TECHNICAL SPECIFICATION

APV6050 Automotive Voltage Variation Simulation Generator 1PC

Main Features:

- Abundant testing function, integrates DC power supply, ISO16750 and P2bP4 Immunity Waveform, can realize the **12V/24V** measurement of electronic equipment of Vehicle;
- 7.8 inch tablet computer built-in, friendly man-machine interface, convenient operation with touchable screen;
- Voltage & Current sampling module built-in, real-time monitoring the output condition;
- Short-circuit and overheat protection, long-term operation reliable ;
- Output impedance: 0mΩ～100mΩ(selectable);
- voltage on-line compensation function, system can realize precision testing;
- Multiple testing can be automatic proceed by one touch;
- Support U disk data import and export;
- RJ45/WIFI communication, can achieve remote control by computer / wireless control
- The Max.Current could be customized to 100A or more.

Technical specification:

1) Voltage of DC power supply

12V DC power supply system

Code	Voltage of power supply								
	U_{smin}	U_{smax}	Accuracy	Injection time	Transient response time	Voltage ripple	Load regulation rate	internal resistance	Maximum compensation voltage
A	6V	16V	±0.2V	1~9999s / continues	＜100μs	＜0.2V	＜1%	0-100mΩ	4V
B	8V	16V							
C	9V	16V							
D	10.5V	16V							
USER	4V	24V							

24V DC power supply system

Code	Voltage of power supply

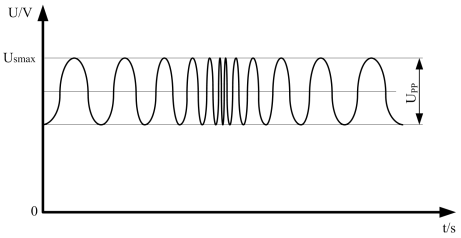
	U_{smin}	U_{smax}	Accuracy	Injection time	Transient response time	Voltage ripple	Load regulation rate	internal resistance	Maximum compensation voltage
E	10V	32V	±0.2V	1~9999s / continues	＜100μs	＜0.2V	＜1%	0-100mΩ	4V
F	16V	32V							
G	22V	32V							
H	18V	32V							
USER	10V	60V							

2) Over voltage

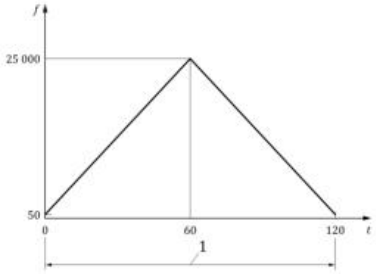
Overvoltage test grade

Nominal voltage U_t（V）	Output voltage U_A（V）		Duration time	Nominal time requirement
12	18		1s ~ 9999s	60min
	24			60s±10%
	USER	U Upper limit U lower limit 12~24V		/
24	36			60min
	USER	U Upper limit U lower limit 24~60V		/

3) Superimposed AC voltage



Waveform of Superimposed AC voltage

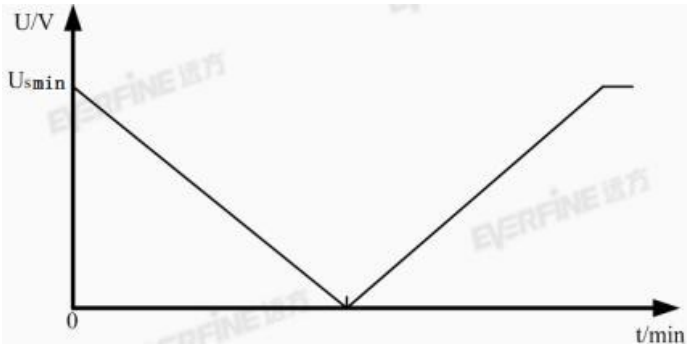


frequency scan

Superimposed AC voltage test grade and waveform parameters

Test grade and waveform parameters	U_N = 12V	U_N = 24V
Test voltage U_{Smax}	16 V	32 V
Grade Ⅰ U_{pp}	1 V	1 V
Grade Ⅱ U_{pp}	4 V	4 V
Grade Ⅲ U_{pp}	/	10 V
Grade Ⅳ Upp	2V	/
USER U_{pp}	1V~6V(0.5V/step)	1V~10V(0.5V/step)
USER U_N	10V~16V(0.1V/step)	20V~32V (0.1V/step)
Lower limit of frequency	50 Hz	
Upper limit of frequency	(20~100) kHz continuous adjustable	
Frequency scan type	Triangle, Logarithm	
Frequency scan duration time	120s	
voltage deviation	±0.2V	
Time/frequency deviation	±5%	

4) Voltage slow rise & drop



Voltage slow rise & drop

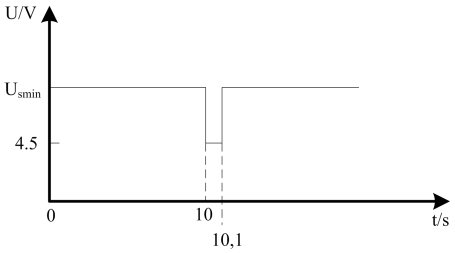
The voltage of power supply slow drop from U_{Smin} to 0 V at the speed of (0.5 ± 0.1) V/min, and then slow rise from 0 V to U_{Smin}.

