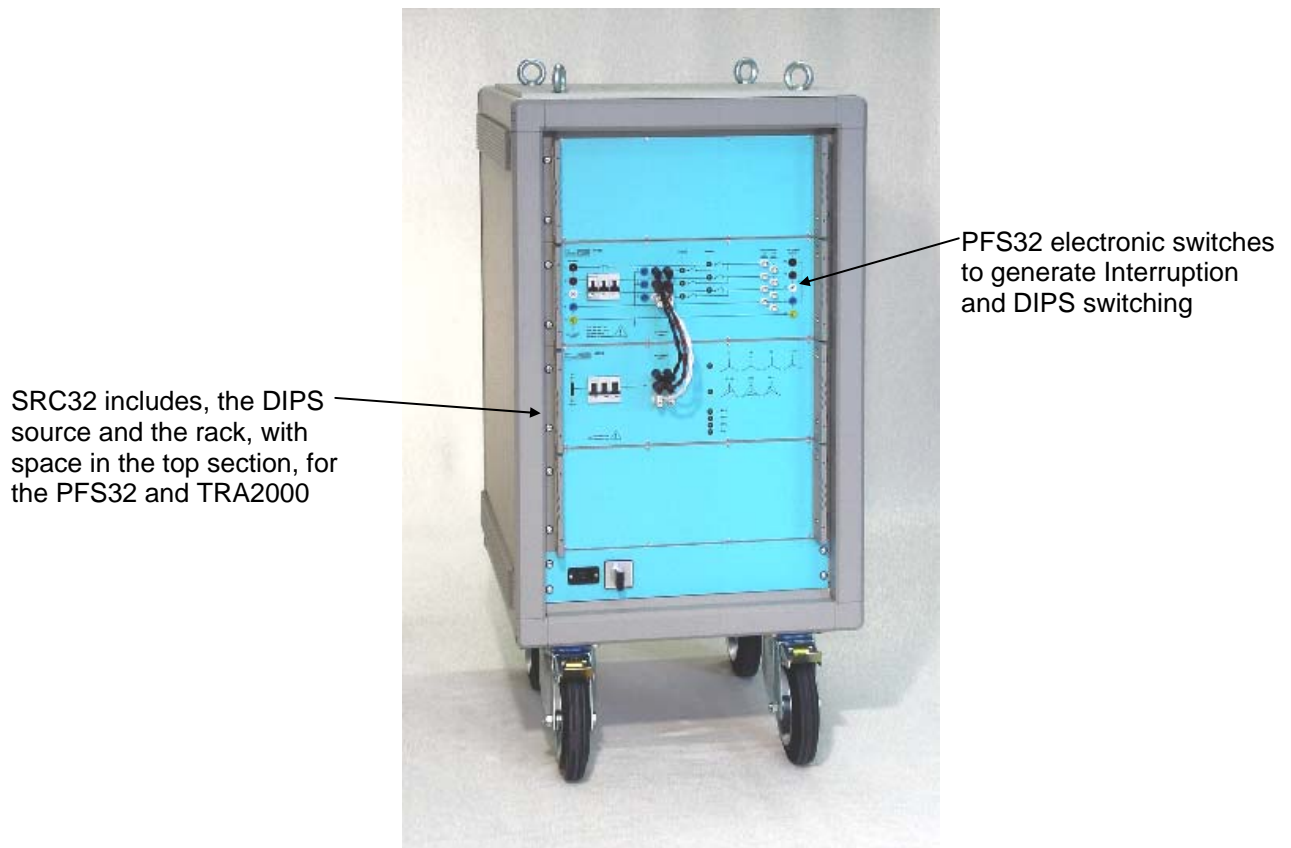


User Manual DIPS Source SRC32



Title:
Date:
General Manager:
Quality Manager:
Revised:

EMC Test System DIPS Source SRC32
22.10.99
M. Lutz
R. Henz
29.November 2011

EMC TESTER
DIPS Source SRC32



Attention Standard References and User Manual

This user manual provides information necessary for operation of the test equipment.

Throughout the user manual, standard references are used as an aid to understanding only.

The relevant standard(s) **must** be obtained and used in conjunction with this user manual



Attention contact EMC PARTNER!

Before starting any test, where specifications or limits for a particular application are not included or could not be found in the EMC PARTNER documentation (User Manual, Instruction Sheet), users must contact EMC PARTNER for clarification.

Repair costs arising from incorrect use or failure to clarify an application with EMC PARTNER remain the responsibility of the user.



Achtung EMC PARTNER kontaktieren!

Wenn für eine Anwendung die notwendigen Informationen: Parameter oder Limiten in der Bedienungsanleitung UM oder in der Instruktionsanweisung IN nicht aufgeführt sind, ist der Anwender verpflichtet, EMC PARTNER zu kontaktieren, bevor die Prüfung gestartet wird. Anfallende Reparatur- und Kalibrationskosten bei nicht Beachtung der Limiten in der Bedienungsanleitung / Instruktionsanweisung oder Unterlassen der Rückfrage werden dem Kunden belastet.



ATTENTION, veuillez contacter EMC PARTNER!

Lorsque, pour une application, des limites ou des informations nécessaires ne sont pas mentionnées dans la documentation, l'utilisateur est tenu de prendre contact avec EMC PARTNER afin de recevoir les informations supplémentaires avant de commencer les tests.

Les coûts de réparation dus au non respect des limites figurant dans le mode d'emploi ou dans la notice d'utilisation ainsi que l'omission d'une demande de précision seront à la charge du client.



Declaration of Conformity

See sheets attached at the end of this user manual:

- Declaration of conformity to product standards
- Declaration of conformity to low voltage directive
- Declaration of conformity to EMC directive

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1 Description

1.1.1 System Introduction

The new IEC61000-4-11 Ed2, clearly defines the **three phase** application of DIPS and Interrupts on AC Power lines up to 16A per phase. In addition to clarifying the three phase application, this new standard contains a supplementary requirement for an **80% DIP** level.

PFS32 & SRC32 are designed for this new application.

PFS 32 & SRC 32 are accessories to the TRA2000 Immunity Test system.

SRC 32 is mounted in an 18 unit high rack, with space in the top section, for the PFS32 and TRA2000 to be fitted. SRC32 adds 32A DIPS source capability to the TRA2000 and PFS32.

The SRC32 rack has large wheels for easy movement in a testing laboratory.

PFS32 is a 4 unit high module that connects to the TRA2000 and extends that units interrupt capability up to 32A for three phase applications.

TRA2000 system is a compact test solution and represents excellent value for money.

The PFS32 and SRC32, are further examples of EMC PARTNER **innovative solutions**, designed to meet customer requirements.

1.1.2 Voltage interruptions, Dips

DIPS means a sudden reduction of the voltage at a point in electrical system, followed by voltage recovery after a short period of time from a few cycles to a few seconds.

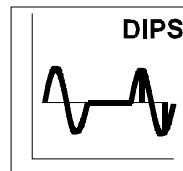


Figure: 1.0.4

Voltage failures occur following switching operations, short-circuits, fuses blowing and when running up heavy loads. These are man-made faults, produced unintentionally, and include operation of domestic appliances, electronically controlled machine tools, switching operations in the public lighting system, economy lamps, etc.

The quality of the electrical power supply is increasingly becoming a central topic of discussion. The interference sources in the mains, caused by electronic power control using non-linear components such as thyristors which are increasingly used in domestic appliances, such as hotplates, heating units, washing machines, television sets, economy lamps, PCs and industrial systems with speed-controlled drives. Simultaneously an increase in electronic systems sensitive to interference is apparent in all sectors of electrical power system.

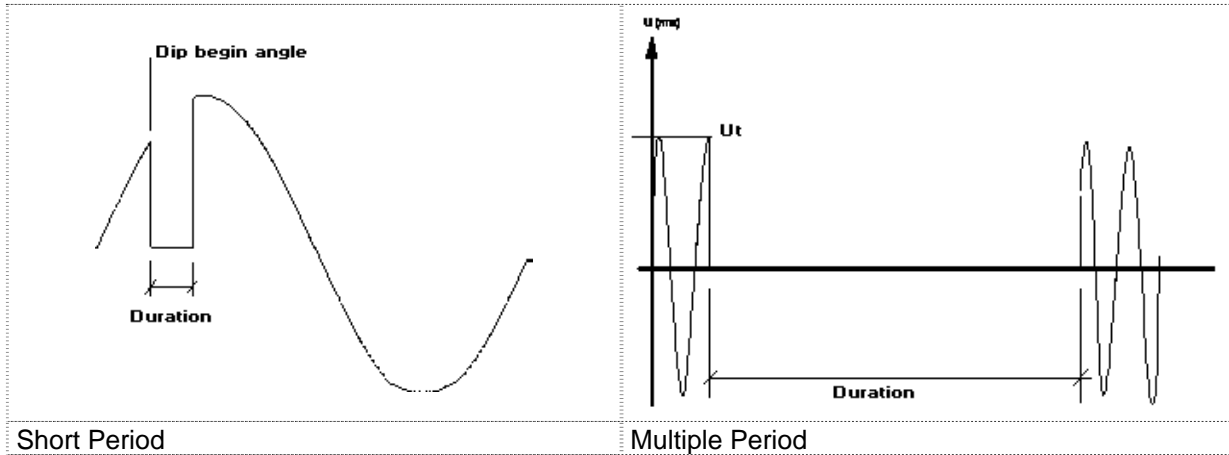
In order to achieve electromagnetic compatibility, both the interaction of the electrical equipment connected to the supply and its noise immunity must be determined.

The electromagnetic compatibility of electronic equipment must be guaranteed e. g. Europe Union 31. December 1995.

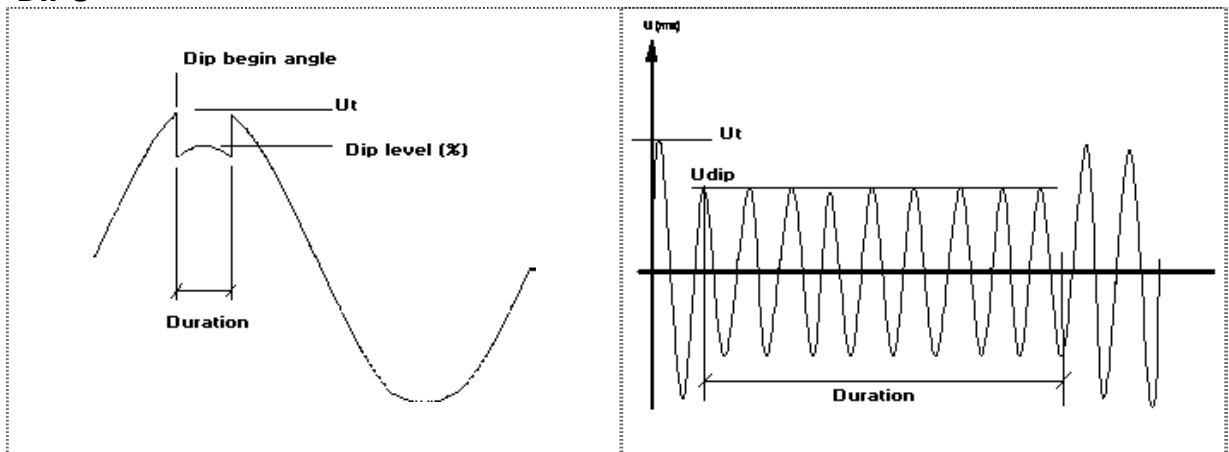
1.1.3 Definition of interrupts and dips

Only one phase is shown. The voltage outputs are defined as follows :

