

Power supply PS3 generates common power voltages and frequencies

Revised: 19.August 2015
PN 103497

1 General Information

The power supply PS3 is a low cost, easy to use equipment with different output configurations. The PS3 can be used together with HAR1000-1P, TRA3000 and IMU3000 generators with CDN.



Power Supply PS3

1.1 Examples of application



HAR1000 with PS3



TRA3000 with PS3

New equipment designs must be tested (EFT, SURGE, DIPS, RING, HARMONICS, Flicker, voltage and frequency variation) for EMC compliance using different power supply voltages. Power supply PS3 from EMCP is an optimum unit for this application.

Use with HAR1000	Yes	
Use with TRA2000	Yes	
MF Magnetic field test	50/60Hz up to full level 100A/m	61000-4-8
Use with MIG		
With CDN	Yes	
With DN-LISN160-32	400Hz power supply	

For further information, see chapter "Test set-up and application"

1.2 Outstanding feature

By pressing one button on the front panel the power supply can be easily switched.



One button for:
 230/50Hz
 115V/60Hz
 115V/400Hz
 230V/16.7Hz

Or

For user defined output voltages the software PS3SOFT-EXT is needed

2 Technical Data

2.1 Overview PS3 System

Type	Input range	Output ranges	Application
PS3 standard	90V up to 264V 47 to 63Hz	230V/50Hz, 115V/60Hz, 115/400Hz 230V/16.7Hz	Public power supply, Avionics, Railways
PS3 plus PS3SOFT-EXT		User defined: a.c. 50V up to 250V, (rms) d.c. 10V* up to 350V	User defined power supply voltages ¹⁾

Note 1) For further information see instruction sheet (IN) PS3SOFT-EXT

*) load regulation performance guaranteed only above 50V. Refer to 2.3 below.

2.2 Input Rating PS3

Voltage range	a.c. 100 up to 240V	±10%
Frequency range	47 up to 63Hz	
Maximum Current	20A ²⁾	rms
Power factor	0.98 a.c. $I_N = 100V$ 0.95 a.c. $I_N = 200V$	
Public power supply fuse	Melting fuse 20 AT Over current trip 20A type C	

Note 2) Output rating can only be reached with available public power supply of 230V/16A or 115/20A

