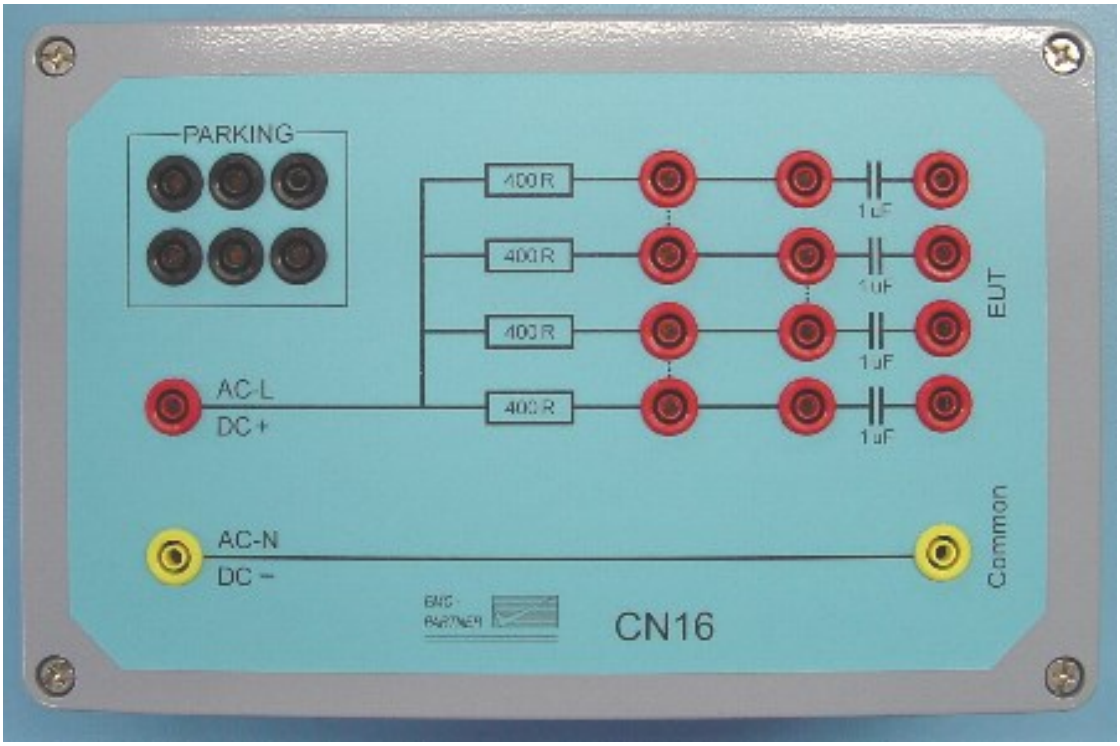
EMC - PARTNER

User Manual CN16

PN 103538

CN16 is an accessory to TRA3000 C and EXT-TRA3000 C SHORT



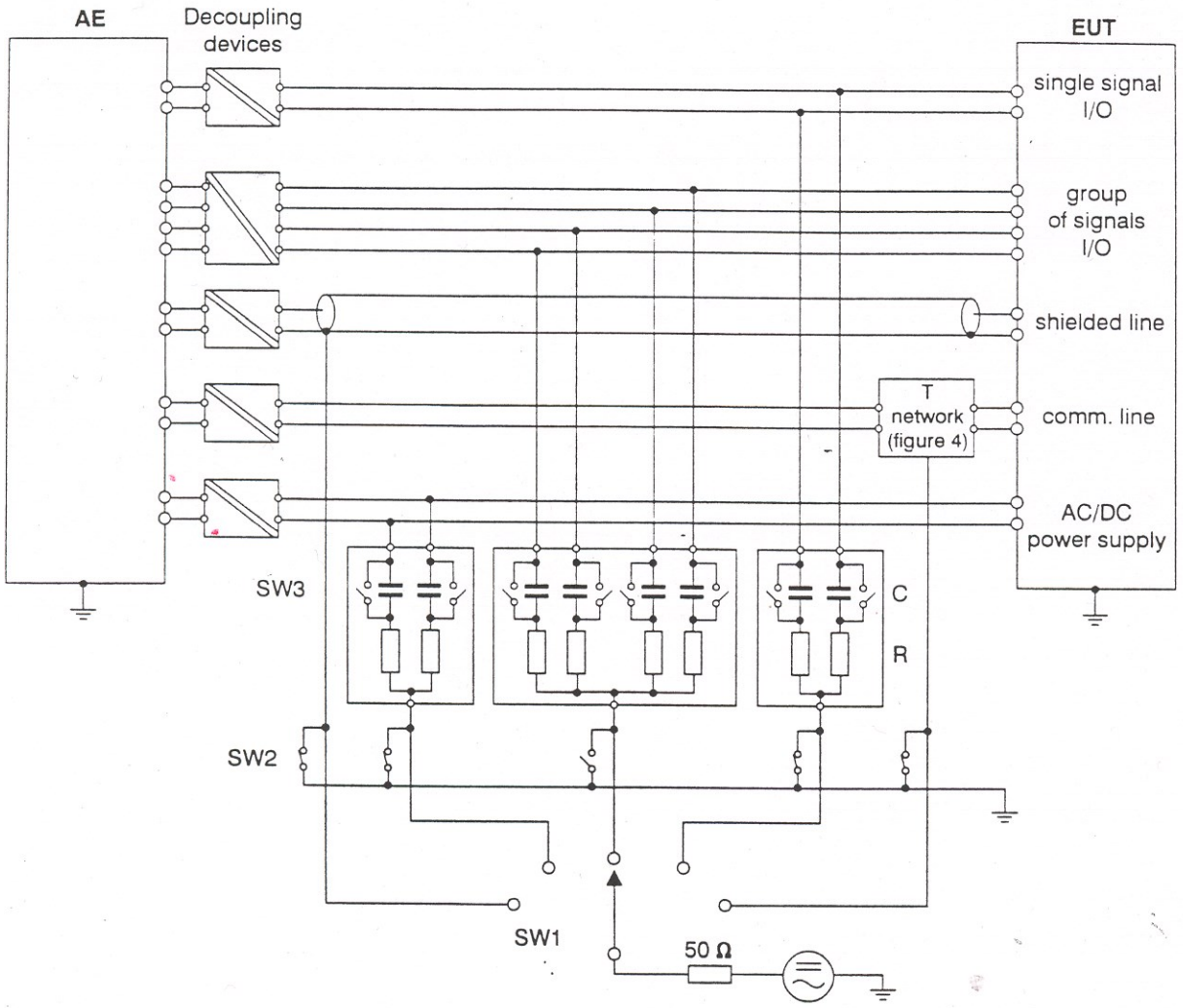
Title:	Coupling Network CN16
Date:	30.04.1999
General Manager:	M. Lutz
Quality Manager:	R. Henz
Revised:	**14. May 2014**

Common Mode - Coupling Network
CN16

Contents:

1 IEC 61000-4-16 Information

1.1 Schematic circuit for the type tests



1.2 Test levels

Table 1 - Levels for continuous disturbance

Level	Open circuit test voltage V (RMS)
1	1
2	3
3	10
4	30
x	Special

NOTE - "x" is an open level. This level can be given in the product committee's specification.
For the duration of the test, see 8.2.

Table 2 - Levels for short duration disturbance

Level	Open circuit test voltage V (RMS)
1	10
2	30
3	100
4	300
x	Special

NOTE - "x" is an open level. This level can be given in the product specification. The duration of the test is 1 s; for particular applications, different duration can be given in the product committee's specification.