INTERRUPTS



DIPS

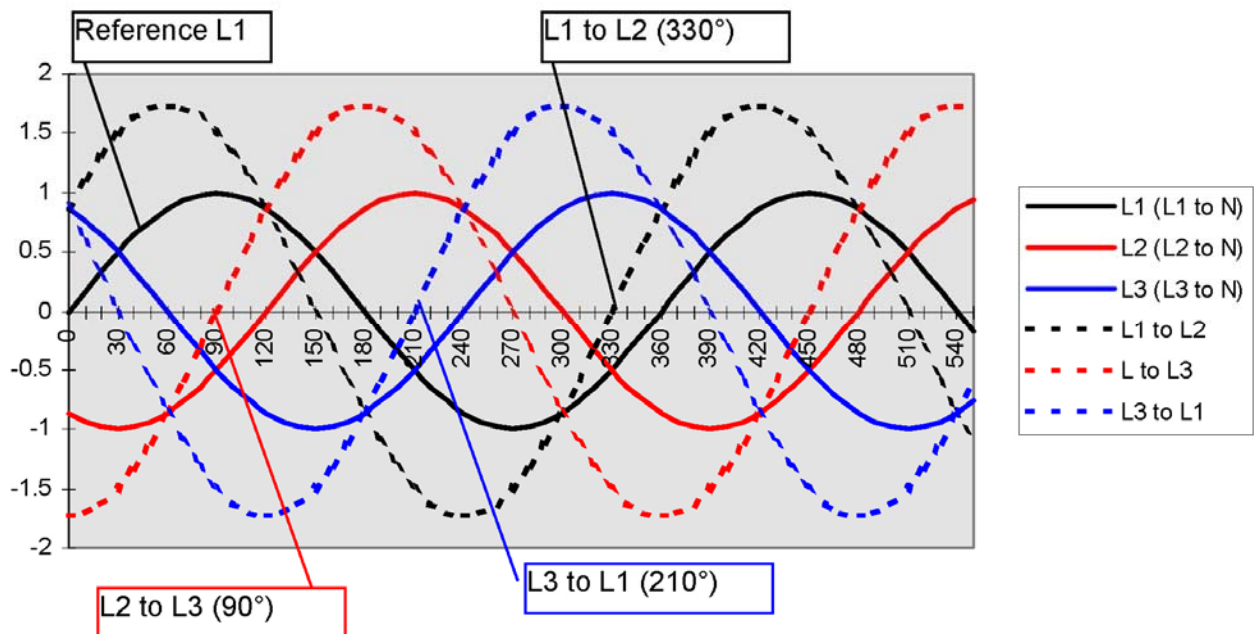


1.1.4 Synchronisation of interruptions and dips



The sequence of the connected phases L1, L2, L3 must be correct. When the sequence is not correct the synchronisation of the interruptions / dips will not be correct. The sequence must be either measured with an three channel oscilloscope or with a phase sequence indicator.

The synchronisation takes place with the L1 phase, with the event then occurring time coincident on the other two phases. This illustrated for both star(Y) and delta (Δ) connections in the following diagram.



For all dips and interruption the zero crossing of L1 is the reference. The software calculate the phase shifting for L2, L3. The operator can select always the phase angle between 0 to 360° for each phase.

Star connections have three phases with defined neutral point which is the reference point for test events. Testing can therefore be performed on each phase individually (L1 to N, L2 to N, L3 to N) and on all three phases simultaneously.

Delta connections on the other hand do not have a fixed neutral point, this means that the reference for any events becomes the phases themselves, dips/ interrupts are once again reference to L1. Automatically the software adds the angle differences for the phase to phase voltage e.g. L1 to L2 (330°), L2 to L3 (90°) and L3 to L1 (210°).

1.1.5 Compliance with Standard

PFS32 & SRC32 meet the following basic standards.

IEC 61000-4-11, EN 61000-4-11, 2001 Electromagnetic compatibility (EMC) - Part 4 Testing and measuring techniques - Section 11: Voltage dips, short interruptions and voltage variations immunity tests.

IEC 61000-4-11 Ed2, 2004 Electromagnetic compatibility (EMC) - Part 11 Testing and measuring techniques - Section 11: Voltage dips, short interruptions and voltage variations immunity tests.

IEC 61000-4-29, EN 61000-4-29, 2000 Electromagnetic compatibility (EMC) - Part 4 Testing and measuring techniques - Section 29: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations on d.c. input power port immunity tests (PFS32 and SRC32 complying only with the section interruption and partly with dips)

IEC 61000-4-34 Ed.1 (2005 FDIS), Electromagnetic compatibility (EMC) - Part 4 Testing and measuring techniques - Voltage dips, short interruptions and voltage variations immunity tests for equipment with input current more than 16A per phase.

1.2 Technical data of the DIPS Source SRC32

PFS32 with SRC32:	DIPS only possible with PFS32 and TRA	
Standard	IEC 61000-4-11, IEC61000-4-11 Ed2, IEC61000-4-34 (FDIS2005)	
DIPS Source voltages	40%, 70%, 80%	
Rise & Fall time	1 - 5 μ s	
Dip Current 80%	40A	
Dip Current 70%	46A	
Dip Current 40%	80A	
Vmax (phase - phase)	Min. 200V up to Max.480Vac @ 50 / 60Hz	
Vmax (phase - neutral)	Min 100V up to Max 280Vac @ 50 / 60Hz	
Dip time	50 μ s to 30s	
Dip phase synchronisation	0 to 360°	
Inrush current	>500A peak	
Nominal current	32A	
Over-current protection	50A constant current 220A short duration <2s	

1.3 TRANSIENT controller

A TRA2000 with the dips circuit is necessary to control the SCR32 with the PFS32. The TRA2000 can be in the rack of SCR32 standard configuration or in a separate rack option as shown below.



Controller TRA2000

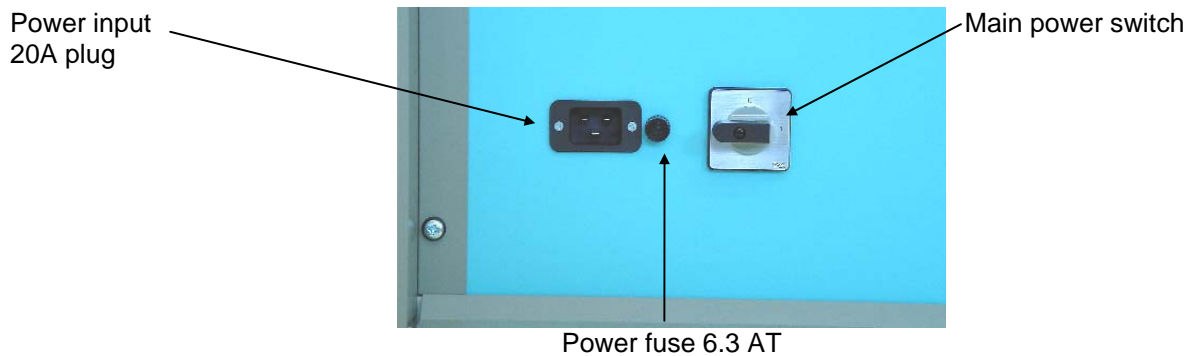
Standard configuration

Configuration „option“ see separate instruction sheet



**Output voltage of the SRC32 is automatically switched and controlled from the TRA2000 controller.
TRA2000 software 3.xx or higher required.**

1.4 Power Consumption



The power line input is located on the front side of the DIPS Source SRC32.

Voltage between phase and neutral	115/230 V (50/60 Hz) Caution: When TRA2000 is used for control, the power supply voltage must be same as TRA2000	± 10 %
Power consumption	Operation mode < 1000 VA Standby < 100 VA	(230 V, 50 Hz) (115 V, 60 Hz)

The tester DIPS Source SRC32 is shipped for a line voltage 230 or 115 V see type plate.

Following power cords can be ordered:

Europe (CEE-7/VII) UK (BS-1363) Switzerland (SEV Type 12) USA (NEMA5-15P)

1.5 Accessories, dimensions

1.5.1 Included articles, dimensions

SRC32-18UH (Article No. 103671)

Mechanical Dimensions

Unit Height:	18
Length:	65 cm
Width:	60 cm
Height:	123 cm
Net Weight:	307 kg

Included Articles

According to STL-Variante 20, STL-Version 1

Qty	PN	Description
1	104801	Brochure TRANSIENT 3000
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	104818	Power Cord 3 pole (20A)

SRC32-36UH (Article No. 103700)

Mechanical Dimensions

Unit Height:	36
Length:	65 cm
Width:	60 cm
Height:	186 cm
Net Weight:	336 kg

Included Articles

According to STL-Variante 20, STL-Version 1

Qty	PN	Description
1	104801	Brochure TRANSIENT 3000
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	104818	Power Cord 3 pole (20A)

1.5.2 Standard accessories

Accessories to SRC32-18UH (Article No. 103671)

Qty	PN	Description	Weight (kg)	Length (cm)	Width (cm)	Height (cm)
1	100844	Key for rack door	0	0	0	0
4	102445	Lift rings	0	5	5	0
1	102540	Spare fuse 5x20mm 6.3AT	0	2	0	0
1	103015	Plastic pack for standard accessories 90x75mm	0	9	7.5	0
1	103027	Accessory plastic pack	0	0	0	0
1	104898	MC safety cable 2x black twisted with protected banana plug	0	0	0	0
1	104899	MC safety cable 2x brown twisted with protected banana plug	0	0	0	0
1	104900	MC safety cable 2x white twisted with protected banana plug	0	0	0	0

Accessories to SRC32-36UH (Article No. 103700)

Qty	PN	Description	Weight (kg)	Length (cm)	Width (cm)	Height (cm)
1	100844	Key for rack door	0	0	0	0
4	102445	Lift rings	0	5	5	0
1	102540	Spare fuse 5x20mm 6.3AT	0	2	0	0
1	103015	Plastic pack for standard accessories 90x75mm	0	9	7.5	0
1	103027	Accessory plastic pack	0	0	0	0
1	104898	MC safety cable 2x black twisted with protected banana plug	0	0	0	0
1	104899	MC safety cable 2x brown twisted with protected banana plug	0	0	0	0
1	104900	MC safety cable 2x white twisted with protected banana plug	0	0	0	0

2 Safety

The DIPS Source SRC32 belongs to Safety class 1

2.1 Safety standard

The DIPS Source SRC32 fulfils the requirements of the safety standards IEC 1010 for laboratory measurements equipment „Safety requirements for electrical measuring, control and laboratory equipment“. Based on EN 61010 (IEC1010) the declaration of conformity to low voltage directive (LVD 73/23/EEC O.J.N° L77, 1973-03-26) is given.



This manual is an integral part of the DIPS Source SRC32 tester. The instructions contained in the manual regarding operation and the test set up are to be strictly observed.

2.2 Climatic Conditions

The DIPS Source SRC32 contains high voltage circuits in integrated form. EMC PARTNER only guarantees a correct functioning of the tester DIPS Source SRC32 and the associated accessories, if the DIPS Source SRC32 is operated in the climatic condition specified.

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

The DIPS Source SRC32 should be operated in a dry, clean room. If for any reason water condenses in the DIPS Source SRC32, then no TRANSIEENT-2000 operation should be started before the tester is dry.



