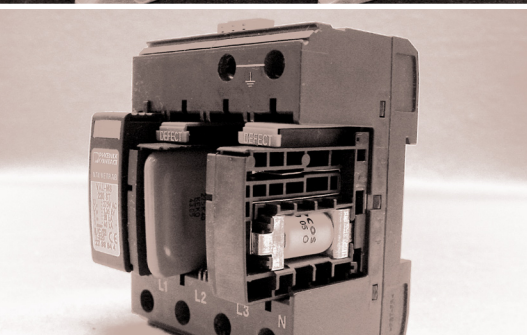
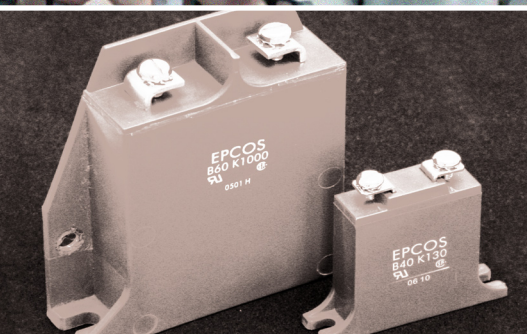




# Protection Device Test System



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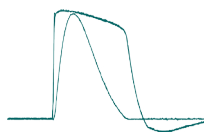
# Brief Overview of Phenomena

Surge currents can generate over voltages in power distribution and data transmission networks. Computer related products, process control equipment and data communications environments can be damaged by high-voltage surges and spikes. Such power surges and spikes are most often caused by lightning strikes. However, there are occasions when the surges and spikes result from any one of a variety of other causes. These causes may include direct contact with power/lightning circuits, high energy transients coupled into equipment from cables in close proximity and potential differences between grounds to which different equipment is connected.

Electronic equipment can be protected from the potentially destructive effects of high-voltage transients through mitigation procedures that include positioning protection devices at building service entrances, central distribution boxes and locally in the equipment power outlets. These protective devices are known by a variety of names including "lightning barriers", "surge arrestors", "lightning protection units", Transient Voltage Surge Suppressors (TVSS), etc. The internationally accepted name to cover all these types of devices is Surge Protection Device or SPD.

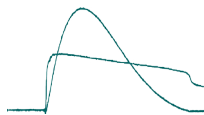
EMC Partner Surge Protection Device Testers are used to assess the correct functioning of protection devices such as varistors, gas arrestors or a combination of both.

Five basic impulse types are employed to test protection devices



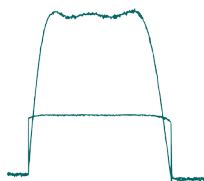
- **Clamping Voltage Tests**

When a transient occurs, the SPD resistance changes from a very high stand-by value to a very low conduction value. The transient is absorbed and clamped at a defined level, protecting sensitive electronic circuits and diverting the transient energy to ground. A normalised current impulse of 8/20 $\mu$ s is defined in the standards IEC 61643-1 and IEC61180-1.



- **Surge Withstand Tests**

Surge withstand tests are intended to assess the maximum peak current carrying capability of varistors. The surge withstand capability is approximately proportional to the varistor disk size (diameter). Energy levels are much higher than for the clamping voltage tests with impulse levels in the tens of kilo amps range.



- **Energy Absorption Tests**

High energy surges are usually generated by inductive discharges of motors and transformers. Energy absorption in an SPD is the integral current flow through and the voltage across an SPD. Surge currents of relatively long duration are required for testing maximum energy absorption capacity of an SPD. A rectangular wave of 2ms duration is sometimes used instead of the double exponential waveforms.



- **Combination Wave Tests**

Surge events can be generated by lightning phenomena, switching transients or the activation of protection devices in the power distribution system. A surge itself is influenced by the propagation path taken so that impulses from the same event may have different forms depending upon where a measurement is taken. Combination Wave Generators (CWG) simulate a surge event in power lines close to or within buildings.

- **Duty Cycle (Flamability) Tests**

A series of pulses is applied to the varistor to assess maximum rated dissipation. Exceeding the maximum rated dissipation will cause the protection device to be destroyed. A flammability risk could occur. The 8/20 $\mu$ s current impulse is superimposed on the mains power supply.

# Applicable Standards

## International Electrotechnical Committee (IEC)

IEC 60060-1 (1989). High-voltage test techniques. Part 1: General definitions and test requirements.

IEC 61643-1 Ed 2 (2005) Low-voltage surge protective devices - Part 1: Surge protective devices connected to low-voltage power distribution systems - Requirements and tests

IEC61000-4-5 Ed 2 (2005) Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test

IEC61180-1 Ed1 (1992) High-voltage test techniques for low voltage equipment - Part 1: Definitions, test and procedure requirements



## International Telecommunications Union (ITU)

K.44 (2008): Resistibility Tests for Telecommunications Equipment exposed to overvoltages and overcurrents - Basic Recommendation



## American National Standards Institute (ANSI)

C62.41 (Date): American National Standard for Electrostatic Discharge Test Methodologies and Criteria for Electronic Equipment.



## Underwriters Laboratories (UL)

UL1449 Ed3 (2006) Standard for Transient Voltage Surge Suppressors (TVSS).



# Test System Overview

## Test System Features

The Protection Device Test System has many unique and outstanding features:

- Clamping Voltage tests
- Surge Withstand tests
- Energy Absorption tests
- Combination Wave Tests
- Currents up to 100kA
- Voltages up to 24kV
- Power Line CDNs up to 50kA
- Short charging time
- Electronic polarity change
- Semiconductor switches
- All parameters on one screen
- Parameter ramp feature
- Internal program memory
- Backlight LCD display
- Compact design
- Fulfils ALL standard requirements
- Remote control and software upgrade through standard interface
- Wide range of accessories
- 2 year warranty

## User Benefits

The technical excellence and many unique features of the Protection Device Testers translate directly into benefits for the user:

- Range of voltage / current combinations optimum return on investment
- Standard control unit, reduces user training
- Impulse reproducibility
- Accurate measurement system delivers information about the SPD
- Integration into existing test facilities saves engineering costs.
- Pass / Fail indication for individual samples, speeds up production
- High degree of automation, reduces operator workload
- Save operator time with the automated test routines and test report facility
- Easy integration into a full test suite
- Unparalleled reliability and system up-time



## Generators

Impulse testing is performed on components and assemblies either on the production line or in quality control laboratories. Tests on power main protection devices are performed on single and three phase power ports. Because of the high energy levels involved, a special Coupling and Decoupling Network (CDN) is required to superimpose the impulses and provide protection for auxiliary equipment that is not part of the test setup. Accurate monitoring of the impulse wave shapes on the EUT is an essential part of any protection device test system.

