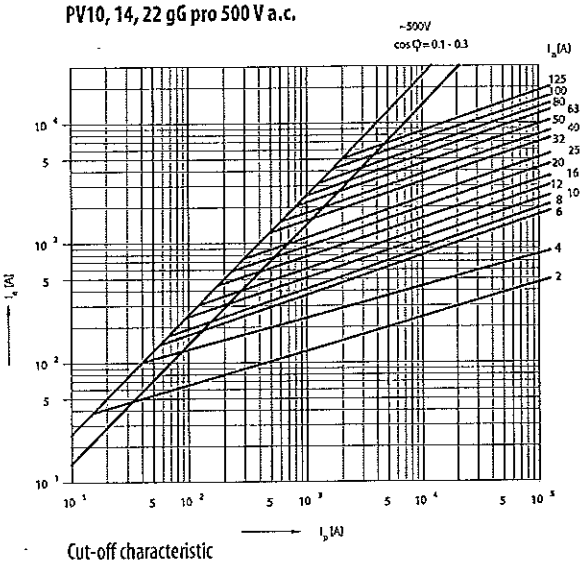
FUSE-LINKS PV

Characteristics

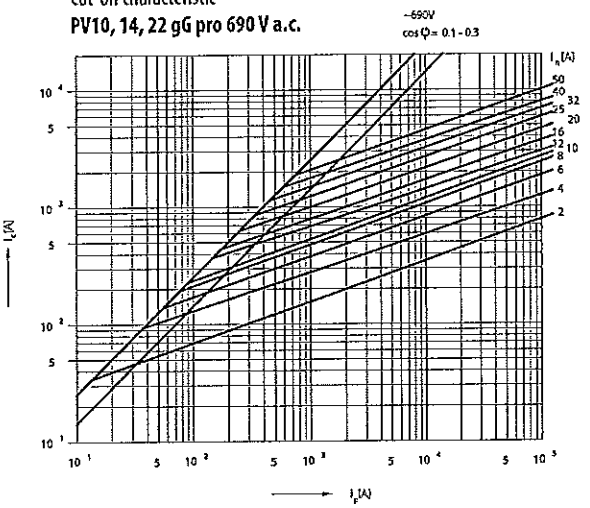
Prearcing time/current characteristic
PV22 gG



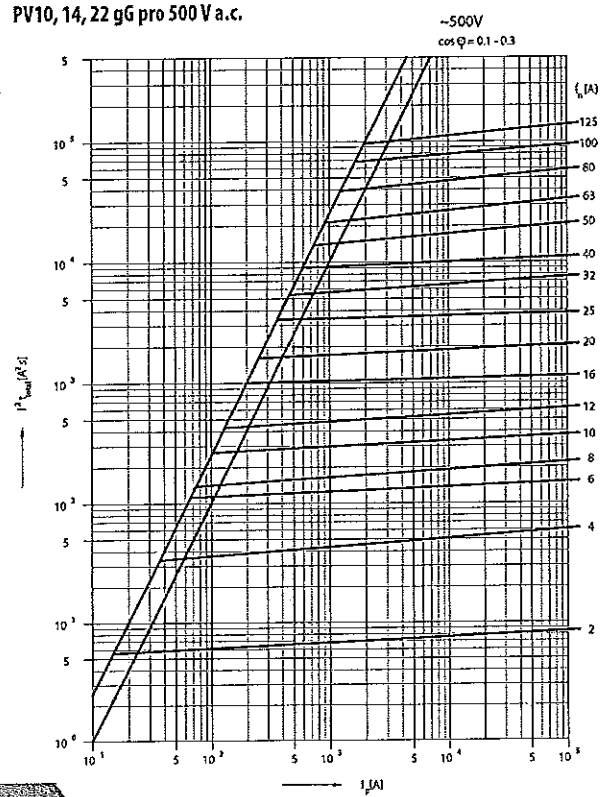
Cut-off characteristic
PV10, 14, 22 gG pro 500 V a.c.



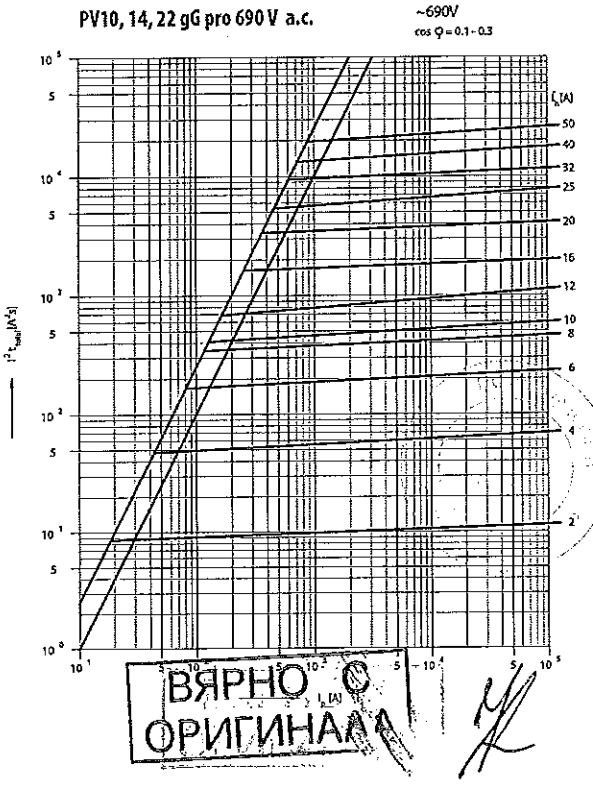
Cut-off characteristic
PV10, 14, 22 gG pro 690 V a.c.



I^2t characteristic
PV10, 14, 22 gG pro 500 V a.c.



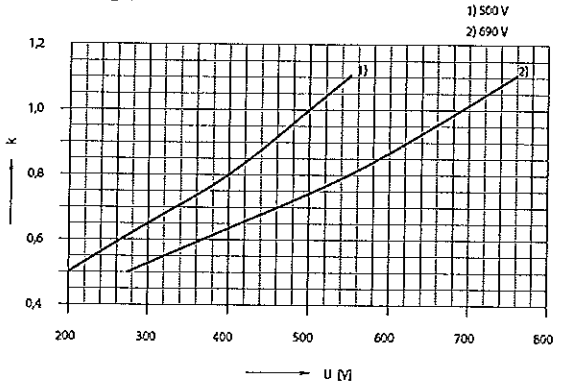
I^2t characteristic
PV10, 14, 22 gG pro 690 V a.c.



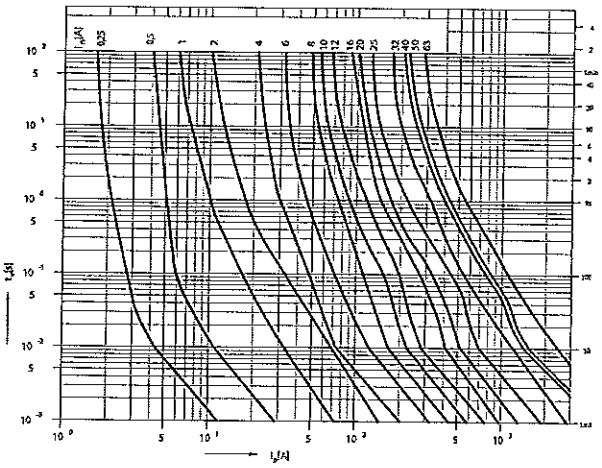
FUSE-LINKS PV

Characteristics

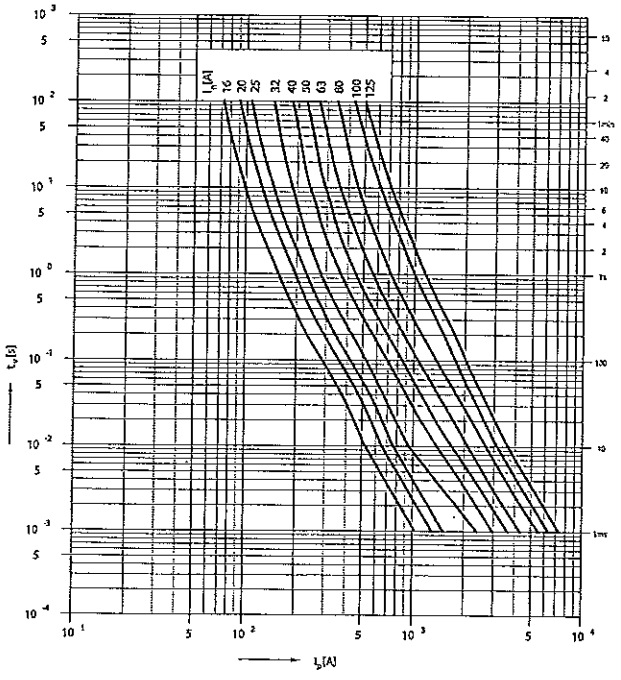
Correction factor $_{a}k^{a}$ of I^2t dependence on operating voltage U
$(I^2t_{total})_{f(U)} = k \times I^2t_{total}$
PV10, 14, 22 gG, aM



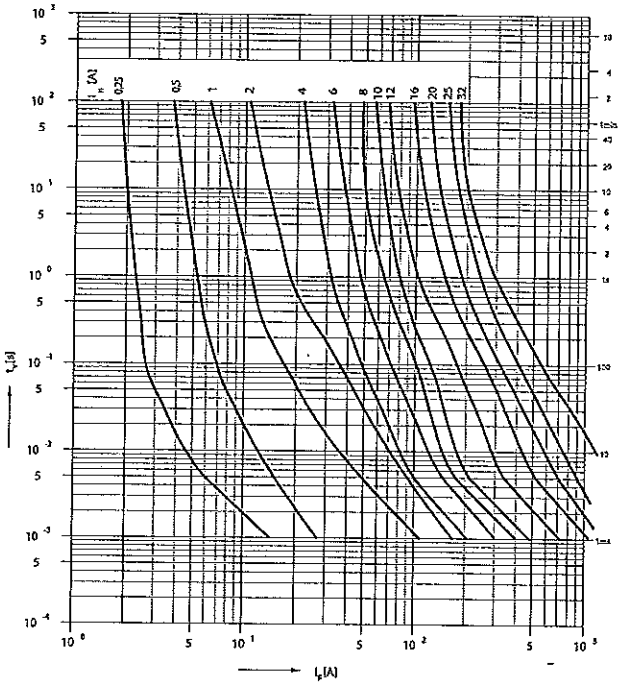
Prearcing time/current characteristic
PV14 aM