It is strictly forbidden to operate the DIPS Source SRC32 in rooms with of gas explosion risk. The high voltage of the DIPS Source SRC32 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

The DIPS Source SRC32 generate high current with associated high magnetic fields. 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 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.

The DIPS Source SRC32 must be connected to power line with a safety ground..

2.4 Electromagnetic Compatibility

The outputs of the DIPS Source SRC32 and the links between DIPS Source SRC32 and the EUT can emit disturbances. Please consider the national PTT rules.

The Test System DIPS Source SRC32 should not be operated near sensitive measuring and control systems.

The DIPS Source SRC32 fulfils the following immunity requirements:

• Electrostatic discharge	Level 4 (8 kV)	(IEC 61000-4-2)
• Burst EFT	Level 4 (4 kV)	(IEC 61000-4-4)
• SURGE	Level 3 (2 kV)	(IEC 61000-4-5)



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

This manual is an integral part of the DIPS Source SRC32 System. 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 observance the safety rules and precautions in the manual.

3 Mechanical structure

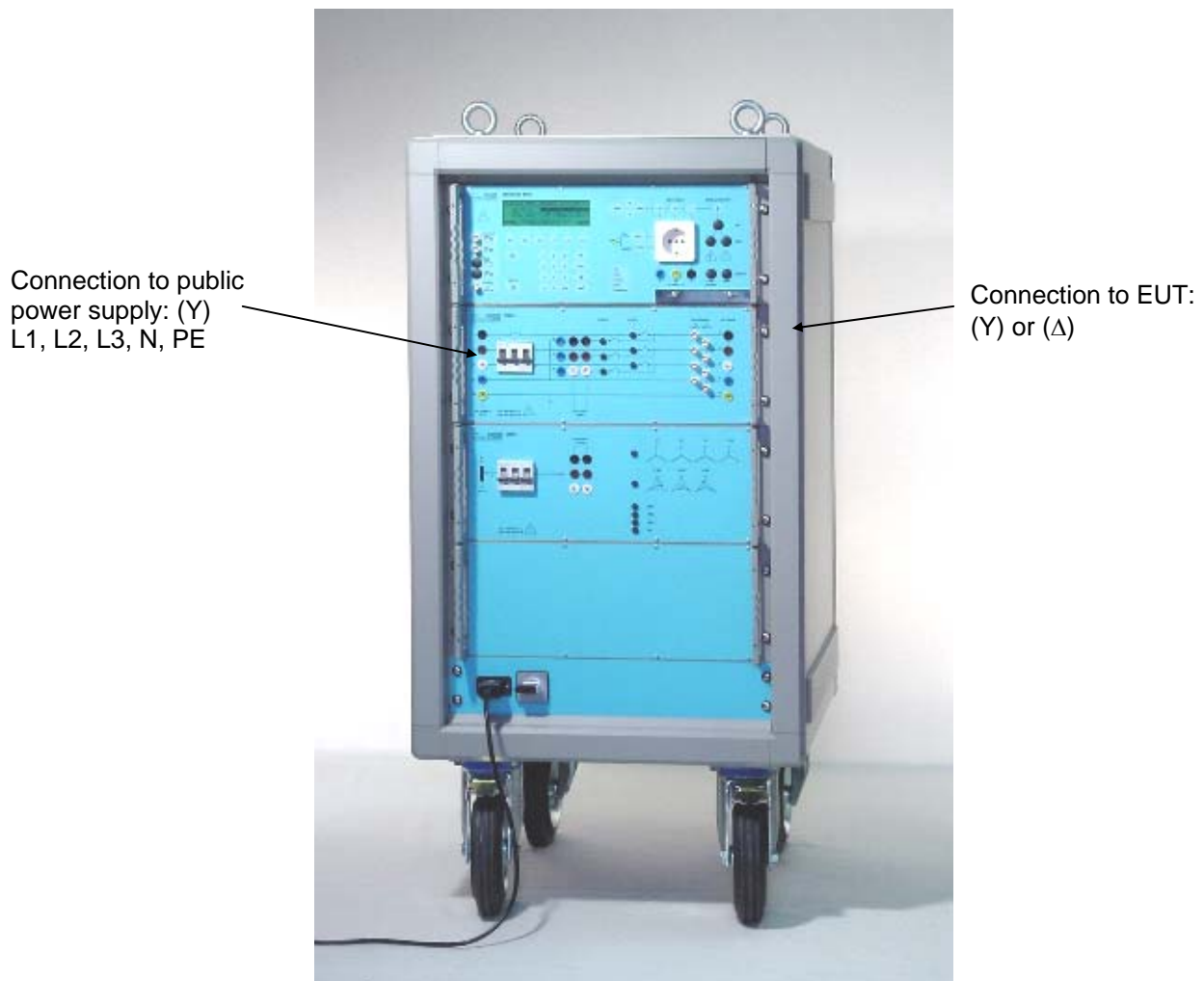
3.1 General

PFS 32 & SRC 32 are an accessory to the TRA2000 Immunity Test System to simulate effects of power line interruptions caused by short circuit or open circuit conditions. This is an expansion of the TRA2000 Single phase capability to enable testing on **Three Phase** power lines.

PFS 32 extends the system to provide **Three Phase** testing of AC and DC Interrupts up to 480V and 32A. SRC 32 is a 480V AC (L to L) source controllable from the TRA2000 to generate DIPS.

Coupling Path switching and the selection of DIP levels is automatically performed from the TRA2000 control system.

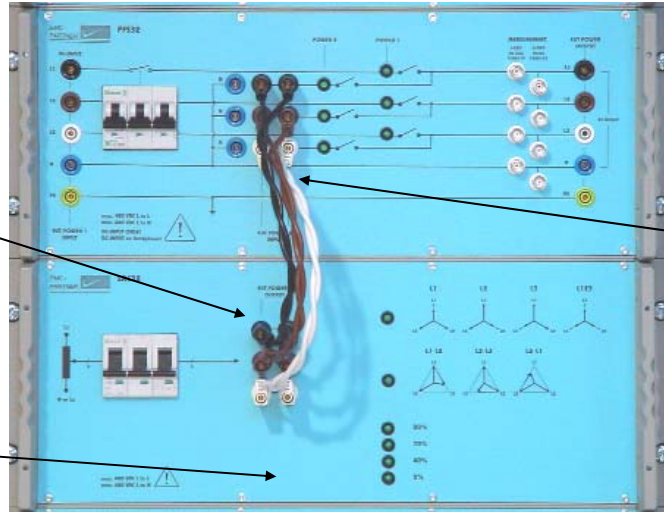
BNC monitors on the PFS32 enable the voltage and current wave-shapes to be verified with an oscilloscope on all three phases.



- EUT connections are on the PFS32 front panel. An EUT is connected via 4mm safety banana plugs and cables. The maximum EUT current is $32A_{RMS}$ per phase. Inrush current is $>500A$ per phase.
- Connections between the SRC32 and PFS32 are via 4mm banana plugs. The SRC32 is connected to PFS32 EUT power 2 input.

Public power supply connection to SRC32 „IN“

Output of SRC32 to PFS32



4 Control Panel

4.1 Front panel of the DIPS Source SRC32

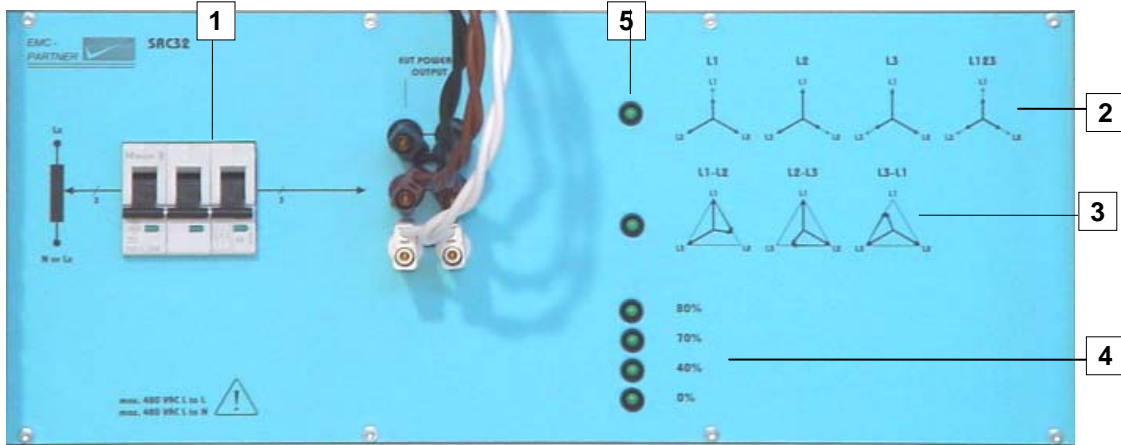


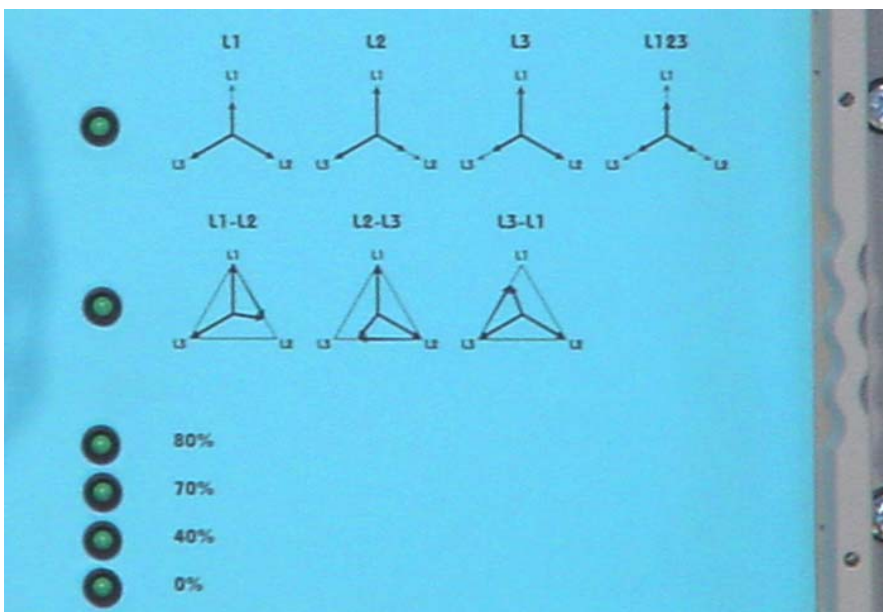
fig.4.1

The most important elements of the front panel are:

1. Over current trip out switch
2. Voltage dips possibilities on (Y) power source
3. Voltage dips possibilities on (Δ) power source
4. DIPS levels 0%, 40%, 70% and 80%
5. LED indicates the activated test mode and test levels

4.1.1 Control part

The control of the DIPS Source SRC32 is carried out by the TRA2000 microprocessor. For more information study the TRA2000 manual. The operator communicates with the DIPS Source SRC32 via the numeric input terminal, the display and the soft keys of the TRA2000.



5 Preparation for Operation

5.1 Attention, Refer to Manual

This manual is an integral part of the DIPS Source SRC32. The safety rules and precautions in the manual must be observed. EMC PARTNER and their representatives accept no responsibility not responsible for damages to persons and equipment as a results of non-observation of the safety rules and precautions in this manual.

Before connecting the DIPS Source SRC32 to a public power line, Chapter 3 „Safety must be carefully studied.