## Clamping Voltage Testers

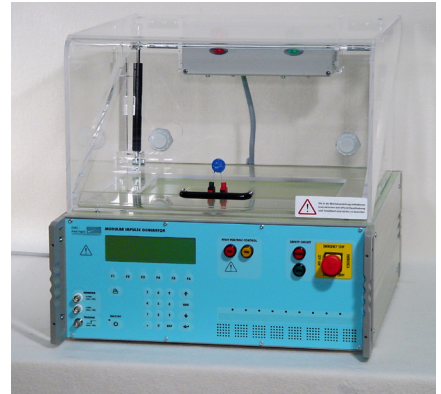
MIG0603CLV1 and CLV2 include three different source impedances (10Ω, 100Ω and 1000Ω) with up to 11 measurement ranges enabling testing of varistor clamping voltages in a range up to 1000V. Varistor disk sizes from 5mm to 40mm can be tested.

### - MIG0603CLV1

Clamping voltage tester 8/20μs current range 0.5A up to 200A.

### - MIG0603CLV2

Clamping voltage tester 8/20μs current range 0.5A up to 500A



MIG0603CLV2

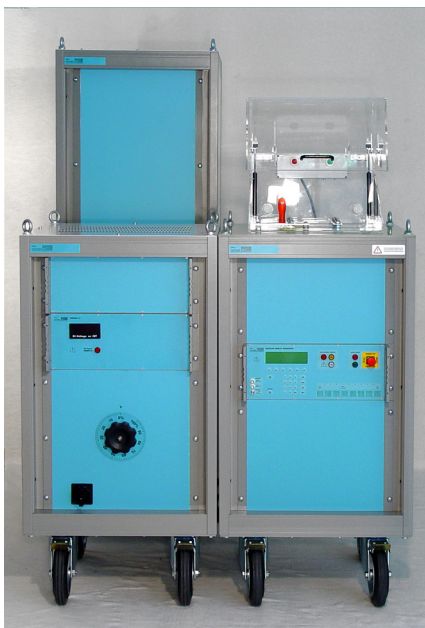
Disk Size	Nominal r.m.s. voltage	Clamping voltage Vcl @I(class)	Class current I(class)	MIG0603CLV1 10V – 3000V 8/20us	MIG0603CLV2 10V – 3000V 8/20us
5mm					
	14V	43V	5A	1A – 200A	1A – 200A
	130V	310V	5A	1A – 200A	1A – 200A
	250V	650V	5A	5A – 200A	5A – 200A
10mm					
	14V	43V	5A	1A – 200A	1A – 200A
	130V	340V	25A	1A – 200A	1A – 200A
	250V	650V	25A	5A – 200A	5A – 200A
	510V	1350V	25A	5A – 200A	5A – 200A
	680V	1800V	25A	5A – 200A	5A – 200A
20mm					
	14V	43V	20A	1A – 200A	1A – 200A
	130V	350V	100A	1A – 200A	1A – 200A
	250V	650V	100A	5A – 200A	5A – 200A
	510V	1350V	100A	5A – 200A	5A – 200A
	680V	1800V	100A	5A – 200A	5A – 200A
	1000V	2700V	100A	5A – 200A	5A – 200A
40mm					
	130V	340V	300A		5A – 500A
	250V	650V	300A		5A – 500A
	510V	1350V	300A		5A – 500A
	680V	1800V	300A		5A – 500A
	1000V	2700V	300A		5A – 500A



MIG0624



MIG1248



MIG1260 & CDN50KA-1P

## Surge Withstand Testers

The 6kV and 12kV testers consist of 4 or 5 identical circuits which can be connected in parallel. The advantages of this configuration are that two or four electrode SPDs can be tested and the overall current range is greater compared to a single circuit device.

### Surge Withstand Testers 6kV

- **MIG0603CLP**  
Varistor tester with waveforms 8/20µs, 10/1000µs, CWG 1.2/50µs / 8/20µs
- **MIG0606**  
Current tester 8/20µs 2x 3kA, Zsource 1 or 2 Ohm
- **MIG0612**  
Current tester 8/20µs, 2x 6kA, Zsource per circuit 1 Ohm
- **MIG0612UL**  
Varistor tester with waveforms 8/20µs, 10/1000µs, CWG 1.2/50µs / 8/20µs
- **MIG0624**  
Current tester 8/20µs, 4x 6kA, Zsource per circuit 1 Ohm

### Surge Withstand Testers 12kV

- **MIG1248**  
Current tester 8/20µs, 4x 12kA, Zsource per circuit 1 Ohm
- **MIG1260**  
Current tester 8/20µs, 5x 12kA, Zsource per circuit 1 Ohm
- **MIG12100**  
Current tester 8/20µs, 10x 12kA, Zsource per circuit 1 Ohm