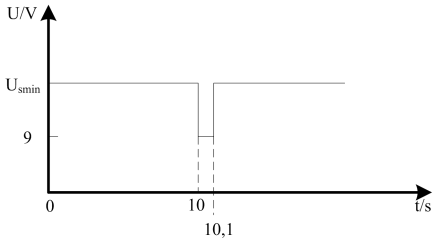
Voltage slow rise & drop test grade

	System type	Grade	Voltage Usmin	Repeat interval	Repeat time
Voltage slow rise &drop	12V system	A	U=6V	(1~99000)ms	1~99 time
		B	U=8V		
		C	U=9V		
		D	U=10.5V		
		USER	U=（6V~24V） Voltage change rate：(0.1~1.0±0.1)V/min		
	24Vsystem	E	U=10V		
		F	U=16V		

		G	U=22V		
		H	U=18V		
		USER	U=（10V~60V） Voltage change rate：(0.1~1.0±0.1)V/min		

5) Short interruption of the voltage of power supply





12V system voltage interruption **24 V system voltage interruption**

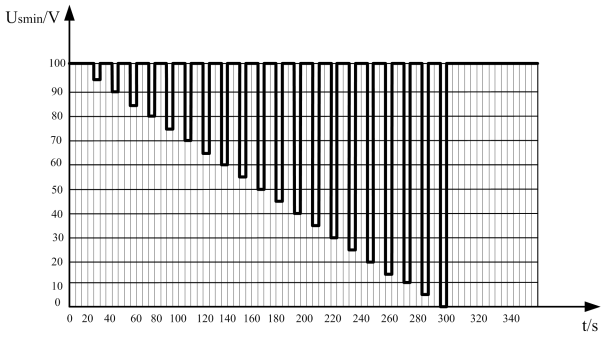
The voltage interruption: voltage drop from U_{Smin} to the aimed figure, and then rise back to the $U_{smin.}$

Voltage error：±0.2V, Time error：±5%.

Voltage interruption test grade

System type	Grade	U_{smin}→U_{drop}	Repeat interval	Repeat time	Pulse duration
12V system	A	6V→4.5V	1s~9999s	(1~99) times	(100~9999)ms
	B	8V→4.5V			
	C	9V→4.5V			
	D	10.5V→4.5V			
	USER	U_{smin}（6.0~12V） →U_{drop}（0~4.5V)			
24V system	E	10V→9V			
	F	16V→9V			
	G	22V→9V			
	H	18V→9V			
	USER	U_{smin}（10.0~24.0V）→ U_{drop}（0~9.0V)			

6) Voltage dip



Waveform of voltage dip

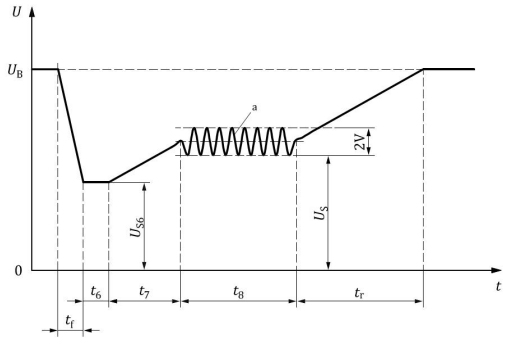
The voltage of power supply drop from U_{Smin} to 0.95 U_{Smin} at the rate of 5% interval, hold 5s and then rise to U_{Smin}. Hold for at least 10s, and then drop to 0.9 U_{Smin}. Hold 5s and then rise

to U_{Smin}，likewise until the voltage drop to 0V, and then rise up to U_{Smin} again.
Voltage error：±0.2V, Time error：±5%.

Voltage dip test grade

System	grade	U_{Smin}	Repeat interval	Repeat times
12V system	A	6V	（1~99000）ms	（1~99）time
	B	8V		
	C	9V		
	D	10.5V		
	USER	6.0~12V		
24V system	E	10V		
	F	16V		
	G	22V		
	H	18V		
	USER	10.0~24.0V		

7) The waveform of the voltage starting



Waveform of voltage starting

12V system voltage starting test grade

grade/voltage/duration time（12V system）						
	Ⅰ	Ⅱ	Ⅲ	Ⅳ	USER	Tolerance
U_{S6}	8V	4.5V	3V	6V	1.5~7V	-0.2V
U_S	9.5V	6.5V	5V	6.5V	4~9.5V（U_{S6}≤U_S）	
t_f	5ms					±10%
t_6	15ms				10~50ms	
t_7	50ms				1~50ms	
t_8	1s	10s	1s	10s	0.5s~20s	
t_r	40ms	100ms	100ms	100ms	40~100ms	
f	2Hz	2Hz	2Hz	2Hz	1~5Hz	/
U_{PP}	2V	2V	2V	2V	1~3V	/
Phase	180°	180°	180°	180°	0° or 180°	/

12V system voltage starting functional status

Code	functional status（12V system）			
	Ⅰ	Ⅱ	Ⅲ	Ⅳ
A[1]	a[2]	b[2]	b[2]	a[2]
B[1]	a[2]	b[2]	c[2]	b[2]
C[1]	b[2]	c[2]	c[2]	c[2]
D[1]	b[2]	c[2]	c[2]	c[2]

Note:

- B、C、D represent the different voltage of 12V system;
- a、b、c represent the functional status grade of Class A、Class B、Class C, and please refer to the ISO 16750-2 standard for the meaning of each functional status grade.