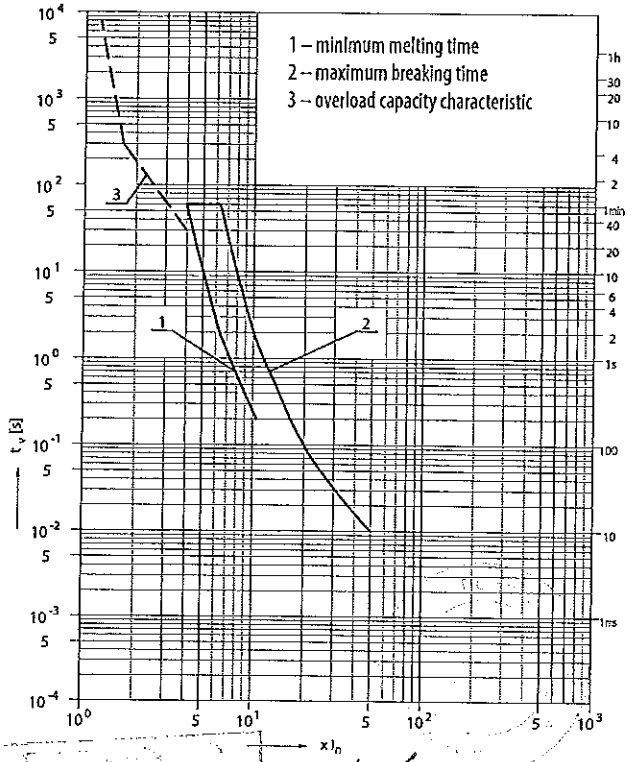
Prearcing time/current characteristic
PV22 aM



Prearcing time/current characteristic
PV10 aM



Time/current ranges
PV10, 14, 22 aM

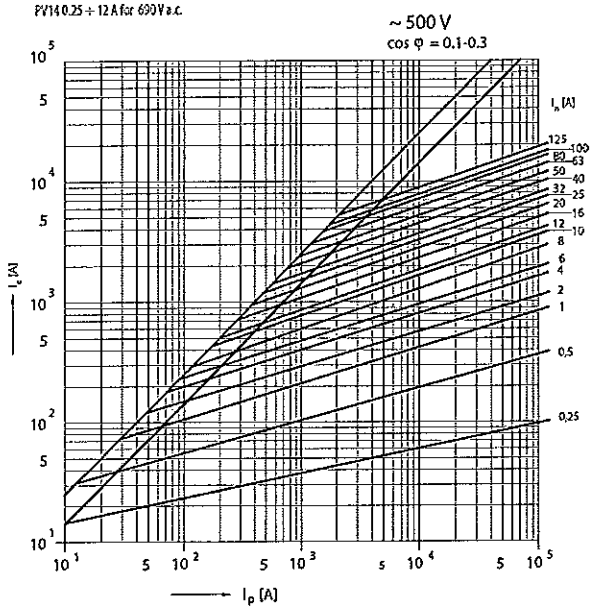


FUSE-LINKS PV

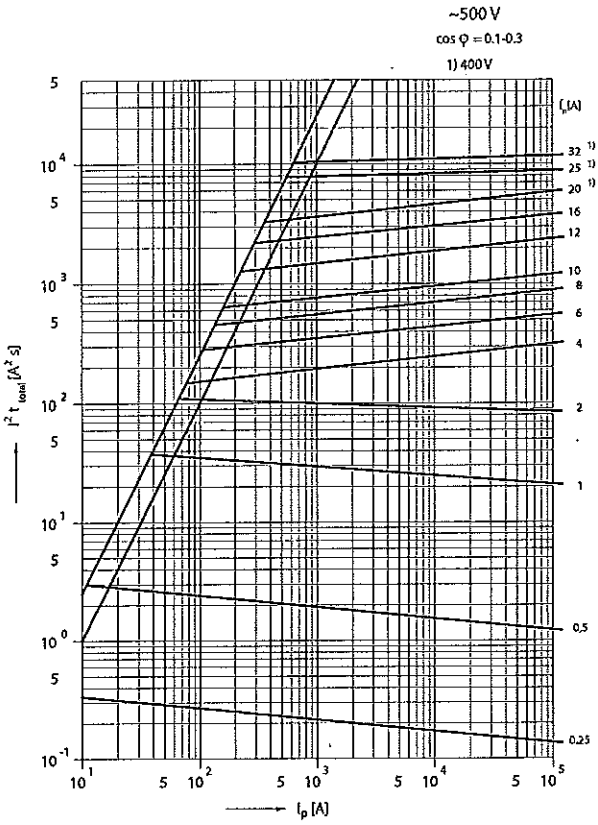
Characteristics

Cut-off characteristic
PV10, 14, 22 aM

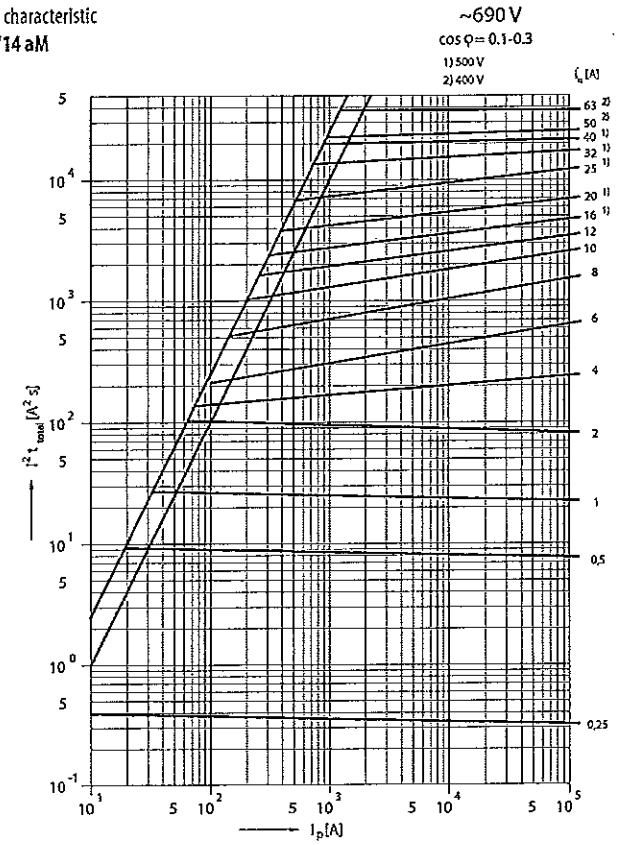
PV10 20 ÷ 32 A for 400 V a.c. PV22 125 A for 400 V a.c.
PV14 50 a 63 A for 400 V a.c. PV22 16 ÷ 50 A for 690 V a.c.
PV14 0.25 ÷ 12 A for 690 V a.c.



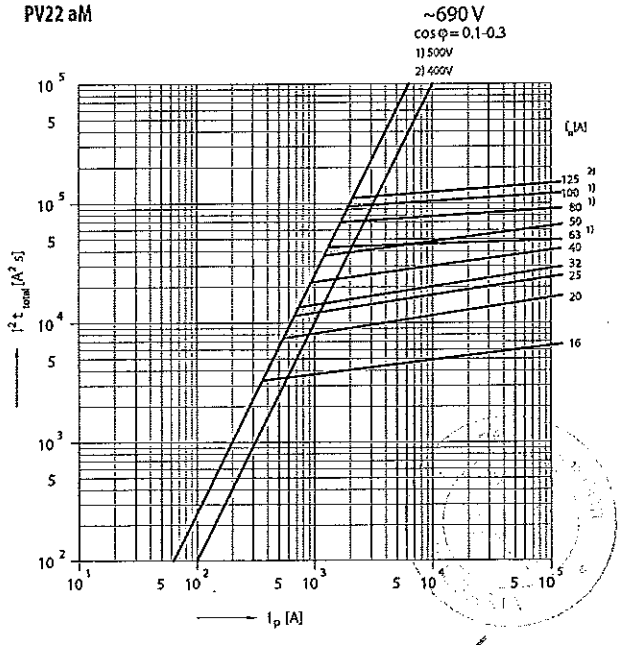
I^2t characteristic
PV10 aM



I^2t characteristic
PV14 aM



I^2t characteristic
PV22 aM



Приложение 25

OEZ

ES PROHLÁŠENÍ O SHODĚ / *CE DECLARATION OF CONFORMITY*

Číslo / *No.* : **502300/1210**

My / *We*, **OEZ s.r.o.**
Šedivská 339, 561 51 Letohrad, Česká republika

prohlašujeme na svou výlučnou odpovědnost, že
declare on our own responsibility that

Výrobek: Odpínače válcových pojistek velikosti 10x38
Product: Fuse switch-sdisconnectors for cylindrical fuse-links size 10x38

Typ / *Type*: OPVA10

Příslušenství / *Accessory*:

je ve shodě s následujícími normami:
complies with the following standards:

České normy / *Czech standards*	**Evropské normy** / *European standards*
ČSN EN 60947-1:08ed.4 +A1:11 ČSN EN 60947-3:10ed.3	EN 60947-1:07 EN 60947-3:09

a následujícími nařízeními vlády, ve znění pozdějších předpisů (NV)
and the following government regulations (NV), as amended

NV 17/2003 Sb. v platném znění	2006/95/ES - including amendments

Elektrotechnický zkušební ústav, Pod Lisem 129, 171 02 Praha 71, Česká republika
zkoušel / certifikoval daný výrobek a vydal:
tested / certified the product and issued:

EZU Certifikát / *EZU Certificate*: 1120754 ze dne 29.09.2012
EZÚ zkušební protokol / *EZU test report*: 204265-01/01 ze dne 21.09.2012

Poslední dvojčíslí roku, v němž bylo označení CE na výrobek umístěno: 12
Last two digits of the year in which the CE mark was placed on the product:

Místo vydání: Letohrad
Place of issue:
signature:

Zástupce výrobce a podpis: **Ing. Roman Schiffer**
Manufacturer's representative and

Datum vydání: **08.10.2012**
Date of issue:

Funkce: **generální ředitel**
Position: *general director*

OEZ s. r. o.
Šedivská 339, Letohrad 561 51
Česká republika
IČO: 49810146, DIČ: CZ49810146

Превод от английски език

ОЕЗ АД
Шедивска 339, 561 51 Летохрад, Чешка република

ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ
№ 502300/1210

Ние, **ОЕЗ АД**, с адрес: Шедивска 339, 561 51 Летохрад, Чешка република, декларираме на наша собствена отговорност, че

Продуктът **Разединител - предпазител за цилиндрични стояеми вложки размер 10x38**

Тип **OPVA10**

Аксесоари:

Съответства на следните стандарти:

Чешки стандарт	Европейски стандарт
CSN EN 60947-1:08 ed.4+A1:11 CSN EN 60947-3:10 ed.3	EN 60947-1:07 EN 60947-3:09

И на следните държавни наредби (NV) и измененията към тях

NV17/2003 Sb. - включително измененията	2006/95/ES - включително измененията

ЕЗУ (Дружество за електротехнически изпитания) с адрес: Под Листем 129, 171 02 Прага 71, Чешка република, удостовери продукта и издаде:

Сертификат № 1120754 от дата 29.09.2012 г.
Изпитателен протокол № 204265-01/01 от дата 21.09.2012 г.