Disk Size	Nominal r.m.s. voltage	Maximum peak current 8/20µs	MIG0612 2x 6kA 300A..12kA 8/20µs	MIG0624 4x 6kA 300A..24kA 8/20µs	MIG1248 4x 12kA 600A..48kA 8/20µs	MIG1260 5x 12kA 600A..60kA 8/20µs	MIG12100 5x 22kA 1000A..100kA 8/20µs
5mm							
	14V	100A					
	130V	400..800A	2x 0.3..6kA	4x 0.3..6kA			
	250V	400..800A	2x 0.3..5kA	4x 0.3..5kA			
10mm							
	14V	0.5..1kA	2x 0.3..6kA	4x 0.3..6kA	4x 0.6..12kA	5x 0.6..12kA	5x 1..22kA
	130V	2.5..3.5kA	2x 0.3..6kA	4x 0.3..6kA	4x 0.6..12kA	5x 0.6..12kA	5x 1..22kA
	250V	2.5..3.5kA	2x 0.3..5kA	4x 0.3..5kA	4x 0.6..12kA	5x 0.6..12kA	5x 1..22kA
	510V	2.5..3.5kA	2x0.3..4.5kA	4x0.3..4.5kA	4x 0.6..11kA	5x 0.6..12kA	5x 1..22kA
	680V	2.5..3.5kA	2x 0.3..4kA	4x 0.3..4kA	4x 0.6..10kA	5x 0.6..12kA	5x 1..22kA
20mm							
	14V	2kA..3kA	2x 0.3..6kA	4x 0.3..6kA	4x 0.6..12kA	5x 0.6..12kA	5x 1..22kA
	130V	6kA..10kA	2x 0.3..6kA	4x 0.3..6kA	4x 0.6..12kA	5x 0.6..12kA	5x 1..22kA
	250V	6kA..10kA	2x 0.3..5kA	4x 0.3..5kA	4x 0.6..12kA	5x 0.6..12kA	5x 1..22kA
	510V	6kA..10kA	2x0.3..4.5kA	4x0.3..4.5kA	4x 0.6..11kA	5x 0.6..12kA	5x 1..22kA
	680V	6kA..10kA	2x 0.3..4kA	4x 0.3..4kA	4x 0.6..10kA	5x 0.6..12kA	5x 1..22kA
	1000V	6kA..10kA	2x 0.3..3kA	4x 0.3..3kA	4x 0.6..9kA	5x 0.6..12kA	5x 1..22kA
40mm							
	130V	40kA			4x 0.6..12kA	40kA & 50kA	40&50&65kA
	250V	40kA			4x 0.6..12kA	40kA & 50kA	40&50&65kA
	510V	40kA			4x 0.6..11kA	40kA & 50kA	40&50&65kA
	680V	40kA			4x 0.6..10kA	40kA & 50kA	40&50&65kA
	1000V	40kA			4x 0.6..9kA	5x 0.6..12kA	5x 1..22kA
60mm							
	130V	70kA					5x 1..22kA
	250V	70kA					5x 1..22kA
	510V	70kA					5x 1..22kA
	680V	70kA					5x 1..22kA
	1100V	70kA					5x 1..22kA
80mm							
	130V	100kA					5x 1..22kA
	250V	100kA					5x 1..22kA
	510V	100kA					Max 85kA
	680V	100kA					Max 80kA
	1100V	100kA					Max 65kA

## Energy Absorption Testers

### - MIG0612EA

2ms rectangular waveform generator for energy testing on varistors: current range 5A up to 150A, Emax 700 Joule on a 20mm varistor disk

### - MIG0636EA

2ms rectangular waveform generator for energy testing on varistors: current range 20A up to 500A, Emax 2100 Joule on a 40mm varistor disk

### - MIG0624LP1

Current tester 8/20µs, 4x 6kA, Zsource per circuit 1 Ohm; 10/1000, 4x 60A.

Disk Size	Nominal r.m.s. voltage	Energy surge rating 2ms or 10/1000µs	MIG0624LP1 4 x 2A – 60A 10/1000µs	MIG0612EA 5A – 180A 2ms	MIG0636EA 20A – 500A 2ms
5mm					
	14V	0.4J – 0.6J	4 x 0.1J – 4J	2J – 25J	
	130V	4J – 8J	4 x 0.5J – 23J	4J – 140J	
	250V	8J – 17J	4 x 1.5J – 44J	8J – 275J	
10mm					
	14V	2J – 3J	4 x 0.1J – 4J	2J – 25J	6J – 75J
	130V	20J – 45J	4 x 0.5J – 23J	4J – 140J	12J – 420J
	250V	38J – 70J	4 x 1.5J – 44J	8J – 275J	24J – 825J
	510V	55J – 125J	4 x 6J – 71J	20J – 490J	50J – 1470J
	680V	72J – 155J	4 x 8J – 94J	30J – 600J	70J – 1800J
20mm					
	14V	12J – 16J		2J – 25J	6J – 75J
	130V	70J – 150J	4 x 0.5J – 23J	4J – 140J	12J – 420J
	250V	130J – 300J	4 x 1.5J – 44J	8J – 275J	24J – 825J
	510V	190J – 470J	4 x 6J – 71J	20J – 490J	50J – 1470J
	680V	250J – 620J	4 x 8J – 94J	30J – 600J	70J – 1800J
	1000V	400J – 860J	4 x 8J – 100J	40J – 700J	100J – 2100J
40mm					
	130V	310J			12J – 420J
	250V	490J			24J – 825J
	510V	900J			50J – 1470J
	680V	1100J			70J – 1800J
	1000V	1400J			100J – 2100J

## Combination Wave Testers

### - MIG1206SPD

SPD tester. CWG up to 12kV/6kA IEC 61643-1 Varistor test CWG Class III, 1.2/50µs up to 12kV Class I and II, 8/20µs up to 6kA Class I and II. Power supply 1ph L, N(L), PE 480V/16A, manual coupling path selection L-N, L-PE, N-PE.

### - MIG2412SPD

SPD tester. CWG up to 24kV/12kA IEC 61643-1 Varistor test CWG Class III, 1.2/50µs up to 24kV Class I and II, 8/20µs up to 12kA Class I and II. Power supply 1ph L, N(L), PE 480V/16A, manual coupling path selection L-N, L-PE, N-PE.



