

# CAR – TESTER

**EMC-Test Equipment**  
for electrical installation of  
vehicles :

**According to  
DIN/ISO 7637**

Pulse	Waveform
<b>#1</b>	<b>1/2000<math>\mu</math>s, 600V</b>
<b>#1a</b>	<b>3/2000<math>\mu</math>s, 600V</b>
<b>#1b</b>	<b>3/1000<math>\mu</math>s, 600V</b>
<b>#2</b>	<b>1/50<math>\mu</math>s, 600V</b>
<b>#3</b>	<b>5/150ns, 800V</b> <b>Ri = 50<math>\Omega</math></b>
<b>#6</b>	<b>60/300<math>\mu</math>s, 400V</b> <b>Ri = 2<math>\Omega</math>/4<math>\Omega</math>/10<math>\Omega</math>/ 20<math>\Omega</math> or 30<math>\Omega</math>/50<math>\Omega</math>/90<math>\Omega</math></b>



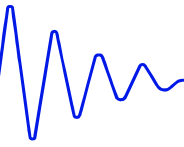
EMC test system designed for testing electromagnetic immunity of the electrical installation of vehicles and components against supply line transients.

The CAR-TESTER includes a set of pulse generators which supply the test pulses listed above, a trigger able power switch (to isolate the DC supply when testing with negative pulses) and the artificial network. A fast voltage probe, ratio 100:1, for capturing transient waveforms is also included.

CAR-TESTER features a microprocessor controlled user interface and display unit for ease of use. The microprocessor allows the user to either execute standard test routines, or a 'user defined' test sequence. The test parameters, which are shown on the built-in display, are easily adjusted by means of the rotary encoder. A standard parallel interface provides the ability to print a summary of the test parameters whilst testing is being carried out.

As well as manual control, the CAR-TESTER and all additional modules may be remotely controlled by a fibre optic computer interface. Software packages for generator control, documentation & test result evaluation are available.

The CAR-TESTER excels by its compact design, simple handling and precise reproducibility of test impulses. High-voltage switching is accomplished by means of a maintenance-free semiconductor switches.



**Technical specification:**

**CAR-TESTER II**

Micro processor control, LCD module  
 Optical-interface for remote control of the generator  
 Parallel printer interface for on-line documentation  
 External trigger input  
 Diagnostic input for monitoring of the test device  
 Connector for external safety interlock loop  
 and external red and green warning lamps according to VDE 0104  
 Mains power  
 Dimensions : plug in unit, 7U, W \* H \* D  
 Weight

8\*40 characters  
 built-in  
 25-way 'D' connector  
 10V at 1kΩ  
 4 channels, 5V-Level  
 24V<sub>DC</sub>  
 230V, 60W  
 230V, 50Hz/60Hz  
 483mm\*311mm\*520mm  
 45kg

**Power supply switch:**

Max. Output current  
 Max. Reverse voltage  
 Trigger-input, connectable to external modules

100A<sub>DC</sub>  
 800V  
 built-in

**Artificial Network:**

Nominal operating voltage  
 Series inductance  
 Load impedance  
 Load resistor R<sub>s</sub>, switch able  
 Connector for external load resistor, 2Ω

