

Technical Specification

No. E-MIG0606
revised: 3.November 2008

1 MIG Tester Type MIG0606

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1.1 Introduction

The MIG0606 current tester is designed to be capable to test the range of protection devices for low voltage application (<1000 V) within specified current waveform tolerances.

The MIG "Modular-Impulse-Generator" is a flexible kit system, ready to quote tailored generators for special test applications. The MIG is a further innovative solution of EMC PARTNER AG to cover customers requests.

The basic units are discharge modules (patent pending) which can be configured in serial or parallel, to offer an optimum solution for the customer need. The use of one type of discharge module guarantees a high reliability and a high quality.

The MIG generators are compact and have an excellent value for money.

The MIG generators are modern test equipment with the following features:

- Solid state impulse switch and solid state polarity change (no mechanical switch, no spark gaps or tubes) - advantages: low jitters, no high frequency switching noise,
- Microprocessor menu controlled, printer port and RS232 remote control
- Safety in accordance with VDE 0104 (safety circuit, connector for warning lamp)
- Integrated peak measurement for voltage and current. Peak display and monitor output for v,i
- Windows software for PC control available for windows 95, 98, 2000, NT or XP.

2 General

2.1 Brief description of the generator

The MIG0606 is a current generator with a current wave shape 8/20 μ s. The wave shapes delivered by the MIG0606 into no load is a voltage waveform approximate 1,2/50 μ s across an open circuit (oc) and the specified current waveform 8/20 μ s into a short circuit (sc). The exact waveform delivered is a function of the surge generator and the impedance to which the surge is applied.

The peak output voltage and current of the MIG are indicated on the front display. The two BNC monitor outputs (v,i) allow monitoring the voltage and current wave shapes by an oscilloscope connected onto.

2.2 EUT connection (equipment under test)

Generally we strongly recommend the test cabinet TC-MIG2412 placed on top of the MIG generators for personal safety reasons. The test cabinet is so designed that the cover can not be opened during the test. Only when the output to the EUT is shorted, and the high voltage circuit is discharged, the test cabinet can be opened. The green and red warning lamps are integrated in the test cabinet. When the dimensions of the EUT are greater then 0,2 x 0,35 x 0,35 m (h x w x l) the test cabinet TC-MIG24 can not be used anymore. A bigger test cabinet can not be placed on top of the MIG generator. In this case the customer either make his own safety appliance or ask EMC PARTNER to quote for a tailor made test cabinet placed beside the MIG generator.

2.3 Standards, applications

IEC 61643-1 "SURGE protective devices connected to low voltage power distribution system" Part 1: Performance requirements and testing methods. Class I and II tests

IEC 61008-1 Electrical accessories - Residual current operated circuit breakers without integral overcurrent protection for household and similar uses (RCCB's) - Part 1: General rules (only 8/20 μ s part)

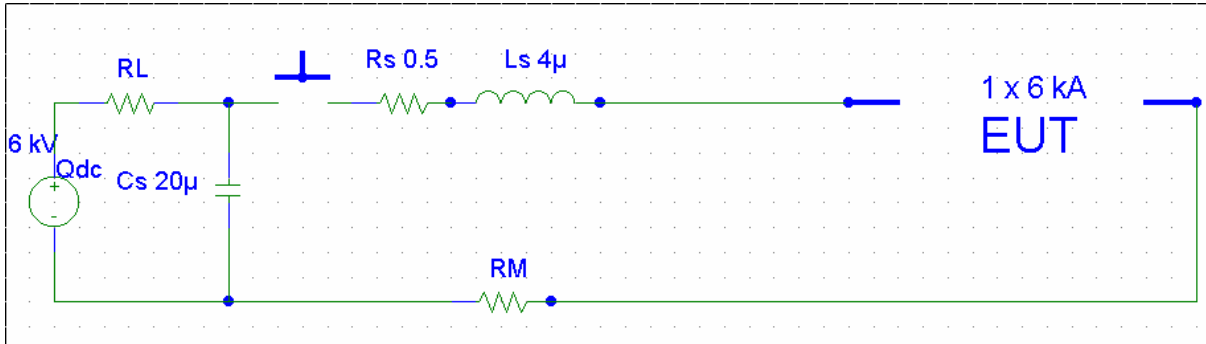
IEC 61009-1 Electrical accessories - Residual current operated circuit breakers with integral overcurrent protection for household and similar uses (RCBO's) - Part 1: General rules (only 8/20 μ s part)

IEC60060-1: 1989, High voltage test techniques. Part 1 General definition and test requirements.