5.2 Operators and Service Personnel

Only trained personnel should carry out EMC tests. For small groups of maximum 10 persons EMC PARTNER AG offers the following in-house seminars in English or German at the customer's location:

1. EMV Introduction
2. EMV Standardisation
3. EMC „ESD“ immunity test
4. EMC „EFT“ immunity test
5. EMC „SURGE“ immunity test
6. EMC „DIPS“ immunity test
7. EMC „HARMONICS“ immunity test
8. EMC „MAGNETIC FIELD“ immunity test
9. EMC „CW CURRENT INJECTION“ immunity test
10. EMC „CE-MARK“ transient immunity tests
11. „NEMP“ immunity test
12. „AC, DC, IMPULSE“ insulation test

5.3 Checks before operation

5.3.1 Optical verification of the DIPS Source SRC32

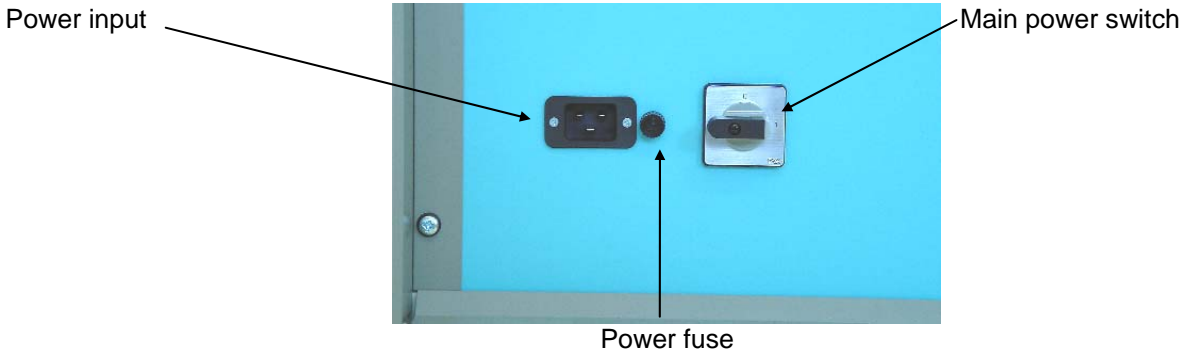
Before you unpack the DIPS Source SRC32, please check whether the packing is deformed or damaged. When the DIPS SRC32 is unpacked, also check whether the tester is damaged. If you detect a damage, please inform EMC PARTNER and the shipping organisation immediately.

5.3.2 Power source check

On the front panel, you will find a type plate. Please check whether the tester has been prepared for the correct power line voltage of your public power. If the power supply voltage is different please inform EMC PARTNER AG in Switzerland, or your EMC PARTNER AG representatives.

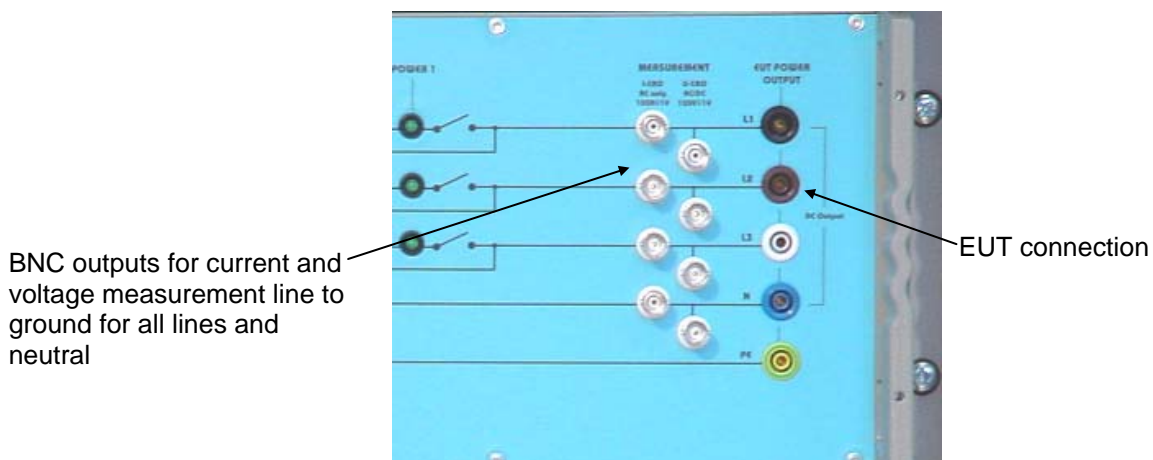
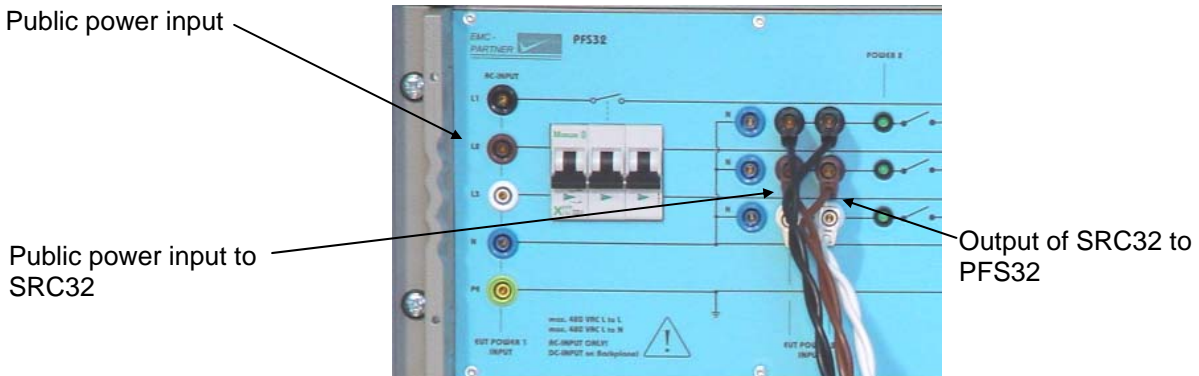
5.3.3 Connecting the DIPS Source SRC32 rack to the power line

Please use the supplied power cord for connecting the DIPS Source SRC32 to your public power supply. As stated on the rear, the power supply must have an earth safety wire. Please check the earth connection on your power outlet before you turn on the DIPS Source SRC32 with the main the main switch on the front.



5.3.4 EUT Power, Power source for the EUT

The EUT power must be connected via the PFS32 interruption generator. Please cut the black, brown, white, blue and green/yellow cables supplied into two halves of the same length. One half can be used for the Three Phase inputs and the other half for the for supplying the EUT from the front panel. The high inrush current during the DIPS test can only be reached, when the public power supply can deliver 500 A peak current. The public power supply must be protected by 32 A fuses.





The sequence of the connected phases L1, L2, L3 must be correct. When the sequence is not correct the synchronisation of the interruptions / dips will not be correct. The sequence must be either measured with an three channel oscilloscope or with a phase sequence indicator.

5.3.5 Supply of the EUT with dc



It is not allowed to connect d.c. power on the front panel a.c. inputs. For d.c. interruption the input on the rear side must be used.

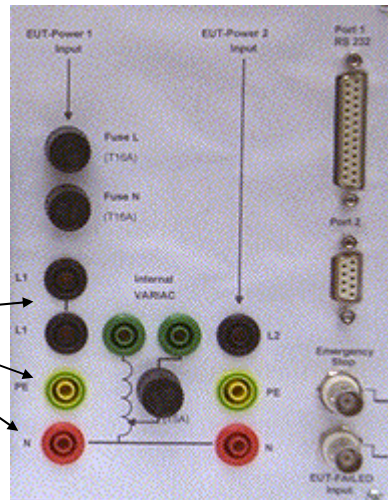
The d.c. can be connected to the EUT from L1 to N output on the front.



Before a d.c. source is connected to the rear of the PFS32 the synchronisation cables to the TRA2000 must be removed. If the cables are not removed and the d.c. is connected to the PFS32, the TRA2000 will be damaged.

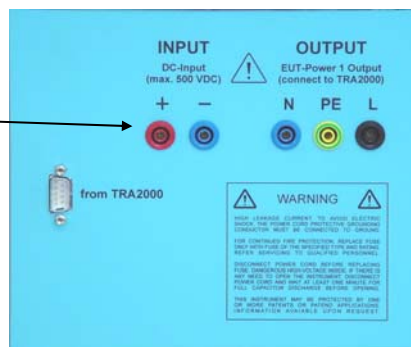


No cables connected to EUT power 1 Input L1, N, PE



For both set-ups: „stand alone or inserted into the SRC32 rack. The cables to EUT Power 1 of the TRA2000 must be removed.

Connect the d.c. supply after you have removed the EUT Power1 cable on the rear side of the



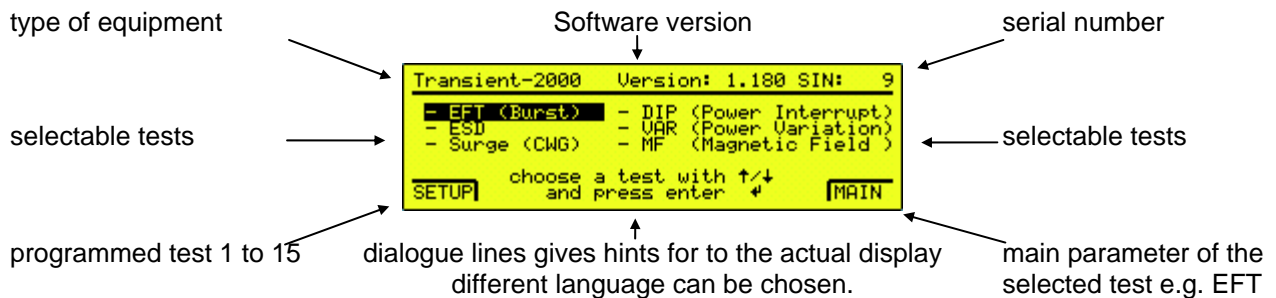
6 Testing with the DIPS Source SRC32, PFS32 and TRA2000

6.1 Quick start of a DIPS test

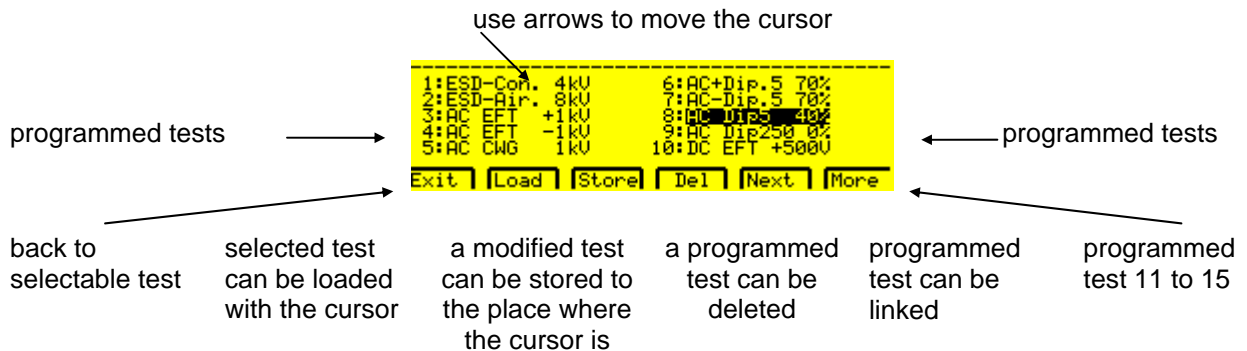
When you have studied Chapter 2 „Safety“ and Chapter 5 „Preparation for operation“ and all instructions have been followed you have green light for a quick start. The quick start includes the most important tests using the DIPS Source SRC32, RFS32 and the TRA2000.