0V ... 58V  
 5μH, 100A<sub>DC</sub>  
 0.1μF + 50Ω  
 10Ω, 20Ω, 40Ω  
 built-in

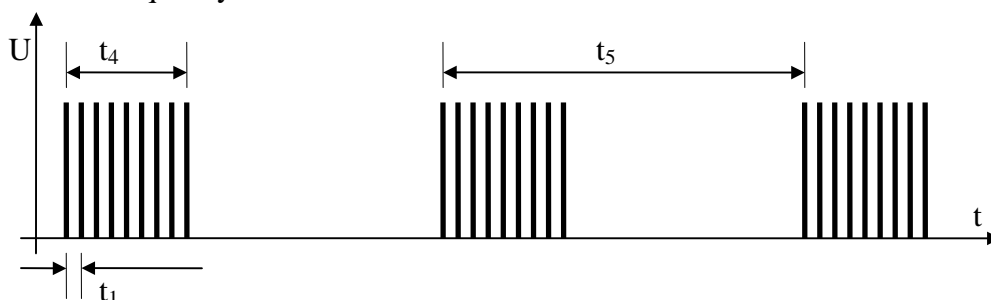
**Measurement probe:**

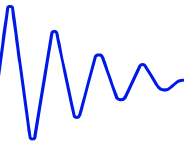
Impulse voltage divider 4.95kΩ/50Ω

100:1, 1kV<sub>p</sub>

**Burst Designed for generation of test pulses #3a / #3b according to ISO 7637-2.3-2002 draft**

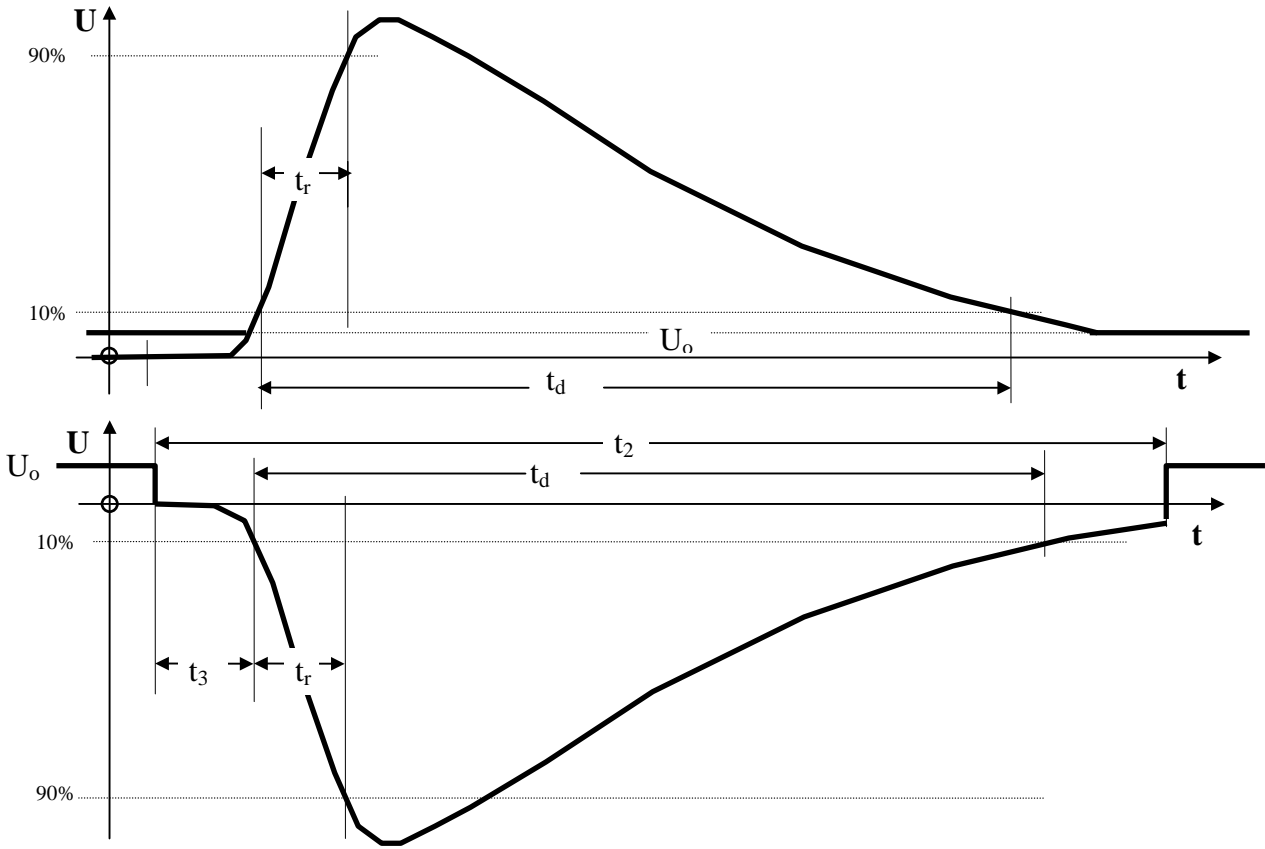
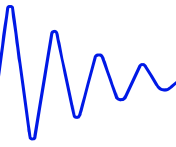
Amplitude of burst output voltage, adjustable		± (25V ... 800V) ± 10%
Waveform	rise time, t <sub>r</sub>	5.0ns ± 30%
	pulse duration, t <sub>d</sub>	150ns ± 30%
Source resistance	R <sub>i</sub>	50Ω
Polarity, switch able		pos./neg./alt
Pulse period	t <sub>1</sub> , adjustable	1.0μs ... 1.0ms
Burst duration	t <sub>4</sub> , adjustable	0.1ms ... 25ms
Burst period	t <sub>5</sub> , adjustable	10ms ... 1000ms
Max. continuous burst frequency		20kHz