Table 3 - Test levels in the frequency range 15 Hz-150 kHz

Level	Profile of the test voltage (open circuit) V (RMS)			
	15 Hz - 150 Hz	150 Hz - 1,5 kHz	1,5 kHz - 15 kHz	15 kHz - 150 kHz
1	1 - 0,1	0,1	0,1 - 1	1
2	3 - 0,3	0,3	0,3 - 3	3
3	10 - 1	1	1 - 10	10
4	30 - 3	3	3 - 30	30
x	x	x	x	x

NOTE - "x" is an open level. This level can be given in the product specification.

1.3 Additional Networks or Accessories

PN	Type	Short discription
PN	Type	Short discription
104123	EXT-TRA3000 C-SHORT	Extends TRA3000 C with short test. EXT-TRA3000 C-SHORT Consists of one external trafo box. Requires 1x PS3 power supply, 1x RS485-RS232 ADAPTER to control the PS3 from TRA3000. Minimum configuration TRA3000 C. IEC 61000-4-16
106900	CN16DC	Coupling network for common mode coupling dc up to 300V onto EUTpower line voltage Lto N/PE of 230V according to IEC 61000-4-16. The mains must be decoupled with a insulation transformer DN16-1P6 single phase 6A or DN16-1P16 single phase 16A
103539	CN16T	T-coupling network for telecom lines coupling dc, 50/60Hz and sinusoidal up to 150kHz according to IEC 61000-4-16. application: 2 lines one pair
106962	DN16-1P16	Mains decoupling transformer single phase 230V/16A 50/60Hz. For tests according to IEC 61000-4-16: DC, 50/60Hz and sinusoidal up to 150kHz . Housing 19" 4 UH For coupling select CN16, CN16T or CN16DC
106961	DN16-1P6	Mains decoupling transformer single phase 230V/6A 50/60Hz. For tests according to IEC 61000-4-16: DC, 50/60Hz and sinusoidal up to 150kHz. Housing 19" 4 UHdc. For coupling select CN16, CN16T or CN16DC
105840	CN16-22-7C	Coupling network for common mode coupling up to 300V 50/60Hz in accordance with IEC 60255-22-7, 2 ports: 2 x R 220 Ohm and 2 x C= 0.47µF
105841	CN16-22-7D	Coupling network for differential mode coupling up to 250V 50/60Hz in accordance with IEC 60255-22-7, 2 ports: 2 x R 100 Ohm and 2 x C= 0.1µF

1.4 Accessories, dimensions

1.4.1 Included articles, dimensions

CN16 (Article No. 103538)

Mechanical Dimensions

Unit Height:	B
Length:	28 cm
Width:	18 cm
Height:	11 cm
Net Weight:	3 kg

Included Articles

According to STL-Variante 20, STL-Version 1

Qty	*PN*	*Description*
1	104801	Brochure TRANSIENT 3000
1	104802	Calibration certificate
1	103191	Standard accessories pack
1	103194	CD-UM-IN-ALL includes all User Manuals and Instruction sheets of all EMC PARTNER AG sales products.

1.4.2 Standard accessories

Accessories to CN16 (Article No. 103538)

Qty	PN	Description	Weight (kg)	Length (cm)	Width (cm)	Height (cm)
1	100280	MC protected banana plug, yellow	0	0	0	0
4	100283	MC protected banana plug, red	0	0	0	0
3	100284	MC bridge black	0	3.8	2.8	0.8
1	103026	Plastic pack small	0.01	25	15	0
1	103064	MC safety cable with protected banana plug, yellow	0	25	0	0
1	103066	MC safety cable with protected banana plug, red	0	25	0	0
1	103089	MC safety cable with protected banana plug, yellow/green	0	50	0	0
0			0	0	0	0

2 Safety

The CN16 belongs to safety class 1

2.1 Safety standards

The CN16 fulfils the requirements of the safety standards IEC 61010 „Safety requirements for electrical equipment for measurement, control and laboratory use and the safety standard VDE 0104 (Safety circuits, warning lamps or connector for warning lamps). Based on EN 61010 (IEC 61010) the declaration of conformity to low voltage directive LVD 73/23/EEC (O.J. N° L77, 1973-03-26) is given.

This manual is a integral part of the CN16 network. The instructions contained in the manual regarding operation and the test set up are to be strictly observed.

2.2 Climatic conditions

The CN16 generators contain high voltage circuits in integrated form. EMC PARTNER only guarantees a correct functioning of the CN16 network and the associated accessories, if the CN16 is operated in the climatic condition specified.

Temperature	15 °C to 35 °C	60 to 90°F
Relative humidity	45 % to 75 %	12.9 to 15.4 PSI
Atmospheric pressure	86 kPa to 106 kPa	(860 to 1060 mbar)
Not influenced by:	direct solar radiation, rain or condensate water, dust or larger electro magnetic fields as specified in the EMC compatibility chapter.	

The CN16 should be operated in a dry, clean room. If for any reason water condenses in the CN16, then no CN16 operation should be started before the tester is dry.

It is strictly forbidden to operate the CN16 network in rooms with of gas explosion risk. The high voltage of the CN16 can generate sparks, which can ignite the gas.

People with heart pacemakers should not be in the vicinity of the test set up during operation.

2.3 Precautionary measure during use

It is wise to observe the following rules:

• Never touch the EUT when a test is in operation.
• Touch no connectors of connection cable when a EMC test is in operation.
• The high voltage of the CN16 network and the power on the EUT must turned off before a manipulation on the EUT is carried out.
• For all services, e.g. check of the fuses, the power cord must first be unplugged.

2.4 The manual is an integral part of the equipment. Refer to the manual.

This manual is an integral part of the CN16 network. The safety rules and precautions in the manual must be observed. EMC PARTNER and their representatives are not responsible for damage to persons and equipment by not observing the safety rules and precautions specified in this manual..

3 Connecting CN16 toTRA3000

3.1 General

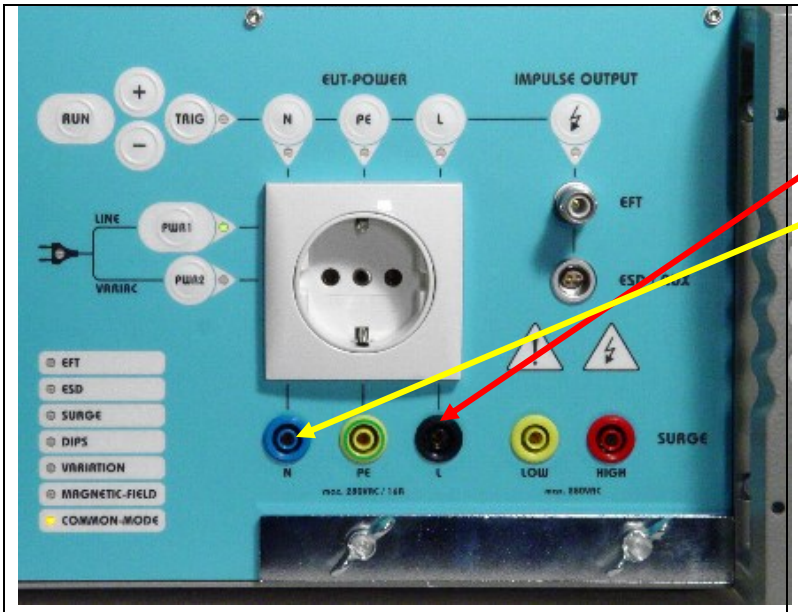
Use the three cables (red, yellow and yellow/green) supplied to connect the CN16 to the TRA3000 C

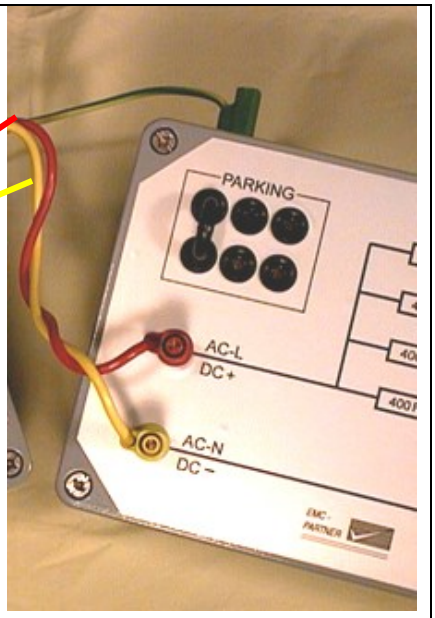
For common mode tests connect the CN16's 'AC-L' and 'AC-N' to the TRA3000 C 'EUT Power L and 'EUT Power-N' (as shown on the following picture for example).