To start a set-up, the follow steps must carried out:

- Turn the main power switch on the front side to position I
- Operate the ON/STBY button on the front panel of TRA2000 the display turns to:

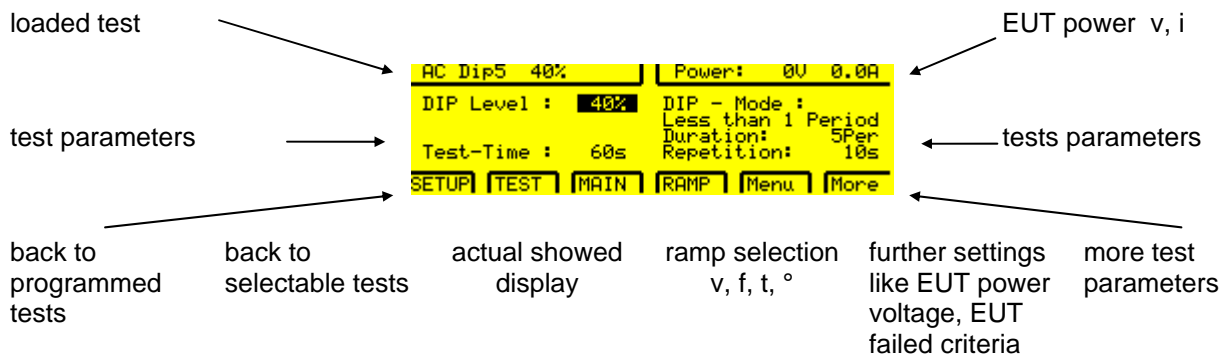


Press "SETUP"



Quick test example AC Dips5 40%:

- move the cursor with the arrow to number 8
- press F2 Load



- press twice „More“
- Activate the PFS and SRC control

loaded test

test parameters

EUT power v, i

tests parameters

- press "RUN" button

test in operation

test voltage and time bar. Black indicates the actual test time carried out

EUT power v, i

tests parameters

indicates the status of the actual test.

when the operator detects visual a EUT failure, F4 can be pressed and the status of the test turns to "failed". Protocol shows " test failed"

by pressing "Mark" the actual test parameter will be written in the protocol and showed on the display at test end.

When the TRA2000 is controlled from a PC with GENECS the following protocol will be printed or showed on the monitor:

EMC-Partner AG

```
-----
TRANSIENT-2000-555  Version: 3.23  Test :  AC Dip5  40%
                               Date :  19.09.05  Time :  16:45:40
```

Test Kind: DIP (Power Interrupt)

```
EUT :                               Operator :
Comment :
```

```
-----
PowerON Syncro:  0Deg  PowerOFF Syncro:  0Deg  Output : PFS-3phase
-----
```

```
DIP Level      :  40%      Repetition :  10s      Trigger :  auto
Number of interrupted Periods :  5      High-Z at 0% :  off
DIP1:  0 to 360 Deg  DIP2:  0 to  0 Deg  Syncro Freq. :  50Hz
-----
```

```
Test-Time :                               60s
=====
```

```
1. DIP (Power Interrupt) -> L3-L1      Result :  EUT failed !!
   Mark                               10s  40%    5Per (  0..360)Deg
   EUT failed !!                       28s  40%    5Per (  0..360)Deg
   Test End .....                      61s
```

```
Test Result :  EUT FAILED :  by operator
```

Well that's easy isn't it ?

All other 14 programmed tests can be started and carried out on the same way. All test can be started or stopped with the "RUN" button.

The quickstart tests contain only a small part of the testing possibilities of the TRA2000 with DIPS Source SRC32 and PFS32.



Further information can be found in the TRA2000 Manual.

7 Maintenance and Servicing

7.1 Maintenance

To avoid electrical shock, be sure that the power cord is disconnected before starting maintenance work.

No further maintenance is necessary on the DIPS Source SRC32.

7.2 Verification of the DIPS Source SRC32 by the user

7.2.1 Interruption

1. Select PFS32 in the menu „select coupling to port“
2. Verification as specified in the Basic Standard 61000-4-11

Trigger the measuring equipment via the external trigger input. Different trigger level, see Chapter 1.2.7 of the TRA2000 Manual

7.2.2 DIPS

1. Setting DIPS Source PFS+SRC32 in the menu „select coupling to port“

1. Measuring point:
BNC output EUT Power V.

2. Setting measuring equipment
Time base 10 to 50 ms,
Vertical deflection 2 V / division

Trigger the measuring equipment via the external trigger input. Different trigger level, see Chapter 1.2.7 of the TRA2000 Manual

7.3 Verification of the DIPS Source SRC32, PFS32 and TRA2000 by EMC PARTNER AG

EMC PARTNER verify the DIPS Source SRC32 System in accordance with the verification chapter in the Basic Standards.

Interruption and DIPS

61000-4-11 Ed.2

EMC PARTNER recommend a full verification of the DIPS Source SRC32 once every two years. A test report with all oscillograms is included in the verification price. A full verification without a repair takes approximately 1 week.

Before a DIPS Source SRC32 is delivered, all verifications are carried out in accordance with the basic documents.

All data are within the tolerable tolerances.

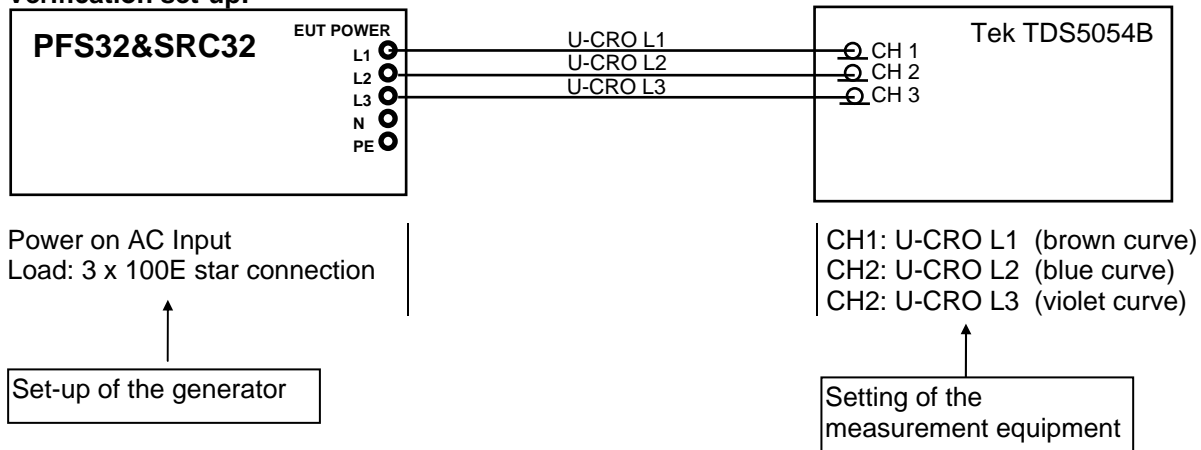
See verification report DIPS Source SRC32 and PFS at the end of the Manual binder.

On the following pages some explanation can be found to the EMCP calibration report.

The head of the calibration report informs about the set-up of the generator and the measurement equipment used for the calibration:

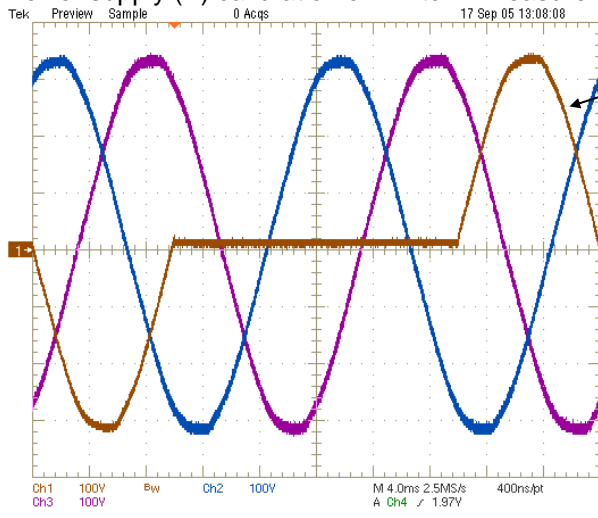
3-Phase DIP with PFS32 & SRC32

Verification set-up:

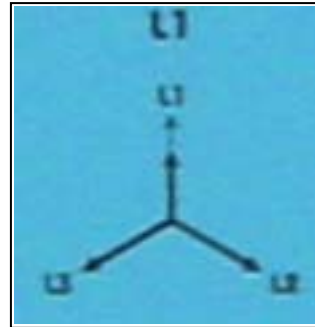


On the next pages some oscillograms are shown, which explain the dips and interruptions on a three phase system.

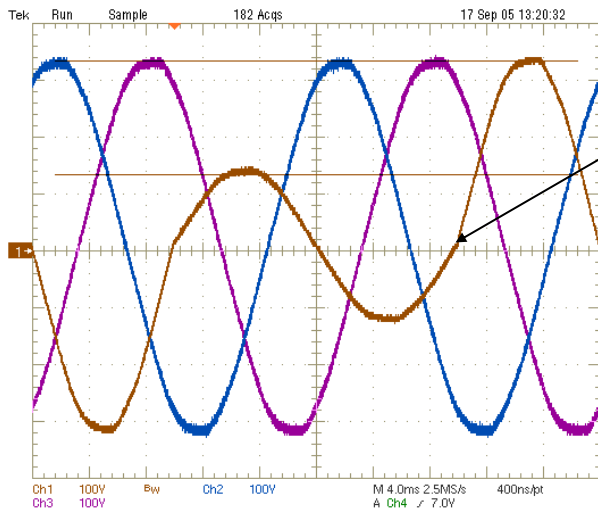
Power supply (Y) calibration on L1 to N. Measurement has been taken between L1 and PE



Phase L1 with 20ms interruption. voltage 0%

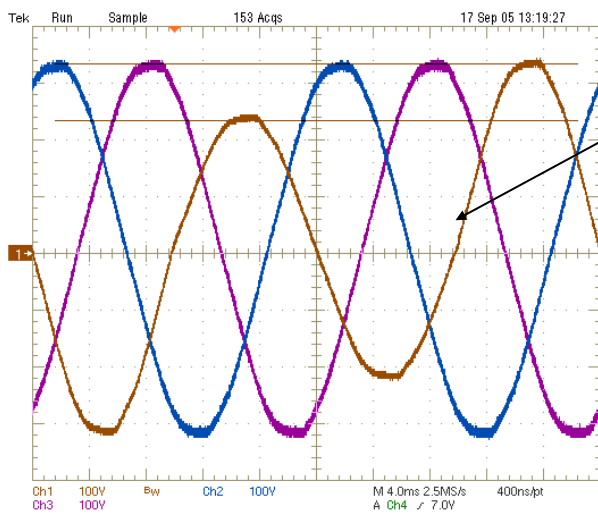


Long DIP: 20ms, begin 0°, end 0°
DIP on L1 (Y connection)



Phase L1 with 20ms dips, voltage 40%
 The phase L1 has no phase shifting, 120°.