MIG0624LP1



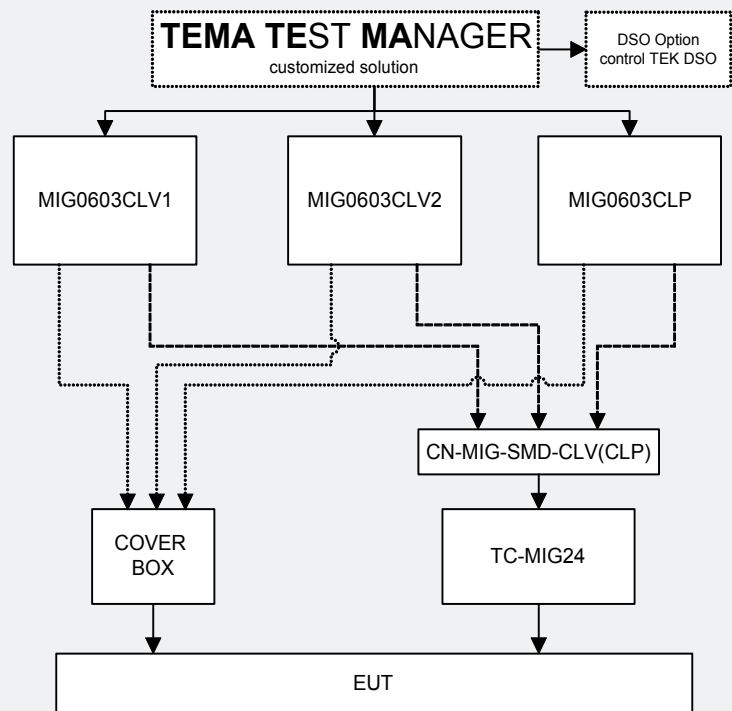
MIG0636EA



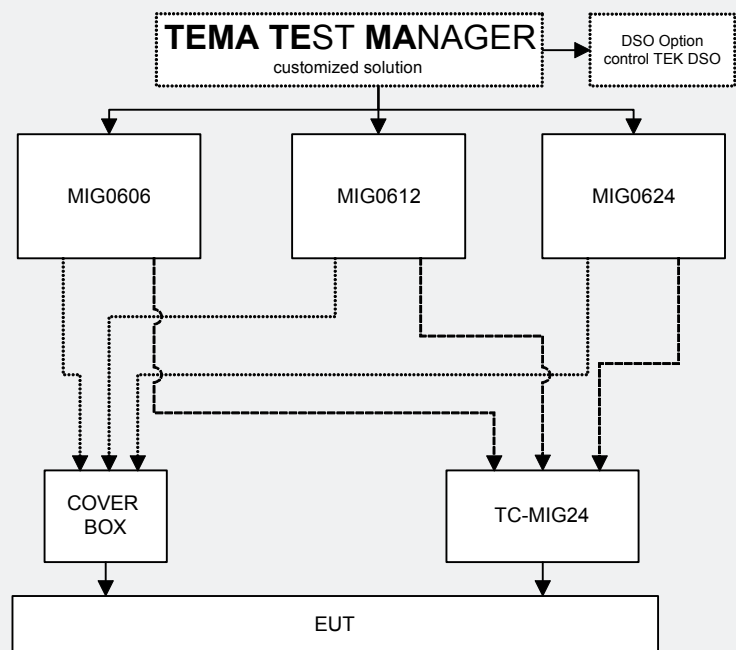
MIG2412SPD

## SYSTEM FLOWCHARTS

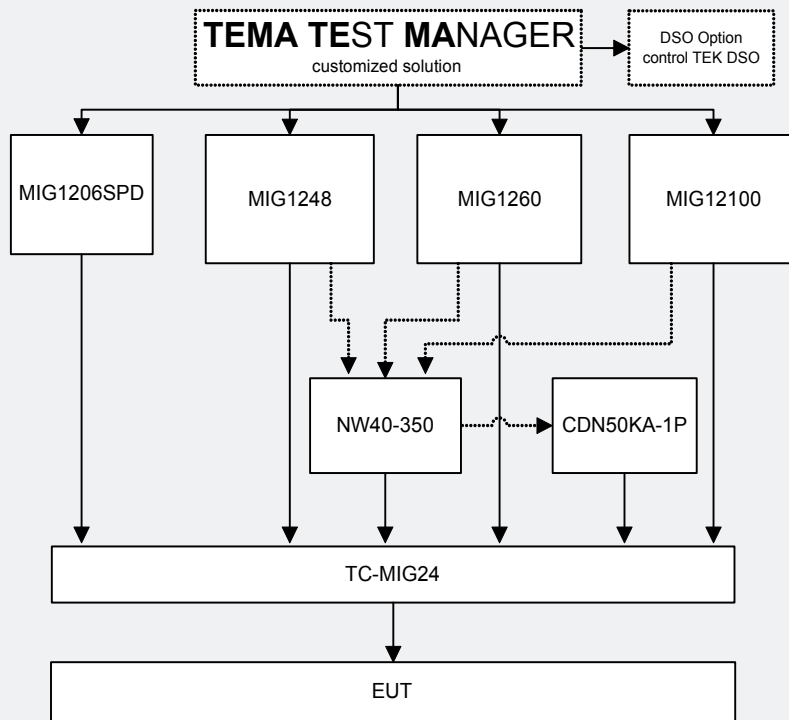
### Clamping Voltage Testers



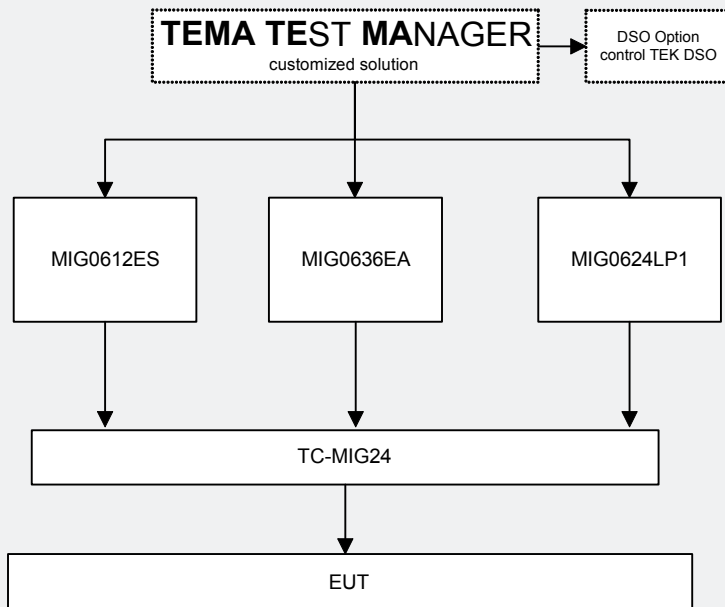
### 6kV Surge Withstand Testers



## 12kV Surge Withstand Testers

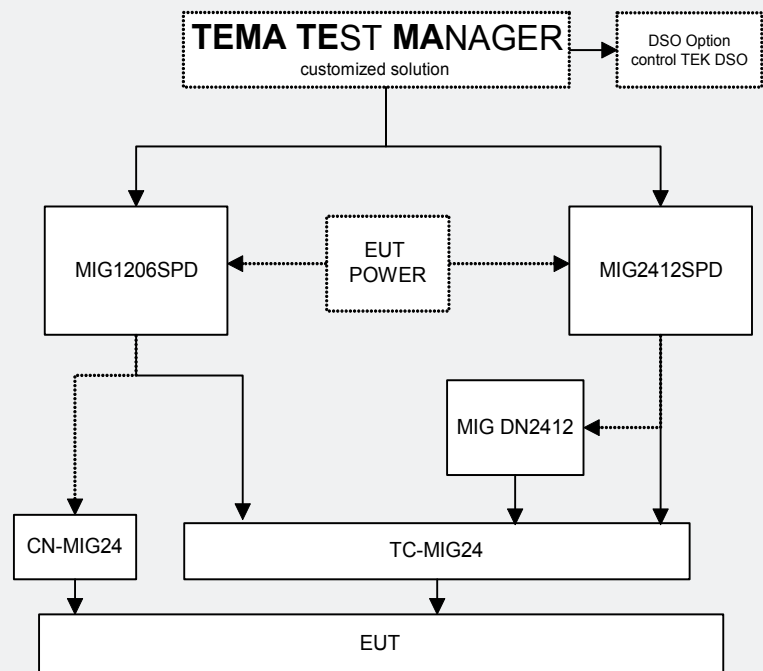


## Energy Absorption Testers





## Combination Wave Testers



# Generator Specifications

## Clamping Voltage

### MIG0603CLV1

Voltage range	0.25 up to 6.3kV
Voltage increment	1V steps
Impulse capacitor	10 $\mu$ F
Maximum energy	180J
Source Impedance	10, 100 and 1000ohm
Pulse front time	8 $\mu$ s
Pulse duration	20 $\mu$ s
Polarity	positive, negative, alternating

### MIG0603CLV2

Voltage range	0.25 up to 6.3kV
Voltage increment	1V steps
Impulse capacitor	10 $\mu$ F
Maximum energy	180J
Source impedance	5, 10, 100 and 1000ohm
Pulse front time	8 $\mu$ s
Pulse duration	20 $\mu$ s
Polarity	positive, negative, alternating

## Surge Withstand 6kV

### MIG0603CLP

Current range Output 1	0.15A up to 3.6A
Current range Output 2	1.5A up to 36A
Current range Output 3	15A up to 360A
Open circuit voltage	150V up to 3.6kV
Impulse capacitor	10 $\mu$ F
Maximum energy	220J
Clamping voltage	1000V
Source Impedance	0 up to 100ohm
Pulse front time	8 $\mu$ s
Pulse duration	20 $\mu$ s
Polarity	positive, negative, alternating

### MIG0606

Current range	0.25 up to 6kV
Current increment	1A steps
Impulse capacitor	20 $\mu$ F
Maximum energy	375J
Source impedance	1ohm
Pulse front time	8 $\mu$ s
Pulse duration	20 $\mu$ s
Polarity	positive, negative, alternating

### MIG0612 (UL)

Output range	0.25 up to 12kA (0.25 up to 6.3kV)
Output increment	1A steps (1V steps)
Impulse capacitor	2 x 20μF (40μF)
