CAR - TEST - SYSTEM 14

EMC-Test Equipment for electrical installation of vehicles

Highlights:

- **Rise time variable 1- 5µs**
- **Vehicle voltages :**
  12V / 24V / 42V / 48V / 70V
- **Battery current:**
  50A / 100A / 200A

According to
ISO 7637: 2011
ISO 16750 : 2012
ISO 21848

Pulse	Waveforms	Ri
#1	1-5/2000µs, 600 V, ISO 1-5/1000µs, 600V, ISO / SAE	
#2a	1 / 50µs, 600 V, ISO	2/4/10/20/30/50/90/150 Ω
#3	5/100 ns, 800 V, ISO	50Ω

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

The CAR-TESTER allows generation of transient immunity test pulses, pulse #1, #2 and #3.

Optionally it can be expanded with the electronic power supply PS xx-xx, which serves as an adjustable voltage source to the electrical system simulation for 12V, 24V, 42V, 48V and 70V and slow switching pulses 2b, 4 sine between, and pulse test A and B (Pulse 5) that can simulate up to a battery current until 200A.

The device contains in its basic configuration, the above pulses, a triggerable load switch and an Ethernet interface board. A fast pulse voltage divider to measure the impulse in the electrical system is also integrated in the device.

The modular system concept allows realisation of different test requirements:

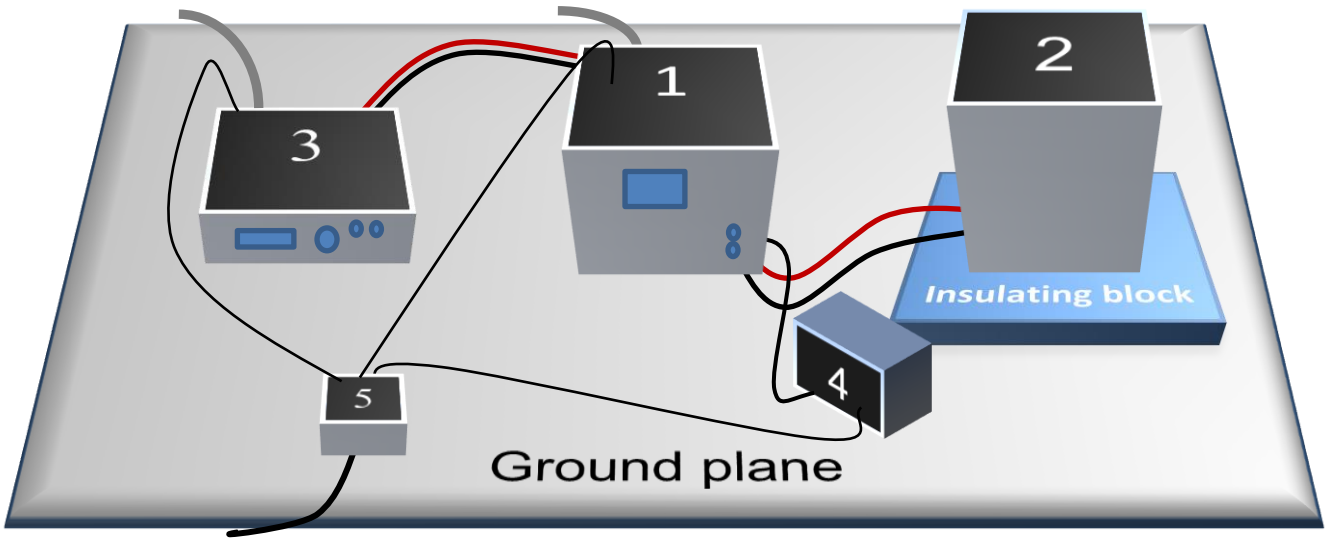
- Different power supply voltages of 12V, 24V, 42V, 48V and 70V (or specific)
- Different power supply currents, nominal power supply current of 50 A, 100 A and 200A
- Option test Superimposed Alternating Voltage 25KHz
- Option test Pulse A and Pulse B (#5)

A microprocessor-controlled 7" touch screen display unit is integrated and permits an easy operation of the generatator.
The software program CAR-remote permits the PC control of the generator via Ethernet and also allows the standardized documentation according to IEC 17025 and the evaluation of test results.
The user can use the standard test routines (ISO, VG, Car manufacturer specific) or define his own test sequences.
It is equipped with an Impulse Recording Function (IRF) to record definite impulses (with oscilloscope).

