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## Complimentary Reference Material

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# PEFT 8010

Burst Test System according to IEC/EN 61000-4-4 Edition 1 & 2 up to 7.3kV

■ **Electrical fast transients (EFT)** are the most popular sources of disturbances in modern electronic circuits. EFT/bursts are caused by the operation of electro-mechanical switches, motors or power distribution switchgears.

The PEFT 8010 instrument contains all the features expected from a top quality EFT generator. Unbeaten performance paired with a high end assembly guarantee a cost effective, long-lasting investment and valuable test results.

PEFT 8010 can either be operated by the front panel keys in a stand alone manner or be controlled by PC via RS232 or IEEE 488 as part of a complete EMC test system.

Tests can be performed manually or automatically with predefined test programs. The front panel layout with its large LCD display and the intuitive software are especially designed for self explanatory and safe operation of the instrument. Up to 36 test setups can be programmed and saved on the internal non-volatile memory.

Bursts are generated according to the related standards IEC 61000-4-4 and EN 61000-4-4. The PEFT 8010 can deliver EFT impulses in different formats including normal, continuous, random and real pulse distribution.

For better handling, the PEFT 8010 is equipped with two grounding connections, one at the front panel and one at the rear panel. This is very helpful in making connections to the ground plane if the PEFT 8010 is used either horizontally or vertically.

With the integrated "Transition Function"  $U_{nominal}$ , the spike frequency, the burst duration and the burst period can be varied automatically during a test. Besides this, it is also possible to edit the parameters manually during a test.

Besides conventional safety features, the PEFT 8010 contains a separate "Line ON/OFF" switch with which the main supply can be disconnected from the equipment under test.

## ■ Features

- ☑ **EFT impulse generation** according to newest standards and latest technology.
- ☑ **ESD control and report functions** for attaching an Electrostatic Discharge gun.
- ☑ **Automatic test operation** for shortest measuring time and minimal setup effort.
- ☑ **Data exchange** to printer or computer is possible without any additional hardware/software.
- ☑ **Compact and reliable construction** for factory, laboratory or field use.
- ☑ **Remote control** is provided by optional software (*WinFEAT&R*) designed specially for EMC testing.
- ☑ **ISO 9001 : 2000 certified** manufactured

## ■ Benefits

### Unmatched Performance

Accurate and fast measurements make this instrument a unique tool for cost-effective and reliable testing practices.

### Wide Range of Extension Options

A wide range of options ensures a customized EMC test solution. Compatibility to other generators or detectors increases the functionality of the instrument up to an overall EMC test system.

### Simple and Safe Operation

Intuitive and clear graphical presentation of the results helps finding exact failure levels. Software menus are simple to follow and do not have too many layers in the structure. A help function has been built into the software, so that pressing the softkey "HELP" will give you more information about the operation you are attempting. Safety features like external emergency stop or warning lamp protect the user from hazardous and dangerous situations.

## ■ Applications

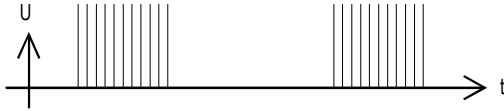
- |                                  |                            |
|----------------------------------|----------------------------|
| ☑ <b>Approval Testing</b>        | ☑ <b>Industrial</b>        |
| ☑ <b>Product Development</b>     | ☑ <b>Medical</b>           |
| ☑ <b>Post Design Diagnostics</b> | ☑ <b>Telecommunication</b> |
|                                  | ☑ <b>Household</b>         |
|                                  | ☑ <b>many more</b>         |



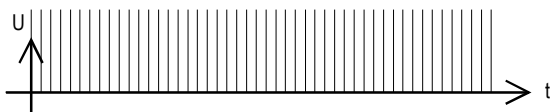
## ■ Burst Modes

On the PEFT 8010 instrument five different burst modes can be selected.

1. **Normal:** Bursts are generated as defined in IEC 61000-4-4.



2. **Continuous:** The spikes are generated continuously with the selected frequency.



3. **Random:** The spike frequency changes within a burst between 16% and 100% of the entered value.



4. **Real:** The spike frequency is changed from the entered value to 16% within a burst. Burst amplitude remains constant.