2.3 Output Rating PS3

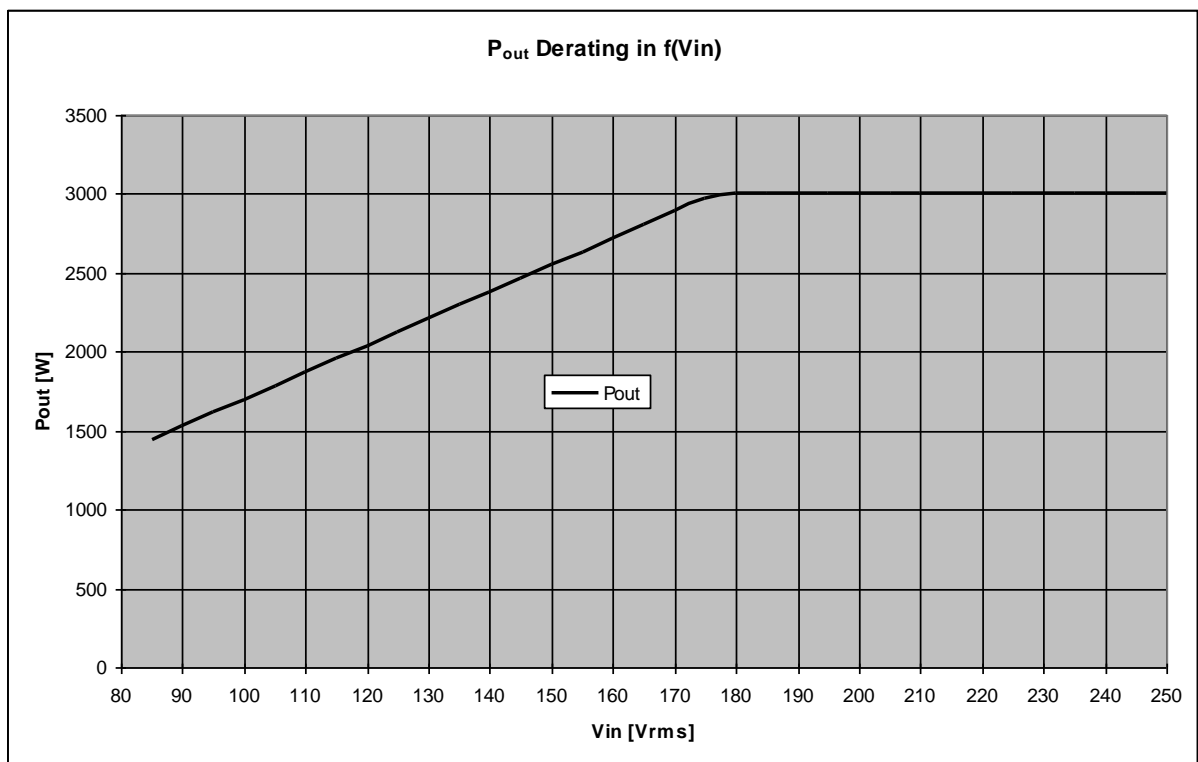
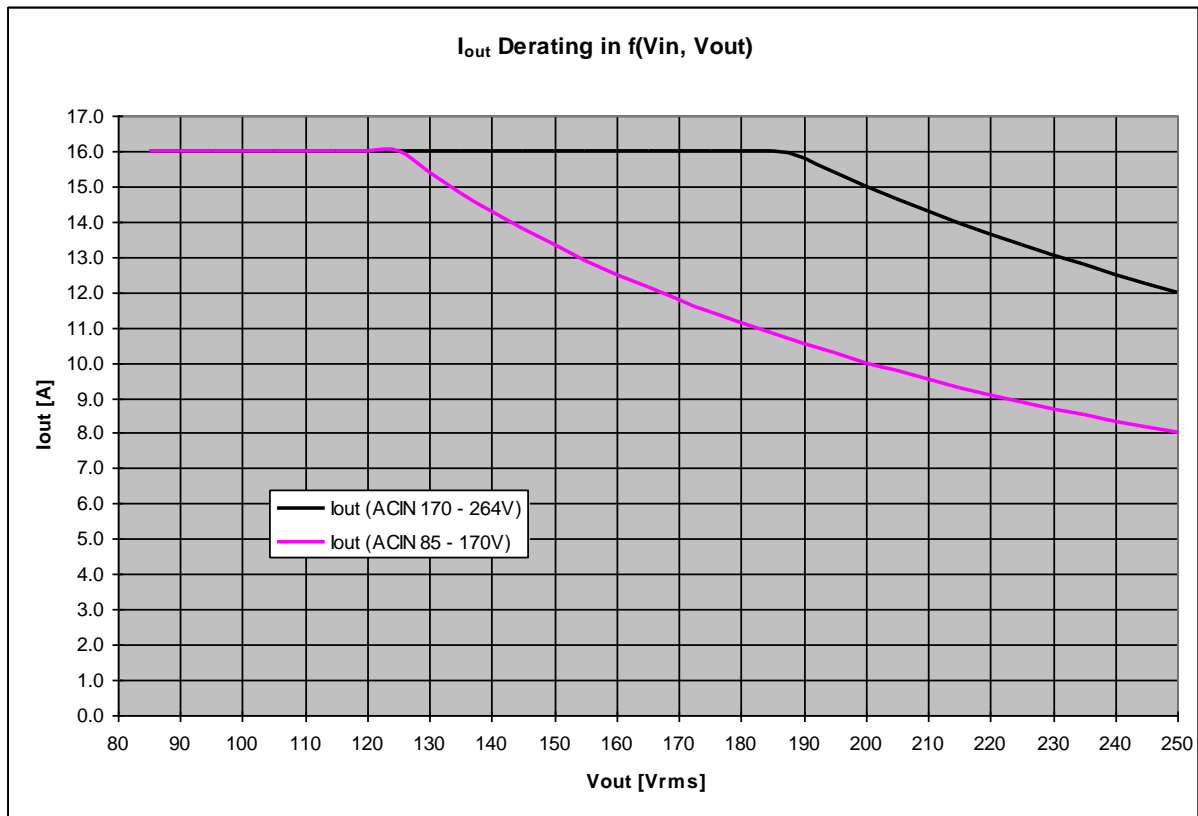
Power	3000W or 3000VA ³⁾	
Output supplies pre-programmed	230V/50Hz; 230V/16.7Hz, 115V/60Hz; 115V/400Hz	
Maximum current	16A ³⁾	rms
Output frequency accuracy	< 0.3% for 16.7, 50, 60Hz < 0.6% for 400Hz	
Output voltage accuracy a.c.	2%	
Output voltage accuracy d.c	±1.5V from ±10 to 49V ±3V from 50 to 150V ±2% from 151 to 350V	1A load 0.5A load No load
THDv Total harmonic distortion	< 1% for 50 / 60Hz into a 1000W resistive load	

Note 3) See derating curves next page

2.4 General Data PS3

Typical Efficiency	85%	
Protections	Overload, over current, over temperature	
EMC	IEC 61326 Electrical equipment for measurement, control and laboratory use .EMC requirements	
Safety	IEC 61010 Safety requirements for electrical equipment for measurement, control and laboratory use	
Operating temperature	0° up to +45°	
Storage temperature	-40° up to 85°	

2.5 Derating Curves



3 With PS3SOFT-EXT

With the PS3SOFT-EXT the PS3 power source is a user defined a.c. or d.c. power supply.