Maximum energy	750J (880J)
Source Impedance	0.5, 1ohm (0.5ohm)
Pulse front time	8μs (1.2μs)
Pulse duration	20μs (50μs)
Polarity	positive, negative, alternating

### MIG0624

Current range	0.25 up to 24kA
Current increment	1A steps
Impulse capacitor	4 x 20μF
Maximum energy	1500J
Source impedance	0.25, 0.33, 0.5 and 1ohm
Pulse front time	8μs
Pulse duration	20μs
Polarity	positive, negative, alternating

## Surge Withstand 12kV

### MIG1248

Current range	1 up to 48kA
Current increment	1A
Impulse capacitor	4 x 20μF
Maximum energy	6000J
Source impedance	0.25, 0.33, 0.5 and 1ohm
Pulse front time	8μs
Pulse duration	20μs
Polarity	positive, negative

### MIG1260

Current range	2 up to 60kA
Current increment	1A
Impulse capacitor	5 x 20μF
Maximum energy	7200J
Source impedance	0.2, 0.25, 0.33, 0.5 and 1ohm
Pulse front time	8μs
Pulse duration	20μs
Polarity	positive, negative

### MIG12100

Current range	2 up to 100kA
Current increment	1A
Impulse capacitor	5 x 20μF
Maximum energy	7200J
Source impedance	0.1, 0.2, 0.25, 0.33, 0.5 and 1ohm
Pulse front time	8μs
Pulse duration	20μs
Pulse front time (NW40-350)	40μs
Pulse duration (NW40-350)	350μs
Current range (NW40-350)	1 up to 25kA
Polarity	positive, negative

## Energy Testers

### MIG0612EA

Current range	10 up to 180A
Vcl varistor ranges	< 3kV, <1kV, <0.3kV and <0.1kV
Impulse capacitor	4 x 10 $\mu$ F
Maximum energy	870J
Pulse duration (90% - 90%)	2ms
Pulse duration (10% - 10%)	3ms
Maximum amplitude deviation	+/- 10%
Polarity	positive only

### MIG0636EA

Current range	20 up to 720A
Vcl varistors	< 3kV, <1kV, <0.3kV and <0.1kV
Impulse capacitor	16 x 10 $\mu$ F
Maximum energy	3500J
Pulse duration (90% - 90%)	2ms
Pulse duration (10% - 10%)	3ms
Maximum amplitude deviation	+/- 10%
Polarity	positive only