Furthermore, nearly all customer-specific impulse adjustments are possible by the flexible software control.
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.

Options	Description
PC Software CAR-Remote (power supplies required)	control of CAR - Tester 14 control of PS xx-xx control of PG2804 control of CAR-Transient Emission 14
CAR-Transient Emission 14	slow and fast pulse
Load Dump PG 2804 acc. to ISO 16750	Test A, (Puls #5) 800J
Load Dump PS 3x66-55 acc. to ISO 16750	With Power Supply PS 330-11, Test A + Test B
Build in 19“ Rack 9HE, 600 deep	
CDN 2012 acc. to ISO 7637-3	Capacitive Coupling clamp
ICC-F140 acc. to ISO 7637-3	Inductive coupling clamp

Basic circuit vehicle CAR-TEST-SYSTEM 14



1 CAR-SYS Generator
with internal power supply resistance R_i
ground connection; maximum length for test pulse 3: 100 mm
2 device under test disconnected / connected
3 Power supply 70V/ 200A
4 Oscilloscope, at monitor output, built in 1:100
5 Ethernet switch including LWL converter
Connected with PC control (CAR-Remote Software)

Options :
- CAR-Transient Emission
- CAR-SS-A1250-16E
- Load Dump 2804
- Load Dump 3xPS 66-55

Technical specifications:	CAR-TEST-SYSTEM 14
Mainframe	
Microprocessor controlled touch panel	7”, capacitive
Ethernet Interface for remote control of the generator	built-in
Interface for saving reports	USB
External trigger input /output	Switch/ 10 V
Connector for external safety interlock loop	24 V=
External red and green warning lamps acc. to VDE 0104	230V / 60 W
Mains power	90V - 264V, 50/60 Hz
Dimensions desk top case, W * H * D	450*310*500 mm^3
Weight	35kg
Measurement Equipment Impulse voltage divider, 4.95 kΩ / 50 Ω	100:1, 1 kV-peak
Surge Puls 1, 2a acc. to ISO 7637-2, 2011	
Charging voltage, adjustable	± (0 - 600) V ± 10%
Max. stored energy	18 J
Max. charging time Pulse #1	0.5 sec – 5 sec.
Max. charging time Pulse #2a	0.2 sec
Polarity, switch able	positive, negative
Source resistance; switch able	150/90/50/30/20/10/4/2Ω
Only with negative pulse polarity	
Power supply disconnection time, t2	(0.2-200) ms ± 20%
Trigger delay, t3	< 100 µs
Risetime, variable	1µs bis 5µs, 1µs steps
Puls 1 (Puls # 1 ISO, 1b SAE)	(see Standard 5.6.1)
Waveform	1-5/2000µs oder 1-5/1000µs
Impulse voltage Us	0 - -600V +/-10%
Rise time, tr	1.0µs + 0/-0.5µs; 3.0µs +0/-1.5µs
Pulse duration, td	2000 µs / 1000 µs ± 20%
Puls 2a	(see Standard 5.6.2)
Waveform 1/50µs	1/50µs
Impuls voltage Us	±0 - 600V
Rise time, tr	1.0 µs +0µs/-0.5µs
Pulse duration, td	50 µs ± 20%
Pulse 2b, with Power Supply PS 66-55 (transients after ignition is switched)	**12V / 24V System** (see Standard 5.6.2)
Us	0-66V
td	0.02 - 2s
t12, tr, t6	1 ms +/-0.5ms
BURST Puls 3a/3b ISO 7637-2, 2011	(see Standard 5.6.3)
Amplitude of burst output voltage, adjustable	± (25-800) V ± 10%
Waveform	
Rise time, tr	5.0 ns ± 30 %
Pulse duration, td	150 ns ± 30 %
Source resistance, Rs	50 Ω
Polarity, switch able	pos / neg
Pulse period t1, adjustable	0,01 ms - 1.0 ms
Burst duration t4, adjustable	0,01 ms - 25 ms
Burst period t5, adjustable	10 ms - 1000 ms
Max. continuous burst frequency	20 kHz