Последните две цифри от годината, в която е поставен знакът ЕС върху продукта: 12

Място на издаване: Летохрад/ дата на издаване: 08.10.2012 г.
Представител на производителя: инж. Роман Шифер, генерален директор (подпис)
ОЕЗ АД с адрес: Шедивска 339, 561 51 Летохрад, Чешка република

OEZ

ES PROHLÁŠENÍ O SHODĚ / *CE DECLARATION OF CONFORMITY*

Číslo / *No.* : 493200/1210

My / *We*, **OEZ s.r.o.**
Šedivská 339, 561 51 Letohrad, Česká republika

prohlašujeme na svou výlučnou odpovědnost, že
declare on our own responsibility that

Výrobek: Pojistkové vložky
Product: Fuse-links

Typ / *Type*: PVA

Příslušenství / *Accessory*:

je ve shodě s následujícími normami:
complies with the following standards:

České normy / *Czech standards*	**Evropské normy** / *European standards*
ČSN EN 60269-1:08ed.3 ČSN 354701-2:11ed.2	EN 60269-1:07 HD 60269-2:10

a následujícími nařízeními vlády, ve znění pozdějších předpisů (NV)
and the following government regulations (NV), as amended

NV 17/2003 Sb. v platném znění	2006/95/ES - including amendments

Elektrotechnický zkušební ústav, Pod Lisem 129, 171 02 Praha 71, Česká republika
zkoušel / certifikoval daný výrobek a vydal:
tested / certified the product and issued:

EZU Certifikát / *EZU Certificate*: 1120633 ze dne 14.8.2012
EZÚ zkušební protokol / *EZU test report*: 203275-01/01 ze dne 30.07.2012

Poslední dvojčíslí roku, v němž bylo označení CE na výrobek umístěno: 12
Last two digits of the year in which the CE mark was placed on the product:

Místo vydání: **Letohrad**
Place of issue:

Datum vydání: **08.10.2012**
Date of issue:

Zástupce výrobce a podpis: **Ing. Roman Schiffer**
Manufacturer's representative and signature:

Funkce: **generální ředitel**
Position: *general director*

OEZ
OEZ s. r. o.
Šedivská 339, Letohrad 561 51
Česká republika
IČO: 49810146, DIČ: CZ49810146

1

Превод от английски език

ОЕЗ АД
Шедивска 339, 561 51 Летохрад, Чешка република

ДЕКЛАРАЦИЯ ЗА СЪОТВЕТСТВИЕ
№ 493200/1210

Ние, **ОЕЗ АД**, с адрес: Шедивска 339, 561 51 Летохрад, Чешка република, декларираме на наша собствена отговорност, че

Продуктът **Стопяем предпазител**

Тип **PVA**

Аксесоари:

Съответства на следните стандарти:

Чешки стандарт	Европейски стандарт
CSN EN 60269-1:08 ed.3 CSN 354701-2:11 ed.2	EN 60269-1:07 HD 60269-2:10

И на следните държавни наредби (NV) и измененията към тях

NV17/2003 Sb. - включително измененията	2006/95/ES - включително измененията

ЕЗУ (Дружество за електротехнически изпитания) с адрес: Под Листем 129, 171 02 Прага 71, Чешка република, удостовери продукта и издаде:

Сертификат № 1120633 от дата 14.08.2012 г.
Изпитателен протокол № 203275-01/01 от дата 30.07.2012 г.

Последните две цифри от годината, в която е поставен знакът ЕС върху продукта: 12

Място на издаване: Летохрад/ дата на издаване: 08.10.2012 г.
Представител на производителя: инж. Роман Шифер, генерален директор (подпис)
ОЕЗ АД с адрес: Шедивска 339, 561 51 Летохрад, Чешка република

Приложение 26

IEC IECEE CB SCHEME

Ref. Certif. No.

CZ-1823

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	Low-voltage fuses
Name and address of the applicant Nom et adresse du demandeur	OEZ s. r. o. Šedivská 339, 561 51 Letohrad, Czech Republic
Name and address of the manufacturer Nom et adresse du fabricant	OEZ s. r. o. Šedivská 339, 561 51 Letohrad, Czech Republic
Name and address of the factory Nome et adresse de l'usine	OEZ s. r. o. Šedivská 339, 561 51 Letohrad, Czech Republic
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	500 V; 2, 4, 6, 8, 10, 12, 16, 20, 25, 32 A
Trademark (if any) Marque de fabrique (si elle existe)	
Model / Type Ref. Ref. De type	PV10 gG Cd/Pb free
Additional information (if necessary) Information complémentaire (si nécessaire)	

	PUBLICATION	EDITION
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	IEC 60269-1 IEC 60269-2 IEC 60269-2-1	1998+A1:2005 1986+A1:1995+A2:2001 2004
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	702102-01/01 of: 03.08.2007	

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

Elektrotechnický zkušební ústav, s.p.
Pod Lisem 129, 171 02 Praha 8 – Troja
Czech Republic

Date: 7.8.2007

ELEKTROTECHNICKÝ ZKUŠEBNÍ ÚSTAV PRAHA - TROJA POD LISEM 129

Signature: Pavel Kudrna
Certification and Inspection Manager

TEST REPORT

IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01; IEC 60269-2-1:04 4th ed.

Report

Reference No. ..... : 702102-01/01
Tested by (+ signature) ..... : Klípa
Approved by (+ signature) ..... : Hlavatý
Date of issue ..... : 03.08. 2007
Contents ..... : 78 pages
Oscillograms ..... : 85 , page 36 - 78

Testing laboratory

Name ..... : Elektrotechnický zkušební ústav
Address ..... : Pod Lisem 129 , 171 02 Praha 8 - Troja , Czech Republic
Testing location ..... : as above

Client

Name ..... : OEZ s.r.o.
Address ..... : Šedivská 339, 56151 Letohrad, Czech Republic

Test specification

Standard ..... : IEC 60269-1:98 3rd ed.+Amd1:05; IEC 60269-2:86 2nd ed. +Amd1:95+ Amd2:01; IEC 60269-2-1:04 4th ed..
Test procedure ..... : CB-scheme
Procedure deviation ..... : N.A.
Non-standard test method ..... : N.A.

Test item

Description ..... : **Low-voltage fuses**
Trademark ..... : OEZ.
Model and/or type reference ..... : **PV10 gG Cd/Pb free**
Manufacturer ..... : **OEZ s.r.o.**
Rating(s) ..... : **500V / 2, 4, 6, 8, 10, 12, 16, 20, 25, 32A**

Test case verdicts

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

TEST REPORT

IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01; IEC 60269-2-1:04 4th ed.

TECHNICAL CHARACTERISTIC

Serie/Type ref.:.....**PV10gG** **Cd/Pb free**

Rated voltage:.....**500 V**

Rated current:..... **2, 4, 6, 8, 10, 12, 16, 20, 25, 32A**

Rated frequency:..... **50 Hz**

Rated breaking capacity:.....**120 kA (100kA/32A)**

Homgeneous series.....**2-4; 6; 8-12;16-20;25; 32A**

Size:.....**10 x 38**

Utilization category:

Gripping lugs:.....**No**

Indicating device:.....**No**

Models/type see page 3
Test sequence see page 3

ВЯРНО С ОРИГИНАЛА

TEST REPORT

IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01; IEC 60269-2-1:04 4th ed.

LOW-VOLTAGE FUSE; NH-SYSTEM
IEC 60269 Test sequence

Number of CB-Test report	Type	Rated current (A)	Rated voltage (V)	Rated breaking capacity (kA)	Size	Table
	PV10 gG	**2**	**500**	**120**	**10x38**	**7B**
	PV10 gG	**4**	**500**	**120**	**10x38**	**7A**
	PV10 gG	**6**	**500**	**120**	**10x38**	**7A**
	PV10 gG	**8**	**500**	**120**	**10x38**	**7B**
	PV10 gG	**10**	**500**	**120**	**10x38**	**7C**
	PV10 gG	**12**	**500**	**120**	**10x38**	**7A**
	PV10 gG	**16**	**500**	**120**	**10x38**	**7B**
	PV10 gG	**20**	**500**	**120**	**10x38**	**7A**
	PV10 gG	**25**	**500**	**120**	**10x38**	**7A**
	PV10 gG	**32**	**500**	**100**	**10x38**	**7A**

Type listing

Rated current (A)	Type	Type	Type	Type

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 2A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7B**	**CB** page **- 4 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7B** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test-sequence	Samples No	R_i mΩ	Test-voltage V (AC)	Test current A	cos φ	Pre-arcing time s	Operating time s	Requirement-Test	Result-Remark verdict	
6	Marking	1							The marking of the rated voltage/rated current /size discernible from the front	P	see page 34
8.1.4	Dimension	1-3							Fig. 1(III) Size 10 x 38	P	see page 6
8.1.5.1	Resistance (R_i)	1-17							Measuring current ≤ 0,1 I_n ; Ambient air temperature 20 ± 5°C	P	see page 4, 5
8.3	Power dissipation (P_n) / / temperature rise (ΔT)	1	**143**	**10**	**2**	-			Tab. M and Fig. 1(III) (60269-2-1), P_n = max 3 W, Ambient air temperature: 24°C; Conventional time 1 h	P	P_n = 0,72W ΔT = 9K
8.4.3.1a)	Conv. non-fusing current (I_{nf})	1	**143**	**10**	**3**	-		**> 3600**	not operate within the conventional time 1h	P	
8.4.3.1b)	Conv. fusing current (I_f)	2	**129**	**10**	**4,2**	-		**1080**	operate within the conventional time 1.h	P	
8.4.3.2	Rated current	3	**140**	**10**	**3**	-		**> 3600**	100 h pulse test; test current 1,05 x I_n **2,1A** ; on 1 h/ off 0,1 x 1h, after the test conventional non-fusing current (I_{nf}) **3 A**; conventional time 1h	P	
8.4.3.3.1	Gate a) I_{min} (10 s)	4	**135**	**10**	**3,7**	-	**>4200**		Testing current of Table 3, column 2; operating time > 10 s	P	
	„ b) I_{max} (5 s)	5	**137**	**200**	**9,2**	-	**0,051**		„ „ „ 3, „ 3 operate within ≤ 5 s	P	
	„ c) I_{min} (0,1 s)	6	**131**	**200**	**6**	-	**0,3**		„ „ „ 3, „ 4 operating time > 0,1 s	P	
	„ d) I_{max} (0,1 s)	7	**132**	**200**	**23**	-	**0,006**		„ „ „ 3, „ 5 operate within ≤ 0,1 s	P	
8.4.3.4	Overload	8	**140**	**10**	**4,2**	-	**1020**		50 pulses; test current equal to 0,8 x **5,2** A stated for a pre-arcing time of 5 s	P	
		9	**138**	**10**	**4,2**	-	**1050**		on - 5 s / off - 0,2 x **1** h of the conventional time; current **4,2** A equal to	P	
		10	**136**	**10**	**4,2**	-	**900**		current for the overload test; pre-arcing time of sample lies within stated zone	P	
8.4.3.6	Indicating devices	-	-						Operation of indicating device verified in combination with the verification of breaking capacity I_1 to I_5 (8.5.5)	N	