### MIG0624LP1

Current range	0.25 up to 24kA
Current increment	1A
Impulse capacitor	4 x 20 $\mu$ F
Maximum energy	1500J
Source impedance	0.25, 0.33, 0.5 and 1ohm
Pulse front time	8 $\mu$ s
Pulse duration	20 $\mu$ s
Current range	6 up to 320A in 4 ranges
Current increment	1A
Impulse capacitor	8 x 10 $\mu$ F
Maximum energy	1500J
Pulse front time	10 $\mu$ s
Pulse duration	1000 $\mu$ s

## Combination Wave Testers

### MIG1206SPD

#### CWG circuit

Voltage range	1 up to 12kV
Pulse front time	1.2µs
Pulse duration	50µs
Current range	0.5 up to 6kA
Pulse front time	8µs
Pulse duration	20µs
Source impedance	2ohm
Coupling Path selection	manual
Coupling Paths	L - N (18µF), L - PE (9µF) and N - PE (9µF)
Maximum voltage on CDN	250Vac 50 / 60Hz (L - N)
Maximum current	16A

#### Voltage Impulse circuit 12kV

Voltage range	1 up to 12kV
Pulse front time	1.2µs
Pulse duration	50µs
Source impedance	40ohm

#### Current Impulse circuit 6kA

Current range	0.5 up to 6kA
Pulse front time	8µs
Pulse duration	20µs
Source impedance	< 2ohm
Polarity	positive, negative, alternating
Impulse capacitor	10µF
Maximum energy	720J

### MIG2412SPD

#### CWG circuit

Voltage range	2 up to 24kV
Pulse front time	1.2µs
Pulse duration	50µs
Current range	1 up to 12kA
Pulse front time	8µs
Pulse duration	20µs
Source impedance	2ohm
Coupling Path selection	manual
Coupling Paths	L - N (18µF), L - PE (9µF) and N - PE (9µF)
Maximum voltage on CDN	440Vac 50 / 60Hz (L - N)
Maximum current	16A

#### Voltage Impulse circuit 24kV

Voltage range	2 up to 24kV
Pulse front time	1.2µs
Pulse duration	50µs
Source impedance	40ohm

#### Current Impulse circuit 12kA

Current range	1 up to 12kA
Pulse front time	8µs
Pulse duration	20µs
Source impedance	2ohm
Polarity	positive, negative, alternating
Impulse capacitor	10µF
Maximum energy	3000J

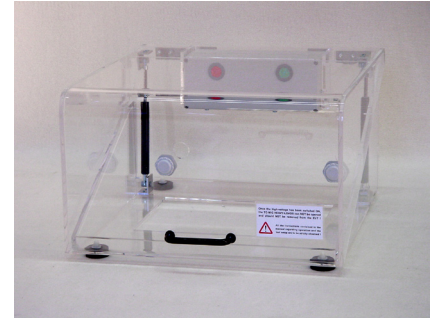


# Accessories and Options

## TC-MIG24

A test cabinet for EUT with maximum dimensions 12 x 15 x 28cm. Can be used together with all Protection Device Testers except the MIG1248 which has its own built-in test cabinet.

TC-MIG24 is linked to the MIG tester safety circuit. Opening the test cabinet disables test voltages. Safety circuit status is indicated by red and green lamps in the test cabinet.

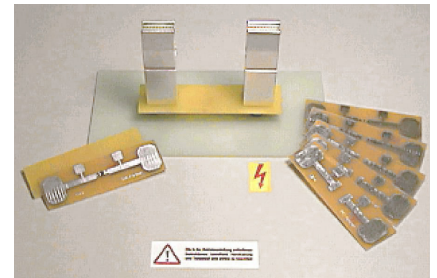


TC-MIG24

## CN-MIG-SMD, CN-MIG-SMD CLV, CN-MIG-SMD CLP

Adapters for SMD varistors. Connection directly to high voltage output of following Protection Device Testers.

- MIG0603CLV1, MIG0603CLV2
- MIG0603CLP



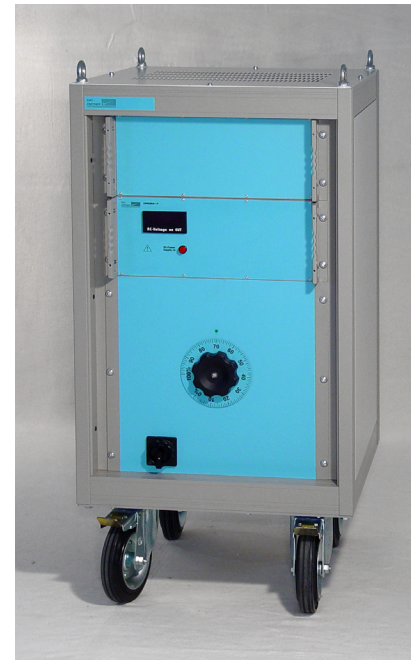
CN-MIG-SMD

## CDN50KA-1P

Coupling decoupling network to MIG1260 and MIG12100 only. Enables superimposition of impulses up to 50kA on single phase mains. The CDN includes a voltage source with setting range from 25V up to 1200Vac.

## NW40-350

Extension to MIG1260 or MIG12100. With the network, the waveform 40(10)/350us can be generated up to 10kA with MIG1260 and 20kA with MIG12100. MIG1248 can also be adapted for use with the NW40-350. The maximum impulse current in this case is reduced.



CDN50KA-1P



MIG-DN2412



CN-MIG24



COVER BOX SMALL

## MIG-DN2412

Accessory to MIG2412SPD.

Special three phase back filter for Combination Wave tests of operating duty cycle. Maximum short duration AC current through the MIG-DN2412 is 2kA. The 2kA can only be guaranteed when the power line impedance is lower than 0.05 ohm.

Cable connection is made to the MIG-DN2412 from the test cabinet on top of the MIG2412SPD

Nominal EUT current 16A per phase. Maximum EUT voltage 480Vac.