The metallic box of the CN16 must be connected to the PE of the TRA3000

Caution

To avoid any damage of the EUT during CM test set-up the EUT power cord on the rear side of the TRA3000 shall be removed. When the CM test is selected the power line is disconnected and the PWR1 and PWR2 can not switched "ON". As soon as an other test e.g. Surge is selected the PWR1 and PWR2 can be activated and the power voltage is on L at the front of the TRA3000.

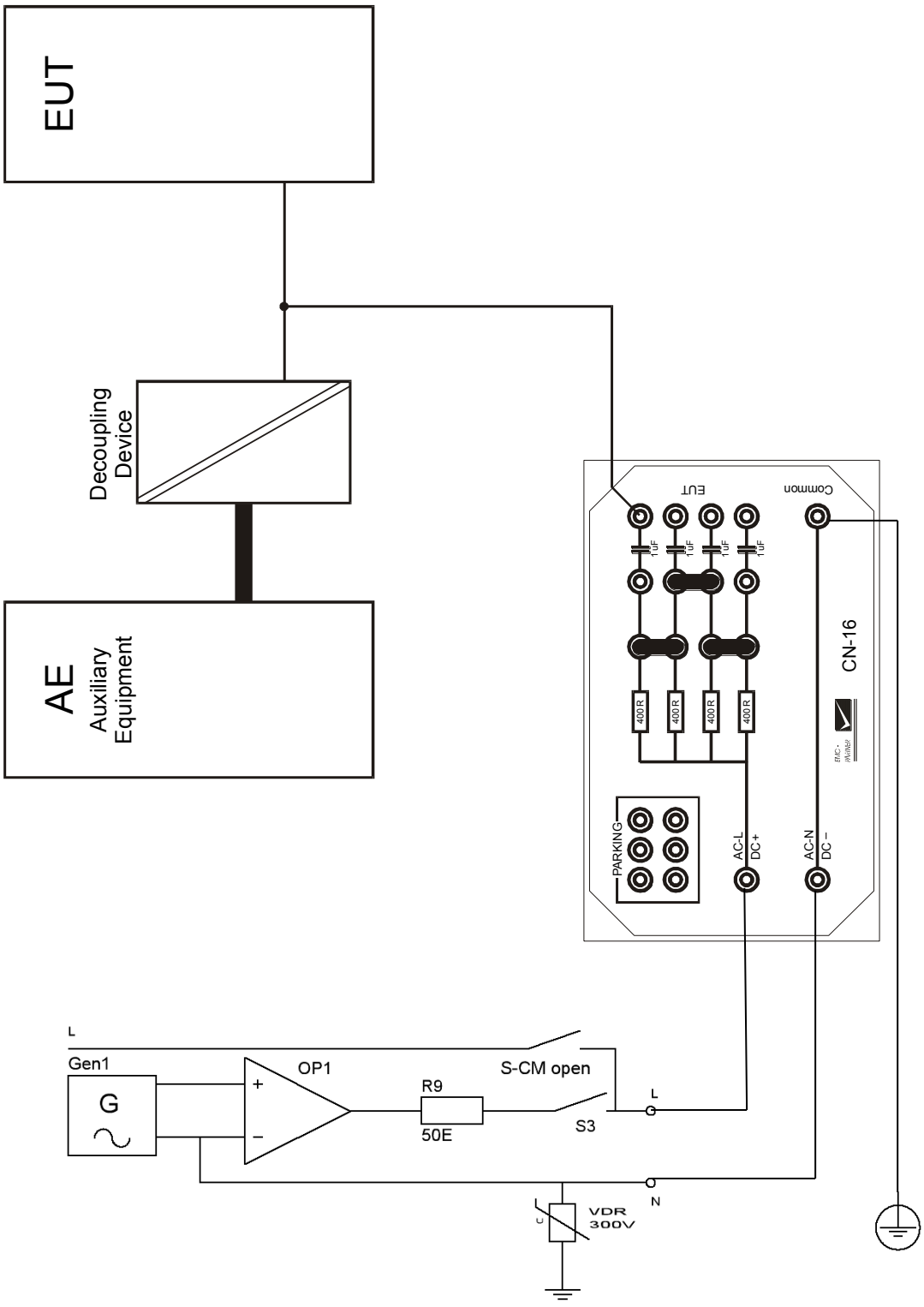




4 AC Test-Voltage

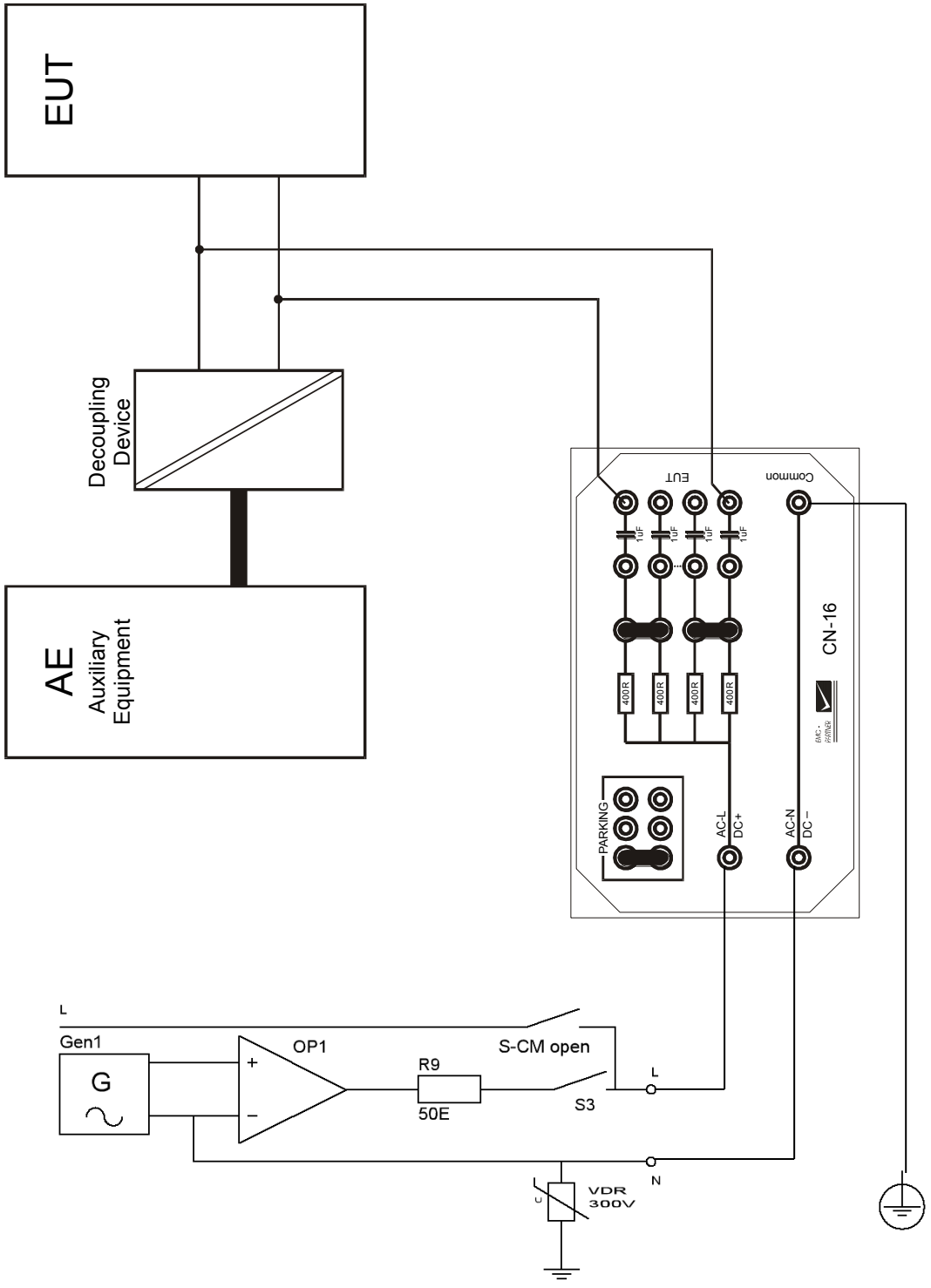
4.1 AC test generator; coupling on one line