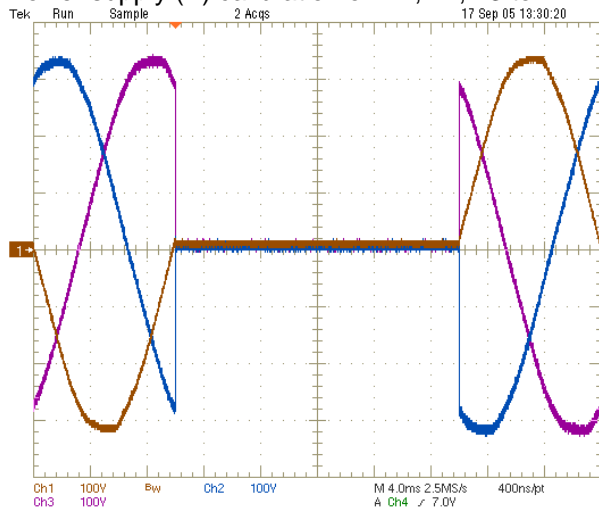
Long DIP:
DIP on L1 (Y connection)



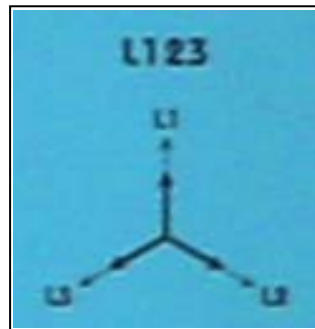
Phase L1 with 20ms dips, voltage 70%
 The phase L1 has no phase shifting, 120°.

Long DIP:
DIP on L1 (Y connection)

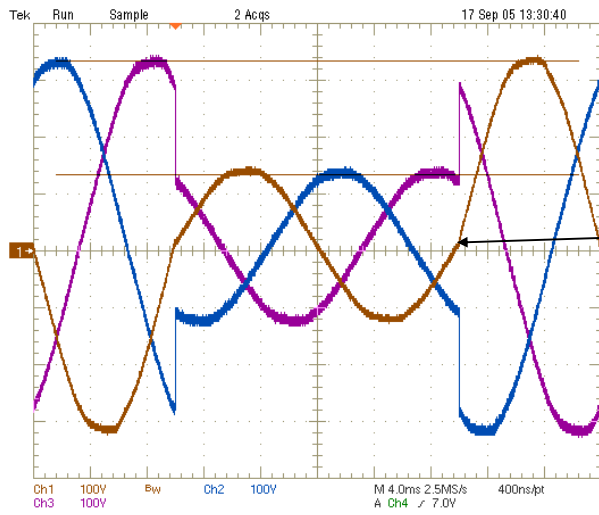
Power supply (Y) calibration on L1, L2, L3 to N. Measurement has been taken between Lx to PE



All three phases with 20ms interruption, voltage 0%

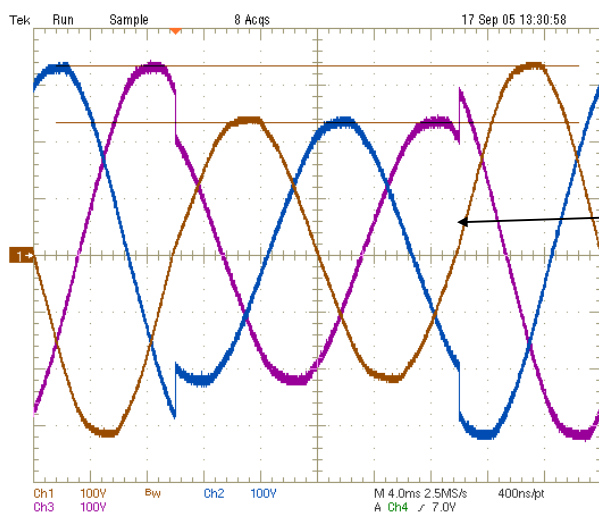


Long DIP: 20ms, begin 0°, end 0°
DIP on L1 (Y connection)



All three phases with 20ms dips, voltage 40%
All lines have no phase shifting, 120°.

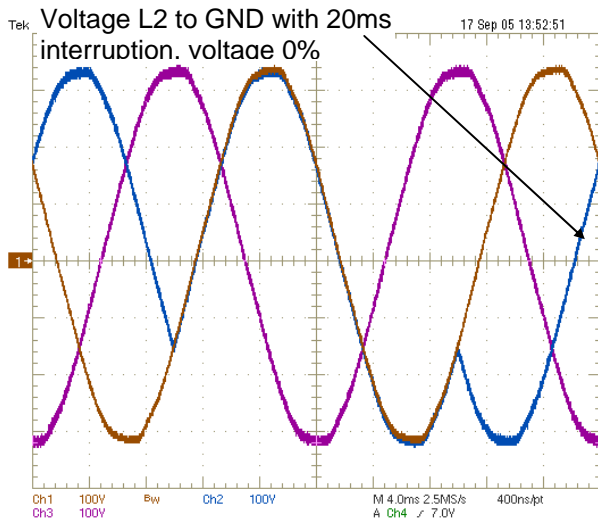
Long DIP:
DIP on L1 (Y connection)



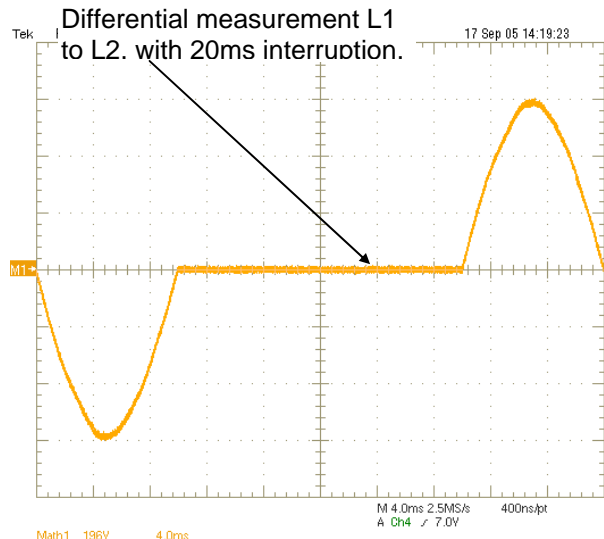
All three phases with 20ms dips, voltage 70%
All lines have no phase shifting, 120°.

Long DIP:
DIP on L1 (Y connection)

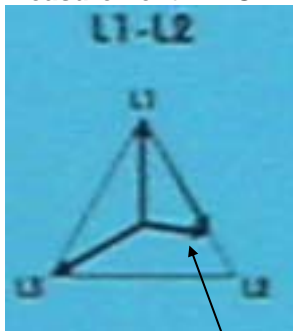
Power supply (Δ) calibration on L1 to L2. Measurement set-up see below the oscillograms



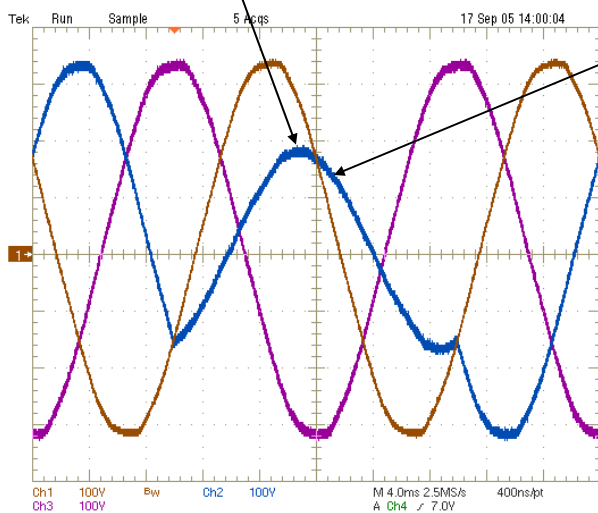
Long DIP:
DIP on L1-L2 (delta connection)
Level: 0%
Measurement: L1-GND, L2-GND, L3-GND



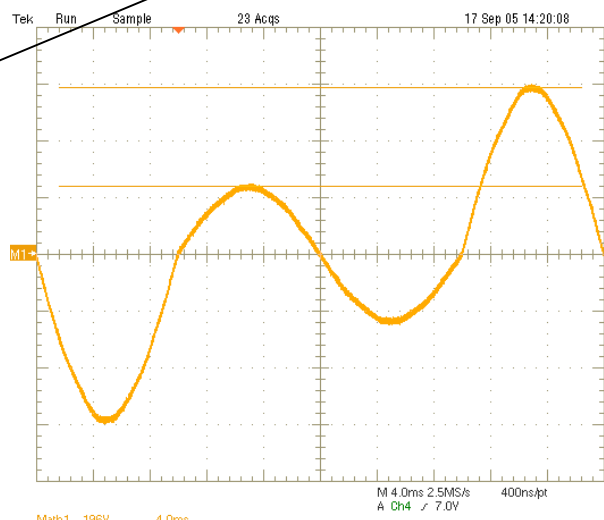
Long DIP:
DIP on L1-L2 (delta connection)
Level: 0%
Measurement: L1-L2 (phase to phase voltage)



Differential measurement must be made, to see the interruptions or dips. Measurement between L2 to GND shows the phase shifting at DIPS.

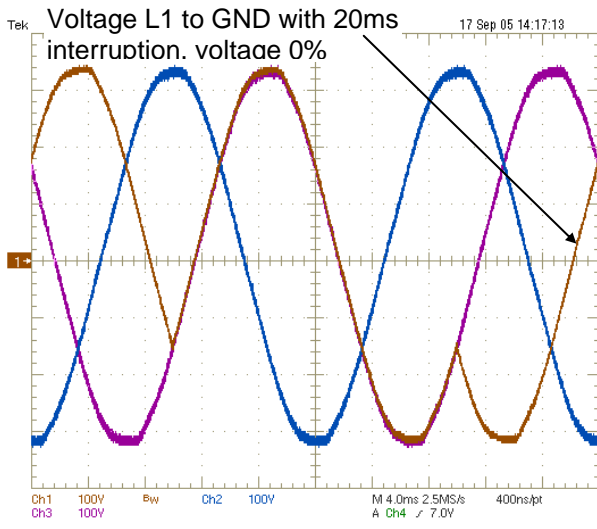


Long DIP:
DIP on L1-L2 (delta connection)
Level: 40%
Measurement: L1-GND, L2-GND, L3-GND

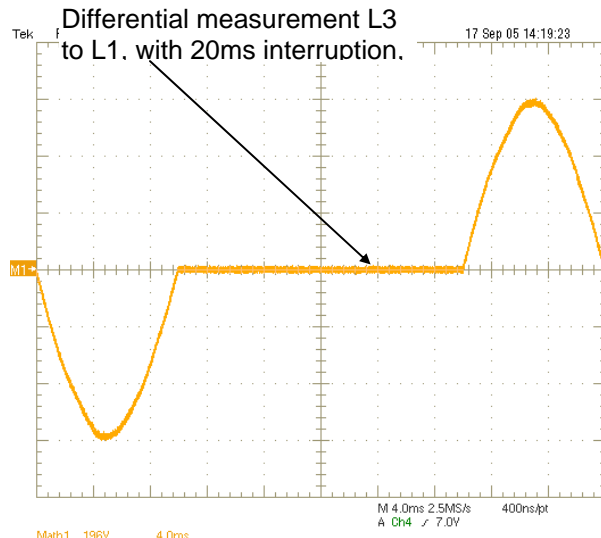


Long DIP:
DIP on L1-L2 (delta connection)
Level: 40%
Measurement: L1-L2 (phase to phase voltage)