3 Generator circuit, wave shapes definition

The MIG0606 consists of two circuit with the follow technical data:

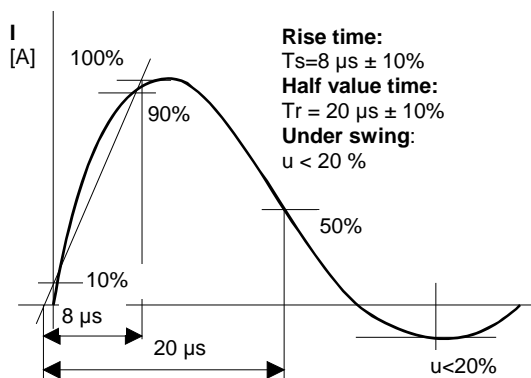
- 2Ω Source impedance, U_{max} . 6 kV, I_{max} . 2 x 3 kA



MIG current testers rise time and tail time are specified $T_a = 8 \mu s -15\% + 5\%$ and $T_r = 20 \mu s -5\%; +15\%$ without loads at short circuit. When loads like varistors are connected the tolerance is increased to $\pm 20\%$, because with loads the inductance and resistance increases and as a consequence front and tail time increases. Generally the waveform will be within tolerances when the load impedance is lower than approximate 10% of the MIG tester source impedance.

3.1 Wave shape definition

Definition of the waveforms:



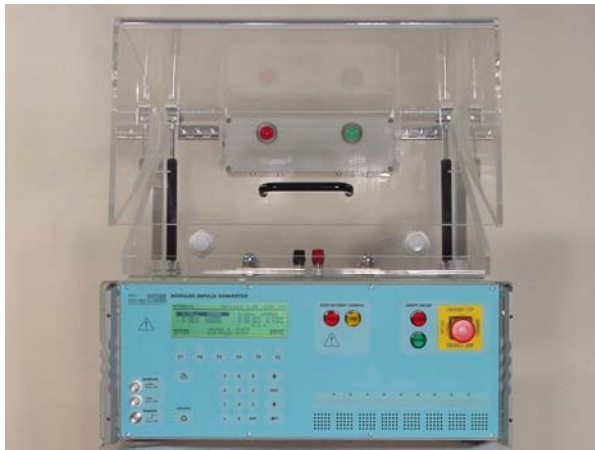
Wave shape "Short circuit" (Current I_{sc})

3.2 Mechanical dimensions, climatic conditions

MIG type	Dimensions [mm]	Weight [kg]	Versions
	width x depth x height		
MIG0606	450 x 570 x 250	24	19" Rack 4 UH

Power :			
Power voltage	L-N single phase 230 V/ 115V ±10% plus protective earth	auto switching	
Power consumption	Maximum <400 VA Standby < 10 VA	(230 V, 50 Hz)	(115 V, 60 Hz)

Environment conditions		
Temperature range	°C	0 to 35 °C
Humidity	rh %	25 to 80%
Pressure	kPa	86 to 106



MIG0606 Tester with TC-MIG24



EUT connection and parallel bridges

Test cabinet

	Dimensions [mm]	Weight [kg]	Version
	width x depth x height		
Test volume	300 x 400 x 200		
Warning lamp	red/green		
Safety	Safety circuit		
TC-MIG24	450 x 500 x 270	8	

4 Technical data

4.1 MIG0606 Waveform

Current I_{sc}	short circuit	R < 0.05 Ω
Rise time 10 to 90% x 1,25	8 μs	+ 5 %; -15%
Half value time 0 to 50%	20 μs	+ 15 %; -5 %
Setting range	250 up to 6'000 A	
in steps of	1 A	
Maximum output I _{sc}	6'000 A	+ 10 % / -5%
Polarity	positive / negative / alternate	
Reversal current	< 20 %	typically < 15%
High voltage output "low"	maximum voltage between "low" and earth 280 V ac	
Voltage waveform	approximate Ts < 1μs; Tr approx. 90 μs	