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 2A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7B**	**CB** page **- 5 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7B** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Sample No	R_i mΩ	Test-voltage V (AC)	Test-current kA	cos φ	Making angle after voltage zero (U_0)	i_D kA	i_S kA	Peak arc voltage V	Initiation of arcing after voltage zero (U_0)	Pre-arcing time ms	Operating time ms	Pre-arcing I^2t A^2s	Operating I^2t A^2s	Osz No	Result-Remark Resistance between fuse-link contacts measured after each test. **Test voltage DC 500 V Resistance >1000 MΩ** Verdict	Remark
8.5 No1	Breaking capacity (I1)	**11**	**129**	**558**	**125**	**0,16**	**46**	**0,620**		**640**	**46**	**0,01**	**0,12**			**27DS044**	**P**	**∞ MΩ**
		12	**130**	**558**	**125**	**0,16**	**86**	**0,623**		**916**	**86**	**0,01**	**0,15**			**27DS045**	**P**	**∞ MΩ**
		13	**137**	**558**	**125**	**0,16**	**84**	**0,494**		**803**	**84**	**0,01**	**0,10**			**27DS046**	**P**	**∞ MΩ**
8.7.4	Overcurrent discrimination(I^2t-Wert)	**14**	**140**	**192**	**0,013**	**0,26**	**0**							**3,10**		**98645**	**P**	**∞ MΩ**
		15	**141**	**192**	**0,013**	**0,26**	**0**							**2,89**		**98646**	**P**	**∞ MΩ**
		16	**131**	**320**	**0,066**	**0,25**	**7**								**3,66**	**98651**	**P**	**∞ MΩ**
		17	**131**	**328**	**0,066**	**0,25**	**0**								**3,61**	**98652**	**P**	**∞ MΩ**
8.9.2	Resistance to heat			Gripping-lugs; to 80°C; 2h, then loaded with 150% rated current; tensile force F_{max} (Table J) .....N													N	
8.11.1.8	Impact resistance			Gripping-lugs; the facility is given in Fig. 9; 168h to 150°C; the weight 300 g; the height 300 mm													N	
				Gripping-lugs; the facility is given in Fig. 9; 72h to -15°C; the weight 300 g; the height 300 mm													N	
8.11.2.2	Resistance to abnormal heat and fire			parts of insulating materials; glow-wire 960°C; to item a) of sub-clause 8.11.2.2.5													N	
				parts of insulating materials; glow-wire 650°C; to item b) of sub-clause 8.11.2.2.5													N	
8.11.2.4	Non-deterioration of insulating parts of fuse-link and fuse-base			for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													N	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													N	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h ;Breaking capacity (I_2) to Table 12A													N	

Clause	Test sequence	Samples Nr	Requirement-Test	***Deviations: Type: PV10 gG In = 2A***					Result-Remark) Verdict	
8.1.4	Dimensions	1-3	Fig. 1(III) Size 10 x 38		Prescribed (mm)	Measured (mm)				
						Samples Nr 1	Samples Nr 2	Samples Nr 3		
				Dimension marking a	38 ± 0,6	**37.4**	**37.5**	**37.7**	**P**	
				Dimension marking b	max 10,5	**9.1**	**9**	**9.1**	**P**	
				Dimension marking c	10,3 ± 0,1	**10.2**	**10.2**	**10.2**	**P**	
				Dimension marking d	min 6	**10.2**	**10.2**	**10.2**	**P**	
				Dimension marking r	1,5 ± 0,5	**1.2**	**1.3**	**1.3**	**P**	

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 4A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 7 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test-sequence	Samples No	R_i mΩ	Test-voltage V (AC)	Test current A	cos φ	Pre-arcing time s	Operating time s	Requirement-Test	Result-Remark verdict	
6	Marking	1							The marking of the rated voltage/rated current /size discernible from the front	P	see page 34
8.1.4	Dimension	1-3							Fig. 1(III) Size 10 x 38	P	see page 9
8.1.5.1	Resistance (R_i)	1-23							Measuring current ≤ 0,1 I_n ; Ambient air temperature 20 ± 5°C	P	see page 7, 8
8.3	Power dissipation (P_n) / / temperature rise (ΔT)	1	**54,0**	**10**	**4**	-			Tab. M and Fig. 1(III) (60269-2-1), P_n = max 3 W, Ambient air temperature: **22°C**; Conventional time 1 h	P	P_n = 1,17W ΔT = 16K
8.4.3.1a)	Conv. non-fusing current (I_{nf})	1	**54,0**	**10**	**6**	-		**> 3600**	not operate within the conventional time **1h**	P	
8.4.3.1b)	Conv. fusing current (I_f)	2	**49,5**	**10**	**8,4**	-		**1140**	operate within the conventional time 1.h	P	
8.4.3.2	Rated current	3	**53,8**	**10**	**6**	-		**> 3600**	100 h pulse test; test current 1,05 x I_n **4,2 A** ; on **1** h/ off 0,1 x **1h**, after the test conventional non-fusing current (I_{nf}) **6 A**; conventional time **1h**	P	
8.4.3.3.1	Gate a) I_{min} (10 s)	4	**51,3**	**10**	**7,8**	-	**>4200**		Testing current of Table 3, column 2; operating time > 10 s	P	
	„ b) I_{max} (5 s)	5	**52,0**	**200**	**18,5**	-	**0,062**		„ „ „ 3, „ 3 operate within ≤ 5 s	P	
	„ c) I_{min} (0,1 s)	6	**51,0**	**200**	**14**	-	**0,144**		„ „ „ 3, „ 4 operating time > 0,1 s	P	
	„ d) I_{max} (0,1 s)	7	**51,5**	**200**	**47**	-	**0,008**		„ „ „ 3, „ 5 operate within ≤ 0,1 s	P	
8.4.3.4	Overload	8	**50,8**	**10**	**8,6**	-	**390**		50 pulses; test current equal to 0,8 x **10,8** A stated for a pre-arcing time of 5 s	P	
		9	**52,0**	**10**	**8,6**	-	**420**		on - 5 s / off - 0,2 x **1** h of the conventional time; current **8,6** A equal to	P	
		10	**53,0**	**10**	**8,6**	-	**360**		current for the overload test; pre-arcing time of sample lies within stated zone	P	
8.4.3.6	Indicating devices	-	-						Operation of indicating device verified in combination with the verification of breaking capacity I_1 to I_5 (8.5.5)	N	

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 4A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 8 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Sample No	R_i mΩ	Test-voltage V (AC)	Test-current kA	cos φ	Making angle after voltage zero (U_0)	i_D kA	i_S kA	Peak arc voltage V	Initiation of arcing after voltage zero (U_0)	Pre-arcing time ms	Operating time ms	Pre-arcing I^2t A^2s	Operating I^2t A^2s	Osz No	Result-Remark Resistance between fuse-link contacts measured after each test. **Test voltage DC 500 V Resistance >1000 MΩ** Verdict	Remark
8.5 No	Breaking capacity (I_1)	11	55,0	558	125	0,16	84	0,802		1104	85	0,03	0,04			27DS041	P	∞ MΩ
		12	54,5	558	125	0,16	83	0,591		1104	84	0,03	0,04			27DS042	P	∞ MΩ
		13	54,0	558	125	0,16	46	0,627		1100	46	0,01	0,04			27DS043	P	∞ MΩ
8.5 No 2	Breaking capacity (I_2)	14	52,5	552	0,124	0,26	0		0,122	2416	69	3,90	6,67			98527	P	∞ MΩ
		15	52,2	560	0,124	0,26	0		0,121	2404	69	3,87	6,87			98528	P	∞ MΩ
		16	52,0	552	0,124	0,26	1		0,121	2528	72	3,97	6,70			98529	P	∞ MΩ
8.5 N0 3	Breaking capacity (I_3)	17	52,0	552	0,026	0,38							0,037 s				P	∞ MΩ
8.5 No 4	Breaking capacity (I_4)	18	52,5	560	0,020	0,40							0,070 s				P	∞ MΩ
8.5 No 5	Breaking capacity (I_5)	19	52,0	556	0,012	0,41							0,480 s				P	∞ MΩ
8.7.4	Overcurrent discrimination(I^2t-Wert)	20	53,8	288	0,034	0,29	3							19,27		98648	P	∞ MΩ
		21	54,0	288	0,034	0,29	1							17,66		98649	P	∞ MΩ
		22	50,0	328	0,130	0,27	5								24,91	98661	P	∞ MΩ
		23	53,3	328	0,130	0,27	4								26,15	98662	P	∞ MΩ
8.9.2	Resistance to heat			Gripping-lugs; to 80°C; 2h, then loaded with 150% rated current; tensile force F_{max} (Table J) .....N													N	
8.11.1.8	Impact resistance			Gripping-lugs; the facility is given in Fig. 9; 168h to 150°C; the weight 300 g; the height 300 mm													N	
				Gripping-lugs; the facility is given in Fig. 9; 72h to -15°C; the weight 300 g; the height 300 mm													N	
8.11.2.2	Resistance to abnormal heat and fire			parts of insulating materials; glow-wire 960°C; to item a) of sub-clause 8.11.2.2.5													N	
				parts of insulating materials; glow-wire 650°C; to item b) of sub-clause 8.11.2.2.5													N	
8.11.2.4	Non-deterioration of insulating parts of fuse-link and fuse-base			for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													N	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													N	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h ;Breaking capacity (I_2) to Table 12A													N	

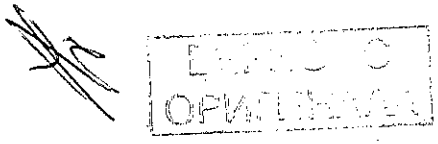
ВЯРНО С ОРИГИНАЛА

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 4A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page - 9 / 78 - **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Samples Nr	Requirement-Test	***Deviations: Type: PV10 In = 4A***					Result-Remark) Verdict	
8.1.4	Dimensions	1-3	Fig. 1(III) Size 10 x 38		Prescribed (mm)	Measured (mm)				
						Samples Nr 1	Samples Nr 2	Samples Nr 3		
				Dimension marking a	38 ± 0,6	**37.5**	**37.5**	**37.7**	**P**	
				Dimension marking b	max 10,5	**9.1**	**9.4**	**9.1**	**P**	
				Dimension marking c	10,3 ± 0,1	**10.2**	**10.2**	**10.2**	**P**	
				Dimension marking d	min 6	**10.2**	**10.2**	**10.2**	**P**	
				Dimension marking r	1,5 ± 0,5	**1.2**	**1.2**	**1.3**	**P**	