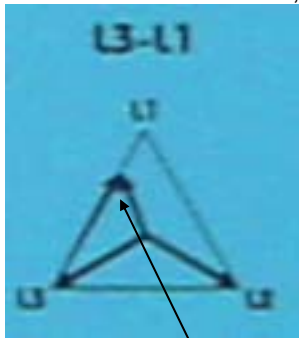
Power supply (Δ) calibration on L3 to L1. Measurement set-up see below the oscillograms



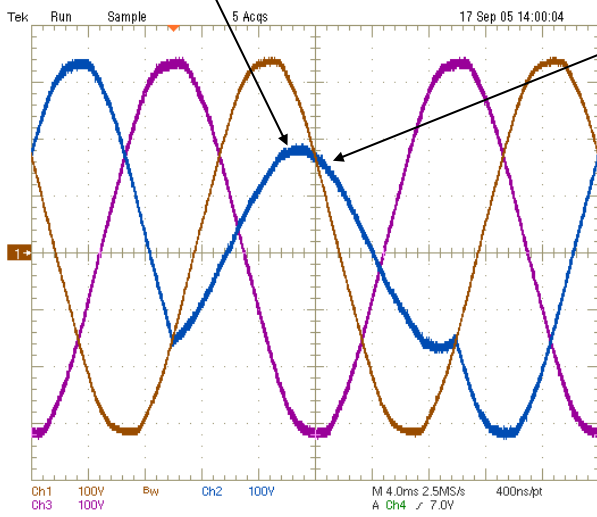
Long DIP:
DIP on L3-L1 (delta connection)
Level: 0%
Measurement: L1-GND, L2-GND, L3-GND



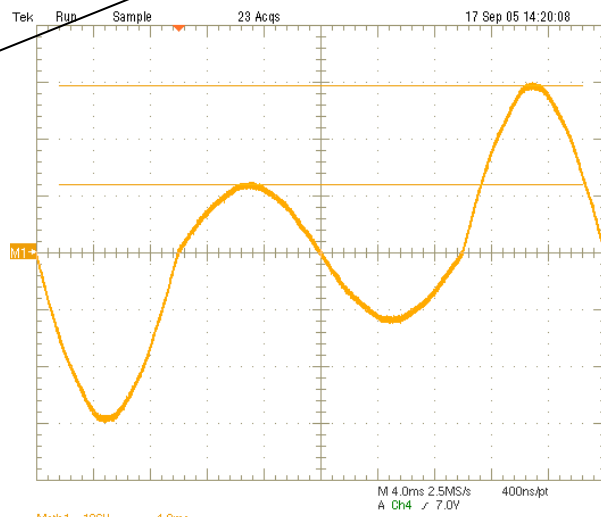
Long DIP:
DIP on L3-L1 (delta connection)
Level: 0%
Measurement: L1-L2 (phase to phase voltage)



Differential measurement must be made, to see the interruptions or dips. Measurement between L1 to GND shows the phase shifting at DIPS.

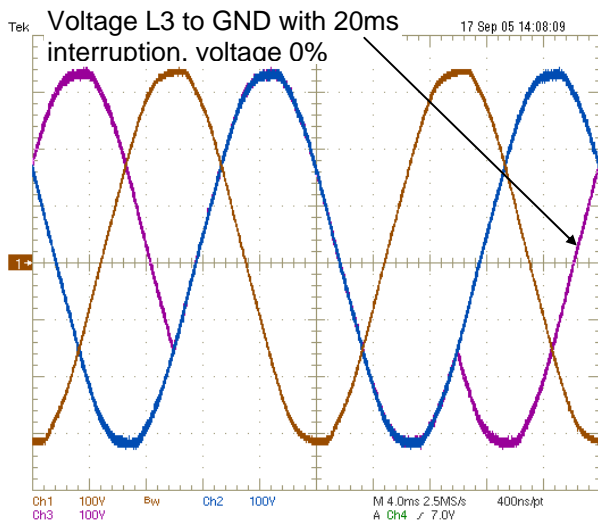


Long DIP:
DIP on L3-L1 (delta connection)
Level: 40%
Measurement: L1-GND, L2-GND, L3-GND

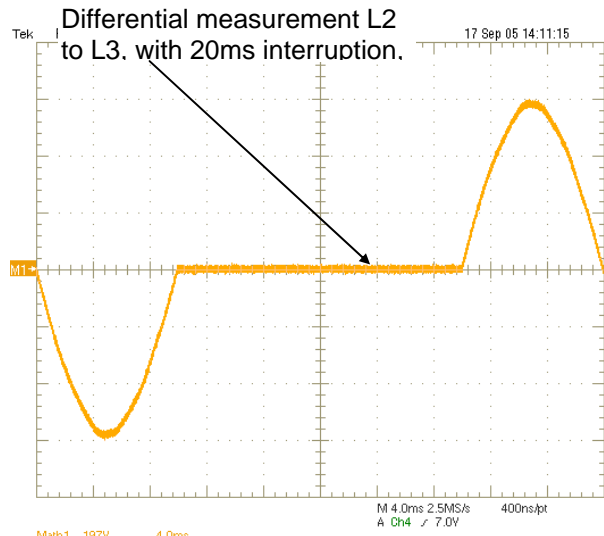


Long DIP:
DIP on L3-L1 (delta connection)
Level: 40%
Measurement: L1-L2 (phase to phase voltage)

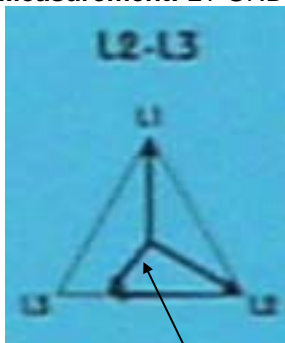
Power supply (Δ) calibration on L2 to L3. Measurement set-up see below the oscillograms



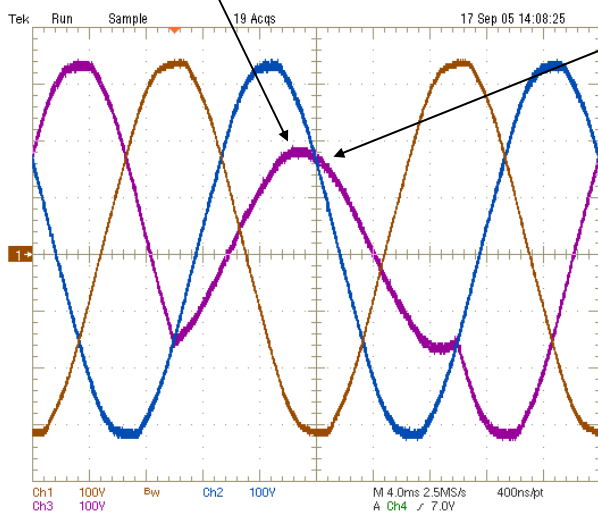
Long DIP:
DIP on L2-L3 (delta connection)
Level: 0%
Measurement: L1-GND, L2-GND, L3-GND



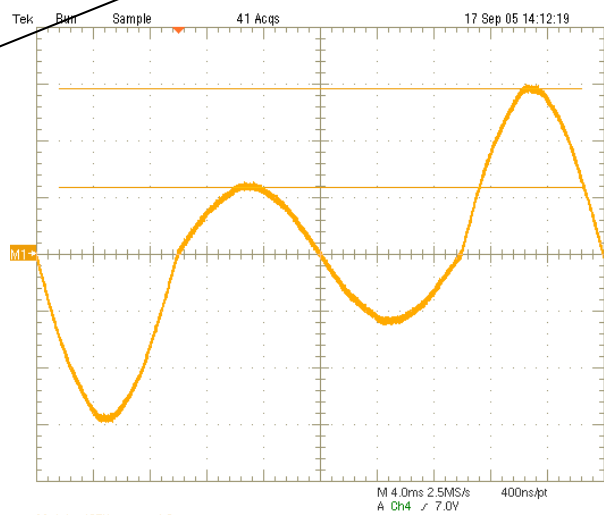
Long DIP:
DIP on L2-L3 (delta connection)
Level: 0%
Measurement: L1-L2 (phase to phase voltage)



Differential measurement must be made, to see the interruptions or dips. Measurement between L3 to GND shows the phase shifting at DIPS.



Long DIP:
DIP on L2-L3 (delta connection)
Level: 40%
Measurement: L1-GND, L2-GND, L3-GND



Long DIP:
DIP on L2-L3 (delta connection)
Level: 40%
Measurement: L1-L2 (phase to phase voltage)

8 What must be done following failed operation

The TRANSIENT generators have many of different messages to assist the operator to solve possible problems, give information regarding incorrect operation of the TRANSIENT-generator, or to correct an incorrect system configuration. Basically, three different messages can be differentiated:

- Error message based on incorrect inputs
- Error based on incorrect operation of the generator
- Warning messages

8.1.1 Error caused by incorrect inputs „Generator not ready for run“

Error code. E?	Message	Description
ECAS10E	Emergency stop active	An emergency stop has been operated via the BNC outlet „Emergency Stop“ on the rear of the DIPS Source SRC32.
ECAS11E	no nominal defined	voltage or current
ECAS12E	V-start > V-nominal	At EFT : The test was selected with a voltage at „Voltage Ramp“ V-Start set lower than V-nominal. The start voltage in the „ Ramp“ menu must be decreased.
ECAS13E	Spike rate > xxxxx pulses/rep. reduce spacing, length or repetition	AT EFT: The spike rate is too high. For information about spike repetition limits of the DIPS Source SRC32, see Chapter 6.2.2.1 EFT. „Main“ Menu
ECAS14E	No coupling path defined	In the „Main“ menu no coupling path for superimposing SURGE and EFT onto the power line has been defined.
ECAS15E	Contact discharge max. 10'000	During ESD contact-discharge mode, a maximum voltage of 10000 V is allowed. Set the equal or lower than 10 kV voltage in the „ Main“ menu.
ECAS16E	Repetition < 100ms	At EFT: When synch mode = On, the Burst repetition must be greater than 100 ms.
ECAS17E	to high nominal	Reduce nominal value
ECAS18E	Repetition too low (<xxsec)	During SURGE test, the minimum repetition depends on the charging voltage. See Chapter 6.2.2.3 for repetition limits. Increase the repetition rate in „Main“ menu .
ECAS19E	DIP-end < DIP-begin	At DIPS: The End-angle of a DIPS must always be greater than the Begin-angle of a ramp. Chose the correct angle in „ RAMP“ menu.