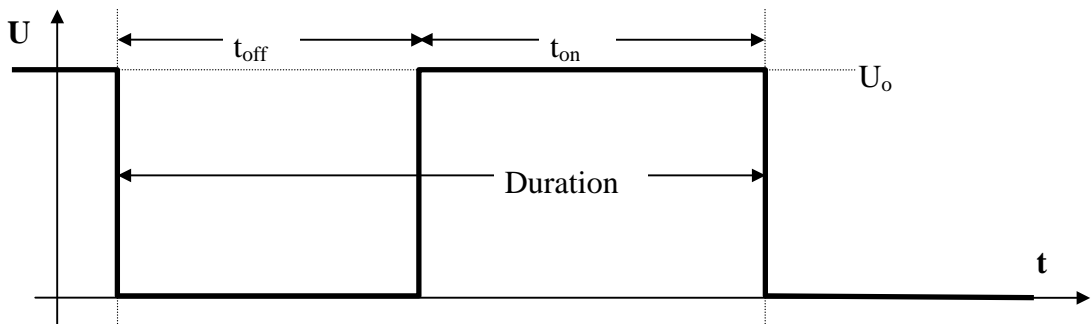
**Surge**    **Designed for generation of test pulses #1, #2 and #6 according ISO 7637-2.3-2002 draft**

Charging voltage, adjustable	$\pm (0V \dots 600V) \pm 10\%$
Max. stored energy	18Ws
Max. charging time	0.5sec ... 5.0sec
Polarity, switch able	positive, negative
Source resistance, switch able	2 $\Omega$ , 4 $\Omega$ , 10 $\Omega$ , 20 $\Omega$ or 30 $\Omega$ , 50 $\Omega$ and 90 $\Omega$
Only with negative pulse polarity:	
Power supply disconnection time, $t_2$	200ms $\pm 10\%$
Trigger delay, $t_3$	< 100 $\mu$ s
<b>PFN 1:</b> <b>Waveform 1/2000<math>\mu</math>s</b>	<b>Pulse # 1</b>
Rise time, $t_r$	1.0 $\mu$ s +0 $\mu$ s/-0.5 $\mu$ s
Pulse duration, $t_d$	2000 $\mu$ s $\pm 20\%$
<b>PFN 1a/b:</b> <b>Waveform 3/2000<math>\mu</math>s or 3/1000<math>\mu</math>s</b>	<b>Puls # 1a, 1b</b>
Rise time, $t_r$	3.0 $\mu$ s +0 $\mu$ s/-1.5 $\mu$ s
Pulse duration, $t_d$	2000 $\mu$ s/1000 $\mu$ s $\pm 20\%$
<b>PFN 2:</b> <b>Waveform 1/50<math>\mu</math>s</b>	<b>Puls # 2</b>
Rise time, $t_r$	1.0 $\mu$ s +0 $\mu$ s/-0.5 $\mu$ s
Pulse duration, $t_d$	50 $\mu$ s $\pm 20\%$
<b>PFN 6:</b> <b>Waveform 60/300<math>\mu</math>s</b>	<b>Puls # 6</b>
Charging voltage, adjustable	$\pm (0V \dots 400V) \pm 10\%$
Rise time, $t_r$	60 $\mu$ s $\pm 20\%$
Pulse duration, $t_d$	300 $\mu$ s $\pm 20\%$



### Transient Emission Test, Power Switch Transients, according to ISO 7637-1/2

Measurement of voltage and current transient while switching the power supply on and off.



Load resistor, switch able  $R_s$   
 Switch-off time,  $t_{off}$ , adjustable  
 Switch-on time,  $t_{on}$ , adjustable  
 Number of Pulses, adjustable

10 $\Omega$ , 20 $\Omega$ , 40 $\Omega$ , ext. >2 $\Omega$   
 1 ... 1000s  
 1 ... 1000ms  
 1 ... 1000