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 6A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 10 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test-sequence	Samples No	R_i mΩ	Test-voltage V (AC)	Test current A	cos φ	Pre-arcing time s	Operating time s	Requirement-Test	Result-Remark verdict	
6	Marking	1							The marking of the rated voltage/rated current /size discernible from the front	P	see page 34
8.1.4	Dimension	1-3							Fig. 1(III) Size 10 x 38	P	see page 12
8.1.5.1	Resistance (R_i)	1-23							Measuring current ≤ 0,1 I_n ; Ambient air temperature 20 ± 5°C	P	see page 10, 11
8.3	Power dissipation (P_n) / / temperature rise (ΔT)	1	23,3	10	6	-			Tab. M and Fig. 1(III) (60269-2-1), P_n = max 3 W, Ambient air temperature: 20°C; Conventional time 1 h	P	P_n = 0,88W ΔT = 13K
8.4.3.1a)	Conv. non-fusing current (I_{nf})	1	23,3	10	9	-		> 3600	not operate within the conventional time 1h	P	
8.4.3.1b)	Conv. fusing current (I_f)	2	19,0	10	11,4	-		780	operate within the conventional time 1.h	P	
8.4.3.2	Rated current	3	20,0	10	9	-		> 3600	100 h pulse test; test current 1,05 x I_n 6,3A ; on 1 h/ off 0,1 x 1h, after the test conventional non-fusing current (I_{nf}) 9 A; conventional time 1h	P	
8.4.3.3.1	Gate a) I_{min} (10 s)	4	19,0	10	11	-	>4200		Testing current of Table 3, column 2; operating time > 10 s	P	
	„ b) I_{max} (5 s)	5	19,0	200	28	-	0,86		„ „ „ 3, „ 3 operate within ≤ 5 s	P	
	„ c) I_{min} (0,1 s)	6	19,2	200	26	-	1,18		„ „ „ 3, „ 4 operating time > 0,1 s	P	
	„ d) I_{max} (0,1 s)	7	19,3	200	72	-	0,015		„ „ „ 3, „ 5 operate within ≤ 0,1 s	P	
8.4.3.4	Overload	8	19,3	10	16,0	-	40		50 pulses; test current equal to 0,8 x 20 A stated for a pre-arcing time of 5 s	P	
		9	19,7	10	16,0	-	38		on - 5 s / off - 0,2 x 1 h of the conventional time; current 16,0 A equal to	P	
		10	19,8	10	16,0	-	42		current for the overload test; pre-arcing time of sample lies within stated zone	P	
8.4.3.6	Indicating devices	-	-						Operation of indicating device verified in combination with the verification of breaking capacity I_1 to I_5 (8.5.5)	N	



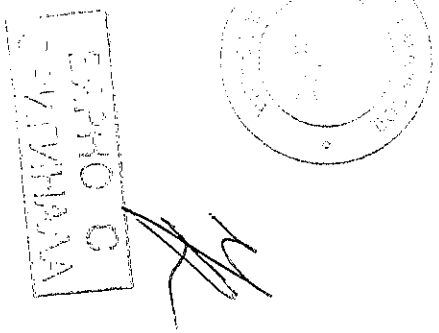
EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 6A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 11 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Sample No	R_i mΩ	Test-voltage V (AC)	Test-current kA	cos φ	Making angle after voltage zero (U_0)	i_D kA	i_S kA	Peak arc voltage V	Initiation of arcing after voltage zero (U_0)	Pre-arcing time ms	Operating time ms	Pre-arcing I^2t A^2s	Operating I^2t A^2s	Osz No	Result-Remark Resistance between fuse-link contacts measured after each test. **Test voltage DC 500 V Resistance >1000 MΩ** Verdict	Remark
8.5 No	Breaking capacity (I_1)	**11**	**19,3**	**558**	**125**	**0,16**	**46**	**1,592**		**803**	**46**	**0,01**	**4,60**			**27DS038**	**P**	**∞ MΩ**
		12	**19,3**	**558**	**125**	**0,16**	**84**	**1,859**		**1167**	**85**	**0,03**	**2,74**			**27DS039**	**P**	**∞ MΩ**
		13	**19,5**	**558**	**125**	**0,16**	**84**	**1,788**		**929**	**84**	**0,02**	**2,42**			**27DS040**	**P**	**∞ MΩ**
8.5 No 2	Breaking capacity (I_2)	**14**	**19,7**	**552**	**0,210**	**0,27**	**1**		**0,209**	**1408**	**73**	**4,13**	**8,80**			**98519**	**P**	**∞ MΩ**
		15	**19,7**	**552**	**0,210**	**0,27**	**0**		**0,190**	**1400**	**71**	**4,00**	**8,90**			**98520**	**P**	**∞ MΩ**
		16	**19,7**	**552**	**0,210**	**0,27**	**0**		**0,211**	**1272**	**70**	**3,93**	**9,23**			**98521**	**P**	**∞ MΩ**
8.5 N0 3	Breaking capacity (I_3)	**17**	**19,3**	**552**	**0,036**	**0,37**							**0,191s**				**P**	**∞ MΩ**
8.5 No 4	Breaking capacity (I_4)	**18**	**19,7**	**552**	**0,026**	**0,38**							**0,988 s**				**P**	**∞ MΩ**
8.5 No 5	Breaking capacity (I_5)	**19**	**19,3**	**552**	**0,015**	**0,4**							**43,3s**				**P**	**∞ MΩ**
8.7.4	Overcurrent discrimination(I^2t-Wert)	**20**	**20,0**	**328**	**0,066**	**0,25**	**5**							**51,04**		**98653**	**P**	**∞ MΩ**
		21	**20,8**	**328**	**0,066**	**0,25**	**2**							**53,49**		**98654**	**P**	**∞ MΩ**
		22	**18,8**	**328**	**0,221**	**0,23**	**8**								**72,02**	**98671**	**P**	**∞ MΩ**
		23	**18,8**	**328**	**0,221**	**0,23**	**7**								**69,08**	**98672**	**P**	**∞ MΩ**
8.9.2	Resistance to heat			Gripping-lugs; to 80°C; 2h, then loaded with 150% rated current; tensile force F_{max} (Table J) .....N													**N**	
8.11.1.8	Impact resistance			Gripping-lugs; the facility is given in Fig. 9; 168h to 150°C; the weight 300 g; the height 300 mm													**N**	
				Gripping-lugs; the facility is given in Fig. 9; 72h to -15°C; the weight 300 g; the height 300 mm													**N**	
8.11.2.2	Resistance to abnormal heat and fire			parts of insulating materials; glow-wire 960°C; to item a) of sub-clause 8.11.2.2.5													**N**	
				parts of insulating materials; glow-wire 650°C; to item b) of sub-clause 8.11.2.2.5													**N**	
8.11.2.4	Non-deterioration of insulating parts of fuse-link and fuse-base			for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													**N**	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													**N**	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h ;Breaking capacity (I_2) to Table 12A													**N**	

Clause	Test sequence	Samples Nr	Requirement-Test	***Deviations: Type: PV10 In = 6A***					Result-Remark) Verdict	
8.1.4	Dimensions	1-3	Fig. 1(III) Size 10 x 38		Prescribed (mm)	Measured (mm)				
						Samples Nr 1	Samples Nr 2	Samples Nr 3		
				Dimension marking a	38 ± 0,6	**37.6**	**37.5**	**37.7**	**P**	
				Dimension marking b	max 10,5	**9.2**	**9.4**	**9.1**	**P**	
				Dimension marking c	10,3 ± 0,1	**10.2**	**10.3**	**10.2**	**P**	
				Dimension marking d	min 6	**10.2**	**10.3**	**10.2**	**P**	
				Dimension marking r	1,5 ± 0,5	**1.2**	**1.2**	**1.3**	**P**	

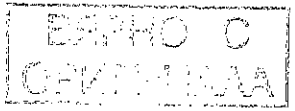
EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 8A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7B**	**CB** page **- 13 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7B** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test-sequence	Samples No	R_i mΩ	Test-voltage V (AC)	Test current A	cos φ	Pre-arcing time s	Operating time s	Requirement-Test	Result-Remark verdict	
6	Marking	1							The marking of the rated voltage/rated current /size discernible from the front	P	see page 34
8.1.4	Dimension	1-3							Fig. 1(III) Size 10 x 38	P	see page 15
8.1.5.1	Resistance (R_i)	1-23							Measuring current ≤ 0,1 I_n ; Ambient air temperature 20 ± 5°C	P	see page 13, 14
8.3	Power dissipation (P_n) / / temperature rise (ΔT)	1	13,6	10	8,0	-			Tab. M and Fig. 1(III) (60269-2-1), P_n = max 3 W, Ambient air temperature: 20°C; Conventional time 1 h	P	P_n = 1,04W ΔT = 18K
8.4.3.1a)	Conv. non-fusing current (I_{nf})	1	13,6	10	12,0	-		> 3600	not operate within the conventional time 1h	P	
8.4.3.1b)	Conv. fusing current (I_f)	2	12,5	10	15,2	-		840	operate within the conventional time 1.h	P	
8.4.3.2	Rated current	3	13,1	10	12	-		> 3600	100 h pulse test; test current 1,05 x I_n 8,4A ; on 1 h/ off 0,1 x 1h, after the test conventional non-fusing current (I_{nf}) 12 A; conventional time 1h	P	
8.4.3.3.1	Gate a) I_{min} (10 s)	4	12,8	10	16,0	-	600		Testing current of Table 3, column 2; operating time > 10 s	P	
	„ b) I_{max} (5 s)	5	12,9	200	35,2	-	1,91		„ „ „ 3, „ 3 operate within ≤ 5 s	P	
	„ c) I_{min} (0,1 s)	6	13,0	200	41,6	-	0,61		„ „ „ 3, „ 4 operating time > 0,1 s	P	
	„ d) I_{max} (0,1 s)	7	12,8	200	92,0	-	0,013		„ „ „ 3, „ 5 operate within ≤ 0,1 s	P	
8.4.3.4	Overload	8	12,8	10	25,0	-	20		50 pulses; test current equal to 0,8 x 31 A stated for a pre-arcing time of 5 s	P	
		9	13,3	10	25,0	-	18		on - 5 s / off - 0,2 x 1 h of the conventional time; current 25 A equal to	P	
		10	13,5	10	25,0	-	24		current for the overload test; pre-arcing time of sample lies within stated zone	P	
8.4.3.6	Indicating devices	-	-						Operation of indicating device verified in combination with the verification of breaking capacity I_1 to I_5 (8.5.5)	N	



EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 8A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7B**	**CB** page **- 14 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7B** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Sample No	R_i mΩ	Test-voltage V (AC)	Test-current kA	cos φ	Making angle after voltage zero (U_0)	i_D kA	i_S kA	Peak arc voltage V	Initiation of arcing after voltage zero (U_0)	Pre-arcing time ms	Operating time ms	Pre-arcing I^2t A^2s	Operating I^2t A^2s	Osz No	Result-Remark Resistance between fuse-link contacts measured after each test. **Test voltage DC 500 V Resistance >1000 MΩ** Verdict	Remark
8.5 No 1	Breaking capacity (I_1)	11	13,3	562	125	0,16	84	2,059		1217	85	0,04	2,77			27DS035	P	∞ MΩ
		12	13,3	558	125	0,16	83	2,059		1217	84	0,04	2,11			27DS036	P	∞ MΩ
		13	13,4	558	125	0,16	46	1,392		1029	46	0,01	3,89			27DS037	P	∞ MΩ
8.7.4	Overcurrent discrimination(I^2t-Wert)	14	13,5	328	0,096	0,23	4							69,63		98658	P	∞ MΩ
		15	13,6	328	0,096	0,23	0							69,99		98659	P	∞ MΩ
		16	12,6	328	0,315	0,24	4								93,50	98679	P	∞ MΩ
		17	12,6	328	0,315	0,24	10								96,98	98680	P	∞ MΩ



EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 8A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7B**	**CB** page **- 15 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7B** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Samples Nr	Requirement-Test	***Deviations: Type: PV10 In = 8A***					Result-Remark) Verdict	
8.1.4	Dimensions	1-3	Fig. 1(III) Size 10 x 38		Prescribed (mm)	Measured (mm)				
						Samples Nr 1	Samples Nr 2	Samples Nr 3		
				Dimension marking a	38 ± 0,6	**37.6**	**37.6**	**37.7**	**P**	
				Dimension marking b	max 10,5	**9.2**	**9.4**	**9.1**	**P**	
				Dimension marking c	10,3 ± 0,1	**10.2**	**10.2**	**10.3**	**P**	
				Dimension marking d	min 6	**10.2**	**10.2**	**10.3**	**P**	
				Dimension marking r	1,5 ± 0,5	**1.2**	**1.2**	**1.3**	**P**	

	Type of fuse: **HRC-fuse ; Type PV10 gG ; 10A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7C**	**CB** page **- 16 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7C** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test-sequence	Samples No	R_i mΩ	Test-voltage V (AC)	Test current A	cos φ	Pre-arcing time s	Operating time s	Requirement-Test	Result-Remark verdict	
6	Marking	1							The marking of the rated voltage/rated current /size discernible from the front	P	see page 34
8.1.4	Dimension	1-3							Fig. 1(III) Size 10 x 38	P	see page 18
8.1.5.1	Resistance (R_i)	1-11							Measuring current ≤ 0,1 I_n ; Ambient air temperature 20 ± 5°C	P	see page 16, 17
8.3	Power dissipation (P_n) / / temperature rise (ΔT)	1	10,4	10	10	-			Tab. M and Fig. 1(III) (60269-2-1), P_n = max 3 W, Ambient air temperature: 20°C; Conventional time 1 h	P	P_n = 1,29W ΔT = 20K
8.4.3.1a)	Conv. non-fusing current (I_{nf})	1	10,4	10	15	-		> 3600	not operate within the conventional time 1h	P	
8.4.3.1b)	Conv. fusing current (I_f)	2	9,45	10	19	-		600	operate within the conventional time 1.h	P	
8.4.3.2	Rated current	3	10,2	10	15	-		> 3600	100 h pulse test; test current 1,05 x I_n 10,5A ; on 1 h/ off 0,1 x 1h, after the test conventional non-fusing current (I_{nf}) 15 A; conventional time 1h	P	
8.4.3.3.1	Gate a) I_{min} (10 s)	4	9,80	10	22	-	208		Testing current of Table 3, column 2; operating time > 10 s	P	
	„ b) I_{max} (5 s)	5	9,90	200	46	-	0,83		„ „ „ 3, „ 3 operate within ≤ 5 s	P	
	„ c) I_{min} (0,1 s)	6	9,75	200	58	-	0,22		„ „ „ 3, „ 4 operating time > 0,1 s	P	
	„ d) I_{max} (0,1 s)	7	9,75	200	110	-	0,023		„ „ „ 3, „ 5 operate within ≤ 0,1 s	P	

	Type of fuse: **HRC-fuse ; Type PV10 gG ; 10A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7C**	**CB** page **- 17 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7C** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Sample No	R_i mΩ	Test-voltage V (AC)	Test-current kA	cos φ	Making angle after voltage zero (U_0)	i_D kA	i_S kA	Peak arc voltage V	Initiation of arcing after voltage zero (U_0)	Pre-arcing time ms	Operating time ms	Pre-arcing I^2t A^2s	Operating I^2t A^2s	Osz No	Result-Remark Resistance between fuse-link contacts measured after each test. **Test voltage DC 500 V Resistance >1000 MΩ** Verdict	Remark
8.7.4	Overcurrent discrimination(I^2t-Wert)	**8**	**10,4**	**328**	**0,130**	**0,27**	**3**							**121,86**		**98663**	**P**	**∞ MΩ**
		9	**10,4**	**328**	**0,130**	**0,27**	**2**							**123,57**		**98664**	**P**	**∞ MΩ**
		10	**9,60**	**328**	**0,404**	**0,25**	**8**								**175,38**	**98682**	**P**	**∞ MΩ**
		11	**9,65**	**320**	**0,404**	**0,25**	**7**								**178,13**	**98683**	**P**	**∞ MΩ**

	Type of fuse: **HRC-fuse ; Type PV10 gG ; 10A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7C**	**CB** page **- 18 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7C** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Samples Nr	Requirement-Test	***Deviations: Type: PV10 In = 10A***					Result-Remark) Verdict	
8.1.4	Dimensions	1-3	Fig. 1(III) Size 10 x 38		Prescribed (mm)	Measured (mm)				
						Samples Nr 1	Samples Nr 2	Samples Nr 3		
				Dimension marking a	38 ± 0,6	**37.6**	**37.6**	**37.7**	**P**	
				Dimension marking b	max 10,5	**9.2**	**9.4**	**9.2**	**P**	
				Dimension marking c	10,3 ± 0,1	**10.2**	**10.3**	**10.2**	**P**	
				Dimension marking d	min 6	**10.2**	**10.3**	**10.2**	**P**	
				Dimension marking r	1,5 ± 0,5	**1.2**	**1.2**	**1.3**	**P**	

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 12A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 19 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test-sequence	Samples No	R_i mΩ	Test-voltage V (AC)	Test current A	cos φ	Pre-arcing time s	Operating time s	Requirement-Test	Result-Remark verdict	
6	Marking	1							The marking of the rated voltage/rated current /size discernible from the front	P	see page 34
8.1.4	Dimension	1-3							Fig. 1(III) Size 10 x 38	P	see page 21
8.1.5.1	Resistance (R_i)	1-23							Measuring current ≤ 0,1 I_n ; Ambient air temperature 20 ± 5°C	P	see page 19, 20
8.3	Power dissipation (P_n) / / temperature rise (ΔT)	1	**8,04**	**10**	**12,0**	-			Tab. M and Fig. 1(III) (60269-2-1), P_n = max 3 W, Ambient air temperature: **20**°C; Conventional time 1 h	P	P_n = 1,48k W ΔT = 23K
8.4.3.1a)	Conv. non-fusing current (I_{nf})	1	**8,04**	**10**	**18,0**	-		**> 3600**	not operate within the conventional time **1**h	P	
8.4.3.1b)	Conv. fusing current (I_f)	2	**7,17**	**10**	**22,8**	-		**480**	operate within the conventional time **1**.h	P	
8.4.3.2	Rated current	3	**7,83**	**10**	**18**	-		**> 3600**	100 h pulse test; test current 1,05 x I_n **12,6A** ; on **1** h/ off 0,1 x **1**h, after the test conventional non-fusing current (I_{nf}) **18 A**; conventional time **1**h	P	
8.4.3.3.1	Gate a) I_{min} (10 s)	4	**7,54**	**10**	**24**	-	**193**		Testing current of Table 3, column 2; operating time > 10 s	P	
	„ b) I_{max} (5 s)	5	**8,04**	**200**	**55,2**	-	**1,18**		„ „ „ 3, „ 3 operate within ≤ 5 s	P	
	„ c) I_{min} (0,1 s)	6	**7,25**	**200**	**69,6**	-	**0,316**		„ „ „ 3, „ 4 operating time > 0,1 s	P	
	„ d) I_{max} (0,1 s)	7	**7,71**	**200**	**140,4**	-	**0,021**		„ „ „ 3, „ 5 operate within ≤ 0,1 s	P	
8.4.3.4	Overload	8	**7,33**	**10**	**36,0**	-	**22**		50 pulses; test current equal to 0,8 x **45** A stated for a pre-arcing time of 5 s	P	
		9	**7,50**	**10**	**36,0**	-	**20**		on - 5 s / off - 0,2 x **1** h of the conventional time; current **36** A equal to	P	
		10	**7,67**	**10**	**36,0**	-	**23**		current for the overload test; pre-arcing time of sample lies within stated zone	P	
8.4.3.6	Indicating devices	-	-						Operation of indicating device verified in combination with the verification of breaking capacity I_1 to I_5 (8.5.5)	N	

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 12A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 20 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Sample No	R_i mΩ	Test-voltage V (AC)	Test-current kA	cos φ	Making angle after voltage zero (U_0)	i_D kA	i_S kA	Peak arc voltage V	Initiation of arcing after voltage zero (U_0)	Pre-arcing time ms	Operating time ms	Pre-arcing I^2t A^2s	Operating I^2t A^2s	Osz No	Result-Remark Resistance between fuse-link contacts measured after each test. **Test voltage DC 500 V Resistance >1000 MΩ** Verdict	Remark
8.5 No 1	Breaking capacity (I_1)	11	7,33	558	125	0,16	48	2,647		1067	49	0,06	4,94			27DS031	P	∞ MΩ
		12	7,33	558	125	0,16	86	3,039		1406	87	0,04	3,06			27DS032	P	∞ MΩ
		13	7,33	558	125	0,16	85	3,000		1343	86	0,04	3,18			27DS033	P	∞ MΩ
8.5 No 2	Breaking capacity (I_2)	14	7,58	560	0,471	0,27	0		0,462	1520	62	3,47	8,63			98503	P	∞ MΩ
		15	7,58	560	0,471	0,27	1		0,472	1544	61	3,50	8,47			98504	P	∞ MΩ
		16	7,54	560	0,471	0,27	1		0,462	1504	59	3,37	8,57			98505	P	∞ MΩ
8.5 N0 3	Breaking capacity (I_3)	17	7,83	552	0,074	0,4							0,231 s				P	∞ MΩ
8.5 No 4	Breaking capacity (I_4)	18	7,29	552	0,050	0,48							1,78 s				P	∞ MΩ
8.5 No 5	Breaking capacity(I_5)	19	7,29	556	0,032	0,38							30,4 s				P	∞ MΩ
8.7.4	Overcurrent discrimination(I^2t-Wert)	20	7,88	328	0,175	0,26	5							220,17		98668	P	∞ MΩ
		21	7,83	320	0,175	0,26	0							220,73		98669	P	∞ MΩ
		22	7,21	328	0,451	0,25	11								316,63	98689	P	∞ MΩ
		23	7,21	328	0,451	0,25	6								315,05	98690	P	∞ MΩ
8.9.2	Resistance to heat			Gripping-lugs; to 80°C; 2h, then loaded with 150% rated current; tensile force F_{max} (Table J) .....N													N	
8.11.1.8	Impact resistance			Gripping-lugs; the facility is given in Fig. 9; 168h to 150°C; the weight 300 g; the height 300 mm													N	
				Gripping-lugs; the facility is given in Fig. 9; 72h to -15°C; the weight 300 g; the height 300 mm													N	
8.11.2.2	Resistance to abnormal heat and fire			parts of insulating materials; glow-wire 960°C; to item a) of sub-clause 8.11.2.2.5													N	
				parts of insulating materials; glow-wire 650°C; to item b) of sub-clause 8.11.2.2.5													N	
8.11.2.4	Non-deterioration of insulating parts of fuse-link and fuse-base			for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													N	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													N	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h ;Breaking capacity (I_2) to Table 12A													N	