ECAS25E	High-Z mode at level 0% only	The high-Z mode is only practical for an interruption to 0%. Turn off the High-Z Mode in „Main“ menu.
ECAS26E	Duration < 1 period	During Long Dip mode, the interruption cannot be shorter than one period. Increase the

		duration in „Main“ menu Long Dip, or choose short Dip .
ECAS27E	No ESD-Relay circuit found	Connect the ESD2000 to DIPS Source SRC32
ECAS28E	DIP2 begin < DIP1 begin	AT DIPS: The start of the DIP2 must always be greater than the start of the DIP1. Choose the correct angle in „ RAMP“ menu.
ECAS29E	No DIP test while PWR2 is on	Turn off the PWR2 (power supply form variac
ECAS50E	Switch on power first	Press PWR1

8.1.2 Failure based on error at the generator „Generator malfunction“

ERR5L3E	Generator malfunctioning	Title of the message followed by the information below
ERR5L31E	no high-voltage	The voltage of the high voltage source of the DIPS Source SRC32 cannot be increased. Press any of the front panel buttons. Repeat the test. If there is no change contact EMC PARTNER.
ERR5L33E	High-voltage overshoot	The high voltage has exceeded a voltage limit. Press any of the front panel buttons. Repeat the test. If there is no change contact EMC PARTNER.
ERR5L34E	self firing	The pulse release has been before the trigger released. Press any of the front panel buttons. Repeat the test. If there is no change contact EMC PARTNER
ERR5L35E	no firing	The pulse release has not functioned. Press any of the front panel buttons. Repeat the test. If there is no change contact EMC PARTNER
ERR5L37E	Variac fault	The variac could not be set to the correct value. Please check: -Is voltage on EUT Power 1? -variac bracket inserted on the rear panel? -variac fuse o.k.?
ERR5L38E	earth switch fault	The earth switch worked not correctly. Press any of the front panel buttons. Repeat the test. If there is no change contact EMC PARTNER.
ERR5L398E	High voltage regulation fault	The high voltage regulation of the source is not functioning correctly. Press any of the front panel buttons. Repeat the test If there is no change contact EMC PARTNER

8.2 Service; Repairs

The DIPS Source SRC32 is a compact equipment and servicing or repairing the tester can only be carried out by EMC PARTNER authorised service companies.

8.3 Spare parts list

No spare parts are necessary for the DIPS Source SRC32.

8.4 Check before you contact the service of EMCP

8.4.1 Fuses

Always check first the fuses of the unit before you contact EMCP service. A set of fuses has been delivered with the tester.

8.4.2 System Reset (Software) on TRA2000

On three different ways a system reset can be done:

1. Reset without deleting the stored 1 to 15 programs

- Press the following softkey
- Main - Menu - Menu - Reset - quit with Yes

2. Reset via the display

- Press the following softkey:
- Main - Menu - Menu - Util - General Reset

3. Reset with keyboard buttons

- Press „Power ON“ and „1“ buttons simultaneously
- Wait until beep sounds
- Press button „2“ immediately

8.5 Service department of EMC PARTNER AG

EMC PARTNER AG
Baselstrasse 160
CH - 4242 Laufen
Switzerland



++41 61 775 20 50



++41 61 775 20 59



service@emc-partner.ch



www.emc-partner.com

9 Putting out of operation

Whenever the DIPS Source SRC32 is not needed remove the power cord.

Reasons for putting the TRANSIENT out of operation:

1. Maintenance work
2. Service, repair
3. Verification by EMC PARTNER
4. Shipment for outdoor tests

The DIPS Source SRC32 is a laboratory test equipment. When the tester is not used, store it in a dry, clean dark place.

10 Packaging and Transport

10.1 Packaging

If you transport the DIPS Source SRC32, pack it in the original shipping box and packing material.

10.2 Transport

If you are transporting the DIPS Source SRC32 to an EMC PARTNER field office for repair, attach a tag to the equipment showing the instrument owner and address, the name of the person to contact about the instrument, the instrument type and the serial number.

11 Recycling / Disposal

11.1 RoHS directive 2002/95/EG

The SRC32 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.

11.2 WEEE directive 2002/96/EG

The EMC Partner SRC32, 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.

11.3 Information for dismantling



Remove always power cord fist.

There is no special danger involved in dismantling the SRC32.

11.4 Parts which can be recycled

The SRC32 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.

11.5 Parts which can not be recycled

All parts in the SRC32 can be recycled.

12 Accessories

12.1 DIPS Source SRC32 Options

Software

Pos.	Product No.	Type	Short Description
27	TRA1Z225N	TEMA	Test Manager (TEMA). Comfortable control of DIPS Source SRC32, MIG2000 or ESD3000 systems: EUT control, test report, test library. Each serial number requires one "ENTRY CODE". Incl. connection cable 25/9 pole to PC.
28	TRA1Z252A	TEMA OPTION DSO CONTROL	Option to TEMA Software: module for DSO (digital storage oscilloscope) control. "Extended" and "Option" codes necessary.

12.1.1.1 DIPS Accessories

Pos.	Product No.	Type	Short Description
52	TRA1Z19B	VERI-DIPS	Measuring set for calibration / verification of the inrush current TRA1000, DIPS Source SRC32xx, PFS32 and PFS63.
56	TRA1Z409	PFS32	Extension of DIPS Source SRC32 DIPS. The PFS32 can generate interruptions on three phase power supply up to 480V/ 32A. For DIPS and supply configuration the PFS32 can be inserted in the SRC32 rack.
59	TRA1Z421	DIPS100E	100 Ohm resistor for switching time calibration / verification. Can be used with TRA1000, DIPS Source SRC32xx, PFS32, PFS63. 100 Ohm +/- 5%, 1kW.

13 Serial Remote Port

13.1 General

The different commands can be found in the TRA2000 Manual.

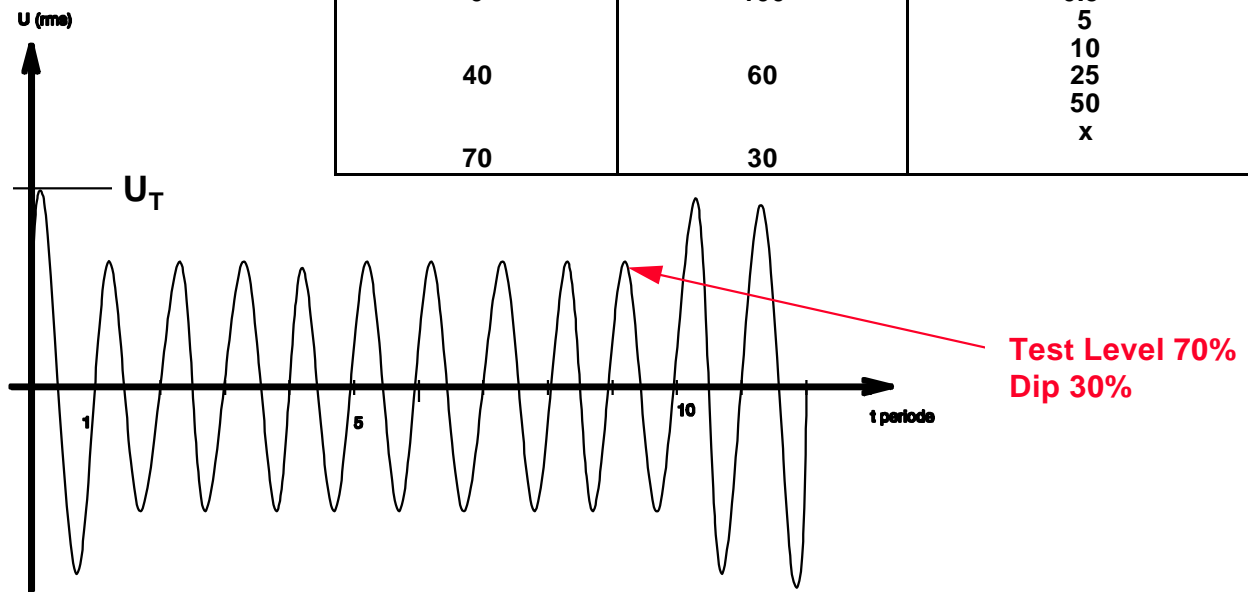
14 Appendix and Corrections

14.1 Appendix

14.1.1 DIPS Specification

Test levels DIPS

Test Level % U_T	Voltage Dip/int % U_T	Duration (in period)
0	100	0.5* 5 10 25 50 x
40	60	
70	30	



In addition to the data showed in the figure, such as test levels, duration of the interruption, transition time, etc., the inrush current must be tested. Electronic equipment very often contain inrush current limitation circuits. These inrush limiting circuits are often bypassed during interrupts at the turn on part. Consequences are defective power switching modules, or the equipment can not be turned on after the test because the software has not made a restart etc.

So that the test will cover this aspect, the inrush current capability of the generator must be at least 500 A peak. The verification of the generator inrush current is defined as follow:

Turn on the generator at a phase angle of 90 degrees. Using a current sensor, measure the current in a capacitor of several μF . The measured amplitude must be equal to/or greater than 500 A. When the tester can generate a current amplitude of 500 A, all equipment with current consuming up to 16 A can then be tested.

If the current amplitude of 500 A is not reached, then the inrush current of the EUT must be measured. The inrush current of the tester must be a minimum of 30 % higher than the inrush current of the EUT.

14.2 Correction

14.2.1 Declaration of conformity to the EMC directive 89/336/EEC

see appendix at the end of this documents.

14.2.2 Declaration of conformity to the LV directive 93/68/EEC

see appendix at the end of this documents.

14.2.3 Declaration of conformity to the Basic Standards




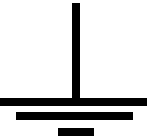
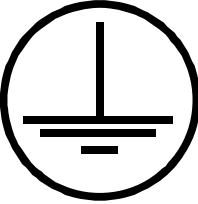
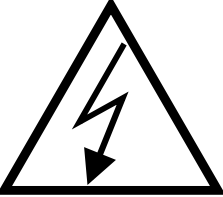

see appendix at the end of this documents.

15 Glossary

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

EUT	Equipment under Test
EST	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 μ s and current at short circuit 8 / 20 μ s.
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)	Consist 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.	root mean square; effective value

Used symbols:

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

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M		Verification of EMC PARTNER	28
Maintenance	27	V-start > V-nominal	30
Mechanical dimension	10	<hr/>	
Mechanical structure			
Standard	15		

Declaration of Conformity to Standards

The EMC Tester

Type: DIPS Source SRC32

complies with the following standards:

DIPS on a.c. power

IEC/EN 61000-4-11 Ed.2

INTERRUPTION on d.c.

IEC/EN 61000-4-34 Ed.1

IEC/EN 61000-4-29



Laufen, 02. February 2004

EMC PARTNER AG



M. Lutz
Managing Director

EMC PARTNER AG



R. Casanova
Manager Development

Appendix to 14.2.3 Conformity declaration with basic standards



Manufacturer Declaration Of Conformity LV

Directive 73/23/EWG; with table VI 2006/95/EG

The EMC Tester

**Type: DIPS Source SRC32; S/N >
10**

is designed and manufactured complying with the following harmonised standards:

Harmonised:
EN 61010-1: 2001

international
IEC 61010-1

in accordance with the regulation of LV - directive of the members states 73/23/EWG and with table VI 2006/95/EG

EMC PARTNER authorised representative established within the EC Community

H+H High Voltage
Technology GmbH
Im kurzen Busch 3
DE - 58640 Iserlohn

Laufen, 05.August 2009

EMC PARTNER AG



M. Lutz
Managing Director

EMC PARTNER AG



R. Casanova
Manager Quality Department

Appendix to 14.2.2 Conformity declaration with Low Voltage Directive 93/68/EEC and with table VI 2006/95/EG



Manufacturer Declaration Of Conformity EMC

Directive 89/336/EEG with table VII 2004/108/EG

The EMC Tester

**Type: DIPS Source SRC32, S/N >
10**

has been tested in accordance with the following standards:

harmonised:
EN 61000-6-3: 2007
EN 61326: 2006

international
IEC 61000-6-3
IEC 61326-1

Fulfilling the directions of the EMC - Directive 89/336/EEG and with table VII 2004/108/EG

EMC PARTNER authorised representative established within the EC Community

H+H High Voltage
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Laufen: 04. August 2009

EMC PARTNER AG



M. Lutz
Managing Director

EMC PARTNER AG



R. Henz
Manager Quality Department

Appendix to 14.2.2 K Conformity declaration with the EMC directive