Connect the cables and bridges as shown on the following picture:



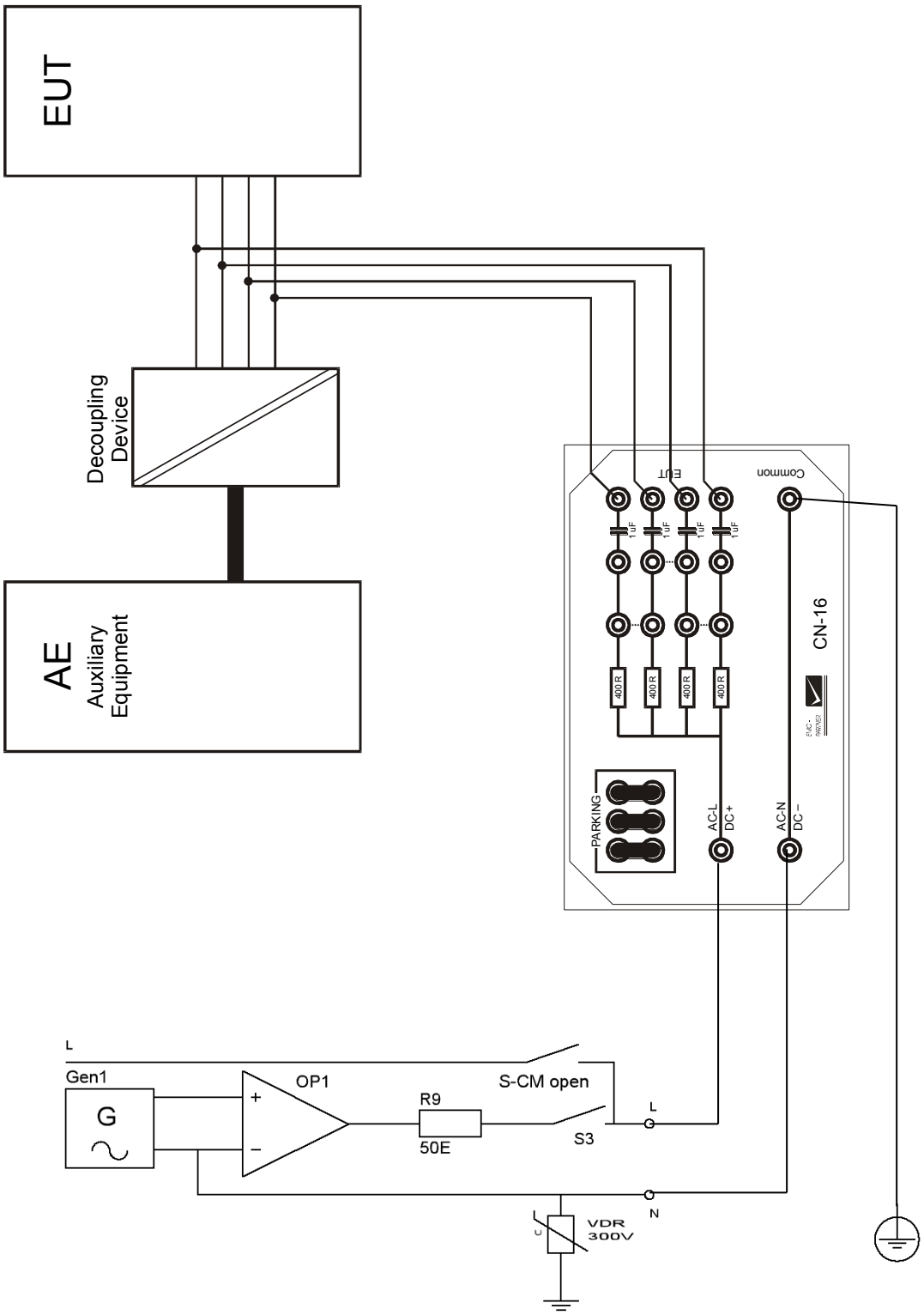
4.2 AC test generator; coupling on two lines

Maximum line to line voltage (EUT-AT) a.c. 230V and d.c.300V
Connect the cables and bridges as shown on the following picture:



4.3 AC test generator; coupling on four lines

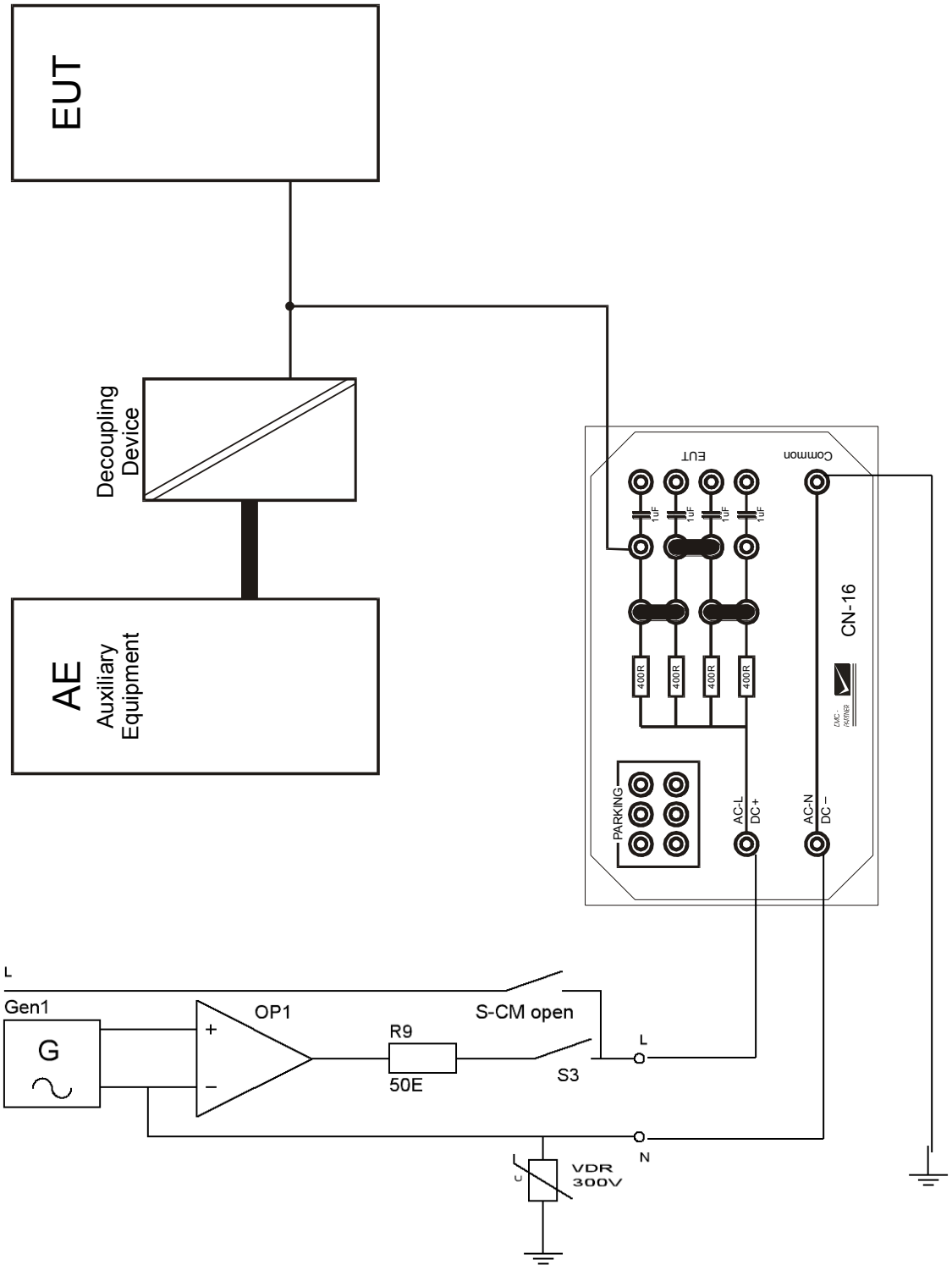
Maximum line to line voltage (EUT-AT) a.c. 230V and d.c.300V
Connect the cables and bridges as shown on the following picture:



5 DC-Voltage Test

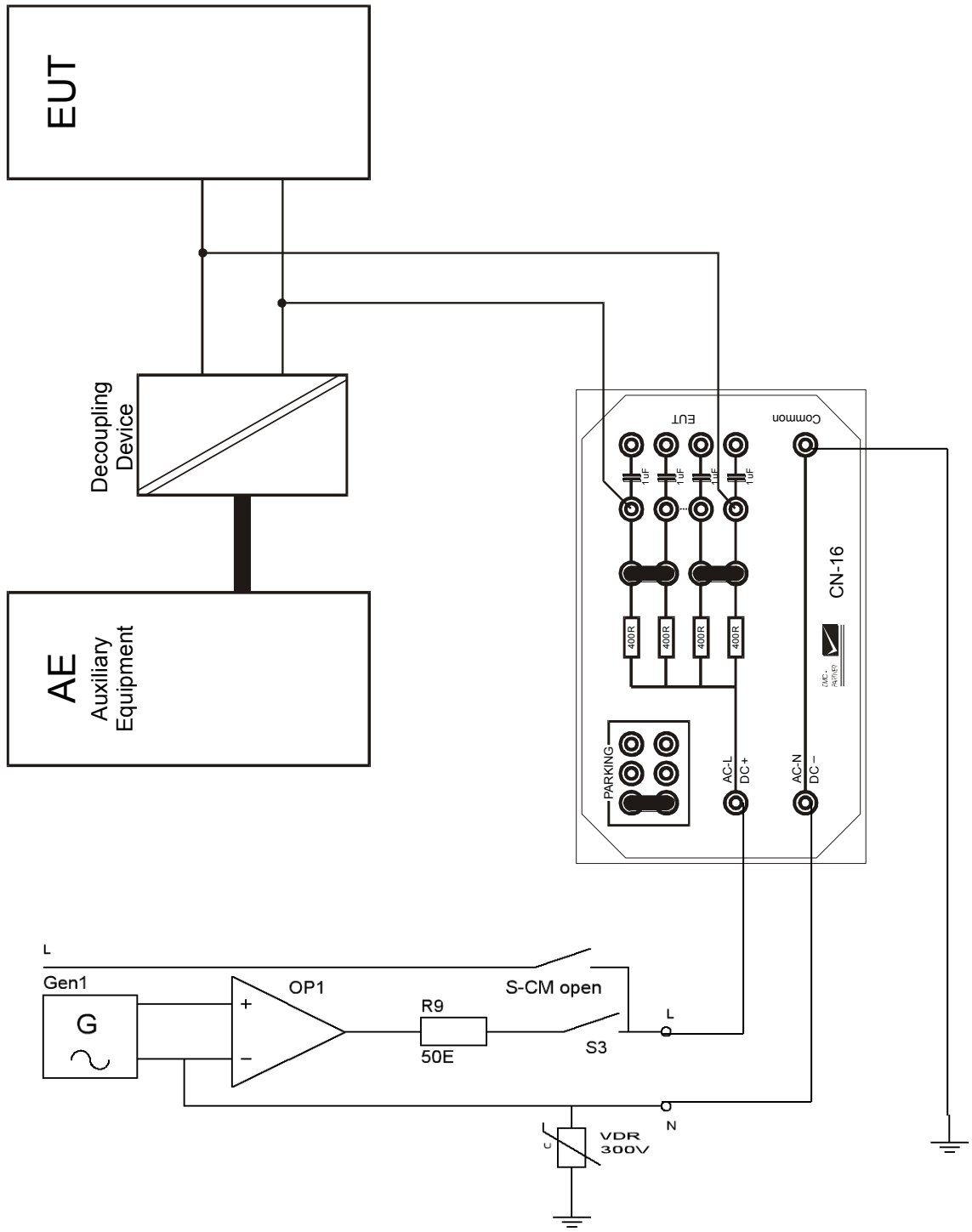
5.1 DC test generator; coupling on one line

Maximum line to line voltage (EUT-AT) a.c. ¨48V and d.c.68V
Connect the cables and bridges as shown on the following picture:



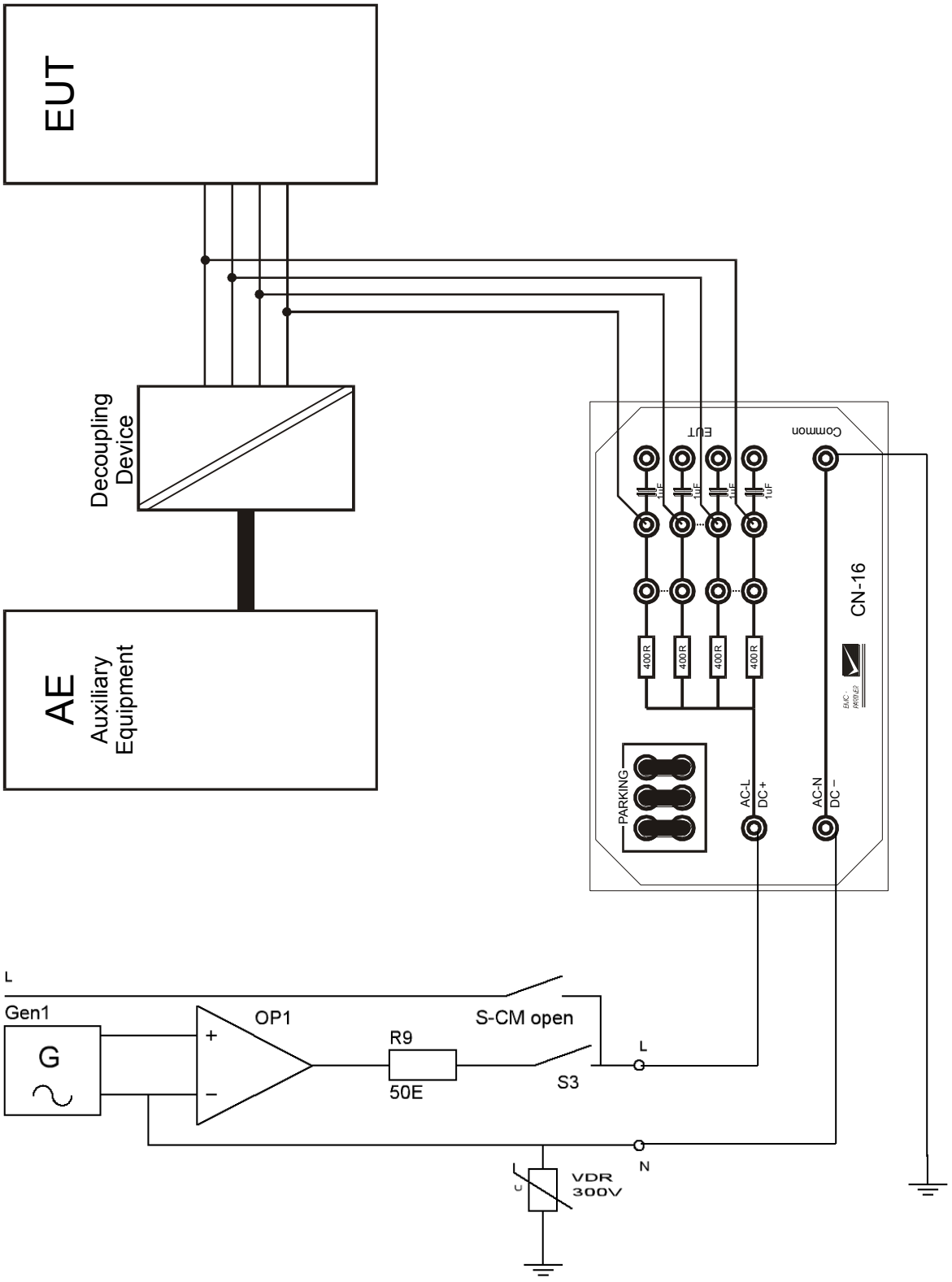
5.2 DC test generator; coupling on two lines