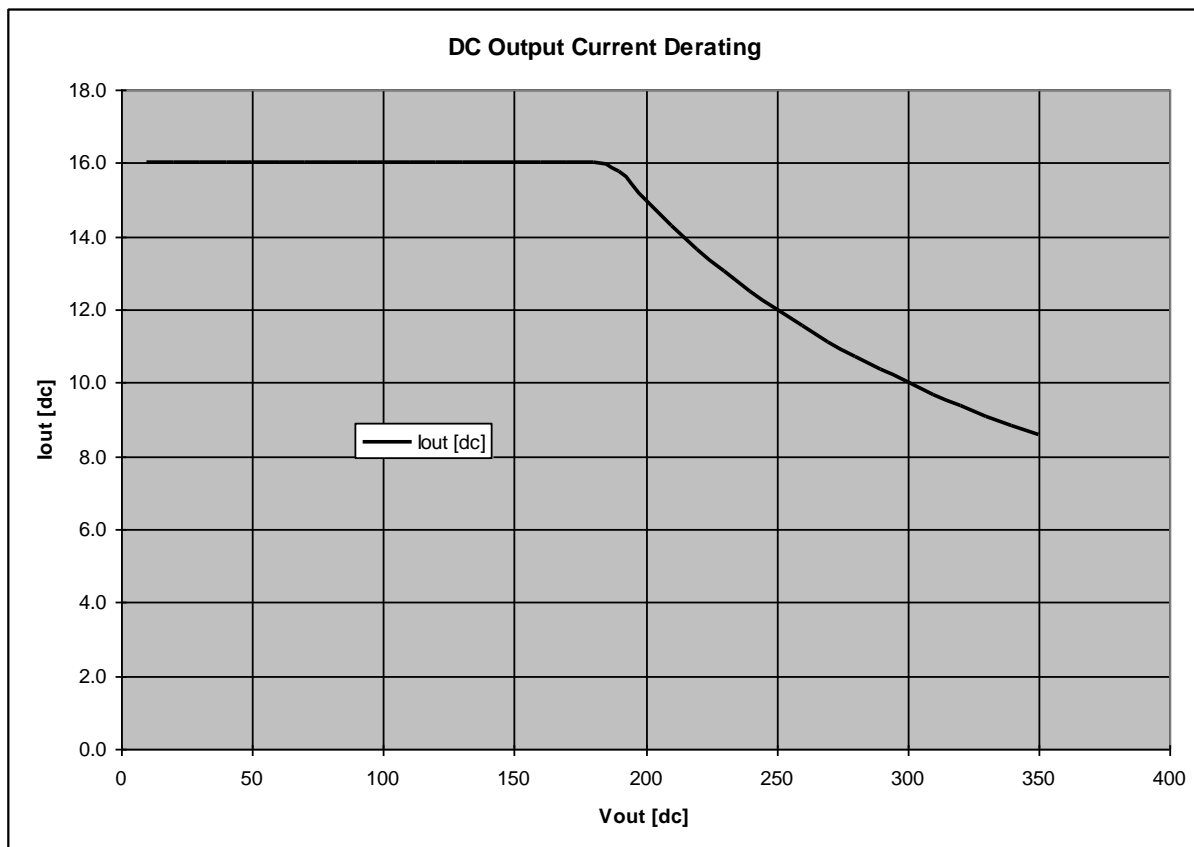
3.1 General Data PS3 with PS3SOFT-EXT

Voltage range	a.c. 50 up to 250V d.c. 10V up to 350V	
Frequency range	16.7 up to 400Hz	
Maximum Current	16A ¹⁾	
Resolution	1V	
Output voltage measurement a.c.	1 % of reading or $\pm 1.5V$	
Output voltage measurement d.c.	1 % of reading or $\pm 1.5V$	
Output current measurement a.c.	3 % reading for $> 1.6A$	
Output current measurement d.c.	5 % reading for $> 1.6A$	

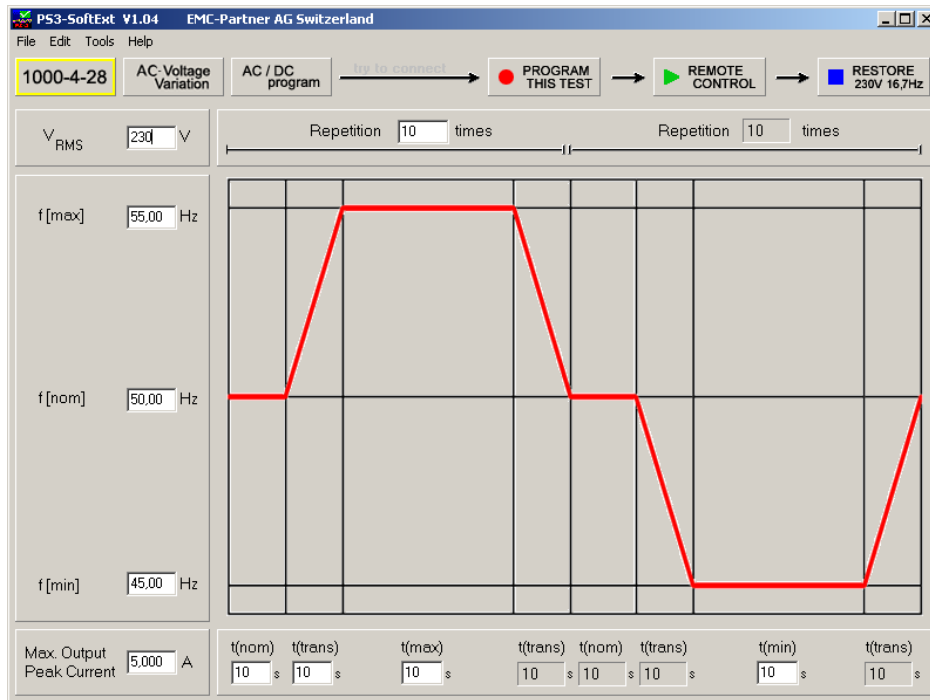
Notes:

1) See derating curve below

For further information, see PS3SOFT-EXT instruction sheet.