24V system voltage starting test grade

grade/voltage/duration time（24V system）					
	Ⅰ	Ⅱ	Ⅲ	USER	Tolerance
U_{S6}	10V	8V	6V	(5~12)V	-0.2V
U_S	20V	15V	10V	(12~16)V	
t_f	10ms				±10%
t_6	50ms			(10~50)ms	
t_7	50ms			(1~50)ms	
t_8	1s	10s	1s	(0.5~20)s	
t_r	40ms	100ms	40ms	(40~100)ms	
f	2Hz	2Hz	2Hz	(1~5)Hz	/
U_{PP}	2V	2V	2V	(1~3)V	/
Phase	180°	180°	180°	0° or 180°	/

24V system voltage starting functional status

Code	functional status		
	Ⅰ	Ⅱ	Ⅲ
E[1]	a[2]	b[2]	b[2]
F[1]	b[2]	c[2]	c[2]
G[1]	b[2]	c[2]	c[2]

Note:

- E, F, G represent the different voltage of 24V system;
- a、b、c represent the functional status grade of Class A、Class B、Class C, and please refer to the ISO 16750-2 standard for the meaning of each functional status grade.

8) Reverse voltage

Reverse voltage test grade

System type	Test grade	Test voltage U_A（V）	Duration time	Time requirement of the standards
12V	4	4	1~9999s	（60±6）s
	14	14		
	USER	4~18V		
24V	28	28		
	USER	10~36V		

9) Open circuit mode

Open circuit test parameters

Type	Open circuit impedance（MΩ）	Break time	Time requirement of the standards
Circuit breaker (single line)	≧10	1~9999s	（10±1）s
Circuit breaker (mutil line)			

10) Short circuit mode

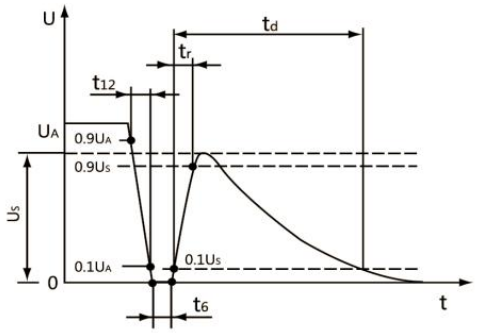
Short circuit test parameters

Short circuit current（A)	50A

11) P2b Mode

P2b test technical specification

Parameters	12V system	24V system
Stable voltage U_A	13.5V±0.5V	27V±1V
Pulse volatage U_S	10V	20V
Pulse duration time t_d	0.2s～2s (0.1s/step)	
Voltage drop time t_{12}	0.5ms~1.5ms (0.1ms/step)	
Pulse rise time t_r	0.5ms~1.5ms (0.1ms/step)	
Voltage delay time t_6	0.5ms~1.5ms (0.1ms/step)	
Pulse interval time	0.5s～5s (0.1s/step)	
Allowable repetition	1～99次 (1/step)	
Max. Load current I_{max}	50A	

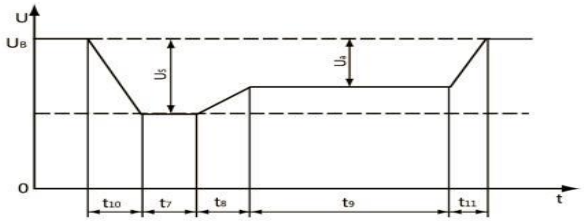


Test waveform of pulse P2b

12) P4 Mode

P4 pulse technical specification

Parameters	12V system	24V system
Stable voltage U_B	12V±0.2V	24V±0.4V
The first step of voltage drop U_S	6.0V～7.0V (0.1V/step)	12.0V～16.0V（0.1V/step）
The second step of voltage drop U_A	2.5V～6.0V (0.1V/step)	5.0V～12.0V（0.1V/step）
The stable time of the first voltage drop t_7	10ms～45ms (1ms/step)	5ms～100ms（1ms/step）
The stable time of the first voltage rise t_8	1ms～50ms (1ms/step)	
The stable time of the second voltage drop t_9	0.5s～20.0s (0.5s/step)	
The time of the first voltage drop t_{10}	5 ms	10 ms
The time of the second voltage rise t_{11}	5ms～100ms (1ms/step)	
Pulse interval time	1min~5min (1min/step)	
Allowable repetition	1～99 times (1/step)	
Max. Load current I_{max}	50A	



The test waveform of P4 pulse