Maximum line to line voltage (EUT-AT) a.c. ¨48V and d.c.68V
Connect the cables and bridges as shown on the following picture:



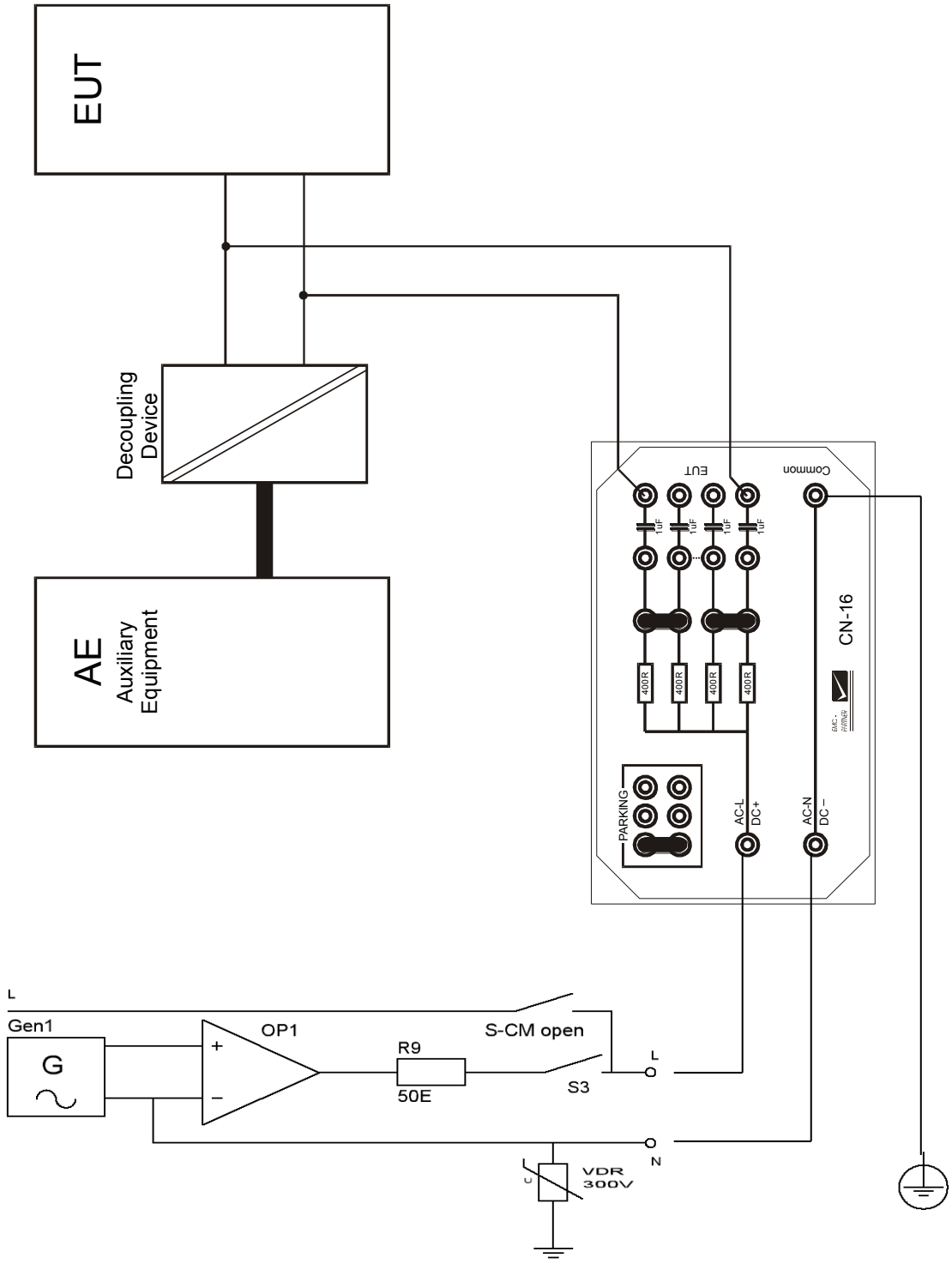
5.3 DC test generator; coupling on four lines

Maximum line to line voltage (EUT-AT) a.c. ¨48V and d.c.68V
Connect the cables and bridges as shown on the following picture:

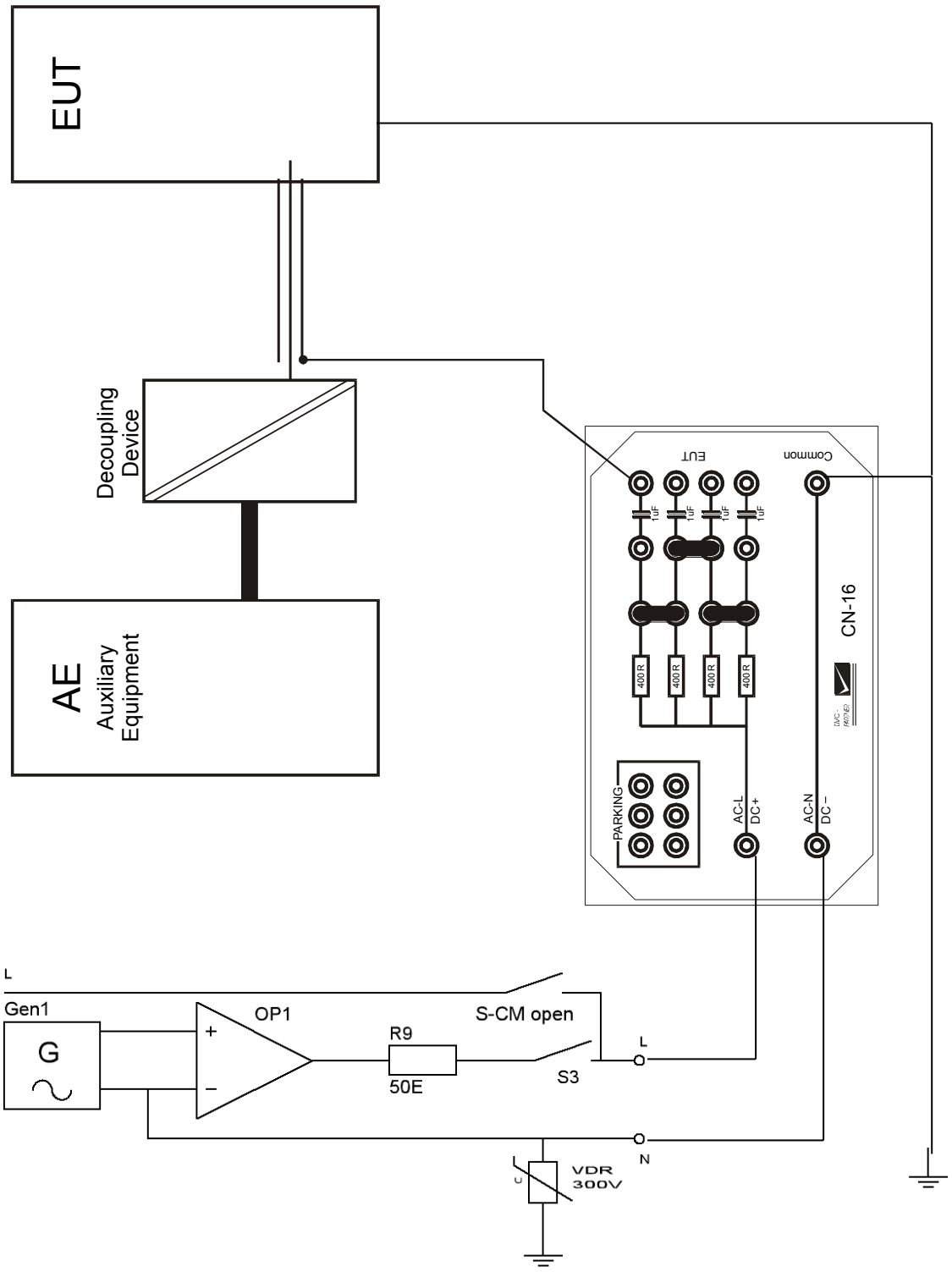


6 1 Hz to 150 kHz tests

6.1 Coupling on two lines



6.2 Coupling on shielded lines



7 Recycling / Disposal

7.1 RoHS directive 2002/95/EG

The CN16 complies with the directive 2002/95/EG (RoHS - Restriction of certain Hazardous Substances).

From December 2005, all EMC Partner products either hand soldered or by machine are produced using lead-free solder.

7.2 WEEE directive 2002/96/EG

The EMC Partner CN16, is exempted from the directive 2002/96/EG (WEEE) under category 9.

The product should be recycled through a professional organisation with appropriate experience for the disposal and recycling of electronic products. EMC Partner are also available to help with questions relating to the recycling of this product.

7.3 Information for dismantling

 Remove always power cord fist.

There is no special danger involved in dismantling the CN16.

7.4 Parts which can be recycled

The CN16 contains parts made from steel, aluminium, PVC, two-component sealing compound. The impulse capacitors are filled with non-poisonous mineral oil. The various parts can be separated and recycled.

7.5 Parts which can not be recycled

All parts in the CN16 can be recycled.

8 Service Information

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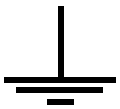
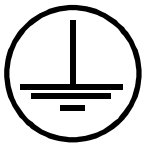
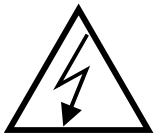
9 Glossary

Wherever possible, definitions in accordance with IEC 50 (IEV 161) are used.

EUT EST	Equipment under Test. French abbreviation of EUT.
EMV = EMC = CEM	Electro Magnetic Compatibility German:Elektromagnetische Verträglichkeit French: =compatibilité elctromagnetique.
Hybrid pulse	Voltage at no load 1.2 / 50 µs and current at short circuit 8 / 20µs.
CWG	Definition in IEC 1000-4-5 used for surge tester Combination Wave Generator.
Coupling network	Electric circuit for transferring energy with low losses from one circuit into another circuit.
Decoupling network	Electric circuit to prevent transmitting energy from one circuit into another circuit.
CDN coupling decoupling network (single or three phase unit)	Consists of a coupling and a de-coupling network.
EFT	Electric Fast Transient (switched inductance).
ESD	Electric Static Discharge.
SURGE	Transients with high energy content with relatively low frequency content as produced by lightning and switching of power lines.
DIP	Short voltage interruption or short voltage drop.
IEC	International standardisation organisation for electronic technology.
VARIAC	Voltage variable transformer.
SPIKE	One pulse of the burst.
CRO	Oscilloscope.
HV	High Voltage.
rms.	Rot mean square; effective value.
Clamping voltage	Peak voltage across the varistor measured under condition of a specified Vc pulse current and specified waveform.
Rated Peak Single Pulse Transient Currents	Maximum peak current which may be applied for a single 8/20µs impulse.
Lifetime Rated Pulse Currents	Derated values of I for multiple impulses which may be applied over device rated lifetime.
Rated RMS voltage	Maximum continuous sinusoidal RMS voltage which may be applied.
Rated DC voltage	Maximum continuous DC voltage which may be applied.
Insulation test	The voltage waveform is relevant.
Energy test	The current waveform is relevant.
Combination test	The voltage and current waveform is relevant.

Used symbols:

	Direct current
	Alternating current
	Three phase alternating current
	Earth (ground) terminal
	Protective conductor terminal IEC 417, No. 5019
	Caution, risk of electric shock ISO 3864, No. B.3.6
	Caution (refer to accompanying documents) ISO 3864, No. B.3.1

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Multi-Contact France S.A.
4, rue de l'industrie
Zone industrielle
F-68220 Hésingue
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Montageanleitung

Sicherheitsverbindungsleitungen
SLK425-K, SLK425-K Sil, SLK410-K Sil

Bei der Benutzung von anderen als von MC® angegebenen Einzelteilen und Werkzeugen, sowie bei Abweichung der hier beschriebenen Vorgänge, zur Vorbereitung und Montage, kann bei der Selbstkonfektionierung weder die Sicherheit, noch die Einhaltung der technischen Daten gewährleistet werden. Silikonleitungen sollten konfektioniert bei MC® bezogen werden.

Assembly instructions

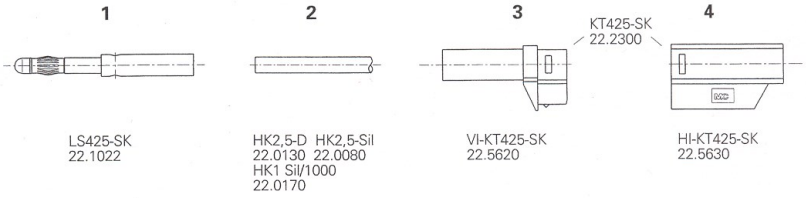
Safety Connecting Leads
SLK425-K, SLK425-K Sil, SLK410-K Sil

The use of parts, tools and preparation other than those stated by MC® can have an effect on the safety and quality of the do-it-yourself leads and therefore the technical data cannot be guaranteed.
We recommend leads made with silicon cable ready-made from MC®.

Instructions de montage

Cordons de sécurité
SLK425-K, SLK425-K Sil, SLK410-K Sil

Lors du montage personnel de cordons, si des composants, des méthodes de montage ou des outillages autres que ceux prescrits par MC® sont utilisés, les règles de sécurité ainsi que le respect des caractéristiques techniques ne sauraient être garantis.
Il est conseillé de commander les cordons en silicone à l'état fini à MC®.