3.1.1 IEC/EN 61000-4-28 frequency variation



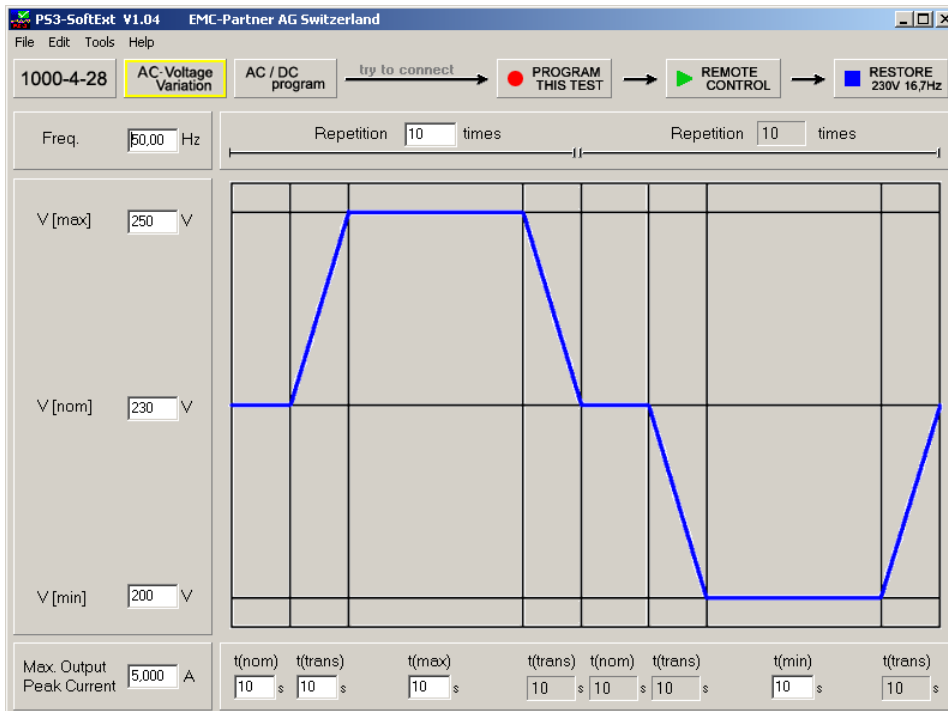
Applicable for 50/60 power supplies

Frequency range $f \pm 20\%$

Transition time setting 1 - 10s

Example frequency variation

3.1.2 Voltage variation



With the PS3SOFT-EXT the PS3 power supply can be used for voltage variation tests.