## ■ Remote Control Software (WinFEAT&R)

The control software (WinFEAT&R<sup>®</sup>) can be installed in the Microsoft<sup>®</sup> Windows 95 or higher environments and can be used to control equipment for EFT (IEC 61000-4-4), SURGE (IEC 61000-4-5), AC Magnetic fields (IEC 61000-4-8) and Dips or Interrupts (IEC 61000-4-11) etc.

## ■ Coupling/Decoupling Network (CDN)

A single phase Coupling/Decoupling Network (CDN) is built into the PEFT 8010 which enables coupling of the EFT impulses into a single phase mains network.

If it is necessary to inject EFT Impulse into a three phase mains system, the PEFT 8010 can be used together with an external three phase CDN (up to 100A per phase) with coupling path selection either controlled directly from the PEFT 8010 or manually.

Injection of EFT impulses into signal and control cables is required by IEC 61000-4-4. The PEFT 8010 has a direct high voltage output connector for use with the coupling clamp IP4A. The IP4A fulfils all the requirements of IEC 61000-4-4.

Bursts can also be coupled directly into electronic circuits using the optional electric and magnetic field generation probes, mainly used for failure detection.

## ■ Interfacing

### EUT Failed

Connect pass/fail detection hardware to this BNC input and the EUT (Equipment Under Test) condition, as determined by specific EUT supervision hardware, is added to the database of test information and finally the log file. EUT condition can also be used to determine the test course.

### Trigger In

External signals can be used to trigger impulse generation to a particular event.

### Sync In

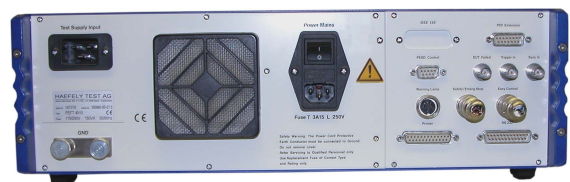
Impulses can be synchronised to any external cyclic signal with a high degree of accuracy.

### PESD Control

This interface can be used to attach the PESD 1610 generator to the PEFT 8010. The PEFT 8010 is able to control and document the ESD pistol operation.

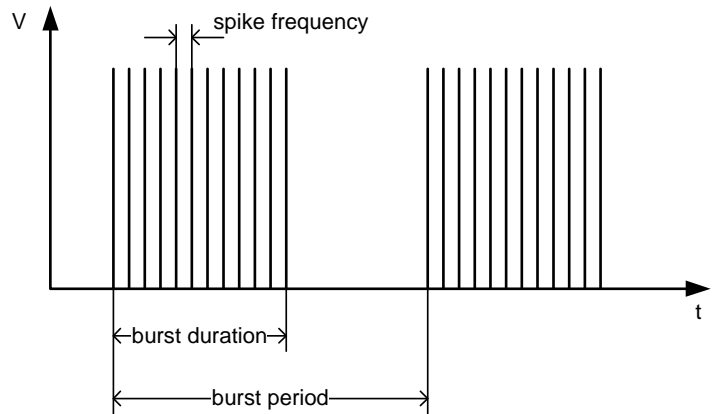
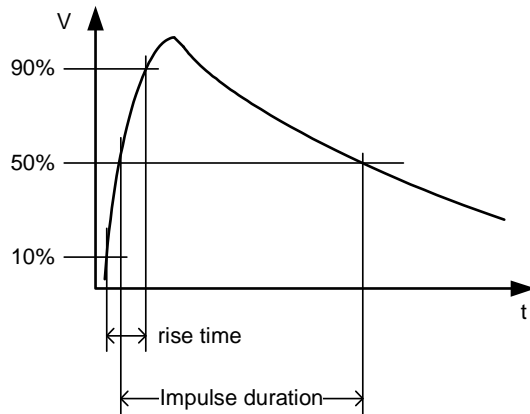
### P90 Extension

The P90 interface is a self developed standard used for communication between test instruments. The primary function of this interface is to control the automatic three phase CDN which is available as an option.