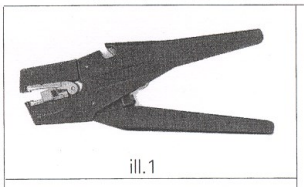


LS425-SK 22.1022

HK2,5-D HK2,5-Sil 22.0130 22.0080
HK1 Sil/1000 22.0170

VI-KT425-SK 22.5620

HI-KT425-SK 22.5630


ill.1

Notwendiges Werkzeug

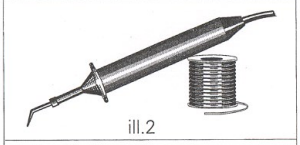
(ill.1)
Abisolierzange "Stripax"
Bestellnr. 25.0015

Tools required

(ill.1)
Cable stripper "Stripax"
Order No. 25.0015

Outillage nécessaire

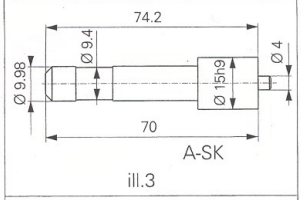
(ill.1)
Pince à dénuder "Stripax"
No. de Cde 25.0015


ill.2

(ill.2)
- Lötkolben 60 W
- Lötdraht
z.B. Elsold Ø 1,5 mm
DIN 8516 (L-Sn60PbCuZ)

(ill.2)
- Soldering iron 60 W
- Solder
e.g. Elsold Ø 1,5 mm
DIN 8516 (L-Sn60PbCuZ)

(ill.2)
- Fers à souder 60 W
- Fil de soudure
p.e. Elsold Ø 1,5 mm
DIN 8516 (L-Sn60PbCuZ)

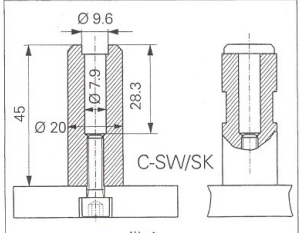


ill.3

(ill.3)
Hilfswerkzeug A-SK
Empfohlenes Material:
Stahl.

(ill.3)
Auxiliary tool A-SK
Recommended material:
Steel.

(ill.3)
L'outil A-SK
Matériel recommandé:
Acier.



ill.4

(ill.4)
Hilfswerkzeug C-SW/SK
Empfohlenes Material:
Messing.

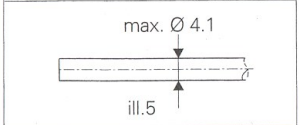
(ill.4)
Auxiliary tool C-SW/SK
Recommended material:
Brass.

(ill.4)
L'outil C-SW/SK
Matériel recommandé:
Laiton.

Vorbereitung der Leitung

Preparation of the cable

Préparation du câble

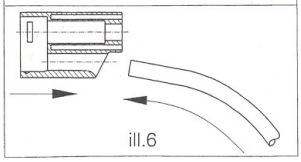


ill.5

(ill.5)
Leitung 2 auf gewünschte Nennlänge ablängen.

(ill.5)
Cut the cable 2 to the desired nominal length

(ill.5)
Couper le câble 2 à la longueur prévue.

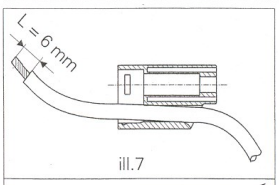

ill.6

(ill.6)
Leitung 2 durch Isolierteil 4 schieben.

(ill.6)
Feed cable 2 through insulator 4.

(ill.6)
Glisser le câble 2 à travers l'isolant 4.

Multi-Contact

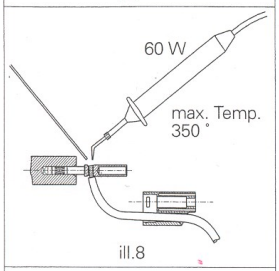


ill.7

(ILL.7)
Leitung mittels Abisolierzange auf Länge L = 6 mm abisolieren.

(ILL. 7)
Strip cable insulation to length L = 6 mm with cable stripper.

(ILL. 7)
Dénuder le câble sur la longueur L = 6 mm avec la pince à dénuder.



ill.8

(ILL. 8)
Leitung 2 in Stecker 1 löten. Beim Löten darf der Stecker wegen dem Kunststoffkopf nicht zu heiss werden . Löttemperatur: 350° C max.

Stecker und Lötstelle müssen frei von austretendem Lötzinn sein.

MC®-Empfehlung:
Ein Block mit Bohrung Ø 4,2 mm hält den Stecker 1 beim Löten fest.

(ILL. 8)
Solder cable 2 in plug 1. When soldering the plug should not get too hot because of the plastic head. Soldering temp. 350 ° C max.

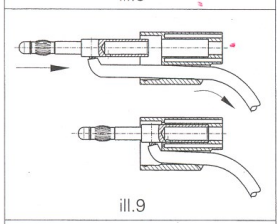
Plug and solder area should be free from excess solder.

MC®-Recommendation:
For soldering purposes a block with a drilled hole Ø 4,2 mm should be used to hold the plug 1 in position.

(ILL. 8)
Souder le câble 2 dans la fiche 1. Lors de la soudure la température ne doit pas être excessive à cause de la tète en plastique. Max. température de soudure 350°

La fiche et l'endroit de soudure doivent être exempt de coulure de soudure.

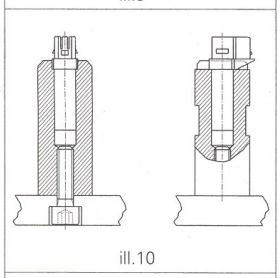
Recommandation MC®:
Utiliser un bloc avec un perçage Ø 4,2 mm pour maintenir la fiche 1 lors de la soudure.


ill.9

(ILL. 9)
Stecker 1 zurück in Isolierteil 4 einschieben und gleichzeitig die Leitung leicht nachziehen.

(ILL. 9)
Push plug 1 back into insulator 4 and at the same time take-up the wire.

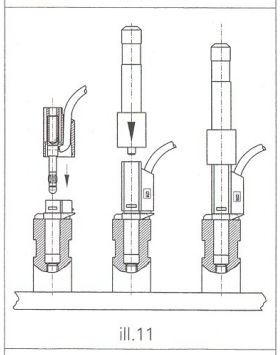
ILL. 9)
Insérer la fiche 1 dans l'isolant 4 et en mème temps tirer légèrement le câble.


ill.10

(ILL. 10)
Isolierteil 3 in Hilfswerkzeug C-SW/SK einlegen.

(ILL. 10)
Place insulator 3 into the auxiliary tool C-SW/SK.

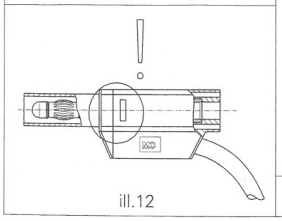
ILL. 10)
Mettre l'isolant 3 dans l'outil C-SW/SK.


ill.11

(ILL. 11)
Isolierteil 4 (+2+1) in Isolierteil 3 einschieben und mittels Hilfswerkzeug A-SK und einer Tischbohrmaschine oder Kniehebelpresse bis zum Einrasten einpressen.

(ILL.11)
Insert insulator 4 (+2+1) into insulator 3 and with auxiliary tool A-SK mounted in a lever press or bench drilling machine, press and snap into position.

(ILL.11)
Insérer l'isolant 4 (+2+1) dans l'isolant 3 et presser jusqu'au point d'arrêt avec l'outil A-SK à l'aide d'une perceuse ou d'une petite presse.


ill.12

ILL. 12)
Einrasten kontrollieren.

(ILL.12)
Control snap in.

(ILL.12)
Contrôler l'enclenchement

MA 105

Änderungen vorbehalten/Subject to alterations/Modifications sous réserve.
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