Technical specifications:	CAR-TEST-SYSTEM 14
Power supply switch:	
Output current, depending on system type	50 A, 100 A, 200 A
Max. reverse voltage	800 V
Transient over voltage protection	>1000V
High short circuit current capability	900A
Protection with automatic circuit breaker	50 A, 100 A, 200 A
Amplifier sense line decoupled form output	built-in
Trigger input, connectable to external modules	built-in
Direct current supply voltage	(see Standard 4.2.2)
Test method, Code A-H	for U_N 12V / 24V
Usmin	0-66V; 0-72V
Usmax	0-66V; 0-72V
Overvoltage	(see Standard 4.3.x.x)
Test method (see Standard 4.3.1.1.2)	for U_N 12V
Test method (see Standard 4.3.1.2.2)	for U_N 12V
Test at a temperature of Tmax=20°C (see Standard 4.3.2.2)	for U_N 24V
Us	0-66V
Superimposed alternating voltage	(see Standard 4.4.2)
Test method	Severity level 1-4
Internal resistance of the power supply	50 mΩ to 100 mΩ
Frequency range	50 Hz to 25 kHz
Type of frequency sweep	triangular, logarithmic
Sweep duration	120s
Number of sweeps:(continuously)	5
Power Supply current	30A
Slow decrease and increase of supply voltage	(see Standard 4.5.2)
Test method, Code A-H	for U_N 12V / 24V
Us	0-66V
Rate	0,1-10V/min
Discontinuities in supply voltage	(see Standard 4.6.1.2)
Test method Momentary drop Code A-H	for U_N 12V/24V
Us	0-66V
Drop Voltage	0-66V
Variable waittime	
Test Reset Behavior at voltage drop Code A-H	**for U_N 12V / 24V** (see Standard 4.6.2.2)
Us	0-66V
Drop step	1-100%
Drop width	1-100s
Drop period	2-101s

Technical specifications:	CAR-TEST-SYSTEM 14
Test method Starting profile Level 1-4 (sine between)	**for U_N 12V / 24V** (see Standard 4.6.3.2)
Us6	0-66V
Us	0-66V
tf	1-10ms
t6	1-100ms
t7	1-100ms
t8	500-10000ms
tr	1-100ms
Load Dump: **- With PG 2804 or** **- In conjunction with 3xPS 66-50 (option), part of the CAR SYS**	
Test method Test A (see Standard 4.6.4.2.2)	for U_N 12V / 24V
Test method Test B suppression (see Standard 4.6.4.2.3)	for U_N 12V / 24V
Us	0-200V
Imax	till 50A
Ri	0,5 - 8Ω, steps 0.5Ω (0,5 – 8 Ω in steps 0,5 Ω)
td	40 - 1000ms
tr	2 - 20 ms +0/-5ms steps 1ms
Repetition	20s

Example configuration of HILO-TEST system

CAR-TEST-SYSTEM 14 I
Puls #1, #2 und #3, Built in 19” Rack

+ Option Power Supply PS 66-55 (66V, 55A, 3300W)
Puls #2b, #4, and more, 50A continuous current (battery load), see technical specification

+ Option 19” rack
9HE, 600 mm deep

CAR-TEST-SYSTEM 14 II
Puls #1, #2 und #3, built-in 19” rack
+ power supply amplifier PS 66-110, (66V, 110A, 6600W)
Pulse #2b, #4, 100 A= cont. current, and other tests, see tech. specifications

CAR-TEST-SYSTEM 14 III
+ power supply amplifier PS 54-220, (54V, 220A, 9900W)
Pulse #2b, #4, 200 A= cont. current, and other test, see tech. specifications