Rear panel view of the PEFT 8010

## ■ Technical Specifications



### Wave Shape into 50Ω load

Rise time	5 ns ± 30 %
Impulse duration	50 ns ± 30 %

### Wave Shape into 1000Ω load

Rise time	5 ns ± 30 %
Impulse duration	50 ns – 15 / + 100 ns

### Burst Characteristic

Voltage at HV-output:	1.0 ... 7.3 kV
Voltage at CDN output:	1.0 ... 6.6 kV
Spike frequency	1 Hz ... 110 kHz
Burst duration	0.01 ... 999 ms
Burst period	0.1 Hz ... 400 Hz 2.5 ms ... 10 s 1 period ... 500 periods
Impulses per second	max. 250 for $U_{nom} > 4$ kV max. 500 for $U_{nom} \leq 4$ kV
Impulses per burst	max. 75 for $U_{nom} > 4$ kV max. 150 for $U_{nom} \leq 4$ kV
Spike distribution	normal, continuous, random, real
Polarity	positive, negative
Test time	10 s ... 8 h per path

### Weight and Dimension

Weight	14 kg
W x H x D	450mm x 130mm x 570mm

### Single Phase Coupling/Decoupling Network

Maximum AC voltage	264 V @ 16 ... 440 Hz
Maximum AC current	16 A @ 50 ... 60 Hz, 10 A @ 400 Hz
Maximum DC voltage	125 V
Maximum DC current	16 A (dependant on DC voltage)
Coupling Modes	L-GND, N-GND, PE-GND, LN-GND, LPE-GND, NPE-GND, LNPE-GND
Residual voltage at Test Supply Input	≤ 10% of applied test voltage

### Synchronisation

Frequency	16 <sup>2</sup> / <sub>3</sub> Hz, 40 Hz, 50 Hz, 60 Hz, 400 Hz, auto
Impulse trigger	automatic, manual, external

### System Configuration

EUT fail input	BNC, logic low to trigger
P90 interface	for a 3-phase CDN extension
PESD interface	for connecting an ESD generator
Printer interface	Centronix
Computer interface	RS-232, IEEE-488 (optional)

### Power Supply

Voltage	85 ... 264 VAC, 150 VA
Frequency	50 / 60 Hz

## ■ Scope of Supply

**PEFT 8010** instrument including  
all cables, user manual and  
calibration certificate  
Art. No. 249180



Picture shows: vertical mounted PEFT 8010 with Field Generation Probes, Coax Cables, PESD 1610, Easy Control and Verification Kit.

## ■ Accessories and Options

Ordering Information	Ordering Number
<b>FP-EFT 32.1</b> is a fully automatic three phase 32A, 690V/400V CDN. Coupling path selection is controlled from the PEFT 8010.	249253
<b>FP-EFT 32M</b> is manual three phase 32A, 690V/400V CDN. Coupling path selection is manual.	249017
<b>FP-EFT 100M</b> is a manual three phase CDN for operation up to 100A, 690V/400V.	249586
<b>IP4A</b> is a capacitive coupling clamp for superposition of burst on data lines in accordance with IEC 61000-4-4, edition 1 and 2.	249130
<b>PAT 14</b> is an attenuator with division factor 5 (14dB). Allows to reach the lower levels required in IEC 61000-4-4 with external CDNs.	249948
<b>Easy Control hand held</b> remote control unit used to start, stop or load tests and programs from the PEFT 8010 memory.	249602
<b>Vertical Operation Stand</b> mounts the PEFT 8010 vertically for easy access while the instrument stands on a floor level ground plane.	249735
<b>E and H Field Generation Probes</b> set can be used to inject near fields and to find electromagnetic sensitive areas in a test object.	249608
<b>WinFEAT&amp;R control software</b> for remote operation, data logging and analysis (FEAT&R = Fast, Easy, Accurate Testing & Reporting).	249970
<b>IEEE-488 Interface P95</b> IEEE card	249556
<b>OPTICAL DEC95</b> RS-232 optical link for a galvanic isolation between PEFT 8010 and PC.	249689
<b>EUT-OPT.1</b> optical link for electrical decoupling of the EUT failed input.	249449
<b>AC Adapter Set</b> for country specific power plug (B, CH, US).	249200
<b>AC Adapter Schuko-UK</b> converts Euro to UK plugs (13A, 250V).	249739
<b>DC Adapter Set</b> for DC applications.	249733
<b>EFT Verification Set</b> for verifying the HV output with 50Ω and 1000Ω load (U max. 8kV)	249995
<b>Adapter Verification</b> for wave shape verification at the line output of the PEFT 8010.	249603
<b>Fiber Optic Interface</b> for connecting the PESD 1610 with the PEFT 8010 mainframe.	249667
<b>Warning Lamp</b>	249944
<b>Emergency Stop Switch</b>	249945

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