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 12A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 21 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Samples Nr	Requirement-Test	***Deviations: Type: PV10 In = 12A***					Result-Remark) Verdict	
8.1.4	Dimensions	1-3	Fig. 1(III) Size 10 x 38		Prescribed (mm)	Measured (mm)				
						Samples Nr 1	Samples Nr 2	Samples Nr 3		
				Dimension marking a	38 ± 0,6	**37.7**	**37.6**	**37.6**	**P**	
				Dimension marking b	max 10,5	**9.5**	**9.4**	**9.2**	**P**	
				Dimension marking c	10,3 ± 0,1	**10.2**	**10.3**	**10.3**	**P**	
				Dimension marking d	min 6	**10.2**	**10.3**	**10.3**	**P**	
				Dimension marking r	1,5 ± 0,5	**1.3**	**1.2**	**1.3**	**P**	

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 16A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7B**	**CB** page **- 22 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7B** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Samples Nr	R_i mΩ	Test-voltage V (AC)	Test-current A	cosφ	Pre-arcing time s	Operating time s	Requirement-Test	Result-Remark) Verdict	
6	Marking	1							The marking of the rated voltage/rated current /size discernible from the front	**P**	see page 34
8.1.4	Dimension	1-3							Fig. 1(III) Size 10 x 38	**P**	see page 24
8.1.5.1	Resistance (R_i)	1-17							Measuring current ≤ 0,1 I_n ; Ambient air temperature 20 ± 5°C	**P**	see page 22 , 23
8.3	Power dissipation (P_n) / / temperature rise (ΔT)	1	**5,69**	**10**	**16**	**-**			Tab. M and Fig. 1(III) (60269-2-1), P_n = max 3 W, Ambient air temperature: **24°C**; Conventional time **1** h	**P**	**P_n=1,86W** **ΔT = 25K**
8.4.3.1a)	Conv. non-fusing current (I_{nf})	1	**5,69**	**10**	**20**	**-**		**> 3600**	not operate within the conventional time **1** h	**P**	
8.4.3.1b)	Conv. fusing current (I_f)	2	**5,25**	**10**	**25,6**	**-**		**780**	operate within the conventional time **1** h	**P**	
8.4.3.2	Rated current	3	**5,63**	**10**	**20**	**-**		**> 3600**	100 h pulse test; test current 1,05 x I_n, **16,8 A**; on **1** h/ off 0,1 x **1** h, after the test conventional non-fusing current (I_{nf}) **20**A; conventional time **1** h	**P**	
8.4.3.2	Gate a) I_{min} (10 s)	4	**5,47**	**10**	**33**	**-**	**87**		Testing current of Table 3, column 2; operating time > 10 s	**P**	
	„ b) I_{max} (5 s)	5	**5,44**	**200**	**65**	**-**	**2,05**		„ „ „ 3, „ 3 operate within ≤ 5 s	**P**	
	„ c) I_{min} (0,1 s)	6	**5,56**	**200**	**85**	**-**	**0,52**		„ „ „ 3, „ 4 operating time > 0,1 s	**P**	
	„ d) I_{max} (0,1 s)	7	**5,53**	**200**	**150**	**-**	**0,032**		„ „ „ 3, „ 5 operate within ≤ 0,1 s	**P**	
8.4.3.4	Overload	8	**5,38**	**10**	**46,0**	**-**	**15**		50 pulses; test current equal to 0,8 x **57,0** A stated for a pre-arcing time of 5 s	**P**	
		9	**5,38**	**10**	**46,0**	**-**	**14**		on - 5 s / off - 0,2 x **1** h of the conventional time; current **46,0** A equal to	**P**	
		10	**5,42**	**10**	**46,0**	**-**	**16**		current for the overload test; pre-arcing time of sample lies within stated zone	**P**	
8.4.3.6	Indicating devices	-	-						Operation of indicating device verified in combination with the verification of breaking capacity I_1 to I_5 (8.5.5)	**N**	

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 16A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7B**	**CB** page **- 23 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7B** **Checked by: J,. Hlavatý** **Dated:03.08.07**

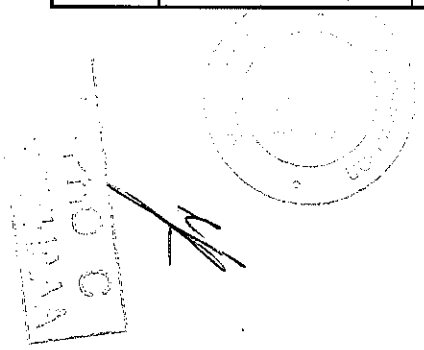
Clause	Test sequence	Sample No	R_i mΩ	Test-voltage V (AC)	Test-current kA	cos φ	Making angle after voltage zero (U_0)	i_D kA	i_S kA	Peak arc voltage V	Initiation of arcing after voltage zero (U_0)	Pre-arcing time ms	Operating time ms	Pre-arcing I^2t A^2s	Operating I^2t A^2s	Osz No	Result-Remark Resistance between fuse-link contacts measured after each test. **Test voltage DC 500 V** **Resistance >1000 MΩ** Verdict	Remark
8.5 No 1	Breaking capacity (I_1)	11	5,63	558	125	0,16	85	3,490		1368	86	0,06	3,51			27DS028	P	∞ MΩ
		12	5,63	558	125	0,16	86	3,608		1368	87	0,06	3,39			27DS029	P	∞ MΩ
		13	5,75	558	125	0,16	48	3,294		1104	49	0,08	5,19			27DS030	P	∞ MΩ
8.7.4	overcurrent discrimination (I^2t-Wert)	14	5,56	328	0,278	0,24	2							448,24		99982	P	∞ MΩ
		15	5,56	320	0,278	0,24	0							429,26		99983	P	∞ MΩ
		16	5,25	320	0,544	0,23	3								761,03	99977	P	∞ MΩ
		17	5,31	320	0,544	0,23	5								752,26	99978	P	∞ MΩ

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 16A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7B**	**CB** page - 24 / 78 - **Ref. No.: 702102-01/01** **Table No: 7B** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Samples Nr	Requirement-Test	***Deviations: Type: PV10 In = 16 A***					Result-Remark) Verdict	
8.1.4	Dimensions	1-3	Fig. 1(III) Size 10 x 38		Prescribed (mm)	Measured (mm)				
						Samples Nr 1	Samples Nr 2	Samples Nr 3		
				Dimension marking a	38 ± 0,6	**37.6**	**37.5**	**37.6**	**P**	
				Dimension marking b	max 10,5	**9.5**	**9.4**	**9.3**	**P**	
				Dimension marking c	10,3 ± 0,1	**10.2**	**10.3**	**10.2**	**P**	
				Dimension marking d	min 6	**10.2**	**10.3**	**10.2**	**P**	
				Dimension marking r	1,5 ± 0,5	**1.2**	**1.2**	**1.3**	**P**	

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 20A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 25 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test-sequence	Samples No	R_i mΩ	Test-voltage V (AC)	Test current A	cos φ	Pre-arcing time s	Operating time s	Requirement-Test	Result-Remark verdict	
6	Marking	1							The marking of the rated voltage/rated current /size discernible from the front	P	see page 34
8.1.4	Dimension	1-3							Fig. 1(III) Size 10 x 38	P	see page 27
8.1.5.1	Resistance (R_i)	1-23							Measuring current ≤ 0,1 I_n ; Ambient air temperature 20 ± 5°C	P	see page 25, 26
8.3	Power dissipation (P_n) / / temperature rise (ΔT)	1	4,33	10	20	-			Tab. M and Fig. 1(III) (60269-2-1), P_n = max 3 W, Ambient air temperature: 24°C; Conventional time 1 h	P	P_n = 2,2 W ΔT = 33K
8.4.3.1a)	Conv. non-fusing current (I_{nf})	1	4,33	10	25	-		> 3600	not operate within the conventional time 1h	P	
8.4.3.1b)	Conv. fusing current (I_f)	2	3,95	10	32	-		480	operate within the conventional time 1.h	P	
8.4.3.2	Rated current	3	4,20	10	25	-		> 3600	100 h pulse test; test current 1,05 x I_n 21A ; on 1 h/ off 0,1 x 1h, after the test conventional non-fusing current (I_{nf}) 25 A; conventional time 1h	P	
8.4.3.3.1	Gate a) I_{min} (10 s)	4	4,18	10	42	-	56		Testing current of Table 3, column 2; operating time > 10 s	P	
	„ b) I_{max} (5 s)	5	3,90	200	85	-	2,64		„ „ „ 3, „ 3 operate within ≤ 5 s	P	
	„ c) I_{min} (0,1 s)	6	4,03	200	110	-	0,27		„ „ „ 3, „ 4 operating time > 0,1 s	P	
	„ d) I_{max} (0,1 s)	7	4,05	200	200	-	0,038		„ „ „ 3, „ 5 operate within ≤ 0,1 s	P	
8.4.3.4	Overload	8	4,00	10	56,0	-	15		50 pulses; test current equal to 0,8 x 70,0 A stated for a pre-arcing time of 5 s	P	
		9	4,03	10	56,0	-	16		on - 5 s / off - 0,2 x 1 h of the conventional time; current 56,0 A equal to	P	
		10	4,03	10	56,0	-	15		current for the overload test; pre-arcing time of sample lies within stated zone	P	
8.4.3.6	Indicating devices	-	-						Operation of indicating device verified in combination with the verification of breaking capacity I_1 to I_5 (8.5.5)	N	



EZU Testing and Certification - Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 20A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 26 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Sample No	R_i mΩ	Test-voltage V (AC)	Test-current kA	cos φ	Making angle after voltage zero (U_0)	i_D kA	i_S kA	Peak arc voltage V	Initiation of arcing after voltage zero (U_0)	Pre-arcing time ms	Operating time ms	Pre-arcing I^2t A^2s	Operating I^2t A^2s	Osz No	Result-Remark Resistance between fuse-link contacts measured after each test. **Test voltage DC 500 V** **Resistance >1000 MΩ** Verdict	Remark
8.5 No 1	Breaking capacity (I_1)	11	3,90	558	125	0,16	48	4,157		1155	50	0,09	4,68			27DS025	P	∞ MΩ
		12	3,90	558	125	0,16	87	4,628		1443	88	0,08	2,19			27DS026	P	∞ MΩ
		13	3,95	558	125	0,16	85	4,588		1418	86	0,07	2,58			27DS027	P	∞ MΩ
8.5 No 2	Breaking capacity (I_2)	14	3,98	560	0,993	0,24	0		0,908	1384	68	3,80	7,70			99989	P	∞ MΩ
		15	3,98	560	0,993	0,24	3		0,896	1328	68	3,63	7,37			99990	P	∞ MΩ
		16	4,00	560	0,993	0,24	4		0,900	1272	69	3,63	7,70			99991	P	∞ MΩ
8.5 N0 3	Breaking capacity (I_3)	17	4,03	560	0,117	0,43							0,221 s				P	∞ MΩ
8.5 No 4	Breaking capacity (I_4)	18	4,10	552	0,075	0,4							1,54 s				P	∞ MΩ
8.5 No 5	Breaking capacity(I_5)	19	4,18	558	0,044	0,38							59,3 s				P	∞ MΩ
8.7.4	Overcurrent discrimination(I^2t-Wert)	20	4,00	320	0,408	0,24	1							740,98		99980	P	∞ MΩ
		21	4,03	320	0,408	0,24	4							748,83		99981	P	∞ MΩ
		22	3,95	344	0,793	0,28	6								1263,84	99972	P	∞ MΩ
		23	4,00	336	0,793	0,28	5								1236,53	99973	P	∞ MΩ
8.9.2	Resistance to heat			Gripping-lugs; to 80°C; 2h, then loaded with 150% rated current; tensile force F_{max} (Table J) .....N													N	
8.11.1.8	Impact resistance			Gripping-lugs; the facility is given in Fig. 9; 168h to 150°C; the weight 300 g; the height 300 mm													N	
				Gripping-lugs; the facility is given in Fig. 9; 72h to -15°C; the weight 300 g; the height 300 mm													N	
8.11.2.2	Resistance to abnormal heat and fire			parts of insulating materials; glow-wire 960°C; to item a) of sub-clause 8.11.2.2.5													N	
				parts of insulating materials; glow-wire 650°C; to item b) of sub-clause 8.11.2.2.5													N	
8.11.2.4	Non-deterioration of insulating parts of fuse-link and fuse-base			for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													N	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													N	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h ;Breaking capacity (I_2) to Table 12A													N	