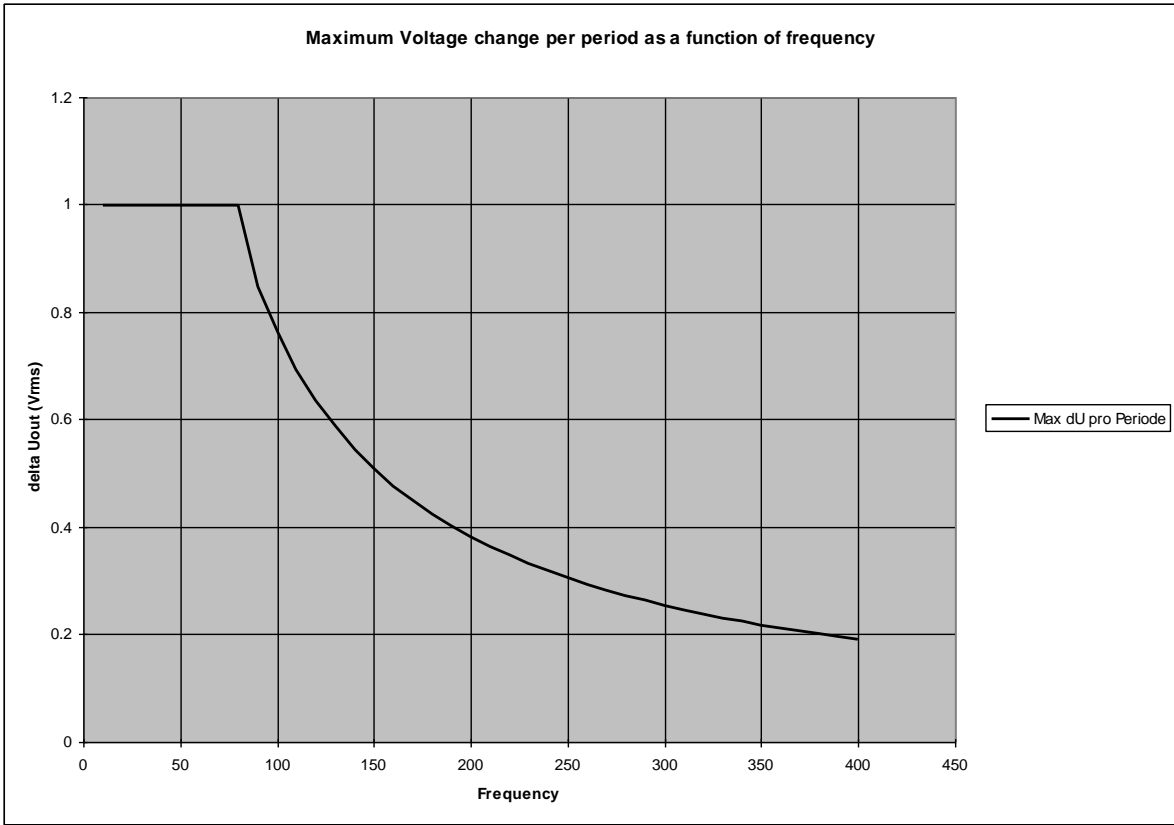
a.c. voltage range 50V up to 250V rms

Maximum transition 1V per Period up to 60Hz

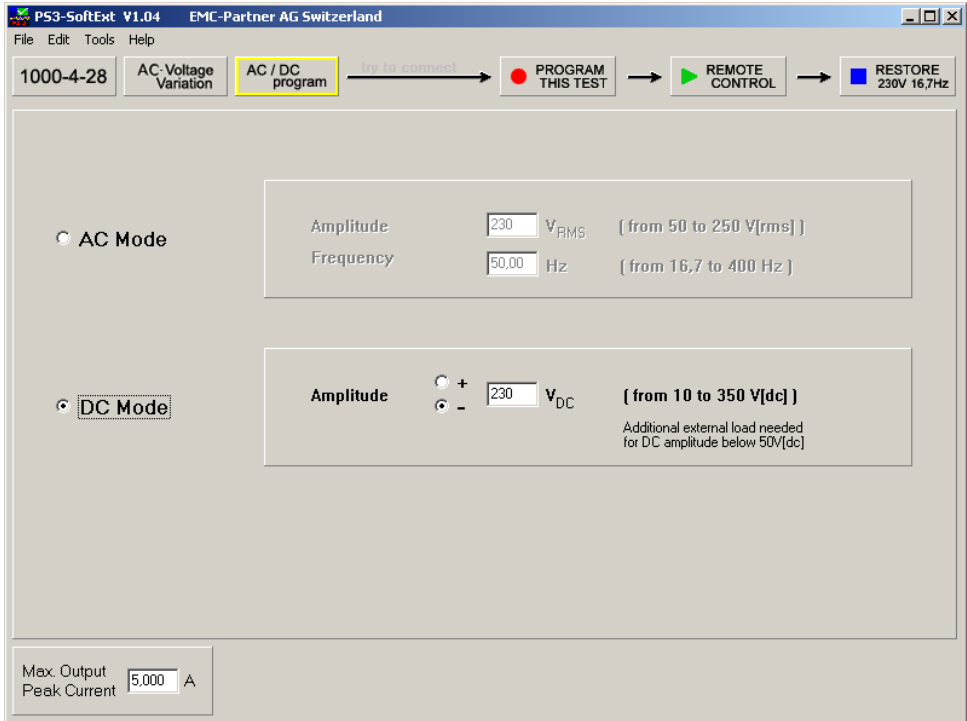
Transition time setting 1 - 30000s

Example: Windows: "voltage variation"

The rate of change of voltage is a function of frequency. Refer to next graph.



3.1.3 Customized ac/dc sources



Different voltage levels or test voltages can be programmed

d.c. voltage range: 10V up to 350V

a.c. voltage range 50V up to 250V rms

AC/DC program

For further information, see PS3SOFT-EXT instruction sheet.

4 Standard accessories, dimensions

4.1.1 Included articles, dimensions

PS3 (Article No. 103497)

Mechanical Dimensions

Unit Height: 2
Length: 57 cm
Width: 45 cm
Height: 10 cm
Net Weight: 18 kg

Included Articles

According to STL-Variante 20, STL-Version 1

Qty	PN	Description
1	104986	Broschure -System Automation Hardware and power supplies
1	103194	CD-UM-IN-ALL includes all User Manuals and Instruction sheets of all EMC PARTNER AG sales products.
1	104802	Standard calibration report
1	104818	Power Cord 3 pole (20A)

4.1.2 Standard accessories

Accessories to PS3 (Article No. 103497)

According to OP-Variante 1, OP-Version 1

Qty	PN	Description	Weight (kg)	Length (cm)	Width (cm)	Height (cm)
1	102523	Spare fuse 6.3x32mm T-16A	0	3.2	0.63	0
1	102560	Spare fuse 6.3x32mm 20AT	0	3	0	0
1	103063	MC safety cable with protected banana plug, blue	0	25	0	0
1	103065	MC safety cable with protected banana plug, yellow/green	0	25	0	0
1	103067	MC safety cable with protected banana plug, black	0	25	0	0
1	103179	Serial connection 9/9 pole between PC and PS3. Cable with connectors D-Sub 9pol female-female, 2m	0	0	0	0

5 Recycling / Disposal

5.1 RoHS directive 2002/95/EG

The PS3 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.