4.2 Circuit parameters

Impulse capacitance	1 x 20 μF	± 10 %
Energy at max. charging voltage	375 joule	
Source impedance	1 Ω	± 10 %
Waveform within tolerances	I _{min} 250 A and I _{max} 6'000 A	± 20 %

4.3 Control and measurement

Control and measurement		
Minimum time between two impulses	15 seconds	steps 1 second
Counter	1 to 29'999	
Trigger, Impulse release	auto or manual synchronisation onto EUT power	
Ramp functions	Voltage, polarity	
Voltage measurement V _{peak} on front-display v on BNC output	Accuracy 250 to 6'600 V 10 V equals 6'000 V	± 3 % measurement only on output T1
Current measurement I _{peak} on front-display i on BNC output	Accuracy 250 up to 6'600 A 10V equals 6'000 A	± 3 %
Protocol	u peak, i peak, polarity, number of pulses; RS232 for printer	
Limits for u peak and i peak for detection "passed" - "failed"	<ul style="list-style-type: none"> • Stop • Protocol • Next test 	
Set-up memory	Up to 23 memory places	
Test sequences	The set-ups can be linked serially	
Remote control	RS232	
Auxiliary port	Vac synchronisation, external warning lamp, safety circuit	
Emergency switch	On the front panel	

4.4 General information to MIG control

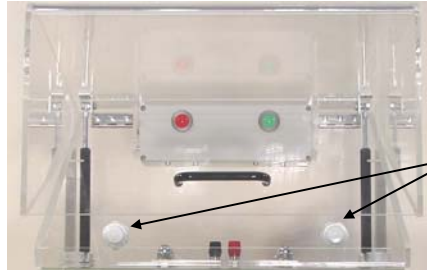
Set-up memory	Up to 15 memory places
Test sequences	the test set-ups can be linked serially
Ramps	automatic linear variation of one parameter e.g. voltage, frequency etc.
Synchronisation on different power line frequencies	16, $\frac{2}{3}$; 40; 50; 60
Pulse trigger	Manuel or automatic Front panel: with Trigger button Rear panel: with BNC plug
Failure detection on EUT	-External Input EUT failed -Selectable limit value for impulse voltage and current for SURGE
Safety switching	Emergency stop Switch off the EMC Test and the EUT power
Test report	Printer, connected to the standard port RS 232

5 Accessories

5.1 Accessories to MIG Testers with high voltage output on top

Type
TC-MIG24
Test cabinet

Pictures



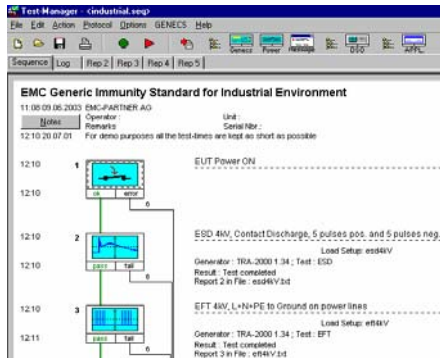
Application

High voltage outputs on top . The test cabinet can be used up to 24 kV.

Probes for measurements or high voltage cables can be feed to the two holes in the test cabinet.

5.2 Accessories to all MIG and TRA Testers

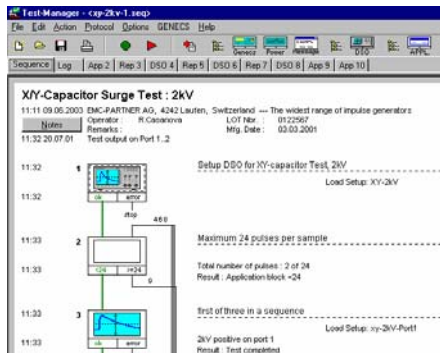
TEest Manager
Platform Software



For MIG, TRA and ESD testers

- Test Library
- Remote control
- Customised protocolling without oscillograms

DSO control to TEMA
Software
„TEMA OPTION DSO
CONTROL“



For MIG, TRA and ESD testers

- Test Library
- Remote control tester
- **Remote control DSO**
- Customised protocolling **with oscillograms**