ВЯРНО С ОРИГИНАЛА

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 20A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 27 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Samples Nr	Requirement-Test	***Deviations: Type: PV10 In = 20 A***					Result-Remark) Verdict	
8.1.4	Dimensions	1-3	Fig. 1(III) Size 10 x 38		Prescribed (mm)	Measured (mm)				
						Samples Nr 1	Samples Nr 2	Samples Nr 3		
				Dimension marking a	38 ± 0,6	**37.6**	**37.5**	**37.6**	**P**	
				Dimension marking b	max 10,5	**9.5**	**9.4**	**9.3**	**P**	
				Dimension marking c	10,3 ± 0,1	**10.2**	**10.3**	**10.2**	**P**	
				Dimension marking d	min 6	**10.2**	**10.3**	**10.2**	**P**	
				Dimension marking r	1,5 ± 0,5	**1.2**	**1.2**	**1.3**	**P**	

ВЯРНО С ОРИГИНАЛА

Clause	Test sequence	Samples Nr	R_i mΩ	Test-voltage V (AC)	Test-current A	cosφ	Pre-arcing time s	Operating time s	Requirement-Test	Verdict	Result-Remark)
6	Marking	1							The marking of the rated voltage/rated current /size discernible from the front	P	see page **34**
8.1.4	Dimension	1-3							Fig. 1(III) Size 10 x 38	P	see page **30**
8.1.5.1	Resistance (R_i)	1-20							Measuring current ≤ 0,1 I_n ; Ambient air temperature 20 ± 5°C	P	see page **28, 29**
8.3	Power dissipation (P_n) / / temperature rise (ΔT)	1	**3,14**	**10**	**25**	-			Tab. M and Fig. 1(III) (60269-2-1), P_n = max 3 W, Ambient air temperature: **24°C**; Conventional time **1 h**	P	**P_n = 2,58W** **ΔT = 33K**
8.4.3.1a)	Conv. non-fusing current (I_{nf})	1	**3,14**	**10**	**31,25**	-		**> 3600**	not operate within the conventional time 1 h	P	
8.4.3.1b)	Conv. fusing current (I_f)	2	**2,9**	**10**	**40**	-		**1620**	operate within the conventional time **1 h**	P	
8.4.3.2	Rated current	3	**3,60**	**10**	**31,25**	-		**> 3600**	100 h pulse test; test current 1,05 x I_n, **26,25 A;** on **1 h**/ off 0,1 x **1 h**, after the test conventional non-fusing current (I_{nf}) **31,25**; conventional time **1 h**	P	
8.4.3.3.2	Gate a) I_{min} (10 s)	4	**3,18**	**10**	**52**	-	**117**		Testing current of Table 3, column 2; operating time > 10 s	P	
	„ b) I_{max} (5 s)	5	**3,06**	**200**	**110**	-	**2,86**		„ „ „ 3, „ 3 operate within ≤ 5 s	P	
	„ c) I_{min} (0,1 s)	6	**3,02**	**200**	**150**	-	**0,7**		„ „ „ 3, „ 4 operating time > 0,1 s	P	
	„ d) I_{max} (0,1 s)	7	**3,02**	**200**	**260**	-	**0,037**		„ „ „ 3, „ 5 operate within ≤ 0,1 s	P	
8.4.3.4	Overload	8	**2,96**	**10**	**78,0**	-	**16**		50 pulses; test current equal to 0,8 x **98,0** A stated for a pre-arcing time of 5 s	P	
		9	**3,00**	**10**	**78,0**	-	**15**		on - 5 s / off - 0,2 x **1 h** of the conventional time; current **78,0**A equal to	P	
		10	**3,04**	**10**	**78,0**	-	**18**		current for the overload test; pre-arcing time of sample lies within stated zone	P	
8.4.3.5	Conventional cable	11	**3,08**	**10**	**37,7**	-		**1560**	conductors of cross-sectional areas **2,5** mm²;	P	
	overload protection	12	**3,10**	**10**	**37,7**	-		**1320**	preheated with test current I_n (**25** A); time. **1 h** equal to the conv. time;	P	
		13	**3,12**	**10**	**37,7**	-		**1140**	test current increased 1,45 x I_z **37,7 A;** samples operated within the conv. time (1 h)	P	
8.4.3.6	Indicating devices	-	-						Operation of indicating device verified in combination with the verification of breaking capacity I_1 to I_5 (8.5.5)	N	

ВЯРНО С ОРИГИНАЛА

EZU Testing and Certification Institute	Type of fuse: **HRC-fuse ; Type PV10 gG ; 25A ; AC 500V ; Size 10x38** Made by: **OEZ Letohrad s.r.o.** **Tests according** **IEC 60269-1:98 3rd ed.+ Amd1:05; IEC 60269-2: 2nd ed.+ Amd1:95+ Amd2:01;** **IEC 60269-2-1:04 4th ed.** **table 7A**	**CB** page **- 29 / 78 -** **Ref. No.: 702102-01/01** **Table No: 7A** **Checked by: J,. Hlavatý** **Dated:03.08.07**

Clause	Test sequence	Sample No	R_i mΩ	Test-voltage V (AC)	Test-current kA	cos φ	Making angle after voltage zero (U_0)	i_D kA	i_S kA	Peak arc voltage V	Initiation of arcing after voltage zero (U_0)	Pre-arcing time ms	Operating time ms	Pre-arcing I^2t A^2s	Operating I^2t A^2s	Osz No	Result-Remark Resistance between fuse-link contacts measured after each test. **Test voltage DC 500 V** **Resistance >1000 MΩ** Verdict	Remark
8.5 No 1	Breaking capacity (I_1)	**14**	**3,08**	**558**	**125**	**0,16**	**76**	**5,333**		**1368**	**77**	**0,08**	**2,71**			**27DS022**	**P**	**∞ MΩ**
		15	**3,08**	**558**	**125**	**0,16**	**90**	**5,490**		**1418**	**92**	**0,09**	**2,23**			**27DS023**	**P**	**∞ MΩ**
		16	**3,08**	**558**	**125**	**0,16**	**50**	**4,902**		**1117**	**52**	**0,12**	**4,27**			**27DS024**	**P**	**∞ MΩ**
8.5 No 2	Breaking capacity (I_2)	**17**	**2,92**	**552**	**1,260**	**0,27**	**5**		**1,216**	**1376**	**72**	**3,73**	**7,27**			**1604**	**P**	**∞ MΩ**
		18	**2,92**	**552**	**1,260**	**0,27**	**3**		**1,184**	**1400**	**70**	**3,73**	**7,43**			**1605**	**P**	**∞ MΩ**
		19	**2,98**	**552**	**1,260**	**0,27**	**3**		**1,200**	**1368**	**68**	**3,67**	**7,17**			**1606**	**P**	**∞ MΩ**
8.5 N0 3	Breaking capacity (I_3)	**20**	**3,02**	**560**	**0,145**	**0,48**							**0, 595 s**				**P**	**∞ MΩ**
8.5 No 4	Breaking capacity (I_4)	**21**	**3,02**	**552**	**0,093**	**0,43**							**5,66 s**				**P**	**∞ MΩ**
8.5 No 5	Breaking capacity(I_5)	**22**	**2,98**	**556**	**0,058**	**0,41**							**104 s**				**P**	**∞ MΩ**
8.7.4	Overcurrent discrimination(I^2t-Wert)	**23**	**3,04**	**328**	**0,544**	**0,23**	**4**							**1399,3**		**99975**	**P**	**∞ MΩ**
		24	**3,04**	**320**	**0,544**	**0,23**	**1**							**1255,4**		**99976**	**P**	**∞ MΩ**
		25	**2,96**	**344**	**1,010**	**0,26**	**5**								**1967,3**	**99964**	**P**	**∞ MΩ**
		26	**2,96**	**344**	**1,010**	**0,26**	**8**								**1986,9**	**99965**	**P**	**∞ MΩ**
8.9.2	Resistance to heat			Gripping-lugs; to 80°C; 2h, then loaded with 150% rated current; tensile force F_{max} (Table J) .....N													**N**	
8.11.1.8	Impact resistance			Gripping-lugs; the facility is given in Fig. 9; 168h to 150°C; the weight 300 g; the height 300 mm													**N**	
				Gripping-lugs; the facility is given in Fig. 9; 72h to -15°C; the weight 300 g; the height 300 mm													**N**	
8.11.2.2	Resistance to abnormal heat and fire			parts of insulating materials; glow-wire 960°C; to item a) of sub-clause 8.11.2.2.5													**N**	
				parts of insulating materials; glow-wire 650°C; to item b) of sub-clause 8.11.2.2.5													**N**	
8.11.2.4	Non-deterioration of insulating parts of fuse-link and fuse-base			for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													**N**	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h; Breaking capacity (I_1) to Table 12A													**N**	
				for equipment comprising moulded elements intended to support live parts; 150°C; 168h ;Breaking capacity (I_2) to Table 12A													**N**	

Clause	Test sequence	Samples Nr	Requirement-Test	***Deviations: Type: PV10 In = 25A***					Result-Remark) Verdict	
8.1.4	Dimensions	1-3	Fig. 1(III) Size 10 x 38		Prescribed (mm)	Measured (mm)				
						Samples Nr 1	Samples Nr 2	Samples Nr 3		
				Dimension marking a	38 ± 0,6	**37.6**	**37.7**	**37.4**	**P**	
				Dimension marking b	max 10,5	**9.3**	**9.4**	**9.7**	**P**	
				Dimension marking c	10,3 ± 0,1	**10.3**	**10.3**	**10.2**	**P**	
				Dimension marking d	min 6	**10.3**	**10.3**	**10.2**	**P**	
				Dimension marking r	1,5 ± 0,5	**1.3**	**1.2**	**1.3**	**P**	