## CN-MIG24

EUT connection box with two test pistols, interlock and green / red safety warning lamps. Usable with MIG systems with output on top up to  $V_{max}$  18kV (1.2/50 $\mu$ s),  $I_{max}$  1kA (8/20 $\mu$ s).

Application limited to MIG1206SPD 1.2/50 $\mu$ s voltage impulse output with maximum current of 1kA.

## COVER BOX

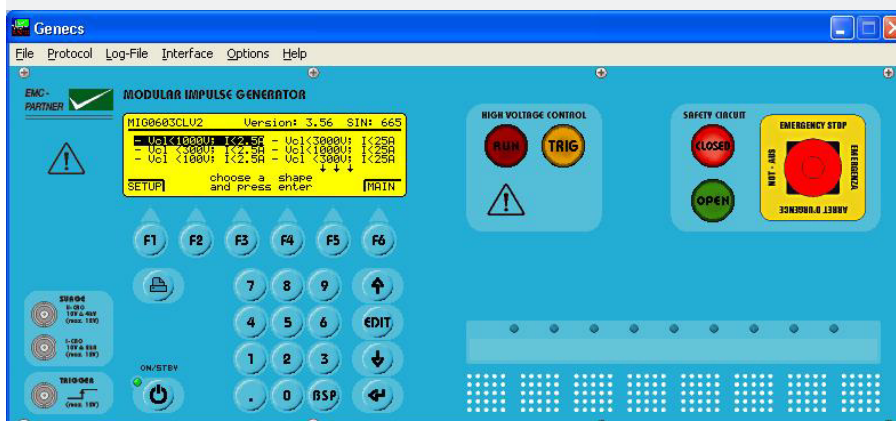
Available for all Testers with the high voltage outputs on top. Cover boxes provide personnel safety when a tester is operated without either a TC-MIG24 test cabinet. They also enable customized connections to be made. Two sizes are available:

- COVER BOX SMALL for single output testers
- COVER BOX LARGE for testers with multiple high voltage connections on the top panel.

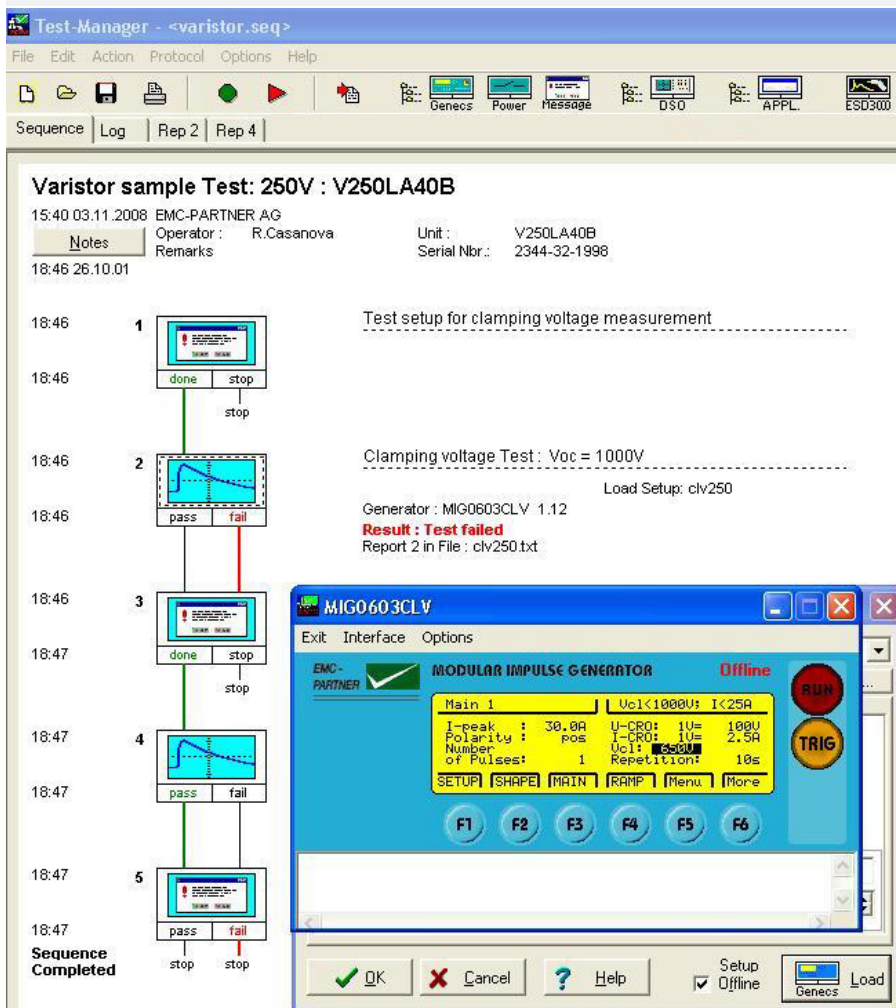
# Software

For remote control of Protection Device Testers, an OPTICAL LINK and one of the following software packages is needed:

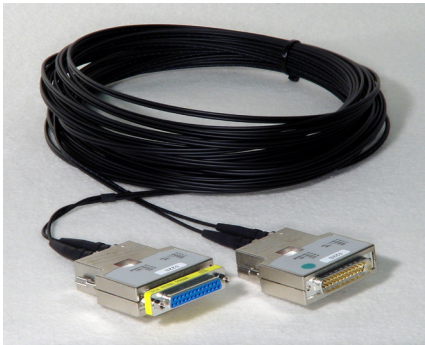
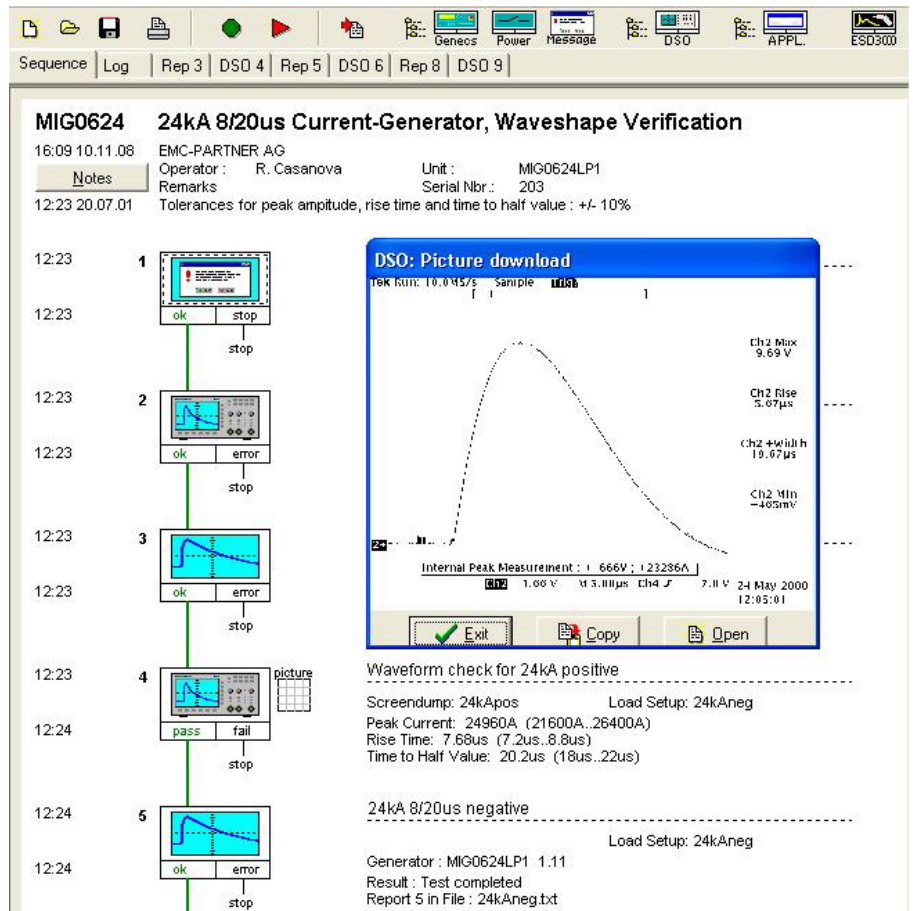
- GENECS-MIG: This is a relatively simple program that reproduces generator front panel functions on a PC. In addition to remote programming and control of the generators, test report information is available to word processing or other evaluation programs such as EXCEL.
- TEMA Software: Comfortable control of EMC PARTNER generators from a PC. Enables up to four generator types to be included in the same test sequence. Generates an enhanced test report.



GENECS MIG



TEMA software



Optical Link



USB - RS232 Adapter

## OPTICAL LINK

For remote control of Protection Device Testers, an OPTICAL LINK is recommended. The Optical link provides a galvanic separation between the test equipment and a controlling computer.

## USB - RS232 ADAPTER

To connect with the USB port of a control computer, the USB to RS232 adapter must be used. Together with the OPTICAL LINK, this combination provides a stable control connection between the test equipment and a controlling computer.



# EMC PARTNER's Product Range

The Largest Range of Impulse Test Equipment up to 100kA and 100kV.

## Immunity Tests

Transient Test System can be used to perform all EMC tests on electronic equipment. ESD, EFT, surge, AC dips, AC magnetic field, surge magnetic field, common mode, damped oscillatory and DC dips tests are available as stand-alone or combined test instruments. A large range of accessories for different applications is available: three phase couplers up to 690V/100A, telecom and data line couplers, verification sets, magnetic field coils. Immunity test systems fulfill IEC and EN 61000-4-2, -4, -5, -8, -9, -11, -12, -16, -18, -29.

TRA3000 and ESD3000 ideal for CE testing  
Easily extended to meet other applications



## Lightning Tests

A range of test equipment and accessories for aircraft, military and telecom applications. Complete solutions including all hardware and software to meet the requirements of RTCA / EUROCAE DO160 / ED14 for indirect lightning on aircraft systems, MIL-STD-461 tests CS106, CS115, CS116, for military vehicles, ITU-T .K44 basic and enhanced tests for impulse, power contact and power induction, FCC part 68 for telecom equipment testing.

MIG2000-6 – a flexible solution for military and avionic applications



## Component Tests

Modular impulse generators (MIG) for transient component testing on: varistors, gas discharge tubes (GDT), surge protective devices (SPD), XY capacitors, circuit breakers, watt-hour meters, protection relays, insulation material, suppressor diodes, connectors, chokes, fuses, resistors, emc-gaskets, cables, etc. Manual or fully automated solutions are available up to 100kA (8/20us) and 144kV (1.2/50us).

MIG1212CAP – an automatic  
8 bank capacitor test system



## Emission Measurements

One unit performs all measurements on the power supplies of electronic equipment and products for the CE-Mark. HAR1000 uses a novel technique to deliver clean power source for the EUT in a compact and lightweight form. The system includes all hardware and software including line impedance networks, control and evaluation software. A basic 1-phase system can be easily extended to 3-phase by adding 2 further phases. HARCS Immunity software further expands the system by adding interharmonic tests, voltage variation and ripple on DC tests. Complies with IEC / EN 61000-3-2, -3 IEC / EN 61000-4-13, -14,

HAR1000-3P and HARCS software  
a complete test system



## System Automation

As addition to the basic generators, a range of accessories are available to enhance capability. Test cabinets, test pistols, adapters and software, simplify interfacing with the EUT.

PS3 programmable source is an EMC hardened supply for frequencies from 16.7Hz to 400Hz. Frequency variation tests can be made using the PS3-SOFT-EXT. Complies with IEC / EN 61000-4-28

PS3 - programmable source  
ideal for EMC applications





For further information please do not hesitate to contact EMC PARTNER's representative in your region. You will find a complete list of our representatives and a lot of other useful information on our website:

# [www.emc-partner.com](http://www.emc-partner.com)

## **The Headquarters in Switzerland**

EMC PARTNER AG  
Baselstrasse 160  
CH - 4242 Laufen  
Switzerland

Phone: +41 61 775 20 30  
Fax: +41 61 775 20 59  
Email: [sales@emc-partner.ch](mailto:sales@emc-partner.ch)  
Web-Site: [www.emc-partner.com](http://www.emc-partner.com)

## **Your local representative**