5.2 WEEE directive 2002/96/EG

The EMC Partner PS3 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.

5.3 Information for dismantling



Remove always power cord first. Wait at least 3 minutes before opening the housing.

There is no special danger involved in dismantling the PS3.

5.4 Parts which can be recycled

The PS3 contains parts made from steel, aluminium, PVC, two-component sealing compound. The various parts can be separated and recycled.

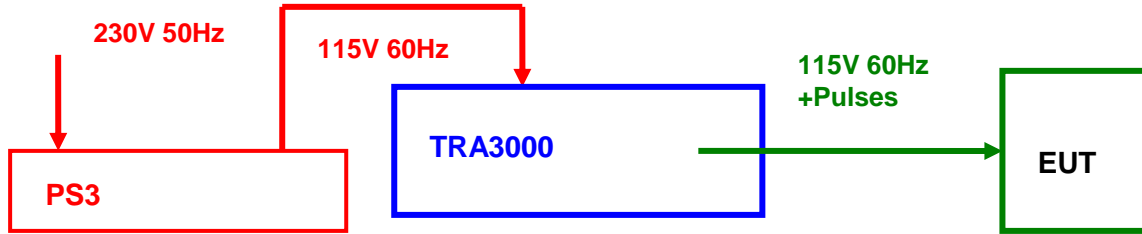
5.5 Parts which can not be recycled

All parts in the PS3 can be recycled.

6 Test set up and applications

6.1 61000-4-x Immunity Tests with TRA2000

Public power supply 230V 50Hz



Immunity tests:

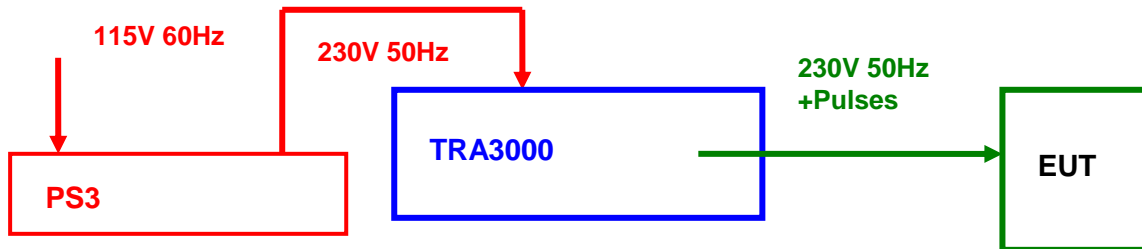
IEC 61000-4-4- Ed.3 EFT
IEC 61000-4-5 Ed.3 SURGE
IEC 61000-4-11 Ed.2 DIPS

Test set up as shown above, tested as follows:

Test	Level	Remarks
EFT	4.1kV pos. and neg.	Load 100 Ohm
SURGE	4.4.kV pos. and neg.	Load 100 Ohm
DIPS	50%, 0 to 180°	Load 100 Ohm
INTERRUPTION	0%, 90 to 270°	Load 100 Ohm
INTERRUPTION	Turn "ON" 90° I _{max} = 250A	VERI-DIPS

Note: See derating curves paragraph 2.5

Public power supply 115V 60Hz



Immunity tests:

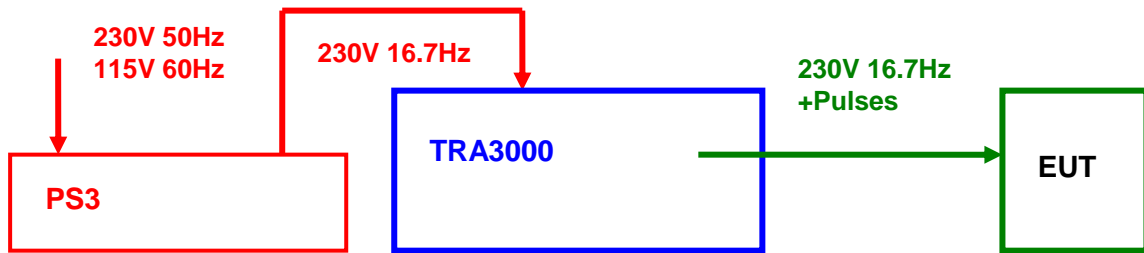
IEC 61000-4-4- Ed.3 EFT
IEC 61000-4-5 Ed.3 SURGE
IEC 61000-4-11 Ed.2 DIPS

Test set up as shown above, tested as follows:

Test	Level	Remarks
EFT	4.1kV pos. and neg.	Load 100 Ohm
SURGE	4.4.kV pos. and neg.	Load 100 Ohm
DIPS	50%, 0 to 180°	Load 100 Ohm
INTERRUPTION	0%, 90 to 270°	Load 100 Ohm
INTERRUPTION	Turn "ON" 90° I _{max} =250A	VERI-DIPS

Note: See derating curves paragraph 2.5

Train electronic 230V 16.7Hz



Immunity tests:

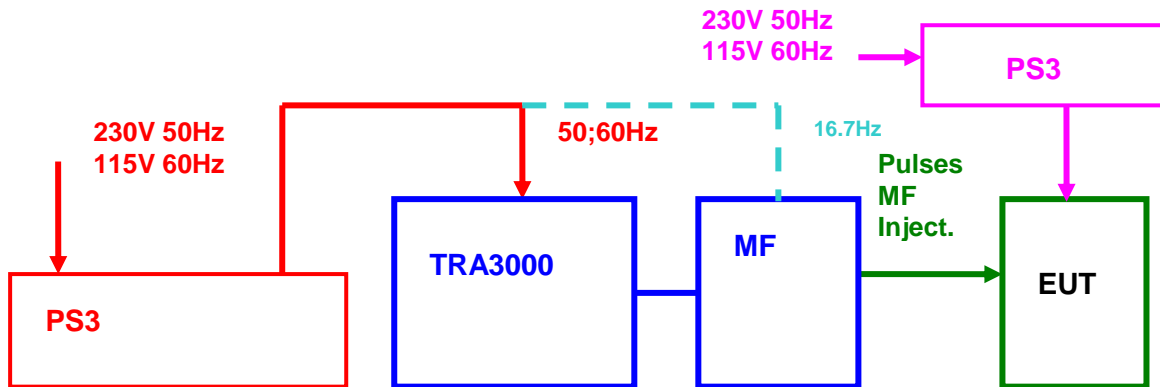
- IEC 61000-4-4- Ed.3 EFT
- IEC 61000-4-5 Ed.3 SURGE
- IEC 61000-4-11 Ed.2 DIPS

Test set up as shown above, tested as follows:

Test	Level	Remarks
EFT	4.1kV pos. and neg.	Load 100 Ohm
SURGE	4.4.kV pos. and neg.	Load 100 Ohm
DIPS	Not possible	Limitation Internal Variac
INTERRUPTION	0%, 90 to 270°	Load 100 Ohm

Note: See derating curves paragraph 2.5

TRA2000 plus MF antennas, NW networks



Immunity tests:

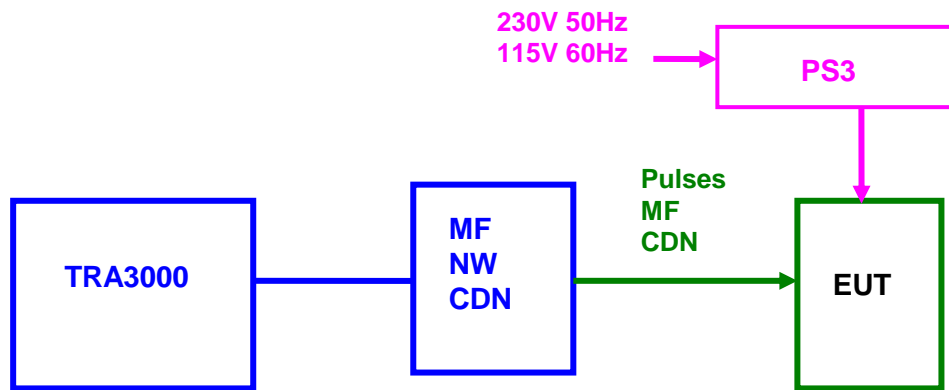
- IEC 61000-4-8 Ed.1 MF

Test set up as shown above, tested as follows:

Test	Level	Remarks
Magnetic Field 50/60Hz IEC 61000-4-8	>100A/m.	Without PS3 115V/60Hz --> max. 80A/m. With PS3 > 100A/m*
Magnetic Field 16,7Hz IEC 61000-4-8, ITU-K20	>100A/m	Without TRA. Voltage setting via PS3*

*Note: PS3SOFT-EXT required,

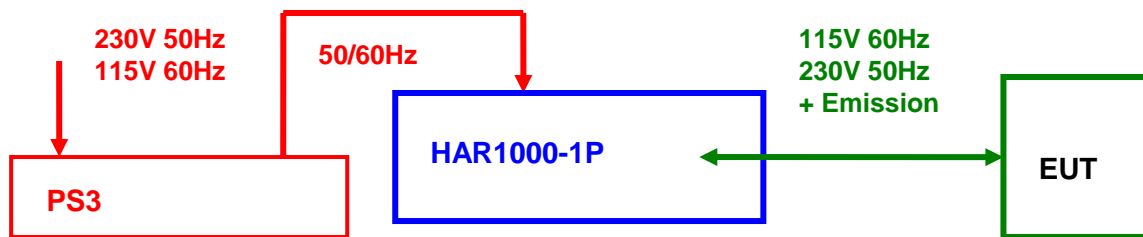
TRA2000 with CDN (coupling clamp, SURGE CDN)



Immunity tests:

IEC 61000-4-4 Ed.3 EFT
 IEC 61000-4-5 Ed.3 SURGE
 IEC 61000-4-16- Ed.2
 IEC 61000-4-8 Ed.1 MF

6.2 61000-3-x Emission Measurement with HAR1000



Emission Measurement:

IEC 61000-3-2 Harmonics
 IEC 61000-4-3 Flicker

Test set up as shown above, tested as follows:

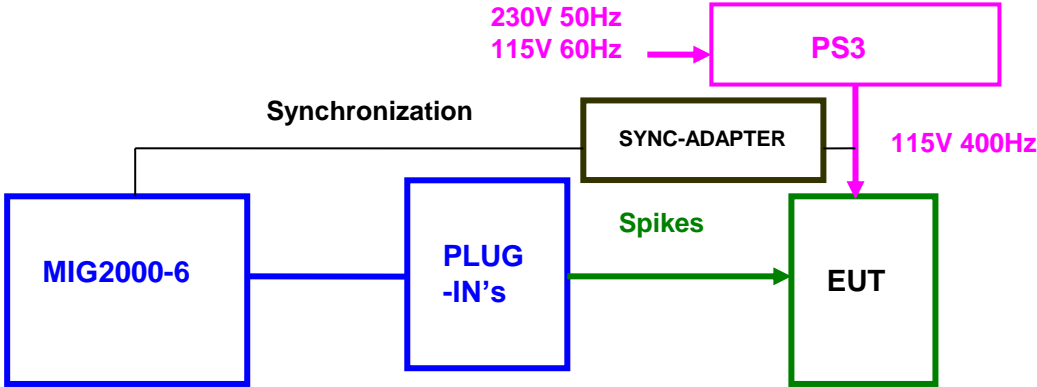
Test	Level	Remarks
Flicker	All Levels dV/V IEC 61000-4-15 Ed.1.1	with HAR-CAL

Note: See derating curves paragraph 2.5

Further applications of PS3

HAR1000 HARMONICS measurement	Message: "Out of Spec" (highly distorted public power supply)	Connect PS3 between public power supply and HAR1000
HAR1000 Flicker measurement	Compensation of power supply network impedance	Connect PS3 between public power supply and HAR1000
HAR1000 +PS3	Independent of public power supply frequencies	

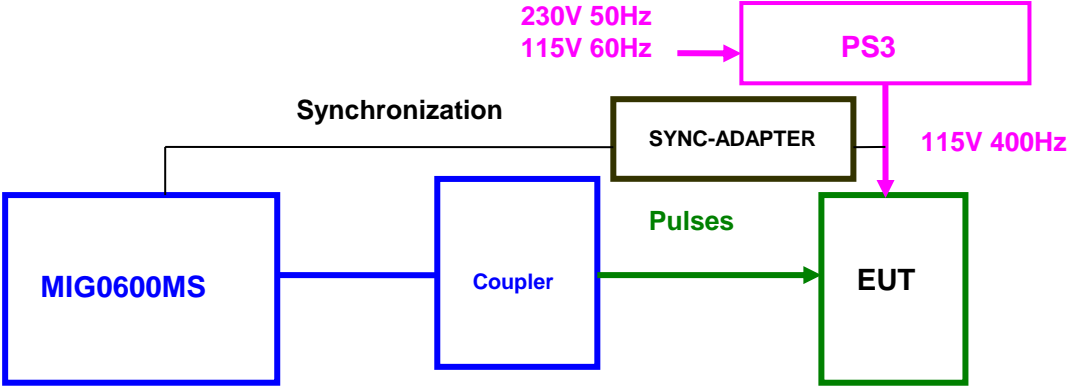
6.3 RTCA/DO 160, S17 Spikes on power supply



Immunity tests:

- S17 Spikes on power supply
- NATO Fast / Slow
- MIL461C

6.4 RTCA/DO 160, S22 Single Stroke, Multiple Stroke



Immunity tests:

- S22 single or Multiple pulses

7 Service Information

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Switzerland
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Fax ++41 61 775 20 59
Email service@emc-partner.ch
Web www.emc-partner.com

Declaration of Conformity to Standards

The EMC Tester

Type: PS3

Complies with the following standards:

a.c. MF
INTERRUPTION on d.c..
Frequency variation

IEC/EN 61000-4-8 with coil and TRA/IMU
IEC/EN 61000-4-29 with TRA/IMU
IEC/EN 61000-4-28 with PS3SOFT-EXT



Laufen, 03. February 2008

EMC PARTNER AG



M. Lutz
Managing Director

EMC PARTNER AG



R. Henz
Manager Quality

Appendix: Conformity declaration with basic standards

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Manufacturer Declaration Of Conformity EMC

Directive 2004/108/EC

The EMC Tester

Type: PS3

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 2004/108/EC

EMC PARTNER authorised representative established within the EC Community

H+H High Voltage
Technology GmbH
Im kurzen Busch 15
DE - 58640 Iserlohn

Laufen: 01.March 208

EMC PARTNER AG



M. Lutz
Managing Director

EMC PARTNER AG



R. Henz
Manager Quality Department

Appendix: Conformity declaration with the EMC directive

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Manufacturer Declaration Of Conformity LV

Directive 2006/95/EC;

The EMC Tester

Type: PS3

is designed and manufactured complying with the following harmonised standards:

Harmonised:
EN 61010-1: 2010

international
IEC 61010-1: 2010

in accordance with the regulation of LV - directive of the members states 2006/95/EC

EMC PARTNER authorised representative established within the EC Community

H+H High Voltage
Technology GmbH
Im kurzen Busch 15
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Laufen, 23. February 2008

EMC PARTNER AG



M. Lutz
Managing Director

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Manager Quality Department

Appendix: Conformity declaration with Low Voltage Directive 2006/95/EC

